MINISTRY OF HEALTH
DECISION BRIEFING NOTE

Cliff # 1087027

PREPARED FOR: Arlene Paton, Assistant Deputy Minister, Population and Public Health - **FOR DECISION**

TITLE: Guidelines for Addressing Lead in Drinking Water

PURPOSE: To seek ADM approval to adopt new guidelines for lead in drinking water

BACKGROUND:
Lead in water can cause adverse neurodevelopmental and behavioural problems in children among other health effects. Under certain conditions, leaching of lead from water supply distribution systems and older indoor plumbing can result in adverse concentrations in tap water. Water quality results from several communities in British Columbia, as well as drinking water issues in Flint, Michigan, have highlighted the need for specific BC guidance on evaluating and mitigating lead in drinking water.

Health Canada establishes national guidelines for maximum acceptable lead concentrations in drinking water, while the provinces are responsible for regulating community water systems to meet health protection objectives. Health Canada is currently revising the guidelines and is expected to take the position that no amount of lead is safe, and to reduce the current maximum acceptable concentration from 10 µg/L to 5 µg/L, or as low as reasonably achievable.

The Ministry of Education, on advice of the Provincial Health Officer, has directed all public and independent schools in BC to test drinking water and to develop mitigation strategies if necessary. Health authorities need guidance to provide consistent advice to school boards on evaluating lead. Consequently, the provincial Environmental Health Policy Advisory Committee (EHPAC) requested the Ministry of Health draft guidelines that lay out roles and responsibilities as well as best practices to test and mitigate lead in drinking water.

DISCUSSION:
The Draft *Guidelines on Evaluating and Mitigating Lead in Drinking Water Supplies, Schools, Daycares and Other Buildings* (Appendix A) have been developed and vetted through EHPAC and Drinking Water Leadership Council. The prevalence of blood lead levels in BC children is out of scope of the project, however, the issue is considered indirectly as the guidelines are designed to prevent retention of lead in children's blood.

Evaluating lead in drinking water is more complex and site-specific than other drinking water parameters because it comes from points in the distribution system and from building plumbing, rather than originating in the water source. Consequently, decentralized, rather than centralized testing is required, which is more labour and cost intensive than traditional testing. Testing protocols may also differ depending on whether there is a need to evaluate corrosion (i.e., the ability of water to dissolve and carry lead), to evaluate health risk, or to determine sources of lead in a building. The guideline summarizes best practices and explains the difference between these protocols.

Lead is a unique contaminant because it enters water from distribution lines or from building plumbing systems, which raises questions as to who has responsibility for mitigation. The position of the guideline is that suppliers, building owners, users and regulators each have a distinct role to play in mitigating lead problems. Mitigation can range from simple flushing of pipes or replacing plumbing by the building owner, to centralized conditioning of water by the water supplier to reduce corrosion.

s.13
s.13 Under the *Drinking Water Protection Act*, the guideline must be considered when there is an elevated risk, but it is not an expectation on all communities to fully implement everything in the guide.

OPTIONS:
Option 1 – s.13
s.13

Option 2 – s.13
s.13

Option 3 – Adopt guidelines as interim, and update when Health Canada releases new lead guidelines.
This option responds to immediate issues in high risk communities and schools. The proposed guideline draws heavily on the updated Health Canada draft, and public consultation for that is now complete. This approach allows feedback to be incorporated after Health Canada releases their guideline and following some experience through implementation of the proposed BC lead guideline.

FINANCIAL IMPLICATIONS:
Direct financial implications to the province are not expected, however, water suppliers, building owners, health authorities and consumers may face costs related to the need for mitigation outlined in the guidelines.

RECOMMENDATION:
Option 3

(Approved)/Not Approved
Arlene Paton
Assistant Deputy Minister,
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July 13, 2017
Date Signed

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GUIDELINES ON EVALUATING AND MITIGATING LEAD IN DRINKING WATER SUPPLIES, SCHOOLS, DAYCARES AND OTHER BUILDINGS

APRIL 2017

HEALTH PROTECTION BRANCH

BRITISH COLUMBIA

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1. PURPOSE AND SCOPE

This document provides guidance to drinking water officers on the roles and responsibilities of stakeholders in the reduction of lead in drinking water at the tap.

This document also provides guidance and tools for:

- Screening communities to identify those with increased risk of corrosive water;
- assessing typical lead concentrations in drinking water at the tap in communities;
- screening and assessing typical lead concentrations of water in schools, day cares and other buildings; and
- possible mitigation strategies and examples of communication material.

This document does not address collecting or assessing human exposure data such as blood lead reporting, or assessment of broader human lead exposure beyond drinking water. It also focusses on lead corrosion only, and does not discuss other corrosion products including copper and iron, that can cause significant aesthetic and economic impacts if unchecked.

2. INTRO/BACKGROUND

Ingestion of lead can be hazardous to human health, especially for young children and infants, as they absorb lead more easily than adults and are more susceptible to its harmful effects. Even low level exposure may harm the intellectual development, behaviour, size and hearing of infants and children. Lead can also cross the placenta during pregnancy to affect the unborn child, and can be released into breast milk.

The degree of harm from lead exposure depends on a number of factors including the frequency, duration, and dose of the exposure(s) and individual susceptibility factors (e.g., age, previous exposure history, nutrition, and health). The degree of harm also depends on an individual's total exposure to lead from all sources in the environment – air, soil, dust, food, and water. Common sources of lead exposure for children are chips and particles of deteriorating lead paint found in house dust and soil. While drinking water is the second largest source of exposure when lead levels in water are above 5 µg/L, there is currently no evidence that drinking water in BC is a significant source of dietary lead intake. It is important to note that people often consume water from numerous sources throughout the day (i.e. workplaces, schools, homes, restaurants), thereby the lead concentration in water from any one source may only represent a small portion of total daily intake. Nonetheless, it is important to minimize lead intake from all sources as much as possible, and where Drinking Water Officers consider drinking water is at risk of having elevated concentrations of lead, take steps to reduce lead in drinking water to levels as low as is reasonably achievable.

Under the *Drinking Water Protection Act* (DWPA), drinking water supply systems in BC are responsible for monitoring water they deliver to verify it is within acceptable limits for lead and other metals. The Guidelines for Canadian Drinking Water Quality (GCDWQ) suggest a maximum acceptable concentration

(MAC) of total lead in drinking water of 10 micrograms per litre (µg/L) or 10 parts per billion (ppb). You may also see this guideline value written as 0.010 milligrams per litre (mg/L) or 0.010 parts per million (ppm).

Most drinking water supply systems in BC deliver water that has levels of lead well below 10 µg/L. Lead is usually not found in drinking water when it leaves the treatment plant. Instead lead tends to leach out of pipes and fixtures in buildings or homes, or service lines connecting homes to water mains[1]. The extent of leaching depends on the nature of the plumbing materials used, the corrosiveness of the water (i.e. the extent to which the water can cause a chemical reaction that will cause a deterioration in the material used in the pipes), and the length of time that the water is stagnant in the plumbing. The longer water remains in contact with leaded plumbing, the more opportunity there is for lead to leach into the water. As a result, older facilities with intermittent water use patterns and older plumbing materials, such as schools, child care facilities and office buildings, may have elevated levels of lead in their drinking water. The water sits in the pipes of these facilities for long periods (overnight, weekends, and holidays), which allows the leaching of lead to occur. If the water entering the building is corrosive, the lead will leach more quickly. Corrosive water may sometimes be described as “acidic” or “aggressive”.

Since 1989, the BC Building Code has restricted the lead content in components in the construction of potable water lines and fixtures. This restriction reduces the amount of lead available to react with corrosive water and lowers the risk of lead leaching into drinking water supplies. As a result, in buildings constructed on or before that time, there may be a greater probability of finding elevated lead levels in the water from service plumbing, especially if the corrosiveness of the water entering the building and the water use patterns in the building are conducive to lead leaching.

The quality and characteristics of the delivered water not only impact lead solubility and lead speciation (i.e., the chemical and mineral form of lead created found), they also impact the behaviour of pipe scales (i.e., a coating that forms inside of pipes) that contain lead. Physical disturbances or changes in water quality and flow velocity can cause lead particles found within pipe scales to become dislodged and released into drinking water. These lead particles can cause intermittent spikes in the lead concentrations found in drinking water. Screened aerators on kitchen taps may trap these particles and should be periodically cleaned.

Under the National Plumbing Code (NPC), all fittings must comply with the American Society of Mechanical Engineers (ASME) 112.18.1 / Canadian Standards Association (CSA) B125.1 standard for plumbing supply fittings. In 2012, these standards revised the requirement for "lead-free" components from 8% down to 0.25% lead as a weighted average with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures. This means that fixtures produced as late as 2012 could legally contain 8% lead – enough to cause an exceedance of the MAC on stagnant ("first flush") water samples.

Anecdote: A city in Northern BC was conducting a survey of lead content in the drinking water in their various facilities. In one new building, built in 2013, the lunchroom tap surprisingly failed its first-flush sample. The City responded by changing the tap to a newer model with an NSF certification. The retest for lead was lower, but again exceeded the MAC. Only when the shutoff valve was also replaced did the sink pass the first-flush lead test.

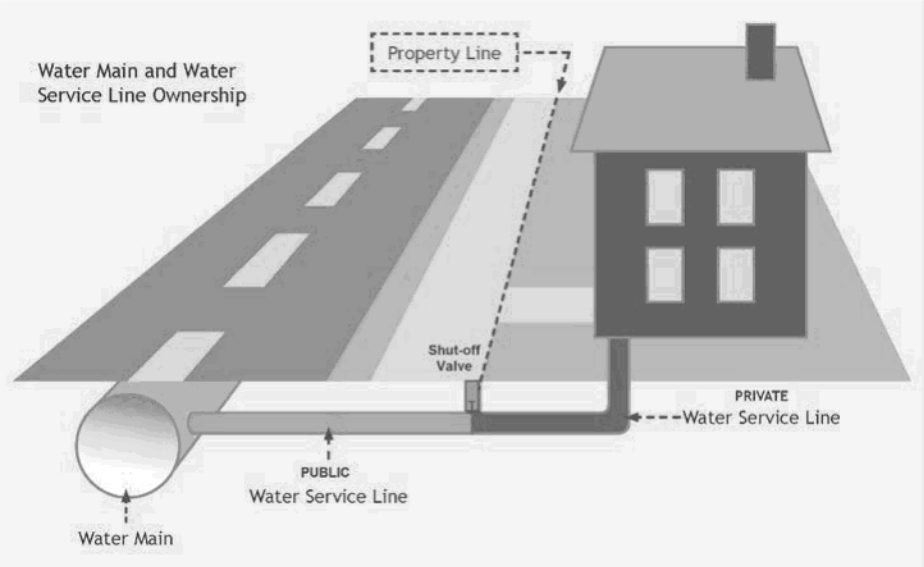
[1] Service lines connect individual buildings to the water supply system distribution main. Service line ownership is shared. The utility typically owns the portion up to the property line and the home or building owner owns the portion on their property. Before the 1960s, service lines were commonly made of lead in some communities.

3. ROLES AND RESPONSIBILITIES

The question of responsibility for lead in drinking water is unique in that water delivered by water suppliers may be potable at the point of delivery, but may have characteristics that make it susceptible to leaching lead and other metals from pipes, solder and fixtures after it is delivered to the property. This may result in significant portions of the community being affected or localized problem areas affecting some buildings or neighborhoods in a community but not others. The problems can also be localized within buildings, affecting only some taps depending on water use patterns, plumbing configurations and materials, and differences in plumbing fixtures.

The issue of who is responsible for lead in drinking water is complex given that lead in drinking water may come from the pipes and fixtures contained within private properties, or services lines. Water suppliers are not responsible for the maintenance or replacement of plumbing beyond service lines and other fixtures upstream of the curb stop where water is delivered, after which it becomes the responsibility of the property owner (see Figure 1). So while the water supplier may own the water supply system, property owners own the pipes and plumbing on their property. This shared ownership also means a shared responsibility to mitigate excessive lead concentrations found at the tap. Property owners are responsible for the condition of their building's plumbing and for taking any necessary remedial action to minimize lead exposure deriving from the plumbing and fixtures in their property, such as replacing leaded plumbing and fixtures, installing treatment devices to remove lead, or implementing a flushing program. Where the characteristics of the water (i.e., the corrosiveness) are expected to significantly contribute to leaching, the water supplier has the responsibility to take reasonable steps to mitigate likelihood of a hazard being associated with the water being delivered to the end user.

Figure 1: Water service line responsibilities (modified from: https://www.alexandriava.gov/uploadedImages/health/info/AlexandriaWaterService.jpg



Several statutes play a role in ensuring that drinking water does not pose a health risk for consumers. These include: the *Drinking Water Protection Act,* the *BC Plumbing and Building Code,* the *Public Health Act,* the *School Act* and the *Community Care and Assisted Living Act.* As these statutes apply concurrently, the overlap indicates a shared responsibility of all parties involved.

- The *Drinking Water Protection Act:*
    - Requires water suppliers to deliver potable water to customers. While the DWPA may not directly compel water suppliers to ensure potability beyond the point where it is delivered to the consumer, health authorities may impose conditions on permits that require water suppliers to take actions to reduce the likelihood that the water they deliver contributes to a drinking water health hazard.
- The BC Building Code:
    - Speaks to plumbing standards within buildings. However, this statute is only applied at the time of construction and many buildings constructed prior to 1989 can be assumed to be at an increased risk for lead leaching from plumbing under certain water conditions.
- The *School Act* and the *Community Care and Assisted Living Act* (Child Care Licensing Regulation):
    - These Acts protect children in schools and in licensed child day care facilities. Medical Health Officers may act as School Health Officers under the *School Act* and may conduct inspections, and where necessary impose requirements for the construction and/or operation of the facilities. Similarly, Licensing Officers (who are delegates of the Medical Health Officer) inspect child day care facilities, issue licences to operators of child care facilities, and where necessary impose requirements for the health, safety and well-being of children who attend child day care, the physical premises and/or operation of the facilities. Similarly, where there is reason to believe there are children at risk due to lead exposure in residential care facilities, action may also be warranted to assess and mitigate these situations.
- The *Public Health Act:*
    - Requires landlords to provide potable water to tenants. The *Public Health Act* may also be used as a legal tool where a lack of action by water suppliers, building owners, or others may contribute to a health hazard.

Successful reduction of lead in tap water depends on a multi-barrier approach with participation and actions of all parties as it is difficult to achieve lead reduction through centralized mitigation alone. The following table lays out high level expectations of roles and responsibilities of each stakeholder in this process. More specific roles and responsibilities related to each stakeholder are discussed below.

Table 1. Stakeholder Responsibility for Lead in Drinking Water

Responsibility	*Responsible Stakeholders*		
	Drinking Water Supply systems	***Schools/Day cares***	***Private buildings***
Screening & Prioritizing	*HA* + Water supplier*	*HA + SD + IS + CF*	*Building owner*
Planning to Test	*HA + Water supplier*	*HA + SD + IS + CF*	*Building owner*
Testing	*Water supplier* *Building owner***	*SD + IS + CF*	*Building owner*
Interpretation	*HA*	*HA*	*HA upon request*
Planning to Mitigate	*Water supplier + HA review & permitting*	*SD + IS + CF + HA review*	*Building owner*
Implementing Mitigation	*Water supplier*	*SD + IS +CF*	*Building owner*
Verification of Mitigation	*Water supplier + HA review*	*SD +IS +CF + HA review*	*Building owner*
Communication/ Education	*Water Supplier (system specific)* *HA (community level)*	*SD + IS +CF (facility specific)* *HA (community level)*	*Building owner (building specific)* *HA (community level)*

** HA- Health Authorities; SD – School Districts; IS – Independent Schools; CF – Care Facilities*
***As lead testing is done at the tap, building owners are key participants in testing programs*

3.A ROLES AND RESPONSIBILITIES OF HEALTH AUTHORITIES

The high level roles of drinking water officers (DWO), medical health officers (MHO), environmental health officers (EHO), public health engineers (PHE) and licensing officers (LO) are to:

- Screen communities to identify those likely to have lead issues, and for those identified;
- work with water suppliers to determine if elevated lead concentrations in community tap water pose an unacceptable risk to end users, and where there is an unacceptable risk; and
- advocate for, or mandate the evaluation and mitigation of lead risks by all stakeholders through appropriate and reasonably achievable mitigation measures.

In communities likely to have lead issues due to corrosion concerns, PHEs and DWOs may need to determine with water suppliers whether concerns are best addressed through centralized mitigation measures at the water supply (e.g., pH and alkalinity adjustment or the addition of corrosion inhibitors at treatment), decentralized measures by users (e.g., flushing, point-of-use treatment devices, leaded plumbing replacement, etc.), or by a combination of both.

The role of the health authority in evaluating and mitigating the risk of lead in a community should include actively working with all stakeholders to ensure they are aware of risks and of the actions they should take to evaluate and reduce risks. Where necessary, health authorities may also need to take progressive enforcement actions with regulated facilities. The priority of any enforcement action should

be directed towards large community water systems where the corrosiveness of the water supply contributes to excessive lead levels known to exist in public and private buildings.

As infants and children are more susceptible to health effects from lead, schools and care facilities where children may be exposed to elevated lead concentrations in drinking water should be the focus of health authority efforts. Health authorities should include evaluation of risks for lead in drinking water as part of their engagement with schools and child day care facilities and re-assess the frequency of monitoring in areas where lead has been found to be a problem. Drinking water officers should work with licensing officers to introduce testing for lead and ensure appropriate mitigation measures are in place as part of inspections and licensing requirements for child day care facilities.

Details of specific roles and responsibilities of health authorities in relation to stakeholders are outlined below. Technical information on assessing risks and sampling are in the appendices of this document.

3.B ROLES AND RESPONSIBILITIES OF WATER SUPPLIERS

The *Drinking Water Protection Act* requires water suppliers to deliver potable water to users, but does not directly compel water suppliers to ensure potability after delivery to customers. However, where it is probable that the nature of the water is likely to pose a potential health risk to users after delivery, the DWO may be justified in requiring the water supplier, through conditions on the operating permit, to take steps to assess whether corrosivity of the water, and/or resulting water lead concentrations in buildings presents a risk to the population, and if necessary, to take steps to reduce risks.

To assess corrosion risks in community water supplies, water suppliers, in collaboration with the local health authority, should develop plans to conduct surveys, tests, inventories or studies to:

- Screen water for indicators of corrosivity;
- survey the prevalence of lead service lines in communities;
- survey the prevalence of buildings with plumbing and fixtures with elevated lead content; and
- implement testing, including surveys of representative samples taken at consumers' taps to evaluate impact of the corrosivity of the water supply in the community.

Results of assessment programs should be reviewed with health authorities. Where the corrosive nature of water quality is determined to contribute to lead exposure from interaction with plumbing at the community level, building owners and the water supplier may need to take steps to reduce risks as described later in the document. For water suppliers, these risk mitigation steps may be done informally through agreement, or may be formalized by the health authority through conditions on its operating permit.

Table 2. Health authority and water supplier roles

Health Authority	Water Supplier
• Liaise with water supplier and advise them as necessary to conduct community risk	• Liaise with health authority on the necessity to conduct a community risk assessment for

Health Authority	Water Supplier
assessment for corrosion and typical lead exposure. • If necessary, in consultation with the Water Supplier, place conditions on the operating permit, to ensure that an adequate assessment of population health risks from lead in drinking water is undertaken. • Provide direction and advice to water supplier on sampling protocols. • Interpret surveys and studies to advise water suppliers on the risks that the water supply system poses. • Advise water suppliers on public education messaging and provide information on risks. • Follow up on complaints or concerns regarding potential health hazards in the community. • Provide progressive enforcement to mitigate health hazards under the *Public Health Act* and/or DWPA.	corrosion. • Design and implement a residential testing strategy to evaluate lead exposure burden from drinking water in the community, if necessary. • Conduct sampling, tests and surveys in the community. • Report any potential health hazards associated with water supply to end users of water supplies related to the corrosivity of water. Provide messaging and information to the public regarding what is being done to mitigate hazards by the water supplier, and what the public can do to protect itself. • Minimize leaching impacts through planning and implementing corrosion control programs.

3.C ROLES AND RESPONSIBILITIES OF SCHOOL DISTRICTS AND INDEPENDENT SCHOOLS

Schools districts and independent schools are responsible for operating schools in a manner that does not adversely affect the health of their students. School districts and independent schools should work with heath authorities to establish a plan to identify where lead risks might occur, as well as to mitigate any identified risks. Details on developing a plan are found in Section 4.

Table 3: Health authority and water supplier roles relative roles of school districts, independent schools, health authorities, and the provincial government in determining risk and actions that should be taken to identify and reduce lead risks in schools.

School Districts / Independent Schools	Health Authority	Ministry of Health and Ministry of Education
• Inventory and characterize schools and identify whether they are on a community water supply or school district operated water supply. • Plan and carry out screening/testing programs in consultation with the health	• Work with water suppliers to identify where schools are at increased risk. • Assist school officials to develop plans to evaluate lead risks in schools. Provide advice on sampling protocols. • Interpret results and provide	• Provide policy and guideline direction. • The Minister of Health under the School Act can require the school medical officer to conduct inspections of schools and can require the

School Districts / Independent Schools	Health Authority	Ministry of Health and Ministry of Education
authority. • Plan and implement lead mitigation programs for school buildings. • Communicate risks to parents and students. • Send annual reminders to school maintenance staff regarding flushing or other mitigation measures that might be necessary. • Maintain records and report findings to HAs including a summary of the mitigation strategy that identifies flushing schedules and the locations being flushed.	information on mitigation options. • Review the effectiveness of mitigation options. • Advise school officials on risk messaging for the schools. • Engage with schools to verify lead mitigation programs are adhered to, and follow up on complaints or concerns. • Provide progressive enforcement where necessary if health hazard remains unabated.	MHO to provide a report.

3.D ROLES AND RESPONSIBILITIES OF LICENSED CHILD CARE FACILITIES

Licensed child care facilities are responsible for operating in a manner that will promote the health, safety and dignity of persons in care. Licensed child care facilities should work with heath authorities to evaluate lead risks in their facility, as well as mitigation planning to identify and mitigate the risks.

Table 4: Relative roles of licensed child care facilities and health authorities in determining the actions that should be taken to identify and reduce the risks of lead in drinking water.

Child Care Facilities	Health Authority	Ministry of Health and Director of Licensing
• Plan and carry out screening/testing programs in consultation with health authority where there is a risk of lead in drinking water. • Plan and implement lead mitigation programs for their facilities. • Communicate risks and mitigation steps to parents. May consider sharing with parents new to a facility upon child enrollment, and include in parents	• Provide education materials relating to lead in drinking water. Work with water suppliers to identify where conditions might exist that put facilities at increased risk. • Assist affected facilities to develop plans to evaluate lead risks. Provide advice on sampling protocols. Interpret results and provide information on mitigation options. • Review the effectiveness of mitigation options. • Work with child care facilities to	• Provide policy direction • Develop educational materials on lead in drinking water. • Recommend or require testing for lead in high risk child care facilities.

handbook. • Send annual reminders to staff regarding flushing, alternate sources of water, or other mitigation measures necessary.	develop messaging to users and their families on lead risks in the child care facilities. • Include lead education in inspections. Verify lead mitigation programs are adhered to and effective. Follow up on complaints or concerns regarding lead in child care facilities. • Provide progressive enforcement where necessary if health hazard remains unabated.	

3.E ROLES AND RESPONSIBILITIES OF THE OWNERS OF HOMES AND OTHER BUILDINGS

The BC Building Code provides plumbing standards within buildings; however this statute is only applied at the time of construction. As a result, it can be assumed that most homes and other buildings constructed or altered prior to the 1989 revisions of the BC Building Code have a higher risk of lead leaching into drinking water from their plumbing. Under the *Public Health Act*, the owners of these properties are responsible for ensuring that the plumbing does not create a drinking water health hazard for those who consume the water.

While there are no specific regulations that require lead to be tested and mitigated in individual homes and buildings, owners are required to provide tenants with potable water that is fit to drink without further treatment. Owners are responsible for testing their own water and taking mitigation steps (e.g. flushing, service line/plumbing fixture replacement), and health authorities may provide reference information on the best practices for doing so.

Table 5: Relative roles of building owners and health authorities in determining risk and actions that should be taken to identify and reduce the risks of lead in drinking water.

Building/Home Owners	Health Authority
• Provide potable water to rental units intended to be living accommodations. • Learn about the risks of corrosion from communications from the water supplier (system specific info) and/or the health authority (general info). • Plan and carry out testing on building water. • Provide information and communications to tenants and/or employees. • Develop and implement a mitigation strategy for lead in their buildings.	• Work with water suppliers to ensure that risks are communicated to users. • Provide information to the public on the risks of lead in drinking water, lead testing, the interpretation of test results, and mitigation options.

3.F ROLE OF PROVINCIAL GOVERNMENT

Ministry of Health is the main agency for provincial drinking water policy development. The Ministry will work with Health Canada, BC's health authorities, the Ministry of Education and other stakeholders to provide advice and policy on best practices for assessing lead risks from drinking water, to develop educational material, and to advocate for the reduction of lead exposure to the public from drinking water.

4. ASSESSMENT AND MITIGATION OF LEAD RISKS IN DRINKING WATER

4.A WATER SUPPLY SYSTEM/COMMUNITY LEVEL

EVALUATE AND PRIORITIZE

Screening water supply systems for high risk of corrosion:

Health authorities should work with water suppliers to screen water supply systems for characteristics that suggest potential corrosion risks, and/or the prevalence of buildings at risk. These systems may be prioritized for further investigation of the potential for unacceptable lead concentrations in water for consumers.

The chemistry of corrosivity is complex, typically involving many different factors (chemical, physical or microbiological), which can make it challenging to predict how it will impact leaching when it comes into contact with leaded components.

Many indexes such as the Langelier Saturation Index (LSI), the Ryzner Index, the Aggressiveness Index, the Momentary Excess and the Calcium Carbonate Precipitation Potential, were developed to assess the calcium carbonate–bicarbonate equilibrium, and were historically used as an indicator of the corrosivity of water. However, Health Canada's *Guidance on Controlling Corrosion in Drinking Water Distribution Systems* and Ontario's *Guidance Document for Preparing Corrosion Control Plans for Drinking Water Systems*, report significant empirical evidence contradicting the presumed connection between corrosion and the most common of the corrosion indices, the Langelier Index. The American Water Works Association Research Foundation recommends that the use of corrosion indices for corrosion control practices be abandoned. Because of these limitations, these authorities recommend lead and/or other metal sampling at the tap as the most reliable indicator of corrosive water. This is critical, because corrosivity of the water is under control of the water supplier, whereas the lead content in the plumbing is largely under control of the building/home owner. Because the most reliable indicator of corrosive water is actual corrosion as detected in sampling at the tap, water suppliers should not conclude that their water is not corrosive until that is confirmed by sampling inside buildings and homes.

This being said, the chemistry of the water in water supply systems can be proactively evaluated for risk factors that indicate a higher probability that it will be corrosive. Water supplies with one or more of the

following water chemistry characteristics should be *prioritized* for further evaluation of potential lead risks from corrosion of plumbing in the community:

- Lower pH (<7)
- Low alkalinity (<30 mg/L)
- Low hardness, i.e., "soft water" (<60 mg/L as calcium carbonate $CaCO_3$)[2]

Other drinking water quality parameters that might impact corrosivity may also be considered such as: higher temperatures, fluctuations in free chlorine residual, chloramines, chloride, sulphate, natural organic matter (NOM), oxidation-reduction potential (ORP), and chloride-sulphate mass ratio (CSMR) (see Table 6).

Table 6. Water Quality Factors Affecting Corrosion.

Factor	Effect
pH	Low pH causes iron, lead, and copper corrode rapidly.
Alkalinity and Dissolved Inorganic Carbonate (DIC)	Neutralize strong acids and provide buffering capacity against a pH drop. Affect many reactions in corrosion chemistry.
Hardness	In combination with alkalinity, promote the formation of a protective passivating film.
Disinfectant Residual	Gaseous chlorine lowers pH. Higher chlorine residuals (2 mg/L) may cause protective lead scales.
Dissolved Oxygen	Increases corrosion of copper; effect on lead less certain.
Oxidation Reduction Potential, Redox Potential (ORP, Eh)	High ORP and high pH promote protective lead scales.
Ammonia	Interfere with the formation of passivating films. Oxidation of ammonia (nitrification) lowers alkalinity and pH, increasing corrosion.
Chloride and Sulphate	Chloride (Cl^-) and sulphate (SO_4^{2-}) cause dissolved metals to remain soluble. Increase the salinity (TDS) and electrical conductivity of water. High chloride-to-sulphate-mass ratios (CSMRs) increase corrosion rates for lead solder connected to copper pipe.
Salinity (TDS)	The higher the TDS, the higher the ionic strength and electrical conductivity.
Natural Colour and Organic Matter	May form a protective film and reduce corrosion. May react with the corrosion products to increase corrosion. Food for microorganisms growing in biofilms in the pipes.

[2] According to Health Canada's Guideline Technical Document for Hardness, soft water can lead to corrosion of pipes. The degree to which this occurs is also a function of pH, alkalinity and dissolved oxygen content. According to the Water Research Centre, in water that is soft, corrosion occurs because of the lack of dissolved cations, such as calcium or magnesium in the water. In scale forming water (hard water), a precipitate or coating of calcium or magnesium carbonate forms on the inside of the piping called scale. This scale coating can inhibit the corrosion of the pipe by acting as a barrier, but it can also clog the pipe (i.e., incrustation). Health Canada recommends hardness levels between 80 and 100 mg/L (as $CaCO_3$), which are generally considered to provide an acceptable balance between corrosion and incrustation from scale. (Source: http://healthycanadians.gc.ca/publications/healthy-living-vie-saine/water-hardness-durete-eau/index-eng.php)

Factor	Effect
Corrosion Indices	Langelier Saturation Index (LSI) measures calcium carbonate ($CaCO_3$) scale-forming tendency. LSI does not correlate well with actual corrosion, so LSI is less reliable than sampling at taps for corrosion products.
Temperature	For every 10°C rise in temperature, chemical reaction rates, including corrosion, typically tend to double.
Flow velocity	High velocity: increases the supply of dissolved oxygen; erodes pipe walls if abrasive suspended solids are present. Zero velocity: Stagnation may cause pitting and tuberculation, especially in iron pipes, as well as promoting biological growth
Microbiological	Microbiologically induced corrosion (MIC) ≡ localised high corrosion zones (pinholes) sheltered inside biofilms.
Orthophosphate	Corrosion inhibitor added to water to form a passivating film on the pipe surface.

Based on: ON (2009) Guidance Document for Preparing Corrosion Control Plans for Drinking Water Systems. Section 2.3 Water Quality Factors Affecting Corrosion.

To confirm whether corrosion is an issue for a community's water supply system, the most reliable approach is sampling surveys of lead at consumers' taps as described in Health Canada's *Guideline Technical Document on Corrosion Control*, and Appendix C of this document.

Health Authorities may also consider data from lead testing programs in schools, day cares or other buildings, which may serve as sentinel information for a community, and help flag the need to further investigate.

Where the initial screening of water chemistry (pH, alkalinity and softness) indicates increased risk factors for corrosive water, a survey of the prevalence of service connections and of the typical age and condition of buildings in the community can also help determine the magnitude of risk. This information can also be used in later steps to assist in determining where to focus lead sampling program from consumers' taps. Communities where a high proportion of buildings were constructed prior to 1989, that have not upgraded their plumbing to lower lead content are likely to be at the highest risk of having lead in their plumbing.

Large communities with older housing stock and buildings as well as a water supply with corrosive characteristics should be targeted for further sampling first. Additionally, communities where there has been a change in water source or water chemistry or treatment processes should also be flagged for testing.

TESTING AND EVALUATING RESULTS

Those drinking water systems identified as being at the highest risk by the screening step should develop and implement lead sampling programs conducted at consumers' taps. The objectives of these sampling programs are to:

- Determine whether community level lead mitigation measures are warranted to reduce corrosion;
- establish base lines to help evaluate the effectiveness of any mitigation measures that are adopted; and
- evaluate if the water typically consumed by customers exceeds the maximum acceptable concentration (MAC) level for lead set out in the *Guidelines for Canadian Drinking Water Quality*.

High level descriptions of sampling protocols for corrosion risks, as well as for determining whether concentrations of lead typically found in the community's water meets the *Guidelines for Canadian Drinking Water Quality* are outlined in Appendix C.

MITIGATION

Both centralized and decentralized mitigation measures can be taken to address concerns from lead at user's taps resulting from corrosive water. The most appropriate method will depend on a number of factors. In areas where the nature of the water supply itself is reasonably believed to contribute to a health risk from lead at users' taps, water suppliers should work with health authorities to determine feasible strategies for mitigating lead risk. Reducing risk will usually involve a combination of communicating how consumers can reduce their own risks as well as planning long term corrosion control strategies as follows:

1. Communicate the results of testing programs to consumers and inform them of the appropriate measures that they can take to reduce their exposure to lead. Corrective measures that consumers can take could include any or a combination of the following:
    - flushing the building plumbing system;
    - replacing their portion of the lead service line (if applicable);
    - replacing brass fittings or in-line devices (pre-2012);
    - using drinking water treatment devices certified to reduce lead; and
    - using an alternate water supply for drinking water or food preparation.[3]

[3] Exposure through bathing and other household purposes is not a health hazard.

2. Implement appropriate corrective measures to control corrosion in the drinking water supply system. Results of sampling should be used to help determine the best corrective measures for the system, which may include any or a combination of the following:
    - replacing lead service lines;
    - adjusting drinking water pH and alkalinity;
    - adding corrosion inhibitors;
    - replacing brass fittings or in-line devices containing lead;
    - carrying out *ad hoc* or unidirectional flushing, swabbing, or pigging of water mains to reduce accumulated sediment and biofilms; and
    - maintaining a disinfectant residual to avoid reducing conditions and to control biofilms.

Corrosion control programs have been shown to significantly reduce leaching, but may not eliminate it. Careful consideration should be given to the potential effectiveness, potential unintended effects on water, public acceptance, and the cost of mitigation measures and programs to determine the most appropriate course of action to follow. Bench-scale and pilot testing should be carried out for any proposed change to distribution water chemistry. No matter what type of mitigation measures are employed, an evaluation of the effectiveness of the mitigation measures should be done after they are implemented. Community level assessment and mitigation steps are outlined in the flow chart set out in Appendix A.

4B. INDIVIDUAL BUILDINGS

EVALUATE AND PRIORITIZE

Owners and operators of buildings (particularly school boards and child care facilities), particularly those on water systems identified to be at risk from corrosive water, should evaluate their buildings for plumbing components that can leach lead into drinking water. The complexity of the evaluation may vary depending on whether the building in question is a single family home, a multi-family dwelling, an industrial/office building, a school, or a child care facility; however the overlying evaluation principles will be the same. [4]

Evaluations should include:

- Developing a plumbing profile for the building that identifies plumbing components such as service lines, pipes, solder or fixtures that contain lead, and inventories drinking fountains and other points of consumption that might contain lead or brass;

[4] *For the purpose of this document:*
"buildings" includes private residences and private schools served by a community water system;and
"schools" and "facilities" mean those that are connected to an approved water supplier and are not themselves a water supplier under the DWPA. Schools and other facilities that are their own water supplier may need to also take on roles of water suppliers in this document.

- identifying potential problems and health hazards to users through screening tests and/or more comprehensive testing;
- maintain records and communicate plans and results with stakeholders; and
- taking routine, interim and permanent mitigation measures.

An example of school and child day care assessment and mitigation steps is outlined in the flow chart set out in Appendix B. The following publication from the Province of Ontario manual is an excellent reference for evaluating risks from their plumbing and identifying options to remedy any excess lead in facilities: (2009) A Manual for Operators of Schools, Private Schools and Day Nurseries with excess Lead in their Drinking Water: A resource guide on how to locate the source and remedy the problem [Available at: https://www.ontario.ca/document/manual-operators-schools-private-schools-and-day-nurseries-excess-lead-their-drinking-water].

TESTING AND EVALUATING RESULTS

For schools, licensed child care facilities and other buildings that have plumbing containing lead components, or where there is a lack of information about the plumbing that is in place, screening tests and/or more comprehensive testing programs should be planned and implemented in consultation with regional health authorities.

When testing water, it is important to determine the sampling objective, so that the appropriate sampling protocol is used. Sampling protocols differ depending on the desired objective: e.g. whether it is screening of schools for potential lead problems, identifying fixtures/sources of lead for replacement or to estimate health risk from exposure to lead. In order to provide meaningful results, multiple samples are needed. Health authorities can provide advice on what sampling method is appropriate and can help evaluate and interpret the results.

A high level description of how, when and where to test buildings is outlined in Appendix C. Health authorities can provide advice on how it should be applied to individual facilities, and can help evaluate and interpret the results against the guidelines.

Subsequent to initial screening and evaluation, schools and child care facilities should develop a plan for long term routine lead monitoring. Annual testing would be ideal, however risk-based decisions on frequency may be warranted from a resource perspective. In general, higher risk facilities where lead has been found as a problem may require more frequent testing than facilities where lead is not known to be an issue or risk. In BC, the Ministry of Education has developed policies for schools districts and independent school authorities regarding expectations for lead sampling, reporting and mitigation. These policies (see links below) require regular screening for lead in all schools. This guidance document serves as a guide on how to meet this testing requirement.

BC Ministry of Education (Sept 26, 2016) *Testing Lead Content in Drinking Water of School Facilities*

BC Ministry of Education (January 1, 2017) *Testing Lead Content in Drinking Water of Independent School Facilities*

MITIGATION

In buildings where the risk of exposure to lead in drinking water is determined to be unacceptable, mitigation measures should be taken. Owners should communicate results of evaluations, and identify what consumers can do to reduce exposure to lead in the short term, and what building owners can do to reduce exposure in the long term. In situations where the drinking water is at risk of elevated lead and testing to establish water quality has not yet been done, it would be prudent to err on the side of caution and adopt interim measures (flushing, bottled water) to reduce the risks associated with the presence of lead in drinking water while awaiting assessment results.

Options for reducing lead in buildings may include short and long term solutions such as:

- Educating the occupants of the building (e.g., teachers, day care providers, students) and other interested parties (e.g., parents, occupational health and safety committees) on the sampling results and the interim and long-term corrective measures that are being undertaken;
- flushing all water taps used for drinking water or food preparation at the start of each day or after periods of stagnation;
- providing an alternative water supply such as bottled water;
- installing point-of-use (POU) filtration units designed specifically to remove lead;
- installing corrosion control equipment at the point-of-entry (POE) into the building to adjust pH to reduce the likelihood of lead leaching into water (however complexity of maintenance may pose challenges in many situations);
- where lead sample results identify particulate vs dissolved lead, this may help decide whether it is better solved by filtration than conditioning for corrosion control;
- removing drinking water taps from service that contain unacceptable levels of lead;
- posting signs that identify “designated drinking water taps” (DDWTs) and "Do not drink" taps (non-DDWTs);
- replacing lead containing outlets, fixtures, fountains, pipes and fittings with low-lead alternatives;
- replacing old water lines and solder that might contain lead;
- working collaboratively with the water supplier to ensure that the water delivered to the building is not corrosive.

Evaluation of the effectiveness of mitigation measures should be done after they have been implemented, and at regular time intervals afterwards. No matter what type of mitigation measures are employed, re-sampling should be done to verify the effectiveness of the mitigation measures and to ensure that the concentration of lead falls below the GCDWQ maximum acceptable concentration.

COMMUNICATION

Users of drinking water systems and buildings need to know the risks that exist, if any, and what is being done to mitigate the risks. Users should be advised regularly on lead risks associated with their drinking water and the need for regular testing, and mitigation measures. Communication should be clear and transparent to avoid confusion and ensure the goals, message and actions are understood.

Simple handouts for the public and other stakeholders such as: Health Files https://www.healthlinkbc.ca/healthlinkbc-files/lead-drinking-water, as well as those specific to School testing, and daycares may be helpful in communicating key messages.

Table 7: Communication Expectations

Who and What?
Health Authorities
• General messaging about lead and health risks to the public • General technical medical questions • Audience: General public, media, water suppliers, school boards; operators of child care facilities
Water Suppliers
• What is known about water corrosivity • What the drinking water supply system is doing about it • What users need to do to protect themselves • Audience: users of the water supply system
School Boards, Child Care Facilities and Other Building Owners
• What assessments are being done • Results of the assessments • Mitigation measures being taken • Audience: building users, parents of children and students in care
How?
• Written and media communication: Targeted mail outs, flyers in water bills, media releases, annual reports, newsletters, e-mails, websites and social media • Face to face conversations: interviews, public events • Signage: Warning signs on taps. Where flushing is the mitigation measure of choice, signage should be posted by fountains warning users to flush until the water runs cold
When?
• Whenever new, reliable information is available • Prior to and after lead screening and testing programs • Reminders should be done regularly in problem areas

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Deshommes et al. (2016) Evaluation of exposure to lead from drinking water in large buildings, *Water Research*; 99:46-55 [URL: http://dx.doi.org/10.1016/j.watres.2016.04.050]

Health Canada (2007) Water Talk: Minimizing Exposure to Lead from Drinking Water Distribution Systems [URL: http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/lead-plomb-eng.php]

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Health Canada (1992) Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Lead Air and Climate Change Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. (Catalogue No. H128-1/09-595E).

Ontario Ministry of Environment (2009) A Manual for Operators of Schools, Private Schools and Day Nurseries with Excess Lead in the Drinking Water: A resource guide on how to locate the source and remedy the problem [URL: https://www.ontario.ca/document/manual-operators-schools-private-schools-and-day-nurseries-excess-lead-their-drinking-water]

Ontario Ministry of Environment and Climate Change (updated June 23, 2016) Guide for schools, private schools and day nurseries on flushing for lead: A guide to requirements for flushing and testing drinking water taps in schools, private schools and day nurseries. [URL: https://www.ontario.ca/page/guide-schools-private-schools-and-day-nurseries-flushing-and-testing-lead]

Ontario Ministry of Environment and Climate Change (2009) Guidance Document for Preparing Corrosion Control Plans for Drinking Water Systems [URL: https://archive.org/details/guidancedocument00snsn21738]

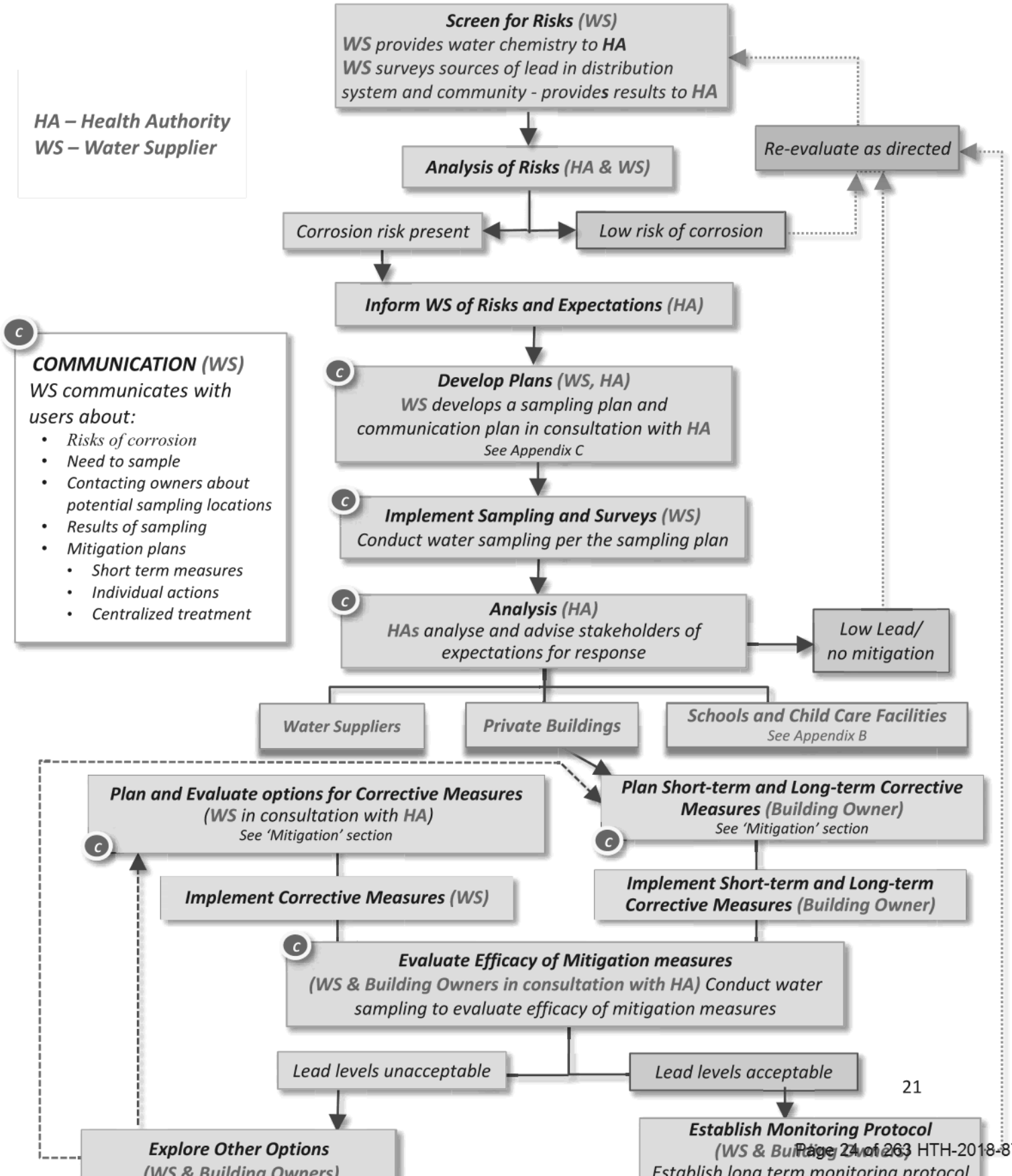
US EPA (Nov 9, 2015) Testing Schools and Child Care Centres for Lead in the Drinking Water [URL: https://www.epa.gov/dwreginfo/testing-schools-and-child-care-centers-lead-drinking-water]

US EPA (2005) 3Ts for Reducing Lead in Drinking Water in Child Care Facilities: Revised Guidance [URL: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=20017JVA.txt]

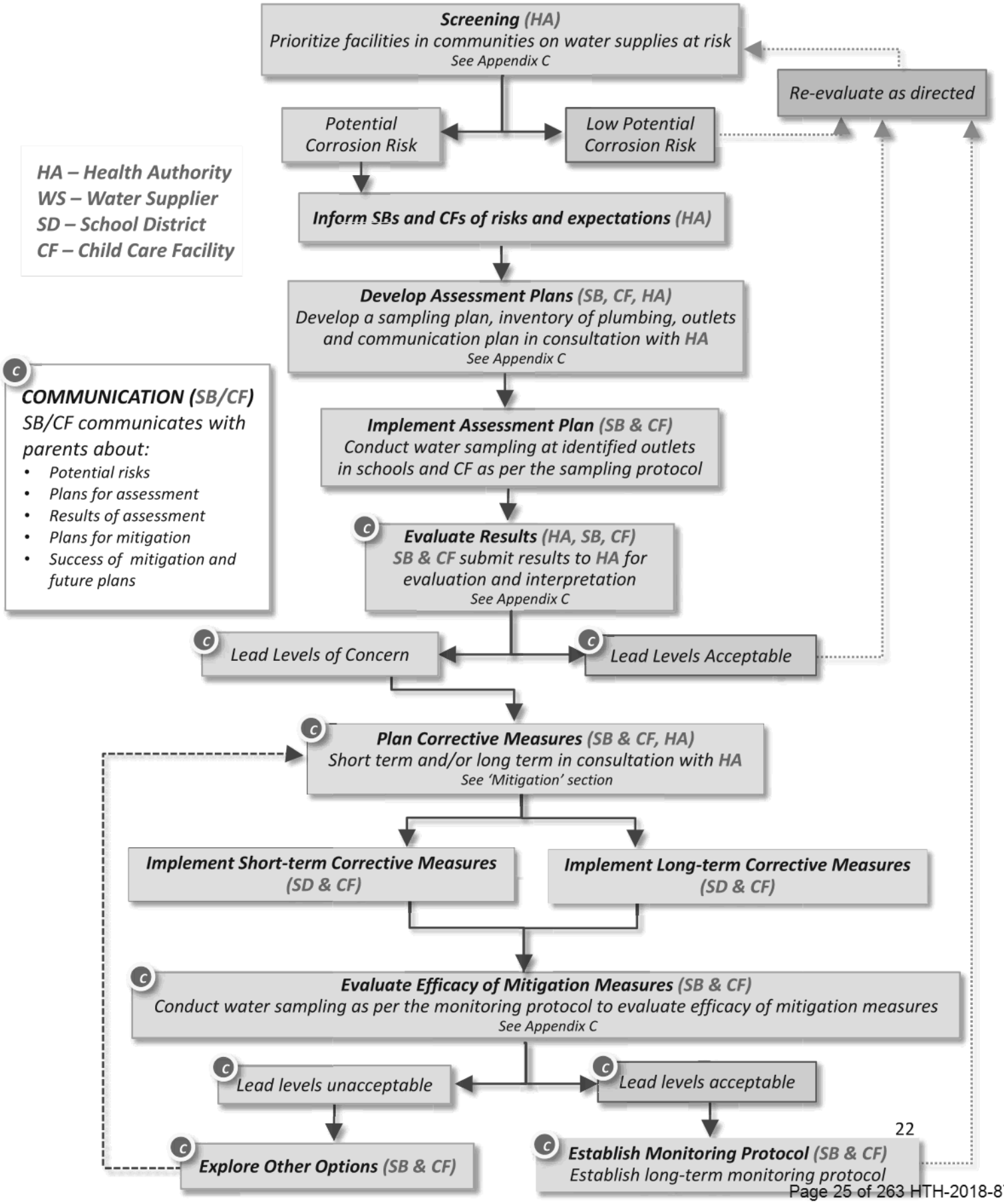
US EPA (2006) 3Ts for Reducing Lead in Drinking Water in Schools: Revised Technical Guidance [URL: https://www.epa.gov/dwreginfo/lead-drinking-water-schools-and-child-care-facilities#3Ts]

Water Research Foundation / American Water Works Association (2015) Controlling Lead in Drinking Water; Web Report # 4409 [URL: http://www.waterrf.org/PublicReportLibrary/4409.pdf]

Appendix A – Process Flow for Evaluating Corrosion Risk in Water Supplies



Appendix B - Processs Flow for Evaluating Lead in Schools and Child Care Facilities



APPENDIX C - EVALUATING LEAD IN DRINKING WATER

Contents:

1. WHY ARE YOU SAMPLING?

The purpose of this appendix is to provide a reference of best practices for evaluating and sampling lead content in drinking water. As lead concentrations in drinking water vary both spatially and temporally, there are many sampling protocols that have been developed. Therefore consideration should be taken to choose the one that is the most appropriate for the situation.

Prior to embarking on a sampling program, the questions should be asked – what is the objective of sampling and what is it that one would like to demonstrate? Sampling protocols differ depending on the desired objective (e.g. identifying corrosive water, identifying fixtures and potential sources of lead in a building, and estimating if typically consumed lead concentrations in water meets guidelines). It is important that the selected protocol be appropriate to meet the desired objective.

1.1. EVALUATING IF CENTRALIZED WATER SYSTEM CORROSION CONTROL IS WARRANTED

Depending upon the drinking water supply system and the characteristics of the drinking water produced, it may be necessary to determine whether the drinking water is capable of causing downstream corrosion problems in buildings with leaded plumbing components. Sampling results can be used to make decisions on whether community water system level actions are needed, and to evaluate the effectiveness of corrosion control measures after they are implemented. (See Section 2.1)

1.2. EVALUATING SOURCES OF LEAD WITHIN A BUILDING

Where sources of lead are suspected in buildings, such as schools, child care facilities or other structures, testing should be done to determine if mitigation measures are warranted. This can range from simple screening for potential problems, to comprehensively testing to determine which specific taps/fixtures or other plumbing components within a building are contributors to lead. Results can be used to make decisions on whether building level actions are needed, and to evaluate the effectiveness of control measures after they have been implemented. (See Section 2.2)

1.3. EVALUATING WHETHER LEAD CONCENTRATIONS IN TYPICALLY CONSUMED TAP WATER POSE A HUMAN HEALTH RISK

The health advice and the Maximum Acceptable Concentration (MAC) for lead in the *Guidelines for Canadian Drinking Water Quality* is based on samples representing typical or average concentrations of lead consumed throughout the day, not best or worst case scenarios. To evaluate whether the guideline for lead is being met, typical lead concentrations in drinking water ingested by users (i.e. representative of normal use) need to be determined. This may be done in the context of a building such as a school, a residence, or an entire community. The results can be used to determine what messaging should be

delivered to advise of potential health risks, action plans to mitigate the risks, and to determine if mitigation measures are successful after they have been implemented. (See section 2.3)

Once sampling objectives have been determined, careful planning should be done to get meaningful results, and to ensure that the sampling objectives are met.

2.0 SAMPLING PROTOCOLS:

2.1. TO EVALUATE IF CENTRALIZED WATER SYSTEM CORROSION CONTROL IS APPROPRIATE.

The purpose of this type of monitoring program is to identify drinking water supply systems in which corrosion is an issue, to allow decisions to be made as to whether corrective measures at the water supplier level are warranted, and to determine what measures are likely to be the most effective. These programs can also be used to assess the effectiveness of corrosion control programs after their implementation. Results of this type of protocol do not represent typical concentrations of the lead in drinking water ingested by consumers, therefore, results should not be used for the interpretation of health risks, nor whether the Maximum Acceptable Concentration (MAC) in the Guidelines for Canadian Drinking Water Quality (GCDWQ) is being met.

For the evaluation of the risk of corrosion, "Option 1 (two-tier protocol)" from page 4 of Health Canada's *Guidance on Controlling Corrosion in Drinking Water Distribution Systems* (GCCDWDS) is the preferred protocol. A second option, "Option 2 (lead service line residences)" described in the document can be used as an alternate where the two tier protocol is impractical. A brief overview of the protocol is described below; however, the original document should be referred to for the details.

Investigators will need to determine the number and location of monitoring sites. These sites should include taps within residences. To provide meaningful results, investigators will need to collect between 5 and 100 samples, depending on the size of the drinking water system (i.e., the number of people served). The recommended minimum number of sites to be monitored is shown in Table A. Sampling at individual sites is conducted as follows:

First Tier: Sample to establish whether the community water system has corrosion concerns.

- 6 hour stagnation, then collect 1L of water.
- If more than 10% of the sampled residential sites have a lead concentration greater than the action level of 15 µg/L, go to second tier. Note that this action level is different than the MAC for lead, as this is a measure of corrosion risk, not health risk.

Second Tier: For systems with corrosion concerns, this will provide detailed information about how lead is typically entering the drinking water, and will help plan mitigation measures that most appropriately target the sources found.

- Sampling is conducted at 10% of the sites sampled in Tier 1, specifically, the sites in which the highest lead concentrations were measured.
- Four consecutive 1L samples should be taken at a consumer's cold drinking water tap after a 6 hour stagnation period. This will provide a detailed profile of the sources of lead from within each building (e.g., the faucet, plumbing (lead in solder, brass and bronze fittings, brass water meters, etc.) and the lead service line.
- Each sample should be analysed separately to determine where the highest lead concentrations come from.

Table A: Suggested minimum number of monitoring sites

System Size (number of people served)	Number of Sites (annual Monitoring)	Number of Sites (reduced annual monitoring)
>100 000	100	50
10 001-100 000	60	30
3 301-10 000	40	20
501-3 300	20	10
101-500	10	5
≤ 100	5	5

Adapted from USEPA (1991a)

Interpreting Results

Where the sampling program shows more than 10% of the sampled residential sites have a lead concentration greater than the action level of 15 µg/L the water supply system should consider mitigation programs. This may include any or all of those listed in section 4 of this Guideline. It is recommended that water supply systems considering mitigation options initiate the second tier to help pinpoint typical sources of lead (fixtures vs plumbing vs lead service lines), so that the most effective mitigation measures can be planned to target those sources.

2.2. SCREENING FOR AND LOCATING SOURCES OF LEAD WITHIN A NON-RESIDENTIAL BUILDING (INCLUDING SCHOOLS, DAY CARES)

This protocol is designed to locate specific lead sources within a building's plumbing and to help identify where and how to proceed with remedial actions. It provides details that help identify specific cold drinking water outlets that have elevated levels of lead following periods of water stagnation.

This is based on Section A.2.5. of Health Canada's *Guidance on Controlling Corrosion in Drinking Water Distribution Systems* be used in conjunction with a systematic plan for lead sampling. While a brief overview of the sampling protocol is described briefly below, the original Health Canada document should be referred to for details.

2.2.1 - SCREENING FOR LEAD

- Survey and inventory the building to identify all locations in the building where drinking water is likely to be consumed.
- Take a First Draw (FD) 250ml sample from each location after an 8 hour stagnation period.
- In addition to those locations where drinking water is consumed, an additional fully flushed (FF) sample should be taken at a faucet near the water main to be representative of water from the water main.
- If lead concentration exceeds 20 µg/L (lead action level) at any of the monitoring locations, further investigation and remedial action is warranted. This may include short term measures such as flushing programs, and/or long term measures to find and replace source of lead in plumbing (see below).

2.2.2 – LOCATING SPECIFIC SOURCES OF LEAD IN THE PLUMBING FOR REMEDIATION

- To evaluate whether lead may come from other sources within the building, monitoring locations (above) exceeding 20 µg/L (lead action level) a subsequent 250 ml sample should be taken at those locations after an 8 hour stagnation period plus 30 seconds of flushing.
- Alternatively, while it may initially require more samples be taken, it may be more cost efficient for investigators to simply take a second sample at all sampling locations 30 seconds after taking the first sample.
- An analysis of results against plumbing plans for the building can be used to pinpoint sources of lead.

Interpreting Results

A comparison of the results can be used to help determine sources of lead, and to plan corrective actions. For example:

- Where the first samples do not exceed the lead action level – no further action would be required unless other samples in the building exceed the action level.
- Where the first samples exceed the lead action level, and subsequent samples do not, the fixture is the likely source of contamination and mitigation measures targeted at the fixture should be considered.
- Where the first and subsequent samples exceed the lead action level, mitigation measures targeted to the entire building should be considered.

Successful determination of lead sources within buildings is dependent on developing and implementing a systematic sampling plan to ensure meaningful results. Sampling plans should be tailored to specific situations. Ontario's Manual for Operators of Schools, Private Schools and Day Nurseries with Excess Lead in their Drinking Water published by the Ontario Ministry of the Environment and Climate Change provides an excellent resource for school and other buildings to locate the source of problems and mitigate them. This manual guides users through four key steps:

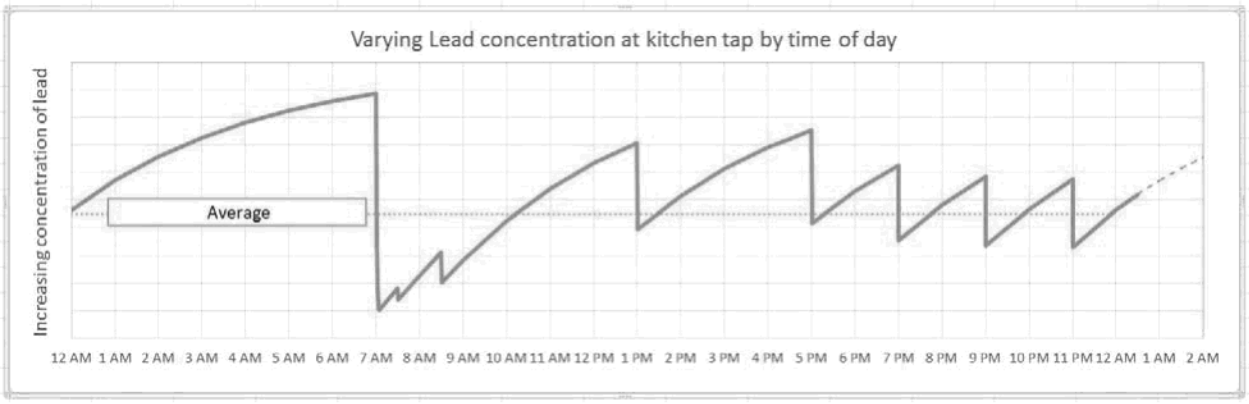
- Assessing plumbing;
- developing a sampling strategy;
- executing the sampling strategy and using the test results to remedy the problem; and
- taking routine, interim and permanent measures.

The manual may describe slightly different sampling protocols and action levels than this document, but its description of the processes for sampling still applies. The general process in this manual could also be applied to non-school settings.

Ideally, schools should be monitored at least once per year with consideration for reductions in the sampling frequency if monitoring shows that the results are acceptable. The BC Ministry of Education may recommend alternative frequencies, however the health authority should be consulted in order to help determine an appropriate health-based sampling frequency based on the data available. In circumstances where Ministry of Education lead sampling policies require testing at a frequency greater than what a DWO would typically recommend, the frequency set by the Ministry of Education's policy should be followed.

2.3 TO EVALUATE HEALTH RISKS:

The Maximum Acceptable Concentration (MAC) published in the *Guidelines for Canadian Drinking Water Quality (GCDWQ)* is intended to apply to the average concentration in the water consumed. This implies that when evaluating health risk, the sampling protocol should be designed to estimate the average or typical exposure to lead in drinking water not the worst possible case scenario. (See conceptual figure A below.)



As water that has remained stagnant in pipes is at highest risk for lead content, it would be expected that concentrations in plumbing will be highest in the morning, and drop over the day with use. Assessing whether or not typical concentrations consumed meet the GCDWQ should therefore be based on sampling at times and places where water is usually consumed, and not a worst or best case scenario.

The following describes specific approaches to estimate typical concentrations in different scenarios, including community risk, and risks with individual dwellings or larger buildings.

2.3.1 EVALUATING HEALTH RISK AT THE COMMUNITY LEVEL:

While it is relatively simple to sample lead concentrations in drinking water as it leaves the treatment plant, it is not representative of what is consumed by users as building plumbing can significantly impact lead content. To establish a typical concentration of lead being consumed by customers, a series of either Random Daytime Samples (RDT) or Thirty Minute Stagnation (30MS) samples should be taken at multiple points of consumption. These samples should be averaged. Details of the pros and cons of each method are discussed in part three of this document.

Sampling plan designs should consider:

- Producing reliable results typically requires 20 or more samples, taken at different consumer locations and at different times of year;
- choosing sampling points from consumer's taps that are balanced between public and private buildings;
- identifying homes with lead service lines for inclusion in the sampling program, as these are likely to have the highest lead concentrations;
- dividing larger distribution networks into neighbourhoods or zones of similar age and evaluating the risk of each community independently may be advisable in some areas; and
- taking samples of the water supplied to the distribution network to establish baselines of the lead concentration of water supplies.

After selection of the taps being sampled, either:

a) For RDT programs, the first 1 litre of water, from each tap is sampled without flushing at random times throughout the day, or
b) for 30MS programs, flush taps for 5 minutes, let stagnate for 30 minutes, then take two consecutive 1-litre samples.

Interpretation

Results should be averaged to determine a typical value for evaluation against the MAC set in the GCDWQ of 10 µg/L. Individual samples that exceed the MAC should not be cause for community concern, however further investigation of the cause might be warranted. Where averaged samples exceed the MAC, the Health Authority should be engaged with the water supplier to further investigate and plan mitigation options.

2.3.2 EVALUATING HEALTH RISKS IN INDIVIDUAL DWELLINGS:

Homeowners, operators of child care facilities in residential settings or occupants of dwellings with older plumbing may wish to investigate whether drinking water from their home meets the requirements of the GCDWQ. This scenario provides a challenge as it is unlikely that a series of samples will be taken and averaged to produce "typical" results. Where only one sample is practical to be taken, a 30MS sample should be done as it is the most reproducible for post mitigation evaluation, and can be done at any time of the day.

Interpretation

Where possible, multiple samples should be taken and averaged, and results evaluated against the MAC of 10 µg/L in the GCDWQ. Where the MAC is exceeded, further investigation should be done to determine the source of lead and/or the mitigation measures that can be implemented.

2.3.3 EVALUATING HEALTH RISKS IN SCHOOLS AND OTHER LARGER BUILDINGS:

The purpose is to determine if water typically consumed by students in schools or occupants/residents of larger buildings are likely to be at levels that exceed the GCDWQ. This may be done after screening (See Section 2.3). If screening does not show exceedance of action levels, further sampling and calculation of the MAC is likely not warranted. As school plumbing tends to be complex in use patterns, age, and variability, there is typically no single sentinel site that can be established for most schools, thereby requiring the sampling of every drinking water location. Large buildings face similar challenges.

A RDT sampling protocol is recommended to capture typical exposures, including potential exposure to particulate lead. This should be conducted by sampling at all drinking water fountains and cold water taps where water is used for drinking or food preparation. Samples should be taken:

- At random times throughout the school day;
- preferably taken between May and September as leaching increases with higher water temperatures; and
- two consecutive 125 mL samples should be collected at each fountain or tap without a stagnation period and without prior flushing. Note: smaller samples are taken as it can provide valuable data for find and fix options if needed at a later date.

Interpreting Results

Results from a sampling program should be calculated by averaging the results from at least two samples and averaging sampling locations within a building. Averages should not exceed the MAC for lead that is set out in the GCDWQ.

Those schools and buildings with indicators of lead problems should undertake further screening and mitigation as per section 2.3 below. Taking two 125ml samples is preferable to taking a 1L sample as it can help determine if the fixture or the plumbing system is the problem by providing valuable data for further investigation and for determining mitigation options.

3.0.0 DEFINITIONS

3.1.1 RANDOM DAYTIME SAMPLING (RDT):

Purpose: To capture typical exposures at residential sites, assess health risk, and set priorities.

A sample is taken at a random time during a working day directly from the tap in a property without previous flushing. The stagnation of water in a distribution system influences the concentration of lead in a random manner. Health Canada recommends taking a 1L samples for sampling programs conducted at the community level. For schools and other large buildings, Health Canada recommends taking two 125ml samples be taken as the data from smaller volumes can provide valuable data for identifying and mitigating problem fixtures and areas within buildings.

RDT sampling is relatively inexpensive and convenient (per sample), but needs to be repeated numerous times to provide confidence in the results. Results are close to typical use when averaged over many samples. RDT sampling is better suited for determining system wide health risks than for individual sites. It requires 2-5 times more samples that 30MS sampling to provide statistically significant results.

3.1.2 THIRTY MINUTE STAGNATION (30MS):

Purpose: To capture typical exposures at residential sites, assess health risk, and set priorities.

A typical 30MS sampling protocol is to flush a tap for 5 minutes, then allow water to stand for 30 minutes. Two consecutive 1L samples are then taken and the results of the two samples are averaged.

30MS samples are more reproducible than RDT samples, and may be the most appropriate for single samples estimating lead risk in individual dwellings. Using two consecutive samples allows the estimation of the relative contribution of the fixture to the lead concentration. 30MS sampling is time consuming and may underestimate typical exposure to lead in drinking water.

3.1.4. FIRST DRAW (FD)

Purpose: To capture the highest levels of lead using long stagnation times.

During the stagnation period no water should be drawn from any outlet within the property (this includes the flushing of toilets). If any water is drawn during the stagnation period the result will be invalid.

- 6-8hr stagnation period then the collection of a 250 mL or 1L sample.

First draw gives the “worst case scenario”. This may also be useful in conjunction with flushed samples to help determine if a specific fixture is contributing lead to the water. This protocol is not appropriate for assessing health risk based on average exposure to lead in drinking water, unless it confirms samples are below thresholds of concern.

3.1.5. FULLY FLUSHED (FF)

Purpose: To determine lead levels in plumbing after complete flushing of the system, or to infer lead levels from water mains.

Samples are taken after prolonged flushing of the tap in a premise in such way that the stagnation of water in the domestic distribution system does not influence the concentration of lead in the drinking water. In practice a sample is taken after flushing at least three plumbing volumes, a prescribed time, or after an observed temperature drop.

While fully flushed samples provide an indication of lead concentrations in systems that are under heavy use, they are not suitable for assessing average exposure to lead in drinking water, as they are likely to underestimate typical lead exposure. Calculating pipe volumes, flow rates and flushing times may be challenging for some larger buildings with complex plumbing systems.

4.0 REFERENCES

Health Canada (2009) Guidance on Controlling Corrosion in Drinking Water Distribution Systems. Water, Air and Climate Change Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. (Catalogue No. H128-1/09-595E).

Health Canada (1992) Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Lead Air and Climate Change Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. (Catalogue No. H128-1/09-595E).

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UK Drinking Water Inspectorate, DWI PR14 Guidance – Lead in Drinking Water, 2013.
http://www.dwi.gov.uk/stakeholders/price-review-process/PR14-guidance-lead.pdf

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APPENDIX D: GUIDANCE ON FLUSHING FOR MITIGATION

One option for mitigation of lead risks from drinking water in schools, licensed child care facilities, or other buildings is to implement a flushing program. The intention of flushing is to run the tap water until the water from the water main in the street or the water supply from within the well reaches the taps. This has been shown to significantly reduce lead levels in drinking water at the tap. However, the degree to which flushing helps reduce lead levels in drinking water can vary, depending upon the age and condition of a facility's plumbing and the corrosiveness of the water. Regardless of these limitations, flushing is still the quickest and easiest measure to reduce high lead levels in drinking water, especially when contamination is localized in a small area or in a small building.

CIRCUMSTANCES THAT INDICATE IMPLEMENTING A FLUSHING PROGRAM

Where assessment and/or water sampling of a facility has identified risks for elevated lead in water mitigation actions should be taken. These circumstances include:

- Results of testing for lead in water (see appendix C) exceed the Maximum Acceptable Concentration in the *Guidelines for Canadian Drinking Water Quality or* action levels;
- any part of the plumbing was installed before January 1, 1990 that has not been assessed for lead content, and/or there is no sampling history for the last 24 months;
- it is recommended by the Regional Health Authority.

Mitigation should include implementing a flushing program until permanent measures can be taken to reduce the lead or until testing confirms that lead levels are within acceptable limits. Any additional flushing requirements will be determined by the results of the facility's plumbing profile and risk assessment in consultation with the local Environmental Health Officer.

WHEN TO FLUSH:

- Flushing should be conducted daily when the facility or part of the facility is open.
- Flushing should be completed before the facility opens for the day. Where a facility is open for 24 hours on that day (e.g., a building housing student residences within a school property), flushing should be completed as early in the day as possible.

WHERE AND HOW TO FLUSH:

- First, turn on the cold water for at least five minutes at the last tap on each branch or each run of pipe in the plumbing that serves a drinking water tap that is commonly used to provide water for consumption. In many cases, depending on the plumbing configuration, it may be necessary to flush the plumbing for a longer period of time. The actual amount of time that will be needed depends on the type of tap, diameter of pipes, and its location within the building plumbing (i.e. distance from the water main in the street or the distance to the water supply well). For best

results, the volume of the plumbing and the flow rate at the tap should be calculated, and the flushing time should be adjusted accordingly – See **Calculating how long to flush** below.

- Then, turn on the cold water for at least 10 seconds at every drinking water fountain and every tap that is commonly used to provide drinking water for human consumption.
- Additional recommendations for flushing specific types of non-end-of-run outlets include:
    - For drinking water fountains without refrigeration units, the water should run for at least 15 seconds, or until the water is cold.
    - For drinking water fountains with refrigeration units, the water should run for at least 15 minutes. If it is not feasible to flush for such a long time, these outlets should be replaced with lead-free, NSF-approved devices.
    - For all kitchen faucets and other faucets where water may be used for drinking (including bathroom faucets where it is possible to obtain cold water), the water should run for at least 10 seconds or until the water is cold.
- Be careful not to flush too many taps at once. This could dislodge sediments that might create further lead problems, or could reduce pressure in the system below safe levels. If the flow from drinking water outlets is reduced noticeably during flushing, too many taps are probably being turned on at once.

CALCULATING HOW LONG TO FLUSH:

The amount of time it will take to fully flush a building's plumbing will vary depending on the diameter of the water supply pipe and the water flow rate during flushing. Some of the ways to determine how long to flush include:

- Calculating the pipe volume, in litres, between the outlet and the location in the plumbing being flushed using the formula: 3.14 x pipe radius^2 x pipe length (i.e., $\pi r^2 l$);
- measuring the outlet flow rate in litres per minute;
- dividing the pipe volume in litres by the outlet flow rate in litres per minute.

The following table and information from the 2016 Copper Tube Handbook[5] can assist in calculations.

Table B: Pipe Volume (per unit of pipe length) for different diameters of copper pipe

Pipe diameter	Volume of tube (litres per meter of length) Type L Copper
9.53 (3/8)	0.0938
12.70 (1/2)	0.1505
15.88 (5/8)	0.2248
19.05 (3/4)	0.3122
25.40 (1)	0.5323
31.75 (1 ¼)	0.8129
38.10 (1 ½)	1.1520
50.80 (2)	1.9974
63.50 (2 ½)	3.0751
76.20 (3)	4.3943

[5] Copper Development Association Inc.(2016) *Copper Tube Handbook: Industry Standard Guide for the Design and Installation of Copper Piping Systems*; CDA Publication A4015-14/16, NY

ESTABLISHING DUE DILIGENCE – RECORDING AND REPORTING:

- Keep written records of the date and time of every required flushing and the name of the person who performed the flushing. If auto flushers are used, record the name of the person who verified that the automatic flushing took place. Records for auto flushers need to be completed based on the frequency set out in the manufacturer's instructions or at least once a month if no instructions are available.
- Keep the written record on file and available for review by an Environmental Health Officer.

ADDITIONAL INFORMATION:

- It is not required to flush any tap or drinking water fountain in a part of a building that is not in use by children or staff during the day as well as in private student residences or in a public washroom (e.g., in a shopping mall).
- If a tap or drinking water fountain has an aerator, the aerator should not be removed when flushing.
- If a tap or drinking water fountain has an individual filter or other water treatment device, the filter should be bypassed when flushing if this can be done easily. A filter or treatment device is not required to be bypassed if it would require removing or dismantling the device to do so.
- To save water, thoroughly flush several designated drinking water outlets daily while taking all others temporarily out of service. Collect the water being flushed and use it for non-consumptive purposes.

REFERENCES:

Copper Development Association Inc.(2016) *Copper Tube Handbook: Industry Standard Guide for the Design and Installation of Copper Piping Systems*; CDA Publication A4015-14/16, NY

Ontario Ministry of the Environment and Climate Change (updated June 23, 2016) *Guide for schools, private schools and day nurseries on flushing for lead: A guide on the requirements for flushing and testing drinking water taps in schools, private schools and day nurseries* [Available at: https://www.ontario.ca/page/guide-schools-private-schools-and-day-nurseries-flushing-and-testing-lead]

Ontario Ministry of the Environment (2009) *A Manual for Operators of Schools, Private Schools and Day Nurseries with Excess Lead in their Drinking Water: A resource guide on how to locate the source and remedy the problem* [Available at: https://www.ontario.ca/document/manual-operators-schools-private-schools-and-day-nurseries-excess-lead-their-drinking-water]

MINISTRY OF HEALTH
INFORMATION BRIEFING NOTE

Cliff # 1122543

PREPARED FOR: Honourable Adrian Dix, Minister of Health
- FOR INFORMATION

TITLE: Lead in Child Care Facilities

PURPOSE: To provide an overview of the risks of lead in drinking water in British Columbia daycares.

BACKGROUND:
Ingestion of lead can harm health, especially young children and infants. Even low level exposure may harm intellectual development, behaviour, size and hearing. The degree of harm depends on exposure from all sources in air, soil, dust, food, water, and consumer products. Common sources of lead exposure for children are deteriorating lead paint found in dust and soil, and drinking water when lead levels in water are elevated. It is important to note that people often consume water from numerous sources throughout the day, so any one source may only represent a small portion of total intake. Nonetheless, lead intake from all sources should be minimized as much as possible.

Most drinking water supply systems in BC deliver water with negligible levels of lead prior to piping into buildings. Lead contamination usually occurs by leaching from service lines and pipes/fixtures within buildings. The extent of leaching depends on the nature of the plumbing materials used, the corrosiveness of the water, and the length of time that the water sits stagnant.

Since 1989, the BC Building Code has restricted the lead content in potable water lines and fixtures. As a result, only facilities with older plumbing materials, such as some schools, child care facilities and office buildings, are at most risk of elevated levels of lead in drinking water.

The issue of responsibility for lead in drinking water is complex given that pipes and fixtures are generally contained within private properties. Water suppliers are responsible for service lines and other fixtures from the water treatment plant up to the property line, after which it becomes the responsibility of the property owner, creating a shared responsibility for the final lead concentrations at the tap. Where the characteristics of the water itself may contribute to leaching, the water supplier also has the responsibility to take reasonable steps to reduce corrosiveness of the water.

Options for effectively reducing lead in buildings that have lead problems include: ~~F~~flushing standing water in pipes before consuming, using an appropriate filter, finding an alternate source (e.g., bottles), or replacing lead-containing pipes.

DISCUSSION:

To address the issue of lead in drinking water, the Ministry of Health has:

- Developed guidance on evaluating and mitigating lead in drinking water supplies, schools, daycares, and other buildings (see Appendix A).
- Worked with the Ministry of Education to require all schools test for lead in drinking water
- Produced public educational materials on lead in drinking water throught the HealthLink Files (Appendix B), Baby's Best Chance (Appendix C) and a fact sheet on lead in drinking water targeted at daycares (Appendix D).

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The operators of day care facilities are required to provide safe drinking water under the Community Care and Assisted Living Act, however there are currently no requirements for sampling. Currently the extent of lead problems in daycares is unknown as there have not been any sampling/evaluation programs; however it is expected to be like other buildings in BC. For example, the schools sampling program has identified buildings at risk in some communities. There are sensitivities around additional costs at daycare facilities that may be passed on to parents.

The Ministry of Health's Environmental Health Policy Advisory Committee (EHPAC) has initiated a task group to outline options for implementing screening for lead in daycares across the province. EHPAC is targeting making a decision on the issue in early 2019.

ADVICE:

Support EHPAC in the development of a consistent, pragmatic provincial approach to addressing potential lead in water supplies in daycares.

Program ADM/Division: Matt Herman, Executive Lead/Population and Public Health
Telephone: 250 952-1731
Program Contact (for content): Tim Lambert
Drafter: David Fishwick
Date: October 17, 2018

INTERIM GUIDELINES ON EVALUATING AND MITIGATING LEAD IN DRINKING WATER SUPPLIES, SCHOOLS, DAYCARES AND OTHER BUILDINGS

JULY 2017

HEALTH PROTECTION BRANCH

BRITISH COLUMBIA

TABLE OF CONTENTS

1. PURPOSE AND SCOPE

This document provides guidance to drinking water officers on the roles and responsibilities of stakeholders in the reduction of lead in drinking water at the tap.

This document also provides guidance and tools for:

- Screening communities to identify those with increased risk of corrosive water;
- assessing typical lead concentrations in drinking water at the tap in communities;
- screening and assessing typical lead concentrations of water in schools, day cares and other buildings; and
- possible mitigation strategies and examples of communication material.

This document does not address collecting or assessing human exposure data such as blood lead reporting, or assessment of broader human lead exposure beyond drinking water. It also focusses on lead corrosion only, and does not discuss other corrosion products including copper and iron, that can cause significant aesthetic and economic impacts if unchecked.

2. INTRO/BACKGROUND

Ingestion of lead can be hazardous to human health, especially for young children and infants, as they absorb lead more easily than adults and are more susceptible to its harmful effects. Even low level exposure may harm the intellectual development, behaviour, size and hearing of infants and children. Lead can also cross the placenta during pregnancy to affect the unborn child, and can be released into breast milk.

The degree of harm from lead exposure depends on a number of factors including the frequency, duration, and dose of the exposure(s) and individual susceptibility factors (e.g., age, previous exposure history, nutrition, and health). The degree of harm also depends on an individual's total exposure to lead from all sources in the environment – air, soil, dust, food, and water. Common sources of lead exposure for children are chips and particles of deteriorating lead paint found in house dust and soil. While drinking water is the second largest source of exposure when lead levels in water are above 5 µg/L, there is currently no evidence that drinking water in BC is a significant source of dietary lead intake. It is important to note that people often consume water from numerous sources throughout the day (i.e. workplaces, schools, homes, restaurants), thereby the lead concentration in water from any one source may only represent a small portion of total daily intake. Nonetheless, it is important to minimize lead intake from all sources as much as possible, and where Drinking Water Officers consider drinking water is at risk of having elevated concentrations of lead, take steps to reduce lead in drinking water to levels as low as is reasonably achievable.

Under the *Drinking Water Protection Act* (DWPA), drinking water supply systems in BC are responsible for monitoring water they deliver to verify it is within acceptable limits for lead and other metals. The Guidelines for Canadian Drinking Water Quality (GCDWQ) suggest a maximum acceptable concentration

(MAC) of total lead in drinking water of 10 micrograms per litre (µg/L) or 10 parts per billion (ppb). You may also see this guideline value written as 0.010 milligrams per litre (mg/L) or 0.010 parts per million (ppm).

Most drinking water supply systems in BC deliver water that has levels of lead well below 10 µg/L. Lead is usually not found in drinking water when it leaves the treatment plant. Instead lead tends to leach out of pipes and fixtures in buildings or homes, or service lines connecting homes to water mains[1]. The extent of leaching depends on the nature of the plumbing materials used, the corrosiveness of the water (i.e. the extent to which the water can cause a chemical reaction that will cause a deterioration in the material used in the pipes), and the length of time that the water is stagnant in the plumbing. The longer water remains in contact with leaded plumbing, the more opportunity there is for lead to leach into the water. As a result, older facilities with intermittent water use patterns and older plumbing materials, such as schools, child care facilities and office buildings, may have elevated levels of lead in their drinking water. The water sits in the pipes of these facilities for long periods (overnight, weekends, and holidays), which allows the leaching of lead to occur. If the water entering the building is corrosive, the lead will leach more quickly. Corrosive water may sometimes be described as “acidic” or “aggressive”.

Since 1989, the BC Building Code has restricted the lead content in components in the construction of potable water lines and fixtures. This restriction reduces the amount of lead available to react with corrosive water and lowers the risk of lead leaching into drinking water supplies. As a result, in buildings constructed on or before that time, there may be a greater probability of finding elevated lead levels in the water from service plumbing, especially if the corrosiveness of the water entering the building and the water use patterns in the building are conducive to lead leaching.

The quality and characteristics of the delivered water not only impact lead solubility and lead speciation (i.e., the chemical and mineral form of lead), they also impact the behaviour of pipe scales (i.e., a coating that forms inside of pipes) that contain lead. Physical disturbances or changes in water quality and flow velocity can cause lead particles found within pipe scales to become dislodged and released into drinking water. These lead particles can cause intermittent spikes in the lead concentrations found in drinking water. Screened aerators on kitchen taps may trap these particles and should be periodically cleaned.

Under the National Plumbing Code (NPC), all fittings must comply with the American Society of Mechanical Engineers (ASME) 112.18.1 / Canadian Standards Association (CSA) B125.1 standard for plumbing supply fittings. In 2012, these standards revised the requirement for "lead-free" components from 8% down to 0.25% lead as a weighted average with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures. This means that fixtures produced as late as 2012 could legally contain 8% lead – enough to cause an exceedance of the MAC on stagnant ("first flush") water samples.

Anecdote: A city in Northern BC was conducting a survey of lead content in the drinking water in their various facilities. In one new building, built in 2013, the lunchroom tap surprisingly failed its first-flush sample. The City responded by changing the tap to a newer model with an NSF certification. The retest for lead was lower, but again exceeded the MAC. Only when the shutoff valve was also replaced did the sink pass the first-flush lead test.

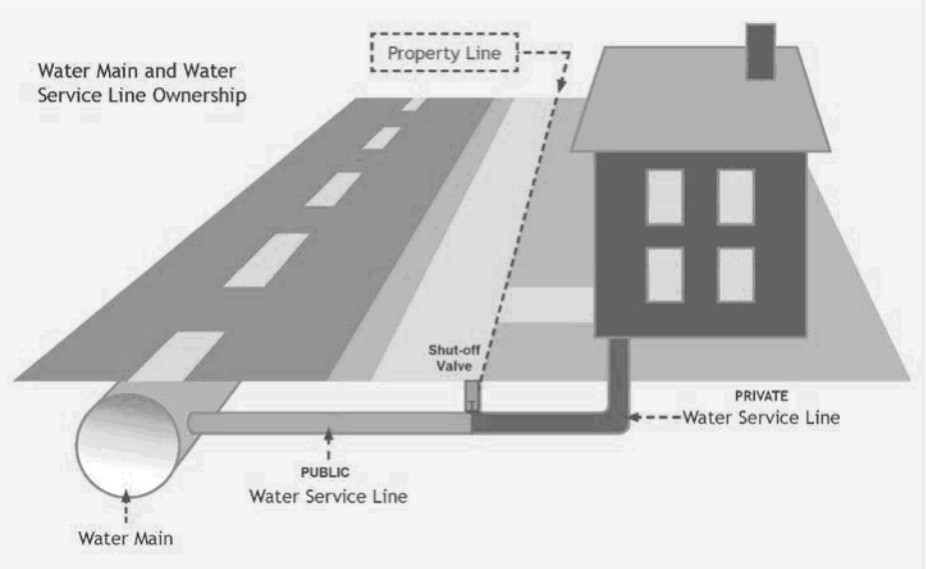
[1] Service lines connect individual buildings to the water supply system distribution main. Service line ownership is shared. The utility typically owns the portion up to the property line and the home or building owner owns the portion on their property. Before the 1960s, service lines were commonly made of lead in some communities.

3. ROLES AND RESPONSIBILITIES

The question of responsibility for lead in drinking water is unique in that water delivered by water suppliers may be potable at the point of delivery, but may have characteristics that make it susceptible to leaching lead and other metals from pipes, solder and fixtures after it is delivered to the property. This may result in significant portions of the community being affected or localized problem areas affecting some buildings or neighborhoods in a community but not others. The problems can also be localized within buildings, affecting only some taps depending on water use patterns, plumbing configurations and materials, and differences in plumbing fixtures.

The issue of who is responsible for lead in drinking water is complex given that lead in drinking water may come from the pipes and fixtures contained within private properties, or services lines. Water suppliers are not responsible for the maintenance or replacement of plumbing beyond service lines and other fixtures upstream of the curb stop where water is delivered, after which it becomes the responsibility of the property owner (see Figure 1). So while the water supplier may own the water supply system, property owners own the pipes and plumbing on their property. This shared ownership also means a shared responsibility to mitigate excessive lead concentrations found at the tap. Property owners are responsible for the condition of their building's plumbing and for taking any necessary remedial action to minimize lead exposure deriving from the plumbing and fixtures in their property, such as replacing leaded plumbing and fixtures, installing treatment devices to remove lead, or implementing a flushing program. Where the characteristics of the water (i.e., the corrosiveness) are expected to significantly contribute to leaching, the water supplier has the responsibility to take reasonable steps to mitigate likelihood of a hazard being associated with the water being delivered to the end user.

Figure 1: Water service line responsibilities (modified from: https://www.alexandriava.gov/uploadedImages/health/info/AlexandriaWaterService.jpg



Several statutes play a role in ensuring that drinking water does not pose a health risk for consumers. These include: the *Drinking Water Protection Act,* the *BC Plumbing and Building Code,* the *Public Health Act,* the *School Act* and the *Community Care and Assisted Living Act.* As these statutes apply concurrently, the overlap indicates a shared responsibility of all parties involved.

- The *Drinking Water Protection Act:*
    - Requires water suppliers to deliver potable water to customers. While the DWPA may not directly compel water suppliers to ensure potability beyond the point where it is delivered to the consumer, health authorities may impose conditions on permits that require water suppliers to take actions to reduce the likelihood that the water they deliver contributes to a drinking water health hazard.
- The BC Building Code:
    - Speaks to plumbing standards within buildings. However, this statute is only applied at the time of construction and many buildings constructed prior to 1989 can be assumed to be at an increased risk for lead leaching from plumbing under certain water conditions.
- The *School Act* and the *Community Care and Assisted Living Act* (Child Care Licensing Regulation):
    - These Acts protect children in schools and in licensed child day care facilities. Medical Health Officers may act as School Health Officers under the *School Act* and may conduct inspections, and where necessary impose requirements for the construction and/or operation of the facilities. Similarly, Licensing Officers (who are delegates of the Medical Health Officer) inspect child day care facilities, issue licences to operators of child care facilities, and where necessary impose requirements for the health, safety and well-being of children who attend child day care, the physical premises and/or operation of the facilities. Similarly, where there is reason to believe there are children at risk due to lead exposure in residential care facilities, action may also be warranted to assess and mitigate these situations.
- The *Public Health Act:*
    - Requires landlords to provide potable water to tenants. The *Public Health Act* may also be used as a legal tool where a lack of action by water suppliers, building owners, or others may contribute to a health hazard.

Successful reduction of lead in tap water depends on a multi-barrier approach with participation and actions of all parties as it is difficult to achieve lead reduction through centralized mitigation alone. The following table lays out high level expectations of roles and responsibilities of each stakeholder in this process. More specific roles and responsibilities related to each stakeholder are discussed below.

Table 1. Stakeholder Responsibility for Lead in Drinking Water

Responsibility	*Responsible Stakeholders*		
	Drinking Water Supply systems	***Schools/Day cares***	***Private buildings***
Screening & Prioritizing	*HA* + Water supplier*	*HA + SD + IS + CF*	*Building owner*
Planning to Test	*HA + Water supplier*	*HA + SD + IS + CF*	*Building owner*
Testing	*Water supplier* *Building owner***	*SD + IS + CF*	*Building owner*
Interpretation	*HA*	*HA*	*HA upon request*
Planning to Mitigate	*Water supplier + HA review & permitting*	*SD + IS + CF + HA review*	*Building owner*
Implementing Mitigation	*Water supplier*	*SD + IS +CF*	*Building owner*
Verification of Mitigation	*Water supplier + HA review*	*SD +IS +CF + HA review*	*Building owner*
Communication/ Education	*Water Supplier (system specific)* *HA (community level)*	*SD + IS +CF (facility specific)* *HA (community level)*	*Building owner (building specific)* *HA (community level)*

** HA- Health Authorities; SD – School Districts; IS – Independent Schools; CF – Care Facilities*
***As lead testing is done at the tap, building owners are key participants in testing programs*

3.A ROLES AND RESPONSIBILITIES OF HEALTH AUTHORITIES

The high level roles of drinking water officers (DWO), medical health officers (MHO), environmental health officers (EHO), public health engineers (PHE) and licensing officers (LO) are to:

- Screen communities to identify those likely to have lead issues, and for those identified;
- work with water suppliers to determine if elevated lead concentrations in community tap water pose an unacceptable risk to end users, and where there is an unacceptable risk; and
- advocate for, or mandate the evaluation and mitigation of lead risks by all stakeholders through appropriate and reasonably achievable mitigation measures.

In communities likely to have lead issues due to corrosion concerns, PHEs and DWOs may need to determine with water suppliers whether concerns are best addressed through centralized mitigation measures at the water supply (e.g., pH and alkalinity adjustment or the addition of corrosion inhibitors at treatment), decentralized measures by users (e.g., flushing, point-of-use treatment devices, leaded plumbing replacement, etc.), or by a combination of both.

The role of the health authority in evaluating and mitigating the risk of lead in a community should include actively working with all stakeholders to ensure they are aware of risks and of the actions they should take to evaluate and reduce risks. Where necessary, health authorities may also need to take progressive enforcement actions with regulated facilities. The priority of any enforcement action should

be directed towards large community water systems where the corrosiveness of the water supply contributes to excessive lead levels known to exist in public and private buildings.

As infants and children are more susceptible to health effects from lead, schools and care facilities where children may be exposed to elevated lead concentrations in drinking water should be the focus of health authority efforts. Health authorities should include evaluation of risks for lead in drinking water as part of their engagement with schools and child day care facilities and re-assess the frequency of monitoring in areas where lead has been found to be a problem. Drinking water officers should work with licensing officers to introduce testing for lead and ensure appropriate mitigation measures are in place as part of inspections and licensing requirements for child day care facilities.

Details of specific roles and responsibilities of health authorities in relation to stakeholders are outlined below. Technical information on assessing risks and sampling are in the appendices of this document.

3.B ROLES AND RESPONSIBILITIES OF WATER SUPPLIERS

The *Drinking Water Protection Act* requires water suppliers to deliver potable water to users, but does not directly compel water suppliers to ensure potability after delivery to customers. However, where it is probable that the nature of the water is likely to pose a potential health risk to users after delivery, the DWO may be justified in requiring the water supplier, through conditions on the operating permit, to take steps to assess whether corrosivity of the water, and/or resulting water lead concentrations in buildings presents a risk to the population, and if necessary, to take steps to reduce risks.

To assess corrosion risks in community water supplies, water suppliers, in collaboration with the local health authority, should develop plans to conduct surveys, tests, inventories or studies to:

- Screen water for indicators of corrosivity;
- survey the prevalence of lead service lines in communities;
- survey the prevalence of buildings with plumbing and fixtures with elevated lead content; and
- implement testing, including surveys of representative samples taken at consumers' taps to evaluate impact of the corrosivity of the water supply in the community.

Results of assessment programs should be reviewed with health authorities. Where the corrosive nature of water quality is determined to contribute to lead exposure from interaction with plumbing at the community level, building owners and the water supplier may need to take steps to reduce risks as described later in the document. For water suppliers, these risk mitigation steps may be done informally through agreement, or may be formalized by the health authority through conditions on its operating permit.

Table 2. Health authority and water supplier roles

Health Authority	Water Supplier
• Liaise with water supplier and advise them as necessary to conduct community risk	• Liaise with health authority on the necessity to conduct a community risk assessment for

Health Authority	Water Supplier
assessment for corrosion and typical lead exposure. • If necessary, in consultation with the Water Supplier, place conditions on the operating permit, to ensure that an adequate assessment of population health risks from lead in drinking water is undertaken. • Provide direction and advice to water supplier on sampling protocols. • Interpret surveys and studies to advise water suppliers on the risks that the water supply system poses. • Advise water suppliers on public education messaging and provide information on risks. • Follow up on complaints or concerns regarding potential health hazards in the community. • Provide progressive enforcement to mitigate health hazards under the *Public Health Act* and/or DWPA.	corrosion. • Design and implement a residential testing strategy to evaluate lead exposure burden from drinking water in the community, if necessary. • Conduct sampling, tests and surveys in the community. • Report any potential health hazards associated with water supply to end users of water supplies related to the corrosivity of water. Provide messaging and information to the public regarding what is being done to mitigate hazards by the water supplier, and what the public can do to protect itself. • Minimize leaching impacts through planning and implementing corrosion control programs.

3.C ROLES AND RESPONSIBILITIES OF SCHOOL DISTRICTS AND INDEPENDENT SCHOOLS

Schools districts and independent schools are responsible for operating schools in a manner that does not adversely affect the health of their students. School districts and independent schools should work with heath authorities to establish a plan to identify where lead risks might occur, as well as to mitigate any identified risks. Details on developing a plan are found in Section 4.

Table 3: Health authority and water supplier roles relative roles of school districts, independent schools, health authorities, and the provincial government in determining risk and actions that should be taken to identify and reduce lead risks in schools.

School Districts / Independent Schools	Health Authority	Ministry of Health and Ministry of Education
• Inventory and characterize schools and identify whether they are on a community water supply or school district operated water supply. • Plan and carry out screening/testing programs in consultation with the health	• Work with water suppliers to identify where schools are at increased risk. • Assist school officials to develop plans to evaluate lead risks in schools. Provide advice on sampling protocols. • Interpret results and provide	• Provide policy and guideline direction. • The Minister of Health under the School Act can require the school medical officer to conduct inspections of schools and can require the

School Districts / Independent Schools	Health Authority	Ministry of Health and Ministry of Education
authority. • Plan and implement lead mitigation programs for school buildings. • Communicate risks to parents and students. • Send annual reminders to school maintenance staff regarding flushing or other mitigation measures that might be necessary. • Maintain records and report findings to HAs including a summary of the mitigation strategy that identifies flushing schedules and the locations being flushed.	information on mitigation options. • Review the effectiveness of mitigation options. • Advise school officials on risk messaging for the schools. • Engage with schools to verify lead mitigation programs are adhered to, and follow up on complaints or concerns. • Provide progressive enforcement where necessary if health hazard remains unabated.	MHO to provide a report.

3.D ROLES AND RESPONSIBILITIES OF LICENSED CHILD CARE FACILITIES

Licensed child care facilities are responsible for operating in a manner that will promote the health, safety and dignity of persons in care. Licensed child care facilities should work with heath authorities to evaluate lead risks in their facility, as well as mitigation planning to identify and mitigate the risks.

Table 4: Relative roles of licensed child care facilities and health authorities in determining the actions that should be taken to identify and reduce the risks of lead in drinking water.

Child Care Facilities	Health Authority	Ministry of Health and Director of Licensing
• Plan and carry out screening/testing programs in consultation with health authority where there is a risk of lead in drinking water. • Plan and implement lead mitigation programs for their facilities. • Communicate risks and mitigation steps to parents. May consider sharing with parents new to a facility upon child enrollment, and include in parents	• Provide education materials relating to lead in drinking water. Work with water suppliers to identify where conditions might exist that put facilities at increased risk. • Assist affected facilities to develop plans to evaluate lead risks. Provide advice on sampling protocols. Interpret results and provide information on mitigation options. • Review the effectiveness of mitigation options. • Work with child care facilities to	• Provide policy direction • Develop educational materials on lead in drinking water. • Recommend or require testing for lead in high risk child care facilities.

handbook. • Send annual reminders to staff regarding flushing, alternate sources of water, or other mitigation measures necessary.	develop messaging to users and their families on lead risks in the child care facilities. • Include lead education in inspections. Verify lead mitigation programs are adhered to and effective. Follow up on complaints or concerns regarding lead in child care facilities. • Provide progressive enforcement where necessary if health hazard remains unabated.	

3.E ROLES AND RESPONSIBILITIES OF THE OWNERS OF HOMES AND OTHER BUILDINGS

The BC Building Code provides plumbing standards within buildings; however this statute is only applied at the time of construction. As a result, it can be assumed that most homes and other buildings constructed or altered prior to the 1989 revisions of the BC Building Code have a higher risk of lead leaching into drinking water from their plumbing. Under the *Public Health Act*, the owners of these properties are responsible for ensuring that the plumbing does not create a drinking water health hazard for those who consume the water.

While there are no specific regulations that require lead to be tested and mitigated in individual homes and buildings, owners are required to provide tenants with potable water that is fit to drink without further treatment. Owners are responsible for testing their own water and taking mitigation steps (e.g. flushing, service line/plumbing fixture replacement), and health authorities may provide reference information on the best practices for doing so.

Table 5: Relative roles of building owners and health authorities in determining risk and actions that should be taken to identify and reduce the risks of lead in drinking water.

Building/Home Owners	Health Authority
• Provide potable water to rental units intended to be living accommodations. • Learn about the risks of corrosion from communications from the water supplier (system specific info) and/or the health authority (general info). • Plan and carry out testing on building water. • Provide information and communications to tenants and/or employees. • Develop and implement a mitigation strategy for lead in their buildings.	• Work with water suppliers to ensure that risks are communicated to users. • Provide information to the public on the risks of lead in drinking water, lead testing, the interpretation of test results, and mitigation options.

3.F ROLE OF PROVINCIAL GOVERNMENT

Ministry of Health is the main agency for provincial drinking water policy development. The Ministry will work with Health Canada, BC's health authorities, the Ministry of Education and other stakeholders to provide advice and policy on best practices for assessing lead risks from drinking water, to develop educational material, and to advocate for the reduction of lead exposure to the public from drinking water.

4. ASSESSMENT AND MITIGATION OF LEAD RISKS IN DRINKING WATER

4.A WATER SUPPLY SYSTEM/COMMUNITY LEVEL

EVALUATE AND PRIORITIZE

Screening water supply systems for high risk of corrosion:

Health authorities should work with water suppliers to screen water supply systems for characteristics that suggest potential corrosion risks, and/or the prevalence of buildings at risk. These systems may be prioritized for further investigation of the potential for unacceptable lead concentrations in water for consumers.

The chemistry of corrosivity is complex, typically involving many different factors (chemical, physical or microbiological), which can make it challenging to predict how it will impact leaching when it comes into contact with leaded components.

Many indexes such as the Langelier Saturation Index (LSI), the Ryzner Index, the Aggressiveness Index, the Momentary Excess and the Calcium Carbonate Precipitation Potential, were developed to assess the calcium carbonate–bicarbonate equilibrium, and were historically used as an indicator of the corrosivity of water. However, Health Canada's *Guidance on Controlling Corrosion in Drinking Water Distribution Systems* and Ontario's *Guidance Document for Preparing Corrosion Control Plans for Drinking Water Systems*, report significant empirical evidence contradicting the presumed connection between corrosion and the most common of the corrosion indices, the Langelier Index. The American Water Works Association Research Foundation recommends that the use of corrosion indices for corrosion control practices be abandoned. Because of these limitations, these authorities recommend lead and/or other metal sampling at the tap as the most reliable indicator of corrosive water. This is critical, because corrosivity of the water is under control of the water supplier, whereas the lead content in the plumbing is largely under control of the building/home owner. Because the most reliable indicator of corrosive water is actual corrosion as detected in sampling at the tap, water suppliers should not conclude that their water is not corrosive until that is confirmed by sampling inside buildings and homes.

This being said, the chemistry of the water in water supply systems can be proactively evaluated for risk factors that indicate a higher probability that it will be corrosive. Water supplies with one or more of the

following water chemistry characteristics should be *prioritized* for further evaluation of potential lead risks from corrosion of plumbing in the community:

- Lower pH (<7)
- Low alkalinity (<30 mg/L)
- Low hardness, i.e., "soft water" (<60 mg/L as calcium carbonate $CaCO_3$)[2]

Other drinking water quality parameters that might impact corrosivity may also be considered such as: higher temperatures, fluctuations in free chlorine residual, chloramines, chloride, sulphate, natural organic matter (NOM), oxidation-reduction potential (ORP), and chloride-sulphate mass ratio (CSMR) (see Table 6).

Table 6. Water Quality Factors Affecting Corrosion.

Factor	Effect
pH	Low pH causes iron, lead, and copper corrode rapidly.
Alkalinity and Dissolved Inorganic Carbonate (DIC)	Neutralize strong acids and provide buffering capacity against a pH drop. Affect many reactions in corrosion chemistry.
Hardness	In combination with alkalinity, promote the formation of a protective passivating film.
Disinfectant Residual	Gaseous chlorine lowers pH. Higher chlorine residuals (2 mg/L) may cause protective lead scales.
Dissolved Oxygen	Increases corrosion of copper; effect on lead less certain.
Oxidation Reduction Potential, Redox Potential (ORP, Eh)	High ORP and high pH promote protective lead scales.
Ammonia	Interfere with the formation of passivating films. Oxidation of ammonia (nitrification) lowers alkalinity and pH, increasing corrosion.
Chloride and Sulphate	Chloride (Cl^-) and sulphate (SO_4^{2-}) cause dissolved metals to remain soluble. Increase the salinity (TDS) and electrical conductivity of water. High chloride-to-sulphate-mass ratios (CSMRs) increase corrosion rates for lead solder connected to copper pipe.
Salinity (TDS)	The higher the TDS, the higher the ionic strength and electrical conductivity.
Natural Colour and Organic Matter	May form a protective film and reduce corrosion. May react with the corrosion products to increase corrosion. Food for microorganisms growing in biofilms in the pipes.

[2] According to Health Canada's Guideline Technical Document for Hardness, soft water can lead to corrosion of pipes. The degree to which this occurs is also a function of pH, alkalinity and dissolved oxygen content. According to the Water Research Centre, in water that is soft, corrosion occurs because of the lack of dissolved cations, such as calcium or magnesium in the water. In scale forming water (hard water), a precipitate or coating of calcium or magnesium carbonate forms on the inside of the piping called scale. This scale coating can inhibit the corrosion of the pipe by acting as a barrier, but it can also clog the pipe (i.e., incrustation). Health Canada recommends hardness levels between 80 and 100 mg/L (as $CaCO_3$), which are generally considered to provide an acceptable balance between corrosion and incrustation from scale. (Source: http://healthycanadians.gc.ca/publications/healthy-living-vie-saine/water-hardness-durete-eau/index-eng.php)

Factor	Effect
Corrosion Indices	Langelier Saturation Index (LSI) measures calcium carbonate ($CaCO_3$) scale-forming tendency. LSI does not correlate well with actual corrosion, so LSI is less reliable than sampling at taps for corrosion products.
Temperature	For every 10°C rise in temperature, chemical reaction rates, including corrosion, typically tend to double.
Flow velocity	High velocity: increases the supply of dissolved oxygen; erodes pipe walls if abrasive suspended solids are present. Zero velocity: Stagnation may cause pitting and tuberculation, especially in iron pipes, as well as promoting biological growth
Microbiological	Microbiologically induced corrosion (MIC) ≡ localised high corrosion zones (pinholes) sheltered inside biofilms.
Orthophosphate	Corrosion inhibitor added to water to form a passivating film on the pipe surface.

Based on: ON (2009) Guidance Document for Preparing Corrosion Control Plans for Drinking Water Systems. Section 2.3 Water Quality Factors Affecting Corrosion.

To confirm whether corrosion is an issue for a community's water supply system, the most reliable approach is sampling surveys of lead at consumers' taps as described in Health Canada's *Guideline Technical Document on Corrosion Control*, and Appendix C of this document.

Health Authorities may also consider data from lead testing programs in schools, day cares or other buildings, which may serve as sentinel information for a community, and help flag the need to further investigate.

Where the initial screening of water chemistry (pH, alkalinity and softness) indicates increased risk factors for corrosive water, a survey of the prevalence of service connections and of the typical age and condition of buildings in the community can also help determine the magnitude of risk. This information can also be used in later steps to assist in determining where to focus lead sampling program from consumers' taps. Communities where a high proportion of buildings were constructed prior to 1989, that have not upgraded their plumbing to lower lead content are likely to be at the highest risk of having lead in their plumbing.

Large communities with older housing stock and buildings as well as a water supply with corrosive characteristics should be targeted for further sampling first. Additionally, communities where there has been a change in water source or water chemistry or treatment processes should also be flagged for testing.

TESTING AND EVALUATING RESULTS

Those drinking water systems identified as being at the highest risk by the screening step should develop and implement lead sampling programs conducted at consumers' taps. The objectives of these sampling programs are to:

- Determine whether community level lead mitigation measures are warranted to reduce corrosion;
- establish base lines to help evaluate the effectiveness of any mitigation measures that are adopted; and
- evaluate if the water typically consumed by customers exceeds the maximum acceptable concentration (MAC) level for lead set out in the *Guidelines for Canadian Drinking Water Quality*.

High level descriptions of sampling protocols for corrosion risks, as well as for determining whether concentrations of lead typically found in the community's water meets the *Guidelines for Canadian Drinking Water Quality* are outlined in Appendix C.

MITIGATION

Both centralized and decentralized mitigation measures can be taken to address concerns from lead at user's taps resulting from corrosive water. The most appropriate method will depend on a number of factors. In areas where the nature of the water supply itself is reasonably believed to contribute to a health risk from lead at users' taps, water suppliers should work with health authorities to determine feasible strategies for mitigating lead risk. Reducing risk will usually involve a combination of communicating how consumers can reduce their own risks as well as planning long term corrosion control strategies as follows:

1. Communicate the results of testing programs to consumers and inform them of the appropriate measures that they can take to reduce their exposure to lead. Corrective measures that consumers can take could include any or a combination of the following:
    - flushing the building plumbing system;
    - replacing their portion of the lead service line (if applicable);
    - replacing brass fittings or in-line devices (pre-2012);
    - using drinking water treatment devices certified to reduce lead; and
    - using an alternate water supply for drinking water or food preparation.[3]

[3] Exposure through bathing and other household purposes is not a health hazard.

2. Implement appropriate corrective measures to control corrosion in the drinking water supply system. Results of sampling should be used to help determine the best corrective measures for the system, which may include any or a combination of the following:
    - replacing lead service lines;
    - adjusting drinking water pH and alkalinity;
    - adding corrosion inhibitors;
    - replacing brass fittings or in-line devices containing lead;
    - carrying out *ad hoc* or unidirectional flushing, swabbing, or pigging of water mains to reduce accumulated sediment and biofilms; and
    - maintaining a disinfectant residual to avoid reducing conditions and to control biofilms.

Corrosion control programs have been shown to significantly reduce leaching, but may not eliminate it. Careful consideration should be given to the potential effectiveness, potential unintended effects on water, public acceptance, and the cost of mitigation measures and programs to determine the most appropriate course of action to follow. Bench-scale and pilot testing should be carried out for any proposed change to distribution water chemistry. No matter what type of mitigation measures are employed, an evaluation of the effectiveness of the mitigation measures should be done after they are implemented. Community level assessment and mitigation steps are outlined in the flow chart set out in Appendix A.

4B. INDIVIDUAL BUILDINGS

EVALUATE AND PRIORITIZE

Owners and operators of buildings (particularly school boards and child care facilities), particularly those on water systems identified to be at risk from corrosive water, should evaluate their buildings for plumbing components that can leach lead into drinking water. The complexity of the evaluation may vary depending on whether the building in question is a single family home, a multi-family dwelling, an industrial/office building, a school, or a child care facility; however the overlying evaluation principles will be the same. [4]

Evaluations should include:

- Developing a plumbing profile for the building that identifies plumbing components such as service lines, pipes, solder or fixtures that contain lead, and inventories drinking fountains and other points of consumption that might contain lead or brass;

[4] *For the purpose of this document:*
"buildings" includes private residences and private schools served by a community water system;and
"schools" and "facilities" mean those that are connected to an approved water supplier and are not themselves a water supplier under the DWPA. Schools and other facilities that are their own water supplier may need to also take on roles of water suppliers in this document.

- identifying potential problems and health hazards to users through screening tests and/or more comprehensive testing;
- maintain records and communicate plans and results with stakeholders; and
- taking routine, interim and permanent mitigation measures.

An example of school and child day care assessment and mitigation steps is outlined in the flow chart set out in Appendix B. The following publication from the Province of Ontario manual is an excellent reference for evaluating risks from their plumbing and identifying options to remedy any excess lead in facilities: (2009) A Manual for Operators of Schools, Private Schools and Day Nurseries with excess Lead in their Drinking Water: A resource guide on how to locate the source and remedy the problem [Available at: https://www.ontario.ca/document/manual-operators-schools-private-schools-and-day-nurseries-excess-lead-their-drinking-water].

TESTING AND EVALUATING RESULTS

For schools, licensed child care facilities and other buildings that have plumbing containing lead components, or where there is a lack of information about the plumbing that is in place, screening tests and/or more comprehensive testing programs should be planned and implemented in consultation with regional health authorities.

When testing water, it is important to determine the sampling objective, so that the appropriate sampling protocol is used. Sampling protocols differ depending on the desired objective: e.g. whether it is screening of schools for potential lead problems, identifying fixtures/sources of lead for replacement or to estimate health risk from exposure to lead. In order to provide meaningful results, multiple samples are needed. Health authorities can provide advice on what sampling method is appropriate and can help evaluate and interpret the results.

A high level description of how, when and where to test buildings is outlined in Appendix C. Health authorities can provide advice on how it should be applied to individual facilities, and can help evaluate and interpret the results against the guidelines.

Subsequent to initial screening and evaluation, schools and child care facilities should develop a plan for long term routine lead monitoring. Annual testing would be ideal, however risk-based decisions on frequency may be warranted from a resource perspective. In general, higher risk facilities where lead has been found as a problem may require more frequent testing than facilities where lead is not known to be an issue or risk. In BC, the Ministry of Education has developed policies for schools districts and independent school authorities regarding expectations for lead sampling, reporting and mitigation. These policies (see links below) require regular screening for lead in all schools. This guidance document serves as a guide on how to meet this testing requirement.

BC Ministry of Education (Sept 26, 2016) *Testing Lead Content in Drinking Water of School Facilities*

BC Ministry of Education (January 1, 2017) *Testing Lead Content in Drinking Water of Independent School Facilities*

MITIGATION

In buildings where the risk of exposure to lead in drinking water is determined to be unacceptable, mitigation measures should be taken. Owners should communicate results of evaluations, and identify what consumers can do to reduce exposure to lead in the short term, and what building owners can do to reduce exposure in the long term. In situations where the drinking water is at risk of elevated lead and testing to establish water quality has not yet been done, it would be prudent to err on the side of caution and adopt interim measures (flushing, bottled water) to reduce the risks associated with the presence of lead in drinking water while awaiting assessment results.

Options for reducing lead in buildings may include short and long term solutions such as:

- Educating the occupants of the building (e.g., teachers, day care providers, students) and other interested parties (e.g., parents, occupational health and safety committees) on the sampling results and the interim and long-term corrective measures that are being undertaken;
- flushing all water taps used for drinking water or food preparation at the start of each day or after periods of stagnation;
- providing an alternative water supply such as bottled water;
- installing point-of-use (POU) filtration units designed specifically to remove lead;
- installing corrosion control equipment at the point-of-entry (POE) into the building to adjust pH to reduce the likelihood of lead leaching into water (however complexity of maintenance may pose challenges in many situations);
- where lead sample results identify particulate vs dissolved lead, this may help decide whether it is better solved by filtration than conditioning for corrosion control;
- removing drinking water taps from service that contain unacceptable levels of lead;
- posting signs that identify “designated drinking water taps” (DDWTs) and "Do not drink" taps (non-DDWTs);
- replacing lead containing outlets, fixtures, fountains, pipes and fittings with low-lead alternatives;
- replacing old water lines and solder that might contain lead;
- working collaboratively with the water supplier to ensure that the water delivered to the building is not corrosive.

Evaluation of the effectiveness of mitigation measures should be done after they have been implemented, and at regular time intervals afterwards. No matter what type of mitigation measures are employed, re-sampling should be done to verify the effectiveness of the mitigation measures and to ensure that the concentration of lead falls below the GCDWQ maximum acceptable concentration.

COMMUNICATION

Users of drinking water systems and buildings need to know the risks that exist, if any, and what is being done to mitigate the risks. Users should be advised regularly on lead risks associated with their drinking water and the need for regular testing, and mitigation measures. Communication should be clear and transparent to avoid confusion and ensure the goals, message and actions are understood.

Simple handouts for the public and other stakeholders such as: Health Files https://www.healthlinkbc.ca/healthlinkbc-files/lead-drinking-water, as well as those specific to School testing, and daycares may be helpful in communicating key messages.

Table 7: Communication Expectations

Who and What?
Health Authorities
• General messaging about lead and health risks to the public • General technical medical questions • Audience: General public, media, water suppliers, school boards; operators of child care facilities
Water Suppliers
• What is known about water corrosivity • What the drinking water supply system is doing about it • What users need to do to protect themselves • Audience: users of the water supply system
School Boards, Child Care Facilities and Other Building Owners
• What assessments are being done • Results of the assessments • Mitigation measures being taken • Audience: building users, parents of children and students in care
How?
• Written and media communication: Targeted mail outs, flyers in water bills, media releases, annual reports, newsletters, e-mails, websites and social media • Face to face conversations: interviews, public events • Signage: Warning signs on taps. Where flushing is the mitigation measure of choice, signage should be posted by fountains warning users to flush until the water runs cold
When?
• Whenever new, reliable information is available • Prior to and after lead screening and testing programs • Reminders should be done regularly in problem areas

REFERENCES:

BC Centre for Disease Control. (2017) Managing risks to children's health from lead in drinking water in British Columbia's daycares and schools.

Deshommes et al. (2016) Evaluation of exposure to lead from drinking water in large buildings, *Water Research*; 99:46-55 [URL: http://dx.doi.org/10.1016/j.watres.2016.04.050]

Health Canada (2007) Water Talk: Minimizing Exposure to Lead from Drinking Water Distribution Systems [URL: http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/lead-plomb-eng.php]

Health Canada (2015) Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – pH.

Health Canada (1979, reprinted 1995) Guidelines for Canadian Drinking Water Quality: Hardness

Health Canada (2009) Guidance on Controlling Corrosion in Drinking Water Distribution Systems. Water, Air and Climate Change Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. (Catalogue No. H128-1/09-595E).

Health Canada (1992) Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Lead Air and Climate Change Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. (Catalogue No. H128-1/09-595E).

Ontario Ministry of Environment (2009) A Manual for Operators of Schools, Private Schools and Day Nurseries with Excess Lead in the Drinking Water: A resource guide on how to locate the source and remedy the problem [URL: https://www.ontario.ca/document/manual-operators-schools-private-schools-and-day-nurseries-excess-lead-their-drinking-water]

Ontario Ministry of Environment and Climate Change (updated June 23, 2016) Guide for schools, private schools and day nurseries on flushing for lead: A guide to requirements for flushing and testing drinking water taps in schools, private schools and day nurseries. [URL: https://www.ontario.ca/page/guide-schools-private-schools-and-day-nurseries-flushing-and-testing-lead]

Ontario Ministry of Environment and Climate Change (2009) Guidance Document for Preparing Corrosion Control Plans for Drinking Water Systems [URL: https://archive.org/details/guidancedocument00snsn21738]

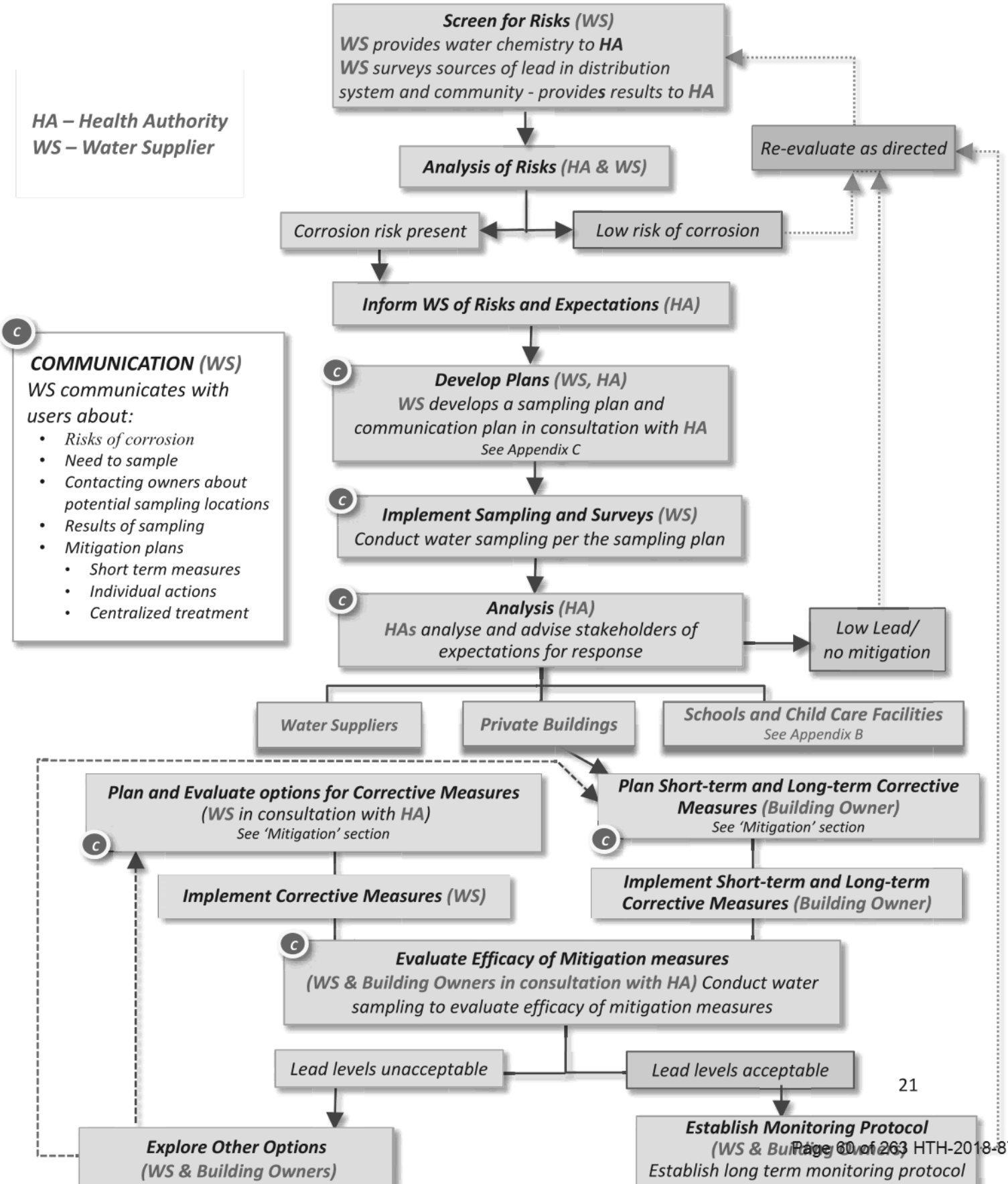
US EPA (Nov 9, 2015) Testing Schools and Child Care Centres for Lead in the Drinking Water [URL: https://www.epa.gov/dwreginfo/testing-schools-and-child-care-centers-lead-drinking-water]

US EPA (2005) 3Ts for Reducing Lead in Drinking Water in Child Care Facilities: Revised Guidance [URL: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=20017JVA.txt]

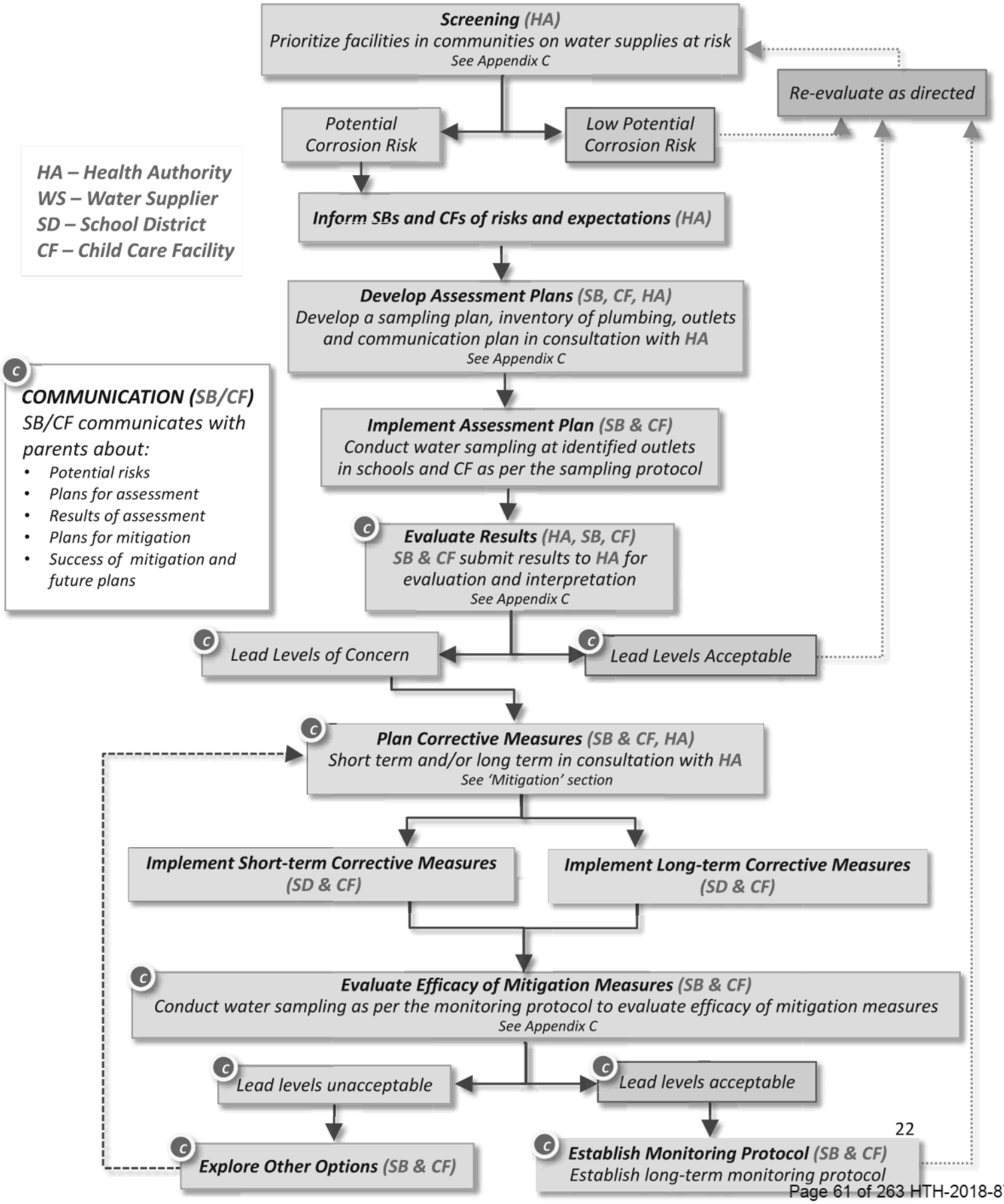
US EPA (2006) 3Ts for Reducing Lead in Drinking Water in Schools: Revised Technical Guidance [URL: https://www.epa.gov/dwreginfo/lead-drinking-water-schools-and-child-care-facilities#3Ts]

Water Research Foundation / American Water Works Association (2015) Controlling Lead in Drinking Water; Web Report # 4409 [URL: http://www.waterrf.org/PublicReportLibrary/4409.pdf]

Appendix A – Process Flow for Evaluating Corrosion Risk in Water Supplies



Appendix B - Processs Flow for Evaluating Lead in Schools and Child Care Facilities



APPENDIX C - EVALUATING LEAD IN DRINKING WATER

Contents:

1. WHY ARE YOU SAMPLING?

The purpose of this appendix is to provide a reference of best practices for evaluating and sampling lead content in drinking water. As lead concentrations in drinking water vary both spatially and temporally, there are many sampling protocols that have been developed. Therefore consideration should be taken to choose the one that is the most appropriate for the situation.

Prior to embarking on a sampling program, the questions should be asked – what is the objective of sampling and what is it that one would like to demonstrate? Sampling protocols differ depending on the desired objective (e.g. identifying corrosive water, identifying fixtures and potential sources of lead in a building, and estimating if typically consumed lead concentrations in water meets guidelines). It is important that the selected protocol be appropriate to meet the desired objective.

1.1. EVALUATING IF CENTRALIZED WATER SYSTEM CORROSION CONTROL IS WARRANTED

Depending upon the drinking water supply system and the characteristics of the drinking water produced, it may be necessary to determine whether the drinking water is capable of causing downstream corrosion problems in buildings with leaded plumbing components. Sampling results can be used to make decisions on whether community water system level actions are needed, and to evaluate the effectiveness of corrosion control measures after they are implemented. (See Section 2.1)

1.2. EVALUATING SOURCES OF LEAD WITHIN A BUILDING

Where sources of lead are suspected in buildings, such as schools, child care facilities or other structures, testing should be done to determine if mitigation measures are warranted. This can range from simple screening for potential problems, to comprehensively testing to determine which specific taps/fixtures or other plumbing components within a building are contributors to lead. Results can be used to make decisions on whether building level actions are needed, and to evaluate the effectiveness of control measures after they have been implemented. (See Section 2.2)

1.3. EVALUATING WHETHER LEAD CONCENTRATIONS IN TYPICALLY CONSUMED TAP WATER POSE A HUMAN HEALTH RISK

The health advice and the Maximum Acceptable Concentration (MAC) for lead in the *Guidelines for Canadian Drinking Water Quality* is based on samples representing typical or average concentrations of lead consumed throughout the day, not best or worst case scenarios. To evaluate whether the guideline for lead is being met, typical lead concentrations in drinking water ingested by users (i.e. representative of normal use) need to be determined. This may be done in the context of a building such as a school, a residence, or an entire community. The results can be used to determine what messaging should be

delivered to advise of potential health risks, action plans to mitigate the risks, and to determine if mitigation measures are successful after they have been implemented. (See section 2.3)

Once sampling objectives have been determined, careful planning should be done to get meaningful results, and to ensure that the sampling objectives are met.

2.0 SAMPLING PROTOCOLS:

2.1. TO EVALUATE IF CENTRALIZED WATER SYSTEM CORROSION CONTROL IS APPROPRIATE.

The purpose of this type of monitoring program is to identify drinking water supply systems in which corrosion is an issue, to allow decisions to be made as to whether corrective measures at the water supplier level are warranted, and to determine what measures are likely to be the most effective. These programs can also be used to assess the effectiveness of corrosion control programs after their implementation. Results of this type of protocol do not represent typical concentrations of the lead in drinking water ingested by consumers, therefore, results should not be used for the interpretation of health risks, nor whether the Maximum Acceptable Concentration (MAC) in the Guidelines for Canadian Drinking Water Quality (GCDWQ) is being met.

For the evaluation of the risk of corrosion, "Option 1 (two-tier protocol)" from page 4 of Health Canada's *Guidance on Controlling Corrosion in Drinking Water Distribution Systems* (GCCDWDS) is the preferred protocol. A second option, "Option 2 (lead service line residences)" described in the document can be used as an alternate where the two tier protocol is impractical. A brief overview of the protocol is described below; however, the original document should be referred to for the details.

Investigators will need to determine the number and location of monitoring sites. These sites should include taps within residences. To provide meaningful results, investigators will need to collect between 5 and 100 samples, depending on the size of the drinking water system (i.e., the number of people served). The recommended minimum number of sites to be monitored is shown in Table A. Sampling at individual sites is conducted as follows:

First Tier: Sample to establish whether the community water system has corrosion concerns.

- 6 hour stagnation, then collect 1L of water.
- If more than 10% of the sampled residential sites have a lead concentration greater than the action level of 15 µg/L, go to second tier. Note that this action level is different than the MAC for lead, as this is a measure of corrosion risk, not health risk.

Second Tier: For systems with corrosion concerns, this will provide detailed information about how lead is typically entering the drinking water, and will help plan mitigation measures that most appropriately target the sources found.

- Sampling is conducted at 10% of the sites sampled in Tier 1, specifically, the sites in which the highest lead concentrations were measured.
- Four consecutive 1L samples should be taken at a consumer's cold drinking water tap after a 6 hour stagnation period. This will provide a detailed profile of the sources of lead from within each building (e.g., the faucet, plumbing (lead in solder, brass and bronze fittings, brass water meters, etc.) and the lead service line.
- Each sample should be analysed separately to determine where the highest lead concentrations come from.

Table A: Suggested minimum number of monitoring sites

System Size (number of people served)	Number of Sites (annual Monitoring)	Number of Sites (reduced annual monitoring)
>100 000	100	50
10 001-100 000	60	30
3 301-10 000	40	20
501-3 300	20	10
101-500	10	5
≤ 100	5	5

Adapted from USEPA (1991a)

Interpreting Results

Where the sampling program shows more than 10% of the sampled residential sites have a lead concentration greater than the action level of 15 µg/L the water supply system should consider mitigation programs. This may include any or all of those listed in section 4 of this Guideline. It is recommended that water supply systems considering mitigation options initiate the second tier to help pinpoint typical sources of lead (fixtures vs plumbing vs lead service lines), so that the most effective mitigation measures can be planned to target those sources.

2.2. SCREENING FOR AND LOCATING SOURCES OF LEAD WITHIN A NON-RESIDENTIAL BUILDING (INCLUDING SCHOOLS, DAY CARES)

This protocol is designed to locate specific lead sources within a building's plumbing and to help identify where and how to proceed with remedial actions. It provides details that help identify specific cold drinking water outlets that have elevated levels of lead following periods of water stagnation.

This is based on Section A.2.5. of Health Canada's *Guidance on Controlling Corrosion in Drinking Water Distribution Systems* be used in conjunction with a systematic plan for lead sampling. While a brief overview of the sampling protocol is described briefly below, the original Health Canada document should be referred to for details.

2.2.1 - SCREENING FOR LEAD

- Survey and inventory the building to identify all locations in the building where drinking water is likely to be consumed.
- Take a First Draw (FD) 250ml sample from each location after an 8 hour stagnation period.
- In addition to those locations where drinking water is consumed, an additional fully flushed (FF) sample should be taken at a faucet near the water main to be representative of water from the water main.
- If lead concentration exceeds 20 µg/L (lead action level) at any of the monitoring locations, further investigation and remedial action is warranted. This may include short term measures such as flushing programs, and/or long term measures to find and replace source of lead in plumbing (see below).

2.2.2 – LOCATING SPECIFIC SOURCES OF LEAD IN THE PLUMBING FOR REMEDIATION

- To evaluate whether lead may come from other sources within the building, monitoring locations (above) exceeding 20 µg/L (lead action level) a subsequent 250 ml sample should be taken at those locations after an 8 hour stagnation period plus 30 seconds of flushing.
- Alternatively, while it may initially require more samples be taken, it may be more cost efficient for investigators to simply take a second sample at all sampling locations 30 seconds after taking the first sample.
- An analysis of results against plumbing plans for the building can be used to pinpoint sources of lead.

Interpreting Results

A comparison of the results can be used to help determine sources of lead, and to plan corrective actions. For example:

- Where the first samples do not exceed the lead action level – no further action would be required unless other samples in the building exceed the action level.
- Where the first samples exceed the lead action level, and subsequent samples do not, the fixture is the likely source of contamination and mitigation measures targeted at the fixture should be considered.
- Where the first and subsequent samples exceed the lead action level, mitigation measures targeted to the entire building should be considered.

Successful determination of lead sources within buildings is dependent on developing and implementing a systematic sampling plan to ensure meaningful results. Sampling plans should be tailored to specific situations. Ontario's Manual for Operators of Schools, Private Schools and Day Nurseries with Excess Lead in their Drinking Water published by the Ontario Ministry of the Environment and Climate Change provides an excellent resource for school and other buildings to locate the source of problems and mitigate them. This manual guides users through four key steps:

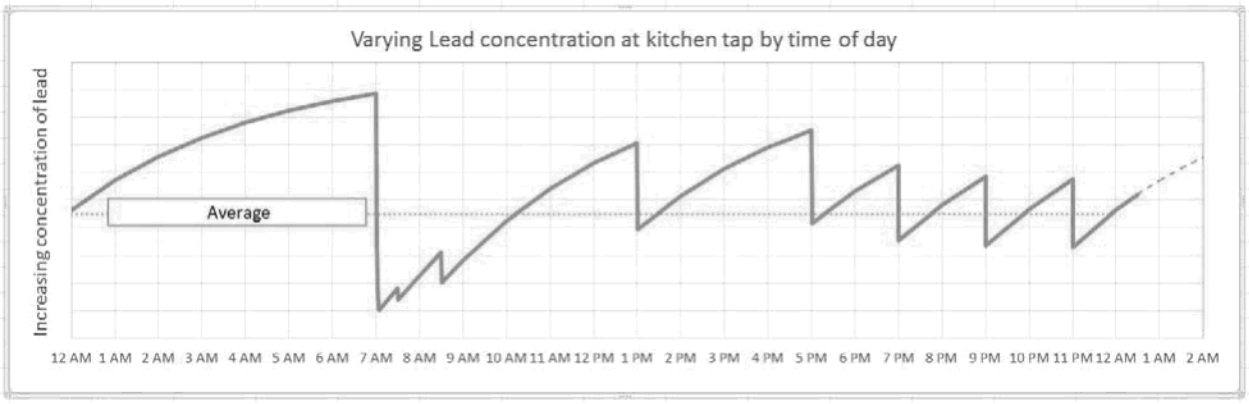
- Assessing plumbing;
- developing a sampling strategy;
- executing the sampling strategy and using the test results to remedy the problem; and
- taking routine, interim and permanent measures.

The manual may describe slightly different sampling protocols and action levels than this document, but its description of the processes for sampling still applies. The general process in this manual could also be applied to non-school settings.

Ideally, schools should be monitored at least once per year with consideration for reductions in the sampling frequency if monitoring shows that the results are acceptable. The BC Ministry of Education may recommend alternative frequencies, however the health authority should be consulted in order to help determine an appropriate health-based sampling frequency based on the data available. In circumstances where Ministry of Education lead sampling policies require testing at a frequency greater than what a DWO would typically recommend, the frequency set by the Ministry of Education's policy should be followed.

2.3 TO EVALUATE HEALTH RISKS:

The Maximum Acceptable Concentration (MAC) published in the *Guidelines for Canadian Drinking Water Quality (GCDWQ)* is intended to apply to the average concentration in the water consumed. This implies that when evaluating health risk, the sampling protocol should be designed to estimate the average or typical exposure to lead in drinking water not the worst possible case scenario. (See conceptual figure A below.)



As water that has remained stagnant in pipes is at highest risk for lead content, it would be expected that concentrations in plumbing will be highest in the morning, and drop over the day with use. Assessing whether or not typical concentrations consumed meet the GCDWQ should therefore be based on sampling at times and places where water is usually consumed, and not a worst or best case scenario.

The following describes specific approaches to estimate typical concentrations in different scenarios, including community risk, and risks with individual dwellings or larger buildings.

2.3.1 EVALUATING HEALTH RISK AT THE COMMUNITY LEVEL:

While it is relatively simple to sample lead concentrations in drinking water as it leaves the treatment plant, it is not representative of what is consumed by users as building plumbing can significantly impact lead content. To establish a typical concentration of lead being consumed by customers, a series of either Random Daytime Samples (RDT) or Thirty Minute Stagnation (30MS) samples should be taken at multiple points of consumption. These samples should be averaged. Details of the pros and cons of each method are discussed in part three of this document.

Sampling plan designs should consider:

- Producing reliable results typically requires 20 or more samples, taken at different consumer locations and at different times of year;
- choosing sampling points from consumer's taps that are balanced between public and private buildings;
- identifying homes with lead service lines for inclusion in the sampling program, as these are likely to have the highest lead concentrations;
- dividing larger distribution networks into neighbourhoods or zones of similar age and evaluating the risk of each community independently may be advisable in some areas; and
- taking samples of the water supplied to the distribution network to establish baselines of the lead concentration of water supplies.

After selection of the taps being sampled, either:

a) For RDT programs, the first 1 litre of water, from each tap is sampled without flushing at random times throughout the day, or
b) for 30MS programs, flush taps for 5 minutes, let stagnate for 30 minutes, then take two consecutive 1-litre samples.

Interpretation

Results should be averaged to determine a typical value for evaluation against the MAC set in the GCDWQ of 10 µg/L. Individual samples that exceed the MAC should not be cause for community concern, however further investigation of the cause might be warranted. Where averaged samples exceed the MAC, the Health Authority should be engaged with the water supplier to further investigate and plan mitigation options.

2.3.2 EVALUATING HEALTH RISKS IN INDIVIDUAL DWELLINGS:

Homeowners, operators of child care facilities in residential settings or occupants of dwellings with older plumbing may wish to investigate whether drinking water from their home meets the requirements of the GCDWQ. This scenario provides a challenge as it is unlikely that a series of samples will be taken and averaged to produce "typical" results. Where only one sample is practical to be taken, a 30MS sample should be done as it is the most reproducible for post mitigation evaluation, and can be done at any time of the day.

Interpretation

Where possible, multiple samples should be taken and averaged, and results evaluated against the MAC of 10 µg/L in the GCDWQ. Where the MAC is exceeded, further investigation should be done to determine the source of lead and/or the mitigation measures that can be implemented.

2.3.3 EVALUATING HEALTH RISKS IN SCHOOLS AND OTHER LARGER BUILDINGS:

The purpose is to determine if water typically consumed by students in schools or occupants/residents of larger buildings are likely to be at levels that exceed the GCDWQ. This may be done after screening (See Section 2.3). If screening does not show exceedance of action levels, further sampling and calculation of the MAC is likely not warranted. As school plumbing tends to be complex in use patterns, age, and variability, there is typically no single sentinel site that can be established for most schools, thereby requiring the sampling of every drinking water location. Large buildings face similar challenges.

A RDT sampling protocol is recommended to capture typical exposures, including potential exposure to particulate lead. This should be conducted by sampling at all drinking water fountains and cold water taps where water is used for drinking or food preparation. Samples should be taken:

- At random times throughout the school day;
- preferably taken between May and September as leaching increases with higher water temperatures; and
- two consecutive 125 mL samples should be collected at each fountain or tap without a stagnation period and without prior flushing. Note: smaller samples are taken as it can provide valuable data for find and fix options if needed at a later date.

Interpreting Results

Results from a sampling program should be calculated by averaging the results from at least two samples and averaging sampling locations within a building. Averages should not exceed the MAC for lead that is set out in the GCDWQ.

Those schools and buildings with indicators of lead problems should undertake further screening and mitigation as per section 2.3 below. Taking two 125ml samples is preferable to taking a 1L sample as it can help determine if the fixture or the plumbing system is the problem by providing valuable data for further investigation and for determining mitigation options.

3.0.0 DEFINITIONS

3.1.1 RANDOM DAYTIME SAMPLING (RDT):

Purpose: To capture typical exposures at residential sites, assess health risk, and set priorities.

A sample is taken at a random time during a working day directly from the tap in a property without previous flushing. The stagnation of water in a distribution system influences the concentration of lead in a random manner. Health Canada recommends taking a 1L samples for sampling programs conducted at the community level. For schools and other large buildings, Health Canada recommends taking two 125ml samples be taken as the data from smaller volumes can provide valuable data for identifying and mitigating problem fixtures and areas within buildings.

RDT sampling is relatively inexpensive and convenient (per sample), but needs to be repeated numerous times to provide confidence in the results. Results are close to typical use when averaged over many samples. RDT sampling is better suited for determining system wide health risks than for individual sites. It requires 2-5 times more samples that 30MS sampling to provide statistically significant results.

3.1.2 THIRTY MINUTE STAGNATION (30MS):

Purpose: To capture typical exposures at residential sites, assess health risk, and set priorities.

A typical 30MS sampling protocol is to flush a tap for 5 minutes, then allow water to stand for 30 minutes. Two consecutive 1L samples are then taken and the results of the two samples are averaged.

30MS samples are more reproducible than RDT samples, and may be the most appropriate for single samples estimating lead risk in individual dwellings. Using two consecutive samples allows the estimation of the relative contribution of the fixture to the lead concentration. 30MS sampling is time consuming and may underestimate typical exposure to lead in drinking water.

3.1.4. FIRST DRAW (FD)

Purpose: To capture the highest levels of lead using long stagnation times.

During the stagnation period no water should be drawn from any outlet within the property (this includes the flushing of toilets). If any water is drawn during the stagnation period the result will be invalid.

- 6-8hr stagnation period then the collection of a 250 mL or 1L sample.

First draw gives the “worst case scenario”. This may also be useful in conjunction with flushed samples to help determine if a specific fixture is contributing lead to the water. This protocol is not appropriate for assessing health risk based on average exposure to lead in drinking water, unless it confirms samples are below thresholds of concern.

3.1.5. FULLY FLUSHED (FF)

Purpose: To determine lead levels in plumbing after complete flushing of the system, or to infer lead levels from water mains.

Samples are taken after prolonged flushing of the tap in a premise in such way that the stagnation of water in the domestic distribution system does not influence the concentration of lead in the drinking water. In practice a sample is taken after flushing at least three plumbing volumes, a prescribed time, or after an observed temperature drop.

While fully flushed samples provide an indication of lead concentrations in systems that are under heavy use, they are not suitable for assessing average exposure to lead in drinking water, as they are likely to underestimate typical lead exposure. Calculating pipe volumes, flow rates and flushing times may be challenging for some larger buildings with complex plumbing systems.

4.0 REFERENCES

Health Canada (2009) Guidance on Controlling Corrosion in Drinking Water Distribution Systems. Water, Air and Climate Change Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. (Catalogue No. H128-1/09-595E).

Health Canada (1992) Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Lead Air and Climate Change Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. (Catalogue No. H128-1/09-595E).

Ontario (2009) A Manual for Operators of Schools, Private Schools and Day Nurseries with Excess Lead in their Drinking Water, Queens Printer for Ontario, (Toronto, Ontario)

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UK Drinking Water Inspectorate, DWI PR14 Guidance – Lead in Drinking Water, 2013.
http://www.dwi.gov.uk/stakeholders/price-review-process/PR14-guidance-lead.pdf

UK Drinking Water Inspectorate, Lead in Drinking Water January 2010,
http://www.dwi.gov.uk/consumers/advice-leaflets/lead.pdf

APPENDIX D: GUIDANCE ON FLUSHING FOR MITIGATION

One option for mitigation of lead risks from drinking water in schools, licensed child care facilities, or other buildings is to implement a flushing program. The intention of flushing is to run the tap water until the water from the water main in the street or the water supply from within the well reaches the taps. This has been shown to significantly reduce lead levels in drinking water at the tap. However, the degree to which flushing helps reduce lead levels in drinking water can vary, depending upon the age and condition of a facility's plumbing and the corrosiveness of the water. Regardless of these limitations, flushing is still the quickest and easiest measure to reduce high lead levels in drinking water, especially when contamination is localized in a small area or in a small building.

CIRCUMSTANCES THAT INDICATE IMPLEMENTING A FLUSHING PROGRAM

Where assessment and/or water sampling of a facility has identified risks for elevated lead in water mitigation actions should be taken. These circumstances include:

- Results of testing for lead in water (see appendix C) exceed the Maximum Acceptable Concentration in the *Guidelines for Canadian Drinking Water Quality or* action levels;
- any part of the plumbing was installed before January 1, 1990 that has not been assessed for lead content, and/or there is no sampling history for the last 24 months;
- it is recommended by the Regional Health Authority.

Mitigation should include implementing a flushing program until permanent measures can be taken to reduce the lead or until testing confirms that lead levels are within acceptable limits. Any additional flushing requirements will be determined by the results of the facility's plumbing profile and risk assessment in consultation with the local Environmental Health Officer.

WHEN TO FLUSH:

- Flushing should be conducted daily when the facility or part of the facility is open.
- Flushing should be completed before the facility opens for the day. Where a facility is open for 24 hours on that day (e.g., a building housing student residences within a school property), flushing should be completed as early in the day as possible.

WHERE AND HOW TO FLUSH:

- First, turn on the cold water for at least five minutes at the last tap on each branch or each run of pipe in the plumbing that serves a drinking water tap that is commonly used to provide water for consumption. In many cases, depending on the plumbing configuration, it may be necessary to flush the plumbing for a longer period of time. The actual amount of time that will be needed depends on the type of tap, diameter of pipes, and its location within the building plumbing (i.e. distance from the water main in the street or the distance to the water supply well). For best

results, the volume of the plumbing and the flow rate at the tap should be calculated, and the flushing time should be adjusted accordingly – See **Calculating how long to flush** below.

- Then, turn on the cold water for at least 10 seconds at every drinking water fountain and every tap that is commonly used to provide drinking water for human consumption.
- Additional recommendations for flushing specific types of non-end-of-run outlets include:
    - For drinking water fountains without refrigeration units, the water should run for at least 15 seconds, or until the water is cold.
    - For drinking water fountains with refrigeration units, the water should run for at least 15 minutes. If it is not feasible to flush for such a long time, these outlets should be replaced with lead-free, NSF-approved devices.
    - For all kitchen faucets and other faucets where water may be used for drinking (including bathroom faucets where it is possible to obtain cold water), the water should run for at least 10 seconds or until the water is cold.
- Be careful not to flush too many taps at once. This could dislodge sediments that might create further lead problems, or could reduce pressure in the system below safe levels. If the flow from drinking water outlets is reduced noticeably during flushing, too many taps are probably being turned on at once.

CALCULATING HOW LONG TO FLUSH:

The amount of time it will take to fully flush a building's plumbing will vary depending on the diameter of the water supply pipe and the water flow rate during flushing. Some of the ways to determine how long to flush include:

- Calculating the pipe volume, in litres, between the outlet and the location in the plumbing being flushed using the formula: 3.14 x pipe radius^2 x pipe length (i.e., $\pi r^2 l$);
- measuring the outlet flow rate in litres per minute;
- dividing the pipe volume in litres by the outlet flow rate in litres per minute.

The following table and information from the 2016 Copper Tube Handbook[5] can assist in calculations.

Table B: Pipe Volume (per unit of pipe length) for different diameters of copper pipe

Pipe diameter	Volume of tube (litres per meter of length) Type L Copper
9.53 (3/8)	0.0938
12.70 (1/2)	0.1505
15.88 (5/8)	0.2248
19.05 (3/4)	0.3122
25.40 (1)	0.5323
31.75 (1 ¼)	0.8129
38.10 (1 ½)	1.1520
50.80 (2)	1.9974
63.50 (2 ½)	3.0751
76.20 (3)	4.3943

[5] Copper Development Association Inc.(2016) *Copper Tube Handbook: Industry Standard Guide for the Design and Installation of Copper Piping Systems*; CDA Publication A4015-14/16, NY

ESTABLISHING DUE DILIGENCE – RECORDING AND REPORTING:

- Keep written records of the date and time of every required flushing and the name of the person who performed the flushing. If auto flushers are used, record the name of the person who verified that the automatic flushing took place. Records for auto flushers need to be completed based on the frequency set out in the manufacturer's instructions or at least once a month if no instructions are available.
- Keep the written record on file and available for review by an Environmental Health Officer.

ADDITIONAL INFORMATION:

- It is not required to flush any tap or drinking water fountain in a part of a building that is not in use by children or staff during the day as well as in private student residences or in a public washroom (e.g., in a shopping mall).
- If a tap or drinking water fountain has an aerator, the aerator should not be removed when flushing.
- If a tap or drinking water fountain has an individual filter or other water treatment device, the filter should be bypassed when flushing if this can be done easily. A filter or treatment device is not required to be bypassed if it would require removing or dismantling the device to do so.
- To save water, thoroughly flush several designated drinking water outlets daily while taking all others temporarily out of service. Collect the water being flushed and use it for non-consumptive purposes.

REFERENCES:

Copper Development Association Inc.(2016) *Copper Tube Handbook: Industry Standard Guide for the Design and Installation of Copper Piping Systems*; CDA Publication A4015-14/16, NY

Ontario Ministry of the Environment and Climate Change (updated June 23, 2016) *Guide for schools, private schools and day nurseries on flushing for lead: A guide on the requirements for flushing and testing drinking water taps in schools, private schools and day nurseries* [Available at: https://www.ontario.ca/page/guide-schools-private-schools-and-day-nurseries-flushing-and-testing-lead]

Ontario Ministry of the Environment (2009) *A Manual for Operators of Schools, Private Schools and Day Nurseries with Excess Lead in their Drinking Water: A resource guide on how to locate the source and remedy the problem* [Available at: https://www.ontario.ca/document/manual-operators-schools-private-schools-and-day-nurseries-excess-lead-their-drinking-water]

BRITISH COLUMBIA | HealthLinkBC

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December 2016

Lead in Drinking Water

Water suppliers are responsible for providing drinking water that meets the Guidelines for Canadian Drinking Water Quality for lead. However, under certain conditions, lead can leach into drinking water through contact with building plumbing after it has been delivered to a property.

What are the guidelines for lead in drinking water?

The Guidelines for Canadian Drinking Water Quality set a maximum acceptable concentration of 0.010 mg/L (10 parts per billion) for total lead in drinking water, measured at the tap. The guideline is designed to protect pregnant women, infants and children as they are the most vulnerable. It is based on average concentrations in water consumed for extended periods.

For more information about the guidelines, visit Health Canada – Guidelines for Canadian Drinking Water Quality www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guideline-technical-document-lead.html

What are the health concerns?

According to Health Canada, even low level ingestion of lead may harm the intellectual development, behaviour, size and hearing of developing babies, infants and young children. The health impact depends on many factors including the amount consumed over time, age, nutrition and underlying health issues.

People may ingest lead from many sources, such as food, drinking water, soil, paint and dust.

There is no evidence that drinking water in B.C. is typically a significant source of lead intake. As lead from drinking water is not well absorbed by the skin, exposure to lead from showering, bathing or cleaning is not a concern. For more information about lead paint, see HealthLinkBC File #31 Lead Paint and Hazards.

How can lead get into my drinking water?

Lead was once commonly used in water pipes, bronze and brass fixtures such as taps, and as a component of solder. In 1989, the BC Plumbing Code was revised to restrict the use of lead in plumbing components. Buildings constructed before 1989 may be at a higher risk of having lead in water due to corrosion of the plumbing.

The amount of lead released into the water depends on the plumbing materials used, the corrosiveness of the water, and the length of time the water sits in the plumbing.

What is being done to address lead in drinking water?

The Ministry of Health works with the regional health authorities and the federal government to develop best practices and policies, and provide advice to water suppliers and the public on reducing lead ingestion.

Some water suppliers take steps to adjust the characteristics of water to reduce corrosion. Schools have been advised to undertake water sampling to ensure lead is at safe levels and if lead is found, take the necessary actions to reduce lead in school drinking water.

Owners of buildings are responsible for assessing their own plumbing and taking actions to reduce lead.

How can I protect myself and my family?

If elevated lead in drinking water is suspected or has been detected in your water supply, you should take actions to reduce your exposure to lead. If you are concerned about your child's or your own current or past exposures to lead, you should discuss your concerns with your health care provider.

Identify the problem

Generally, the water supplier is responsible for the service line up to the water meter or valve at the property line. Your water supplier will have information on water quality in their distribution system; however to know what comes out of your tap, you will have to get your water tested for lead by a laboratory.

If your residence was built prior to 1989, your plumbing may be at higher risk of having components with lead content. A plumber can help identify whether your home has leaded plumbing components, and if the portion of the service line on your property is made of lead.

Take action

If your residence has elevated lead in its water due to your plumbing, you can flush the water from pipes to reduce lead exposure.

To flush water, let your cold water tap run for 1 to 5 minutes or until the water turns colder. You should do this before drinking or cooking first thing in the morning or any other time the plumbing system has not been used for several hours.

Always use cold tap water for drinking or cooking since hot water increases the leaching of lead.

Household water filters and treatment devices, such as carbon-based filters, reverse osmosis and distillation type filters that are certified to remove lead from drinking water are also effective. For best results, install these filters and devices at the tap that is most commonly used for drinking water, such as the kitchen tap, and ensure they are maintained as per the manufacturer's instructions.

You can also address the problem permanently by removing or replacing any sources of lead, such as fixtures in your building or lead service lines to the water supply. Contact your local government to find out if any programs exist in your community to replace service lines.

Note: Boiling water will not remove lead.

For More Information

For more information on lead in drinking water, contact your water supplier directly, or contact the environmental health officer at your local health authority by visiting www2.gov.bc.ca/gov/topic.page?id=F220C3323A3B42D594A07A81947392BF or by phone at:

- First Nations Health Authority 604-693-6500, toll free 1-866-913-0033. Visit www.fnha.ca/what-we-do/environmental-health for Environmental Health officer contact information.
- Fraser Health 604-587-4600
- Interior Health 250-862-4200
- Northern Health 250-565-2649
- Vancouver Coastal Health 604-736-2033
- Vancouver Island Health 250-370-8699

Baby's Best Chance

Find *Baby's Best Chance* and more at:

BRITISH COLUMBIA | Healthy FamiliesBC

www.healthyfamiliesbc.ca

Parents' Handbook of Pregnancy and Baby Care

BRITISH COLUMBIA

sixth revision sixth edition

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Personal Support Team

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Baby's Best Chance

Parents' Handbook of Pregnancy and Baby Care

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Contents

Preface

Welcome to the sixth edition of *Baby's Best Chance: Parents' Handbook of Pregnancy and Baby Care* published by the Government of British Columbia. The first edition was published in 1979 in honour of the "Year of the Child." This edition has been revised to give parents easy to read information, based on best practices and evidence, to ensure a healthy pregnancy and baby. Healthy pregnancy and healthy early childhood development set the foundation for health and well-being across the lifespan.

Baby-Friendly Initiative

The sixth edition of *Baby's Best Chance* has been revised to align with the Baby-Friendly Initiative criteria. The Baby-Friendly Initiative (BFI) is a global program of the World Health Organization (WHO) and UNICEF to increase hospital and community support for promoting, supporting and protecting breastfeeding. Accepted criteria have been established for designation of Baby-Friendly hospitals, maternity facilities and communities.

More information on the Baby-Friendly Initiative can be found at: ***www.breastfeedingcanada.ca/BFI.aspx***

Acknowledgements

Many professionals in the province of British Columbia reviewed the information in this handbook. Thanks are given to them all, with a special word of gratitude to Barbara Selwood. Thanks are also given to the people who worked on the previous editions. Their work has made this edition possible.

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Healthiest Babies Possible (Surrey/Delta/White Rock) participants and *Baby Talk* (Kelowna) participants organized by Christina Sutter and Pam Benson.

Sixth Revision (2017)

Thank you to all the health professionals and other experts who contributed to the sixth revision of this edition.

Introduction

You're going to have a baby! Congratulations! *Baby's Best Chance: Parents' Handbook of Pregnancy and Baby Care* will help you during your pregnancy and prepare you for the birth of your baby, and the first six months of your baby's life. You can use this book as your guide to having a successful, healthy pregnancy and giving your baby a good start in life. The months while your baby is developing as a fetus and the first few months of life are very important for the future health and well-being of your child.

As you read this book you will see it is divided into two sections. The first is to help support you during and after your pregnancy. The second section gives you information on getting the best start with your new baby. Every effort has been made to give you information that you can trust. Using this book will help you make sound decisions about your pregnancy and your baby.

Baby's Best Chance: Parents' Handbook of Pregnancy and Baby Care is the first of two books on pregnancy and early childhood development available from the Government of British Columbia. The second book, *Toddler's First Steps*, covers child development, healthy eating, health and wellbeing, parenting and safety for children aged 6-36 months. Ask your public health nurse for a copy or view it on-line at ***www.HealthyFamiliesBC.ca***.

Welcome to the rewarding and challenging world of parenthood. Good luck on your new venture!

How to Use this Handbook

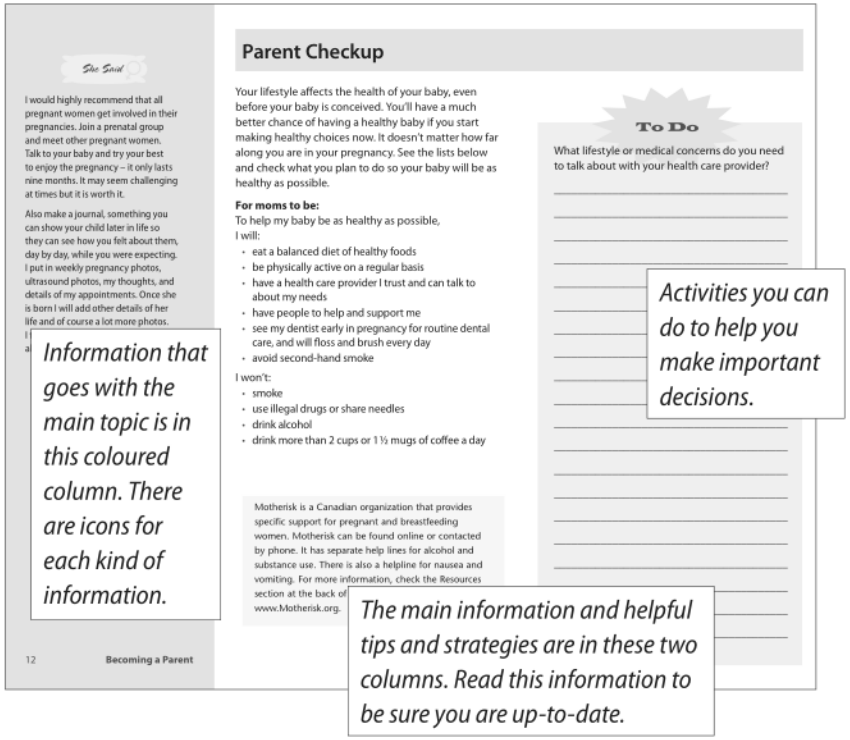
How do you read a book? From cover-to-cover, or do you dip in and out seeking specific information? This book is designed for both types of reading. The following components will help you find the information you need, quickly and efficiently.

Contents

The table of contents will help you find a specific topic. Note that the book is divided into two large sections: *Becoming a Parent* and *Your Baby*. Everything to do with you is in the first section and everything to do with your new baby is in the second section.

Page Arrangement

The layout will help you sort information quickly.



Information Icons

Points to Remember	Important information you need to know.
Facts & Stats	Interesting tidbits of information that can help you.
PROVIDING SUPPORT	Successful pointers on how to build your team.
He Said / She Said	Real accounts from actual parents relating their experiences.

At the back of the book you'll find:

Eating Well with Canada's Food Guide
Need ideas on what to eat during and after pregnancy?
See *Eating Well with Canada's Food Guide* on page 161.

Resources
Need a phone number or contact information?
See the Resources on page 168.

Glossary
Don't know the meaning of some words in this book?
Check the Glossary on page 176.

Index
Need to find a topic quickly? See the Index on page 182.

Becoming a Parent

Welcome to parenthood! You will find all kinds of information in this section. Browse through it with your partner to learn about the stages of pregnancy. Find out how to take good care of yourselves, how to handle any discomforts you may be feeling and the details of birth. There is also a special section on nutrition written especially for pregnant women.

She Said

My family and friends really rallied around me when I was pregnant. My dad would drive me to work on his way into town and pick me up after work so I could rest on the way home. My sister-in-law filled our freezer with food for when the baby came home. Friends would listen to my worries and fears and make me feel like I was normal and that it was all going to be OK in the end.

He Said

I found that my best friend was a great help when Chanel was pregnant. He's got two kids and had gone through all the same fears I had about being a dad. He gave me tips on how to be supportive when Chanel was so nauseated in the early stages and so uncomfortable in the last stage. His hints on how not to faint at the birth were great too!

Your Support Team

You, your baby and your partner will all benefit from having a team of people supporting you during pregnancy and the early years. Who can be on your support team? Anyone you trust. For many women, the primary support person is their partner. However, mothers and partners need more than one support person. They need a health care support team and a personal support team. Remember, support teams vary and are unique to each expectant family.

Who might be on your health care support team?

You might choose among any of these professionals:

- family doctor and/or obstetrician
- registered midwife
- hospital nurses
- public health nurses
- HealthLink BC (tele-nurses, pharmacists and dietitians)
- dentist
- dental hygienist
- prenatal educator
- registered dietitian
- pharmacist
- lactation consultant
- naturopathic physician

To Do

Who will be on your personal support team? Once you have decided, share your plans with them and ask for their commitment. Go to My Team Contact Information on the inside front cover and record their contact information. You will think about your medical support team when reading Choosing Health Care Providers.

Who might be on your personal support team?

- your partner, friends
- a social worker
- a doula (trained, supportive labour companion)
- family members
- neighbours
- expectant families from prenatal classes
- community groups
- co-workers
- members of your cultural or religious groups

How can your personal support team help?

- provide emotional support
- provide practical support
- help while you are pregnant
- help at the birth
- help after the birth

A special word to partners

You can be supportive by:

- sharing a healthy lifestyle before, during and after pregnancy
- sharing in physical activities
- helping with relaxation techniques
- listening
- attending appointments and prenatal classes
- preparing the home for the new baby
- being involved in the labour and birth
- talking about and planning for parenting
- being actively involved in caring for the baby
- encouraging and helping with breastfeeding
- taking parental leave and/or arranging holidays or leave from work to care for your child

Choosing Health Care Providers

Throughout this book you will see the term *health care providers*. It means doctors and midwives.

How can you find health care providers?

- Ask another health care provider for recommendations.
- Call the College of Physicians and Surgeons, College of Family Physicians or College of Midwives.
- Ask friends for recommendations.
- Call your hospital for a list of health care providers accepting new patients.

It is best to visit your health care provider before you decide to become pregnant. However, if you are already pregnant, it is important to have early and regular visits with your health care provider. You can also read about pregnancy care and making a healthy baby at HealthLink BC at ***www.healthlinkbc.ca***. Use "pregnancy" as your search term.

To Do

Some questions to ask when choosing your health care providers:

- Do they work with women who are pregnant?
- What are their policies regarding phone calls, home visits, on-call coverage?
- What is the length and frequency of office visits?
- Will they be available when you are ready to give birth?
- What are your choices for place of birth?
- Are they open to working with you regarding your birth wishes, such as support people, birth positions and pain control choices?
- Do they have any routine procedures?
- Will they support you in breastfeeding?

List any other questions you may want to discuss.

_____

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Once you know who will be on your health care support team, you may want to go to My Team Contact Information (on the inside front cover) and record their contact information.

Facts & Stats

In January 1998, midwifery became a formal part of British Columbia's health care system. In this book the term midwife refers to Registered Midwives, as recognized by the College of Midwives of British Columbia.

The Medical Services Plan in British Columbia covers the costs for doctors and midwives, but it will not pay for both a doctor and a midwife during your pregnancy. You will need to select one or the other. Midwives can provide care for normal, low-risk pregnancies, labour and delivery in hospital or at home, and care after your baby is born.

She Said

I would highly recommend that all pregnant women get involved in their pregnancies. Join a prenatal group and meet other pregnant women. Talk to your baby and try your best to enjoy the pregnancy – it only lasts nine months. It may seem challenging at times but it is worth it.

You may also want to make a journal, something you can show your child later in life so they can see how you felt about them, day by day, while you were expecting. I put in weekly pregnancy photos, ultrasound photos, my thoughts and details of my appointments. Once she is born I will add other details of her life and of course a lot more photos. I think it will be something she will always appreciate.

Parent Checkup

Your lifestyle affects the health of your baby, even before your baby is conceived. Making healthy choices now will help your baby to be healthy. It's never to late to start making healthy choices, no matter how far you are along in your pregnancy.

The lists below may help you decide what to do so your baby will be as healthy as possible.

For moms to be:

To help my baby be as healthy as possible, I will:

- eat a balanced diet of healthy foods
- be physically active on a regular basis
- have a health care provider I trust and can talk to about my needs
- have people to help and support me
- see my dentist early in pregnancy for routine dental care, and will floss and brush every day
- avoid second-hand smoke
- talk to my health care provider about any prescription or non-prescription drugs I am using

I won't:

- smoke
- use street drugs or share needles
- drink alcohol
- drink more than 2 cups or 1 ½ mugs of coffee a day

If I do smoke, drink alcohol or use street drugs, I will get support to reduce my use as much as possible.

For partners/parents to be:

To help my baby be as healthy as possible, I will:

- eat healthy foods
- exercise with my partner
- be supportive to my partner
- avoid second-hand smoke

I won't:

- smoke
- use street drugs or share needles

To Do

What lifestyle or medical concerns do you need to talk about with your health care provider?

Lifestyle and Risk Factors

Saunas, Hot Tubs and Hot Baths

Hot tubs and saunas can be relaxing and soothing, but it is important not to increase your inner body temperature. This overheating can increase your developing baby's body temperature. It is important for your baby not to become overheated. Being overheated can affect your baby's development.

If you choose to use a hot tub or sauna:

- lower the temperature to below 38.9°C
- limit your time in the hot tub or sauna to 10 minutes, or less if you feel uncomfortable
- have another adult with you
- get out right away if you feel dizzy, faint, have rapid pulse, irregular heartbeat, stomach pain or tingling in feet and hands

For more information, see the BC HealthFile #27a, *Hot Tubs – Health and Safety Tips*, available at HealthLink BC at ***www.healthlinkbc.ca***. You can also get this file at your local public health office.

Getting X-rays and Other Tests

Some medical tests may not be safe for pregnant and breastfeeding women. Before having X-rays, dental X-rays, CT scans and other tests, be sure to tell the technician you are pregnant or breastfeeding. If you want to learn more about conditions and tests before you take them, see the HealthLink BC website at ***www.healthlinkbc.ca***.

Taking Medications

If you are pregnant, breastfeeding or even thinking about having a baby, you may be worried about using medication. Some medicines are safe for use during pregnancy or when breastfeeding; however, others may not be safe.

Safety issues can arise with all types of medication, including:

- those available only by prescription
- those available as over-the-counter or non-prescription products
- natural health products

Check with your health care provider, pharmacist or health care professional for advice on your medication. They can help make sure all your medications are safe to take. Some medications, such as those for mood or seizure disorders, should not be stopped suddenly. If you are unsure, and it is after office hours, you can call HealthLink BC at 8-1-1 to speak with a pharmacist between the hours of 5 p.m. and 9 a.m. daily.

Smoking

It is best to stop smoking before you plan to become pregnant. Smoking and second hand smoke are harmful before and during pregnancy, and after your baby is born. Cigarettes and cigarette smoke contain over 4000 chemicals. Many of those chemicals are toxic to you and harmful to your baby – they can cross the placenta and go into your baby's blood.

If you are pregnant and smoke, now is the time for you and anyone in your household to reduce and stop smoking.

To help you quit smoking or reduce the amount you smoke:

- See your health care provider.
- Join a stop-smoking program.
- Contact Quit Now for free, confidential, no-pressure coaching to help you quit. Options include coaching by phone for you or a group, computer live chat, video conference or by phone/text. Visit ***QuitNow.ca*** or call toll-free at 1 877 455-2233.

Facts & Stats

Tobacco kills between ⅓ and ½ of all people who use it, on average 15 years prematurely.

Points to Remember

The best thing you can do is ***quit smoking***.

No one should smoke in your home. A smoke-free home is important for you, your baby's health and for everyone else in your family.

Points to Remember

It is the law in BC not to smoke in cars with children under 16 years of age.

Points to Remember

Partners can help by not drinking alcohol. They can also help by being involved with the mother in social activities that don't involve alcohol. Bring a bottle of sparkling apple juice to a friend's house for dinner, or go to a movie instead of a bar or nightclub.

- Call HealthLink BC at 8-1-1, or go to ***www.healthlinkbc.ca***, for information on local stop smoking programs.
- Access the BC Smoking Cessation Program which helps eligible B.C. residents who wish to stop smoking or using other tobacco products by covering 100% of the cost of nicotine replacement therapy (NRT) products (specific nicotine gum, lozenges, patches, inhaler), or by contributing to the cost of specific smoking cessation prescription drugs. See your pharmacist about NRTs, or your doctor about the prescriptions. For more information, visit: ***www2.gov.bc.ca/gov/content/health/health-drug-coverage/pharmacare-for-bc-residents/what-we-cover/drug-coverage/bc-smoking-cessation-program***.
- Read the BC HealthFile #30a, *The Harmful Effects of Second-hand Smoke* at ***www.healthlinkbc.ca*** if you need more reasons to quit.
- Ask for the support of your physician or midwife, partner, friends, family and co-workers.
- Buy yourself something special with the money you save.
- If you find that you smoke to deal with stress, find other healthy ways to relax.
- Focus on the health of your baby as a motivator.

Harmful effects of smoking on the mother and father:

- causes heart and circulatory disease, lung and other cancers, emphysema and chronic bronchitis
- causes gum disease
- is extremely addictive
- is a powerful stimulant
- increases the risk of cancer of the cervix, infertility and menstrual problems
- promotes high cholesterol

Smoking and exposure to second-hand smoke during pregnancy contribute to a higher risk of:

- slowing your baby's growth and development
- miscarriage
- stillbirth
- preterm birth and low birth weight

Smoking and second-hand smoke after birth contribute to a higher risk of:

- Sudden Infant Death Syndrome (SIDS)
- more hospital admissions in the first year of life than children of non-smoking parents. Children of smokers have more ear infections. They also have more illnesses, such as asthma and bronchitis
- a reduced milk supply in the mother
- your child also becoming a smoker

Reduce exposure of your baby to second-hand smoke by:

- not smoking at home – give your baby a smoke-free and healthy environment at home,
- never smoking in the car with your baby, and
- staying in places where smoking is prohibited or not allowed when you are in public, such as inside and on patios.

Drinking Alcohol

Alcohol and Pregnancy

The safest option during pregnancy or when planning to become pregnant is to not drink alcohol at all.

How does alcohol affect the fetus?

Drinking alcohol during pregnancy can result in lifelong disabilities for your child. This is called Fetal Alcohol Spectrum Disorder (FASD). Children with FASD have problems with hearing, speech and vision, learning problems, poor memory and poor coordination. They also have difficulty handling emotions. These challenges make it difficult for them to handle even simple daily life tasks.

When you drink alcohol during pregnancy, it passes from your bloodstream to the baby. This can have an effect on your baby's development. There is no safe time to drink alcohol during pregnancy. Your baby's brain is developing throughout pregnancy. In fact, it is best to stop drinking before you get pregnant. Any type of

alcohol can harm the fetus (beer, coolers, wine or spirits). Some of these drinks have higher alcohol content per volume than others. What matters is the amount and frequency of alcohol consumed, not the type of drink. Binge drinking (more than three drinks on any occasion) and heavy drinking are very harmful to a fetus.

What are solutions?

- Stop drinking if you are planning a pregnancy.
- If you think you could be pregnant or are already pregnant, stop drinking as soon as possible. It is never too late to stop.
- If you are unable to stop drinking, avoid drinking at risky levels and get support.

If you find it hard to stop drinking:

- Talk to your health care provider or someone you trust about services and supports to help you.
- Contact a Pregnancy Outreach Program for assistance.
- Ask for help from a support group or alcohol and drug counsellor.
- Contact Motherisk at ***www.Motherisk.org*** or 1 877 327-4636.
- If you cannot stop drinking completely, it is important to reduce the amount you drink. Less is better, none is best.

Using Cannabis (Marijuana)

Use of cannabis (marijuana) during pregnancy can be harmful for you and your baby. There is no known safe amount of marijuana use during pregnancy. Heavy cannabis use may affect your energy, judgment and motivation at this important time. The use of cannabis during pregnancy can affect your baby's long-term health and development. Babies born to mothers who have used cannabis during pregnancy may have problems with attention and learning in childhood and adolescence.

Cannabis in any form can be harmful to your baby. The chemical found in marijuana, THC, is passed to your baby through the placenta. Smoking, using a vaporizer or eating cannabis (like in cookies or brownies) will all result in your baby being exposed to THC.

Even though cannabis is sometimes used for medical reasons, that does not mean it is safe for use during pregnancy. Talk to your health care provider if you are considering using cannabis as a treatment for nausea during pregnancy. There are other strategies you can try to cope with morning sickness (see page 24). The safest option during pregnancy is to not use cannabis at all.

Using Other Drugs

Other drugs such as street drugs and some pharmaceutical drugs can be harmful for you and for your developing baby during pregnancy. Like alcohol, these drugs pass through the placenta to the baby. If you are using drugs and want to stop, pregnancy is a great opportunity to reach out for support. Talk to your health care provider or local public health office about the supports and resources available to help you and your baby to be as healthy as possible.

If you use street drugs during pregnancy, you increase the risk of miscarriage, stillbirth and preterm delivery. You may also eat poorly, not get enough sleep and be at risk for diseases such as hepatitis and HIV. Mothers who continue to use street drugs are usually advised not to breastfeed.

Pharmaceutical Drugs

There are some pharmaceutical drugs (medications) that can be harmful to your developing baby during pregnancy. Some medications can also lead to problems like substance use disorders (addiction) or

Points to Remember

Motherisk is a Canadian organization that provides specific support for pregnant and breastfeeding women. Motherisk can be found online or contacted by phone. It has separate help lines for alcohol and substance use. There is also a helpline for nausea and vomiting.

For more information, check the Resources section at the back of the book or visit ***www.Motherisk.org***.

Points to Remember

If you find it hard to stop using street drugs, there are specialized services available to help. If you can't stop drug use, there are ways to reduce harm to you and your baby. There are support services in your community including:

- health care providers
- street nurses and clinics
- pregnancy outreach programs

Services can be found by calling the Alcohol & Drug Information and Referral Line, toll-free at 1 800 663-1441.

overdose. If you are pregnant or thinking of becoming pregnant, talk to your health care provider about any medication you are taking, even if you are using a medication without the advice of a health care provider, or for non-medical reasons.

There are some pharmaceutical drugs that are particularly harmful for pregnant women and their babies. Opioids (such as morphine, oxycodone or fentanyl) are medications that are often prescribed as pain relievers. Non-medical opioid use during pregnancy can increase your risk of miscarriage, preterm birth and low birth weight for your baby. It can also cause your baby to experience symptoms of withdrawal following birth. This withdrawal can affect your baby's vital body functions such as feeding and sleeping. It is important to get help during your pregnancy. Your health care provider can connect you to supports that can help you manage your opioid use in the safest way for you and your baby.

Sedatives such as Xanax, Valium or Ativan (Benzodiazepines) are sometimes prescribed to treat anxiety or sleep problems. These can be harmful to your baby when taken during pregnancy, especially if they are taken at the same time as opioids or alcohol. It is recommended you talk to your health care provider if you are pregnant and taking sedatives. Your health care provider can help you to slowly and safely reduce your use to lessen the impacts on your baby.

Cocaine and Methamphetamine (Crystal Meth)
Using stimulants, such as cocaine and crystal meth, can be very harmful to your overall health, affecting your heart rate, energy, sleeping patterns, memory and mental health. If used during pregnancy, stimulants can cause the premature separation of the placenta from the wall of the uterus. This is a very serious health concern for both you and your baby. Babies are also at risk for Sudden Infant Death Syndrome (SIDS).

Heroin
Using heroin can be risky because of the drug's effects and the use of needles if you inject it. Using heroin in pregnancy can increase the risk of miscarriage and stillbirth. It is important to get help during pregnancy to help you **slowly decrease** your use so your baby does not have withdrawal symptoms, even before he is born. Support for using methadone instead of heroin during pregnancy is available in British Columbia for mothers who cannot stop their heroin use.

Babies born to mothers who have used heroin during pregnancy can have withdrawal symptoms that often start within 72 hours after their birth. At birth, it is important to have your health care provider help the baby with these symptoms.

After the withdrawal period, children whose mothers used heroin during pregnancy may do well in the long term, if they were not exposed to other risks and if they are raised in a positive environment.

Inhalants
Solvents (such as glue, gasoline, paint thinner and cleaning fluids) and aerosols (such as compressed gases from hairspray and spray paint cans) can be very risky for your health when breathed in. In pregnancy, they can affect your blood pressure and increase the risk of miscarriage. Babies of mothers who use solvents in pregnancy are at risk for a range of physical birth defects. There is also concern that babies born to mothers who use inhalants, or come in contact with them a lot in pregnancy, may be at risk for long lasting mental health and behaviour problems similar to Fetal Alcohol Spectrum Disorder.

Living with Abuse

Intimate partner violence is a pattern of physical, sexual or emotional violence. It uses power and control. If your partner used physical, verbal, emotional or sexual abuse in the past, this may get worse once you are pregnant and after you have the baby. You are not the only one at risk if your partner abuses you. Your baby is also at risk. Seek help and safety. You can start by talking to your health care provider. She or he will put you in touch with the right resources. Do not feel ashamed. It is not your fault.

Pet Safety

If you have contact with your cat's feces (poop), you can get a parasite that can cause a serious infection, called toxoplasmosis, in your unborn baby. This can result in miscarriage or birth defects. The disease is often mild or without symptoms and can be mistaken for the flu. How can I practice safety with my cat?

- Have someone else empty the cat litter box, or wear gloves and wash your hands well.
- Wear gloves and avoid direct contact with garden soil that may have cat feces in it.
- You should wash your hands well with soap and water after handling your pets.

Sexually Transmitted Infections

- Some sexually transmitted infections (STIs) can be cured and others cannot.
- Some STIs can cause problems with your pregnancy or harm your baby.

It is important that you and your sexual partner(s) get tested for STIs. The best time to get tested is before pregnancy. If you are pregnant, it is important to get tested early in pregnancy. There are treatments available for you and your baby.

During pregnancy, you can protect yourself and your baby by using condoms and/or by only having sex with one person who only has sex with you, and who has tested negative for sexually transmitted infections.

To Do

- If you have a regular sexual partner, get tested for STIs and ask your sexual partner to be tested as well.
- If you have sex with a new partner, use a condom and get tested for STIs.
- Do not share needles.
- Read the HealthLinkBC series on Sexually Transmitted Infections found at: ***www.healthlinkbc.ca/health-topics/stdis.***

The charts on pages 19–21 provide information on some STIs that could affect your pregnancy, be a risk to your baby or increase your risk of preterm labour. Your healthcare provider will discuss STIs with you prior to, and during pregnancy. If you are at risk of acquiring an STI during pregnancy you may have rescreening each trimester. Examples of risk factors include:

- Having a previous STI
- Having sexual contact with someone with a known STI
- Being a sexually active youth under 25 years of age
- Having a new sexual partner or more than two sexual partners in the past year
- Having multiple one-partner sexual relationships over time without being tested for STIs
- Not using condoms
- Injecting drugs

VictimLinkBC

VictimLinkBC is a province-wide telephone help line for victims of family and sexual violence and all other crimes. VictimLinkBC operates 24 hours a day, seven days a week, and provides service in 110 languages. It will help you find information on the victim services closest to you.
Phone toll-free: 1 800 563-0808
For deaf and hearing-impaired assistance (TTY): 604 875-0885
Website: ***www.victimlinkbc.ca/***

- Using other substances such as alcohol, cannabis, cocaine, ecstasy or crystal meth before or during sex
- Engaging in unsafe sexual practices (such as unprotected oral, genital or anal sex; sex with blood exchange, including sadomasochism; or sharing sex toys)
- Being involved in the sex industry, either as a sex worker or as a client
- Having "survival sex" (exchanging sex for money, drugs, shelter or food)
- Being homeless or street-involved
- Having anonymous sex
- Being a victim of sexual assault/abuse

Your healthcare provider will recommend that you get tested for HIV as part of the initial blood screen. If there is a possibility that you were exposed to an STI during your pregnancy, your healthcare provider will recommend that you get tested for STIs in the third trimester (including testing for HIV, chlamydia, gonorrhea and possibly other STIs).

If you suspect that you have been exposed to an STI, talk with your health care provider, public health nurse or call HealthLink BC at 8-1-1 right away.

Motherisk offers information and counselling about HIV and other STIs. Call the toll-free health line at 1 877 439-2744 or visit ***www.Motherisk.org***.

Sexually Transmitted Infections that Cannot be Cured

Infection	Risks/Complications	Method of Transfer	Treatment/Comments
Herpes Diagnosed by culture of lesion or vaginal secretions.	**Mom:** Can have blisters/sores in genital area only once or she may have outbreaks every once in a while. She may not know she is carrying the virus. Avoid intercourse if a lesion is present. Avoid oral sex if your partner has a cold sore. Using condoms during sex helps, but it is not a guarantee that you won't get herpes. **Baby:** Has poor energy, fever, poor weight gain, infection of skin, eyes, mouth. There can be severe brain injury or death.	Can transfer during birth.	**Mom:** No cure. Antiviral drugs are used to treat outbreaks. If herpes sore is in genital area at time of labour, a caesarean birth is recommended. This is to prevent transfer to the baby. **Baby:** Antiviral drugs can be given if baby develops neonatal herpes.
Hepatitis B Diagnosed by blood test. (Also spread by contact with infected blood.)	**Mom:** Carrier for life. Risk for liver disease and liver cancer later in life. **Baby:** Without treatment, will become a carrier for life.	Can transfer during birth.	**Mom:** If exposed during pregnancy, early treatment with Hepatitis B immune globulin (HBIG) and Hep B vaccine can prevent disease. **Baby:** HBIG and Hep B vaccine at birth if mother (or other caretaker) is a carrier and follow-up vaccinations can prevent disease.
Human Immuno-deficiency Virus (HIV) Diagnosed by blood test.	**Mom:** HIV can develop into AIDS. Adults with AIDS have a shortened lifespan. **Baby:** If anti-HIV drugs are used, children with HIV infection may not develop any symptoms of HIV. HIV infection in children can lead to developmental delays, bacterial infections and lung inflammation.	Can cross placenta during pregnancy and can transfer to baby during birth. Is also possible to transfer through breastfeeding.	**Mom:** No cure. Treatment with antiviral drugs during pregnancy and during labour to reduce risk of passing virus to baby. **Baby:** Antiviral medication given for six weeks after birth.

Sexually Transmitted Infections that Cannot be Cured

Infection	Risks/Complications	Method of Transfer	Treatment/Comments
Zika Virus Diagnosed by blood and/or urine test.	**Mom:** Symptoms are mild fever, skin rash, muscle and joint pain, conjunctivitis or headache, and usually resolve within a week. **Baby:** Serious complications if the mother acquires Zika at any time during pregnancy. Zika infection can trigger Guillain-Barré syndrome, a condition where the immune system attacks the peripheral nerves. It can also cause congenital brain abnormalities, including microcephaly (abnormally small head size). Microcephaly is associated with developmental delays, epilepsy and hearing and visual impairment.	Can cross the placenta during pregnancy. The Zika virus is usually spread to the mother by the bite of an infected mosquito; however it can also be transmitted through sexual contact. If you think your partner may have been infected with Zika, you should use condoms or avoid sexual activity for the duration of your pregnancy.	**Mom:** No specific treatment. The Zika virus disease is usually mild in adults and resolves on its own. **Baby:** The most serious complications of Zika are for the babies of women who acquire Zika while pregnant. Guillain-Barré syndrome can be treated, but the congenital brain abnormalities caused by the Zika virus are permanent and irreversible.

Sexually Transmitted Infections that Can be Cured

Infection	Risks/Complications	Method of Transfer	Treatment/Comments
Chlamydia Diagnosed by a culture of vaginal discharge.	**Mom:** May have pain when peeing, vaginal discharge or no symptoms. Increased risk of preterm labour, premature rupture of membranes. **Baby:** Pneumonia, eye infections.	Can transfer in the birth canal during birth.	**Mom:** Antibiotics. **Baby:** Antibiotics; routine eye treatment with antibiotic ointment soon after birth prevents infection in baby's eyes.
Gonorrhea Diagnosed by a culture of vaginal discharge.	**Mom:** May have lower abdominal pain, vaginal discharge, pain when peeing or no symptoms. **Baby:** Eye infections and health problems, if mother not treated during pregnancy.	Can transfer through birth canal into uterus and to baby, during pregnancy or during birth.	**Mom:** Antibiotics. **Baby:** Antibiotics placed in the eyes of newborns shortly after birth.
Bacterial Vaginosis Diagnosed by culture of vaginal secretions.	**Mom:** May have vaginal discharge, vaginal itching or burning; sometimes no symptoms. Increased risk of preterm labour, premature rupture of membranes, infection during labour or postpartum. **Baby:** Preterm birth.	Can transfer through birth canal into uterus and to baby.	**Mom:** Antibiotics. **Baby:** Care needed for preterm birth.
Syphilis Diagnosed by a blood test.	**Mom:** May have small, painless sore in genital area within two months of exposure. Illness (about six weeks after sore heals) – fever, rash, headache, swollen glands. If not treated can cause problems years later, such as nervous system, eyes, heart. Possible preterm labour. **Baby:** Possible stillbirth; congenital syphilis with physical and mental problems.	Can cross the placenta during pregnancy and can transfer during birth.	**Mom and Baby:** Antibiotics during pregnancy. Baby: Antibiotics if mother not treated during pregnancy.

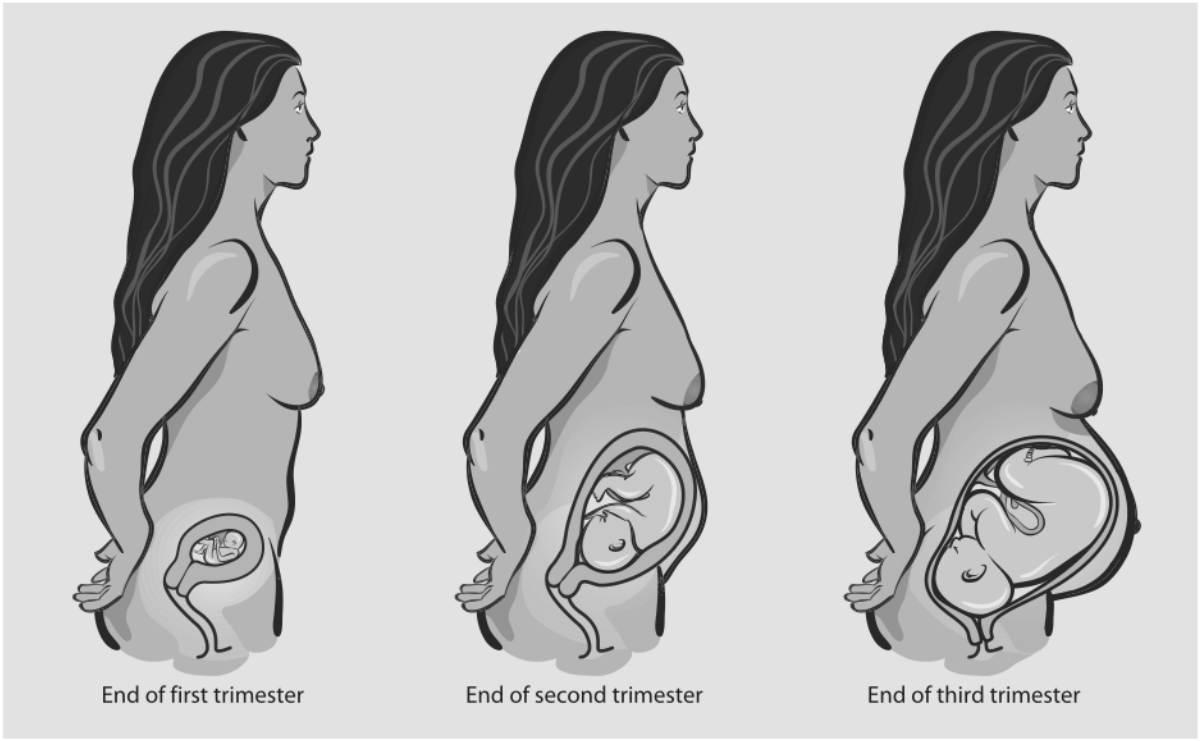
Perinatal Depression
Perinatal depression is depression that may happen any time from when you first become pregnant to one year after your baby is born.

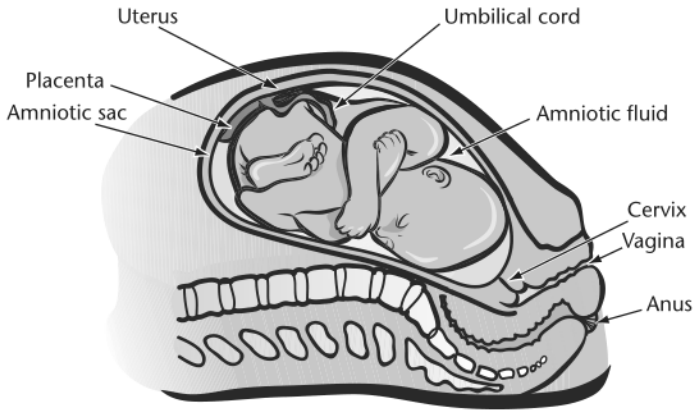
Perinatal depression can impact you physically and affect your emotions, thinking and behaviours.

It is important to get help. Without treatment, perinatal depression affects both you and your baby. A mother who is depressed for a long time can have difficulty bonding with and caring for her baby.

Stages of Pregnancy

Pregnancy affects every system of your body, not just your uterus. The chart, beginning on the next page, lists some of the common changes you may experience in pregnancy. It also suggests what you can do to stay comfortable.





First Trimester: 0 – 14 weeks

What's Happening?	Now What?
your periods will stop and you may have tender or painful breasts	• wear a comfortable, supportive bra
unexpected mood changes	• this is normal • focus on yourself and the changes you are going through • talk with the people around you • eat regularly and often • be physically active **Check in:** If you are feeling down for longer than seven days and the things that used to give you joy no longer do, you may have what is known as postpartum or perinatal depression. See page 93. Talk with your health care provider about how you are feeling.
feeling excitement, fear or uncertainty about being a parent	• it is normal to have many feelings about a new pregnancy • share your feelings • spend time with other new parents, a pregnancy support group or new parent group Call your public health office for information on pregnancy/perinatal support groups. You can find the number in the blue pages of your phone book. You can also ask your health care provider.
fatigue (feeling tired and sleepy)	• this is normal; rest whenever you can • have periods of activity and then of rest; stop before you become overtired • eat small meals several times a day and drink plenty of water • if you are working, try to rest on your breaks and at lunchtime **Feeling tired – how much is normal?** You may not feel tired at all, or you may be falling asleep during the day. Both are normal.
headaches (due to hormonal and postural changes)	• headaches are quite common • practice good posture • eat small, nutritious meals several times a day • drink plenty of water daily throughout the day • avoid activities that cause eyestrain • get plenty of sleep at night and rest during the day • have your neck, shoulders, face and scalp massaged • apply a cool or warm washcloth to your forehead and the back of your neck • drink two cups of water and take some Tylenol • talk to your health care provider if your headache does not go away

1ST trimester mother

PROVIDING SUPPORT

- Don't smoke, drink alcohol or use drugs.
- If your partner smokes, encourage her to stop.
- Expect and accept mood changes.
- Share meal preparation, especially if your partner is nauseated.
- Take over some responsibilities if your partner is feeling tired.
- Go to prenatal checkups with your partner.

Facts & Stats

Nausea and vomiting bother up to 80% of pregnant women to some degree. For many women this can go on beyond 20 weeks.

1ST trimester mother

Points to Remember

See your health care provider if you:

- are sick most of the time and can't keep fluids or food down
- vomit more than 5 times a day
- have lost more than 5% of your pre-pregnant weight
- pee less than 3 times in 24 hours

If you can't manage your nausea and vomiting, talk with your health care provider about medication you can take to help.

You can also call HealthLink BC at 8-1-1 or visit them online at ***www.healthlinkbc.ca***.

What's Happening?	Now What?
need to pee more often	• drink water, milk and 100 percent juice instead of coffee, black tea or colas
morning sickness/nausea	• eat smaller amounts of food every one to two hours during the day • eat what appeals to you. Try to follow *Eating Well with Canada's Food Guide* as much as possible. • try taking a liquid form of vitamins • try to keep taking your folic acid supplement even if you can't take prenatal vitamins for a period of time • avoid fatty and fried foods • sip small amounts of fluid often during the day. Fluids can include water, 100 percent apple juice, sparkling water or ginger ale • try eating cold meals to avoid food smells, or have someone else cook • have fresh air in the bedroom while resting, and in the kitchen while cooking • try not to get too tired. Nausea may get worse if you are tired. • wear loose clothing around your chest and waist If you experience morning sickness and vomiting, avoid brushing your teeth for 30 minutes after vomiting. This will help protect your tooth enamel. Instead, you can try rinsing your mouth with plain water, or a teaspoon of baking soda mixed with water, or a fluoride mouth wash.
increased vaginal secretions (thin and milky)	• wear small pads, cotton underwear and looser slacks • shower or bathe often • contact your health care provider if there is itchiness or frothy, smelly or coloured discharge
bigger or painful breasts and darkening of the areola (the coloured area of the breast surrounding the nipple) with small lumps becoming visible	• wear a supportive bra for comfort, even at night if it helps
light-headedness or feeling faint	• stand up slowly • eat regularly and often
shortness of breath	• this is usually normal, but check with your health care provider if there is a history of heart problems in your family

Second Trimester: 15 – 27 weeks

What's Happening?	Now What?
red, inflamed gums (can be pregnancy gingivitis)	• this can be caused by changes in your hormones, throughout your pregnancy, and happens if plaque is left on your teeth • to prevent this, floss and brush your teeth regularly • see your dentist and be sure to tell her that you are pregnant
little nausea, less bladder pressure, less fatigue	• the chances of having a miscarriage are very small at this stage
early milk leaking from your breasts	• wear breast pads in your bra if needed
stuffy nose and nose bleeds	• do not smoke or be around second-hand smoke • place warm, moist towels on your face for comfort • breathe steam from a hot shower, a pot of boiling water or a vaporizer • a cool-mist humidifier may be helpful • massage your sinuses by rubbing on the bony ridge above and under your eyebrows, under your eyes and down the sides of your nose • drink more water • try saltwater nose drops made from ¼ teaspoon of salt dissolved in 1 cup of warm water • do not use antihistamines unless recommended by your health care provider
quickening – the mother feels the baby's movement	• know that the feeling (may feel like bubbling, fluttering, knocking) can differ for each pregnancy • note the date, and tell your health care provider on your next visit
an increased sense that the pregnancy is real emotions may be more stable than in the first trimester	• pay attention to your body and baby and enjoy your pregnancy • celebrate your pregnancy • connect with your baby by talking to them, and touching your belly – they can hear you and are learning what you sound like • you and your partner can talk to your baby and/or gently massage your belly • if you like, keep a diary or a pregnancy photo album
low back pain	• maintain good posture while sitting or standing – pull in your stomach muscles, tighten your buttocks and tuck in your seat to flatten your lower back (also see page 48) • sit in straight-backed chairs whenever possible • wear low-heeled shoes that give support • sleep on your left side with a pillow under your upper leg for support • avoid lifting heavy items • try heat or cold on your back or have someone give you a massage • talk to your health care provider

2ND trimester mother

Facts & Stats

Some women feel as if they have a constant cold with nasal congestion. This will go away after birth.

2ND trimester mother

PROVIDING SUPPORT

- Enjoy feeling movements of the baby.
- Attend prenatal checkups.
- Talk to the baby.
- Gently massage the mom.
- Exercise together.
- Encourage the mother to eat a healthy diet.
- Help the mother avoid drugs and alcohol.

What's Happening?	Now What?
pubic pain	• walk around objects instead of stepping over them • try not to push objects on the floor, such as boxes, with your feet • avoid opening your knees wide apart • talk to your health care provider
throbbing of legs and appearance of varicose veins	• rest and sleep on either side with a pillow between your legs. Do not lie flat on your back • walk or do other physical activity • wear support hose if recommended • don't sit with your legs crossed • when sitting, do ankle and foot exercises; avoid placing a pillow underneath your knees • try not to wear knee-highs and garters • use a footrest or another chair to lift your legs when sitting
mild swelling of ankles, feet, hands and face (edema) – may be accompanied by tingling in one or both hands	• raise your legs and feet whenever possible • lie on your left side when resting or at night to reduce pressure on major blood vessels • avoid wearing clothes or accessories that feel tight (such as watches, rings or socks with elastic tops) • be physically active **Tips:** Swelling of your feet and ankles is normal in pregnancy. Most of the swelling should be gone when you get up in the morning. If it does not decrease with rest, talk with your health care provider.
hard, dry bowel movements (constipation)	• drink more water • if you feel your iron supplement is causing constipation, talk to your health care provider • eat high-fibre foods • be physically active • have bowel movements when you feel the urge • do not hold back or force the bowel movement • do not use suppositories, mineral oil, laxatives or enemas unless recommended by your health care provider
a brownish "tan" on your face or a line running from the belly button to the pubic area	• these signs will occur in some women and disappear after the baby is born • the line from the belly button may stay there

Third Trimester: 28 – 40 weeks

What's Happening?	Now What?
purple or red marks (striae or stretch marks) on abdomen, breasts and thighs	• after birth, the stretch marks will gradually change from red or purple to tan or white and will become harder to see • some women never lose their stretch marks
dry, itchy skin	• if you choose to use soap, try glycerin soap • avoid long, hot baths • apply oils or lotions to keep your skin moisturized, especially after a bath or shower • calamine lotion may relieve the itching • if you have severe itching, talk with your health care provider
increased fatigue (feeling more tired)	• rest often and listen to your body • ask someone to help with daily chores • if possible, stop work early if you are overtired
feelings of doubt or fear about labour	• develop your birth wishes (see page 60) • talk with your health care provider about concerns and plans for labour • learn about labour and birth so you know your options • attend prenatal classes
pre-labour or Braxton Hicks contractions	• these contractions are normal • tell your health care provider if the contractions are regular and become uncomfortable
muscle cramps in legs, especially at night	• make sure you get enough calcium in your diet or talk to your health care provider about a calcium supplement • avoid getting too tired • put your feet up • be physically active • take a warm bath before going to bed • stretch your lower leg area before going to bed
feeling impatient because the pregnancy seems as though it will never end	• a full term pregnancy is anywhere from 38 to 42 weeks • call upon your support system when you feel frustrated and talk about your feelings
hemorrhoids	• avoid constipation and straining • do pelvic floor (Kegel) exercises (see page 50) • rest and sleep on either side with a pillow between your legs. Do not lie flat on your back, and try not to sit or stand for long periods of time – change positions or walk around • for relief, apply ice wrapped in a cloth to the area

3RD trimester mother

PROVIDING SUPPORT

- Attend prenatal classes with the mother.
- Help develop your birth wishes.
- Help prepare your home for the baby.
- Practice labour positions and relaxation.
- Be ready and available for labour support.

3RD trimester mother

What's Happening?	Now What?
heartburn	• eat small, frequent meals • avoid fried, fatty and spicy foods • drink a lot of liquids between meals • elevate your head and shoulders while resting • do not bend or lie down immediately after a meal • do not wear tight waistbands • chewing sugarless, non-peppermint gum (ideally containing xylitol) may also help
sudden groin pain	• avoid sudden movement • bend slightly at the hips when you expect to cough or sneeze
shortness of breath	• try taking deep, slow breaths through the mouth • wear loose clothing • use good posture • get plenty of rest
difficulty sleeping	• have regular sleep habits • be physically active • before going to bed try: » taking a warm, relaxing bath » eating a snack with a warm drink » using extra pillows for support » practising deep breathing and relaxation exercises » listening to relaxing music
improved breathing	• make a note when this happens and tell your health care provider at your next visit (this usually means your baby has moved down into your pelvis in preparation for birth)
increased need to pee	• pee regularly • avoid caffeine • do pelvic floor (Kegel) exercises (see page 50)
an increase in Braxton Hicks contractions	• this is normal • your uterus is contacting to soften and thin your cervix in preparation for labour • pack your hospital labour kit (see page 62 for what to pack) • arrange to have care for your children and your house while you are in the hospital

Fetal Growth Stages

The first trimester (or first 14 weeks) is an important time in your baby's life. It's a time of fast growth and development. It's also a time when your baby is most at risk from hazards such as smoking, alcohol, drugs, infections and X-rays.

The second trimester is the time between 15 and 27 weeks gestation. During this time your baby's brain grows a lot. The baby is still too small to live outside of your body.

The third trimester is the time between 28 weeks and your baby's birth. The closer to full term or 40 weeks gestation your baby is, the better your baby is able to cope with birth and life outside your body. Forty weeks gestation is the date estimated to be your due date.

There is a higher risk of illness and death in babies born too early or too late. Your baby is considered full term if it is born between 39 weeks 0 days and 40 weeks 6 days.

Gestational Age at Birth	
Preterm	Before 37 weeks
Early Term	Between 37 weeks 0 days and 38 weeks 6 days
Full Term	Between 39 weeks 0 days and 40 weeks 6 days
Late Term	Between 41 weeks 0 days and 41 weeks 6 days
Post Term	Between 42 weeks 0 days and beyond

Check the tables on pages 31–33 to follow the development of your baby.

4 weeks

8 weeks

12 weeks

16 weeks

20 weeks

28 weeks

First Trimester: 0 – 14 weeks

The first trimester (the first three months of pregnancy) is a critical time in your baby's life. It is the period of rapid growth and development. By the end of the first trimester, all of your baby's organs will be formed and functioning.

Time	What is happening
1 day	The sperm and egg unite.
7–10 days	The fertilized egg attaches to the lining of the uterus. The placenta begins to form.
2 weeks	Your baby, called an embryo, is now a layered disc on the uterus wall. You will miss your menstrual period.
4 weeks	The beginnings of the embryo's eyes, ears, nose, spine, digestive tract and nervous system are present. The tube for the future heart starts beating.
8 weeks	Your baby, called a fetus, now has all the organs that a full term baby will have. The heart is functioning. Bones begin to form.
12 weeks	Tooth buds are present. Fingernails and toenails are forming. Immature kidneys secrete urine to the bladder. External genitalia are forming. The fetus can now move in the amniotic fluid, but you can't feel it. Your health care provider may be able to hear your baby's heart beat with an electronic listening device.

1ST trimester baby

2ND trimester baby

Second Trimester: 15 – 27 weeks

During the second trimester (the next three months of your baby's life) the brain develops a lot. Most of the brain's development begins now and continues for two or more years after your baby's birth. During the second trimester until about 24 weeks, the fetus cannot live outside your body because its lungs, heart and blood systems have not developed enough.

Time	What is happening
16 weeks	Your baby's face looks more human, the head has hair, the ears stand out and your baby can hear your voice. Between 16 to 20 weeks, you may feel the baby's movements. You may not feel the movements until 18 to 20 weeks, especially if this is your first pregnancy.
17 weeks	The baby begins to store some of your antibodies. A vaginal birth also helps your baby's immune system develop as important bacteria from your gut is transferred to your baby.
20 weeks	Eyebrows and eyelashes appear. A fine downy hair (lanugo) appears all over your baby's body and may be present at birth. Your baby's skin is thin, shiny and covered with a creamy protective coating called vernix. Oil glands appear. Your baby's legs lengthen, and move well. Teeth develop – enamel and dentine are being formed. (This can begin as early as 14 weeks.) By the end of the fifth month, your baby is about half the length of a newborn. During the second trimester, meconium (the baby's first stool/poop) begins to appear in the intestines.
24 weeks	Sweat glands form. Your baby has a lean body with red and wrinkled skin. Early breathing movements begin. A substance called surfactant is formed in the lungs. This substance helps the lungs to expand normally after the baby is born.
26 weeks	The baby's outline may be felt through your abdomen. The eyes may be open now.

Third Trimester: 28 weeks to birth

During the third trimester (the last three months of pregnancy) your baby continues to develop, gains weight and begins to prepare for the birthing process. The closer to full term, the better your baby will be able to cope with the birth process and life outside the uterus. The earlier a baby is born, the greater the need for special care to decrease the risks from a preterm birth. (See page 153 for more information on preterm babies.)

Time	What is happening
28 weeks	Your baby's body is still lean but the skin is less wrinkled and red. The baby can now store iron, calcium and other nutrients. Your baby can hear and respond to sounds.
32 weeks	Your baby's skin is pink and smoothes out as the fat forms under it. Your baby develops a sense of taste and becomes aware of sounds outside your body. The male baby's testicles begin to drop into the scrotum. The pupils in the baby's eyes can react to light.
36 weeks	Your baby's body is rounded and usually plump. The downy hair on the baby's body begins to disappear. The skin is smooth, pink and covered with a grayish-white cheese-like substance called vernix. The baby continues to increase the store of your antibodies and is able to resist some diseases. Usually your baby can safely be born at this age.
40 weeks	Head hair is usually present. The testicles of male babies are now in the scrotum, and the labia majora of female babies are developed. **Your baby is now full term!**
40–42 weeks (post dates)	The fontanels (soft spots on the head) are becoming smaller and the skull bones are growing firmer and less flexible. The skin may become looser as the fat layer decreases. Skin is also drier and may have small cracks as the amount of vernix decreases. Nails may be long.
More than 42 weeks (overdue)	The skin continues to get drier and will have cracks as the amount of vernix continues to decrease.

3RD trimester baby

Medical Care during Pregnancy

To Do

Your health care provider will ask you some questions during your first prenatal visit.

To prepare, take a moment to fill in the questionnaire to the right.

What is the *Pregnancy Passport?*
The *Pregnancy Passport* is a companion for *Baby's Best Chance*. It is a small booklet that becomes your health record for pregnancy, birth and the early newborn period.

It will help you understand what to expect with your pregnancy care and help you think about how to care for yourself and your baby. It is also a place for you to keep your own record of check-ups and tests and how to find more information. Ask your health care provider or local public health office for your own *Pregnancy Passport*.

Your health care provider can help you have a healthy pregnancy and healthy baby. At the beginning of your pregnancy you should visit your health care provider every four to six weeks. After about 30 weeks, you will have visits every two to three weeks. In the last month, your health care provider will want to see you every one to two weeks or more.

You may need extra medical attention or health care advice from your health care provider if you:

- are underweight or overweight
- had problems with a previous pregnancy, for example, if your baby was preterm or weighed less than 2500 g (5 lb. 8 oz.)
- have diabetes, high blood pressure or other medical conditions
- are over 40 years of age
- are carrying more than one baby
- have had uterine surgery (for example: caesarean birth, cone biopsy)
- use alcohol, cigarettes or drugs
- are under emotional stress or there is violence in your life
- are dealing with depression or other mental health issues

Before you visit with your health care provider, write down any questions you may want to ask. Take important information when you visit your health care provider. This can be a family health history or changes in your condition. If you find it supportive, have your partner or support person go with you. That way, they can ask questions, hear the same information and share in the excitement of your growing baby. You also have the right to visit your health care provider on your own, and to have confidential, private discussions with your health care provider.

My last regular menstrual period began on _____

My last Pap test was done on_____

Our blood groups are_____

I have had:

Miscarriages No Yes How many? _____

Stillbirths No Yes How many? _____

Live births No Yes How many? _____

Forceps, breech, caesarean section births
No Yes How many? _____

I/my partner smokes; uses alcohol; uses drugs: _____

Medical conditions I have that may affect pregnancy include: _____

I am taking these medications: _____

I am using these herbal remedies:_____

I have had German measles (Rubella): No Yes

I have had Chicken pox (Varicella): No Yes

This is what we would like from our health care provider:

_____

_____

_____

We have these questions:

_____

_____

Your Early Pregnancy Visits

Your early pregnancy visits are usually the longest because your health care provider will take a detailed physical history and do a physical examination. Below are some examples of what might happen during your early pregnancy visits:

Discussion/Procedures	Why?
pregnancy test	• to confirm your pregnancy
detailed medical history	• to find any risk factors you may have
lifestyle factors (use of alcohol, drugs and tobacco, physical activity and nutrition)	• to keep you and your baby as healthy as possible
prenatal supplements	• 0.4 mg of folic acid daily reduces the risk of open neural tube defect in your baby • do not take high-dose vitamin A supplements in pregnancy • some natural herbal remedies are not safe in pregnancy
complete checkup that includes: • listening to your heart • taking your blood pressure • measuring your height and weight • having an abdominal examination • having a pelvic exam that includes a Pap test or vaginal swab (if not done in the last 12 months)	• to check and monitor healthy weight gain. See page 46 for more information about healthy weight gain during pregnancy • to check your cervix and to check for infections
blood tests	• to check complete blood count (includes hemoglobin and iron levels) • to confirm blood group, Rh type and antibody screen • to screen for the following STIs: » HIV » syphilis » gonorrhea » chlamydia • to screen for hepatitis B surface antigen (HBsAg) • to test for rubella (German measles) antibody
prenatal genetic screening blood tests and/or special ultrasounds (optional) (blood test #1 done between 10–14 weeks)	• to tell you the chance of your baby having a genetic abnormality (see pages 36 and 56 for more information).
urine tests	• to check for any sugar, protein and urinary tract infections

Points to Remember

Tests that are usually done at all prenatal visits include:

- blood pressure and pulse
- urine test
- baby's heart rate
- measuring your abdomen to check the growth of your baby

Prenatal Genetic Screening

Prenatal genetic screening is a blood test available to all pregnant women in British Columbia. This screening tells you the chance of your baby having Down syndrome, trisomy 18 or an open neural tube defect.

Although most babies are born healthy, all women have a chance of having a baby with these conditions – even if they and their families are healthy.

It is your choice whether to have prenatal genetic screening. The earlier you see your health care provider, the more options you will have.

Points to keep in mind:

- Most women who have a prenatal screen get a result showing that chances are low for these conditions.
- Although some women will screen positive, most will not have a baby with one of these conditions.
- Prenatal screening detects most babies with these conditions, but not all.
- Sometimes prenatal screening may detect other medical conditions in your baby.
- It is important to remember that no test detects every type of physical or mental condition.

Talk to your health care provider if you need more information to help make your decision.

See ***www.bcprenatalscreening.ca*** for more information.

Your Next Pregnancy Visits

What may happen during the visits that follow?

Discussion/Procedures	Why?
prenatal genetic screening blood tests and/or special ultrasounds (optional), (blood test #2 done between 14 weeks to 20 weeks plus 6 days)	• to tell you the chance of your baby having a genetic abnormality. If you miss the first blood test (between 9 weeks to 13 weeks plus 6 days), you may still have the second blood test. It is best if you have both blood tests when possible, as having both improves the accuracy of the screen result. You will need to go back to your health care provider to talk about the results and to find out if more testing will be offered to you. See sidebar and page 56 for more information.
ultrasound test (done between 18–20 weeks)	• to check the development and position of the baby • to check your estimated due date (you may be unsure when you had your last period)
glucose screening (done 24–26 weeks)	• to check for gestational diabetes that may develop during pregnancy Gestational diabetes happens during pregnancy because pregnancy hormones change the way a woman's body uses insulin. For most women, blood sugar levels can be controlled by diet, but some women may need to take insulin by injection. For most women, gestational diabetes goes away after their baby is born.
blood test (done at 24–28 weeks)	• a shot of Rh-immune globulin will be given to women who are Rh-negative
Group B Streptococcus screening (done at 35–37 weeks)	• Group B Streptococcus (GBS) is a type of bacteria found in the vagina and large bowel of 15 to 20% of healthy pregnant women Around the time of birth, GBS may be passed to the baby through the birth canal. If the baby gets a GBS infection, it can be serious. Because of the small chance of GBS infection in the newborn, all pregnant women should be offered screening between 35–37 weeks of pregnancy. A swab for GBS is taken from the vagina and anal areas. Women whose test is positive are given intravenous antibiotics, just to be safe. Often it is a brand of penicillin and is given at the time their membranes rupture or during labour. Treatment of the pregnant woman with antibiotics has been shown to decrease the chance of serious infection. However, no method has been proven to prevent all serious infections. Whether or not you need treatment in labour depends on your situation. Discuss GBS with your health care provider.
discuss your emotional feelings	• women may become depressed during or after pregnancy 10–16% of pregnant women will have depression during their pregnancy. A smaller number will also have anxiety or panic disorder. See pages 22 and 93 for more information on depression during pregnancy.

Your Next Pregnancy Visits *(continued)*

Discussion/Procedures	Why?
count fetal (baby) movements (done from 35–37 weeks and onward)	• to be aware of your baby's movements Babies have active periods and quiet periods during the day and/or night. Healthy babies may slow down slightly toward the end of pregnancy, but they do not slow down a lot. Your baby should not stop moving at a time when she is normally active. You don't need to record your baby's movement count unless you are asked to do so by your health care provider. Be aware of your baby's movement, especially in the third trimester. If you notice a drop or no movement at a time when your baby is normally active, contact your health care provider.
non-stress test	• tells how well your baby is doing • a painless test to check your baby's heartbeat while resting and moving • done with an electronic fetal monitor

Points to Remember

Regular dental cleanings and checkups are safe during pregnancy. Be sure to let your dental office know that you are pregnant when you make your appointment.

Any pain, swelling or infection in your mouth should be treated right away. Your dentist may have recommendations for treatment that would be different if you were not pregnant.

Dental x-rays and local anesthetics for dental treatment can be safely provided during pregnancy. If x-rays are required, the lead apron used at the dental office will shield you and your baby.

What about Pregnancy and Influenza (the "flu")?
If you are pregnant and have symptoms of influenza (fever, cough, headache, aches and pains and/or fatigue), it is a good idea to call your health care provider.

You can also call HealthLink BC at 8-1-1 to speak to a registered nurse or visit ***www.healthlinkbc.ca***.

What about the Flu Shot?
Pregnant women are at higher risk of complications from influenza. It is recommended that all pregnant women get a flu shot (vaccine). The flu shot is safe in pregnancy and is provided at no cost to pregnant women in BC. Visit ***www.immunizebc.ca*** to find out where to get your flu shot.

See your health care provider right away or call HealthLink BC at 8-1-1 if you have any of the following:

- contact with anyone who has rubella (German measles) as there is a danger to your baby if you get sick with rubella during your pregnancy
- rashes of any kind except the ones you often get, like eczema
- sudden, unusual thirst
- fever and/or coughing that isn't getting better
- a feeling of being tired all the time
- dizziness, headaches, dimming and/or blurring of vision
- sudden or continuing swelling of your hands or face
- frequent vomiting, when you are unable to keep fluids down
- abdominal pain or if your abdomen feels hard
- bleeding from your vagina, bowel or bladder
- a burning sensation when peeing
- coloured, frothy and/or bad-smelling vaginal discharge, or vaginal discharge causing itchiness or irritation
- a gush or trickle of water from your vagina
- constant negative feelings or anxiety about your pregnancy and care of the baby
- depression or periods of weeping that don't go away
- feel that your baby has moved a lot less than usual in the last 12 hours
- signs of preterm labour (see page 85)

Share this information with your partner or support person so you all know what to watch for.

Eating for Pregnancy and Breastfeeding

Women who eat well during pregnancy are more likely to have a baby born at a healthy weight. Eating healthy foods gives your baby the nutrients needed to develop normally. This increases your chances of having a healthy baby. You don't need to eat special foods to breastfeed, but healthy foods will keep you healthy as a new mother.

During pregnancy you will need more calories and nutrients for your developing baby and for yourself. Don't forget that the placenta is growing and your blood supply is also increasing.

Eating Guidelines

Eating Well with Canada's Food Guide (Canada's Food Guide) can help you with good eating habits (see page 161). These habits will help your pregnancy, your breastfeeding and the rest of your life.

Remember to:

- enjoy a variety of foods from the four food groups every day
- eat three meals and two to three snacks every day
- eat foods rich in nutrients
- limit foods and beverages high in calories, fat and sugar or sodium (salt) such as cakes, pastries, doughnuts, potato chips, fruit flavoured drinks, soft drinks, sports drinks and energy drinks
- limit foods high in trans fat

To Do

Write down everything you ate and drank yesterday. Find the foods in the food groups in *Canada's Food Guide* and compare your eating to the *Food Guide*.

Note below how many servings you ate of each food:

Vegetables and Fruit: _____ servings

Milk and Alternatives: _____ servings

Grain Products: _____ servings

Meat and Alternatives: _____ servings

Compare your totals to the recommended servings in Canada's Food Guide.

I ate the recommended number of servings in all four food groups. ☐ Yes ☐ No

If I ate less than the recommended number of servings in the four food groups, I need to eat more:

Vegetables and Fruit: _____ servings

Milk and Alternatives: _____ servings

Grain Products: _____ servings

Meat and Alternatives: _____ servings

How will you eat more of the foods you need?

_____

_____

_____

Check *A Guide to Healthy Foods* (page 41) and circle all the foods you ate. In which food group are you strongest? Of which nutrient did you have the most? Of which nutrient did you get the least?

Points to Remember

Eat healthy foods to ensure ideal oral health during pregnancy.

When you snack, choose foods that are low in sugar and nutritious. Suggestions for healthy snacks include:

- Fresh fruit
- Cut-up raw vegetables
- Whole grain crackers and cheese
- Greek yogurt
- Peanut or nut butter on whole grain toast
- Whole grain cereal with or without milk
- Nuts or seeds

Water is a good choice for between meals and thirst.

Points to Remember

Take advantage of your pregnancy to work toward your goals of healthy eating. The changes you make now will set the scene for continued healthy eating for you and your baby as it grows.

Fish and Mercury
Choose fish low in mercury, such as salmon, rainbow trout, Atlantic mackerel, sole or canned light tuna. Do not have more than two servings per month of fresh or frozen tuna, shark, marlin, escolar, orange roughy or swordfish.

See HealthLink BC File #68m, *Food Safety: Mercury in Fish* at ***www.healthlinkbc.ca*** for more information.

Lead and Tap Water
Some plumbing in older buildings may have leaded components that allow lead to get into water. Lead consumption should be reduced as much as possible. Flushing tap water until it runs cold first thing in the morning is an easy way to reduce lead in water.

For more information on how to protect yourself and your baby, see HealthLink BC File #49e, Lead in Drinking Water at ***www.healthlinkbc.ca***

Eating Well with Canada's Food Guide
See Appendix A (page 161) for the complete *Canada's Food Guide*.

Food Group	Recommended Number of Servings per day for Adult Females (19–50)	Examples of one serving
Vegetables and Fruit • Eat at least one dark green and one orange vegetable each day. • Choose vegetables and fruit prepared with little or no added fat, sugar or sodium (salt). • Have vegetables and fruit more often than juice.	7–8	1 piece of fruit ½ cup fresh, frozen or canned vegetables 1 cup raw leafy vegetables ½ cup 100% fruit juice
Milk and Alternatives • Drink skim, 1% or 2% milk each day. • Select lower fat milk alternatives.	2	1 cup milk or unsweetened fortified soy beverage ¾ cup yogurt 50 grams (1 ½ oz) cheese
Grain Products • Make at least half of your grain products whole grain each day. • Choose grain products that are lower in fat, sugar or sodium (salt).	6–7	1 slice bread ½ cup cooked pasta or rice ¾ cup hot cereal 30 grams cold cereal ½ bagel
Meat and Alternatives • Have meat alternatives such as beans, lentils and tofu often. • Eat at least two Food Guide servings of fish each week. • Select lean meat and alternatives prepared with little or no added fat or sodium (salt).	2	½ cup cooked fish, shellfish, poultry, lean meat 2 eggs ¾ cup cooked legumes 2 tbsp peanut or nut butter ¼ cup shelled nuts and seeds

Source: *Eating Well with Canada's Food Guide*, Health Canada, 2007. Reproduced and adapted with the permission of the Minister of Public Works and Government Services Canada, 2010.

A Guide to Healthy Foods

This table shows you how to use *Canada's Food Guide* to get the nutrients you need.

Nutrient	Iron	Folic Acid	Calcium	Essential Fatty Acids	Fibre
Benefits	Needed to prevent anemia (low iron in the blood). Low iron can cause low birth weight. It can make the mother feel tired, make it hard to fight infection and cause difficulty coping with blood loss during birth.	Lessens the risk of having a baby with a neural tube defects, such as spina bifida. Folic acid is also important for healthy growth and development.	You need calcium and vitamin D for your baby's healthy bones and teeth and to protect your bones later in life.	Necessary for the normal development of your baby's nervous system and eyesight during pregnancy and breastfeeding.	Helps prevent constipation.
Vegetables and Fruit	apricots (dried), asparagus, broccoli, dates, prunes, raisins, spinach, Swiss chard	bananas, broccoli, romaine lettuce, Brussels sprouts, corn, beets, oranges, peas, spinach, asparagus, avocado	bok choy, broccoli, kale, mustard greens, Swiss chard		berries, dates, pears, dried figs, bananas, potatoes, prunes, kiwi, corn, peas
Milk and Alternatives	Ovaltine® or Instant Breakfast® added to milk	milk, all types	buttermilk, cheese, milk, skim milk powder, yogurt, ice milk, frozen yogurt		
Grain Products	bran cereal, cream of wheat, enriched cereals, wheat germ, whole-grain cereal, whole-grain bread	enriched bread and cereal, wheat germ, whole-grain bread, cereal	bread (calcium-fortified)		bran muffin, bran cereals, fibre cereal, fibre-enriched crackers, whole-grain cereal
Meat and Alternatives	tofu, baked beans, lentils, clams, dried beans, egg yolk, pumpkin seeds, meat, fish, poultry, hazelnuts, almonds, walnuts	almonds, dried beans, dried peas, lentils, peanuts, sunflower seeds, chickpeas, egg yolk, sesame seeds, hazelnuts, cashews, walnuts	almonds, baked beans, sardines, salmon with bones, soybeans, sesame, tahini, tofu made with calcium, hazelnuts	beef, pork, poultry, salmon, sardines, mackerel, walnuts, pumpkin seeds, Brazil nuts, peanut	dried beans, dried peas, lentils, nuts, seeds

Your public health dietitian will suggest places that can help you eat well during pregnancy if you have limited money.

Call Dietitian Services at HealthLink BC at 8-1-1 for reliable, confidential information and advice on nutrition for yourself and your baby, during pregnancy and after.

Healthy Eating Tips

Encourage your partner and whole family to eat better:

- When families eat together, they eat better.
- Buy in bulk and share with friends.
- Cook larger amounts and freeze leftovers for later.
- Keep convenient and healthy snacks with you so you don't go for that bag of chips or pop.
- When eating out, choose foods such as salads or chili.
- Note the sizes of servings in *Canada's Food Guide*. They are often smaller than you think!
- Try not to skip meals. If nausea is a problem, try smaller meals and regular snacks.

Vegetarian Eating

You need extra amounts of iron, calcium and vitamin B12 during pregnancy. It may be hard to get these nutrients if you eat vegetarian choices only. Talk with your health care provider or a registered dietitian about supplements.

Iron

Vitamin C helps with iron absorption. Combine iron-rich foods with vitamin C-rich foods, such as berries, citrus fruits, peppers, broccoli or tomatoes.

Calcium

Milk and milk products are a good source of calcium. If you do not eat or drink milk and milk products, increase these non-dairy calcium-rich foods in your diet:

- soy or plant-based beverages with added calcium
- orange juice with added calcium
- cooked spinach, kale or broccoli

For other non-dairy sources of calcium, see the HealthLinkBC File #68e, *Food Sources of Calcium and Vitamin D* at ***www.healthlinkbc.ca***. The calcium in non-dairy sources is less easily absorbed than the calcium in milk.

Vitamin B12

Vitamin B12 is found in milk and eggs. Your developing baby needs vitamin B12 for brain and nervous system development. If you do not eat milk and eggs, you should have your vitamin B12 level checked by your health care provider. Make sure you take a supplement that has vitamin B12 – about three micrograms per day. Some nutritional yeast contains vitamin B12, but during pregnancy and breastfeeding it is best to make sure you get enough by taking a supplement.

Soy

Moderate amounts of soy foods (like tofu and soy beverages) are safe to include as part of a balanced diet during pregnancy. Soy supplements, such as soy protein or isoflavone supplements, are not recommended during pregnancy.

Taking Supplements

It is important to tell your health care provider what types of supplements you are taking. Remember to include any herbal supplements or remedies or natural vitamin products that you use. Taking too much of any supplement may be harmful to your baby. This includes natural or herbal products.

Prenatal Supplements

A daily multivitamin and mineral supplement that has folic acid, vitamin B12 and iron is recommended for pregnancy. A healthy diet and these supplements will give you the extra vitamins and minerals you need for your growing baby. If you can't afford prenatal supplements, check with your local health office. There may be a prenatal program that provides these supplements at no cost.

Folic Acid

Your supplement should have 0.4 mg (or 400 mcg) of folic acid. For more information, see HealthLink BC File #38c, Pregnancy and Nutrition: Folate and Neural Tube Defects at ***www.healthlinkbc.ca***.

Iron

Your supplement should have 16-20 mg of iron. Some women may need more iron. Talk to your health care provider to find out how much iron you should be taking from a supplement. Eat foods that are extra high in iron.

- An iron supplement is best absorbed if taken between meals with a light snack.
- An iron supplement may cause nausea if taken on an empty stomach.
- Take an iron supplement with foods high in vitamin C. These include berries, citrus fruits, peppers, broccoli or tomatoes.
- Do not take an iron supplement with tea or coffee, and do not take it with foods that are high in calcium or with your calcium supplements. See page 42 for a list of foods high in calcium.
- An iron supplement may cause constipation. If constipation is a problem, see page 26.

For more information, see HealthLinkBC File #68c, *Iron and Your Health* at ***www.healthlinkbc.ca***.

Vitamin A

Too much vitamin A can cause birth defects especially during the first trimester. Do not take individual vitamin A or fish liver oil supplements during pregnancy. Liver and liver products (e.g. liverwurst spread and liver sausages) are also very high in vitamin A. The safest choice is to limit these foods during pregnancy. If you choose to eat liver products, have no more than 75g (2 ½ ounces) per week. Choose a prenatal supplement that has less than 10,000 IU (3000 mcg) of preformed vitamin A (often listed as acetate or succinate or palmitate).

Calcium and Vitamin D

Your health care provider may recommend a calcium supplement along with foods that are extra high in calcium. New research shows that 600 U of vitamin D daily is recommended for women during pregnancy. Ask your health care provider how much vitamin D to take. See BC HealthFile #68e, *Food Sources of Calcium and Vitamin D* at ***www.healthlinkbc.ca***.

Points to Remember

Foods that are sweet or stick to your teeth can increase the risk of tooth decay. Remember now that you are snacking more, you need to brush more often using a toothpaste that contains fluoride.

For more information, look at BC HealthFile #38b, *Pregnancy and Dental Health* online at ***www.healthlinkbc.ca.***

Reducing Lead Exposure

Lead can be ingested through paint, dirt and dust, as well as from water that passes through older plumbing that contains lead. Minimizing lead intake is important for your baby's brain development. For more information on how to protect yourself and your baby, see HealthLink BC Files #31 and #49e at ***www.healthlinkbc.ca***

Special Food and Beverage Concerns

Essential Fatty Acids (EFA)

EFAs are needed so your baby's nervous and visual systems can develop normally. EFAs are important for normal growth and development during pregnancy and breastfeeding. EFAs can be found in fish, walnuts, soybeans, tofu, ground flax seed, Omega 3 enriched eggs and vegetable oils, such as canola, flaxseed and soybean, and in non-hydrogenated margarines and salad dressings made from canola or soybean oil. Fish is an excellent source of EFAs and other nutrients.

Canada's Food Guide recommends that pregnant women eat at least 150 grams (5 ounces) of cooked fish each week.

If you do not eat fish, talk to your health care provider about taking a fish oil supplement. Choose fish oil supplements that have a Natural Product Number (NPN). Do not take more than 3 grams of EPA (Eicosapentaenoic Acid) and DHA (Docosahexaenoic Acid) per day. Do not take fish liver oils (such as cod liver oil) because they have too much vitamin A.

For more information, see HealthLink BC File #68m, Food Safety: Mercury in Fish at ***www.healthlinkbc.ca***.

Caffeine

Caffeine is found in many products, including coffee, tea, chocolate, cola beverages and soft drinks. Caffeine is also in some prescription and non-prescription medications. A small amount of caffeine should not harm you or your growing baby. While you are breastfeeding, caffeine may make your baby restless. It is recommended that you limit your intake of caffeine to about 300 mg a day while you are pregnant or breastfeeding.

- One cup of regular coffee has 135 to 179 milligrams (may vary according to the brew).
- One cup of tea has 43 milligrams.
- One 355-millilitre can of cola has 36 to 46 milligrams.

You can cut down on your intake of caffeine if you:

- replace your usual caffeine drinks with water, milk or 100% fruit juice
- make only one cup at a time
- change your coffee time into a time for going for a walk

Herbal Teas

Some herbal teas are safe to have during pregnancy and others are not. Choose herbal teas that list the ingredients. Teas made from edible food products are generally safe. These herbal teas are generally safe: ginger, bitter orange/orange peel, echinacea, peppermint, red raspberry leaf, rose hip and rosemary. Supplements of these herbs are not recommended. Some herbal teas may make allergies worse. Limit herbal teas to two to three cups per day. Call Dietitian Services at HealthLink BC at 8-1-1 for more information on teas.

Alternative Sweeteners

Sugar substitutes are approved for use during pregnancy in moderate amounts. Be sure that foods made with these products do not replace nutritious, healthy foods or drinks.

Food Safety During Pregnancy

Some foods can carry bacteria or parasites that may make you sick. Some can affect your baby too. Pregnant women are at increased risk for listeriosis, a serious illness that may come from some foods. For more information, see HealthLink BC File #75, Listeriosis. Follow these safety guidelines to reduce your risk of listeriosis and other illnesses you can get from food.

How can I practice food safety?

- Wash your hands well with soap and warm water after going to the toilet, and before and after preparing food.
- If you touch raw meat, wash your hands well before handling other foods.
- Wash raw vegetables well. Use a brush to remove visible soil.
- Be careful with raw and cooked foods. Keep uncooked meats and seafood separate from vegetables and other ready-to-eat foods when you are preparing them.
- Do not put cooked foods on cutting boards or plates that were used for raw meat.
- Wash and sanitize utensils and cutting boards after handling uncooked foods. To sanitize, use 1 teaspoon of household bleach in 1 litre of water.
- Do not let raw or cooked foods sit at room temperature (no longer than a total of 2 hours).
- Keep hot foods hot (60°C or above) and cold foods cold (4°C or below).
- Do not eat raw meat (like steak tartar) or undercooked meat. Thoroughly cook these foods until their internal temperatures are as shown:
  - » poultry pieces (74°C), whole poultry (85°C), ground poultry dishes (74°C)
  - » egg products (74°C)
  - » meat dishes (68°C)
- Reheat food really well, to an internal temperature of 74°C.
- Cooked foods should be refrigerated and used promptly. Do not keep cooked food in the refrigerator for more than 2 days.
- Keep cooking tools and surfaces clean. Never leave food in open cans. Store food in covered containers. Check for safety seals.
- Change dishcloths and towels daily.
- Avoid unpasteurized milk and milk products (such as cheese and yogurt) and unpasteurized juice.
- Avoid eating raw fish. Some sushi contains raw fish. Eat fish low in mercury most often. See page 40 and the HealthLink BC File #68m, *Healthy Eating: Guidelines for Eating Fish with Higher Mercury Levels* at ***www.healthlinkbc.ca***.
- Avoid or cook well:
  - » Hot dogs, especially straight from the package without further heating. Be careful not to spread the liquid from the hotdog package onto other foods or surfaces.
  - » Non-dried deli meats, such as bologna, roast beef or turkey breast unless you heat them until they are steaming hot.
  - » Soft and semi-soft cheeses such as feta, Brie, Camembert and blue-veined cheese.
  - » Refrigerated pâté and meat spreads, unless they are canned or shelf-stable.
  - » Sprouts, like alfalfa and mung bean

Check these websites for more information:

- » ***www.hc-sc.gc.ca***
- » ***www.inspection.gc.ca/english/toce.shtml***

How do I figure out my BMI?
Body Mass Index (BMI) measures your weight relative to your height. Your BMI is calculated as follows:

BMI = weight (kg)/height $(m)^2$

You can also use the calculator found at ***www.hc-sc.gc.ca***. Use the search tool and search for "BMI calculator."

Body Mass Index (BMI) Chart:

Underweight – BMI less than 18.5

Normal Weight – BMI 18.5-24.9

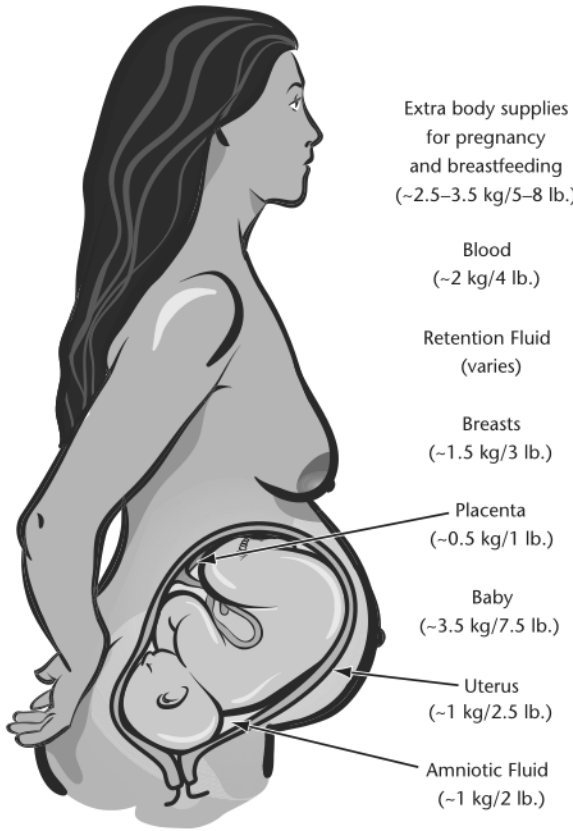
Overweight – BMI 25.0-29.9

Obese – BMI more than 30.0

Weight Gain in Pregnancy

A healthy weight gain during pregnancy is usually between 5 to 18 kilograms (11 to 40 pounds). For women carrying twins, weight gain is usually between 11 to 25 kilograms (25 to 54 pounds). How much weight to gain depends on what your weight was before you became pregnant. Women who have a Body Mass Index (BMI) under 18.5 will need to gain more and women with a BMI over 25 will need to gain less to have a healthy pregnancy.

Weight gain should be minimal in the first trimester (0.5 to 2 kilograms or 1.1 to 4.4 pounds). If you lose or gain a significant amount of weight in the first trimester (more than 5 to 10% of your pre-pregnancy weight), talk with your health care provider for support.



Typical pregnancy, weight gain approximately 14 kg (30 lb.)

Weight gain should be steady and gradual in the second and third trimesters. The average weight gain is around 0.2–0.5 kilograms/week or 0.5–1.0 pound/week. If you are gaining more, compare your eating habits to *Canada's Food Guide* on page 161.

Pregnancy is a time to eat "twice as healthy," not "twice as much." Plan your meals, and choose healthier foods, like vegetables and fruit that are rich in colour and high in fibre.

An active lifestyle during pregnancy is also important for a healthy weight gain during pregnancy. See page 47 and check with your health care provider about being active during pregnancy.

Weight loss and dieting are not recommended in pregnancy. Focus on healthy eating and healthy foods, not your weight. Talk with your health care provider or registered dietitian for further information, or call 8-1-1 to speak to Dietitian Services at HealthLink BC.

What about cravings?
Cravings for non-food items, such as ice, clay or starch, can usually be stopped with a change in your diet. Report any of these cravings to your health care provider.

To Do

The changes I plan to make to my eating habits are:

_____

_____

_____

Self Care for Mothers and Partners

Physical Activity

Staying physically active during pregnancy will cut down on swelling, leg cramps, fatigue, shortness of breath, backache and constipation. It will also help you keep your weight down.

What are good physical activities to do while pregnant?

- walking
- riding a stationary bike
- swimming
- low-impact aerobics
- prenatal yoga
- aquafit
- prenatal fitness classes

How can I start?

- Choose activities that you enjoy.
- Start with three times a week and gradually increase to everyday.
- Start with 15 minutes at a time with rest breaks. Gradually work up to 30 minutes a day.

General Guidelines

- Try to be physically active for 30 minutes every day.
- Drink water or juice before, during and after exercise.
- Eat a snack 1 to 1.5 hours before physical activity.
- Warm up before and cool down after physical activity. Take 10 to 15 minutes to stretch, then do relaxation exercises or mild aerobics before and after.
- If you become short of breath, stop the activity.

Safety

- Your ligaments are more relaxed when you are pregnant, so you can be injured more easily. Avoid bouncing and fast changes in direction, which includes games such as squash or racquetball.
- It is much easier to lose your balance when you are pregnant so be careful while doing new activities that require balance. Avoid activities that might make you fall and hurt your abdomen. These include contact sports, such as rugby and karate, downhill or water skiing, hockey, horseback riding and softball.
- Do not become overheated. If you are physically active in a pool, the water temperature should not be higher than 26 to 28°C.
- Don't lie flat on your back after the fourth month of pregnancy. The weight of your baby presses on your major arteries and veins and can reduce the blood flow to you and your baby. Put a small pillow under one hip to shift the weight of the baby off your arteries.
- Breathe throughout an activity. Breathe out on exertion and breathe in when you relax. Do not strain

Points to Remember

Reasons to stop physical activity and consult your health care provider:

- excessive shortness of breath
- chest pain
- painful uterine contractions (more than 6–8 per hour)
- vaginal bleeding
- any "gush" of fluid from vagina (suggesting premature rupture of the membranes)
- dizziness or faintness

If you have any of the above symptoms, stop exercising right away and call HealthLink BC at 8-1-1.

Source: Physical Activity Readiness Medical Examination for Pregnancy (PARmed-X for pregnancy) © 2002, used with permission from the Canadian Society for Exercise Physiology, Inc.

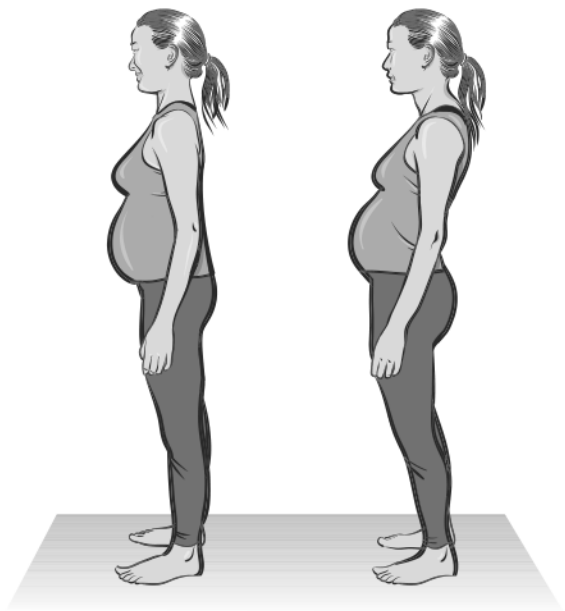
Hot Yoga (Bikram yoga) is a popular form of exercise, but little is known about how it affects pregnant women and their growing babies. Pregnant women should avoid or limit sports or activities that overly increase their body temperature.

while holding your breath. This will cause changes in your blood pressure and can also create pressure on your pelvic floor and abdominal muscles.

- Do not scuba dive when pregnant. The fetus is not protected from decompression sickness (the bends) and gas embolism.
- Use low weights and high repetitions if doing strength training. Use lower weights as you get closer to your baby's birth.
- Don't overdo it. Pregnancy is a time when you need to balance rest and activity.

Checking Posture

Your centre of gravity may shift forward as your uterus and breasts get bigger. This can cause a sway or arch in your lower back, and this sway can cause your shoulders to slump forward. Poor posture can cause discomfort in your back, shoulders and hips.



Correct posture *Incorrect posture*

Check your posture throughout the day by:

- pulling in your abdominal muscles – think "belly button to back bone"
- pulling your shoulders back and straightening your spine
- standing up straight and walking tall

Caring for Your Back

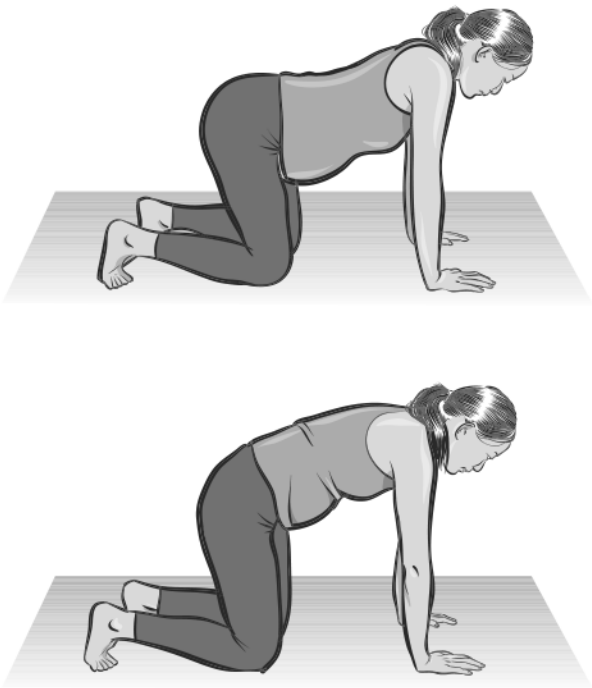
Back pain is common later in pregnancy. Follow these tips for back safety and comfort:

- keep good posture
- don't lift heavy objects
- lift with your legs and not your back by bending your knees
- hold the object you are lifting close to your body
- do not twist when lifting
- keep your knees slightly bent but not locked when standing
- "log roll" when getting up from a lying position (turn onto your side and push up with both arms)
- rest and sleep on your side and put a pillow between your knees to support the upper leg
- avoid moving large objects
- if standing for long periods of time, put one foot on a stool
- wear comfortable, supportive shoes

Strengthening Your Back (Pelvic Tilt)

Strengthen your back with the following pelvic tilt activity:

- Kneel on your hands and knees with elbows slightly bent.
- Keep your back flat. Do not let your back sag downwards.
- Keep your head and neck in line with your spine.
- Arch your lower back and at the same time tighten your abdominal muscles and buttocks.
- Slowly relax and return your back to the flat position.
- Repeat up to a maximum of 5 to 8 times.



Pelvic tilt exercise for strengthening your back.

Caring for your Abdominal Muscles
Abdominal muscles take most of the pressure of the growing baby during pregnancy. These muscles run up and down from your chest to your pubic bone. It is common for these muscles to soften, weaken and separate, like a zipper opening under stress. If you notice bulging along the middle of your abdomen when you get out of the bath or bed, you could have a separation in your abdominal muscles.

You can lessen strain to these muscles by:

- getting out of bed by turning onto your side and pushing up with both arms
- avoiding activities where you curl up
- not holding your breath when you lift and carry something

Until the gap is closed you should not do sit-ups and activities that rotate the trunk, twist the hips or bend the trunk to one side. See page 92 for information on how to see if you have a separation in your abdominal muscles.

Your Pelvic Floor – During Pregnancy
Your pelvic floor plays an important role in pregnancy and birth. Spanning from your pubic bone to your tail bone, these muscles act as a sling to support your internal organs (including your uterus and baby). Your pelvic floor, along with efficient lower tummy muscles, also supports your spine and pelvis, helps control passing urine and stool (poop) and plays an important role in sexual function.

The extra weight of the baby during pregnancy and the birthing process can weaken, stretch or damage both the pelvic floor and the lower tummy. This is true even if you have a caesarean delivery. There are a number of steps you can take to prevent and treat pelvic floor problems during and after pregnancy.

Pelvic Girdle Pain – During Pregnancy
Your pelvic girdle is made of the pelvic bones and joints of the pelvis. Almost half of pregnant women have pelvic girdle pain (PGP), which is pain felt anywhere around the pelvic ring, such as the low back, buttocks, sides of hips, groin and inner thigh areas. PGP can start earlier or later in the pregnancy, or even after delivery and postpartum. PGP often comes back in subsequent pregnancies. Pain is usually worse with sitting, standing and walking, as well as with turning over in bed, climbing stairs or moving from sitting to standing. PGP usually improves after delivery. For some women, it does not improve without treatment.

PGP can be improved with physiotherapy treatment during pregnancy, as well as after delivery. Seek help for PGP if it is affecting your general comfort and ability to do your day to day activity.

He Said

I really wanted to help Peggy with exercising so I started to join in on her evening walks. It seemed to help that I was interested too. We would clock our time and distance and gradually increase it. She had to slow down after about eight months but she still kept at it. She actually walked for a lot of her labour; it seemed to help distract her.

We got back at it again about a week after Jamie was born. We would put him in the stroller and go for a nice walk together.

Your Pelvic Floor – Kegel Exercises

Kegel exercises, sometimes known as pelvic floor exercises, can help to strengthen and relax the pelvic floor muscles. Doing Kegel exercises during pregnancy and after the birth can prevent or improve bladder or bowel leakage when coughing, laughing and being active. Kegels contribute to a healthy pelvic floor, which may lead to an easier delivery and faster return to full activity and function.

Kegel exercises involve a conscious tightening then relaxing of the pelvic floor muscles. Kegels can be done anywhere and in any position. Try doing them in a position that is easiest for you such as sitting or lying down. As you become more confident in your technique, try them standing and with movement like walking and lifting.

Here's how:

- Check your posture. Find a relaxed position standing, sitting or lying. Make sure your pelvis (hips/bum) is in a neutral position. Not tucked under or swayed back. See page 48 for more about posture during pregnancy.
- A great time to do Kegels is when you are sitting while feeding your baby.
- Gently tighten and lift the muscles around your vagina and rectum (above the anus), as if you are stopping the flow of urine and avoiding passing wind. Do not do Kegel exercises by actually stopping your flow of urine when on the toilet. This can cause some urine to stay in your bladder and may lead to infection.
- Your upper belly, thigh and buttock muscles should be relaxed.
- Do not hold your breath while tightening your muscles.
- Hold the muscles tight for a count of 5. Do not strain and keep breathing.
- Release those same muscles. Pause for 10 seconds between Kegels to make sure your muscles have totally relaxed.
- As the exercises get easier, work up to holding for a count of 10 and aim for 10 Kegels per session. Do this several times a day.
- To prevent bladder leakage, try tightening your pelvic floor muscles before you cough, sneeze or lift. Maintain the contraction until the activity is over.

Note: Kegels may not be the right choice for you if you have vaginal or rectal pain or pelvic floor spasms. If you are trying pelvic floor exercises on your own (without a pelvic floor physiotherapist or doctor assessment) and you do not see a benefit within a couple of weeks, it may be because you are not doing the Kegels correctly. A pelvic floor physiotherapist, primary care provider or midwife can teach you how to do them correctly, using the right muscles.

Physical Activity after Baby

Physical activity will help you regain muscle tone, lose weight and have more energy. After a vaginal birth, most physical activities can be started again as soon as you are comfortable. Start slowly, then gradually build up the length of physical activity. If you have heavier and brighter bleeding after an activity, you need to slow down. After a caesarean birth, physical activities can be started when you are comfortable and have discussed your activity plans with a physiotherapist or health care provider.

You can begin Kegel exercises a day after a vaginal birth. Let pain be your guide. These exercises will help strengthen and tone the area around your vagina, and will help you control peeing. Make Kegel exercises a regular part of your daily routine for the rest of your life.

Doing a physical activity can be a time for you, your partner and your baby to spend together. Choose an activity that is comfortable for all of you, and make it one that easily fits into your daily schedule. If you feel pain while exercising, stop and rest.

Activities to Try

- Walking – gradually increase the pace and distance. Use a good stroller or soft carrier so you can take your baby with you. If you jog or walk quickly, wear a supportive bra.

- Swimming – you can begin swimming after vaginal bleeding and discharge have stopped.
- Postnatal fitness classes – your community may have classes designed for new mothers.
- Yoga – start slowly or join a class that is designed for new mothers.

Physical Activity and Breastfeeding

Physical activity does not affect the amount or quality of your breast milk and will not affect the growth of your baby if you are breastfeeding.

Rarely, in some women, intense physical activity will cause an increase in lactic acid in breast milk and the baby may not like the taste. If your baby does not feed well after you have done **intense** physical activity:

- slow down
- feed your baby before the activity
- express breast milk before the activity to give to your baby after
- try feeding again a little later

Remember – your breast milk is the best food for your baby.

To Do

My top two de-stressing activities are:

_____

_____

I will fit these two (or more) activities into my life by:

_____

_____

_____

_____

Oral Health During Pregnancy

Taking extra care of your mouth and teeth during pregnancy is very important. Pregnancy hormones can affect the health of your gums. Some women may find that their gums become red, tender and sore during pregnancy. This is called gingivitis. You can help prevent or improve gingivitis by regularly brushing your teeth and gums.

Plaque build-up, caused by bacteria left in the mouth, can lead to tooth decay and gum disease. Be sure to clean between your teeth (floss) each day and brush with fluoride toothpaste at least twice each day especially in the morning and before bed.

Any pain, swelling or infection in your mouth should be treated right away. Your dentist may have recommendations for treatment that would be different if you were not pregnant.

Reducing Stress

Some stress is normal but too much stress can be unhealthy for you and your baby. Here are some tips for managing stress:

- talk with a professional or someone you trust
- learn to say no to extra responsibilities
- make time for yourself everyday
- be physically active everyday
- get enough sleep and eat healthy foods
- practice relaxation breathing
- plan ahead
- prepare your other children for the new baby
- plan when to leave work
- arrange for help in your home after the baby is born
- go to prenatal classes to learn about pregnancy, birth and parenting

If you have a sudden crisis, such as the death of a loved one, loss of a job or move to a new home, talk with your health care provider or public health nurse. You can also call HealthLink BC at 8-1-1 for advice about seeking professional help.

She Said

Pregnancy can be a time of great stress, both physically and emotionally. I found the greatest stress reliever was learning to say no. That and prenatal yoga! Free your life of extra stress and find an outlet to release the stuff you just can't get rid of. Remember that by taking care of yourself, you are taking care of your baby.

PROVIDING SUPPORT

- Listen to your partner's concerns. You may not have solutions but you can listen and try to understand.
- Ask what you can do to help.
- Talk about your worries and concerns with someone you trust.
- Talk about how you will manage your finances.
- Join a prenatal class to learn about becoming a parent.
- Create your birth wishes together.
- Talk about maternity and paternity leaves.
- Laugh together.

He Said

I didn't realize how stressed I had been about becoming a dad until I was talking with my brother. I just started crying; it was crazy. I had been worried about money, losing my job, would I be a terrible dad, would I faint during the birth, would I basically make a mess of the best thing that had ever happened to me? Would I…? Would I…? Just hearing that he had felt some of the same things really calmed me down.

Are you sad, exhausted, moody or crying a lot?
As many as 1 in 5 women in British Columbia will experience a major depression during pregnancy or in the first year after childbirth. Perinatal depression can happen to women of all ages, cultures and levels of education. See pages 22 and 93 for more information.

Travelling

Wear your seat belt with the lap belt below your baby and the shoulder belt against your chest.

What about car travel?

Always wear seat belts in the car. Wear the seat belt as shown to protect yourself and your baby if you are in a crash.

- Wear the lap belt snug and low over your pelvic bones, below the baby.
- Wear the shoulder belt tightly against your chest.
- Do **not** put the shoulder belt under your arm or behind your back.
- Do **not** recline your seat while travelling because your seat belt will be too loose to protect you.
- Do not drive if you don't have to.
- If you do drive, adjust the vehicle's front seat as far back as you can. This will give the air bag as much room as possible in which to inflate if you are in a crash.

Source: Reproduced and adapted with permission from the Insurance Corporation of British Columbia

What about air travel?

If you have an uncomplicated pregnancy, you will probably be able to travel during most of your pregnancy. When deciding on your destination, be sure to check for any travel advisories in the area, particularly for women who are pregnant or are thinking of becoming pregnant. Talk to your health care provider or local travel clinic at least 6 weeks before your trip to discuss your travel plans and medical needs. There are some illnesses, like malaria or the Zika virus, which can have serious complications for you and your baby. If you think your partner may have the Zika virus, you should use condoms or avoid sexual activity for the duration of your pregnancy.

Before you buy a ticket, check with the airline about their policy on pregnant travellers. Some will not allow you to fly after 36 weeks gestation. They may also require a letter from your health care provider that includes your due date.

If you are flying while pregnant:

- ask for an aisle seat so you can get up and walk frequently
- drink plenty of water
- bring your own healthy snacks
- keep your medications with you on the plane

If you are travelling a long distance:

- take a copy of your prenatal record
- find out about health care in the area you are travelling to
- find out the location of the nearest hospital
- take out medical insurance that includes pregnancy and birth

Also talk with your public health office about immunizations. Discuss any precautions you should take to prevent illness while travelling. These include drinking bottled water and staying away from ice cubes and uncooked fruits and vegetables.

Sexuality

There may be changes in your sexual relationship, but it is possible for a couple going through pregnancy and parenthood to have an intimate relationship. There is more to an intimate relationship than just intercourse. Other types of contact like kissing, cuddling or massage can be satisfying and help you to connect during this time of change.

Is sex during pregnancy safe?
Normally, sex does not harm the baby. However, if sex is painful, talk with your health care provider.

Are there some situations when we shouldn't have sex?
Most couples can have sex right up until active labour. Your health care provider may advise you to avoid vaginal intercourse if you have conditions such as:

- the placenta is over the cervix (placenta previa)
- the amniotic sac ("bag of waters") has broken
- the cervix is opening early and there is a history of preterm labour before or during this pregnancy

Even if you have been advised to avoid intercourse, there are many other ways to have an intimate and loving relationship with your partner.

Will desire change in pregnancy?
Both women and men experience changes in their level of interest in sex during pregnancy. Some will find they have an increased desire for sex. Others will not.

Women may find their breasts and vulva are more sensitive and orgasms are more intense. Other women find they are too tired and nauseated, and have to struggle to adapt to their changing bodies. Some partners may not want to have sex, thinking it may harm the baby or start labour.

Tips for Having Sex

- Uncomfortable? Try positions you do not normally use, and use pillows to help support where needed. When the baby has engaged in the pelvis, the woman can try lying, crouching or kneeling with her back to her partner so he enters her from behind.
- Too tired? Try the morning, afternoon or a time when you are more rested.
- Breasts leaking? Try wearing a padded nursing bra.

Tips for Partners
Use questions to keep communication open:

- Is this position still comfortable for you at this stage?
- What can I do to make this better?
- Does this hurt?
- Are you worried about the baby?
- Would you like to try something else?

Check in frequently during sex to be sure your partner is comfortable and enjoying the experience.

Are condoms necessary?
It is possible to share sexually transmitted infections (STIs) during pregnancy, especially if safer sex practices aren't used. STIs can affect your pregnancy and your baby's health. Use a condom if:

- You or your partner has a sexually transmitted infection
- You are not in a mutually monogamous relationship
- You choose to have sex with a new partner during pregnancy

She Said

When we heard that my prenatal genetic screening test was abnormal, we panicked. It turned out that my dates were wrong and I was actually 19 weeks instead of 17 weeks, so that meant the results were normal. We sure had a rough few days though.

Avoid using condoms that contain nonoxyl-9 (N-9) as it can decrease the effectiveness of latex condoms. It may also be an irritant in the vagina, which can increase the risk of getting an STI if the condom breaks.

What about orgasm?

A mother's orgasm can trigger the uterus to contract. This can happen even with masturbation or oral sex. However, this usually does not affect the baby. Contractions normally stop after a few minutes. If you have a risk for preterm labour, you may be advised by your health care provider to avoid orgasms during your pregnancy.

Is oral sex OK?

Oral sex can be an alternative to vaginal sex. Two points to remember are:

- Don't let your partner blow air into your vagina because it can cause an air bubble in your blood stream. This is a very serious complication.
- Do not have oral sex if your partner has a cold sore (herpes virus) because the virus can infect you.

Is it ok to use vibrators or dildos during pregnancy?

It is generally safe to use a vibrator or dildo during pregnancy as long as your health care provider hasn't advised against vaginal intercourse (see "Are there some situations when we shouldn't have sex?"). Be sure to clean the vibrator or dildo before use and to not penetrate the vagina too forcefully to avoid infection and injury.

Will sex start labour?

Not unless you are ready to go into labour already or are at risk for preterm labour. If your baby is due, sex may help your body get ready for labour because:

- Semen contains a hormone called prostaglandin that may help start contractions and soften the cervix.
- Stimulation of the nipples by rubbing, rolling or sucking releases the hormone oxytocin. This can also cause the uterus to contract. You will notice these as after pains when you first start breastfeeding after birth.
- Orgasm can cause the uterus to contract.

How soon after the baby is born can we have sex?

You may have sex again when you feel ready, usually when vaginal bleeding has decreased and any tears or stitches have healed. If you had tearing or an episiotomy (a surgical cut to the perineum to allow the baby to come through more easily) it is a good idea to wait to have sex until your health care provider has examined you to confirm you have healed. If you find sex to be uncomfortable, try taking a warm bath, using a water-soluble lubricant in the vagina and/or on the penis, and plenty of time for foreplay. If sex is still uncomfortable or painful, talk to your health care provider.

Sex with your partner may not be the same as it was before pregnancy, but it is important to make time to connect intimately. It is normal to need time to "get in the mood," especially if you are feeling tired from late nights and early mornings with baby. Regular exercise can help improve your libido, your mood and energy level. Feeling well rested and lots of foreplay will help. Busy schedules might encourage sexual spontaneity and creativity with your partner. Or it might be helpful to reserve some time each week for sex or other contact like massage, snuggling, kissing or caressing. Set the mood by lighting candles, playing music and turning off your phone. It may take time and experimentation to find interest in and enjoy sex again after pregnancy. Making intimacy a priority can help to nurture your relationship and strengthen your bond, which is good for the whole family.

If you are affected by perinatal depression (PND) or anxiety you may experience decreased interest in sex. PND can also affect fathers and partners. Talk with your health care provider and/or see the Pacific Post-Partum Depression Support Society for resources and support at: ***www.postpartum.org/***

Birth Control After Pregnancy

Before you start having sex again, ensure you have effective birth control (see Family Planning on page 102) because it is possible to become pregnant very soon after delivery, even when breast feeding.

Working Safely

Talk to your health care provider about any risks at work, such as dangerous chemicals and fumes. Also talk about infections or if you get overheated at work. You may have to stop doing physical work, such as heavy lifting, during your pregnancy. Talk to your boss about job changes during this time.

Be comfortable at work. If you stand for long periods:

- shift your weight from one foot to the other often
- put one foot on a footrest
- wear comfortable, supportive shoes
- have as many breaks as possible and try to find a quiet place to lie down or at least put your feet up

If you sit for long periods:

- change your position often
- use a footrest
- get up and walk as often as possible

She Said

When we heard that my prenatal genetic screening test was abnormal, we panicked. It turned out that my dates were wrong and I was actually 19 weeks instead of 17 weeks, so that meant the results were normal. We sure had a rough few days though.

Pregnancy Risk Factors

Mid-life Pregnancies

Pregnant women over 35 are considered to be of advanced age. What are the risks of pregnancy over 35?

- Increased risk of having a baby with a disease or condition that is inherited. Because it is carried through the genes, this is known as a genetic abnormality.
- Greater chance of complications with the pregnancy. Examples are diabetes, high blood pressure and caesarean birth.
- Increased risk of miscarriage.

Age is less important than:

- a woman's health
- nutrition
- lifestyle
- medical and family history
- having good medical care

Prenatal Genetic Screening and Counselling

If you wonder about your chances of having a healthy baby, talk to your health care provider about prenatal genetic screening early in your pregnancy (see page 36 for information about Prenatal Genetic Screening). You can also talk with your health care provider about genetic counselling.

Nuchal Translucency (NT) Ultrasound

NT ultrasound is a special ultrasound done as part of the prenatal genetic screening tests offered to women depending on her age at the time of giving birth and for some women who are at risk of having a baby with a genetic abnormality. It is done around 10-14 weeks. The ultrasound looks at the tiny fluid filled space at the back of baby's neck.

If it is available in your area, you may be offered a NT ultrasound along with the blood tests. If the NT ultrasound shows an increased risk, follow up tests, like an amniocentesis, may be offered.

Although adding the NT gives more information for the screen result, the blood tests are very good screens on their own.

Amniocentesis

This diagnostic test finds genetic abnormalities and it is very accurate. You may be offered an amniocentesis if you are 40 years of age or older, have not had any screening done before your 21st week of pregnancy or your prenatal genetic screening blood tests or ultrasound showed your baby has a higher chance of having an abnormality than expected. Amniocentesis is usually done between 15 and 18 weeks. A needle is used to remove a small amount of amniotic fluid through the mother's abdomen. This test is done with ultrasound guidance. You will have to wait one to three weeks for the results. There is a small risk of miscarriage with this procedure.

Chorionic Villus Sampling (CVS)
CVS is used to detect genetic abnormalities. You may be offered CVS for several reasons, such as:

- being 40 years of age or older
- having a higher chance of your baby having a genetic abnormality (based on prenatal genetic screening blood tests, ultrasound or NT ultrasound)
- pregnant with more than one baby.

This diagnostic test can usually be done between 11 and 13 weeks of pregnancy. A small amount of tissue (chorionic villi) is removed through the vagina or the abdomen with a needle. You will usually know the results by 13 to 16 weeks.

Call your health care provider if you notice:

- bleeding or fluid loss from your vagina
- your baby's movements have stopped or really slowed down over a 12-hour period
- you are really tired
- blurred vision (can't see properly) and/or headaches
- sudden or continuing swelling of hands or face
- abdominal pain or abdomen is hard when touched

Medical Complications

Gestational Diabetes
This form of diabetes can develop during pregnancy. It is important to get tested for gestational diabetes. For most women, following a diabetic diet and getting regular physical activity can control this condition. Some women with gestational diabetes will need to manage it with insulin injections. Your health care provider, in consultation with a registered dietitian or diabetes educator, can help you manage gestational diabetes. Gestational diabetes usually goes away after birth. If you have had gestational diabetes, it is important to follow up with your health care provider after birth because it can increase your risk of getting diabetes in the future.

Vaginal Bleeding
A small amount of vaginal bleeding in the first trimester does not mean you are having a miscarriage, but vaginal bleeding in the second and third trimester should be considered serious. If you have vaginal bleeding any time in your pregnancy, stop whatever you are doing and talk to your health care provider.

What your caregiver needs to know if you have vaginal bleeding:

- What colour is it? Pink, brown or red?
- When did it start?
- What were you doing when it started?
- How much is there? For example, is it spotting the size of a quarter, or soaking your underwear?
- Did it happen after intercourse or a vaginal examination?
- Are you having cramps, pain or any other symptoms?

Placenta Previa
With placenta previa, the placenta is either partially or completely blocking the cervix. This condition may cause vaginal bleeding. If you have a placenta previa at the time of birth, a caesarean birth will be recommended.

High Blood Pressure/Pregnancy Induced Hypertension and HELLP Syndrome
High blood pressure is also known as Pregnancy-Induced Hypertension (PIH). It can lead to toxemia and pre-eclampsia. About 7 in 100 pregnant women will develop high blood pressure. If it is not treated, it can harm both you and your baby.

Signs of high blood pressure in pregnancy:

- swelling in your hands and face
- rapid weight gain
- unusual headaches that don't go away
- blurred vision
- spots or stars in front of your eyes
- pain in the upper right side of your abdomen

If you have any of these symptoms, immediately contact your health care provider or call HealthLink BC at 8-1-1.

Pain in your abdomen can be a sign of a liver disorder called HELLP syndrome, a type of severe pre-eclampsia. HELLP is rare but very serious. If you think you are experiencing symptoms of HELLP syndrome, you should seek emergency medical treatment.

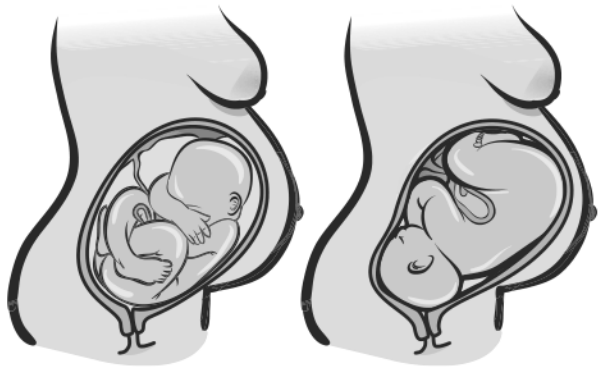
Premature Rupture of Membranes (PROM)
PROM is when the bag of water – also called amniotic sac or membranes – breaks or leaks before you are in labour or before your due date.

If your membranes break or leak:

- contact your health care provider
- note the colour and amount of the fluid
- use a sanitary pad
- do not take baths, put in a tampon or have sex

The type of treatment will depend on:

- how many weeks pregnant you are
- how much fluid was lost
- whether you develop an infection



Breech presentation

Head down presentation (97% of babies at birth)

Breech Position
By about 32 to 36 weeks, most babies will move into the birth position. This is usually head down, meaning that the largest part of the baby is born first. In the breech position, the baby's buttocks or legs are facing down and will be born first.

You may discuss the option to do external cephalic version (ECV). ECV is when the health care provider uses their hands on the outside of your belly to try to turn the baby to a head down position.

If EVC does not work, talk to your health care provider about the possibility of a breech vaginal delivery.

If none of these options are available or successful, you will need to have a caesarean birth.

Rh Factor and Blood Type
Blood tests will tell your blood type and Rh factor, but there is no way to find out your baby's blood type until after birth. If you are Rh-negative and your baby is not, you could develop antibodies – similar to having an allergic reaction – to your baby's Rh-positive blood. This can happen if your blood and your baby's blood mix at birth, during an amniocentesis test or if bleeding occurs in your pregnancy. This can cause serious illness or even death for your next baby. Because it can be prevented, it is seldom seen today. If you are Rh-negative, you will receive an injection of Rh-immune globulin (RhIg). This will prevent your body from forming antibodies and causing possible harm to your next baby.

The RhIg will be given:

- at about 28 weeks gestation
- after birth if your baby is Rh-positive
- after an amniocentesis
- if you have any vaginal bleeding

Preparing to Give Birth

Most babies are born simply and easily without any medical interventions. Your body has been carefully designed so that you likely have the ability to deliver your baby safely. You can trust in your own body to labour and give birth to your baby with the support of your health care provider and support team. Chances are your labour and birth will go smoothly and your baby will be healthy.

Health Care Support

In British Columbia, women and their partners can choose where to have their baby – in a hospital or at home.

You may be advised to have your baby in a hospital if:

- you are carrying more than one baby
- your baby is in a breech position (bottom down) or other unusual position
- you have early labour before 37 weeks, or late labour after 42 weeks of pregnancy
- you have a medical condition, such as high blood pressure, heart or kidney disease, or diabetes
- you have active genital herpes
- you have a high-risk pregnancy for any other reason

You may have special needs, such as carrying more than one baby, or you may have a medical condition, such as diabetes or heart or kidney disease. If this is the case, your health care provider may ask an obstetrician to give you medical care. An obstetrician is a health care provider trained to care for women who have special needs during their pregnancies and birth. If needed, an obstetrician may also be called during your labour and birth.

Having your baby at home?
If you choose to have a midwife, she will be with you during your labour. A second birth attendant will also be present for the birth of your baby. She will be there for a short period of time before and after your baby's birth. Until six weeks after the birth, your midwife will give information and care as you need it. This help is for you and your baby and includes breastfeeding support.

After the birth, your midwife will see you or contact you at home on a daily basis for a week. At two weeks, you will return with your baby to your midwife's office for visits until six weeks after your baby's birth. At that time your care will be transferred back to your family doctor. You will receive information from a public health nurse about services from the health office and services in your community.

To Do

It's important that both you and your partner are comfortable with the place where you choose to have your baby. When thinking about your birth wishes, ask:

- Where will we feel safe and be able to relax and focus on my labour?
- Am I in good health, without any medical problems in my pregnancy?
- Where can my health care provider attend the birth? Will my partner and I be involved in the choices about my care?

He Said

Our birth wishes were useful because I didn't have to tell everyone what we wanted. Our nurses changed at the hospital at shift time, and during their lunch breaks. They would read our birth wishes and come into the room knowing who I was and what we hoped for. It also made us think and talk about what we really wanted. I just wanted a healthy baby. My wife wanted a great experience and a healthy baby. We agreed on safety first and experience second.

Doulas for Aboriginal Families Grant Program

Aboriginal mothers and families living in BC (living either on or off reserve) are eligible for free prenatal, birthing and postpartum doula services through a grant program. The BC Association of Friendship Centres provides up to $1000 of coverage for each pregnancy in a family. For more information visit: ***www.bcaafc.com/index.php/initiatives/doula-support-program***

Having your baby in a hospital?
A nurse and your midwife – if you have one – will be with you during your labour and birth. Your doctor will usually check on you during labour and will be with you during the birth of your baby.

After you go home you will be contacted and visited as needed by a public health nurse. She will answer questions about your baby's feeding and care. She will also talk with you about your health and postpartum adjustment. She will give you information about services provided by the public health office and about other services in your community.

The public health nurse is not available after office hours and on weekends or statutory holidays. During these times, call HealthLink BC at 8-1-1, for confidential health information and advice from a registered nurse.

Personal Support

During labour and birth you can choose to have your partner and anyone else you want to be with you. Having someone with you and your partner during labour has been shown to lessen the amount of pain medication needed and to shorten labour. Before your baby's birth it is helpful to decide who you want to be with you. Many women choose their partner and other important people, such as a close friend, relative or parent to be with them. Some women also choose to have a doula. A doula provides emotional and physical support to you and your partner before, during and just after birth. A doula does not provide medical care. The cost of a doula is not covered by the Medical Services Plan.

Because your labour may be longer than you expect, it may be helpful to have more than one person with you. Then they can take short breaks if needed and you will not be alone. For more information on pregnancy care and who can help, see the BC HealthFiles at ***www.healthlinkbc.ca***.

Can my other children be at the birth?
Yes, children can usually be there. Talk to your health care provider about this ahead of time. You will need to have someone look after your child. If your child needs to leave the room, the support person can look after her. The person who looks after your child should be someone other than the people who are providing your labour support.

Your Birth Wishes

Your birth wishes are a written outline of the things you would prefer to do or have happen during your labour, birth and the days following birth (see page 61 for a sample). It can be a useful tool for you and your support team as you work together. During your prenatal visits, talk to your health care provider about the things you would like, but be aware that for a number of reasons, it is not always possible for all of your birth wishes to be followed.

There are many reasons why you may want to write out your birth wishes:

- To outline what you would prefer to happen during your labour and birth. Examples include walking as much as possible or having no medication unless asked for. Other examples are being in a semi-sitting position for the birth or touching your baby's head during the birth.
- To outline what you would prefer to have happen if your labour or birth needs medical help. For example, being awake for a caesarean birth.
- To outline the care you would prefer for your baby after birth, such as holding your baby skin-to-skin until after completing the first feeding.
- To help you and your support team work together.

Birth wishes for: Kim and Tom Lee
Due Date: October 2ND
Health care provider: Dr. Goodforyou

What we prefer for labour and birth:

- My support people will be my partner Tom, my mother Peggy, and my friend Heather. I would like them to stay with me during my labour and birth.
- We would like to walk around during my labour and spend as much time in the shower as possible.
- I would like to drink water and juice during labour. I do not want an intravenous unless it is necessary.
- My goal is to avoid drugs, except perhaps Entonox near birth, if I ask for it. I would really like your ideas and support for non-medical ways to manage pain.
- Please help Tom in his efforts to help me.
- We would like to have music playing during labour. We will bring a CD player.
- I would like to push squatting or semi-sitting when I have the urge, not with coaching.
- We would like to have a mirror in place to see the birth.
- I would rather have a small tear than an episiotomy, and neither if possible.
- After the birth, we would like to have the baby placed up on my chest, unbundled and skin-to-skin.
- Tom would like to cut the umbilical cord.
- I would like to breastfeed our baby as soon as possible after birth and continue breastfeeding on cue.
- I know babies feed frequently at night and I want to feed on cue without supplements. Help us breastfeed frequently and find ways to settle our baby.
- If I am overwhelmed with visitors, help me remind them that I need to rest.

If things do not go the way we hope they do:

- If I have a caesarean birth:
  - I would like to be awake and have Tom with me.
  - All other wishes for our baby would remain the same.

Sample birth wishes

Points to Remember

- Be flexible. Sometimes things happen that you cannot control and your wishes have to change.
- One page is easiest for everyone involved in your care to read.

PROVIDING SUPPORT

I promise that:

- This birth will be the priority for my time and energy.
- I will make sure everyone at work knows I may have to leave on short notice.
- I will have gas in the car or have other transportation arranged ahead of time.
- I will not plan important travel or events for two weeks before and two weeks after the due date.
- I can be reached at any time.
- I will have child care arranged for any children who will not be attending the birth.
- I will have arranged child care for any children who will be attending the birth.
- I will be kind, supportive, encouraging and helpful.

Packing for the Hospital

Have your things prepared before you go into labour. Pack a small bag because you may be in hospital for only 24 to 36 hours and personal storage space is limited. Place the things you will need for labour at the top of your bag or in a separate bag. Here are some ideas for what to take to the hospital:

Labour Kit:

- *Baby's Best Chance: Parents' Handbook of Pregnancy and Baby Care* and *Pregnancy Passport*
- lip balm or lip gloss
- massage oil or talcum powder
- snacks and drinks for you and the support team
- cell phone, camera, personal music device
- a picture, a design, a figure or anything you find pleasant to look at
- list of friends' and family's telephone numbers
- slippers
- dental care products
- hair care products
- skin care products
- other personal items

Personal Items:

To be brought in after the baby is born. (Note: your clothes should be loose fitting and comfortable.)

- washable dressing gown (front-opening for breastfeeding)
- two or three nightgowns or pairs of pajamas (front-opening for breastfeeding)
- nursing bra and pads, if desired
- at least three pairs of underwear
- socks
- comfortable bedroom slippers
- large sanitary pads
- clothes to wear home

For the Baby:

- Canadian Motor Vehicle Safety Standards (CMVSS) approved infant seat
- undershirt and sleepers
- diapers, pins and plastic pants or disposable diapers (newborn size)
- sweater, hat and booties
- shawl or blanket, depending on the weather
- soft carrier or sling to use to help calm your baby

For the Partner:

- sleeping bag or bedding and pillows for partner (hospitals usually only supply the sleeping mat)
- sweat pants and top suitable for sleeping
- change of clothes
- personal items, like a toothbrush
- partner's swimsuit, so they can get into the shower with you

Preparing for Labour

What is the difference between pre-labour and true labour?

It is easy to confuse pre-labour with true labour. Contractions may be uncomfortable in both true and pre-labour. Although both may be uncomfortable, there are clear differences between them. If you are less than 37 completed weeks in your pregnancy, you may be in preterm labour (see page 85).

What should we do if we're not sure of pre-labour or labour?

- If it's night, try to sleep. You want to be well rested for childbirth. In true labour you may not be able to sleep but will at least rest. If you fall asleep, it is most likely pre-labour.
- Take a shower. The contractions in pre-labour will often become less frequent and shorter. In true labour the contractions will continue no matter what you are doing.
- Distract yourself. Watch a movie, walk in the garden, play cards. If you are in true labour, the contractions will demand your attention. If it's pre-labour, you may be able to carry on with your usual routines.

Pre-labour	True Labour
• Contractions are at irregular intervals, for example, every 5 to 15 minutes. • Contraction length varies, for example, lasting 20 seconds to 90 seconds. • Although they may be painful, the strength of contractions remains the same or may lessen. • Contractions are often felt in the lower abdomen. • You may find that contractions are most uncomfortable when you are moving and lessen when you are resting. • The cervix usually remains closed. • There is usually no "show" (blood-tinged mucus).	• Contractions occur at more regular intervals, for example, 5 to 10 minutes apart. • The length of contractions usually increases, for example, lasting 30 to 60 seconds. • Intensity of contractions gradually increases, becoming progressively more painful. • Contractions can be felt in the abdomen, across the lower back and sometimes in the thighs • Contractions do not decrease when you are resting, but continue regardless of what you are doing. • The cervix thins and shortens (effaces) and opens (dilates). • There may be "show" and/or leaking from your bag of waters.

He Said

The start of Michelle's labour was pretty confusing. She was awake all Sunday night with contractions that kept her awake but then fell asleep again in the morning and everything stopped. The contractions started up again and she walked to try to keep it going. All day it was off and on. She was awake most of Monday night with contractions and a little bit of show. She sent me to bed, thank goodness. Again it stopped when she had breakfast and a bath. On Tuesday, we went to the hospital exhausted, and our son was born late that night.

PROVIDING SUPPORT

- Practice the relaxation and breathing techniques with the mother throughout pregnancy. You may be her main source of ideas and support during labour.
- Make practice a fun and relaxing time for both of you.
- Attend prenatal classes with the mother to learn and practice techniques with others.
- Remind the mother to find her focal point at the beginning of the practice contraction (see Focal Point Concentration).
- Signal the beginning and ending of the practice con tractions.
- Use the exercises to relax. You may need them during labour – and your child's early years – to stay focused and calm.
- Have a shower together. The water is relaxing and may help with the pain.

When should we call our health care provider or hospital?

- When your contractions are regular and painful, last 30 to 60 seconds and happen at 5-minute intervals.
- If your bag of waters breaks.
- If you have vaginal bleeding or show.
- If you are unsure and have concerns.
- If your health care provider has advised you to call early.
- If your baby stops moving or moves less than usual.
- If you're not sure and can't reach your health care provider by phone, call HealthLink BC at 8-1-1. That way you can speak with a registered nurse who can give you helpful information and advice when you need it most.

Relaxing for Labour

Learning to relax can help with childbirth and the busy time after your baby is born. Remember; try to relax, stay positive, breathe through your contractions and rest between them.

Here are some relaxation and breathing techniques you can use. Practice all the techniques well before you go into labour, so you know which will be the most helpful to you when labour begins. If possible, practice the techniques with the person who will be with you during the birth.

Focal Point Concentration
Being able to focus on something other than pain can help you relax. This is true even when you are having a contraction. During labour you may want to look at something or someone and try to clear your mind.

Visualization
Picture something or some place that makes you feel relaxed and safe.

Water Therapy
A shower and bath can be very comforting in any stage of labour. Stand or sit in the shower and direct the water to where it feels comfortable or soak in a tub. Try to postpone a bath until you are in active labour, unless you are tired. Baths may slow your contractions temporarily when taken in early labour. Later in labour, having a bath is very helpful because it can help decrease the pain and increase your labour progress. Remember to drink lots of fluids when using the shower or tub.

Massage
Use smooth, rhythmic stroking or rubbing of the face, neck, shoulders, back, thighs, feet or hands. Do it yourself or have someone give you a massage.

There are three types of massage:

- light, rhythmic stroking of your abdomen
- squeezing and releasing
- pressing with the hand on the lower back to relieve backache

Complete Relaxation

You can do this exercise alone or with your partner:

- Tense and relax each part of your body in turn, using moderate tension, for a period of three to five seconds. Tensing too strongly can cause muscle cramps.
- Breathe in as you tense and out as you relax. Focus on how good it feels each time you relax.
- Work from your toes to the top of your head.

Breathing for Labour

During labour, breathing techniques or variations of them can be used to:

- help with relaxation
- focus your attention during a contraction
- maintain a good supply of oxygen to yourself and your baby
- help relieve pain

Practice a variety of breathing techniques before labour. This will help you to use and change them as needed during labour. They will help you be calm and relaxed.

When you cannot remain relaxed or walk or talk during a contraction, you may wish to use slow breathing for as long as it is helpful. Then you may wish to change to light breathing. You may find that you use both or only one of these breathing techniques. You will also adapt them to suit your needs.

Slow Breathing

- Breathe in slowly through your nose, or through your mouth if your nose is congested.
- Breathe out through your mouth, letting all the air out like a relaxing sigh.
- Breathe about half your normal rate.
- Try to keep your shoulders dropped and relaxed.

Light Breathing in Labour

- Let your contractions guide you in the rate and depth of your breathing.
- Breathe in and out through an open mouth. Breaths will be shallower than slow breathing.
- Breaths will be about twice your normal rate.
- When a contraction starts to decrease, return to your slow breathing.
- When the contraction ends, take a deep breath and end with a relaxing sigh.
- Try to completely relax, change your position or have a sip of fluid as desired.

Short Breath Holding

- During the second stage of labour, you may feel the impulse to push down with each contraction.
- The number of pushing (bearing down) efforts increases as the baby moves down the birth canal.
- You may push down with some short breath holding (usually lasts less than 6 seconds).
- If you have an epidural, you may have a delayed, lessened or loss of the urge to push.

Panting

During the second stage, you may be asked to use panting breaths. This helps you control the urge to push and allows the baby's head to come out slowly and gently.

- Lift your chin.
- Have your mouth open slightly.
- Breathe in and out lightly and quickly (like a dog panting).

Points to Remember

Labour is like getting ready for a marathon. You need to be prepared. If you have practiced comfort positions, relaxation, breathing techniques and other rituals, you will be able to choose the ones you find helpful. While in labour you will need to pace yourself and rest whenever possible. Drink fluids to keep hydrated. Use comfort positions as well as breathing techniques to help with relaxation.

Comfort Positions during Labour

For comfort, walk, move and change your position as often as you can. Try to stay upright, relaxed and moving as much as possible to help move your baby down in your pelvis. These positions may help you to manage pain and avoid medications. Your partner can stay involved and supportive by helping you move and change positions often.

Walking (1st Stage of Labour)

- Being upright moves the baby's head down in your pelvis. It also helps to relieve backache.

Standing (1st Stage of Labour)

- Rock or sway the hips and lean forward while standing.
- Leaning forward and resting on something while standing can be restful and relieve backache.
- To relieve backache, try counter pressure. Counter pressure is firm, constant pressure applied to the back where pain is localized. This can be from a partner's hand or leaning against a firm object, such as a rolled towel, tennis ball or wall.

Sitting Upright (1st and 2nd Stages of Labour)

- Sitting on a toilet may help relax your bottom for pushing.
- Can be a restful change from standing and can be used if you have electronic fetal monitoring.
- If your hemorrhoids and backache are more painful in this position, stand up and move around.

Semi-sitting (1st and 2nd Stages of Labour)

- Semi-sitting can be a restful position. You may be able to nap between contractions.
- If you lean forward and rest on your partner, it is easier to have your back rubbed.

Birthing Ball (1st and 2nd Stages of Labour)

- Have someone help you stay balanced. Don't use a birthing ball if you are slippery with oils or lotions.
- Balls are useful to lean on when you are in a kneeling position or to sit on if you have someone to help you keep your balance.

Kneeling (1st and 2nd Stages of Labour)

- Doing the pelvic tilt can take pressure off hemorrhoids and relieve backache (see page 48 to see how to do the pelvic tilt).
- To lessen the strain on your hands and wrists, lean forward on a chair or bed.
- While you kneel and lean on a support, have someone give you a massage or use counter pressure. Counter pressure is firm, constant pressure applied to the lower back where pain is localized. A partner's hand or a firm object, such as a tennis ball, can be used to apply pressure.

Side-lying (1st and 2nd Stages of Labour)

- Alternate between lying on your side and walking during the first stage of labour.
- This position is comfortable during birth if your upper leg is well supported so you can relax between contractions.
- It is a safe position if you have taken medication for pain or have an epidural.
- It takes the pressure off hemorrhoids.

Squatting (1st and 2nd Stages of Labour)

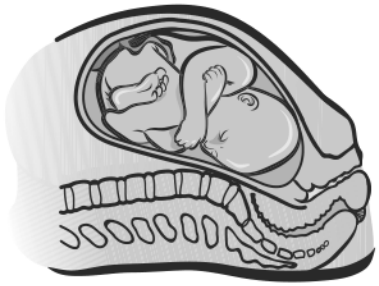
- This position takes advantage of gravity and widens the pelvis to help the baby come down and out.
- It makes your legs tired, so change positions between contractions.
- Your partner can wrap his arms around you, either from the front or back. You can lean on your partner while squatting.

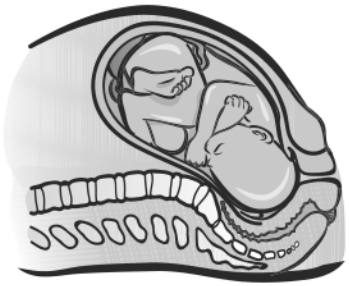
1ST stage labour

Giving Birth

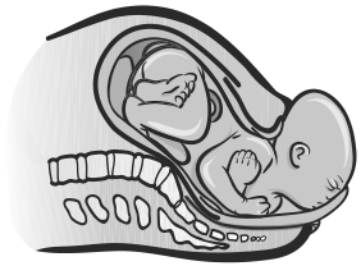
Most women want to know how long their labour will be. A normal labour can be anywhere from three hours or less to days. The average length of time for a woman giving birth for the first time is 10 to 14 hours once contractions are regular.

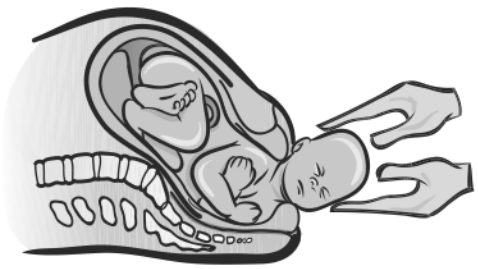
There are four stages of labour and delivery, or birth. The first stage is labour – this is when your cervix is softening and thinning (effacement), and opening (dilating). Your baby's head moves down in your pelvis. The second stage is pushing and the birth of your baby. Your baby can be placed on your chest, skin-to-skin. The third stage is delivery of the placenta. The fourth stage is the first 2–3 hours after birth. Your baby may breastfeed or nuzzle your breast.





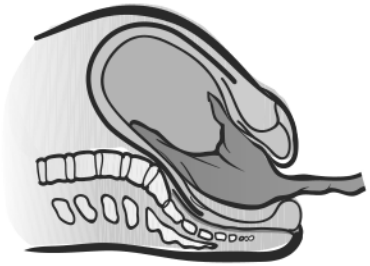
1st Stage: Effacement and Dilation





2nd Stage: Birth

Skin-to-skin Contact



3rd Stage: Placenta Expulsion

Stages of Labour

What is Fetal Monitoring?

During active labour, your baby's heart rate will be listened to every 15 to 30 minutes. This will tell your health care provider about the effects of the contractions on the baby's heart rate. This is done using a hand-held stethoscope called a Doppler.

In the second stage, your baby's heart will be listened to every five minutes or after each contraction. In some situations, there may be a need to monitor your baby's heart with a machine called an electronic fetal monitor.

There are two types of electronic fetal monitoring:

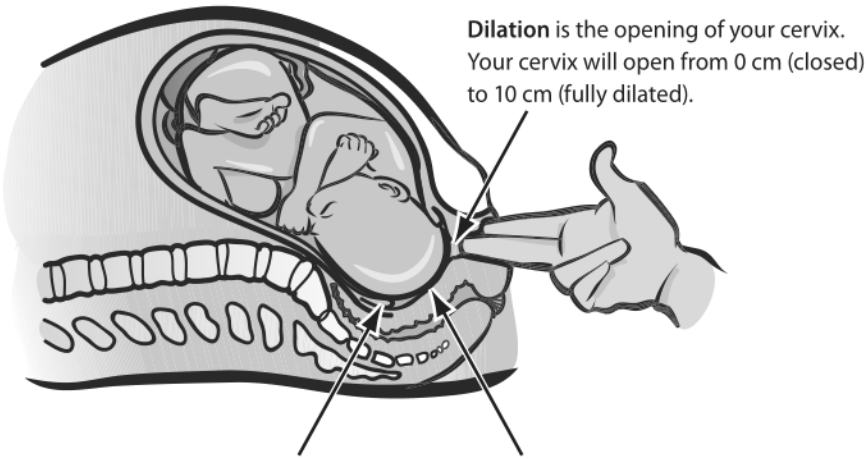
- External: two sensors will be placed around your abdomen.
- Internal: a clip will be placed through the cervix onto the head of your baby.

First Stage of Labour

The first stage is the longest stage of labour and is focused on opening the cervix to allow your baby to pass during birth.

The first stage has three phases: early, active and transition. It begins with contractions that continue to increase in length and intensity, and ends when the cervix is fully opened. The early or latent phase is the very early part, when the cervix opens to 3 to 4 centimetres. During the active phase, your cervix opens from about 4 centimetres to 8 or 9 centimetres. In the transition phase, the cervix opens the last 1 to 2 centimetres.

The first stage can last from a few hours to days. The length of this stage will depend on how strong and often your contractions are and the position of your baby.



Checking the amount of dilation during the 1st stage of labour

1ST stage labour

Early First Stage of Labour

What is happening?	What might you be feeling?	What can you and your support person do?
• Your cervix is opening to about 3–4 centimetres and is softening. • The baby's head is coming down in your pelvis. • You may have some diarrhea. • You may notice "show" (slightly pink, mucusy vaginal discharge). The mucus plug normally sits in the cervix. As the cervix opens, the plug falls out. • Your bag of waters (membranes) may leak or rupture. This can happen any time before or during labour. You may have a small trickle or a big gush.	• Backache and pelvic pressure, as if your period is starting. Some women will feel discomfort in their thighs, hips and abdomen. • Contractions may feel like mild cramps and may last about 20–45 seconds. • Contractions may not be regular. They may start every 10–20 minutes, or you may not be aware of them at first.	• Carry on your usual activities as long as possible. Go for a walk, try to sleep or rest, make meals. • Breathe in a normal manner until you can no longer talk or walk through contractions, then start with slow breathing as needed. • Eat a light meal and remember to drink fluids. • Take a shower if someone is nearby. Try to postpone a bath until you are in active labour, unless you are tired. Baths may slow your contractions temporarily when taken in early labour. Later in labour, having a bath is very helpful because it can help decrease the pain and increase your labour progress. Remember to drink lots of fluids when using the shower or tub. • If your membranes rupture (bag of water breaks or leaks), put on a sanitary pad and call your health care provider. • If your membranes rupture and the amniotic fluid is green go to the hospital. Green amniotic fluid means that your baby has had a bowel movement (meconium). This may happen for no reason. It may also happen if your baby has been stressed or is in a breech position.

Call your health care provider or hospital when:

- Your contractions are regular and uncomfortable, usually about 3–5 minutes apart and lasting 45–60 seconds.
- Your bag of water breaks or leaks (membranes rupture).
- You have vaginal bleeding, or "show" (pink tinged mucous)
- You are uncomfortable staying at home.
- You have been advised to call for other reasons.

Active First Stage of Labour

What is happening?	What might you be feeling?	What can you and your support person do?
• Contractions may be moderate in strength. They may come every 3–5 minutes and last 45–60 seconds. • "Show" may become heavy, dark and bloody. • Your cervix continues to open. • Your baby's head continues to move down in your pelvis. • Your health care provider will listen to your baby's heartbeat every 15–30 minutes or more often if necessary.	• Serious, quiet and thinking mostly about yourself and your labour. • In need of quiet support. • Wondering if you can cope with contractions. • Contractions will be stronger and more uncomfortable.	• Use positions that are the most comfortable. Try to keep moving between contractions. If you are tired, rest between contractions. • Use relaxation techniques, such as visualization, focal points, massage, touch relaxation or Transcutaneous Electronic Nerve Stimulation (TENS). For more information about relaxation and pain relief see pages 66–69 and 80. • Continue slow and light breathing or using breathing techniques that you like. • Concentrate on one contraction at a time. • Sip fluids between contractions or suck on ice chips. • Pee frequently. • Have a warm shower while sitting on a chair or leaning on your partner.

1ST stage labour

1ST stage labour

PROVIDING SUPPORT

- Tell her she is almost done and everything is going well.
- Wipe her forehead with cool cloths.
- Offer small sips of fluids between contractions.
- Look her in the eyes and help her to focus during contractions.

Transition Stage of Labour

What is happening?	What might you be feeling?	What can you and your support person do?
• Your cervix is now almost fully dilated. • The baby moves down further into your pelvis. This puts pressure on your bottom. • Contractions may be strong. They may come every 2–3 minutes and last 60 seconds. • Your health care provider will listen to your baby's heartbeat every 15–30 minutes.	• Moments of panic and confusion. • More and more irritable, sensitive and having trouble saying what you need. • Some nausea and vomiting. • Leg cramps. • Trembling of arms and legs. • Hot or cold flashes. • Constant discomfort with no relief between contractions. • Sweating on your face. • A strong urge to push with contractions.	• You need a lot of support during transition. • Picture your cervix and body opening up to let your baby out. • Tell someone if you have the urge to push. • If you have the urge to push and you are not fully dilated (10 centimetres) use panting until you are fully dilated.

Second Stage of Labour

During the second stage of labour you will push your baby out. Second stage begins with full dilation and ends with the birth of your baby. This stage can last from a few minutes to two to three hours.

What is happening?	What might you be feeling?	What can you and your support person do?
• You will have a vaginal examination to be sure you are fully dilated. If you push too soon the cervix can become swollen and difficult to open further. • Once your cervix is fully open, your baby is pushed out. • If your bag of waters has not broken already it may be broken to help you along. • Your baby's head pushes against your perineum. • Your baby's heartbeat will be checked every 5 minutes or after every contraction. • Your baby's head is usually facing your spine. • As your baby's head first emerges, it will slip back into your vagina between contractions. • Your vagina stretches to allow your baby to pass through: » your perineum may not tear at all » you may have a small tear of the perineum » you may have an episiotomy (cut in the perineum) to allow more room for your baby's head	• Contractions will be powerful and pushing the baby out. They will come about every 2–3 minutes and last 60–90 seconds. • You may feel a strong urge to push. • You may go through a short time with no contractions and no urge to push. • You will have a splitting and burning feeling on your perineum or vagina as they stretch. • Surprised, overwhelmed or frightened by the pushing sensation.	• Breathe deeply. • Relax your bottom and go with the urge to push. • If you feel better grunting with contractions and giving small pushes go with this urge. • Use the same muscles to push that you would use for a bowel movement. • Drop your chin towards your chest and relax your tongue. • Change positions as needed for your comfort and to assist your baby pass through the birth canal (try semi-sitting, squatting, kneeling or side-lying). Support people can help hold your legs, or support you as you squat. • Continue with relaxation techniques between contractions. • Listen to your body and use the breathing techniques you practiced. • If you are asked to stop pushing, use the panting technique.

2ND stage labour

2ND stage labour

Second Stage of Labour (continued)

What is happening?	What might you be feeling?	What can you and your support person do?
• As your baby's head crowns (the largest part of the head is birthing) you may be asked to stop pushing. This allows the head to come out slowly and helps prevent tears. • When your baby's head is out, it is usually face down but will turn to one side. Mucus in the baby's nose and mouth may be suctioned out. • With the next contraction your baby's shoulders and body will come out.	• Very tired but feeling a burst of energy. • Anxious and hesitant to push due to pressure on your bottom. • Like you are having a bowel movement (you may pass some stool as you push). • Full of emotion at the birth of your baby.	• After the baby's head is born, you may be asked again to stop pushing for a moment so your health care provider can check if the umbilical cord is around your baby's neck. Use the panting technique. • You may be able to touch and stroke your baby's head before the body is born. • Look at your baby being born, either by looking down or having a mirror in place. • Your baby will be placed on your chest, skin-to-skin.

Third Stage of Labour

During the third stage, the uterus contracts. The placenta completes its separation from the wall of the uterus and is birthed. This stage can take 5 to 30 minutes or longer.

What is happening?	What might you be feeling?	What can you and your support person do?
• The umbilical cord will be cut and clamped after the baby is born. • Just after birth a health care provider will take an Apgar score. This checks your baby's overall health. • The placenta separates from the wall of the uterus and is pushed out the vagina. • The uterus rises in the abdomen and takes on a grapefruit shape and size. • A gush of blood often comes with or before the placenta comes out. • You may be given a shot to stimulate contractions of the uterus and stop you from bleeding too much. • If you have had a tear or episiotomy, the area may be frozen and stitched.	• You may have cramps as the placenta comes out. • You may be asked to push out the placenta. • You may feel relieved, grateful and filled with joy. Some mothers don't have any particular feelings at this time. • Exhausted. • Shaky and cold. • Hungry and thirsty. • Focused on the baby and wanting to know that your baby is normal.	• Cuddle with your baby on your chest. • If your partner wants to cut the umbilical cord, he or she will be given scissors and told where to cut. • Bring your baby to your breast to begin breastfeeding. Some will suck right away; others will take a little while. • Warm blankets will be put over you and your baby to keep your baby warm. • If asked to, give small pushes to push out the placenta. • Talk to your baby. He already knows the sound of your voice.

3RD stage labour

He Said

It was amazing when our son was born. He was put right up onto my wife's chest, all slippery and wet. I had to hold onto him so he didn't slide off. Even before the placenta was out he was rooting round for the nipple. So my wife moved him over a bit and he latched on right away. I think the breastfeeding really helped because as soon as he was nursing, my wife had cramps and the placenta was delivered.

4TH stage labour

He Said

The birth of our baby was the most amazing thing we have ever experienced. It was hard work for my wife but she was so strong and in control. I was in awe of her. The moment we first held our daughter will be forever etched in my heart. I'm a pretty tough guy but it brings tears to my eyes just thinking of it.

Fourth Stage of Labour

The fourth stage is the first two or three hours after birth.

What is happening?	What might you be feeling?	What can you and your support person do?
• Your body is recovering from the hard work of labour and birth. • Your baby may breastfeed or nuzzle your breast. See page 108. • You have lost blood during the birth and you may be very tired. • Your body may begin to shake. • Difficulty peeing due to swelling.	• Tremors and chills. • Discomfort from after pains, episiotomy or tears, and hemorrhoids. • Dizzy or faint if you try to get up.	• Ask for more warm blankets as you need them. • Place an ice pack (wrapped in a towel) between your legs to decrease swelling in your perineal area. • Drink fluids and have a light meal if you are hungry. • Have help before you get up. • Continue breastfeeding and cuddling your baby. • Keep your baby skin-to-skin until your baby finishes her first feeding and then for as long as you wish. Skin-to-skin is the best way to help your baby learn to breastfeed and keep your baby warm, calm and stable. Partners can help keep baby warm and stable skin-to-skin if you need to get up. • There is generally no need to bathe your baby right after birth. Waiting at least 12–24 hours before bathing will help protect your baby's skin and help keep your baby's temperature stable. Your nurse or midwife may help you with the first bath.

PROVIDING SUPPORT

- Listen to the mother. She can tell you what she needs.
- During labour, actively support her. Make eye contact, say "Breathe with me," and do the breathing yourself so she can follow you. At the end of contractions say, "Take a deep breath and relax."
- Help her to stay relaxed by touching, massaging, talking, breathing with her and reminding her to move around. Check for relaxation by touching her arms, shoulders and legs.
- When a contraction starts, focus on her. If people are trying to talk to her, let them know she is having a contraction. If you find it helpful, you can time the contractions. That way you can tell her when a contraction is at its peak and when it should be easing off.
- When a contraction is over, give her sips of fluids and help her to move and relax.
- Talk and encourage her. Give verbal encouragement by saying, "You're doing great. The contraction is almost over." When the contraction ends, say, "Take a deep breath and relax. It's over."
- If the she tells you something is not working for her, do not try to force her to follow you. Move onto another relaxation or breathing technique that may be more effective.
- Tell her she is doing well. Make eye contact and smile.
- Tell her not to worry about any noises she makes many women find making noise helps them get through the pain of their contractions.
- Get ice chips, wipe her forehead, walk with her, rub her back and help her with comfort positions.
- Have her eyeglasses with you so she can watch her baby being born.
- Stay with her.
- Try to stay calm.
- Take care of yourself – bring snacks and something to drink.
- Talk to your health care provider and members of your medical and support team about your birth wishes.
- Ask questions if you have any concerns or don't understand something.
- Any time the mother needs help to cope, you may need to take charge for a while. To take charge:
  - » Move in close and have your face near hers.
  - » Be calm and say encouraging things.
  - » Hold her shoulders or head in your hands. Hug her tightly but gently.
  - » Tell her to open her eyes and look at you. Make eye contact.
  - » Encourage her with every breath and say things like "Breathe with me, stay with it, look at me, good for you, it's going away now." Use a calm and confident tone.
  - » Talk with her between contractions and ask if you are helping. You might say, "Let's breathe together. You are doing great. Let's get through this part together. Let me help you more this time."
  - » Don't give up when she says she can't go on. Tell her it is hard now but that you can do it together, this is normal, and think of the baby to come. It is OK to ask for help.
  - » Stay with the mother during labour.
  - » If you are unsure of what to do, ask the health care provider to give you some ideas.

Medical Procedures that May Be Needed to Assist Labour and Birth

Sometimes procedures may be needed for you or your baby during birth. The most common procedures are outlined below. You may wish to discuss these with your health care provider ahead of time.

Induction

Induction of labour is used to start labour before it begins on its own. It can be done by:

- breaking the water bag around the baby
- putting a gel into the vagina
- giving medication by IV to start contractions

Induction may be considered if:

- the mother is past 41 weeks of pregnancy. Talk to your health care provider about the risks and benefits of being induced or waiting for labour to start on its own.
- the mother has an illness, such as heart disease, diabetes or high blood pressure
- the baby is not growing well

Episiotomy

An episiotomy is an incision (cut) made in the area between the vagina and rectum. This cut enlarges the space for the baby to pass through the vaginal opening. Freezing is usually given first. After the placenta comes out, the cut is sewn shut with self-dissolving stitches. Episiotomy is not practiced routinely.

Forceps

Forceps are instruments that are placed around the baby's head and used to gently help pull the baby out. They can leave red marks or slight bruises on the baby's head, but these soon fade. An episiotomy may be done before forceps are used.

Forceps are used if:

- the mother has a prolonged pushing stage of labour
- the mother is exhausted and unable to push effectively
- the baby's heart rate slows showing signs of stress
- the position of the baby's head needs to be changed

Vacuum Extraction

A soft plastic vacuum cup is sometimes used to assist with birth. It is put on the baby's head and suction can then be used to help pull the baby out. The cup can leave a bruise and swelling on the baby's head, but this will fade a few days after birth.

A vacuum is used if:

- the mother has a prolonged pushing stage of labour
- the mother is exhausted and unable to push effectively
- the baby's heart rate slows showing signs of stress

Pain Relief Options

Labour pain is different for every woman. Many women cope with pain with the help of:

- a supportive person
- breathing techniques
- relaxation
- warm baths
- showers
- changing positions
- massage and/or visualization
- ice packs
- acupuncture and/or acupressure
- hypnosis

Pharmacological Options

Sometimes women in labour need additional pain relief. This table outlines some options for pain relief medications during labour and birth.

Pain relief option	Benefits	Side effects
Nitrous Oxide and Oxygen (Entonox) Commonly known as *laughing gas*.	• Can be used right up until birth with no effect on the baby. • The woman in labour holds the face mask and breathes in the amount she requires.	• Only recommended for 2–3 hours. • May make some women feel dizzy and have temporary tingling or numbness in their face or hands. • Will only dull the pain, but will not take the pain away.
Narcotic Pain Medications (such as Morphine, Fentanyl)	• Can be given by a health care provider by one of two routes: » Intramuscularly (IM) – the medication is injected directly into a muscle. » Intravenously (IV) – the medication is injected directly into a vein. • Most given by IM will work within 20–30 minutes and will last 2–4 hours. • Most given by IV will work within 2–3 minutes and will last 1–2 hours. • These time frames may vary depending on the medication. • In general, narcotic medications will make most women feel sleepy and relaxed.	• May make the baby sleepy. If a narcotic is given near birth, it may affect the ability of some babies to breathe and breastfeed. • Usually given before the late part of the first stage of labour due to its effect on the baby at birth. This way, it can wear off before the baby's birth. • May make some women feel drowsy, dizzy or nauseated. • Will only dull the pain, but will not take the pain away.

Pain relief option	Benefits	Side effects
Epidural/Spinal Local anaesthetic is injected into the space around the spinal cord, providing pain relief from the waist down. During a caesarean birth, pain relief is from the breastbone down.	• Used at any time during labour. • Provides the most effective pain relief. • Women in labour can have more medication if needed. • May be used for a caesarean birth so women can be awake during the birth. • Women generally do not feel drowsy or groggy.	• Women may have to stay in bed as they will not have good control of their legs. • Women may shiver at first and may itch from the medication. • Blood pressure will be checked frequently. • Most women will also need to have an intravenous (IV) during an epidural. • Women usually have a fetal monitor during an epidural, which may restrict movement. • Women may have a catheter inserted into their bladder to drain urine. • Women may not feel the urge to push or be able to push well. • Increased risk of forceps delivery. • Pain relief may not be complete. • Some women have a headache after an epidural.
Pudendal Block Local anaesthetic is injected to numb the nerves around the vagina. This blocks pain in the vagina, vulva and perineum.	• May be given at the time of birth.	• May affect the ability of some babies to breastfeed immediately after birth.
General Anaesthetic Completely asleep during caesarean and birth.	• Is used when an epidural or spinal is not possible or unsafe to give. • Is used when there is not enough time to place an epidural. • Is used in an emergency situation.	• A woman may react to anaesthesia or other medications during the surgery. • This can be dangerous to her health. • An example of a reaction is her blood pressure dropping quickly. • Her throat may feel dry and sore after the anaesthetic. This is due to the breathing tube placed in her windpipe while she's asleep. • She may feel nauseated and vomit after surgery.

Caesarean Birth

A caesarean section (or C-section) is the birth of a baby through a cut in your abdomen and uterus (surgical delivery). A vaginal delivery is the safest birth option for most women and their babies, however, your health care provider may recommend a caesarean birth in some situations as the safest option for you or your baby. A caesarean can be done before labour (elective) or during labour (emergency), depending on the reason for doing it.

When might you have a caesarean birth?

- Your cervix does not open completely so labour stops progressing.
- Your baby is too big or not positioned in a way that will fit through your pelvis.
- Your baby is in distress (not tolerating labour well).
- You are having more than one baby (twins or triplets) and your babies are in difficult positions for delivery.
- Your baby is in a breech (bottom or feet first) or transverse (sideways) position.
- You have a serious medical condition.
- You have active herpes lesions on your genitals that make vaginal birth unsafe for your baby.
- If you have had a previous caesarean birth with a vertical incision on your uterus.
- If the type of incision on your uterus from a previous caesarean birth is unknown.

Vaginal birth versus caesarean birth

If a caesarean birth is not medically indicated, a vaginal birth is the safest option for you and your baby. Caesarean births have increased risks to both you and your baby.

With a vaginal birth, mothers:

- have less chance of infection
- avoid surgical pain, have a shorter recovery time and are less likely to experience ongoing pain
- can have more support people at the birth
- have a shorter a hospital stay
- have less risk of excessive bleeding, hysterectomy (removal of the uterus) or damage to organs or tissue (these events are rare, but are more likely to occur with caesarean)
- have less risk of death (this is very rate, but more likely to occur with caesarean)

With a vaginal birth, babies have:

- less chance of breathing difficulties
- less chance of being admitted to the special care nursery which separates you from your baby
- less chance of having their skin cut – caesarean is a surgery and this can occur

If you're afraid of a long and painful labour, talk to your health care provider. You may want to consider having additional support during your labour and birth. This could be a doula, who can provide support to both you and your partner. Pain relief is available during labour if you need it.

What are the choices for an anaesthetic?

- Most people have an epidural or spinal anaesthesia. When you have these, you are awake and alert during the surgery and birth.
- Most hospitals support your partner to be in the operating room if you are awake.
- If you have had an epidural or spinal anaesthetic, you will be able to breastfeed and cuddle your baby skin-to-skin soon after birth. Ideally, you or your partner will be able to hold your baby skin-to-skin immediately after delivery in the operating room and/or the recovery room.
- If you have a general anaesthetic, you will be completely asleep during the surgery and birth. Your partner will not be in the operating room but can usually hold the baby very soon after birth. If possible, it is important that your partner hold your baby skin to skin as soon as possible after delivery.

Points to Remember

You may have a lot of conflicting emotions following a caesarean birth. Some parents feel distressed about not having a vaginal birth. Others are relieved they have a healthy baby. The best way to deal with these feelings is to talk openly about them with someone you trust.

To Do

In your birth wishes, include your thoughts and feelings about your choices related to caesarean births. You may need to talk to your health care provider about what you would like.

What happens after a caesarean birth?

- Pain medication will help you move around more easily. You will probably need medication for several days.
- Ask for it when you need it. Avoid medications with codeine (see page 117).
- You will have an IV in your arm until you are drinking well.
- You will have a catheter (a tube into your bladder to take away the urine) until you are able to get up to the bathroom (usually within 24 hours).
- You will need to have help the first few times you get up.
- The surgery will not usually affect breastfeeding, however in some cases there may be a slight delay in milk supply.
- If you had staples, they will need to be removed.
- If you have sutures (stitches), they will usually dissolve by themselves. If you have small adhesive strips across the incision and they do not fall off within a week, carefully peel them off.
- You may have a shower or bath as desired.
- You will need help at home. If you try to return to your usual activities too soon, you will slow your recovery. Most people have help at home for a minimum of 1–2 weeks after a caesarean birth. Healing may take six weeks or longer.
- You need time to heal from major surgery as well as the birth of your baby.
- Don't lift anything that weighs more than your newborn baby.
- If you have toddlers, sit down and have them climb up on your lap.
- You can resume driving when you feel well enough, are able to twist your body to look to each side, and can quickly use the foot pedals in an emergency situation – similar to before you were pregnant.
- Eating healthy foods and drinking lots of fluids will help you heal.

Before you leave the hospital, your care provider should review with you the reason for your caesarean and whether you can safely consider the option of vaginal birth (VBAC) for your next baby.

What about breastfeeding after a caesarean birth?
You will need to experiment to find the most comfortable way to feed your baby. If you hold the baby across your abdomen, put a small cushion under your baby to protect your incision and keep you comfortable. Some women find lying on their side works the best. The side-lying position works better if you have someone to help latch your baby. The football position may also work (see page 111).

What about future births after a caesarean?
Most women who have had a caesarean birth can have a vaginal birth for their next pregnancy.
You should plan to have a vaginal birth if:

- your pregnancy is normal
- the reason you had a caesarean before no longer applies
- the incision you had before is across your uterus, not up and down
- your hospital has timely access to do a caesarean
- birth if needed

Your care provider will review with you what your specific risks are. The worry with a vaginal birth after a caesarean is that the scar on the uterus may pull apart during labour and cause bleeding. This is a rare complication but your health care provider/team will watch you and your baby closely for any signs of this happening such as changes to your baby's heart rate pattern, constant abdominal pain during labour, heavy vaginal bleeding, dizziness or faintness. The risk of your uterus tearing because of the scar from your previous caesarean is between 2 and 4 per thousand. During labour both you and your baby will be monitored closely so that any complications can be acted on quickly.

If you want to learn more about vaginal births after a caesarean (VBAC), go to ***www.healthlinkbc.ca***. Search for "Caesarean Birth."

Special Birth Issues

Preterm Labour

Preterm labour is labour that begins before 37 completed weeks of pregnancy. Preterm labour can happen to anyone and it is often not known why. Preterm labour may result in your baby being born too soon.

Preterm babies are at higher risk of:

- breathing difficulties
- sucking and swallowing problems
- jaundice (yellowish skin)
- infections
- bruising and bleeding
- problems maintaining body temperature
- longer hospital stays

The earlier your baby is born before term, the greater the risk of developing lifelong problems, such as:

- vision problems
- breathing difficulties
- learning problems
- walking difficulties

What causes preterm labour?

We do not know what causes most preterm labour. It is known that the chance of having preterm labour is more likely if:

- have already had a preterm baby
- are carrying more than one baby (twins, triplets)
- smoke and are exposed to smoke in pregnancy
- do not eat a healthy diet
- are using alcohol and/or drugs
- work long hours which cause you to be very tired
- are physically or emotionally abused
- have a chronic illness, such as diabetes, heart disease or kidney disease
- have a current bladder or kidney infection or high blood pressure

What can you and your partner do to decrease your risk of preterm labour?

- go to regular prenatal visits with your health care provider
- follow Canada's Food Guide (see page 161)
- do not smoke, drink alcohol or use drugs
- seek help if you are abused
- avoid strenuous work and do not work for more than 8 hours
- talk with your health care provider about extra stress in your life
- try to have time to rest each day
- wear your seat belt low and over the pelvic bones, with the shoulder belt worn normally
- listen to your body – talk with your health care provider if you feel that something is different

What are the signs of preterm labour?

- bleeding from the vagina
- a trickle or gush of fluid from your vagina
- stomach pains or bad cramps that don't go away
- lower back pain or pressure or a change in lower backache
- pressure in the pelvis, feeling that the baby is pushing down
- contractions – they feel regular and don't go away when you walk or rest
- an increase in the amount of vaginal discharge
- feeling that something is just not right

What do you do if you think you're in preterm labour?

Contact your health care provider and go to the hospital right away. You need to be examined by a health care provider. This can make a big difference to your baby's health.

He Said

Our daughter was born at 34 weeks gestation by caesarean section. My wife had really high blood pressure and the baby was being stressed. I watched her heart beat going down with every cramp. It was a very scary thing for both of us. I had to leave the operating room because my wife was having a general anesthetic, which was the fastest way to get the baby out. I didn't know if I would see a live, healthy baby come out of that room or not. It turned out she was very small, but healthy. She did need to stay in the special care nursery for a few weeks though. I'd have to say that was one of the most frightening things we have ever gone through.

Points to Remember

If you have other children, include them in the grieving process. Siblings often experience sadness, confusion and loneliness. They may sometimes blame themselves for the death.

PROVIDING SUPPORT

You may be tempted to stay away from grieving parents because you don't know what to say. The best thing to say is "I'm so sorry." Allow the woman to respond (or not) in her own way. Letting her know you are there for her is most helpful.

Losing a Baby

A small number of parents lose their baby through a miscarriage, ectopic pregnancy, stillbirth or other misfortune. These events bring emotions of grief, guilt and despair, and can be difficult to handle. Each person grieves differently.

You may feel very sad and empty and have problems being around other pregnant women and mothers with babies. This is normal.

If your baby is stillborn, or dies near birth, you will have the opportunity to see and hold your baby. If you feel comfortable, take pictures of the baby alone or cuddled with you and your partner. Talk with your baby and say goodbye. Take your time. Don't let your baby go until you feel ready. Many women find this helps with their grieving, but this is your choice.

Mementos of your baby will be offered to you – things such as footprints, baby blanket, bracelets or a lock of hair. You may not be able to look at them or you may think you don't want them, but this may change over time. You may wish to put them away for a while.

Knowing where to turn for help is important. Your health care provider can give you information, help you make difficult decisions and possibly set up counselling or referrals. Help is also available from the hospital social worker, chaplain and nurses.

You will need physical and psychological postpartum care in hospital and in the community. In addition to emotional support, you may need help dealing with engorged breasts. If you gave birth vaginally you may experience a sore perineum (the tissue between the vaginal opening and anus). To ease discomfort try sitting in a warm bath or using an ice pack wrapped in a towel (for more information about vaginal discomfort and care see page 88). After you leave the hospital, your health care provider, the public health nurse, local crisis centre and others who have been in a similar situation, can help.

The loss of a baby is difficult for both you and your partner. Being patient with each other helps. Men and women often react differently to losing a baby and time helps. Seek professional help.

Having a Baby after a Pregnancy Loss

The response to pregnancy loss can vary from woman to woman. Some women do not have any difficulty recovering emotionally from a pregnancy loss, but for others it can take up to two to five years. Having experienced a pregnancy loss may affect how you and your partner cope with the stresses of a new pregnancy. It is normal to feel anxious and worried. It is also normal to need reassurance that your baby is doing well.

The majority of miscarriages happen in the first trimester and are usually the result of that particular fetus having a genetic problem. In these cases, there is nothing that you could have done or not done to prevent it from happening.

In some instances, decreasing your stress level and having a healthy lifestyle will help you to have a healthy pregnancy and prevent miscarriage. It's important to be informed and care for yourself to have the healthiest pregnancy possible. Here are some suggestions:

- Talk to your health care provider about your specific risk for miscarriages and the things that you can do to have a healthy pregnancy (see also Lifestyle and Risk Factors on page 13)
- Manage your stress level, by doing activities that make you feel relaxed such as listening to soothing music or taking a walk or doing gentle yoga
- Manage your expectations about household chores and ask for assistance from your partner, family or friends
- Eat nutritious foods and snacks (see Eating for Pregnancy and Breastfeeding, page 39)
- Visualize yourself having a healthy baby

Coming Home

What can we do to prepare for bringing the baby home?

- Bring your infant car seat to the hospital the day you go home. Learn how to use it correctly before your baby is born. The law requires that unless you come home in a taxi, you must have your baby in an infant seat that meets the Canadian Motor Vehicle Safety Standards (see page 151).
- Have diapers, blankets, clothes and a safe, firm, sleeping space ready at home.
- Ask friends and family to help with older children and things such as preparing meals.
- Plan time for rest. Think of this as your "nesting time" when you can focus on each other and your new baby.
- Do not get a new pet when you are bringing your baby home.

What can your partner do to support you?

- arrange time off from work
- be present
- plan to share in the care for your baby
- plan to take responsibility for making meals and housework

What about visitors?

You may have a few visitors or dozens who want to visit. This can disturb your sleep and rest time. Let visitors know your visiting guidelines before your baby is born. That way, their visits can be a positive part of your recovery.

What about older brothers and sisters?

Brothers and sisters will react differently to the new baby. Some may love the baby and others may be angry. Many children will go back to acting like babies themselves for a while.

You can help prepare another child for the new baby by:

- Introducing the idea that families often have more than one child. Take your child to a playgroup. Make friends with parents who have children the same age.
- Making changes in routines several months before the baby arrives, or by making them well after. Some examples are toilet training or moving from a crib to a bed.
- Reading books or watching videos with your child about pregnancy and having a sibling.
- Giving your child a chance to practise staying with family or friends while you give birth. Do this sometime before the birth.

How can we help an older child?

- If your child goes back to baby-like behaviours, wetting his pants, wanting the crib back or wanting to breast or bottle feed, just relax. This will not last long.
- Give extra love and attention to your older child and tell her that you love her and the baby.
- Plan quiet feeding times with the new baby. Prepare a snack for your older child, listen to music or read together while you feed your baby.
- Give your child something to do to show that this is his baby too. He can tell stories or sing to the baby, or help to wash the baby. Mention how helpful he is.
- Make special time just for your older child each day.
- If you are still worried because nothing works with your older child, call your public health nurse or contact a local parent group.

PROVIDING SUPPORT

What should I be careful of when visiting the new parents and baby?

- Do not drop in unannounced.
- Call first.
- Do not visit if you are sick.
- Wash your hands before touching the baby.
- Do not smoke in the house.
- If you have a cold sore, do not kiss the baby. Don't kiss anybody.
- Do not stay long.
- When you come, bring something, such as fresh bran muffins or a meal.
- Offer to help in whatever way you can.

Your Body After Pregnancy

Cramps
After birth, your uterus continues to contract. Cramps are most noticeable in the first few days. They may be more painful if you have had other children. Cramps are often felt most strongly while you breastfeed. Breastfeeding helps your uterus contract and get smaller. They usually disappear after the first week. If they are severe, ask your health care provider about using something for pain.

Vaginal Discomfort and Care
The area between your legs (perineum) may be sore, bruised and swollen. If you have stitches, you may feel more pain. To ease discomfort:

- Cool the area with crushed ice or tap water for short-term relief. Do not put ice directly on your skin. Place a towel or pad between the ice and the skin.
- Clean your perineum by pouring warm water over your vaginal area or sitting in a warm bath.
- Use pain relievers as needed.
- Sit on a soft cushion to relieve pressure on your bottom.
- Continue to do Kegel (pelvic floor) exercises (see page 50).

Vaginal Bleeding (Lochia or Flow)
Following the baby's birth there will be bleeding and discharge from the vagina. This flow will usually last from 2–6 weeks. In the first 2–3 days, this flow is dark red with small clots about the size of a loonie. It should soak less than 1 maxi-pad in 2 hours and not smell bad. Flow then lessens and becomes brownish to pinkish in colour, similar to bleeding during the last days of a menstrual period. After the tenth day, the discharge is yellowish white or brown. If your flow does not become less or smells bad, call your health care provider. **Caution: use pads, not tampons, until any incision or vaginal tears are healed.**

Vaginal Prolapse
Vaginal prolapse occurs when pelvic organs (eg. uterus, bladder, rectum and bowel) bulge into or outside of the vagina. Increased pressure on and injury to the pelvic floor during pregnancy, labour and childbirth are the most common causes. Chronic constipation or repeated straining during bowel movements and a chronic cough can also play a role in why someone may develop a vaginal prolapse. Vaginal prolapse becomes more common as women age, especially for women who have had children. Many women have some vaginal prolapse after delivery. But it is usually not a problem unless they have related symptoms. Symptoms of vaginal prolapse include:

- Feeling a bulging in the vagina or like something is falling out
- Pressure or heaviness in the vaginal or rectal area
- Lower back ache, pelvic pain and/or lower abdominal pain
- Decreased sensation during sexual relations
- Bladder leakage, more frequent urges to urinate, difficulty starting the flow of urine or incomplete emptying of the bladder
- Constipation or incomplete emptying of bowels

An internal exam is needed to check for prolapse and pelvic floor function. A doctor, midwife or pelvic floor physiotherapist, can do this.

Even though bladder leaking, bowel control problems and a vaginal prolapse are common, they are not often talked about. Women can feel isolated, depressed, embarrassed and may avoid getting help. But there are effective treatments that can alleviate the symptoms and improve your quality of life:

- Pelvic floor exercises (Kegels): Strengthening your pelvic floor muscles can help. See page 50 for

information about Kegels. Consult your health care provider if you do not feel improvement after a few weeks.

- A pessary (a small plastic device) can be inserted in to the vagina to support the organs. Your doctor can determine which type and size would work best for you.
- Pelvic floor physiotherapists can support you in a personalized treatment plan.
- If these treatments do not work, surgery to ease the symptoms of bladder, bowel and prolapse concerns is an option.

Seeking treatment and incorporating pelvic floor exercises in to your daily routine can help prevent prolapse and incontinence issues now and down the road.

Vaginal Pain

Some women experience vaginal pain even after any incisions or tears have healed. Women notice this usually when trying to have intercourse, when trying to put in a tampon or during a vaginal examination. Learning how to relax the pelvic floor muscles can make a big difference. A pelvic floor physiotherapist can support you with this, and may also teach you how to use vaginal inserts as part of your treatment, so you can learn how to have pain-free vaginal penetration.

Pelvic Girdle Pain

Back, hip and pubic pain (PGP) (a common problem during pregnancy) usually improves after delivery. Pain is often worse with sitting, standing and walking, as well as with turning over in bed, climbing stairs or moving from sitting to standing. For some women, it does not improve without physiotherapy treatment. Getting treatment will allow you to move with less pain and be able to do your day-to-day activities more comfortably.

Menstruation (Period)

Your period may not start as long as your baby's only source of food is breastfeeding. If you do not breastfeed, your period will usually return 4–9 weeks after the birth. You can become pregnant again before your period starts once more. If you do not want another pregnancy, use some form of birth control (see pages 102–106).

Peeing (Urination)

At first, it may be difficult to pee or tell when your bladder is full. It is helpful to pee at regular times to prevent the bladder from becoming too full. You may also find it hard to start peeing, or it may sting. To help, you can pour warm water over your perineum (the area between the vagina and rectum) or pee in the shower or bath. You may have some bladder leakage for 6–8 weeks after your baby is born. This

Call your health care provider if:

- Your flow gets heavier rather than lighter.
- Your flow has a foul smell.
- You have flu-like symptoms or an unexplained fever over 38°C.
- The stitches on your perineum open up, drain or become infected.
- You have pain, swelling and redness near your caesarean incision.
- The stitches on your caesarean incision open up, drain or become infected.
- You have redness or pain in the calf of your leg.
- You have a tender, reddened area on your breast that is not relieved by more frequent breastfeeding.
- You have to pee often and it hurts when you pee.
- You have constipation that is not relieved with diet, lots of fluids, physical activity and stool softeners.

is called urinary incontinence, and it often occurs when you cough, sneeze, laugh, have a strong urge to urinate, or during physical activity. For many women, this gradually goes away. Some women have bladder leakage that continues beyond 6–8 weeks. Ongoing bladder leakage is not normal or a natural part of ageing. (Bladder leakage in the first three months after delivery increases your chance of developing bladder leakage at menopause. Regular pelvic floor exercises can help prevent this.)

It can be embarrassing to talk about bladder leakage with your health care provider, but you do not have to live with urinary incontinence. Treatment is available. Pelvic floor exercises (like Kegels, see page 50), and/or seeing a pelvic floor physiotherapist (see page 50) can help control bladder leakage and improve your quality of life. Kegels (pelvic floor exercises) in pregnancy and as soon as possible after birth can reduce bladder leakage and allow you to return to your normal activities with more confidence.

Bowel Movements

After birth, your bowels are often sluggish. This is due to stretched muscles, a sore perineum and some pain medications. Most mothers have a bowel movement within 2–3 days after birth.

To make bowel movements easier:

- Drink plenty of fluids, especially water
- Eat foods such as whole grains, bran, dried fruits (especially prunes and figs), fresh fruits, vegetables and juices
- Try using a small step-stool to raise your knees above your hips as you sit on the toilet. This mimics a squat – a more natural position for emptying bowels.
- If the first suggestions do not work, try using stool softeners that can be bought at drug stores. Use them for a short time only.

If you have stitches near the vagina or perineum, you may find that supporting your perineum by gently pressing a cool, clean, wet pad against the area is comforting when you have your first bowel movement.

Hemorrhoids

Hemorrhoids are painful, itchy and sometimes bleeding veins that bulge out around your anus. Hemorrhoids can develop in pregnancy or from the pushing and straining of birth. They often go away in a few weeks after birth.

To help hemorrhoids:

- try not to stand for long periods
- lie down to take pressure off your bottom
- keep bowel movements soft to avoid straining when going to the bathroom
- sit or soak in a warm bath to bring relief

Weight Changes

- It took your entire pregnancy to become the size and shape you are. It will take time to return to your pre-pregnancy weight.
- Do not diet. Focus on nutritious eating and being active.
- Gradually start being more physically active.
- Breastfeeding will help you lose weight. It is especially helpful along with healthy eating and regular activity, such as walking.
- Many women find that most weight loss happens in the second six months of breastfeeding.

Physical Activity After Birth

Pelvic floor exercises like Kegels (see page 50) and gentle walking can be introduced as soon as you feel able, generally within a few days of birth. Some women feel ready to return to physical activity immediately after birth. For others, it might be longer before they are ready for more intense activity.

Returning to physical activity after birth depends on many factors:

- What was your level of fitness before and during pregnancy?
- Was there any injury (like tearing) during delivery?
- Do you have a diastasis (a gap between the two sides of your abdominal muscles)? (See text box on page 92.)
- Have you been checked for vaginal prolapse (see page 88)?

Every woman is different, so it is important to listen to your body as you resume your normal physical activity. A good starting point is strengthening your pelvic floor (see page 50 for how to do Kegel exercises). These muscles help hold your organs, spine and pelvis in place. They can weaken or become damaged during pregnancy and birth. This can make the return to normal activity more difficult.

Separation of Abdominal Muscles

An abdominal muscle gap (diastasis) after delivery is very common and not usually a significant problem. Small gaps (2 finger-widths or less) do not need further assessment. Talk with your health care provider or pelvic floor physiotherapist if you find a large gap or have a very floppy, bulging abdomen.

To check to see if you have a separation in your abdominal muscles do this self-test:

- Lie on your back with your knees bent and feet flat on the floor.
- Place two fingers horizontally along the midline of your abdomen, just above your belly button. Gently press your fingers in.
- Lift your head and shoulders off the floor, keeping your chin tucked in.
- Feel for a gap between the bands of stomach muscles. Move your fingers from your sternum (the place where your ribs come together) down to your pubic bone.
- Note if there is any bulging in the middle of the abdominal muscles.
- If you have heavier and brighter bleeding during or after an activity, you need to slow down. If you feel pain while exercising, stop and rest. See your doctor or midwife and/or a pelvic floor physiotherapist if you have trouble being active; if you have bladder or bowel leakage; pain, discomfort or a bulge/ pressure in your vagina or pelvis. These may be signs of a pelvic floor problem or vaginal prolapse (see pages 88–90 for information about urinary incontinence, bowel movements and vaginal prolapse).
- After a caesarean birth, your scar might affect the function of your pelvic floor and lower tummy muscles. Physical activities can be started when you are comfortable (usually after 6 weeks of recovery time) and have discussed your activity plans with a physiotherapist or health care provider.
- Physical activity can be a time for you, your partner and your baby to spend together. Choose an activity that is comfortable for all of you, and make it one that easily fits into your daily schedule.

Activities to Try

- Kegel exercises - You can begin Kegel exercises a day after a vaginal birth unless you feel pain while doing them. In that case, wait and try again a few days later. These exercises will help strengthen and tone the area around your vagina, and will help you with bladder and bowel control. Make Kegel exercises a regular part of your daily routine (see page 50).
- Walking – gradually increase the pace and distance. Use a good stroller or soft carrier so you can take your baby with you. If you jog or walk quickly, wear a supportive bra.
- Swimming – you can begin after vaginal bleeding and discharge have stopped.
- Postnatal fitness classes – your community may have classes designed for new mothers.
- Yoga – start slowly or join a class that is designed for new mothers.

Vigorous exercises like crunches, planks, push-ups, running and jumping put a lot of pressure on your pelvic organs and your pelvic floor. It's best to wait until your pelvic floor has recovered from pregnancy and delivery before trying these and other high impact activities. Talk to your health care provider or pelvic floor physiotherapist if you have any bladder or bowel leakage, vaginal heaviness or pressure, or pain during physical activity.

Also, try checking your pelvic floor and lower tummy before returning to physical activity: Cough with a full bladder. If there is no bladder leakage you can more confidently increase your level of activity. If you leak or feel vaginal or rectal heaviness, ask your healthcare provider or pelvic floor physiotherapist about treatment options.

Life With Your Baby

Having a baby is a special time in your life. It is a time of changes – both physical and emotional. During your pregnancy, your body changes, your hormones are changing and you have to come to terms with the care of the baby growing inside you. After the birth you will have to deal with your own changes and take care of your baby's needs too.

While having a baby is usually a time of celebration, families and the people around you may forget that pregnancy and childbirth can be a stressful time. It is important to know both what are considered normal feelings/behaviours and also when and how to get support if you need it.

Baby Blues

In the first few days after birth, up to 80% of mothers experience tearfulness and feelings of distress. This is commonly called the **baby blues**. You may feel restless, irritable, tearful, tired, discouraged, sad or helpless. You may also have mood swings where you suddenly feel happy, full of energy or want to talk a lot. These mood changes can be due to many things, such as the quick drop of your hormone levels after birth, or the pain and tiredness from your labour and birth. They can also be the result of looking after your baby for 24 hours a day and not getting enough sleep. Most of the time these baby blues do not last very long, and go away on their own within 2 weeks.

Some women will go on to have what is called **postpartum depression**. Talk to your health care provider or public health nurse if:

- the baby blues do not go away within 2 weeks
- you feel unable to cope
- you are concerned about taking care of or harming yourself or your baby

You can also call HealthLink BC at 8-1-1, to speak confidentially with a registered nurse. There is someone there to answer your call 24 hours a day, 7 days a week. You can also visit the Pacific Post Partum Society's website at ***www.postpartum.org*** for helpful information and advice.

Postpartum Depression

Postpartum depression describes depression that may happen up to one year after birth or adoption. It can also affect women who have had a miscarriage or stillbirth. Approximately 16% of women experience a major depression. Things that can increase the chances that you will experience postpartum depression are:

- having past experience with postpartum depression or other depression (including anxiety and panic attacks)
- having a stressful life situation (such as lack of support, relationship problems or abuse, or financial stress)
- having difficulty in adjusting to your role as a parent

Common signs of depression include:

- Difficulty sleeping, extreme fatigue or exhaustion
- Lack of self care (such as not eating or emotional over-eating)

Facts & Stats

Up to 80% of new mothers experience baby blues, and approximately 15% experience postpartum depression.

Perinatal depression (depression that happens during pregnancy or up to one year after birth) is as common during pregnancy as it is after birth.

Points to Remember

Other factors that can contribute to postpartum depression are:

- being a young mother
- having an unexpected pregnancy
- feeling unsure about your pregnancy
- unstable marriage or relationship
- not having enough money
- difficult life events (death of a loved one or loss of a job)
- violence or abuse
- chronic or serious health problems
- having a baby with health problems
- having a baby that you feel has a demanding nature
- having a baby is not what you thought it would be

She Said

I couldn't believe how angry I could become with this beautiful baby that I loved so much. Our daughter was premature so needed a lot of care every two to three hours, day and night for the first five months. I was so sleep deprived I couldn't drive the car at times. I had to put her down almost every day and walk away just to keep my cool. I called on my friends to take her for a walk in the afternoons just so I could sleep. Once I got enough rest, I coped so much better.

She Said

One of the best lessons I learned in taking care of my baby was the importance of sleep (hers and mine). I tried to nap the minute she did, because I could never count on her sleeping for very long. Since I needed to be well rested to deal with her crying, the housework had to wait!

- Uncontrollable crying
- Feeling upset or angry over things that usually wouldn't bother you
- Depressed feelings or extreme mood swings
- Feeling unable to enjoy your baby
- Feeling unfit or unable to care for your child
- Thoughts of harming yourself or the baby
- Strong feelings of guilt, failure or worthlessness
- Panic attacks where you feel your heart is racing, you are out of breath or shaking and sweating
- Lack of interest in things that you usually enjoy

Postpartum depression can impact you physically and affect your emotions, thinking and behaviours. Untreated, postpartum depression can also impact your ability to bond with and care for your baby. This can affect the social, emotional and behavioural development of your child. A mother's depression can affect her baby's sense of safety, security and love. Treating depression early will lessen possible long-term effects on both you and your baby.

It is important to get help. If you think you, your partner or family member may be experiencing postpartum depression, ask your health care provider or public health nurse for help. There are many effective supports and treatments that can help you. The best help usually comes from a mix of support from health care providers, family, friends, the community and self-help.

Getting Help

Health care providers.
Some women have a hard time asking for help, but it is important to tell your health care provider or public health nurse about how you are feeling so that they can help you. Women in BC are screened for postpartum depression using a questionnaire called the Edinburgh Postnatal Depression Scale (EPDS). You should receive a phone call or visit from a public health nurse to talk to you about postpartum depression. Local support groups may be helpful, as they know about the feelings you are having. Other treatments could be individual counselling, and sometimes, medication. You will probably be able to continue breastfeeding while using medication.

Friends, family and community.
Mothers who have had postpartum depression report that having a strong circle of supportive people helped them recover. If possible, talk to your partner about how you are feeling. Talk with someone you

Taking Care of Yourself

Remember there are two people who need to be taken care of – your baby and you. Each day ask yourself, have I:

- eaten at least three meals today and also had healthy snacks in between if hungry?
- done some physical activity, such as walking with my baby in a stroller?
- taken a short break? Done something that is nice to do? When your baby is asleep or your partner can take over, take a nap, read a book, take a bath or sit in the garden.
- talked with friends or family about my feelings?
- met with a support group of people who understand my feelings? Your public health office can tell you about postpartum support groups.
- shared the responsibilities of taking care of our baby with my partner? Make a plan with your partner so you can share the care of your baby.

trust and who you think will understand your feelings. Ask your partner, family members or a babysitter to care for your baby so that you can take regular breaks. It is also a good idea to find a support network, such as a mother-child group.

Self-help. Try to get enough sleep, eat well and be physically active. Sleep while your baby naps, take a daily walk with your baby, have a friend over and keep in contact with friends.

Anxiety

There are many changes and challenges for expectant and new parents. Hormonal changes, sleep deprivation, adjusting to a new role, relationship changes and the demands of caring for a baby can leave many parents feeling stressed, anxious or worried from time to time. However, if you experience recurring intense worries or disabling fears that take over your thinking, you may have an anxiety disorder. Anxiety disorders, including Generalized Anxiety Disorder and Panic Disorder, are very common with approximately eight per cent of women experiencing Anxiety Disorders during pregnancy or the first year of their child's life. It is not uncommon to also experience depression at the same time.

If left untreated, anxiety and depression can affect the quality of your daily life and your ability to enjoy and bond with your baby. There can be a lasting impact on your health and well-being, and it can also affect your child's growth and development. For more information about depression, refer to page 93.

Recognize Anxiety

There are a number of ways women can experience anxiety. Some possible signs include:

- Unrealistic or excessive worry that something bad will happen to your baby, e.g., constant checking on your baby
- Recurring intense thoughts or irrational fears of accidentally or intentionally harming your baby
- Avoiding everyday situations such as driving with your baby
- Trembling, twitching or feeling shaky
- Insomnia – trouble falling or staying asleep
- Restless, agitated/irritable, feeling constantly on edge or moody
- Becoming easily tired, short of breath or smothering sensations
- Racing heart, panic attacks
- Dizziness or light headedness
- Sweating or cold, clammy hands
- Difficulty concentrating or remembering
- Gas, constipation or diarrhea
- Being easily startled

Women who have experienced anxiety or depression in the past (or have a family history of mental health disorders) may be at greater risk of perinatal anxiety. Women who have felt anxiety in the past may find their symptoms return or worsen during this time. Sleep deprivation and a lack of support can also contribute to worsening symptoms.

Seek Early Treatment and Support

Anxiety and depression are serious but treatable conditions. Early identification and treatment can help to reduce how long symptoms last. If you or one of your loved ones may be experiencing anxiety, be sure to ask for help as soon as possible. Talk to your public health nurse or health care provider about your feelings and worries, and to learn about self-care and coping strategies. Remember they are there to help you and your baby to be as happy and healthy as possible.

In some cases psychotherapy, may be recommended. Cognitive Behavioural Therapy is a very effective therapy for Anxiety Disorders. Recently, there has been some studies looking at the effectiveness of Mindfulness Based Cognitive therapy in pregnancy.

PROVIDING SUPPORT

How Partners and Family Members Can Help

A mother who is trying to cope with depression needs support. You may feel helpless during this difficult time and may think there is little you can do, but you can make a difference.

Here are some suggestions that may help a mother with depression:

- Encourage her to talk about her feelings.
- Show that you are trying to understand.
- Help with or take over household chores and responsibilities.
- Let her know that she is loved and valued.
- Let friends know when she doesn't feel like having company.
- Say yes when friends or family offer to help with things like cleaning the house or helping care for the baby. She needs some time away from her baby.
- If you are a partner, be loving without asking for sex.
- Try not to act like you think she is making a fuss over nothing. Depression is a serious health issue.
- If you have concerns about how she is coping, show your support and concern. One way to do this is by going with her to visit her healthcare provider and sharing your concerns.

There are a number of safe and effective medications available for the treatment of more severe Anxiety Disorders. Medication may be necessary to help get your anxiety under control and many can be taken by breastfeeding mothers. Antidepressants, like the Selective Serotonin Reuptake Inhibitors (SSRIs) may be indicated, in conjunction with psychotherapy, for women whose anxiety symptoms do not respond to self- care strategies or psychotherapy.

The approaches that are right for you depend on the severity of your anxiety. Self- Care Strategies, Cognitive Behavioural Therapy and in some cases medications are used to manage anxiety. Mindfulness, progressive muscle relaxation exercises and physical activity are also great ways to help cope with stress and anxiety.

Anxiety can worsen over time if not treated. Taking care of yourself and your baby can be more challenging without treatment and supports to improve your symptoms. Remember that you are not alone and that there are effective therapies and support available to help get your symptoms under control and enjoy this special time with your baby.

If you are thinking of hurting yourself, your baby, or others, contact HealthLink BC at 8-1-1 or your health care provider right away. Do not try to deal with depression by yourself. There are people who help women in this situation. Remember – this is common and can be treated.

Being a Supportive Partner

Today partners are taking an active role, not only in child care but during pregnancy as well. Whatever you are feeling – fear, excitement or panic – other people have felt the same thing. Parenthood is a new and exciting time in your life. Here are a few feelings new fathers have reported:

- My partner is so involved with the baby that there is no time for us.
- I don't have friends who are parents. None of my old friends understand what I'm going through.
- I'm scared of the baby. What if I drop her? My partner is much more at ease with changing, bathing, handling and playing with our baby than I am.
- How will I be able to protect and provide for my new family?
- I used to feel immortal. Now I have to be here to look after my family. I had never thought about life insurance before.
- I'm afraid of being replaced by the baby. My partner loves the baby so much and only seems to let me be involved when she says it's okay.
- This is a whole new role for me. I'm not sure I like having to do more chores around the house. I want my partner and my old life back.
- I'm so tired. Getting a whole night's sleep is all I want right now.
- How can someone like me be a good Dad? I don't know what I'm doing.

Here are some things you can do:

Talk with your partner as often as possible about your feelings, what you need and how you can best be involved in caring for your baby.

- Support your partner while she is breastfeeding. Bring her a glass of water or milk. Ask her if she needs a pillow.
- Don't worry about being scared of the baby. You are not alone with this feeling. Always think safety first. Ask yourself what is the safest thing to do here? By handling your baby, you will become more comfortable. You probably didn't feel comfortable the first time you drove a car either.
- Lay your baby on your chest and relax together. Children need closeness with both parents.
- Change your baby's diaper, give your baby a bath, dress, sing, dance or just cuddle your baby. Always wash your hands first.
- Play with your baby as often as possible. It's okay to choose toys you like to play with too.
- Remember not to leave your baby alone even for a second on a change table, counter, chair or couch, or in the bath.
- Don't leave your baby alone with your pet.
- Get enough sleep, be physically active, go for walks as a family and eat healthy foods.
- Listen to other parents. They have been through this.
- Get involved with other dads – from your prenatal classes, work or from a new parenting class.
- Remember – all parents make mistakes.
- Enjoy each phase of being a parent. It won't come around again with this child.
- Plan to have time for activities other than parenting. Do tag team parenting – let one parent be "off" sometimes.
- Talk with your partner about the best method of birth control for both of you (see pages 102–106).
- Don't expect your partner to be her old self in a week or two – recovery from birth takes time.

Parenting Can Be Frustrating

Bringing home a baby is not easy. Your family has changed, your schedule will change and you will be more tired than you have ever been in your life. This is normal!

Here are a few frustrations **mothers** have expressed:

- I don't feel as though I have the same body I had before pregnancy.
- I have never been so tired in my life.
- I get so frustrated when the baby cries and I can't soothe her, and the crying seems endless.
- I can't do the same activities I did before having the baby.
- I am so tired, and here I am acting like a happy hostess to all these visitors who want to see the baby.
- Everyone has an opinion on how we should take care of our baby.

He Said

We were both getting frustrated being in the house so much. The baby would cry at times and I'd think, "What have we done? I want my old life back." But then the good times are so great, I can't imagine not being a dad. It does all work out in the end but the first few months were tough. If I could give advice it would be to take help when it's offered and know when to just walk away for a few minutes.

A few frustrations **partners** have expressed:

- I don't seem to have any time for myself. I am either working or taking care of the baby.
- I can't seem to find a way to comfort my baby that will make him stop crying.
- I have never been so sleep starved in my life. I just want one complete night's rest.
- It seems like we never leave the house.
- I really miss having sex and my partner isn't as close as she used to be.

Hints from other parents on staying calm:

- Anytime I start to lose my temper I put the baby down somewhere safe and leave the room.
- I realized how much I need my sleep. I get my family to help by taking the baby out for a walk every day so I have time to nap and catch up.
- I plan a nap for the late afternoon. That gives me more strength to handle my baby's nighttime needs.
- I talk to my partner about what the baby and I might need. He used to wait until I told him what to do. Now he just does what needs to be done.
- We talk about how we feel. We have become very good at being frank about our needs.
- We plan to spend time together, just the two of us, at least once a week. Even if it is to just go for a walk. We ask a friend or family member to help out by watching the baby.
- We find it really helps to talk to a group of new parents. We get together with our prenatal group to swap stories and advice. It is reassuring to find out that most of them feel the same way we do.
- When we find things are getting too difficult with the baby, we talk with the public health nurse. She tells us about parenting groups and resources that are really helpful.

Being a Single Parent

Being a single parent is common today. For some people, family and friends are a good source of support. Others may not have family and friends close by. If you don't have a partner, that does not mean you will be alone. There are people and programs to help you, and it is important to find them. To find these programs, contact your public health nurse, social worker or health care provider.

Some of the places where parents meet are:

- parent and infant groups at the public health office
- pregnancy outreach programs
- breastfeeding groups
- movie theatre showtimes for parents and babies
- local playgrounds
- community centres
- family resource centres
- spiritual or religious groups

Doing the Paperwork

Leave from Work

Two different kinds of leave from work are available for parents: maternity leave and parental leave.

- Maternity leave is available only for the birth mother. If you have been employed prior to the birth, you may qualify for Employment Insurance benefits during this time.
- Parental leave is available for the birth mother and/or father. If you or the father have been employed prior to the birth, you may qualify for Employment Insurance benefits during this time. The birth mother usually takes parental leave right after her maternity leave is over. Adoptive parents also qualify for parental leave.

Under the *British Columbia Employment Standards Act*, employees are entitled to a leave of absence from work, without pay, so they can spend time with a new child. A birth mother is entitled to up to 17 consecutive weeks of unpaid maternity leave. This leave period may be extended by up to six consecutive weeks if an employee is unable to return to work for reasons related to the birth. An employer may require an employee to provide a health care provider's certificate in support of a request for leave or a leave extension. The Act also provides for parental leave of 35 weeks for birth mothers and 37 weeks for fathers and adopting parents.

Please note: This is for general information only. It is not a legal document. Please refer to the Employment Standards Act and Regulation for purposes of interpretation and application of the law.

Changing Your Will

If either or both of you die, you want to be sure your child is well taken care of by someone you trust. Decide who will be the best guardian to look after your child, then ask if they will do it. After you get their consent, you can either make a will or change your current will.

Registering the Birth

The birth registration creates a legal record of your baby's birth and legal name. As soon as possible after the birth of your baby (within 30 days), you must apply to have your baby registered with the BC Vital Statistics Agency. This can be done by applying online or completing the *Registration of Live Birth* form and applying by mail or in person. There is no cost if you do this within 30 days of your baby's birth.

Applying Online

To apply online using the secure and easy online birth registration service visit ***https://ebr.vs.gov.bc.ca/***.
In order for a mother, father or co-parent to be registered as a parent of the child, they must be present during the completion of the online birth registration process, as each parent must certify the registration separately.

Applying by Mail or in Person

The Registration of Live Birth Form is available from:

- the hospital where you give birth,
- your midwife, if you give birth at home,
- a Vital Statistics office, or
- the government website: ***www.vs.gov.bc.ca/forms***.

Complete the *Registration of Live Birth* form and send the form or go to any Vital Statistics Agency or Service BC Office. If you need help filling out your form, contact the Vital Statistics Agency or visit the office closest you. The phone number and address can be found in the blue pages of your local phone book or online at ***www.vs.gov.bc.ca/admin/offices.html***.

Normally, both parents sign the registration form. If the father does not sign it, he will not be registered as the baby's parent and none of his personal information will be printed on the baby's birth certificate.

Points to Remember

Call the Employment Standards information line for more information on any provincial rules. Look in the blue pages of your phone book for the phone number. You can also visit the Employment Standards Branch website, ***www.labour.gov.bc.ca/esb***, where you'll find links to a number of fact sheets. One of these will provide information about Leave of Absence.

For information on federal rules and Employment Insurance for maternity, parental or other leaves, call Human Resources and Skills Development Canada. Check the blue pages of your phone book for the Government of Canada section and look under "Employment." You can also visit their website at: ***https://www.canada.ca/en/services/benefits/ei/ei-maternity-parental.html***.

- Talk to your employer about any other benefits your place of work may have.
- Your employer must keep your job or a similar position while you are on maternity or parental leave.
- Your benefits, such as medical coverage, will continue during your unpaid leave if you keep paying your share of the premium cost.

When applying for the birth registration online, by mail or in person, you will have the option to:

- apply for your baby's first birth certificate,
- enrol your baby in the Medical Services Plan for BC residents,
- apply for Canada Child Benefits, and
- apply for your baby's Social Insurance Number.

Getting a Birth Certificate

A birth certificate is used for official identification and as proof of a person's legal name, date and place of birth. It is an important document to have. To get a birth certificate, you can fill out the order form on the back of the Registration of Live Birth form, fill out an Application for Service form from the Vital Statistics Agency or apply online at ***www.vs.gov.bc.ca/births/***.

There is a fee for a birth certificate.

Choosing a Name

You can choose any name you like for your baby. Your baby must have a first name (given name) and a last name (surname). You can give your baby one or more middle names if you wish. The baby's surname can be different from the mother or father's surname. The baby's surname can be two surnames, hyphenated or combined together.

Applying for Canada Child Benefits

When you register your baby's birth, you can also apply for Canada Child Benefits. All you need to do is check the consent box in the Release of Information section on the back of the birth registration form, sign and include your Social Insurance Number (SIN).

If you give consent, the following information will be sent to the Canada Revenue Agency (CRA):

- mother's name, date of birth, place of birth, SIN and mailing address
- child's name, date and place of birth and gender
- child's birth registration number.

When you do this, your baby will be registered for any related British Columbia programs, and the goods and services tax (GST) credit.

For more information about the Canada Child Benefits, visit ***www.cra.gc.ca/benefits*** or call 1 800 387-1193.

Arranging for Medical Coverage

To get medical coverage for your baby, you must fill out the *Medical Services Plan (MSP) Baby Registration* form. This form should be filled out and sent within 60 days of your baby's birth. It is available at the hospital, from your midwife or at ***www.health.gov.bc.ca/exforms/msp/115fil.pdf***.

If you pay your own premiums, or if the premiums are paid by Health Canada, send the form to the MSP address on the form. If your premiums are to be paid by the Ministry of Housing and Social Development, take the form to your social worker. If premiums are paid through your place of work or union welfare plan, take the form to your group administration for authorization.

A BC CareCard for your baby will be sent to you six to eight weeks after the MSP office receives the completed form. In the first 60 days after birth, your baby will get medical care using your medical number.

Arranging for Drug Coverage

Fair PharmaCare Coverage gives financial help with prescription drugs costs. To register for Fair PharmaCare financial help you must have:

- lived in British Columbia for at least three months
- medical services coverage with the MSP of BC
- sent in an income tax return for the right taxation year

If you are already registered, your baby will automatically be registered. If you need information or wish to register, phone the PharmaCare Program. Look in the Provincial section of the phone book blue pages or visit the website at ***www2.gov.bc.ca/gov/content/health/health-drug-coverage/pharmacare-for-bc-residents***.

PharmaCare offers a voluntary Monthly Deductible Payment Option. For more information, contact the Fair PharmaCare Registration toll-free at 1 800 663-7100.

Next Steps

Babysitters

You may decide to leave your baby with family or friends for short periods of time in the first months after your baby is born. You should know and feel comfortable with the person you choose to leave your baby with – even if it's just for a few minutes. Check to see if the sitter has taken a recognized babysitter course.

- Have the babysitter hold and play with your baby and watch how they act together.
- Ask how they would deal with a crying/fussy baby.
- Watch as they feed and diaper your baby.

Be clear about your expectations regarding care of your baby. Things you might mention:

- it is never OK to hit or shake your baby
- never leave your baby unattended on a change table, couch or sofa
- how often you expect your baby to be checked when sleeping

Pay attention to how you feel about the potential babysitter. Do you feel secure and confident? Or tense, worried and ill at ease? Remember – the goal of leaving your baby with a sitter is for you to have time to relax.

When the babysitter arrives:

- Allow time for them to play with your baby (if awake) before you leave.
- Stress that your baby be placed on his back for sleeping.
- Review your expectations regarding care and attention to your baby. See above.
- Show your babysitter where things are kept.
- Reinforce that to warm breast milk or formula, the bottle should be set in a container of warm tap water. Milk for your baby should never be warmed on the stove or in a microwave. A microwave will heat the breast milk (or formula) unevenly and can burn your baby's mouth.

To make the babysitter's job easier, and to make you feel more confident about leaving your baby, be sure to leave this information:

- Where you are going, when you expect to return and how you can be reached.
- Insist that the babysitter call you if there are any problems. Remind him or her never to shake or hit your baby.
- Keep these emergency telephone numbers close to the phone:
  - » fire
  - » police
  - » poison information
  - » health care provider
  - » hospital (pediatric emergency number)
  - » helpful neighbour (name and number)
  - » closest relative
  - » taxi
- Some personal information may be needed in an emergency, so leave the following close to the phone as well:
  - » baby's and your last name(s)
  - » home phone number
  - » home address
  - » baby's BC Care Card number or photocopy

She Said

I'm glad we had been together for a few years before our baby was born. After Jacob came into our lives we would pass by each other like zombies. Sex didn't happen for quite awhile even before the birth and then after, I was just too tired from being awake at night. We had to consciously make time for us as a couple so we could reconnect.

To Do

Write down all the emergency information listed on this page to leave close to your telephone for your babysitter.

Points to Remember

What should we ask ourselves when choosing birth control methods?

- How effective is it?
- Will the method affect breastfeeding?
- How easy is it to use?
- How much does it cost?
- How do we feel about the method?
- Will we be protected against sexually transmitted infections (STIs)?
- Could we manage another pregnancy now?

For more information, talk with your health care provider, call Options for Sexual Health 1 800 SEX-SENSE (1 800 739-7367) or HealthLink BC at 8-1-1.

Family Planning

Once your pregnancy is over and you have given birth to your baby, you and your partner will have to think about birth control methods. As soon as you start having sex, it is possible to get pregnant.

Which methods of birth control are NOT reliable and NOT recommended?

- withdrawing the penis before ejaculation (73–96% effective)
- douching or rinsing the vagina with a water-based or spermicide-containing solution after intercourse

Is breastfeeding an effective birth control method?

Although there are no absolute guarantees, breastfeeding may be effective birth control if all the following apply to you:

- your baby is under six months old, and
- your baby is exclusively breastfed during the day (at least every four hours) and at night (at least every 6 hours), and
- your baby is not given a bottle, infant cereal (pablum) or soother, and
- you have not started your period.

However, as soon as your baby is sleeping longer at night or having other foods or fluids, breastfeeding is less likely to work as a birth control method.

Birth Control Methods

Single-use Birth Control Methods

Type	Advantages	Disadvantages
Male Condom (85 – 98% effective) A latex sheath rolled onto the erect penis before any contact with the vagina, carefully taken off the penis after ejaculation to prevent spillage and then discarded. It is recommended to use with water-based lubrication.	• does not require a prescription • protects against most STIs • safe while breastfeeding	• condoms can fail by falling off or breaking • some men and women are allergic to the latex and/or the lubricant
Female Condom (79 – 95% effective) A polyurethane sheath inserted to cover the wall of the vagina during intercourse. May need to use water-based lubricant.	• protects against most STIs • safe while breastfeeding	• can be difficult to insert • can be noisy during sex • can be expensive
Diaphragm or Cervical Cap (with spermicide) (84 – 94% effective) Rubber or silicone cup-like barriers inserted into the vagina to cover the entrance to the uterus. Must be fitted by a doctor. They must be used with a spermicide and left in at least 6 to 8 hours after intercourse. Need to carefully clean with soap and warm water when removed, and inspected for holes. The woman must learn how to insert them correctly.	• can last several years, if cared for correctly • can be inserted up to 6 hours before intercourse • safe while breastfeeding	• must be inserted properly before intercourse • some risk of allergic reactions to rubber or spermicide • more risk of bladder infections • cannot be used during menstruation • must be refitted after pregnancy or weight changes • no protection against STIs

Single-use Birth Control Methods

Type	Advantages	Disadvantages
Vaginal Spermicides (71–82% effective if used alone) Creams, gels, foams, vaginal film or vaginal suppositories that destroy sperm. These must be inserted high into the vagina 15 to 20 minutes before intercourse. They only work for about one hour. If you choose to douche after using a spermicide during intercourse, wait six hours before you do. The method is best used in combination with another method of birth control.	• does not require a prescription • adds extra lubrication • safe while breastfeeding • when used in combination with other birth control methods, it is more effective than using 1 method alone	• can create sensitivity or allergic reactions • no protection from STIs (can actually increase risk)

Ongoing Birth Control Methods

Type	Advantages	Disadvantages
Intrauterine Contraceptives (IUC) (approximately 99% effective) An IUC is a small t-shaped contraception device inserted into the uterus by a doctor. There are two types of IUCs available. The copper intrauterine device (IUD) is made of a small, flexible piece of plastic with copper wire wrapped around it. The Mirena intrauterine system (IUS) is made of plastic and contains a small amount of the hormone progesterone. In both, a small string (or strings) hangs through the cervix allowing the woman to check that it is in position.	• can be left in place for two and a half to ten years before needing to be replaced (depends on the type of IUC you choose) • can be removed by a doctor whenever necessary • Mirena IUS may make periods lighter and may eventually lead to having no periods • safe while breastfeeding	• copper IUD may cause more painful or heavier periods • initial cost of IUC may be high • no protection from STIs

Ongoing Birth Control Methods

Type	Advantages	Disadvantages
Oral Contraceptive Pills (92 – 99% effective) The "pill" is usually a combination of the hormones estrogen and progestin, and prevents ovulation. Pills are prescribed by doctors and must be taken on a regular daily schedule.	• easy to use • may regulate periods • may lower the risk of some types of cancers (ovarian, endometrial, etc.)	• may have hormone-related side effects (minor weight gain, headaches, nausea, etc.) • may be rare but serious health risks, such as blood clots, heart attack and stroke. Women over 35 years of age who smoke are at greater risk. • some prescription medicines and some natural supplements may stop the pill from working; talk to your doctor • no protection from STIs • may lower breast milk supply and should be used with caution if breastfeeding is not well established
Contraceptive Patch (Birth Control Patch) (92 – 99% effective) The patch works the same way as the birth control pill but is worn on the skin and replaced once a week.	• easy to use • may regulate periods	• less than 3% of patches become unstuck, but may remain effective if replaced within 24 hours • need to check every day that it's on • some women may have side effects • no protection from STIs • not recommended for women who are breastfeeding
DMPA Injection – Depo-Provera® (97 – 99% effective) A hormone injection (progestin only) given by a doctor in your arm or buttock every 12 weeks. It prevents ovulation by stopping the release of an egg. It also makes the cervical mucous thicker so that sperm cannot get into the uterus. Women often stop having periods while using Depo-Provera.	• easy to use • may cause lighter periods or may stop them • no estrogen-related side effects • not affected by antibiotic use • can be used when breastfeeding • can start 6 weeks after your baby's birth	• some side effects (irregular periods, depression, weight gains, etc.) • return to fertility may take 1–2 years • no protection from STIs • mothers must have more calcium and vitamin D while on Depo-Provera® The use of Depo-Provera® is linked with the loss of bone mineral density. This could lead to osteoporosis and related bone fractures in later life. Talk to your doctor about risks and benefits of this method.

Ongoing Birth Control Methods

Type	Advantages	Disadvantages
Vaginal Ring **(92% effective)** A contraception device that you insert in your vagina for three weeks per month. It releases hormones and needs to be changed monthly.	• a good method to use if you do not want to take a pill every day	• may not be suitable for women who are uncomfortable with touching their genitalia • may lower breast milk supply and should be used with caution if breastfeeding is not well established • may have hormone-related side effects (minor weight gain, headaches, etc.) • may be rare but serious health risks, such as blood clots, heart attack and stroke. Women over 35 years of age who smoke are at greater risk.

Permanent Birth Control Methods

Type	Advantages	Disadvantages
Sterilization: **Vasectomy (male) (99.9% effective)** **Tubal Occlusion (female) (99.9% effective)** The tubes carrying sperm from the testes in men or the eggs from the ovaries in women are surgically cut or plugged. Males must have follow-up visits to determine when sperm production has ceased. Both can be done on an outpatient basis. Tubal occlusion can be done during a caesarean birth.	• no fears of pregnancy • both covered by MSP • safe while breastfeeding	• slight chance of complications from surgery • permanent; reversals rarely work • no protection from STIs

Other Birth Control Methods

Type	Advantages	Disadvantages
Fertility Awareness Techniques (75 – 98% effective depending on what method you use) Involve accurately predicting the menstrual cycle to determine when a woman is fertile and when sex should be avoided or other protection used. Special training from a qualified fertility counsellor is needed to use this method effectively.	• inexpensive • teaches about fertility patterns • safe while breastfeeding	• the woman must have a regular cycle • may not work during breastfeeding as menses is changing • requires careful monitoring of the woman's cycle and avoiding sex or using extra protection • no protection from STIs

Emergency Birth Control

Type	Advantages	Disadvantages
There are currently two types of emergency contraceptive pills available in Canada: **Plan B®, a progestin-only method and Yuzpe (Ovral®) method, containing both estrogen and progestin.** Plan B® is up to 89% and is most effective if you take it within 72 hours after unprotected intercourse or birth control failure (e.g., broken condom). However, it can be taken up to 5 days later to prevent unplanned pregnancy. For Ovral®, the regimen involves taking two pills followed 12 hours later by another two pills. Ovral is most effective (approximately 75%) if taken within 24 hours of unprotected intercourse. The effectiveness begins to drop steeply after 24 hours but can be taken up to 5 days (120 hours) after unprotected sex or birth control failure.	• provides a second chance to prevent an unplanned pregnancy in case another method fails • a single dose of the pill will not likely affect breastfeeding	• may cause nausea and vomiting • may disrupt your period • no protection from STIs

Your Baby

This section of the book will help you learn about your baby. It gives you lots of information on how your baby grows, how to breastfeed and helpful hints on caring for your baby. You may have received this book after your baby was born. Maybe you got it when your adoptive baby joined your family. Be assured that if any of the things recommended earlier in the book did not happen, you can still make a difference. Your baby's brain and body growth happen in the womb, but the growth (especially of the brain) continues in the first two or more years. You as a parent and your family can make an important difference in your baby's development.

Breastfeeding Your Baby

Breastfeeding is the normal and unequalled way to feed your baby, and is the healthy first choice for both mothers and babies. At six months of age, complementary solid foods should be introduced, but health experts recommend that breastfeeding continue for up to two years of age or longer. Breast milk has hundreds of antibodies, enzymes and other factors that protect your baby from infections and disease. Breast milk is easy for your baby to digest, is always at the right temperature, is easy to provide, is always handy, changes as your baby grows and is free. Breast milk and breastfeeding help every part of your baby's development.

Why is it important to breastfeed my baby?
Breast milk is the safest and healthiest food for your baby. It's easily digested and provides all the nutrition your baby needs for the first six months. Babies who breastfeed have better mental development and emotional security. They also have better jaw and tooth development and stronger immune systems. Babies who are breastfed have lower rates of:

- Sudden Infant Death Syndrome (SIDS)
- obesity
- Type I diabetes
- childhood cancers, including leukemia and lymphoma
- pneumonia and other respiratory infections
- coughs and colds
- gastrointestinal infections
- vomiting, diarrhea, constipation
- urinary tract infections
- ear infections that can damage hearing
- meningitis
- Crohn's disease, ulcerative colitis
- Celiac disease
- heart disease and liver disease in adulthood

What are the benefits for the mother?
Breastfeeding helps women:

- heal after baby's birth and avoid severe postpartum bleeding
- return more quickly to pre-pregnancy weight, burning 500 extra calories per day
- have stronger bones later in life
- build a strong emotional bond with their babies
- relax; every time a baby feeds, the mother gets a surge of the bonding hormone oxytocin, which has a calming and relaxing effect
- save time and money; formula is expensive and time-consuming to prepare. But breast milk is always ready and always at the right temperature – ideal when you're tired.

Later in life, women who do not breastfeed are at higher risk for diabetes, osteoporosis, breast, ovarian and endometrial cancers.

Planning to Breastfeed
Breastfeeding is natural, but that doesn't mean it's always easy. Breastfeeding is a learned skill and it takes time, patience and support for both you and your baby to learn how to effectively breastfeed. As with other aspects of your baby's care, it's best if you can do some planning in advance. Practice the various breastfeeding positions with a doll to get comfortable with positioning your baby. Watch videos on the first hours after birth, latching, positioning and skin-to-skin. Before the baby is born, talk to family and friends who have breastfed successfully and find out who can provide you with support with breastfeeding. Enlist the help of your partner and other people who can provide you with practical help like supporting you emotionally, making meals or looking after other children.

Facts & Stats

Health Canada, The World Health Organization, UNICEF and many other national and international organizations recommend that no other foods besides breast milk be given to your baby until she is six months old.

They also recommend that you continue to breastfeed after you start giving your baby solid foods until age six months.

It is recommended that you breastfeed for two years or longer.

Myths and Misconceptions About Breastfeeding

There are many myths and misconceptions about breastfeeding. Don't let them discourage you. The truth is, almost all women can breastfeed after giving birth.

Here are some of the common myths and concerns about breastfeeding:

- My mother couldn't breastfeed, so I probably won't be able to either.
- I have small breasts and won't produce enough milk.
- I'm afraid breastfeeding will hurt.
- I have breast implants or have had a breast reduction.
- I'm afraid breastfeeding will make my breasts saggy.
- I'll be too embarrassed to breastfeed in public.
- I'm too insecure about my body and my breasts to breastfeed.
- I have experienced abuse so I'm not sure I'll be comfortable breastfeeding.
- I wasn't able to successfully breastfeed my older child.
- My nipples don't stick out – they're flat or inverted.
- My partner isn't supportive of breastfeeding.
- I'll be too busy to breastfeed.

All of these are common concerns, but none of them mean you can't breastfeed your baby.

Colostrum - Baby's First Milk

Even if you decide not to breastfeed, consider trying it for the first few days so your baby can benefit from colostrum. Colostrum, often called 'liquid gold', is your baby's first milk. Your breasts make colostrum from about the middle of your pregnancy until your baby's a few days old.

You may notice colostrum leaking from your breasts during pregnancy. This is normal.

This special first milk comes in small amounts – perfect for your baby's tiny tummy. Colostrum is a concentrated, rich food containing high levels of antibodies and other key ingredients to help protect your baby from infections. Colostrum also plays a huge role in helping your baby pass meconium (baby's first poop). It helps to coat the digestive tract, making it less vulnerable to any harmful bugs.

If it's not possible to give your baby your breast milk, pasteurized donor human milk is recommended (if available) or store-bought formula. A prescription from a doctor or midwife is required for donor milk, and due to its limited supply, it is necessarily allocated to the sickest babies. For more information about donor milk or becoming a donor, visit the BC Women's Milk Bank website at ***www.bcwomensmilkbank.ca/home/faqs/***

Signs that your baby is ready to breastfeed

Your baby will give you signs that she is ready to nurse. These are called feeding cues. Feeding cues may Include:

- bringing hands to mouth, rooting (moves head as if looking for your nipple)
- mouth opening, lip licking, sucking
- clenching fingers and fists over chest and tummy, bending arms and legs or fussiness
- Crying is a late sign of hunger (For more information about crying and soothing your baby, see page 141.)

How can we get a good start?

- It is important to put your baby on your bare chest, especially in the first few days after birth. This is called skin-to-skin.
- Offer your breast soon after birth. Most babies will show readiness to feed in the first 30 to 60 minutes after birth.
- Your baby can stay skin-to-skin with you at least until he finishes his first feeding at your breast.
- Feed your baby frequently – 8 or more times a day.
- After your baby's first breastfeeding, she may sleep for a few hours so may not feed 8 times.
- In their second 24 hours, babies wake up a lot to feed – 8 or more times a day and, in the beginning, very often during the night.
- Give your baby only your breast milk. The small amount of colostrum (first milk) your baby gets in the first two to three days is perfect until the amount of your milk increases.

- You can hand express drops of colostrum to give your baby (see page 123 for more information about hand expression).
- Feed on the first breast until the baby falls away from your breast. In the early days, offer from both breasts to help make your milk supply. Later your baby may still feed from both breasts, or may be satisfied after one.
- After burping, offer the other breast. If still hungry, your baby will latch on, suck and swallow. Begin the next feeding on the breast you didn't use at the last feeding, or the one you finished last.
- If baby isn't feeding well, hand express or pump your milk at every feeding. It can be provided to your baby using another method such as a cup, spoon or bottle. (see page 123 for more information about hand expression).

Getting Ready to Breastfeed

If this is your first time breastfeeding, it may take some practice for you and your baby before you feel confident.

The most important thing to consider when you breastfeed is comfort – yours and your baby's. Trying different positions, and changing when you need to, can help make the whole process easier and more successful in getting your baby on your breast well – a good latch.

Get ready for breastfeeding by making yourself comfortable. Use as many pillows as you need to support your arms, back and feet.

The first time try simply lying back in a comfortable semi-reclined position where every part of your body is supported especially your shoulders and neck. Then lie your baby on his tummy on top of your body so that his head is somewhere near the breast, skin to skin. In this position babies often need little to no assistance, finding the nipple and latching using their own instincts and reflexes. This is called Laid-Back breastfeeding, or Biological Nurturing.

If you are more comfortable sitting in a chair, support your feet on a footstool (or anything that raises your feet and is comfortable), especially in the early weeks.

If you are sitting, a pillow on your lap can help bring your baby up to breast height so you don't have to hunch, and it may be less tiring to your arms.

You may also find you need to support your breast with your free hand. You can usually let go of the breast once your baby is latched on and sucking.

You may also want a glass of water, juice or milk on a table beside you. Some moms include this with their breastfeeding routine as a reminder to drink enough fluids.

Have someone stay with you – in hospital and at home – to help.

Call your public health nurse or HealthLink BC at 8-1-1, if you need extra support to keep breastfeeding or if you have questions. It's worth it, for you and your baby.

Comfortable Positions

The position you use is not important as long as both you and your baby are comfortable, relaxed and your baby is able to latch onto your breast. You may find that the modified cradle or football hold is easiest to use if your baby isn't latching well.

Modified cradle position

Football hold

Side-lying

Cradle position

Laid-back

Points to Remember

More feeding = more milk. In other words, the more you breastfeed your baby, the more milk you will make, as long as your baby is feeding well.

She Said

Learning to breastfeed can take time, commitment and concentration. In the long run it is one of the most rewarding experiences a mother and baby can share. Contact your public health nurse, or use the community breastfeeding clinic if you have concerns or problems. Surround yourself with other breastfeeding moms who can give support and share helpful tips.

Latching On

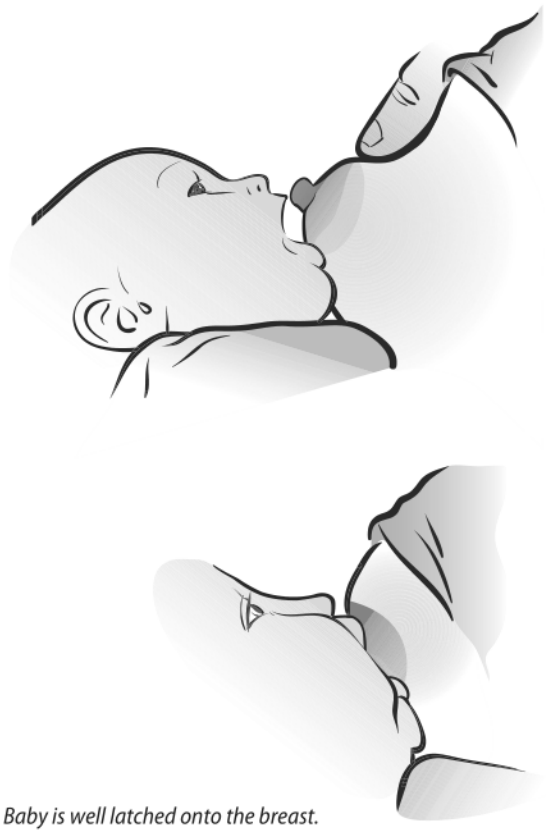
Correctly latching your baby on to the breast is an important step in successful breastfeeding. Having your baby skin-to-skin with you is the ideal way to start. It helps your baby find the breast and nipple. If you feel pain when your baby is on the breast (not a passing discomfort), a poor latch may be the problem. Gently remove your baby from the breast and start again. To take your baby off your breast and break the suction, gently place a finger in the corner of your baby's mouth.

How can I get a good latch?

- Unwrap your baby. Blankets make it hard for baby to be close enough to latch well.
- Turn your baby's whole body to face you (tummy to tummy).
- Support your breast but keep your fingers well back from the areola (the coloured area of the breast surrounding the nipple).
- Aim your nipple high in your baby's mouth.
- Touch the baby's lips with your breast to help her to open her mouth wide.
- Wait until your baby opens his mouth wide, like a yawn.
- Bring your baby in close to you.
- Put your hand on her shoulders, not her head.

When is my baby well latched?

- The initial latch may hurt but you should not feel pain in the nipple area. You may feel a tug.
- Your baby's chin is touching your breast and his nose is slightly away from the breast.
- Your baby's lips are flanged (flared outward).
- Your baby begins to suck. Her cheeks will be full and rounded. If there are dimples in the cheeks, she may not be latched well.
- While sucking, your baby may suck quickly, then more slowly, with short rest pauses. You may be able to hear the baby swallowing. Listen for a "ca" sound. You will hear this more easily when your milk increases.



Baby is well latched onto the breast.

- Sometimes you may hear your baby gulping, especially if you have a lot of milk.
- Clicking or smacking sounds may mean that your baby is not latched correctly.
- Your nipple looks rounded, not flattened, when your baby comes off your breast.
- The nipple does not have any cracks, blisters or bleeding.

Tongue-tie
Sometimes, babies have a medical condition that may impact their ability to effectively breastfeed. "Tongue-tie" is when the tissue that connects the tongue to the floor of the mouth is too short, restricting the tongue's movement. Depending on the severity of the condition, babies may not be able to latch well or form the sucking motions required to breastfeed. They may become frustrated, fussy at the breast and may not gain weight. You may experience sore or painful nipples and frustration as well.

If you are experiencing ongoing difficulty breastfeeding, ask your health care provider to check for tongue-tie or other problems that might be impacting successful breastfeeding. They may recommend that the tight tissue be snipped to release the tongue. This is a pain free procedure that can be done right in the office.

The Let-down Reflex

Let-down happens as milk is released into milk ducts in your breast. This usually happens when your baby sucks on your breast. You may even have a let-down when your baby or someone else's baby cries, or for no reason at all. Some women don't feel the let-down. Others may feel a pins and needles or tingling sensation. Others will have a very strong sensation or discomfort. Other signs of let-down include leaking milk from the opposite breast, cramping, increased vaginal flow, increased thirst and relaxation.

Can I have a let-down if I'm not feeding my baby?
Yes. If you find you are soaking your shirts with milk at inconvenient times:

- Wear one or more breast pads as needed. Change these pads to keep the skin dry. If pad becomes dry, moisten before removing from breast.
- Wear dark patterned clothes to hide the milk spilled on your tops.
- Cross your arms and press the palm of your hand on the nipple area when you feel the let-down happening. This will help to hold back the milk.

What if my let-down is slow?
Make sure you are comfortable when breastfeeding. If you are embarrassed or anxious about breastfeeding, it may take a little longer for the milk to flow well.

- Find a private, quiet place if you are uncomfortable.
- Sit or lie comfortably.
- Have a drink handy (non-alcoholic).
- Massage your breasts or apply a warm face cloth to the breast before feeding.

If you have followed these tips and still have a problem with let-down, talk with your public health nurse, midwife or a lactation consultant – a person with extra knowledge to help breastfeeding mothers and babies.

How Much and How Long?

How often and how long should I feed my baby?

- In the first three to four days after birth, your baby may lose some weight. This is normal, as long as your baby still has wet and soiled diapers (see page 114). Healthy babies, when fed according to their feeding cues, will take what they need. Let your baby be your guide.
- Keep in mind that your baby's stomach at birth is very small, which means that she will want to be fed often. See page 114.
- In the early days, offer from both breasts at each feeding to help make your milk supply. Later your baby may still feed from both breasts, or may be satisfied after one.
- Feed on the first breast until the baby falls away from your breast. This usually tells you that your baby has had enough milk. Don't rush though – your baby may be just resting and not yet finished.
- Begin the next feeding on the breast you didn't use at the last feeding, or the one you finished last.

Points to Remember

How much weight will my baby gain?
In the first 3-4 days after birth, your baby may lose some weight (7-10% of birth weight). This is normal, as long as your baby still has wet and soiled diapers (see page 114).

Your baby will probably be back up to his birth weight by about 10-14 days.

From 2-3 weeks old, expect him to gain about 120-240 grams (4-8 oz) per week until he doubles his birth weight. Your baby will usually double his birth weight by about 4-6 months.

All babies are unique and will grow at a rate that is unique to them, always listen to their hunger and fullness cues.

If you have concerns about your baby's weight gain, talk to your public health nurse or health care provider.

He Said

We both felt that breastfeeding would be the best thing to do for our baby. I got involved by bringing my wife a glass of water every time she sat down to nurse the baby. We ate well, exercised, didn't drink alcohol and generally were the most healthy we've ever been during those two years. She would express milk sometimes so she could go out for a break and I would take over and do the feeding. I really liked the closeness at those times.

Points to Remember

Your baby needs to breastfeed often. Even though she only drinks 10 to 100 ml (1 tablespoon to 1/2 cup) per day in the first few days, breastfeeding will help increase the milk supply for your baby as she needs it. In the first three to four days after birth, your baby may lose some weight. This is normal. See page 113.

- Some babies feed very often at first – as much as every one to two hours, from the start of one feed to the start of the next – and then go for longer periods between feedings. This cluster feeding is normal.
- It is normal to feed eight or more times in 24 hours. This will usually decrease once breastfeeding is well established. When babies go through a growth spurt, they may want to breastfeed more often for a couple of days to increase they milk supply.
- There is no set amount of time for how long your baby should feed at your breast. In the early days it may seem as though it takes a very long time to feed your baby.
- For the first 24 hours, your breasts will feel soft. After 2–5 days, your breasts will feel full at the start of a feeding and soft after a feeding. After a few weeks, it is normal to have soft breasts and still have lots of milk. Ask for help if you are having difficulty or feedings take longer than an hour. Call your public health nurse, midwife or community or hospital breastfeeding clinic.
- After your milk supply is well established, the feedings will be shorter.

If you are worried that your baby isn't getting enough milk, remember that the size of your baby's stomach is very small.

Baby's Stomach Size up to Day 10

Baby's Age	Baby's Stomach Size	
Day 1	Size of shooter marble	(5–7 ml)
Day 3	Size of a ping pong ball	(22–27 ml)
Day 10	Size of a large chicken egg	(60–81 ml)

Source: 10 Valuable Tips for Successful Breastfeeding, Public Health Agency of Canada, 2009.

How can I tell that my baby is getting enough milk in the first weeks?

- Your baby has a good latch and feeding doesn't hurt.
- You see your baby sucking and swallowing. You will hear a "ca" sound during the feeding.
- Your baby is feeding eight or more times a day after the first 24 hours. Night time feedings are to be expected.
- In the first three days of life, your baby has 1 to 3 wet diapers per day. By days four to six, as your milk supply increases, your baby should have 5 or more wet diapers a day. His urine should be pale yellow.
- Your baby has 2 to 3 or more bowel movements a day. After the first 4 to 6 weeks it is common for bowel movements to be less often. They may come once every few days. As long as the bowel movement is loose and the baby has wet diapers, this is normal.
- Your baby is satisfied and content after most feedings. When your baby is full, he may fall away from your breast, decrease sucking, stretch her arms and legs, straighten her arms along her sides, relax her fingers or fall asleep.
- Your baby has returned to his birth weight by about two weeks.
- Your breasts are full before a feeding and softer after a feeding. After several weeks, it is normal to have soft breasts all the time and still have lots of milk.

Call your health care provider, public health nurse or HealthLinkBC at 8-1-1 right away if your baby:

- Does not have:
  - 1 or more wet diapers with clear, pale yellow urine on day 1
  - 2-3 wet diapers each day, with clear, pale yellow urine on days 2-3
  - 3-5 wet diapers each day, with clear, pale yellow urine on days 3-5
  - 4-6 wet diapers each day, with clear, pale yellow urine on days 5-7
  - Many wet diapers each day with clear, pale yellow urine on days 7-28
- Does not have (at least) 2 or more bowel movements each day after 4-5 days of age
- Is not interested in feeding and often goes without feeding for 4-5 hours in the first few weeks

If you're concerned that you don't have enough milk and you're breastfeeding or expressing milk at least eight times a day, seek support from your healthcare provider. Some herbs and medicines may increase milk production, but they only work if you're emptying your breasts often.

Caring for yourself is important for successful breastfeeding. Make it a priority to get enough rest and sleep, drink plenty of fluids and eat nutritious foods. Ask for help from your partner, family and friends so you can focus on taking care of yourself and breastfeeding your baby. See Taking Care of Yourself on page 116 and Partner Support on pages 96 and 120 for more information.

Maintaining and Increasing Your Milk Supply

The perception of insufficient milk supply is one of the most common reasons mothers give for stopping breastfeeding or supplementing with formula. However, the vast majority of women are able to produce enough milk, especially when breastfeeding information and support are given.

Here are some tips for increasing your milk supply:

- More breastfeeding = more milk: The more you breastfeed, the more milk your body produces. Your baby's sucking stimulates your milk supply, so try to breastfeed often for as long as your baby will nurse. Offer both breasts each time.
- Start with skin-to-skin: This is especially important right after birth and during the first few weeks. Skin-to-skin contact releases calming hormones in the mother and the baby, helping mom and baby to bond. Babies who have skin-to-skin contact breastfeed for a longer term than babies who don't. Skin-to-skin contact also helps baby to latch well and to more easily find the breast and nipple.
- Ensure a good latch: A correct latch is very important for successful breastfeeding. A good latch feels comfortable for you and helps your baby get a good feed. A poor latch can cause sore nipples, a hungry baby and a lower milk supply.
- Hand expression or pumping: A little bit of hand expression or pumping for 5–10 minutes after breastfeeding can also help to further stimulate your milk supply.
- Avoid supplementing with formula if at all possible: Supplementing unnecessarily with formula can disrupt the supply and demand of your milk production and increase your baby's health risks. Speak with a health care provider to explore your options before choosing to supplement. See page 121 for more information about supplementing.
- Respond to your baby's feeding cues: Healthy babies will take what they need, as long as you respond to their feeding cues. Look for signs that your baby is hungry and signs of a good feed (see How can I tell that my baby is getting enough milk in the first weeks? on page 114). After the first few weeks, it is normal to have soft breasts and to still have lots of milk. Remember that a newborn's stomach is very small and your baby doesn't need a lot of milk to be satisfied.
- Take care of yourself: Remember breastfeeding is a learned skill and can be hard work. Seek support from your partner, family or friends and health care providers. Your local public health clinic and lactation consultants can be a great source of support. Try to eat well and drink plenty of fluids.

What about soothers?

Soothers are also called pacifiers or dummies. Soothers are sometimes given to babies to help them satisfy their need to suck, beyond their need for nutrition. Breastfed babies rarely need soothers because their need to suck for comfort, stress release and pleasure can easily be met by breastfeeding.

If you choose to use a soother, wait until breastfeeding is going very well (about 4–6 weeks after birth). Avoid using a soother if your baby has any problems with breastfeeding or you have low milk production. If your baby uses a soother, she may feed less often at the breast, which will decrease milk production.

Points to Remember

Sucking is important for feeding, comfort, stress release and pleasure for babies. Your baby may suck on her hand, fingers or thumb.

Warning about Codeine and Breastfeeding

Medications with codeine (like Tylenol 3) may not be safe during breastfeeding. For some breastfed babies, the mother's use of codeine puts the baby at risk of side effects or even death.

If you need pain medication after birth, talk with your health care provider about taking a medication that does not have codeine. There are other pain medications that will help you.

For more information visit the Motherisk website ***(www.motherisk.org)*** or call toll free 1 877 439-2744.

A soother should not be used in place of cuddling, comforting or breastfeeding. (See page 149 for more information on soother safety.)

What about spitting up?

Spitting up small amounts after a feeding is very common in the first few months of life and is not the same as vomiting. Spitting up usually stops as your baby grows. Spitting up is not a concern as long as your baby is healthy, happy and gaining weight well.

What about hiccups?

Many babies have a lot of hiccups, which can be quite loud, but they don't seem to bother the baby and go away by themselves.

How do I burp my baby?

Burping between feedings may help bring up air bubbles and prevent some spitting up. To burp your baby, gently rub or pat his back. Thumping your baby on the back can make her spit up all the milk that was just taken. Sometimes just sitting your baby upright works.

When your baby has finished breastfeeding from one breast, try burping her. You will soon find out which position works best. If your baby does not burp after a minute or two and seems content, she probably does not need to burp.

Positions to try:

- Sitting
  - » sit your baby sideways on your lap
  - » cup your thumb and first finger under her chin to support her head and use the rest of your hand to support her chest
  - » support her back with your other hand
  - » gently rock your baby back and forth and lightly rub or pat her back until you hear a burp
- On your shoulder
  - » hold your baby upright with her head peeking over your shoulder
  - » support her head and back with your hand gently rub or pat her back until you hear a burp
- On your lap
  - » lay your baby on her tummy on your lap gently rub or pat her back until you hear a burp

Taking Care of Yourself

Having a baby can be a wonderful experience, but also takes a toll on the mother physically, emotionally and mentally. It's important to take time out every day to care for yourself to support your recovery. You will also enjoy your baby more if you are feeling more rested and taking care of yourself. Also, refer to Taking Care of Yourself, page 94.

Nutrition

- When breastfeeding, follow *Canada's Food Guide* for breastfeeding and pregnant women (see page 161).
- Whenever you are breastfeeding, have a glass of water, milk, soup or juice within reach.
- Continue to take a daily multivitamin with folic acid.

Rest

- You will be up during the night to feed your baby, so catch up on your sleep during the day by napping when the baby is sleeping.
- Breastfeeding takes time. Do not take on too many activities and responsibilities other than caring for your baby.

Alcohol, Cannabis and Street Drugs

The safest choice is not to drink alcohol while breastfeeding. Alcohol may decrease the amount of breast milk you produce. Alcohol can affect your baby's motor development and sleep. It can also decrease the amount of breast milk your baby takes at feeding time. Despite popular myth, it has been shown that drinking beer does not increase your milk supply.

Breastfeeding mothers who choose to drink alcohol should plan breastfeeding around it to prevent alcohol from reaching their baby. This may include pumping and storing milk before drinking and waiting until alcohol has passed out of their milk before breastfeeding their baby (approximately 2 – 3 hours per drink). There is no need to 'pump and dump' after drinking alcohol unless it is for comfort or to maintain your milk supply. Pumping does not speed up how fast the alcohol leaves your milk. Talk to your health care provider if you have questions about how to safely continue breastfeeding if you plan to drink alcohol.

Cannabis (marijuana) is different from alcohol. THC, the chemical in cannabis, is stored in body fat and can stay in your body for weeks or longer. Alcohol leaves the body much faster than THC because it is not stored in fat. Breast milk contains a lot of fat, and the THC in cannabis is passed through your breast milk to your baby. THC may cause learning difficulties in your baby. Since THC stays in your body for so much longer, you cannot plan ahead the same way you can with alcohol. The safest choice for mothers who are breastfeeding is not to use cannabis at all.

Smoking, using a vaporizer, or eating cannabis (like in cookies or brownies) can all result in THC being passed to your baby through your breast milk. If you or someone around you chooses to smoke cannabis, avoid exposing your baby to second-hand smoke.

If you are taking street drugs or drinking alcohol in large amounts on a daily basis, do not breastfeed if you are unable to find a safe time to feed your baby. These substances pass through your breast milk and can affect your baby. Talk with your health care provider, public health nurse, pharmacist or HealthLink BC (dial 8-1-1) about getting help. You can also call the Motherisk Alcohol and Substance Use Helpline at 1 877 327-4636. The Alcohol and Drug Information and Referral Line (1 800 663-1441) also has information about drug and alcohol programs.

Medication

If you need to take medicine while you're breastfeeding, talk to your pharmacist or healthcare provider. As a general rule, don't take anything unless you know it's safe for your baby.

Some medications, including common pain relievers such as Tylenol 3, which contains codeine may not be safe for breastfeeding mothers. Codeine can put your baby at risk of side effects such as lethargy, slowed metabolism or even death. If you need pain medication, talk with your healthcare provider about taking something that doesn't have codeine.

For more information about medication safety during breastfeeding, you can also contact Motherisk toll-free at 1 877 439-2744.

Herbal Products

Many are not safe during breastfeeding. These include black cohosh, ma huang and aloe. Talk to your healthcare provider before taking any herbal product.

If you're wondering about a particular product, ask the pharmacist about its safety. You can also check the label for an NPN or DIN number. Then go to Health Canada's natural health product website (***webprod3.hc-sc.gc.ca/lnhpd-bdpsnh/index-eng.jsp***) and "simple search" the product's NPN or DIN to learn about any health warnings.

Being Healthy

If you get sick with the cold or flu, you should continue to breastfeed because your breast milk can help protect your baby from your illness.

Before taking any prescription or non-prescription medications – including natural health products – speak with your health care provider or pharmacist. Some medications will pass into the breast milk. While some are safe, others are not. Check to be sure that all your medications are safe to take while breastfeeding. For more information about medication safety during breastfeeding, you can also contact Motherisk toll-free at 1 877 439-2744.

She Said

After reading all about the benefits of breastfeeding I was excited to get started. But after a couple days of nursing I started to get discouraged. The process of engorgement left my breasts swollen and very sore, not to mention the pain in my nipples. I felt like giving up. However, after a couple of weeks it got much easier and I actually began to enjoy the special time spent with my baby. The discomfort and short-term pain were long forgotten, as I knew I was doing the best for my baby.

Be Careful with Herbal Products

Herbal products are drugs. They can produce side effects. Be careful with the use of all herbal products. They are not regulated and have limited information available. For example, ingredients may be different from crop to crop. Check with a pharmacist about a specific herb and if it's safe to use while you are breastfeeding.

Did you know? A missed feeding or pressure from your bra or seat belt can cause a plugged duct.

Points to Remember

It's important to note that nipple damage from a poor latch is sometimes mistaken for thrush. Most mothers with a yeast infection say that, while their nipples hurt more when the baby is feeding, they still hurt all the time. If it doesn't hurt when you express or pump, then you probably don't have a yeast infection.

Keeping Breasts Healthy

- Wash your hands with soap and water before handling your breasts.
- Allow your nipples to air dry after each feeding and expose them to air as much as possible.
- If you wear nursing pads, change them as soon as they are wet.
- Be sure your bra fits well.
- If your bra leaves a mark on your breast tissue, it is too tight. A good estimate is to buy a bra two sizes larger than you normally wear.
- If the nipple is too sore to breastfeed, express or pump your milk.

Most mothers have sore nipples in the first week. However, if your nipples are damaged – cracked, bleeding, scabbed or blistered – talk with your public health nurse, midwife or lactation consultant about your baby's latch. It may help to breastfeed on the least sore side first.

What should I do if I have full, heavy, painful breasts (engorgement)?

Breast engorgement sometimes happens after your milk supply increases between the third and fifth day. It may also happen if you miss a feeding. Apart from discomfort, the main concern is that – with nipples often flattened against a swollen, sore and warm breast, your baby may have difficulty latching on.

To help:

- Start breastfeeding your baby right after birth and feed often, 8 or more times in 24 hours. Night time feedings are important.
- Before feeding, take a shower or place warm, wet washcloths on your breasts. Massage your breasts as well and express colostrum or breast milk to soften the nipple before feeding. This will make it easier for your baby to latch on.
- Breastfeed on the engorged breast first.
- After feedings, try placing ice packs or a bag of frozen peas on your breasts to lessen swelling.
- Position and latch your baby correctly. To help your baby latch, soften the nipple area by hand-expressing a small amount of milk before feeding.
- Some women find that it is helpful to put chilled, washed and dried raw cabbage leaves on breasts or inside their bra.
- Get as much rest as possible and drink water, milk or 100% juice when you are thirsty.
- Avoid supplementing with formula – this can result in engorgement because you're not emptying your breasts as often.
- Contact your public health nurse if you need more help.

What causes a red sore area in a breast?

This may be a plugged duct. Milk ducts are the channels in your breast that milk flows through to get to the nipple. If a duct gets plugged, you may have a sore breast. You may also notice redness and a lump or firm area. A plugged duct can happen if milk builds up in a milk duct and does not flow. Pressure builds up behind the duct and can cause soreness in the surrounding area. Plugged ducts can become infected. With continued breastfeeding, plugged ducts usually clear up in 1 to 2 days.

To relieve plugged ducts:

- Breastfeed every two to three hours. Sucking will help relieve the plugged duct.
- Before feeding, take a shower or place warm, wet washcloths on your breasts.
- Massage your breast before the feeding. During feeding, firmly massage the breast from behind the lumpy area towards the nipple area to help the milk come out of the breast.
- Change your baby's breastfeeding position to encourage proper drainage.
- Drain one breast well before switching sides.
- Express the milk from your breasts by hand or with a pump if they are still lumpy after feeding.
- Get as much rest as possible and drink whenever you are thirsty.
- Make sure your clothing and bra are loose.

Mastitis (breast infection)

If you develop a fever greater than 38˚C, feel as though you are getting the flu, or your breast is red and sore, you may have mastitis (a breast infection). If you think you have mastitis, contact your healthcare provider right away or HealthLink BC at 8-1-1, and don't stop breastfeeding. Your baby won't get sick from mastitis.

Mastitis is an infection of the breast tissue and/or milk ducts. It may come on suddenly and make you feel sick with chills and aches. The breast may feel firm, swollen, hot and painful and may appear red or have red streaking. Mastitis can be treated with frequent feedings, antibiotics and pain relievers. Rest is extremely important in treating mastitis. Keep the breast well emptied by frequent breastfeeding. If it hurts too much to breastfeed, express or pump at least every two to three hours.

Preventing Mastitis

- Breastfeed regularly. If you must skip a feeding, express or pump milk to keep your milk ducts emptying on a regular basis.
- Ensure your baby has a good latch and position.
- Use different positions to ensure all areas of your breasts are drained.
- Don't hold or pinch parts of your breast as you can block the ducts.
- Ensure your bra fits well without tightness or restriction.
- Get lots of rest and seek help from people around you.

Thrush (yeast infection)

If you have red, itching, persistent sore nipples, burning or shooting pain in the breast during and after feeding, or cracked nipples that don't heal, you may have thrush (a yeast infection). Both the mother and the baby may show signs of infection, or just one of you may show signs.

Your baby may refuse to breastfeed, may repeatedly pull off the breast during feedings, be gassy and cranky, and have slow weight gain. The baby may have thrush in the mouth (white patchy areas that look like milk that will not rub off) or in the diaper area (red rash).

If you have thrush:

- Both you and your baby may need to be treated. See your healthcare provider as soon as possible. Antifungal creams are used to help clear up thrush in babies while mothers can use non-prescription medications.
- Wash your hands frequently with warm water and soap.
- Wash frequently all objects that come in contact with your nipples and your infant's mouth.
- Wash bras daily and avoid using breast pads if possible.
- Keep your nipples dry.
- If you're using a breast pump, boil the parts every day.
- Talk to a healthcare provider for additional advice about dietary restrictions. It may help to avoid cheese, bread, wheat products, sugar and honey during your treatment period.
- Your partner should also be treated.
- Soothers can carry thrush back into your baby's mouth. Avoid soothers, replace them frequently or boil for five to 10 minutes each day.

Flat or Inverted Nipples

If your nipples are flat or inverted, breastfeeding may be a little more challenging, but most babies will learn how to latch on anyway with a bit more time. Flat nipples don't stick out when they're stimulated by touch or cold. Inverted nipples sink into the breast – either all the time or when they're pinched. If you're concerned about flat or inverted nipples, try these tips:

- After birth, put your baby to the breast. Some babies will pull the nipple out with their sucking movements. Other babies will need time to learn to latch on.
- Gently roll the nipple with your fingers before feeding and use a breast pump to help stretch the nipple tissue. While babies are learning to latch, it may be helpful to use a cup or spoon rather than a bottle to give colostrum.
- The most important thing to do is create skin-to-skin contact after the baby is born. Start pumping and expressing your milk if the baby has difficulty latching.

Sore or Damaged Nipples

A poor latch can result in damaged nipples. It may help to nurse on the least sore side first.

Here are a few tips that may help if you have sore or damaged nipples:

- Help your baby latch better. If the pain persists, get help latching on.
- Allow your nipples to air dry after each feeding and expose to the air as much as possible.
- Keep breastfeeding or express or pump your milk. If your nipples bleed, you may see blood in your milk or in your baby's mouth. That's OK – the blood is not harmful.
- Look at your baby's tongue. Sometimes a poor latch and damaged nipples happen because the baby has a 'tongue tie' or tight frenulum – the piece of skin under the tongue. A tongue tie is only a problem if your baby cannot latch well or if it's causing damage to your nipples. Your doctor or a pediatrician can fix the tongue tie very easily.

Points to Remember

If you are having difficulty with breastfeeding get help right away. Your public health office or HealthLink BC (call 8-1-1) can provide support.

- During pregnancy, it may help to get used to handling your breasts, just as you would when performing a breast self-exam. Some women with flat or inverted nipples have good results from gently rolling the nipples out with their fingers.

Breast Surgery and Breastfeeding

Breastfeeding is usually not a problem for women who have had breast implants unless a cut has been made along the edge of the areola (the coloured part of the nipple). This causes more damage to the breast and may decrease the amount of milk a mother makes. Women who have had breast reduction surgery may have a problem with breastfeeding. If you've had breast surgery, start breastfeeding as soon as your baby is born. If your baby shows signs of needing more milk, check with your healthcare provider.

Getting Help with Breastfeeding

A new baby can be overwhelming and exhausting. It is important to have people around you to talk to or help you. If you are having difficulties with breastfeeding, such as sore nipples, or are tired or having emotional difficulties, call for help right away. Your public health office or HealthLink BC (call 8-1-1) can answer breastfeeding questions. Many public health offices and hospitals have breastfeeding clinics where you can go and have a nurse help you while feeding. If you have a midwife, she will help you with breastfeeding. La Leche League ***(www.LLLc.ca)*** is also a valuable resource.

Partner Support for Breastfeeding

Women are more successful at breastfeeding when they have support. Partners and families can make the difference in a long list of areas – and breastfeeding is no exception.

The early weeks with a new baby are incredibly joyful – but can also be tiring, overwhelming and stressful. All of these emotions are normal for the entire family. Spend time figuring out how you can support the new mom and baby:

- Create the family team: Mothers and babies need time to recover from birth and learn how to breastfeed. A supportive network of loved ones can make a huge difference to a successful feeding relationship.
- Arrange to take time off work after the baby is born to help the new mother recover and care for the baby. It's especially important for a support person to stay overnight with the new mom in the hospital after the baby is born.
- Bond with your baby through skin-to-skin cuddling, bathing, changing, walking, reading to and burping your baby. Some dads and partners worry that they won't effectively bond with their baby unless they can bottle feed. In fact, there are so many other ways that partners can bond with their little ones and support the baby's need to breastfeed. You have an amazing opportunity to build a relationship based on fun, not food!
- Understand the importance of breastfeeding and educate yourself on the basics, such as supply and demand – the more the baby feeds, the more milk the mother makes.
- Don't be afraid to ask your families for help.

Support your partner with positive comments and share the joys and worries that new babies bring. If you see your partner struggling with breastfeeding, you may be tempted to say, "Why don't you just give the baby a bottle?" This can be discouraging! It might be more helpful to say, "I know you're tired, but you're doing a great job. What can I do to help?" When breastfeeding is not going well, mothers can feel like giving up. If your partner becomes overwhelmed:

- Ask her what she needs to feel supported.
- Remind her that she does have a choice – and even though you have confidence that she can overcome

her challenges, she can still be a good mother if she decides not to continue breastfeeding. If she feels like she has a choice, it may be easier to continue breastfeeding.

- Remind her that breastfeeding does not have to be all or nothing. Any breastfeeding is better than none. She could choose to breastfeed and offer some formula or express milk for a day.
- Help her set small goals – breastfeeding is not forever! Small goals could be getting through the next feeding or trying to breastfeed for another week.
- Take the baby out for a walk and let the new mom sleep.
- Praise her for how hard she's working.
- Help her find the support she needs. Connect with your health care provider, public health clinic and/or a lactation consultant or look for more information at ***www.healthyfamiliesbc.ca***
- Let her know that you will love and support her through any decision she makes.

Remember to take care of yourself too. Caring for a new baby is a 24-hour job. Lower your expectations of yourself and your partner while offering practical help with baby care and household tasks. If you can't be available, find someone who can. Ask family and friends to help you support your partner so it doesn't fall completely on your shoulders.

Supplementing

Supplementing means giving your baby any other milk in addition to breastfeeding. The decision to supplement is an important one. Sometimes it is medically necessary, and sometimes it is not. Giving your baby a supplement does not mean you have to stop breastfeeding. If you are breastfeeding and need to supplement your baby, consider offering the supplement in a small lidless cup or spoon rather than a bottle. Your baby may have difficulty switching back and forth between the bottle and breast as the sucking technique for getting milk out of a bottle is different.

Your baby may become frustrated when trying to latch on to the breast after using a bottle and may even refuse the breast.

Parents often feel they need to supplement because they are worried that their baby is not getting enough milk. The most common times when parents worry are in the first few days before their milk 'comes in', especially at night and when their baby goes through growth spurts. Every few weeks your baby will need to feed very frequently, often around two to three weeks, six weeks and around two to three months of age. Giving your baby a supplement during these times is not recommended. It is normal for a baby to feed more often at certain times. Your baby's frequent suckling at the breast tells your body to produce the amount of breast milk your baby needs.

If you are concerned about whether your baby is getting enough by breastfeeding and are thinking that you need to supplement your baby get help from your hospital nurse, public health nurse or health care provider. They can help you determine what your options are and give you information that will help you safely feed your baby. For more information visit ***www.healthyfamilies.bc*** and search for supplementing.

Informal (Peer-to-Peer) Human Milk Sharing

Informal milk sharing includes peer-to-peer, unpasteurized, community or internet based human milk sharing. Informal milk sharing is different from pasteurized donor human milk from an official milk bank.

Women who produce an oversupply may be able to donate their excess milk to a non-profit milk bank where the milk is carefully screened, pasteurized and tested to make sure that it is safe (see the sidebar on donating human milk).

Health Canada, the Canadian Paediatric Society and the Human Milk Banking Association of North America recommend that you do not share

Donating to BC Women's Milk Bank

Pasteurized donor human milk is expressed milk that is donated to the B.C. Women's Provincial Milk Bank by other mothers. It is the only milk bank in B.C. Both the donor and the human milk are carefully screened, and the milk is pasteurized and tested to make sure that it is safe. The milk bank provides human milk to all the neonatal intensive care units in our province. The demand for human milk is great and donors are needed. Pasteurized donor human milk is only available by prescription. Talk to your doctor or midwife, or see the BC Women's Provincial Milk Bank at ***www.bcwomensmilkbank.ca*** for more information.

She Said

The best piece of advice I would give for breastfeeding is to be persistent. Don't give up if you have problems. There are many supports out there to help with breastfeeding and it is so worthwhile. I loved breastfeeding all of my babies. When they woke at night, it was so much easier to have their food warm and ready just when they needed it.

Warning about Bisphenol A

Bisphenol A (BPA) is a chemical used to make a hard, clear plastic known as polycarbonate. In 2008, Canada became the first country in the world to ban the sale of baby bottles that have bisphenol A.

Choose glass baby bottles or look for hard plastic bottles made without bisphenol A ("BPA-free"). Bisphenol A can also be found on the lining of cans of liquid infant formula. Visit ***www.chemicalsubstanceschimiques.gc.ca*** for more information.

unpasteurized breast milk. If you are thinking about giving your baby human milk from an informal donor, talk with your health care provider first to discuss the risks and benefits of all feeding options. For more information on human milk sharing check out: ***www.perinatalservicesbc.ca/Documents/Guidelines-Standards/HealthPromotion/InformalMilkSharing_FamilyInfo.pdf***

Do not microwave breast milk because the uneven heating can burn your baby's mouth.
Warm breast milk by:

- running the container under warm tap water (if using any infant bottle, keep the nipple area out of the water)
- putting the container in a bowl of warm water
- overheating breast milk can destroy some of the important ingredients.

Using a Bottle or Cup

Once they have settled into a breastfeeding routine after 4–6 weeks, some mothers introduce an occasional cup or bottle of pumped or hand-expressed breast milk. Remember to express milk from your breast if you have missed a feeding. This milk can be stored for future use.

If the baby is getting several bottles a day on a regular basis and your milk supply decreases because the baby is breastfeeding less, it is possible that the baby will start refusing the breast, even if breastfeeding is well established.

Expressing Breast Milk

When your milk supply is first coming in, you may only get a few drops when you express. To get more milk, hand-express and pump for the first few days. The amount you express will increase as you practice and your milk supply increases. If you express milk for a preterm or sick baby, or a baby having difficulty breastfeeding, express or pump for every feeding (eight times in 24 hours).

If you are expressing to get extra milk for a feeding when you will be away, you may need to express milk several times to get enough milk for one feeding. Find the time that works best for you. You may feel fullest in the morning, so this is a good time to try to express your milk. You can tuck a small (non-breakable) container under your nipple on the second breast while your baby is nursing. You may find you leak milk from both breasts when you have the let-down reflex. Save this milk for use later. You may want to express breast milk:

- If you are having challenges with breastfeeding and want to help increase or maintain your milk supply (see also Maintaining and Increasing Your Milk Supply, page 115).
- If your baby is unable to breastfeed (ill or in the special care nursery).
- If you are going to be away from your baby for longer than a few hours.
- To relieve full breasts so your baby can latch better.
- If you are going back to work.
- So your partner can feed the baby after 4 to 6 weeks when your milk supply is well established.

How can you express breast milk?

- by hand
- with a hand pump
- with an electric pump

All bottles, containers and pump pieces used for expressing milk should be washed and cleaned daily before use. For more information, see the How to Clean and Disinfect instruction sheet on the How to Choose, Prepare and Store Infant Formula page at ***www.healthyfamiliesbc.com***.

Hand Expressing

- Wash your hands with soap and water and get comfortable.
- Have a clean cup, bowl or jar ready to catch the milk.
- Gently massage your breast in a circular motion, working from shoulder to nipple.

- To start the let-down reflex, roll your nipple between your thumb and finger.
- Put your hand in a C-shape on your breast. Put fingers on the bottom and your thumb on the top at the outer edge of the areola.
- Gently push your thumb and fingers back towards your chest, then squeeze them together while you move them towards the nipple, but do not pinch your nipple.
- Catch the milk in the clean cup, bowl or jar.

Move your fingers around the areola in a circle to express from different parts of your breast. Press and release, repeat the movement on your breast and switch between breasts every few minutes.

Hand Pumps

Some women like to use hand pumps. These pumps can usually be bought in a drug store or child care supply stores.

Electric Pumps

Electric pumps are fast and efficient. They are useful if you will be expressing milk often or for a longer period of time. You are able to express both breasts at the same time with some electric pumps. Electric pumps that suck and release automatically work best. Many mothers find that pumps requiring them to create and release the suction with their fingers do not work well. Talk with the nurses in the hospital or your public health nurse about renting or buying an electric pump.

Collecting and Storing Breast Milk

Store your expressed breast milk for:

- Up to 4 hours at room temperature.
- 3 days in a fridge that has a temperature of 0 to 4°C. Store in the main part of the refrigerator, not in the door. If you do not have a fridge thermometer, it is best to freeze milk you do not intend to use within 24 hours.
- 1 month in a freezer compartment that is inside a fridge.

Expressing milk by hand

- Up to 6 months in a separate-door fridge freezer (they temperature changes if the door is opened often). Keep milk on the back top shelf at a temperature of -18°C.
- 6 to 12 months in a deep freeze (-20°C).
- Label your container, including the date and time it was expressed.

How do I use frozen breast milk safely?

Always use the oldest milk first. Breast milk can separate when it is frozen. Gently shake to remix once it thaws.

Thaw breast milk by:

- putting the container in the fridge
- running the container under warm tap water
- putting the container in a bowl of warm water (take care that the water does not touch the lid of the container).

Hunger and Fullness Cues

Look for cues (signs) that your baby is ready to feed. These signs are called hunger cues. Hunger cues may include bringing hands to mouth, rooting (moves head as if she is looking for your nipple), mouth opening, lip licking, sucking, clenching fingers and fists over chest and tummy, bending arms and legs, or fussiness. Crying is a late hunger cue.

Points to Remember

Do you have too much breast milk? Consider contacting the BC Women's Milk Bank at BC Women's Hospital and Health Centre.

Call 604 875-3743 to find out about the screening process to become a milk donor.

Once milk has thawed, it may be refrigerated for up to 24 hours. Do not store at room temperature. Avoid wasting thawed breast milk. Thaw only what you need for one feeding.

Do not refreeze breast milk.

Do not heat breast milk on top of the stove. It can get too hot too fast.

Overheating breast milk can destroy some of the important ingredients.

Do not microwave breast milk because the uneven heating can burn your baby's mouth.

Warm breast milk by:

- running the container under warm tap water (if using any infant bottle, keep the nipple area out of the water)
- putting the container in a bowl of warm water

Breastfeeding in Public

More and more women are breastfeeding in public these days, but if you're just starting out, it's understandable that you might be uncomfortable. It's tough to learn a new skill when people are watching and many women are embarrassed by the thought of exposing their breast. There are lots of ways around these concerns. Here are some ideas to consider:

- Breastfeeding is normal – breasts exist for feeding babies.
- Breastfeeding can be performed discreetly. Try it sitting in front of a mirror. See how little breast actually shows when you breastfeed.
- Some mothers will place a cover, such as a light receiving blanket, over their baby while they latch on, removing the cover once the baby is latched.
- When enough mothers breastfeed in public, it will become so common, no one will notice.
- If someone has a problem with breastfeeding, it is their problem, not yours or your baby's.
- In British Columbia, all mothers have the legal right to breastfeed in any public area. Asking a mother who is breastfeeding her child to move or cover up is illegal.

Formula Feeding

Human milk is important for infant growth and development. Your milk is the only food your baby needs for the first 6 months of life, and breastfeeding can be continued until your baby is 2 years of age or older. If you are unsure about breastfeeding, find it difficult to breastfeed or would like to discuss other infant feeding options you can call your local public health nurse, call HealthLink BC at 8-1-1, or talk to your health care provider for more information. They can provide you with information on the benefits, risks and costs of different feeding options. They can also ensure that your baby is gaining weight and growing well and support you to achieve your infant feeding goals by helping to put plans and supports in place.

Babies should not be given anything other than breast milk or iron fortified formula in the first 6 months. Cow's milk, goat's milk, condensed or evaporated milk should not be given to your baby until they are 9 to 12 months of age. Other drinks such as fortified soy or rice beverages may be offered after 2 years of age. Refer to the resource *Toddler's First Steps* for further information on feeding older babies and toddlers.

More information about how to get started with infant formula is available from BC Health Files #69a, *Feeding Your Baby Formula: Before You Start*, and #69b, *Feeding Your Baby Formula: Safely Making and Storing Formula*, which can be picked up at your local public health office or viewed online at ***www.healthlinkbc.ca.*** You may also want to view the HealthLink BC page *Reducing Risk of Food Allergy in Your Baby*. You can also call Dietitian Services at HealthLink BC at 8-1-1.

For more information on how to safely prepare and store infant formula, the article *How to Choose, Prepare and Store Infant Formula* can be viewed online at ***www.healthyfamiliesbc.com***. This page has printable, easy-to-use instruction sheets available on how to safely prepare each type of formula, and how to properly clean all the necessary equipment. Your health care provider may be able to provide a printed copy of this resource.

Although all commercial infant formulas must undergo a safety inspection and nutritional assessment by Health Canada, keep in mind that it is not a sterile product. Although very rare, it's possible for something to go wrong when it's being made and cause it to come into contact with bacteria or have a missing ingredient. To check for safety concerns and product recalls, visit the Healthy Canadians website (***http://healthycanadians.gc.ca/recall-alert-rappel-avis/index-eng.php***) and compare the lot numbers of your formula cans to the lot numbers on this website. You can also sign up for alerts.

Breastfeeding and Work

You can breastfeed and work outside the home. In British Columbia, employers must make reasonable efforts to allow you to breastfeed or express milk at work.

How can you be successful?

- Have breastfeeding well established before returning to work. The first six weeks or more are the most important for getting a good milk supply for your baby.
- Contact your public health nurse, lactation consultant, La Leche League or breastfeeding support group for help and advice.
- Talk to your boss before you go back to work. Talk about the importance of support for breastfeeding. Breastfed babies are healthier. Their mothers need less time off work to care for sick babies.

You will need:

- A quiet, smoke-free place to feed or express milk.
- A fridge to store expressed milk. If you do not have a fridge at work, use a Styrofoam box with an ice pack to store expressed milk that will be fed to your baby within 24 hours.
- A reasonable workload.

To keep enough breast milk, you will need to pump your breasts or feed your baby one to three times during a eight-hour work shift.

Remember to take healthy snacks to work, as well as breast pads, breast pump, clean cups or jars to store your breast milk and phone numbers of support people.

How can I get ready to go back to work?

- Learn how to express your milk by hand or pump. Start storing milk 10 to 14 days before you plan to return to work.
- About two weeks before you go back to work, slowly introduce your baby to other ways of feeding. Let your baby get used to a cup or bottle. It may help if someone other than you feeds the baby at these times. If you use a bottle and your baby refuses the nipple, try a different nipple or a cup.
- Breastfeed as soon as you see your baby after work and breastfeed often on your days off, in the evening and at night.
- Your baby may refuse food, wake at night or be fussier when you are away.
- Tell your child care provider how important breastfeeding is to you and your baby. Talk about when you will be gone, when you will breastfeed your baby and about your baby's feeding routines. Make sure your caregiver knows how to safely prepare and store milk.
- Get extra help with chores at home.

Vitamin D Supplement

Health Canada recommends that all breastfed, healthy, full term babies get a daily liquid vitamin D supplement of 400 IU per day. You should start giving your baby vitamin D supplement at birth. Carefully read the label for directions. Vitamin D supplements are available at your local pharmacy or health food store.

Continue giving it until your baby's foods include 400 IU of vitamin D each day. Babies fed only formula do not need vitamin D. If your baby is getting breast milk and formula, she still needs a vitamin D supplement. Call Dietitian Services at HealthLink BC (at 8-1-1) for more information about vitamin D supplements.

- Your baby needs vitamin D to build strong, healthy bones and teeth.
- Not enough vitamin D increases the risk of your baby getting rickets – a disease that affects the way bones grow and develop.
- After 12 months, give your baby foods that contain vitamin D, such as cow's milk, each day. 500 mL (or two cups) of whole milk meets your baby's vitamin D needs. Other sources include fish, egg yolks, soft margarine, bread made with vitamin D-enhanced yeast and yogurt or cheese made from fortified milk.

Vitamin D and Sunlight

Sunlight is the main source of vitamin D, but wearing sunscreen prevents vitamin D from being formed. Canada's northern location and our use of sunscreen to lessen the risk of skin cancer means we can't count on getting enough vitamin D from being in the sun. Babies less than 12 months of age should be kept out of direct sunlight.

Children and adults can get additional vitamin D from foods. See HealthLinkBC File #68e, *Food Sources of Calcium and Vitamin D* at ***www.healthlinkbc.ca***. Also see page 135 for information about sun safety for your baby.

Feeding the First Solid Foods

Breast milk is the only food your baby needs for the first six months of life. Sometimes babies as young as four to five months seem interested in eating solid foods, but it doesn't mean they are ready. It takes approximately 6 months for a baby's digestive system to mature enough to handle solid foods. At around six months, a baby is usually ready for solid foods when he can sit up with some support, open his mouth when he sees food coming and move the soft food from the front of the tongue to the back of his mouth to swallow. If you wait until your baby can do these things, your baby will feel more confident about learning to eat and will give you signals about hunger, fullness, likes and dislikes by turning his head away.

For more information about how to introduce solid foods, see the section on Introducing Solid Foods in *Toddler's First Steps* or the HealthLink BC File #69c Baby's First Foods at ***www.healthlinkbc.ca***.

For more information about preventing a food allergy, see page 146.

Baby Care

Emotional Attachment

Emotional attachment is one of the key factors in raising a happy and confident child. A healthy attachment is when you and your baby become bonded into a close and connected relationship. When your baby is attached to you in this healthy way, she feels safe, secure and protected on physical, emotional and mental levels.

Attachment between you and your baby occurs gradually over time, through day to day actions and routines. To build a healthy emotional attachment with your baby:

- Listen, watch and try to understand her cues about what she needs and wants.
- Respond to her in a loving way.
- Respond to her as quickly as you can.
- Be consistent.

These actions will build her trust that you are there for her and that she is safe and secure.

Is Baby Too Warm or Too Cold?

The best guide for how many clothes or blankets a baby needs is to dress your baby as you would dress yourself. Your baby needs to be comfortably warm or cool, depending on the temperature outside and inside your house.

In the house, babies need about the same number of layers of clothes as an adult to stay warm. When putting your baby to sleep, it is recommended that you use a sleeper and a light blanket or a blanket-weight sleeper. Keep your baby's head uncovered when sleeping. This is so your baby does not get too hot.

If your baby is overdressed or is wrapped in too many blankets, he may develop a rash that looks like clusters of tiny pink pimples surrounded by pink skin. Your baby may also get sleepy and sweaty. Infants who are too cold will usually fuss until the problem is fixed. Cold hands and feet don't necessarily mean that the baby is cold. Feel the warmth on the upper arms or thighs. Add a sweater or a light blanket.

A large portion of an infant's body surface area is on their heads. In other words, their heads are large in comparison to their bodies. Because of this, they can lose a lot of heat through their heads. When outdoors, use a hat to keep your baby warm when the weather is cool. In summer, protect your baby's head from the sun by using a light, wide-brimmed hat, keeping him in the shade and out of the mid-day heat.

Swaddling
Swaddling (wrapping snugly in a blanket) is not recommended. If you are thinking of swaddling your baby ask your health care provider how to make swaddling safer. If you do chose to swaddle, your baby should always be placed on her back to sleep on her own sleep surface. Babies who can roll over on their own should not be swaddled. Never cover your baby's head with the blanket when sleeping.

Sleeping

For the first month, your baby may sleep for about 15 hours of every 24 hours. She will usually not sleep longer than two or three hours at a time. In the early days, it is common for babies to wake up several times at night. Getting enough sleep can be a big issue for many parents. Breastfeeding is the best way to get your baby back to sleep. Over time, your baby will gradually sleep longer during the night.

Here are a few tips:

- Have a clear difference between daytime and nighttime sleeping. When you are up at night to feed your baby, keep the room darkened and do not turn on the TV or music. Try not to play with or stimulate your baby before putting him back down to sleep. During the daytime, let your baby sleep in a lightened room with normal daytime noises. In the daytime sing to your baby, play and generally get on with your day.
- Have enough nap time during the day. An over-tired baby will not sleep better at night.
- Make sure your baby is warm but not hot.
- Put your baby to sleep on his back in a safe sleep environment.
- Have a routine that you follow at night. This may not be possible in the first few months. As your baby gets older, give him a warm bath at night followed by rocking or singing and quiet time. This routine signals to your baby that sleep is coming.

Safety and Sleeping

Safe Sleeping for You and Your Baby
You need to carefully choose where your baby sleeps for every sleep, including nap time. There are many ways to help you and your baby sleep well and safely. Be sure everyone who cares for your baby knows and follows safe sleep practices.

Room sharing refers to the sleeping arrangement where the infant sleeps in the same room as a parent, but not in the same bed. Room sharing, near to the mother, on a separate sleep surface is recommended for the first 6 months of life. Having your baby sleep in the same room, but on a separate firm sleep surface may help lower the risk of Sudden Infant Death Syndrome (SIDS). Being close can also help to calm your baby if he is unsettled.

Bedsharing means the baby shares the same sleep surface with another person, usually the mother. In many areas of the world it is a common practice for mothers to sleep with their babies on a firm, flat mat or mattress on the floor so they can watch them, breastfeed them and be near them.

You need to know the benefits and risks of room sharing and bedsharing, and think about them each time you choose where your baby sleeps. Having your baby in bed means that you can breastfeed in comfort, and your baby can feed more often. However, it is easy to fall asleep while breastfeeding, especially when lying down. Keep in mind that adult beds are not designed for babies as they may get trapped or wedged or a parent may roll on them. The safest place for a baby to sleep is on their back in a crib or bassinet beside your bed.

The Canadian Pediatric Society (CPS) discourages bedsharing for the first year of life. Sharing a bed with your baby can increase your risk of smothering your baby, especially if you are very tired or have been drinking alcohol or using drugs. The CPS also knows that some parents will choose to share a bed with their baby. Bedsharing should be discussed with your health care provider.

Consider the following when choosing where your baby sleeps:

- **It is safest to put your baby on his back to sleep. This is very important!**
- Be sure your baby sleeps on a firm, flat mattress. Do not put your baby to sleep on a pillow top mattress, waterbed, sagging mattress, air mattress, couch or other surface that is soft.
- Do not put your baby down to sleep on or beside a pillow.
- Do not sleep with your baby while sitting or lying on a sofa, recliner or chair. Your baby could fall between the cushions and suffocate, or fall to the floor.
- Be sure your baby does not get too warm. Use only a light blanket or blanket-weight sleeper. Make sure the blanket cannot cover your baby's head. Avoid heavy blankets, quilts and duvets to prevent overheating or suffocation.
- Use a crib that meets Canadian safety standards and don't use pillows, bumper pads, sheepskins or comforters, or have stuffed toys in the crib.
- Do not leave your baby alone on an adult bed or let other children or pets sleep in the same bed as your baby.

You should NOT sleep with your baby if you or any other person in the bed:

- is a smoker, or your baby is exposed to second-hand smoke
- have been drinking alcohol or using drugs
- have taken any medicines that could make you extra sleepy
- are very tired, to the point where you would not be able to respond to your baby
- have long hair that is not tied back, or
- if your baby was born premature (before 37 weeks) or was small-at-birth (weighing less than 2.5 kg or 5.5 pounds when they were born).

SIDS (Sudden Infant Death Syndrome)

SIDS, also known as crib death, is the sudden and unexpected death of a healthy baby. There are steps you can take to lessen the risk.

- **Babies should sleep on their backs on a firm surface.**
- Once your baby can turn over on his own, continue to put your baby on his back to sleep; there is no need to continuously reposition your baby onto his back if he has rolled to his side or tummy during sleep. When your baby is awake, allow some tummy time to help develop arm and neck strength. See page 141 for more information on tummy time.
- **No one should smoke inside your home or around your baby.** A smoke-free home is important for your baby's health and to reduce the risk of SIDS.
- Keep your baby warm, not hot. To check if your baby is too hot, place your hand on the back of the neck. Your baby should not be sweating.
- Breastfeeding helps prevent SIDS.

Co-sleepers

A co-sleeper is a type of crib that attaches to the side of an adult bed. These may pose a danger of suffocation, as infants have been trapped between the edge of the mattress and the side of the co-sleeper.

A baby is safest when put down to sleep on their back, in a crib or bassinet that meets Canadian safety standards, with no quilts, pillows, stuffed toys or other soft material in the crib.

Warning about using cribs with a Moveable (Drop) Side

In 2016, the sale of new or used drop-side cribs was banned in Canada. Over time a crib's drop-side hardware may break or deform. The drop-side can also be installed upside-down, which can result in broken parts. All of these problems can cause the drop-side to fall apart in one or more corners. If the drop-side falls off, it creates space between the drop-side and the crib mattress. Your baby can fall into the space and get trapped. Your baby could also fall out of the crib. If you do use a drop-side crib, follow the manufacturer's directions carefully so that you put the drop-side on properly. Check your drop-side hardware regularly. Some manufacturers provide kits that safely secure the drop-side so it does not move.

Visit ***www.hc-sc.gc.ca/cps-spc/advisories-avis/index-eng.php*** for information on recalls.

Points to Remember

Do not use:

- bumper pads
- pillows
- stuffed toys
- comforters
- sheep skins

These things can stop good air circulation around your baby's face. Plastics, such as the mattress wrapping, may also prevent air circulation. These should be removed to reduce the risk of SIDS and suffocation.

Do not place your baby to sleep on:

- pillow top mattresses
- couches or sofas
- recliner chairs
- pillows
- down comforters
- beanbag chairs
- waterbeds

Car Seats are for Travel Only
Car seats are designed for safety when traveling with your baby in a car. Some babies fall asleep while travelling in a car seat. Take your baby out of the car seat once you have reached your destination. Your baby should not be left to sleep in the car seat. Sleeping babies should be placed on their backs on a flat, firm, safe sleep surface.

Sleeping Equipment

What do I need to know about cribs?
Your baby can sleep in a crib, cradle, bassinet, basket, or even a box or drawer as long as the sleep surface is firm and not soft. When your baby becomes active you may find that a crib is needed.

Only use cribs that meet the Canadian Cribs, Cradles and Bassinets Regulations. Check your crib regularly before using it, and do not use it if any parts are loose or missing, or if there are signs of damage. Be sure that each part of the crib is properly and securely in place at all times. Follow the manufacturer's instructions when putting the crib together.

Do not use a crib made before 1986 or that does not have a label with the date it was manufactured. In 2016, the sale of new or used drop-side cribs was banned in Canada. If you do use a drop-side crib or a crib that folds up, make sure it has double locks to prevent the crib from folding or collapsing.

What do I need to know about mattresses?
The crib mattress should be firm, no more than 15 cm (6 inches) thick, fit the frame properly, have no gaps greater than 3 cm (1 1/8 inches) along the sides or ends of the crib. If spaces are larger than this, your baby can get his head stuck in any gaps between the mattress and the frame and suffocate. If the mattress is worn or has a tear, it is dangerous. Do not use it. The mattress support should hold firmly and be checked often. You can do this by shaking the mattress support, thumping the mattress from the top and pushing hard on the support from underneath. Make sure all screws, locks and clamps are tight.

What do I need to know about bedding?

- To protect the crib mattress, you can use either a quilted crib pad (one side waterproof) or a mattress cover, placed under a bottom sheet. Do not use plastic sheets as they can get in the way of breathing.
- Pillowcases tucked in firmly, can be used as a bottom sheet for a cradle or bassinet mattress.
- You can use some bottom sheets (can be fitted) for the crib mattress.
- In a warm room, a sleeper and a light blanket or a blanket-weight sleeper should be enough to keep your baby comfortable. Your baby should be warm but not hot.
- To prevent overheating or suffocation do not use heavy blankets, quilts or duvets.
- Top sheets are not recommended until your child is an older toddler. Babies can get tangled in a top sheet.
- Never cover your baby's face or head with blankets.

Diapering

Your newborn baby may need her diaper changed 10 to 15 times a day. Since you will spend a lot of time changing diapers, make it a special time for talking, laughing and playing with your baby. You do not need to wake your baby to change her diaper.

Your pregnancy hormones may have caused some changes in your baby's body after birth. A girl's genitals may look larger than normal and you might see a small amount of bleeding or white discharge from the vagina. Boys may have a reddened scrotum. Breasts in both boys and girls may be larger than normal and may even leak a small amount of milk. These changes are normal and will go away in a few days.

Tips for Diapering

- Wash your hands with soap and water before and after each change.
- Put your baby on a flat, safe surface, such as a change table with side rails or on the floor.
- Keep one hand on your baby at all times.
- Babies move around, so keep creams, pins, etc., out of reach. Give your baby a toy or something to watch to keep him entertained.
- Wipe the diaper area with a warm wet washcloth or baby wipe (one that does not have perfume).
- Pat the area dry or allow it to air dry.
- Safety pins pushed into a bar of soap are easier to pin into the diaper.
- Do not use powder or cornstarch. A puff of powder near they face or nostrils can cause choking and breathing difficulty.

How do I diaper and clean a girl?

Wipe from the front to the back to prevent germs from her bowel movements getting into the urinary tract. Gently clean between the outer folds of the labia. There is no need to clean inside the vagina.

How do I diaper and clean a boy?

Do not pull the foreskin back when cleaning the penis. Pulling this skin back may cause infection or tightening of the foreskin. Wash the area well and clean from the front to the back.

What is diaper rash?

This is a red and painful rash on the diaper area. Rashes can be caused by:

- Irritation from dampness of urine or bowel movement on the skin.
- Allergic reaction to soaps, perfumes or oils that touch the skin.
- Yeast infection that can be spread from the mouth or from stool. A yeast infection can develop after your baby has had a rash for several days.

Hints to Prevent Diaper Rash

- Wash your hands before and after changing diapers.
- Keep the skin dry by changing diapers as soon as the are wet or soiled.
- Wash the diaper area with warm water and dry well. Do not use soap.
- Take the diaper off and expose the area to the air for 10 to 15 minutes, three or four times a day. You can lay your baby on an absorbent towel and play with her during this time.
- When the diaper area is clean and dry, rub on a thin layer of zinc-based cream.
- Avoid using perfumed fabric softeners or baby care products like diaper wipes (purchased diaper wipes may cause or further irritate diaper rash).
- If you use cloth diapers you may want to do an extra rinse when washing the diapers or use an antibacterial product or vinegar in they wash. This will decrease the ammonia build up in the diapers caused by urine.
- Avoid using airtight plastic pants over the diaper.
- Try switching to cloth diapers if you are using disposables and the rash is getting worse.

Contact your health care provider if you have followed these suggestions and the rash lasts longer than five days, has blisters, pus, peeling areas or crusty patches, or is mainly in the skin creases.

Choosing Diapers

Your baby will be in diapers for two to three years. Consider these factors when making your choice.

Disposable diapers:

- do not need to be worn with a waterproof cover
- will cost more than cloth diapers
- come in a number of styles and sizes
- are convenient, no laundering is needed
- create a lot of extra garbage

Cloth diapers:

- can be made or bought
- can be fastened with diaper pins or velcro fasteners
- some types will need to be worn with a waterproof cover
- can be cleaned by a diaper service that picks up soiled diapers and leaves clean ones

Flushable and/or compostable diapers:

- can be flushed and/or composted, depending on the brand
- may be entirely flushable/compostable or have a reusable cloth cover with a flushable/compostable insert
- may be made of recycled materials

Washing Cloth Diapers

- Diapers may be soaked in a diaper pail until there are enough to be washed.
- Fill the diaper pail three-quarters full of water and add 175 ml (¾ cup) of vinegar (not bleach).
- Rinse soiled diapers in the toilet. Wet diapers do not need to be rinsed.
- If you use diaper pail deodorizing tablets, you must keep the pail out of reach of your children.
- When the diaper pail is full, empty the contents into the washing machine and spin out the excess water.
- Fill the machine with hot water to the highest water level.
- Use a phosphate-free detergent or biodegradable soap. Run diapers through an extra rinse at the end of the cycle.
- Dry diapers in the dryer on a hot setting or hang outside to dry. Many diapers will stay softer if put in a dryer for 15 minutes, then hung outside on a line or rail to finish drying.

Bathing

You don't need to bathe your baby every day. Washing the face, neck, hands and diaper area, in that order and with attention to skin folds, can be done daily. Your baby may love the bath or cry when he is naked. Most babies usually relax when they are floating in the water. Don't worry, you are not harming your baby. If you are calm and talk gently, your baby will get used to the routine and start to enjoy the bath. For the first bath it helps to have someone with you who has done it before. Try to make bath time a relaxed playful experience for your baby. Smile, make eye contact, sing and talk with your baby.

General Tips for Bathing

- Have the room warm, about 22 to 27°C (72 to 80°F).
- Remove jewellery that could scratch your baby.
- A baby can have a bath in the sink, a basin, a baby bathtub or in a bathtub with an adult.
- Lay out a blanket or towel next to the sink, basin or baby bathtub to lay your baby on.
- Bath water should be lukewarm. Check the temperature of the water on your wrist or elbow. It should feel warm, not hot.
- Have everything within easy reach before you start.
- Always keep at least one hand on your baby when in the bath or on the table.
- Using oils in the bath can make your baby slippery. Apply any oils you may want to use after the bath.
- When washing, think cleanest to dirtiest. Wash the eyes and face first.
- Another way to bathe your baby is to have one adult sit in a bathtub while the other passes the baby in for a bath. When the bath is finished, the baby can be passed to the other adult. Your baby may feel more secure and cry less.

Eyes and Face

- Wash the face using warm water only. Soap is not needed on this area.
- Wipe eyes from inner corner to the outer corner.
- Do not use cotton tipped applicators in your baby's ears, nose or eyes as they can harm the delicate tissues.
- Use a soft washcloth, and only clean the outer part of the ear. Don't dig into the ear canal.
- Wipe your baby's gums with a soft clean cloth every day. See page 138.

Scalp and Hair

- You can use a mild soap or baby shampoo. Lather up and rinse well with clear water.
- Your baby's scalp is normally mildly scaly. If the scalp is crusty you can rub in a small amount of non-perfumed oil, then wash if off. Oil left on the scalp can cause a build-up of oil and skin known as cradle cap.

Never leave your baby alone in the bath.

Points to Remember

To prevent burns, keep the temperature of your hot water tank below 49°C (120°F).

Points to Remember

Health Canada recommends that parents not use bath seats or rings because of safety concerns. It is very easy for any infant to tip over or slip underwater and drown. This can happen in less than a minute.

Points to Remember

Another way to bathe your baby is to have one adult sit in a bathtub while the other passes the baby in for a bath. When the bath is finished, the baby can be passed to the other adult. Your baby may feel more secure and cry less.

Points to Remember

Call your health care provider if:

- The skin around your baby's umbilical cord is warm, red or swollen.
- There is a bad-smelling discharge from the cord.
- The cord is very wet and will not dry with exposure to air.

Points to Remember

If a rash flares up and becomes red, itchy and oozes fluid, call your health care provider. For more information on checking the seriousness of a rash and knowing when to call a health care provider, call HealthLink BC at 8-1-1 for confidential advice and help.

Umbilical Cord

- The umbilical cord stump will usually fall off in 5 to 15 days.
- Keep the cord clean and dry to prevent infection.
- Use water on a cotton-tipped applicator or washcloth to clean gently around the base of the cord. Wipe away any cord discharge.
- Clean around the base of the cord after bathing and at diaper changes.
- Fold the diaper below the cord to stop irritation and to keep it dry and exposed to air.
- Continue to clean the belly button (umbilicus) for a few days after the cord falls off.

The cord may be infected if the area around the cord becomes reddened, swollen or has pus coming from it. Call your health care provider or the public health nurse if you are concerned.

Diaper Area

Wash this area last as it will be the least clean.

Drying

After you have bathed your baby, place her on the towel and pat her dry, being sure to remember the skin folds. Your baby will cool down quickly when wet. Have clothes ready to dress her.

Caring for Baby's Skin

A newborn's skin is usually soft and smooth but may be peeling or wrinkled in the first few days after birth.

What are the tiny white raised dots on my baby's face?

These spots are called milia. Your hormones before birth cause extra oil gland activity in your baby. Milia are caused by plugged oil glands and will usually clear within three to four weeks. Do not try to remove or pop these glands.

Do I need to treat newborn rash?

Newborn rash is common in the first few months after birth. This rash is blotchy red with tiny pin points that can be found anywhere on the body. The cause is unknown. It is normal and will pass on its own with no treatment.

What can I do to avoid rashes on my baby?

- Remove your baby's extra clothing. Keep him warm but not hot.
- Bathe your baby every second or third day. Keep the baths short and the water lukewarm, not hot. Water and soap can dry and irritate the skin.
- Dress your baby in 100% cotton.
- Use plain non-medicated, unscented skin lotions or oils to keep the skin moist. Do not use perfumed soaps, lotions or fabric softeners.

Caring for Baby's Nails

Keeping your baby's nails trimmed will help prevent your baby from scratching himself.

- Use blunt scissors or an emery board to cut or file your baby's nails.
- The best time to do your baby's nails is when he is asleep or at least sleepy and his hands are open and still.

Jaundice

Jaundice appears in about half of full term babies and about three-quarters of preterm babies. Following birth, your baby has extra red blood cells. As the blood cells breakdown, a yellow-coloured substance called bilirubin is released. The yellow-coloured substance in the baby's blood causes the skin and the whites of the eyes to take on a yellowish tinge called jaundice.

In most infants, jaundice is mild. It comes on during the first three to five days and lasts only a few days. The only treatment needed is lots of breastfeeding. Your baby may be a little sleepier and may need to

be woken on a regular basis – every three hours – for feeding. The extra breast milk will help get rid of the bilirubin. To help with jaundice, feed your baby as often and for as long as she wants. Do not give water by bottle as bilirubin is better eliminated through stools than urine. Water will only fill up the tummy and decrease breastfeeding. This will decrease the number of stools.

In rare cases, jaundice is severe. Untreated severe jaundice can lead to brain damage and deafness. With higher levels of jaundice, your baby still needs lots of breastfeeding. She will be placed under special lights to get rid of bilirubin.

Call your health care provider if:

- Your baby seems sleepy and refuses the breast or bottle.
- You notice your newborn is jaundiced, especially on his arms and legs.

Bowel Movements

Normal Stools

For the first week after birth, the look of your baby's stool will change every day. Usually within the first 24 hours after birth, your baby will pass his first bowel movement, called meconium. This first stool will be thick, dark, greenish black, sticky and tar-like, and have no smell. The next stool is called transitional stool. It will be looser and greenish brown. After the meconium has passed, your baby's stools will vary, depending on how your baby is fed. If your baby is less than two weeks old and has fewer than two stools per day, contact your health care provider or public health nurse.

Sun Safety for Your Baby

How can you protect your baby from the sun and heat?

Your baby has sensitive skin that is easily damaged by the sun, even on cloudy or overcast days. Protect your baby from sunburns to reduce the chance of skin cancer by:

Keeping your baby out of the sun and heat

- Keep babies less than 12 months of age out of direct sunlight. Seek or create shade for your baby.
- Try to keep your baby out of the sun between 10 a.m. and 4 p.m., when the sun's rays are the strongest.
- Never leave your baby alone in a car.
- Do not let your baby get overheated.
- Make sure she has plenty of breast milk to drink in hot weather. Offer a drink every hour or so.
- Dress your baby in loose clothing that offers protection from the sun.

Dress for protection

- Dress your baby in loose clothes that have a tight weave.
- Use a large-brimmed hat with a neck cover and no ties.
- Use sunscreen.
- Because sunscreen can be irritating if it gets in your baby's eyes, use sunscreen only on small areas of skin, while protecting most of the skin with clothing, hats and shade. You can use water-resistant sunscreens rated SPF 30 or higher and approved by the Canadian Dermatology Association. (Look for their logo or name on the label.)
- Do not wait for signs of sunburn to get your baby out of the sun. Sunburns do not usually show up for six to 24 hours.

Put sunglasses on your baby

Stools of Breastfed Babies

After the third or fourth day, the stool will tend to be soft and golden-yellow (mustard) coloured. The stools will be soft and runny with a curdled or seed-like appearance. They will not smell. Breastfed babies often pass a stool after each feeding. After day 4, your baby should have at least 3–4 stools about the size of a loonie or 1 large stool every 24 hours in the first weeks. After the first month, bowel movements happen less often. Breast milk leaves very little waste in the intestines so bowel movements may come only once every few days to once a week. Almost all infants will grunt and turn red when passing a stool. If your baby is totally breastfed, he will not be constipated.

Stools of Formula Fed Babies

Formula-fed infants pass stools that are pasty and pudding-like. They are pale yellow to light brown with a strong odour. Formula-fed newborns usually have 1–2 bowel movements daily in the first weeks. After the first month your baby may have a bowel movement every 1–2 days. It is important to know that almost all infants will grunt and turn red when passing a stool. If you think your child is having a hard time passing a stool, contact your health care provider.

Abnormal Infant Stool Colour

If your newborn's stool is pale-coloured, it may be a sign of a rare liver disease called biliary atresia. As part of the Biliary Atresia Home Screening Program, after the birth of your baby and before leaving the hospital, you are given a stool colour card that contains photos of normal and abnormal infant stool colours. If you have a home birth, you're given the stool colour card by your midwife.

Check your newborn's stool colour against the colour card every day for the first month after birth. If you see an abnormal stool colour, call or email the Biliary Atresia Home Screening Program directly:
1 877 583-7842 (1 877 5-TEST-4-BA)
Email: psbc@phsa.ca

The symptoms of biliary atresia are:

- jaundice that lasts longer than two weeks; and
- pale yellow, chalk-white or clay-coloured stools.

There is no single blood test for biliary atresia, so checking your baby's stool colour to determine if it is abnormal is the main way to detect this rare disease early.

Constipation

A baby who is completely breastfed rarely gets constipated. Breast milk is almost totally digested. After the first few weeks, a fully breastfed baby may go as long as a week between bowel movements. Newborns and infants may grunt and get red in the face when having a bowel movement. This does not mean they are constipated. Babies differ in how often they have bowel movements. After the first few weeks, some newborns will have stools every day. Others will go for days without a bowel movement. Constipation may be evident if stools are dry and hard or if your baby has difficulty passing them. If constipation continues for more than a week, or if there is fresh blood in the baby's stools, see your health care provider or call HealthLink BC at 8-1-1. Do not use laxatives, suppositories or enemas unless a health care provider prescribes them.

Peeing (Urination)

When and how much should my baby pee?
Your baby may pee either immediately after birth or several hours later. Most newborns will pee within 24 hours of birth. In the first 3 days of life, 1–3 wet diapers per day are normal. By days 4–6, as your milk supply increases, your baby should have 5 or more very wet diapers per day (see page 114).

Urine will be pale and may be difficult to see. To tell if your baby has peed:

- feel how heavy the diaper is compared to a dry one
- a tissue or paper towel can be used inside a disposable diaper to see if it becomes wet
- cut the disposable diaper and feel if it is wet.

It is common to find a pink stain on the diapers. A rusty orange stain may also be seen on the diaper in the first 1–3 days after birth. This stain is caused by uric acid crystals in the urine. If you notice these crystals after the fourth day, feed your baby more often.

Call your health care provider or HealthLink BC at 8-1-1 if:

- the uric acid crystals continue
- urine is bloody or the colour of cola
- there is little or no urine for 8 hours

Diarrhea

Diarrhea is often caused by an infection or some other illness or irritation. Diarrhea is different from normal stools. Diarrhea stools are watery and foul smelling. Diarrhea can cause dehydration. Babies can become very sick, very quickly.

Most cases of mild diarrhea can be treated at home. Your baby should be taking in enough fluids and nutrients and be peeing normal amounts and seem to be improving. If your baby has signs of dehydration, see your health care provider right away.

Signs of Dehydration
Your baby could be dehydrated if she has any of these signs:

- decreased urination (fewer than 4 wet diapers in 24 hours after 4–5 days of age);
- increased thirst;
- no tears;
- dry skin, mouth and tongue;
- faster heart beat;
- sunken eyes;
- grayish skin;
- sunken soft spot (fotanelle) on baby's head; and
- is irritable or extremely difficult to wake up.

Dehydration in babies is very serious. If your baby has any of these signs, call your health care provider or HealthLink BC at 8-1-1 right away.

Teething Necklaces
Young children can be injured by necklaces marketed and sold with the promise of preventing or reducing teething pain. Pieces of the necklace can break off, creating a choking risk, and there is also risk of strangulation. Parents and caregivers should avoid placing a necklace of any kind on a child under 3 years of age.

Vomiting

Vomiting is the forceful throwing up of large amounts of liquid. Vomiting is usually caused by a virus or bacteria. It can lead to dehydration. See your health care provider if your baby is unable to keep any fluids down or appears dehydrated.

Coughing and Sneezing

Babies clear their nasal passages by coughing and sneezing. This is common in newborns and does not mean they have a cold. It is uncommon for a newborn to develop a cold within the first six weeks. If you are concerned, check with your health care provider or call HealthLink BC at 8-1-1.

Many over-the-counter cough and cold medicines are being relabelled to say: "Do not give to children under 6." Talk to your health care provider, pharmacist or call HealthLink BC at 8-1-1 before you give any cough and cold medicines to your baby.

Dental Care

Tooth decay is an infectious disease caused by bacteria in the mouth. Babies are not born with the bacteria that cause decay. These germs can be passed from parent to a baby through saliva if sharing spoons, tasting food or licking the baby's soother. If either parent has tooth decay, they should see a dentist. Good dental health can help to prevent passing bacteria to your baby.

Once babies have their first teeth, allowing them to have bottles during the day for long periods or during sleep times (nap or overnight) can lead to tooth decay.

To learn more about baby dental care, go to BC HealthFile #19a, *Dental Care for Your Infant and Toddlers* at ***www.healthlinkbc.ca***.

How can I care for my baby's mouth?
You should start to clean your baby's mouth everyday with a clean, wet cloth soon after birth.

Find a position that is comfortable for both of you. One suggestion is to have your baby lie in your lap.

Position your baby so her head is stable and you can see into her mouth.

- Wipe all around your baby's gums with a clean, wet cloth held over your finger.
- Once teeth appear, lift the lip so you can see along the gum line when cleaning.
- Use a soft baby toothbrush and a grain of rice-sized amount of fluoride toothpaste to clean teeth.
- Brush your baby's teeth twice a day at morning and bedtime.
- For more information on fluoride, refer to *Toddler's First Steps* and BC HealthFile #28, *Water Fluoridation Facts* at ***www.healthlinkbc.ca***.

Teething

Each baby has its own schedule for teething. Most babies get their first tooth between 6–9 months. Once teething starts, it continues almost uninterrupted for about two years. Some babies have no difficulty with teething while others may become fussy and uncomfortable.

Some things you can do to relieve sore or tender gums:

- Give your baby a clean, chilled teething ring or cold, wet cloth to chew on. Teething gels and ointments are not recommended.
- Clean and massage the gums regularly to ease discomfort.
- Give your baby extra love and patience to help him through the teething process.

Your baby's first teeth are very important. Although baby teeth will be replaced by permanent teeth, first teeth:

- Make it possible for your baby to eat solid foods.
- Play a role in helping your baby learn to speak.
- Help in jaw development and hold the space for the permanent teeth.

Your child will have some baby teeth until he is 11 to 12 years of age.

Immunization

What are immunizations?

Immunizations help to protect your child from many diseases before they have a chance to make him sick. Other words for immunizations are inoculations, vaccinations, needles, boosters and shots.

How do immunizations work?

Immunizations help your baby's immune system make substances called antibodies that fight diseases. Your baby then develops protection against these diseases. With immunization, your baby does not have to get sick first to get that protection. Immunizations work best when they are given at certain ages. For example, the MMR vaccine (measles, mumps, rubella) is not given until a child is at least a year old. If it is given earlier than that, it may not work as well. Some vaccines are only given once or twice, and some need to be given over a period of time in a series of properly spaced immunizations.

Why should I have my baby immunized?

Immunization is the best way to protect your child against many serious diseases. Many diseases are not common in Canada because of immunizations. The germs that cause these diseases still exist.

How can I keep my child's immunizations up-to-date?

It is important to keep a record of all the immunizations your child gets. Keeping a record helps you keep your child's immunizations up-to-date. Ask your public health nurse for a *Child Health Passport* to help you keep track of your child's immunizations. Always take your child's record with you when she gets her immunizations. Keep it with other important papers, because your child will need his immunization record when she is older. You can also use the ImmunizeCA app to keep track of immunizations. Visit ***www.immunizebc.ca/ask-us/questions/there-anyway-keeping-track-personal-immunizations*** for more information.

Points to Remember

It is important for your baby to get his immunizations on time. For more information you can read about various immunizations in the BC HealthFiles found at ***www.healthlinkbc.ca***. You can also call HealthLink BC at 8-1-1, your public health office, or visit ***www.immunizeBC.ca***.

Points to Remember

By immunizing your baby, you give him the best possible protection against many serious diseases.

What diseases do immunizations protect against?
British Columbia provides publicly-funded immunizations to protect your child against these diseases: measles, mumps, rubella, hepatitis B, diphtheria, tetanus, pertussis (whooping cough), polio, rotavirus, Haemophilus influenzae type b disease (Hib), varicella (chicken pox), pneumococcal and meningococcal diseases, and human papilloma virus (for girls). Without getting immunizations, your child could get very sick.

What about the "flu"?
The influenza vaccine protects against the 3 strains of influenza viruses that health experts think will likely cause influenza – often called the "flu" – during the flu season. It does not protect against other viruses or bacteria that may cause colds or stomach illnesses (the stomach "flu"). The virus changes (mutates) every year, which means a new seasonal flu immunization must be given every year.

Influenza (flu) vaccine is recommended for all children 6–23 months of age, as early as October of each Fall. Children 6–23 months of age can get free influenza immunizations. Older children with certain health conditions can also get free influenza immunizations. Ask your health care provider or public health nurse whether your baby needs to be immunized for the flu.

Are immunizations safe?
Yes, immunizations are very safe. Sometimes immunizations may cause minor side effects, but these are temporary. These side effects might be soreness where the needle went into the arm or leg, or a slight fever. These do not usually last long. Serious side effects from immunizations are very rare. If your child gets one of these diseases, the risks of the disease are far greater than the risk of a serious reaction to the immunization.

If you have questions about these side effects or how to make your baby more comfortable if he gets a fever or a sore arm or leg, ask your health care provider.

When should I have my child immunized?
Your child's first immunizations begin at 2 months of age. Some immunizations are only given once or twice, and some need to be given over a period of time. Children are usually immunized at: 2 months of age, 4 months of age, 6 months of age, 12 months of age, 18 months of age, 4–6 years of age, 11 years of age (Grade 6 level), and 14 years of age (Grade 9 level). The immunization schedule can change. To find out more about the current immunization schedule, visit ***www.immunizebc.ca***. For more information, contact your health care provider, public health nurse or HealthLink BC (at 8-1-1).

How to Prevent Flat Areas on Your Baby's Head

Why do some babies develop flat areas on their heads?
Babies' skulls are very soft and the bones can be flattened by pressure. Babies also have weak neck muscles. Because of this, they tend to turn their heads to one side when placed on their backs. If babies always rest on the same area of the head, the skull may flatten. A baby can also get a flat area on the head because of their position in pregnancy or during birth. This is known as a' flathead'. The medical term for this is positional plagiocephaly.

A little bit of head flattening will go away on its own. More serious flattening may be permanent, but it will not affect a baby's brain or development.

Can a baby's flat head be prevented?
Yes. You can help your baby have a round head shape by:

- having supervised tummy time several times a day
- avoiding long periods in bouncy seats, infant swings, strollers and car seats
- changing the positions you use to hold and carry your baby
- switching your baby's position in the crib each day:
  - » One day, place your baby with her head at one end of the crib and the next day, place your baby with her head at the other end of the crib.

More information is also available at:
www.caringforkids.cps.ca/handouts/preventing_flat_heads

If your baby still develops flat spots, talk to your health care provider or public health nurse.

Tummy Time

Tummy time is when you lay your baby on her stomach or side when she is awake. You can put her on the floor, on a safe firm surface, on your lap or on your chest for tummy time. Your baby needs supervised tummy time several times a day. Tummy time is important because it:

- prevents your baby from getting a flat area on her head
- makes the muscles of your baby's neck, back and arms stronger
- helps your baby learn to roll and crawl
- supports your baby's overall development

Some babies like being on their tummies, but many babies do not like tummy time at all at first. You may have to help your baby learn to enjoy tummy time. Here are some tips:

- Start tummy time when your baby is a newborn.
- Put your baby on her tummy after each diaper change. Add one minute of tummy time each day. Respect your baby's cries. If she gets very upset, increase the time more slowly.
- Talk and sing to your baby. Try to comfort her.
- Give your baby a massage on her back, arms or legs. Gently touch or stroke her.
- Give her interesting things to look at. Get down on the floor so she can see your face. Put brightly coloured toys or a mirror in front of her to look at.
- You can also roll up a towel and put it under your baby's chest with her arms propped in front of her to give support. At first, put your hand under her chin to support her head until she is strong enough to do it by herself.

Crying

All babies cry. Crying is normal for babies especially in the first few months. Some babies cry a little and some babies cry a lot. This does not mean there is anything wrong with your baby or that you are doing something wrong as a parent. If your baby is healthy but is crying a lot he may be going through a normal developmental stage called the Period of PURPLE Crying®. This stage usually starts at about 2 weeks, gets worse through the second month of life and usually stops about 4–5 months of age. It is normal for babies to cry a lot more in these early months of life, sometimes even for hours a day.

Why do babies cry?

Sometimes it is easy to figure out why your baby is crying. Sometimes it is not so easy. Babies usually cry because they are hungry, uncomfortable, sick, hurt or they want to be held. Crying does not mean your baby is being bad or that your baby is mad at you.

She Said

We would tag team every evening for the first three months. I would walk and rock for 20 minutes and then my partner would take over for 20 minutes. And then when we would both be worn out, my mother would take over and we would walk outside for a 20 minute break. The key for us was to not leave one person to cope alone for too long. It was definitely a team effort.

Remember – Your baby only needs to be on her back when she is sleeping. When your baby is awake hold her, love her, play with her and give her supervised tummy time.

Points to Remember

Remember – Never shake a baby!
Babies have weak neck muscles and heavy heads. Even a few seconds of hard shaking can cause serious damage to babies.

If you have a babysitter tell them they must never shake or hit your baby.

He Said

I was overwhelmed by how much our baby cried. I had a hard time understanding that she would cry for not minutes at a time, but hours! We would feed, diaper, rock and cuddle her, but sometimes nothing seemed to comfort her. The only thing that would calm her at those times would be a drive in the car. I did many trips in the evening, just driving around the neighbourhood until she would go to sleep.

Period of Purple Crying
You may have been given a DVD and booklet about the Period of PURPLE Crying when your baby was born. This may be helpful if your baby is crying a lot. For more information about the Period of PURPLE Crying, visit ***www.purplecrying.info.***

Sometimes there is nothing you can do to help your baby stop crying. This is called unsoothable crying and it usually ends by about 3–5 months of age. After a few months, you and your baby will get through this crying stage and smiles and laughter will soon replace all the crying. The most important thing you can do during the crying stage is stay calm and take a break when you need it.

What can you do to try to help your baby to stop crying?
There is no magic answer that works all of the time with every baby. You may have to try several things before you figure out what works best for you and your baby. Often what works one day will not work the next. Sometimes nothing you do will help your baby stop crying.

Here are some things you can try to comfort your baby when he is crying:

- **Snuggle him close to your chest.** Your heartbeat may comfort him.
- **Check his diaper.** Keep him clean and dry.
- **Feed him and burp him often.**
- **Wrap him in a soft blanket.** Keep him warm and comfortable – but not too hot. Do not put him in crib or bassinette wrapped in a blanket.
- **Provide some soft music or other relaxing sounds.**
  - » Try humming or singing a lullaby.
  - » Sometimes, the sound of the vacuum cleaner, clothes dryer, fish tank aerator, white noise machine or dishwasher will help.
- **Offer a soother or teething ring.**
- **Offer a favourite blanket or soft toy while cuddling.**
- **Provide gentle motion.**
  - » Walk with him or rock him.
  - » Use a baby swing (if you have one).
  - » Go for a walk in a stroller.
  - » Go for a car ride.

Sometimes these things work and sometimes they do not work. Do not be discouraged. They are worth trying, but do not blame yourself or the baby if your baby is still crying. It is a normal stage that will come to an end.

Staying Calm as a Parent

What can you do when your baby won't stop crying?
Even if you try everything you can think of, your baby might still keep crying.

Crying is an annoying sound. It is supposed to be. It is easy to get frustrated and angry when your baby won't stop crying. You may be feeling tired, alone or feel like your efforts are not good enough. Many people feel this way.

- **If the crying is very, very frustrating for you.** Take a break. Gently place your baby in a safe place and leave the room. Take a 10–15 minute break to give yourself a chance to calm down. Remember, it is more important to calm yourself before you try to calm your baby. Letting your baby cry for a few minutes is not harmful.
- **Find someone to help you.** It is important to get away from your baby if you think you might lose control. It is just as important to be sure that your baby will be safe while you are gone. Ask for help from:
  - » Family
  - » Friends
  - » Your child's health care provider
  - » Parent groups
  - » HealthLink BC at 8-1-1
  - » Your public health nurse, or
  - » Call your local hospital or health clinic for other contacts in your community.

If the crying is constant, louder than usual, or the baby has a fever or is vomiting, or you have concerns that something is wrong, go to the hospital or health clinic.

- **Never shake your baby!**

Shaken Baby Syndrome

Shaken Baby Syndrome (or neurotrauma) is the name for the injuries that can happen when a baby is shaken. Shaking a baby can cause serious injury or death. Shaking can cause brain damage, blindness, paralysis and seizures. Shaken Baby Syndrome may happen when a parent or caregiver loses control because a baby won't stop crying. The parent or care giver gets angry and ends up hurting the child.

To prevent Shaken Baby Syndrome:

- Learn how to calmly cope with your baby's crying (see Crying on pages 141–142).
- Tell others who care for your baby that crying is normal. Ask them to call you if they get frustrated, so you can return.
- Learn how to control your anger. If you are very angry, put your baby in a safe place, such as the crib, and walk away until you are under control again. If you feel unable to cope or are afraid that you may hurt your baby, make sure he is safe. Then call someone for help. Never pick up a baby when you are angry about the crying.
- Do not leave your baby in the care of someone who has problems controlling their anger.

Call a family member, a friend, HealthLink BC at 8-1-1, your public health unit or your health care provider if you need someone to talk to.

Managing Your Anger

It can be very difficult to deal calmly with a crying baby day after day. Many parents feel they are responsible for the crying or that they are bad parents. Crying won't last forever and it is okay to ask for help.

It helps to have a plan to help you stay calm and deal with the difficult times. Here are some suggestions:

- If you are becoming angry, put your baby down and hold onto something you can't throw. Count to ten, leave the room, cry into a pillow or run on the spot. Don't touch your baby until you are calm.
- Ask someone to be your immediate back up, someone you can call if you are losing control. Keep their number close by your phone.
- Take regular breaks. Have someone take over so you can rest, walk or just get away. Be sure the caregiver has a plan if the crying is hard to cope with.
- Talk with your partner about how you can help each other.
- Talk with other parents about how they coped.
- Talk with your health care provider about parenting courses or the challenges of parenting.

She Said

I actually got out of the car at one point and walked away. I couldn't believe I would just walk away from my husband and baby like that but I just cracked. The crying was too much sometimes. But after a short break and a cry, I got back in the car. That's what parenting is all about, just doing the best you can, day after day, and realizing that being a parent doesn't make you a super human being.

If you are concerned about your baby:

- If it's an emergency, call 9-1-1 or the local emergency number in your phone book.
- Visit ***www.healthlinkbc.ca*** for more in-depth health information. These resources cover over 3,000 conditions and concerns. This includes when to see a health care provider or other health professional.
- Call HealthLink BC at 8-1-1, to speak to a registered nurse if you need:
  - » more information
  - » help to decide when it's best to see a health professional
  - » help to decide when its safe to try home treatment
- Pharmacists are also at HealthLink BC at 8-1-1 between 5 p.m. and 9 a.m. every day.
- If you need a translator for this information, 8-1-1 can provide service in 130 languages.
- If your baby is under the care of a health care provider, specialist or other health care professional, always follow their advice.

Facts & Stats

About one out of every 300 babies will have some hearing loss at birth. Over half of babies with hearing loss are healthy and have no history of risk factors.

Points to Remember

If your baby doesn't get an early disease newborn screening (blood test) in the hospital, talk to your health care provider or public health nurse.

Baby Medical Care

Vitamin K Injection

The Canadian Pediatric Society advises that all newborns have an injection of vitamin K within 6 hours after birth. This injection helps prevent hemorrhagic disease of the newborn. Hemorrhagic disease of the newborn is a bleeding problem that occurs during the first few days of life. Babies are born with low levels of vitamin K, an important factor in blood clotting. In the newborn, the low level of vitamin K is the main cause of hemorrhagic disease. If you do not want your baby to receive the injection, talk with your health care provider. Giving vitamin K by mouth may be an option. However, the recommended way to give vitamin K is by injection. Oral vitamin K needs to be given at birth and twice more over 4–8 weeks.

Eye Treatment

Following birth your baby will be given treatment to prevent an infection of gonorrhea or chlamydia. These infections can get into the baby's eyes during birth. Today, an eye ointment is usually used to treat a baby's eyes. If not treated, these infections are severe and can cause blindness.

Ideally, treatment will be delayed for about one hour after birth. This allows for parent-infant contact, for the baby to be skin-to-skin with the mother, and for breastfeeding.

Newborn Screening

Early Disease Screening

A newborn baby can look healthy but have a rare and serious disorder. Newborn screening is a quick blood test that finds babies who may have one of a number of treatable rare disorders. In British Columbia, there are about 40 babies born each year (1 out of every 1,000) who are found to have one of these rare disorders.

Early treatment of these disorders can prevent mental delays, growth problems, health problems and sudden infant death.

Your baby is screened by using a small spot of blood. Your baby's heel is pricked and a few drops of blood are taken and put onto a special card. Your baby may cry, but taking the blood sample does not cause any harm. You can help your baby by holding and breastfeeding her while the blood is being taken.

The blood sample is usually taken between 24 and 48 hours after birth. This will be done before your baby leaves the hospital (or, if you had a home birth, your health care provider will do the screen at home).

A positive screen tells that you there might be a problem. It does not mean that your baby has one of these disorders. More tests would be needed to find out for sure.

For more information about newborn screening, talk to your health care provider or visit ***www.newbornscreeningbc.ca***.

Early Hearing Screening

Hearing is important. Babies begin to learn speech and language from the moment they are born. Special equipment is being used to screen hearing in babies soon after birth. Newborn hearing screening may be offered in hospitals, or through public health offices. All babies born in British Columbia are eligible for newborn hearing screening.

Some risk factors for hearing loss are:

- family history of permanent childhood hearing loss
- low birth weight or admission to the special care nursery
- jaundice that requires a transfusion
- exposure to some infections during pregnancy
- unusual eyes, nose, ears, mouth or palate
- meningitis

Hearing

Good hearing is very important for normal speech, language and social development. Even mild or temporary hearing loss may result in delays in these areas of development. An audiologist can test your baby's hearing, even shortly after birth. The most common cause of hearing problems in very young children is ear infection(otitis media). Signs may include:

- irritability
- pain
- hand or fist to the ear
- fever
- drainage from the ear
- mild hearing loss

Many factors can contribute to the risk of ear infection. Having cigarette smoke in the household will increase the risk of ear disease.

If you think your baby cannot hear, or if you have questions about screening, contact your health care provider or audiologist immediately. For more information about hearing and language development, see pages 156–157.

Vision

From birth, babies can distinguish light and dark, shapes, and patterns. When they are quiet and alert, babies can focus on objects 18 to 45 cm (7 to 18 in.) away for brief periods of time. Babies prefer to look at faces rather than objects, especially at their mother's eyes.

It is not uncommon for your baby's eyes to "wander" or cross independently at times. This is normal in the first 3 months until he develops proper eye co-ordination. Constant "eye wandering" should not be ignored.

Some important points about your baby's vision:

- Children with a family history of a lazy or crossed eye are at a higher risk of having an eye problem.
- Early treatment of turned eye or decreased vision is very important for sight.
- If you have any concerns about your baby's vision, contact your health care provider.

Thrush (Yeast Infection)

Thrush is a common infection in infants. Thrush appears as a whitish-gray coating on the tongue and on the insides of the cheeks and gums. This coating is not easily wiped off. Babies may also develop thrush on their skin. Most babies do not have any pain or complications with thrush. For more information, see page 119. If you think your baby has thrush, see your health care provider.

Circumcision

Circumcision is surgery to remove the layer of skin (foreskin) that covers the head of the penis and part of the shaft. The Canadian Pediatric Society does not recommend routine circumcision of every newborn male. There is pain during and after the procedure. Complications from circumcision include bleeding, infection, cutting the foreskin too short or too long, and poor healing. Parents can think about their own familial, cultural and religious beliefs and preferences, and make decisions based on unbiased, up-to-date, personalized medical information. Circumcision is not only done on newborns. Keep in mind that your child can make their own decision later in life about circumcision. The cost of circumcision is not covered by provincial medical plans. For more information, please see Circumcision at: ***www.healthlinkbc.ca/health-topics/hw142449***

Points to Remember

Not every sick baby will have a fever, especially if they are less than 1 month old. Some signs of a sick baby may be poor feeding or not acting normally. Contact your primary health care provider if you think your baby may be sick. You can also call HealthLink BC at 8-1-1.

Method	Normal temperature range
Rectum	36.6°C to 38°C (97.9°F to 100.4°F)
Armpit	36.5°C to 37.5°C (97.8°F to 99.5°F)
Ear	35.8°C to 38°C (96.4°F to 100.4°F)

Points to Remember

Immunizations may cause a temporary fever.

Do not give your child Aspirin or other drugs that have acetylsalicylic acid (ASA) in them. Medicines that contain ASA may cause Reye syndrome in children and teenagers (a condition that causes damage to the brain and liver).

Food Allergies

Allergies tend to run in families. A baby is at increased risk of developing a food allergy if a parent, brother or sister has food allergy, atopic dermatitis (eczema), asthma or allergic rhinitis (hay fever).

Breast feeding may help prevent the development of food allergy. Common food allergens can be introduced, one at a time, at about six months of age. Delaying the introduction of common food allergens may increase the risk of food allergy developing. Once introduced, offering these foods regularly, as part of a baby's usual diet, may help maintain tolerance (prevent an allergy developing) to the food.

The common food allergens are milk, egg, peanut, tree nuts, soy, seafood (fish, shellfish, crustaceans), wheat and sesame seeds.

For more information about reducing the risk of food allergy in babies at increased risk, see the HealthLink BC resource Reducing Risk of Food Allergy in Your Baby.

Once a person has a food allergy an allergic reaction will happen every time the food is eaten. Allergic reactions can range from mild to severe and often begin within minutes of eating the food. Common signs include:

- Hives, swelling, redness and rash,
- Stuffy or runny nose with itchy watery eyes,
- Cough.

Although they are less common, symptoms such as vomiting, sometimes combined with diarrhea, can also occur hours later. Severe symptoms of an allergic reaction require immediate attention:

- Swelling of the mouth, tongue and throat,
- Hives that are spreading,
- Difficulty breathing, coughing or wheezing,
- Difficulty swallowing or hoarse voice or cry,
- Pale or blue colour of the face or lips,
- Faintness, weakness or passing out.

Call 911 or the local emergency number right away if signs of a severe allergic reaction occur.

If you are concerned a food is causing an allergic reaction, stop giving the food to your baby and talk to your baby's doctor. You can continue to offer other new foods.

For more information on food allergies, call Dietitian Services at HealthLink BC at 8-1-1.

High Temperatures

Fever is usually caused by an infection. The source of the infection can be bacteria or a virus. Fever is the normal process of fighting an infection. It is important to watch your baby's behaviour. If you think your baby has a fever, take action right away. All babies less than three months old should be taken to their health care provider when they have a fever. Call your health care provider or HealthLink BC at 8-1-1, if your baby is 3–6 months old and has a fever, or if you need more advice about what to do.

Some signs of fever in your baby are:

- the back of the neck feels hot, even when extra clothing is removed,
- poor feeding, or not showing an interest in usual things,
- looking ill or overly sleepy,
- looking flushed or pale,
- may be sweaty, and
- may be extra thirsty (want to feed or drink more).

What kind of thermometer should I use?

Use an easy-to-read, digital thermometer. A mercury thermometer should not be used. Forehead 'fever strips', and pacifier thermometers are less accurate and are not recommended. You might want to be prepared by buying a thermometer before your baby arrives.

How should I take the temperature?

If you suspect that your baby has a fever, you can check by taking a temperature under his armpit. Use a rectal thermometer only if your health care provider has showed you how and you are comfortable doing so. For more information about taking a temperature, see the HealthLink BC Health File ***www.healthlinkbc.ca/healthfiles/hfile99.stm*** .

What is a normal temperature range?

Your baby's body temperature changes throughout the day. It is lowest in the early morning and highest in the early evening. Your infant may have a higher or lower temperature and still be considered normal.

Taking your baby's temperature:

- Do not take your baby's temperature by mouth.
- Put the tip of the thermometer in the centre of the armpit.
- Tuck the arm snugly against the body, then comfort and distract your baby.
- After about 1 minute the digital thermometer will beep. Gently remove the thermometer and read the temperature.
- If you find your baby has a temperature by taking it under the arm, check it again.

When your baby has a fever:

- Let your baby breastfeed more, or offer more to drink.
- Take off extra clothes that your baby is wearing.
- Give your baby medicine to help bring down the fever and make him more comfortable.

Call HealthLink BC at 8-1-1 for information and advice on how to check and manage your baby's fever.

He Said

As an intern, I cared for a three month-old baby with both legs fractured from falling off a change table. When we had our own babies, I changed, bathed, fed and played with them on a blanket on the floor to make sure they would never fall.

Baby Safety

Maintaining Basic Hygiene

During your pregnancy and after the birth of your baby, you can keep your family healthy by following these practices:

Washing hands – wash your hands with soap and water for at least 15 seconds before feeding your baby, after using the bathroom or handling diapers, handling pets, sneezing or coughing. Make sure your older children do this as well.

Cleanliness – keep high chairs, bibs and eating areas clean by washing with water and soap after each use. Clean and sanitize other surfaces in the home. It is important to clean the surfaces that your baby will come in contact with. These include floors, toys, teething ring, crib, stroller and changing table. Use a bleach/water solution. For additional information, see Food Safety on page 45 and Pet Safety on page 17.

General Home Safety Tips

Protect your baby from all danger. Most injuries can be prevented and happen in your own home:

- when you are not prepared for your baby's next stage of development, such as learning to roll over, crawl or walk
- when you are busy with something else
- when either you or your baby are tired

Childproof your home before your baby begins moving around.

- Fasten carpet on stairs and remove loose rugs to avoid falling while carrying your baby.
- Post poison control, ambulance and health care provider's numbers and other emergency numbers near your phone so you can find them quickly.
- Install smoke detectors and a fire extinguisher. Plan an escape route to help you and your baby get out safely in case of fire. Check your smoke detector batteries each time you turn your clock forward in the spring and back in the fall.
- Remove PVC mini-blinds that may contain lead from your home. Do not have any dangling cords in or near the baby's crib or the floor.
- Know how to help a choking baby. Courses on basic first aid and baby and home safety may be available through community centres, St. John Ambulance and the Red Cross. Check with your public health nurse for courses in your area.
- Furniture such as bookcases or television stands that could topple or fall during an earthquake should be fastened toy the wall.

To prevent burns:

- never hold your baby while
  - » drinking a hot drink like coffee or tea
  - » cooking, or handling a hot utensil
  - » smoking
- check the temperature of bottles on the inside of your wrist
- check bath water temperature by using your elbow
- keep the temperature in your hot water heater below 49°C (120°F)

See *Toddler's First Steps* and ***https://www.healthyfamiliesbc.ca/*** for more information on childproofing your home.

Keeping Your Baby Safe

- Toys should be soft, non-toxic and washable. Toys that have no removable small parts or sharp edges are best.
- Keep small objects, such as coins, buttons, marbles, stickers and batteries, out of reach and in safe containers.
- Keep all household cleaners and other chemicals out of reach.
- Keep all objects out of the crib and out of reach.

- Move baby's crib away from long mobiles, blinds or curtain cords to avoid strangling.
- Never leave your baby alone with a toddler, a pet, a bottle or on a soft surface.
- Always ask door-to-door canvassers and service personnel for ID. Public health nurses will call to make an appointment and should also be wearing identification.

Some Toys are Not for Chewing and Sucking
Your baby should only chew and suck on toys that have been specifically made for a baby's mouth (such as teethers and soothers).

Don't let your baby suck or chew on any soft plastic (vinyl) toys and items that weren't made to be in a baby's mouth. Many soft vinyl items (such as vinyl bibs, school supplies, bath, squeeze or inflatable toys) contain chemicals called phthalates, which can cause health problems.

Safe Baby Equipment

Cribs

For safety information about cribs, refer to page 130.

Playpens

Playpens must meet these guidelines:

- Playpen walls should be mosquito-type netting. Your little finger should not be able to pass through the mesh.
- Have no more than two wheels or casters.
- Have walls at least 48 cm (19 in.) high.
- All parts must be free from rough or sharp edges. Hinges should be designed to prevent pinching or unintended collapse.
- Any open holes drilled in metal, plastic or wood components should be less than 3 mm (1/8 in.) or more than 10 mm (3/8 in.) in diameter.
- All parts that are small enough for a baby to choke on must be firmly attached.
- Vinyl rails and mattress pads should not be torn.

Do not leave your infant in a drop-sided mesh playpen unless all of the sides are fixed firmly in the fully raised position. Do not put scarves, necklaces, long cords, pillows or large toys in a playpen. Many brands of playpens made in the 1990s have been recalled because they can injure or kill babies. Always check for recalls before accepting a second-hand playpen or portable crib.

Baby Walkers

Baby walkers are banned in Canada because they allow babies to move too fast and can cause serious head injuries. Instead, use an activity centre that doesn't move around on the floor.

Soothers

Soother Safety Checklist

- Make sure the soother is a one-piece design.
- Check regularly that the nipple is firmly attached to the handle by giving it a good tug.
- Replace the soother every two months. If the soother is sticky, cracked or torn, throw it away. It can easily tear and become a choking hazard.
- Sterilize the soother before the first use by boiling it in water for five minutes and then letting it cool completely.
- Clean the soother in warm, soapy water. Never wet the soother in your own mouth, which can transfer bacteria from your mouth to your baby's mouth.
- Never tie a cord to a soother and hang it around your baby's neck or attach it to clothes. It can get tangled around her neck, causing her to strangle. You can use a clip with a short ribbon attached.
- Avoid letting your baby chew a soother for teething. It can tear or break and become a choking hazard.
- Never dip a soother into honey, syrup or any other sweetener. This can lead to tooth decay.
- If your baby has thrush, replace or boil the soother for 5–10 minutes each day to prevent reinfecting your baby's mouth (see page 119).

No Honey for Babies
Do not give honey to babies less than 12 months of age. It can cause a serious infection.

Strollers

- Use the 5-point harness to prevent your baby from falling forward and tipping the stroller over.
- Be careful to prevent injury to fingers when folding and unfolding a stroller. Also be careful when changing the handle on reversible handle strollers.
- Do not hang your purse or heavy packages on the stroller handle. They can tip the stroller over.
- Check the stroller regularly for sharp edges, loose folding parts, brakes that don't work properly and loose wheels.
- Always read the manufacturer's instructions for a new or used stroller.

Jogging or Running Strollers

Jogging strollers are meant for uneven surfaces such as paths, trails or snow. Until your baby is at least one year old, do not jog with your baby in one of these strollers. Infants have weak neck muscles and cannot handle the constant jostling or the bumpy terrain when on trails. If used as a stroller for infants, they must have a fully reclining seat. Always use a 5-point harness to secure your baby into these types of strollers. They are bulky and do not fold easily, so may not be the best choice if you plan to load a stroller in the back of your car.

Baby Carriers

Baby carriers can be soft strap-on carriers, slings or framed back carriers.

Safety tips for slings or strap-on carriers:

- Always read the instructions first.
- Make sure it has a firm, padded head support that adjusts to the size of your baby.
- Check that the leg holes are wide enough for your baby to be comfortable but small enough that the baby can't slip through.
- Never use a carrier while skiing, jogging, biking or in a car.

- Do not use a carrier when you are doing any activity, such as cooking, that could harm your baby.
- Give your baby plenty of time out of the carrier to move, crawl and explore her environment.

Framed Back Carrier

- Do not use a framed back carrier until your baby can sit alone – about 6 months of age.
- Never leave your baby alone, even when it seems safe.
- The carrier should have a wide, solid base so it can't tip over. Never place the carrier on a table with your baby in it.
- If a seat has wire supports that snap on the back, make sure they are secure.
- Fasten straps and restraining buckles every time you use the seat. They should be adjusted to fit comfortably and to prevent your baby from turning in the seat. Babies in back carriers should not be placed on tables, counters or furniture. An active baby may lunge forward, tip the carrier and fall to the floor. This can cause a head injury.

A framed back carrier is not a car seat and must never be used as one.

Infant/Child Car Seats

Use an infant/child car seat every time your child travels in a car. Car seats are required by law and must meet Canadian Motor Vehicle Safety Standards (CMVSS).

When buying a child car seat:

- Look for the CMVSS label. Do not buy a child seat in the United States – it will not have this label.
- Look for a child seat that is easy to use and fits in your vehicle. Try it in your vehicle before buying it. Be sure it is easy to use so you will use it correctly every time.
- Look for a child seat with at least two sets of shoulder harness strap slots to allow room for growth. Make sure they are easy to adjust.

It is recommended that you do not buy a second-hand child seat. If you do, the child seat should be inspected and checked for any possible recalls. Make sure a second-hand child seat meets CMVSS standards. Do not use a child seat that has been in a crash or has passed the expiration date stamped on the seat.
If no expiration date is present, check with the child seat manufacturer. For more information, call Transport Canada at 1 800 333-0371.

The BCAA Road Safety Foundation ***(www.bcaaroadsafety.com)*** also provides more information about child car seats and has the Child Car Seat Information Line at 1 877 247-5551. Free New Parent Car Seat workshops are also offered to help you correctly install your child's seat and show you how to use it properly.

If you want to rent a child seat, call the toll-free Child Car Seat Information Line 1 877 247-5551 for a list of providers. You can also visit ***www.bcaa.com/road-safety/child-passenger-safety/overview*** for more information.

When using your child seat:

- Never place a rear-facing child seat in a vehicle seat equipped with an active air bag.
- A rear-facing seat is safest. Use a rear-facing seat for as long as possible, at least until one year of age.
- Follow the instructions in your vehicle's owner's manual and the instructions that come with your child seat. They contain important information for safe installation of the seat.
- If you are securing the child seat with your vehicle's lap belt, make sure it is long enough to go through the child seat's frame or over the seat according to the instructions.
- Some lap-shoulder belt systems will need a locking clip. This special H-shaped metal clip must be used to lock the lap and shoulder portion of a seat belt to keep the child seat in position. Refer to the owner's manual for your vehicle for specific information.

Infant Seats

- Infants seats are to be used from birth until the baby reaches the weight limitation of the seat. The weight limitation depends on the make and the model.
- Infant seats must be used in the rear-facing position.
- The safest place for the infant seat is in the middle of the back seat.

Convertible Rear-facing Seats

If your baby has outgrown the weight limit of the infant seat, switch to a convertible seat in the rear-facing position. Rear-facing child car seats must be used until the child is at least one year old AND weighs at least 11 kg (22 lb.). After age one, your child should be keep rear-facing for as long as possible (until he reaches the rear-facing weight limit of the seat or his head is within 2.5 cm (1 inch) of the top edge of the seat. This will prevent severe head and spinal cord injuries in a crash.

Points to Remember

When you leave the car for any reason, take time to unbuckle the child seat and bring your baby with you. An infant should never be left alone in a vehicle! Never. Not for any length of time.

Points to Remember

Besides always putting your baby in an infant or child seat, vehicle safety includes removing any loose, breakable and sharp objects from inside the vehicle.

Correct Installation

- Place the child seat, rear-facing, in the back seat. Read and follow instructions that come with the child seat.
- Lower the carrying handle behind the infant seat.
- Maintain the correct reclining angle for the child seat. The back of the rear-facing seat should be tilted back to a maximum of 45 degrees so the baby's head and body lie back comfortably. If your baby's head falls forward, the seat is too upright.
- Secure the child seat with the Universal Anchorage System (UAS) or with the adult seat belt and, if necessary, use a locking clip.
- Check the ***www.bcaaroadsafety.com*** for more information.

Never place a rear-facing infant or child seat in the front seat if there is an active air bag.

Correct Harnessing

- Always check the manufacturer's instructions and your vehicle's owner's manual.
- Buckle your baby into the infant/child seat before every trip, no matter how short.
- When rear-facing, the harness straps should be at your baby's shoulders, or slightly below, to ensure a snug fit. Raise the harness straps to the next highest slot in the seat back when the baby's shoulders are level with the next highest slot.
- Avoid the use of head huggers that were not manufactured with the child seat. A rolled receiving blanket or towel, one on either side of the baby's head and body will provide support. A rolled washcloth or diaper between the crotch and the crotch strap can prevent slouching.
- Place your baby in the seat and fasten the harness snugly. Only one finger should fit between the harness and the baby's collarbone.
- Avoid dressing your baby in heavy clothing or bunting bags. Dress your baby in clothes that have arms and legs. In cold weather, put blankets over your baby after you have fastened your baby into the seat.
- On each trip, check the harness tension and raise the chest clip to the level of your baby's underarms. The chest clip holds the harness straps in place on the shoulders.
- Double back all harness straps that pass through buckles to prevent them from slipping under tension.
- Be sure that anyone who will have your baby in their car is aware of the correct use of child seats.

Source: Reproduced and adapted with permission from the Insurance Corporation of British Columbia

Special Circumstances

Preterm Babies

Preterm babies or preemies are those who are born before 37 weeks gestation. Preemies may have immature organ systems. Generally, the younger your baby's age at birth, the more health problems she may have. If your baby is 36 weeks gestation at birth she may have very few, or no problems at all. On the other hand, a baby born at 25 weeks gestation would be expected to need intensive care and monitoring. Birth weight is usually closely related to the length of the pregnancy.

Your preterm baby may need to be separated from you at birth if special care is required. Have your partner go with the baby to the nursery if possible. You should be able to visit your baby soon after the birth.

Preterm babies, like all babies, need to be touched, stroked and talked to, even while inside the incubator or isolette. When your baby is well enough, you may be encouraged to have skin-to-skin contact. This is called Kangaroo Care. Your baby is unwrapped and placed on your chest where she can hear your heart beat, feel you breathing and breastfeed. A warm blanket is placed on the baby. Research shows that babies who have lots of contact with their mothers grow faster than babies who do not.

Small babies may have problems with feeding. Often you will need to pump breast milk to give for feedings.

Preterm babies may have problems breathing while in an infant car seat. They may be more floppy and the chin may drop down on the chest blocking breathing. They need to be checked in their car seat before leaving the hospital. After a feeding, the baby will be placed in his car seat and observed for about an hour. The baby will be observed longer if the drive home is more than an hour.

Low Weight Babies

About one-third of low birth weight babies (less than 2.5 kilograms or 5 ½ pounds) are born at term (40 weeks gestation).

Low weight babies may have some of the complications seen in the preterm baby. As with the preterm baby, the low weight baby should be encouraged to have skin-to-skin contact or Kangaroo Care. This will keep the baby warm and encourage extra breastfeeding. You may need extra support with breastfeeding.

Once at home, it is important that your preterm or low weight baby be placed on her back for sleeping.

Twins, Triplets or More

Multiple births can cause complications with your pregnancy, labour and birth. The babies can be delivered vaginally or by caesarean section. The type of delivery depends on the position of the babies in your uterus, their gestational age and their health.

Multiples can be breastfed successfully. Feeding early and often will help you to have enough milk for all of your babies. Try different positions for holding your babies while breastfeeding. Parents of multiples need extra support and assistance with their infants. Do not be afraid to ask for help when you get home.

He Said

I was scared to touch my son at first; he was so small and fragile. All of the wires, tubes and alarms put me off for the first day. After that I got so used to it all that I was completely comfortable handling him. My tip would be to take each day one at a time. Ask questions until you are satisfied. Count the blessings you are given, like today he's feeding better, or he's grown. Don't focus on what could go wrong.

Points to Remember

If you have any concerns about your baby's development or interaction with you, contact your health care provider to get advice.

Baby Development

Babies develop quickly because of rapid physical growth and brain development. This in turn helps a baby to develop thinking and language skills, and to grow socially and emotionally. Most babies develop in predictable ways and parents usually have a keen eye for what their baby is doing. Parents need to remember that each baby is unique.

While your baby is moving along on his or her own unique development timetable, you are a key partner in this development. Your caring, nurturing and safe parenting will help ensure your baby's optimal development. Help your baby understand that his or her world is a safe and welcoming place. See page 127 for more information on emotional attachment.

How can I be a caring and nurturing parent?

- Keep safe – always keep your baby warm, dry, comfortable and safe.
- Keep healthy – ensure your baby's health through breastfeeding and good medical care.
- Follow cues – listen to and watch your baby. It is easy to over- or under-stimulate a baby. Follow their cues. If your baby turns his head away or fusses or cries, he wants to stop an activity.
- Give praise – when your baby accomplishes something new, give encouragement (clap, hug her, make happy noises, etc.).
- Be engaged – be there for your baby and always respond gently and soothingly.
- Discover your baby – your baby has a unique personality. Watch for this to emerge and celebrate your baby's uniqueness.

Physical Development

From 2–3 weeks, your baby will probably gain about 120–240 g (4–8 oz.) per week until she doubles her birth weight, usually by about 4–6 months. Your baby will sleep about 15 hours per day in the first 3–4 months, and less time as she grows older. Eyesight and hearing develop and become more acute. Your baby's brain continues to develop.

First month:

- weight will drop after birth but will be regained
- hand, arm, leg and rooting movements are all reflex motions
- head flops if not supported
- focuses eyes at 18 to 45 cm
- stares at high contrast patterns and objects but does not reach
- recognizes mother's voice
- startles at noise

Second month:

- muscles relax and twitch less
- lifts head about 45 degrees while lying on tummy
- hands start to unfold
- may reach and grasp an object for a short time
- eyes move in unison and can track close moving objects
- may roll over one way

Third month:

- stretches out arms and legs
- rolls over from back to side
- holds head up to search for sounds and movement
- discovers feet and hands
- holds objects longer
- swipes with arms
- briefly bears weight on legs
- responds to detailed, high-contrast objects
- cuts first tooth (3rd to 6th month or later)

Fourth month:

- stands up and holds weight with help
- rolls over from front to side
- lifts head about 90 degrees
- sits with arms propped
- reaches for objects
- lets go of objects
- holds hands together

Fifth month:

- rolls over from front to back
- grabs toes and feet
- wiggles forward on floor
- reaches with a good aim
- transfers objects from hand to hand

Sixth month:

- holds head steady
- sits with back straight when propped
- grasps small objects and studies them
- rolls in both directions
- understands that object may be hiding behind another

Activities for Healthy Development

- Always supervise your baby to prevent falling.
- Baby proof your home so that everything harmful is out of the way.
- Hold the things you want your baby to see close to her eyes so she can focus clearly.
- Have lots of supervised tummy time on a mat so your baby can kick and move.
- Provide bright hanging objects that make noise within hitting range.
- Give clean rattles and toys that your baby can feel and mouth.
- Provide a variety of toys and objects with textures.
- Play in front of a mirror.
- Create safe play spaces on the floor.
- Take lots of walks with your baby in the fresh air.
- Give safe, clean, chewable toys.
- Everything will go in the mouth. Make sure objects are big enough that they cannot be swallowed.
- Extend bath time so your baby can kick and squeal while you supervise. **Never** leave your baby alone in the bath

baby's physical development

He Said

Our daughter put everything she could reach into her mouth. It got worse when she could move around more. I always gave her something safe to play with when I was changing her and made sure anything sharp or dangerous was a long way out of her reach.

baby's social emotional development

She Said

My mother-in-law kept saying I was spoiling our baby by carrying her all the time and picking her up when she fussed. But I had read about child development and knew just the opposite was true. Now our little girl is trusting and calm. She knows we will always be there for her, and that we come back if we've been away. I'm glad I listened to my own heart and did what I knew was right.

Social/Emotional Development

The first 6 months are an important time for you and your baby. Take time to give love, hugs, smiles and lots of reassurance. Can you spoil a new baby? No. Research has shown that well-loved babies do better in every way. What about crying? Again, research says that you should go to and try to comfort a crying baby within 1–2 minutes.

First month:

- is alert 1 out of every 10 hours
- enjoys eye contact
- smiles at faces
- recognizes parents' voices
- begins to trust caregiver
- cries if under or over stimulated
- persistent crying can start at about two to three weeks

Second month:

- responsive smiling
- communicates moods
- enjoys visual stimulation
- studies faces
- your baby's personality becomes more obvious
- cries to have needs met
- persistent crying usually peaks in the second month

Third month:

- makes eye contact
- smiles at faces and may laugh out loud
- knows difference between parents and strangers
- stops crying when you come in the room
- persistent crying usually stops in month three or four

Fourth month:

- laughs hard when tickled
- greets caregiver
- starts social gestures
- may move arms to signal "pick me up"
- enjoys social interaction

Fifth month:

- turns head toward speaker
- watches your mouth movements
- shows interest in colours
- pushes away disliked actions

Sixth month:

- mimics facial expressions
- exhibits moods with varied sounds and body movements
- may be shy or afraid of strangers
- responds to his name
- raises arms to signal he wants to be picked up
- likes his reflection

Activities for Healthy Development

- Have skin-to-skin contact with newborns.
- Always respond to crying within one or two minutes.
- Look into your baby's eyes; you will fall in love.
- Talk to your baby soothingly
- Don't feel rejected if your baby turns away from you – young babies get tired easily.
- Plan daily quiet times with your baby.
- Don't jiggle crying babies – use slow, gentle motions
- Don't over stimulate your baby.
- Copy your baby's movements and sounds.
- Rock and cuddle your baby.
- Do finger and toe playing.

Language Development

Babies first communicate by crying. Then they learn to make sounds and smile. This is"talking." Eventually they learn to use words. Communicating is a two-way street – so talk to your baby when your baby"talks"to you. Your baby will want to "talk"with you using her language.

First month:

- responds to voices
- small cooing begins
- responds when you talk
- communicates with smiles, gazes and crying

Second month:

- discovers her own voice
- gurgles, coos and squeals
- exhibits emotions
- smiles at mother or father when they smile
- looks at mother's or father's face when they talk

Third month:

- begins extended vowel sounds ("ah")
- starts to laugh
- has different cries for different needs

Fourth month:

- babbles ("ba-ba")
- tries to mimic sounds
- squeals and is interested in the sounds the parent makes

Fifth month:

- turns head toward speaker
- watches your mouth movements
- shows interest in colours
- pushes away disliked actions

Sixth month:

- longer and more varied sounds ("ga-ga, dada, papa")
- experiments with different volumes and pitches of sounds
- squeals with delight when happy
- makes sputtering sounds with the lips and tongue
- makes sounds or talks to toys

Activities for Healthy Development

- Talk to your baby using the language in which you feel most comfortable. Don't worry if it is not English.
- Comfort your crying baby with a soothing voice and gentle words.
- Hum to your child.
- Sing nursery rhymes and songs.
- Read and tell stories toy our baby, even your newborn
- Play games (peek-a-boo, imitating sounds your baby makes, gentle tickling, shaking toys, etc.).
- Talk to your baby about what you are doing (bathing, diapering, nursing, etc.).
- Call your baby by name.
- Make sure your baby can see your face when you talk to her.
- Talk to your baby about what you think she is trying to tell you with her coos, cries and babbles.
- Mimic any sounds your baby makes. This encourages your baby to make more sounds

baby's language development

Points to Remember

If you have any concerns about your baby's development or interaction with you, contact your health care provider to get advice.

When should you be concerned about your baby's development?

If your baby:

- has an unusually stiff or floppy body
- is not watching faces by 2–3 months
- is unusually quiet or placid
- has unusual difficulties with feeding
- does not startle to loud noises
- holds hands in tight fists
- does not follow activities with his eyes
- does not seem to recognize his mother
- does not vocalize
- does not seek sounds with his eyes
- is almost always unable to settle

For more information on your child's development after 6 months, refer to the resource *Toddler's First Steps* or visit the Healthy Families BC website at ***www.healthlinkbc.ca***. For other helpful information on a variety of topics related to infant and child development and parenting, search for "Child Development" at ***www.healthlinkbc.ca***.

You can find *Toddler's First Steps* at ***www.healthyfamiliesbc.ca/about-us/additional-resources#TFS***.

You can buy your own copy at ***www.crownpub.bc.ca***.

Notes

Parents' Best Chance

You have wonderful opportunities to care for and nurture your baby, and help your baby become happy and healthy. While you read the words of other parents, you may be thinking about the kind of parent you would like to be.

I want to be a parent who:

- is there when ever my baby needs me
- feeds my baby whenever and wherever she is hungry
- keeps my baby safe
- keeps my baby as healthy as possible
- plays with my baby every chance I get
- helps my baby explore the world
- listens to my baby
- reads and sings to my baby
- knows when to walk away and cool down
- knows when to seek advice and help
- makes time to look after my own health.

To Do

Talk over your parenting ideas with your partner and together write down a few goals you can use to guide your parenting.

A New Support Team

A support team is one of the most important resources you can have. It can help you be the parent you want to be. Throughout this handbook you have explored the ways support teams can help during and after pregnancy. Once you leave pregnancy behind and start to care for and nurture your baby, you will find that you need new members on your health care and personal support teams.

To Do

Take a few moments to rethink your support team and decide whom you might want to add.

Health Care Support

_____

_____

Personal Support

_____

_____

_____

_____

_____

_____

He Said

Having our baby was the best thing we have every done. She has brought such joy – not only in to our lives but to our whole family.

What are the Next Steps?

Toddler's First Steps: A Best Chance Guide to Parenting Your 6- to 36-Month-old Child (2nd Edition) is a parenting handbook that follows *Baby's Best Chance.*

Toddler's First Steps is designed to help parents and caregivers of children six months to three years of age. It is filled with important information on child development, nutrition, health and wellness, parenting and safety.

You can find *Toddler's First Steps* at ***www.healthyfamiliesbc.ca/about-us/additional-resources#TFS***

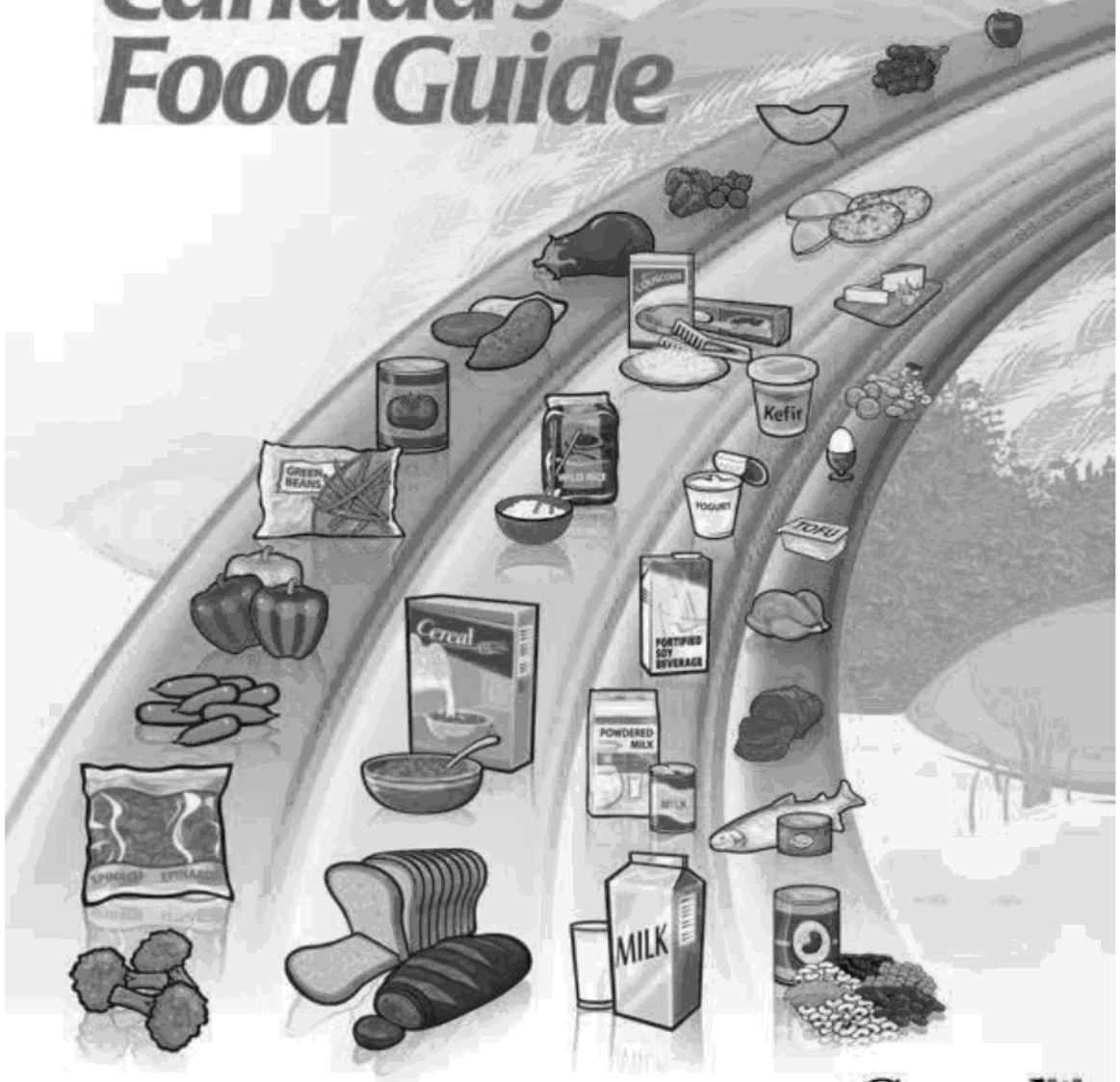
You can buy your own copy at ***www.crownpub.bc.ca***.

You can also visit the Healthy Families BC website at ***www.healthyfamiliesbc.ca*** for more helpful and up-to-date information on having a healthy pregnancy and caring for babies and toddlers.

Health Canada Santé Canada

Your health and safety... our priority. *Votre santé et votre sécurité... notre priorité.*

Eating Well with Canada's Food Guide



Canada

Recommended Number of Food Guide Servings per Day

The following chart shows how many Food Guide Servings you need from each of the four food groups every day.

	Children			Teens		Adults			
Age in Years	**2-3**	**4-8**	**9-13**	**14-18**		**19-50**		**51+**	
Sex	**Girls and Boys**			**Females**	**Males**	**Females**	**Males**	**Females**	**Males**
Vegetables and Fruit	*4*	*5*	*6*	*7*	*8*	*7-8*	*8-10*	*7*	*7*
Grain Products	*3*	*4*	*6*	*6*	*7*	*6-7*	*8*	*6*	*7*
Milk and Alternatives	*2*	*2*	*3-4*	*3-4*	*3-4*	*2*	*2*	*3*	*3*
Meat and Alternatives	*1*	*1*	*1-2*	*2*	*3*	*2*	*3*	*2*	*3*

What is One Food Guide Serving?

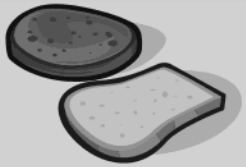
Look at the examples below.

Fresh, frozen or canned vegetables
125 mL (½ cup)

Leafy vegetables
Cooked: 125 mL (½ cup)
Raw: 250 mL (1 cup)

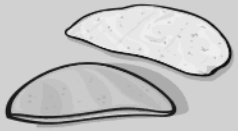
Fresh, frozen or canned fruits
1 fruit or 125 mL (½ cup)

100% Juice
125 mL (½ cup)



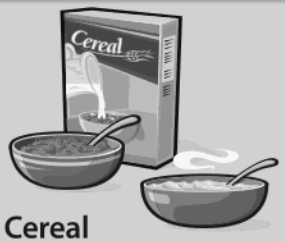
Bread
1 slice (35 g)

Bagel
½ bagel (45 g)

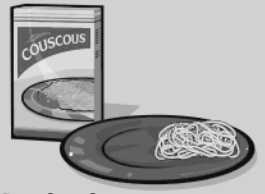


Flat breads
½ pita or ½ tortilla (35 g)

Cooked rice, bulgur or quinoa
125 mL (½ cup)



Cereal
Cold: 30 g
Hot: 175 mL (¾ cup)



Cooked pasta or couscous
125 mL (½ cup)

Milk or powdered milk (reconstituted)
250 mL (1 cup)

Canned milk (evaporated)
125 mL (½ cup)

Fortified soy beverage
250 mL (1 cup)

Yogurt
175 g
(¾ cup)

Kefir
175 g
(¾ cup)

Cheese
50 g (1½ oz)

Cooked fish, shellfish, poultry, lean meat
75 g (2½ oz)/125 mL (½ cup)

Cooked legumes
175 mL (¾ cup)

Tofu
150 g or
175 mL (¾ cup)

Eggs
2 eggs

Peanut or nut butters
30 mL (2 tbsp)

Shelled nuts and seeds
60 mL (¼ cup)

Make each Food Guide Serving count…

wherever you are – at home, at school, at work or when eating out!

➤ **Eat at least one dark green and one orange vegetable each day.**
- Go for dark green vegetables such as broccoli, romaine lettuce and spinach.
- Go for orange vegetables such as carrots, sweet potatoes and winter squash.

➤ **Choose vegetables and fruit prepared with little or no added fat, sugar or salt.**
- Enjoy vegetables steamed, baked or stir-fried instead of deep-fried.

➤ **Have vegetables and fruit more often than juice.**

➤ **Make at least half of your grain products whole grain each day.**
- Eat a variety of whole grains such as barley, brown rice, oats, quinoa and wild rice.
- Enjoy whole grain breads, oatmeal or whole wheat pasta.

➤ **Choose grain products that are lower in fat, sugar or salt.**
- Compare the Nutrition Facts table on labels to make wise choices.
- Enjoy the true taste of grain products. When adding sauces or spreads, use small amounts.

➤ **Drink skim, 1%, or 2% milk each day.**
- Have 500 mL (2 cups) of milk every day for adequate vitamin D.
- Drink fortified soy beverages if you do not drink milk.

➤ **Select lower fat milk alternatives.**
- Compare the Nutrition Facts table on yogurts or cheeses to make wise choices.

➤ **Have meat alternatives such as beans, lentils and tofu often.**

➤ **Eat at least two Food Guide Servings of fish each week.***
- Choose fish such as char, herring, mackerel, salmon, sardines and trout.

➤ **Select lean meat and alternatives prepared with little or no added fat or salt.**
- Trim the visible fat from meats. Remove the skin on poultry.
- Use cooking methods such as roasting, baking or poaching that require little or no added fat.
- If you eat luncheon meats, sausages or prepackaged meats, choose those lower in salt (sodium) and fat.

* Health Canada provides advice for limiting exposure to mercury from certain types of fish. Refer to www.canada.ca/en/health-canada.html for the latest information.

Having the amount and type of food recommended and following the tips in *Canada's Food Guide* will help:

- Meet your needs for vitamins, minerals and other nutrients.
- Reduce your risk of obesity, type 2 diabetes, heart disease, certain types of cancer and osteoporosis.
- Contribute to your overall health and vitality.

Oils and Fats

- Include a small amount – 30 to 45 mL (2 to 3 tbsp) – of unsaturated fat each day. This includes oil used for cooking, salad dressings, margarine and mayonnaise.
- Use vegetable oils such as canola, olive and soybean.
- Choose soft margarines that are low in saturated and trans fats.
- Limit butter, hard margarine, lard and shortening.

Enjoy a variety of foods from the four food groups.

Satisfy your thirst with water!

Drink water regularly. It's a calorie-free way to quench your thirst. Drink more water in hot weather or when you are very active.

Advice for different ages and stages…

Children

Following *Canada's Food Guide* helps children grow and thrive.

Young children have small appetites and need calories for growth and development.

- Serve small nutritious meals and snacks each day.
- Do not restrict nutritious foods because of their fat content. Offer a variety of foods from the four food groups.
- Most of all... be a good role model.

Women of childbearing age

All women who could become pregnant and those who are pregnant or breastfeeding need a multivitamin containing **folic acid** every day. Pregnant women need to ensure that their multivitamin also contains **iron**. A health care professional can help you find the multivitamin that's right for you.

Pregnant and breastfeeding women need more calories. Include an extra 2 to 3 Food Guide Servings each day.

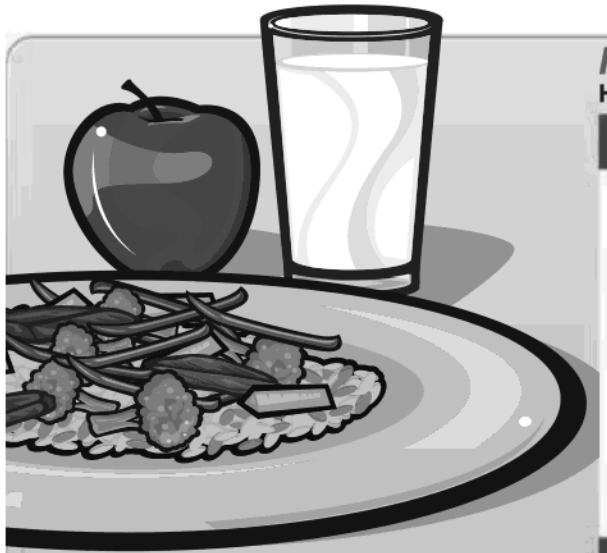
Here are two examples:

- Have fruit and yogurt for a snack, or
- Have an extra slice of toast at breakfast and an extra glass of milk at supper.

Men and women over 50

The need for **vitamin D** increases after the age of 50.

In addition to following *Canada's Food Guide*, everyone over the age of 50 should take a daily vitamin D supplement of 10 µg (400 IU).



How do I count Food Guide Servings in a meal?

Here is an example:

Vegetable and beef stir-fry with rice, a glass of milk and an apple for dessert		
250 mL (1 cup) mixed broccoli, carrot and sweet red pepper	=	2 **Vegetables and Fruit** Food Guide Servings
75 g (2 ½ oz.) lean beef	=	1 **Meat and Alternatives** Food Guide Serving
250 mL (1 cup) brown rice	=	2 **Grain Products** Food Guide Servings
5 mL (1 tsp) canola oil	=	part of your **Oils and Fats** intake for the day
250 mL (1 cup) 1% milk	=	1 **Milk and Alternatives** Food Guide Serving
1 apple	=	1 **Vegetables and Fruit** Food Guide Serving

Eat well and be active today and every day!

The benefits of eating well and being active include:

- Better overall health.
- Lower risk of disease.
- A healthy body weight.
- Feeling and looking better.
- More energy.
- Stronger muscles and bones.

Be active

To be active every day is a step towards better health and a healthy body weight.

It is recommended that adults accumulate at least 2 ½ hours of moderate to vigorous physical activity each week and that children and youth accumulate at least 60 minutes per day. You don't have to do it all at once. Choose a variety of activities spread throughout the week.

Start slowly and build up.

Eat well

Another important step towards better health and a healthy body weight is to follow *Canada's Food Guide* by:

- Eating the recommended amount and type of food each day.
- Limiting foods and beverages high in calories, fat, sugar or salt (sodium) such as cakes and pastries, chocolate and candies, cookies and granola bars, doughnuts and muffins, ice cream and frozen desserts, french fries, potato chips, nachos and other salty snacks, alcohol, fruit flavoured drinks, soft drinks, sports and energy drinks, and sweetened hot or cold drinks.

Limit trans fat

When a Nutrition Facts table is not available, ask for nutrition information to choose foods lower in trans and saturated fats.

Read the label

- Compare the Nutrition Facts table on food labels to choose products that contain less fat, saturated fat, trans fat, sugar and sodium.
- Keep in mind that the calories and nutrients listed are for the amount of food found at the top of the Nutrition Facts table.

Take a step today…

- ✓ Have breakfast every day. It may help control your hunger later in the day.
- ✓ Walk wherever you can – get off the bus early, use the stairs.
- ✓ Benefit from eating vegetables and fruit at all meals and as snacks.
- ✓ Spend less time being inactive such as watching TV or playing computer games.
- ✓ Request nutrition information about menu items when eating out to help you make healthier choices.
- ✓ Enjoy eating with family and friends!
- ✓ Take time to eat and savour every bite!

Nutrition Facts

Per 0 mL (0 g)

Amount		% Daily Value
Calories 0		
Fat 0 g		**0** %
Saturates 0 g + Trans 0 g		**0** %
Cholesterol		
Sodium 0 g		**0** %
Carbohydrate 0 g		**0** %
Fibre 0 g		
Sugars 0 g		
Protein 0 g		**0** %
Vitamin A	0 %	Vitamin C 0 %
Calcium	0 %	Iron 0 %

For more information, interactive tools, or additional copies visit Canada's Food Guide on-line at: www.canada.ca/en/health-canada/services/canada-food-guides.html

or contact:

Publications
Health Canada
Ottawa, Ontario K1A 0K9
E-Mail: publications@hc-sc.gc.ca
Tel.: 1 866 225-0709
Fax: (613) 941-5366
TTY: 1 800 267-1245

Également disponible en français sous le titre :
Bien manger avec le Guide alimentaire canadien

This publication can be made available on request on diskette, large print, audio-cassette and braille.

Source: *Eating Well with Canada's Food Guide*, Health Canada, 2011: Adapted and reproduced with the permission of the Ministry of Public Works and Government Services Canada, 2007.

Resources

Key Resources for Parents

9-1-1 Emergency

BC Poison Control Centre
Phone toll-free: 1 800 567-8911
Website: ***www.dpic.org***

HealthyFamilies BC Website
An easy-to-use website for pregnant women and parents of babies and toddlers. Filled with up-to-date and practical information on pregnancy, child health, parenting, safety, child development, healthy eating and much more.
Website: ***www.healthyfamiliesbc.ca/parenting***

Toddler's First Steps: A Best Chance Guide to Parenting Your 6 - to 36-Month-old Child **(2nd Edition)**
Toddler's First Steps is a parenting handbook that comes after *Baby's Best Chance*. It is designed to help parents and caregivers of children 6 to 36 months of age. Website: ***www.healthyfamiliesbc.ca/about-us/additional-resources***. To purchase a copy: Go to ***www.crownpub.bc.ca*** and search for *Toddler's First Steps*.

HealthLink BC
British Columbians have trusted health information at their fingertips with just a phone call or a click away with HealthLink BC. HealthLink BC gives you quick and easy access to non-emergency health information and services. You can:

- speak with a nurse about your symptoms
- talk to a pharmacist about your medication questions
- get healthy eating advice from a dietitian
- find the health services and resources you need that are close to you
- get information about physical activity from a qualified exercise professional

Phone: 8-1-1. For deaf and hearing-impaired assistance (TTY), call 7-1-1. Translation services are available in over 130 languages on request.
Website: ***www.healthlinkbc.ca***

Public Health Offices/Community Health Centres
Offer a wide range of services to promote the optimal physical development, communication and cognitive abilities, healthy emotional attachment, and positive social development for all infants and children. Services include: breastfeeding clinics, nutrition information and consultation, parent and infant drop-in, child health clinics and family and infant follow-up. Contact your local health authority for more information.

Aboriginal Resources

Aboriginal Head Start Association of BC includes 12 urban Aboriginal Head Start preschool sites. These programs provide early childhood education and services to Aboriginal children and their families.
Website: ***http://ahsabc.net/***

Aboriginal Health Services: See the blue pages of your phone book under Health Authorities, Key Word Listings. For other Aboriginal and Métis organizations, see the Yellow Pages of your phone book.

The BC Aboriginal Child Care Society is a non-profit provincial organization serving Aboriginal early childhood programs throughout British Columbia.
Website: ***www.acc-society.bc.ca***

The BC Aboriginal Infant Development Program offers services for Aboriginal children. It is a parallel organization to the BC Infant Development Program. For information on local programs, contact your public health unit.
Phone: 250 388-5593
Website: ***http://aidp.bc.ca/home/***

BC Association of Aboriginal Friendship Centres. Aboriginal friendship centres aim to improve the quality of life of Canada's Aboriginal people and to protect and preserve Aboriginal culture for the benefit of all Canadians.
Phone toll-free: 1 800 990-2432
Website: ***www.bcaafc.com***

Eating Well With Canada's Food Guide: First Nations, Inuit and Métis is a new tailored food guide that includes both traditional foods and store-bought foods that are generally available, affordable and accessible across Canada.
Phone toll-free: 1 866 225-0709
Website: ***www.hc-sc.gc.ca/fn-an/pubs/fnim-pnim/index-eng.php***

Abuse or Neglect

Helpline for Children
A child is anyone under the age of 19. Abuse can be physical, emotional or sexual. Abuse can be abandonment, desertion, neglect, ill treatment or failure to meet the physical, emotional or medical needs of a child. Anyone can call the Helpline for Children for help 24 hours a day, including parents who are afraid they might hurt their child or if you know a child is being abused. You can call anonymously.
Phone: 310-1234 (no area code needed)
Website: ***www.mcf.gov.bc.ca/getting_help/help.htm***

Alcohol, Tobacco and Drug Use

To learn about programs for people with alcohol and other drug problems, ask your health-care professional or check in the Yellow Pages under "Alcohol" or "Drugs."

HealthLink BC
Phone: 8-1-1. For deaf and hearing-impaired assistance (TTY), call 7-1-1. Translation services are available in over 130 languages on request.
Website: ***www.healthlinkbc.ca***

The Alcohol and Drug Information and Referral Line offers a confidential, toll-free information line for alcohol and other drug programs in the province.
Phone toll-free: 1 800 663-1441

Motherisk offers information on the use of alcohol and other drugs while breastfeeding. Visit the Motherisk website or call its Alcohol and Substance Use Helpline.
Motherisk Helpline: 1 877 439-2744
Alcohol and Substance Use Helpline: 1 877 327-4636
Website: ***www.Motherisk.org***

QuitNow
QuitNow Services provide a wide range of free smoking cessation services that are available 24/7 for all BC residents. Trained care coaches will help develop a quit plan, deal with cravings and provide on-going support.
Phone: HealthLink BC at 8-1-1
Website: ***www.quitnow.ca***

Smoke-Free Housing BC
Website: ***www.smokefreehousingbc.ca/***

Breastfeeding

The La Leche League Canada encourages, promotes and provides mother-to-mother breastfeeding support and information.
Website: ***www.llc.ca***

Dietitian Services, HealthLink BC
A help line staffed by registered dietitians who can answer general and medical nutrition questions. Translation services are available in 130 languages.
Phone 8-1-1. For deaf and hearing-impaired assistance (TTY), call 7-1-1.
Website: ***www.healthlinkbc.ca***

Public Health Office or Hospital
Public health offices or hospitals in your area may offer additional breastfeeding services such as lactation consultants, breastfeeding support groups and phone consultation. Contact your local health authority for more information.

Child Care

*Your local Ministry for Children and Family Development office or public health office can give you information to help you select a child-care facility. You can also go online to HealthLink BC (**www.healthlinkbc.ca**) for tips and information on choosing child-care providers.*

The BC Aboriginal Child Care Society is a non-profit provincial organization serving Aboriginal early childhood programs throughout British Columbia.
Website: ***www.acc-society.bc.ca***

The Canada Revenue Agency administers tax laws for the Government of Canada and for most provinces and territories; and various social and economic benefit and incentive programs delivered through the tax system.
Website: ***www.cra.gc.ca***

The Child Care BC Help Line provides information for service providers and parents on child-care funding and subsidies.
Phone toll-free: 1 888 338-6622 In Victoria: 250 356-6501
Website: ***www.mcf.gov.bc.ca/childcare/parents.htm***

Child Care Licensing Regulations describe what is required of child care operators in British Columbia.
Website: ***www.health.gov.bc.ca/ccf/child_care.html***

Child Care Resource and Referral Program (CCRR) is a source of information on child care in your local community.
Phone toll-free: 1 888 338-6622 In Victoria: 250 356-6501
Website: ***www.mcf.gov.bc.ca/childcare/cc_resource.htm***

Ministry of Children and Family Development: Information for Parents. Helpful information on how to select child care and local child-care options.
Website: ***www.mcf.gov.bc.ca/childcare/parents.htm***

Parents' Guide to Selecting Child Care. This brochure from the British Columbia government is full of information that will help you make decisions about child care.
Website: ***www2.gov.bc.ca/gov/content/family-social-supports/caring-for-young-children/child-care/how-to-choose-quality-day-care***

WorkSafeBC is dedicated to promoting workplace health and safety for British Columbia workers and employers.
Website: ***www.worksafebc.com***

Child Development

The BC Aboriginal Infant Development Program offers services for Aboriginal children. It is a parallel organization to the BC Infant Development Program. For information on local programs, contact your public health unit.
Phone: 1 866 388-4881
Website: ***www.aidp.bc.ca/home***

The Infant Development Program of BC offers help to B.C. children and parents. The program has specialized practitioners who are trained to foster healthy child development. These practitioners work in your local health area. Contact your local Infant Development Program of BC office or public health unit.
Website: ***www.mcf.gov.bc.ca/spec_needs/idp.htm***

DECODA provides children from birth to age five with a strong foundation in literacy, physical activity and healthy eating, through fun activities and play. This new program values the learning and bonding that happen when children and caregivers play together.
Website: ***www.decoda.ca/resources/***

Ready, Set, Learn is a British Columbia government initiative that helps families connect with the school system and community agencies.
Website: ***www.bced.gov.bc.ca/early_learning/rsl/***

Child Support

Family Justice Services has information about government support for families.
Website: ***www2.gov.bc.ca/gov/content/life-events/divorce/family-justice***

Ministry of Attorney General: Family Maintenance Enforcement Program has information on government financial support for families.
Website: ***www.ag.gov.bc.ca/family-justice/law/child***

Dental Care

British Columbia Dental Association
Phone toll-free: 1 888 396-9888
Lower Mainland: 604 736-7202
Website: ***www.bcdental.org***

BC Dental Hygienists' Association
Phone: 604 415-4559
Website: ***www.bcdha.bc.ca***

BC Healthy Kids Program helps low-income families with the costs of basic dental care for their children. For more information, visit the website or talk to your public health unit.
Phone toll-free: 1 866 866-0800.
Website: ***www2.gov.bc.ca/gov/content/health/managing-your-health/healthy-women-children/child-teen-health/dental-eyeglasses***

Kidsmiles.ca is a program created by the BC Dental Association and the British Columbia government, to help parents, guardians and other caregivers learn more about caring for the oral health of young children.
Website: ***www.kidsmiles.ca/index.htm***

Family Planning/Birth Control

Canadian Federation for Sexual Health
Website: ***www.cfsh.ca***

Options for Sexual Health
A confidential phone line staffed by registered nurses and trained volunteers.
Phone toll-free: 1 800 739-7367
Lower Mainland: 604 731-7803
Website: ***www.optionsforsexualhealth.org***

Family Resources

BC Association of Family Resource Programs is a not-for-profit provincial organization dedicated to raising awareness of the importance of community-based family resource programs.
Website: ***www.frpbc.ca***

BC Council for Families is a province-wide community service that works on behalf of families and people who serve families.
Phone: 604-678-8884
Website: ***www.bccf.ca***

British Columbia Representative for Children and Youth supports children, youth and families who need help in dealing with the child-serving system and pushes for changes to the system itself. The Representative is responsible for advocating for children and youth and for protecting their rights. The Office works to help to improve the system of support for children and youth, mainly those who are most vulnerable. This includes those who are:

- in-care and live in foster or group homes
- in the home of a relative under a government program
- in youth custody.

The Representative for Children and Youth is an Independent Officer of the Legislature and does not report through a provincial ministry.
Phone toll-free: 1 800 476-3933
Website: ***www.rcybc.ca***

Vanier Institute of the Family is a national charitable organization dedicated to promoting the well-being of Canadian families. Its website offers resources on many family-related issues.
Website: ***www.vanierinstitute.ca***

Family Violence

When violence happens, get help.

In case of emergency, call 9-1-1 and ask for the police. If your community does not have a 9-1-1 service, look for the local police emergency phone number on the first page of your phone book under 'Emergency'. To find out about crisis support services in your community, call **VictimLinkBC** toll-free at **1 800 563-0808**. VictimLinkBC can provide immediate support 24 hours a day, 7 days a week.

BC Women's Hospital Woman Abuse Response Program
Phone: 604 875-3717
Website: ***www.bcwomens.ca/our-services/support-services***

British Columbia/Yukon Society of Transition Houses
Website: ***www.bcsth.ca***

Kids Help Phone is Canada's only toll-free, 24-hour, bilingual and anonymous phone counselling, referral and Internet service for children and youth.
Phone toll-free: 1 800 668-6868
Website: ***www.kidshelpphone.ca***

National Clearinghouse on Family Violence is a resource centre for information on violence within relationships of kinship, intimacy, dependency or trust.
Website: ***www.phac-aspc.gc.ca/sfv-avf/index-eng.php***

VictimLinkBC is a province-wide telephone help line for victims of family and sexual violence and all other crimes. VictimLinkBC operates 24 hours a day, seven days a week, and provides service in 110 languages. It will help you find information on the victim services closest to you.
Phone toll-free: 1 800 563-0808
For deaf and hearing-impaired assistance (TTY): 604 875-0885
Website: ***www.victimlinkbc.ca/***

Fathering

BC Council for Families provides educational resources on topics such as parenting, childhood development, parent-teen relationships, work-life balance, suicide awareness and more. Information about involved fathering and parenting in general is available on the website. Print resources on fathering can be purchased as well.
Website: ***www.dadcentral.ca***

Health Authorities

Northern Health
Phone: 250 565-2649
Website: ***www.northernhealth.ca***

Interior Health
Phone: 250 469-7070
Website: ***www.interiorhealth.ca***

Island Health
Phone: 250 370-8699
Website: ***www.viha.ca***

Vancouver Coastal Health
Phone toll-free 1 866 884-0888
Lower Mainland: 604 736-2033
Website: ***www.vch.ca***

Fraser Health
Phone: 604 587-4600
Phone toll-free: 1 877-935-5669
Website: ***www.fraserhealth.ca***

Provincial Health Services Authority of BC
Phone: 604 675-7400
Website: ***www.phsa.ca***

Hearing

British Columbia Early Hearing Program is the first province-wide screening program to check hearing in babies born in British Columbia.
Website: ***www.phsa.ca/our-services/programs-services/bc-early-hearing-program***

Immunizatons

HealthLink BC Files contain information on many vaccination topics.
Website: ***www.healthlinkbc.ca***

ImmunizeBC. This website has information about immunizations in British Columbia, including common questions.
Website: ***www.immunizebc.ca***

Vaccination and Your Child is a web page of the Canadian Paediatric Society that answers many common questions about having your child vaccinated.
Website: ***www.caringforkids.cps.ca/handouts/vaccination_and_your_child***

Medical Resources

BC College of Family Physicians
Phone: 604 736-1877
Website: ***www.bccfp.bc.ca***

Canadian Mental Health Association is a nationwide, voluntary organization that promotes the mental health of all and supports the resilience and recovery of people experiencing mental illness.
Website: ***www.cmha.ca/bins/index.asp***

Canadian Paediatric Society promotes quality health care for Canadian children and establishes guidelines for pediatric care. The organization offers educational materials on a variety of topics, including information on immunizations, pregnancy, safety issues and teen health.
Phone: 613-526-9397
Website: ***www.cps.ca***

Caring for Kids is a website designed to provide parents with information about their child's health and well-being. Developed by the Canadian Paediatric Society.
Website: ***www.caringforkids.cps.ca***

College of Midwives of British Columbia
Midwives in British Columbia offer primary care to healthy pregnant women and their normal newborn babies from early pregnancy, through labour and birth, and up to six weeks after birth.
Phone: 604 742-2230
Website: ***www.cmbc.bc.ca***

Society of Obstetricians and Gynaecologists of Canada (SOGC) is a leading authority on reproductive health care. The SOGC provides public education on important women's health issues.
Phone toll free: 1 800 561-2416
Website: ***www.sogc.org***

Nutrition

Eating Well with Canada's Food Guide is available through the Canada's Food Guide website or from your public health office.
Website: ***www.hc-sc.gc.ca/fn-an/food-guide-aliment/index-eng.php***

Dietitian Services – HealthLink BC. The HealthLink BC's help line is staffed by registered dietitians who can answer general and medical nutrition questions. Translation services are available in 130 languages.
Phone: 8-1-1. For deaf and hearing-impaired assistance (TTY), call 7-1-1.
Website: ***www.healthlinkbc.ca/healthy-eating***

Parenting

Support groups, such as Parents without Partners, Mother Goose! and Nobody's Perfect, and the family resource program (Family Place) are available in many communities. Contact your local public health unit, mental health agency or family resource centre about programs.

Perinatal Depression

For information about perinatal depression support groups, contact your public health unit.

BC Reproductive Mental Health Program provides counselling to women with depression in pregnancy and after birth.
Website: ***www.reproductivementalhealth.ca/***

Pacific Post Partum Support Society is a non-profit society dedicated to supporting the needs of postpartum mothers and their families. They also publish *Postpartum Depression* and *Anxiety: A Self-Help Guide for Mothers*.
Phone: 604 255-7999
Phone toll-free: 1 855-255-7999
Website: ***www.postpartum.org***

Pregnancy

BC Association of Pregnancy Outreach Programs
Website: ***www.bcapop.ca***

BC Women's Hospital and Health Centre
Website: ***www.bcwomens.ca/health-info/pregnancy-parenting/pregnancy***

HealthyFamilies BC
Website: ***www.healthyfamiliesbc.ca***

Pregnancy Weight Gain Calculator
Website: ***www.hc-sc.gc.ca/fn-an/nutrition/prenatal/bmi/index-eng.php***

Physical Activity

Physical Activity Services – HealthLink BC. The HealthLink BC's help line is staffed by qualified exercise professionals who can answer general physical activity questions. Translation services are available in 130 languages. Phone: 8-1-1

Canada's Physical Activity Guide shows you how to make active living part of everyday life. Includes guides for children and youth.
Website: ***www.phac-aspc.gc.ca/hp-ps/hl-mvs/pa-ap/***

HealthyFamilies BC
Website: ***www.healthyfamiliesbc.ca/activity-lifestyles***

Prescription Drugs

PharmaCare subsidizes eligible prescription drugs and designated medical supplies.
Phone toll-free: 1 800 663-7100
Lower Mainland: 604 683-7151
Website: ***www2.gov.bc.ca/gov/content/health/health-drug-coverage/pharmacare-for-bc-residents***

Safety

BCAA Child Passenger Safety Program
Provides workshops and resources about child car seats.
Phone toll free: 1 877 247-5551
Website: ***www.bcaa.com/road-safety/child-passenger-safety/overview#tab-/road-safety/child-passenger-safety/overview/car-seat-clinics-workshops***

BC Injury Research and Prevention Unit provides useful fact sheets by e-mail.
Website: ***www.injuryresearch.bc.ca***

Canada Safety Council is a national, non-government, charitable organization dedicated to safety. The CSC provides resources for safety information, education and awareness – in traffic, at home, at work and at leisure. The CSC website offers a wide variety of safety-related information and education materials for the general public.
Phone: 613 739-1535
Website: ***http://canadasafetycouncil.org/***

Canadian Red Cross teaches emergency child care first aid, CPR and basic skills for dealing with emergencies.
Phone toll-free: 1 877 356-3226
Website: ***www.redcross.ca***

Health Canada: Consumer Product Safety
Phone: 1 866 662-0666
Website: ***www.hc-sc.gc.ca/cps-spc/index-eng.php***

National Highway Traffic Safety Administration. This U.S. traffic safety website provides information on child car seat recalls.
Website: ***www.nhtsa.gov***

Poison Control Centre. The BC Drug and Poison Information Centre provides 24-hour poison information services.
Phone toll-free: 1 800 567-8911
Website: ***www.dpic.org***

Emergency Management BC offers help with emergency planning or to create an emergency kit.
Website: ***www2.gov.bc.ca/gov/content/safety/emergency-preparedness-response-recovery***

Public Health Agency of Canada offers information on many child safety topics on its website. Use the search function to find a specific topic. Website: ***www.phac.gc.ca***

Parachute provides information of keeping children safe and preventing injuries.
Phone toll-free: 1 888 537-7777
Website: ***www.parachutecanada.org/***

Safe Start is an injury prevention program of BC Children's Hospital. It provides information to parents and caregivers on how to make homes and cars safer.
Website: ***www.bcchildrens.ca/health-info/healthy-living/child-safety***

St. John's Ambulance
St John Ambulance offers programs in first aid, CPR and child care. Local branches of St. John Ambulance are listed in the white pages of your telephone directory, and in the Yellow Pages under "First Aid Services."
Website: ***www.sja.ca***

Shaken Baby Syndrome

Prevent Shaken Baby Syndrome British Columbia
Phone: 1 888 300-3088
Website: ***http://dontshake.ca/***

The Crisis Intervention and Suicide Prevention Centre of British Columbia
The Distress Line provides confidential, non-judgmental, free emotional support 24 hours a day, 7 days a week for people experiencing feelings of distress or despair.
Phone: 1 800 784-2433
Website: ***www.crisiscentre.bc.ca***

Special Needs

Your public health nurse can help if you think your baby has a developmental problem or a disability. Most communities have an Infant Development Program for children. Staff in this program can help you with activities for your baby that will encourage development. You will also have help finding other support services.

Ministry of Children and Family Development: Early Childhood Intervention can help determine your family and child's needs and match these with the resources available in your community. Visit the website or contact your local MCFD office.
Website: ***www2.gov.bc.ca/gov/content/health/managing-your-health/healthy-women-children/child-behaviour-development/special-needs***

Speech Therapy

British Columbia Association of Speech/Language Pathologists and Audiologists
Phone tol***l-free: 1 877 BCASLPA (222-7572)***
Website: www.bcaslpa.ca/public

Vision

BC Healthy Kids Program helps low-income families with the costs of prescription eyewear for their children. For more information, call, visit the website, or contact your public health unit.
Phone toll-free: 1 866 866-0800
Website: ***www2.gov.bc.ca/gov/content/health/managing-your-health/healthy-women-children/child-teen-health/dental-eyeglasses***

Glossary

abdomen
The front part of the body between the chest and the pelvis.

acetaminophen
A medicine that is used to relieve pain and decrease fever.

acetylsalicylic acid (ASA)
Commonly known as aspirin. A drug used to relieve pain and reduce fever. Do not give aspirin (ASA) to babies, children or teenagers because there is an association between the development of Reye Syndrome and the use of aspirin.

AIDS
Acquired Immune Deficiency Syndrome. It can develop if one becomes infected by the HIV virus.

amniocentesis
A diagnostic test for finding genetic fetal abnormalities such as Down Syndrome. It is usually done between 15 to 18 weeks of pregnancy. It is done by removing a small amount of amniotic fluid using a needle under ultrasound guidance.

amniotic fluid
The liquid that surrounds the fetus. It helps the baby by absorbing bumps from the outside, maintaining an even temperature inside and allowing the baby to move easily. When the amniotic sack ruptures at birth, it is often called the water breaking.

amniotic sac
The membrane inside the uterus that holds the fetus and amniotic fluid. (See diagram on page 181.)

antibiotic
Drugs used to fight many infections caused by bacteria. Antibiotics do not work against viral infections.

antihistamine
A drug that acts to relieve the effects of histamine, a normal body chemical that is thought to cause symptoms in people who are very sensitive to various allergens (substances causing a person to become sensitive).

Apgar test
A simple and easy way to measure how healthy a baby is. The test rates five areas: the baby's heart rate, breathing, muscle tone, reflexes and skin colour. The rating is a number out of a total of 10 called the Apgar score. Most babies score an Apgar between 7 and 10.

Baby-Friendly Initiative
A global program of the World Health Organization (WHO) and UNICEF to encourage practices in hospitals and communities that promote, protect and support breastfeeding.

bacterial vaginosis
A condition in women where the normal balance of bacteria in the vagina is disrupted. Can cause pain, itching, burning, a bad smell or discharge.

Biliary Atresia
A rare but serious liver disease that begins to affect newborns in the first month of life. It is the most common reason why children need a liver transplant, and it is life-threatening if it is not treated. It is detected by abnormal coloured infant stools (poop).

bilirubin
The yellow-coloured substance formed when the extra red blood cells break down after birth. Eliminated from the baby's body in its bowel movements. It is the cause of jaundice.

binge drinking
Drinking 4 or more standard "drink" units at any one time. One "drink" is:

- 12 oz. bottle of 5% alcohol beer, cider or cooler;
- 5 oz. glass of 12% alcohol wine; or
- 1.5 oz. serving of 40% distilled alcohol (such as rye, gin and rum).

body mass index (BMI)
A measure of a person's weight in relation to height. Often used as general health indicator.

birth wishes
A written document that explains what you would like to happen during and after labour and birth.

Braxton Hicks contractions
Contractions of the uterus that occur during pregnancy. They are not usually painful and can last for about a minute. Often called practicing contractions.

breech position
The unborn baby's buttocks, buttocks and legs, or legs are facing down and would be born first.

caesarean
A surgical procedure used to deliver a baby through incisions in the abdomen and the uterus. Often referred to as a caesarean birth or C-section.

cervix
The lower part of the uterus that protrudes into the vagina through which the baby passes during birth. (See diagram on page 181.)

chloasma
The darkening of the skin around the eyes and over the nose and cheeks during pregnancy. Often called the mask of pregnancy.

chorionic villus sampling (CVS)
A diagnostic test used to detect genetic abnormalities in the fetus. Done by removing a small amount of chorionic villi tissue through the woman's vagina or the abdomen. The test is unable to detect neural tube defects.

chromosome abnormality
Genetic defects in the structure of a baby's chromosomes.

circumcision
The surgical procedure to remove the layer of skin (foreskin) that covers the head of the penis and part of the shaft.

colostrum
The first breast milk produced. It begins to be produced during pregnancy and is important for the baby's first feedings.

cue-based feeding
Feeding a baby when she shows an interest in feeding before reaching the crying state. Feeding cues include: rapid eye movements (eyes moving under eyelids), waking, stretching, stirring, hand-to-mouth movements, sucking, licking and rooting.

dehydration
Loss of water from the body. Usually due to not taking in enough fluids. Can be serious.

diabetes
A disease that occurs when the body has difficulty making or using insulin (a hormone that makes it possible for the body to use sugar as a source of energy). Without the help of insulin, the blood sugar level will become much higher than normal.

dilation
The opening of the cervix during the first stage of labour. It is measured in centimetres and is about 10 centimetres when fully opened.

doula
A labour companion who is trained and experienced in childbirth, and provides continuous physical and emotional support during labour, birth and the immediate postpartum period.

Down syndrome
Down syndrome is a genetic condition in which a baby has 47 chromosomes (three copies of chromosome 21 instead of two) instead of 46. Down syndrome is the most common chromosome problem. People with Down syndrome have mild to moderate mental delays and a higher chance of some health problems. Each person with Down syndrome is different and there is no way to predict how serious any problems will be. People with Down syndrome usually live into their 50s.

ectopic pregnancy
A pregnancy in which the fertilized egg begins to develop outside the uterus.

eczema
A skin rash that often has itching, swelling, blistering, oozing and scaling of the skin.

effacement
The ongoing thinning and shortening of the cervix during the first stage of labour.

embryo
The developing baby from the fourth week after the egg has been fertilized until the eighth week of pregnancy.

engorgement
Occurs when the breasts become overly full (swollen), hard and painful. It is prevented by early (soon after birth) and frequent breastfeeding, not restricting the time for feeding, and ensuring the baby is well latched on and feeding well.

Entonox
The drug nitrous oxide, commonly known as laughing gas. It can be used to relieve pain during labour.

epidural
Local anaesthetic given into the space around the spinal cord, providing pain relief from the waist down. Used during labour and vaginal birth by some women and for most caesarean births.

episiotomy
An incision (cut) made in the area between the vagina and rectum to enlarge the space for the baby to pass through the vaginal opening.

erythromycin eye ointment
An antibiotic cream used in the eyes of newborns to prevent infection.

external cephalic version (ECV)
A way to try to turn a baby from a breech position to head-down (vertex) position while it's still in the mother's uterus. The health care provider uses his or her hands on the outside of the woman's abdomen to try to turn the baby.

family-centred care
The process of providing safe, skilled care to meet the physical, emotional and psychosocial needs of each mother, newborn and family. Pregnancy and birth are considered to be a normal and healthy life event. Also recognizes the importance of family support and participation and care is adapted to meet their needs.

feeding on demand
Feeding a baby on cue when they indicate hunger by watching for the baby's feeding cues. Newborns feed frequently. This is the preferred approach. A regular timed schedule is not followed.

Fetal Alcohol Spectrum Disorder (FASD)
The full range of birth defects and disabilities that can result from drinking alcohol during pregnancy. Can range from mild to very severe defects and developmental delays. Is totally preventable by not drinking any alcohol during pregnancy.

fetus
The unborn baby from eight weeks until birth. Also spelled foetus.

folic acid
One of the B vitamins that women of childbearing age (18–45 years old) are recommended to take before pregnancy and in early pregnancy to prevent defects of the spinal cord, such as spina bifida.

forceps
Spoon-like instruments that are placed on either side of the baby's head during some deliveries. They are used to gently help pull the baby out.

fundus
The top part of the uterus.

gestational diabetes
Diabetes that can develop during pregnancy and usually disappears after birth. Women with gestational diabetes are at increased risk for developing diabetes in later life.

glucose screening (glucose tolerance test)
Screening test used to screen for gestational diabetes. Measures the mother's blood after drinking a liquid high in sugar.

groin
The place where the abdomen and the thigh meet.

group B streptococcus (group B strep)
Bacteria that is found in the vagina and bowel of 15–20% of healthy pregnant women. It can pass from the mother to the baby during birth and cause serious infection. Treated with antibiotics.

hemorrhagic disease
A bleeding problem that can occur during the first few days of life. Vitamin K is given to newborns to prevent hemorrhagic disease.

hemorrhoids
Painful, itchy and sometimes bleeding veins that bulge out around your anus, especially during pregnancy or after birth.

HIV (Human Immunodeficiency Virus)
The virus that causes AIDS (Acquired Immune Deficiency Syndrome). Can be passed from the mother to the unborn child. Antiviral drugs are used to help prevent infant infection.

HSV (herpes simplex virus)
Common viral sexually transmitted infection.

hypertension
High blood pressure.

incontinence
Leakage of urine.

induction of labour
A medical intervention that starts labour artificially.

intravenous (IV)
Giving fluid through a vein.

jaundice
The breaking down of extra red blood cells, forming a yellow substance called bilirubin. When extra bilirubin accumulates, it appears in the skin, the mucous membranes or the whites of the eyes. Common in newborns.

Kangaroo Care
Care that places a baby, even preterm babies, skin-to-skin with a parent. Babies benefit from the smell, sound of the heartbeat and the warmth the parent provides. Improves the growth of preterm babies and gives parents an opportunity to be close to their baby.

Kegel exercises
Exercises to strengthen the vaginal and perineal area (between the vagina and anus).

labia
The fold of skin, on both sides, at the opening of the vagina in females. (See diagram on page 181.)

labour nurse
Registered nurse who provides nursing care to the pregnant mother and supports the family during labour and birth.

lactation consultant
A healthcare provider who has training and is certified to help women with breastfeeding. This person receives a certificate from the international board of lactation consultants.

lanugo
Fine hair that covers the body of the fetus.

let-down reflex
Hormonal reaction to the baby sucking on the breast that causes milk to flow into the breasts. May be felt as a warm, tingling feeling.

leukemia
Cancer of the tissues in the bone marrow, spleen and lymph nodes.

linea nigra
A dark line between the pubic bone and the navel that appears in some pregnant women. Due to hormonal changes during pregnancy.

listeriosis
An infection caused by eating foods that have the Listeria bacteria. Pregnant women and newborns are more vulnerable to listeriosis.

lochia
Bloody discharge flowing from the uterus and vagina following birth.

lymphoma
A tumor or condition affecting the lymph tissue.

mastitis
An infection of the breast tissue and/or milk ducts. There is always a hard, swollen, red, painful area in the breast.

maternity leave
A mother's time off work after the birth of a child.

Eligible employees may get Employment Insurance maternity benefits. Parental leave may follow.

meconium
The baby's first bowel movement. It is a sticky, greenish-black substance present in the baby's intestine before birth. It is passed for one to two days after birth.

menstruation
A woman's monthly bleeding. It is also called menses, menstrual period, or period.

milia
Small white raised spots commonly seen on a newborn's face. Milia are caused by plugged oil glands and usually clear within three to four weeks.

morning sickness
Nausea and vomiting that woman may experience during pregnancy. Commonly seen in the first trimester but can occur throughout an entire pregnancy.

non-stress test
Electronic monitoring test used before labour to check the functioning of the fetus' heart rate patterns in response to fetal movement.

nuchal translucency
An ultrasound measurement of the fluid behind the neck of a baby during pregnancy. Used to see if the baby has a greater risk of a genetic abnormality.

open neural tube defect
An open neural tube defect occurs when the brain or spinal cord does not form properly. Spina bifida is an open neural tube defect in which the spine does not completely close around the spinal cord. This is the most common form of open neural tube defect. People with spina bifida may have both physical and mental disabilities.

Anencephaly is an open neural tube defect involving the brain. A baby with anencephaly will be stillborn or die shortly after birth.

otitis media
Infection of the middle ear. Most commonly seen in young children. It frequently follows or occurs at the same time as an upper respiratory infection (cold).

oxytocin
A hormone naturally produced by the body that is responsible for starting uterine contractions.

parental leave
Time off work to care for a newborn. May be taken by either or both parents. Eligible employees may get Employment Insurance parental benefits. Usually follows maternity leave.

perinatal nurse
A Registered Nurse who provides nursing care for the woman, newborn and the family during labour, birth and postpartum.

perinatal depression
Perinatal depression is more than just the "postpartum blues" or "baby blues." Perinatal depression is depression that happens any time from when you first become pregnant to one year after your baby is born (postpartum depression is depression that happens after birth.) It can also happen after miscarriage, stillbirth or adoption. Symptoms can include extreme fatigue or exhaustion, lack of interest in things that usually bring pleasure, uncontrollable crying, depressed feelings or extreme mood swings, strong feelings of guilt or failure. Perinatal depression is a serious health concern.

perineum
The area between the vagina and the anus, including the pelvic floor muscles, the external genitals, urethra and anus. (See diagram on page 181.)

pica
An unusual craving or compulsion to eat non-food substances, such as dirt, clay and laundry starch.

placenta
The structure that grows on the wall of the uterus during pregnancy that connects the fetus to the mother. Blood passes through the placenta to the baby, providing oxygen, nutrition and antibodies. Blood circulated back to the mother's body brings waste from the baby's body for removal. The placenta also produces a number of hormones that affect the body during pregnancy. (See diagram on page 181.)

placenta previa
A condition in which the placenta covers all or part of the cervix. It can cause bleeding.

plaque
A sticky film of bacteria that is present in the mouth all the time. This bacteria is the primary cause of inflammation of the gums (gum disease or gingivitis) and tooth decay.

positional plagiocephaly
The flattening of one side or the back of the baby's head. It is caused by the baby always lying in the same position.

posterior position
The back of the unborn baby's head is toward the mother's back.

postpartum
The period after childbirth.

postpartum blues (or baby blues)
Occur within the first 3–5 days after birth. Up to 80% of mothers can experience temporary emotional distress (from happiness to sadness). In most women these resolve without treatment within a week or two.

postpartum depression
A type of perinatal depression that can affect the mother after birth. It is described as a group of symptoms that can change a woman's mood, behaviour and outlook. See Perinatal Depression.

pregnancy gingivitis
Red, swollen, tender and bleeding gums caused by hormonal changes in pregnancy combined with poor oral hygiene. It can be prevented with correct gum care. If the condition persists, or there is extreme swelling, see a dentist or dental hygienist.

pregnancy-induced hypertension (PIH)
High blood pressure that occurs in pregnancy in a woman who has had normal blood pressure. High blood pressure disappears quickly after birth.

pre-labour
The time before labour actively begins when the uterus may start gentle but irregular contractions (Braxton Hicks).

prenatal
Related to the time from when a woman becomes pregnant to the time of birth.

prenatal genetic screening
Blood tests offered to pregnant women to screen whether they are at increased risk of carrying a baby with certain conditions, such as Down Syndrome or an open neural tube defect. This screening is optional.

prenatal supplement
Vitamin and/or mineral pill designed for pregnancy and taken in addition to a healthy diet. These supplements provide extra vitamins and minerals needed to help meet the needs of a growing baby.

public health nurse
Registered Nurse who provides prevention and health promotion services to mothers, infants and families in homes, preschools, schools and other community settings.

pudendal block
Local freezing given around the vagina. This stops the pain in the vagina, vulva and perineum. Given at the time of birth.

quickening
The first time a baby's movements can be felt by a pregnant woman.

Registered Midwife
A trained professional who provides care for women during normal pregnancy labour, birth and after the baby is born.

Reye syndrome
A serious disease that affects the organs of the body. It can cause very serious damage to the liver and the brain. Because there is an association between the development of Reye Syndrome and the use of aspirin (ASA), babies, children and teenagers should not be given aspirin (ASA).

Rh-negative
Women who are Rh-negative can develop antibodies to an Rh-positive baby. If there is mixing between the blood of the mother and baby, the woman's body may respond by developing antibodies as if it is allergic to the baby. This can be very serious for the baby. This is preventable. An injection of Rh immunoglobulin (RhIg) is given at about 28 weeks pregnancy. It will also be given at any time in pregnancy there is bleeding or an amniocentesis. Rh-negative women will also be tested after birth to determine if another injection of RhIg is needed.

rubella antibody screen
A blood test to determine a woman's immunity to rubella (German measles). If a woman becomes infected during pregnancy her unborn baby can be affected.

salmonella
A bacterium of the genus Salmonella, especially of a species causing food poisoning.

scrotum
The skin-covered pouch below the penis that contains the testes in males.

sexually transmitted infections (STIs)
Once called venereal diseases, these are spread mostly by sexual contact. There are about 20 identified types, including herpes, Hepatitis B, Chlamydia, AIDS/HIV, genital warts, gonorrhea and syphilis. They can cause sterility, miscarriage, ectopic pregnancies, etc., and can affect the baby while in the uterus or at the time of birth. Treatment and prevention is available for most STIs.

shaken baby syndrome (SBS)
Shaken baby syndrome is a form of non-accidental head injury with or without impact, that results from violent shaking. It is a form of child abuse and can cause serious lifelong injuries or death.

show
Blood-tinged vaginal discharge that may be one of the signs of labour. Bloody show continues as labour progresses. It has blood in it because small blood vessels in the cervix break as the cervix thins and opens.

skin-to-skin
The naked or diaper-clad baby is placed on the mother's or partner's bare chest. A blanket is placed over both for warmth. Babies benefit from the smell, sound of the heartbeat and the warmth of the parent's body. It also encourages breastfeeding.

station
The position of the baby's presenting part (the lowest part, usually the head) in relation to the mother's pelvic bones.

stillbirth
When a baby that appeared to be well during pregnancy is born dead.

stool
The waste that comes out of the bowels. Also called bowel movement.

Sudden Infant Death Syndrome (SIDS)
The sudden and unexpected death of a healthy baby that remains unexplained after all known and possible causes have been carefully ruled out. Research suggests that cigarette smoke and the baby sleeping on its tummy are contributing factors.

supplements
Vitamin and/or mineral pill, taken in addition to a healthy diet. Supplements provide extra vitamins and minerals needed to help meet the needs of a growing baby.

surfactant
A substance formed in the lungs late in fetal life that helps to keep the small air sacs expanded. Babies born preterm without enough surfactant have difficulty breathing.

transcutaneous electronic nerve stimulation (TENS)
A method for relief of back pain. Electrodes are placed on the lower back. They are attached to a small, hand-held battery device. The stimulation gives tingling, buzzing or prickling sensations over the back.

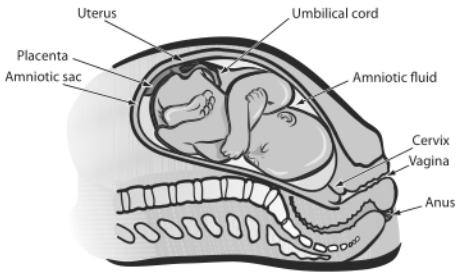
thrush
A yeast infection that can cause breast infection. Yeast grows well on milk and in warm moist areas (such as mother's nipples, infant's mouth, diaper area and vaginal area). Generally responds well to treatment. Mother and baby are usually treated together. Continue to breastfeed.

toxoplasmosis
A disease caused by a parasite and transmitted by: eating raw or undercooked meat or other raw foods including fruits and vegetables; drinking unpasteurized milk; cleaning cat litter boxes; or working in gardens or playing in sandboxes that contain cat feces (poop). Can result in miscarriage, poor fetal growth, preterm birth or stillbirth. Babies born with toxoplasmosis may have serious physical and mental disabilities.

trimester
The nine months of pregnancy divided into three parts.

ultrasound test
A scan that uses very high-frequency sound waves (can't be heard by humans) to show the development of the baby in the uterus.

umbilical cord
Links the placenta to the baby. Nutrients and waste products pass through the umbilical cord. It is attached to the baby at the belly button. The

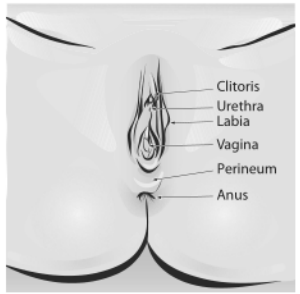


umbilical cord is usually about 56 cm (22 inches) long and feels like a smooth, tough rope.

urethra
The tube between the bladder and the opening to the outside of the body. Urine passes through the urethra.

urine
The fluid containing water and waste products that is produced by the kidneys, stored in the bladder and discharged through the urethra when you go pee.

uterus
A hollow, muscular, pear-shaped organ located in the woman's pelvis. It holds the growing baby.



vagina
The canal going from the cervix to the outside of the body through which the baby passes during a vaginal birth.

varicose veins
Blood vessels that are swollen, distended and twisted, showing just beneath the skin, especially on the legs. They result from a slowing of the flow of blood, probably in combination with defects in the valves within the veins and weakened walls of the veins. Pregnancy is often a cause. They may disappear at the end of pregnancy.

VDRL test
A blood test to identify women with untreated syphilis.

vernix
A white creamy substance that covers the baby's skin for protection while in the uterus.

voiding
Urinating or peeing.

vulva
The external parts of a woman's reproductive system that surround the opening of the vagina.

Zika virus
A virus that is usually transmitted by an infected mosquito bite but can also be transmitted sexually. Infection during pregnancy can have serious complications for the baby's brain development, such as microcephaly (abnormally small head size).

Index

Baby's Best Chance

Parents' Handbook of Pregnancy and Baby Care

You will experience many physical and emotional changes during pregnancy, childbirth, and new parenthood. Knowing what to expect can make these changes easier to handle and to enjoy.

In this easy-to-read handbook you will find the answers to your questions about your pregnancy, birth, and taking care of your baby for the first six months.

The sixth edition (sixth revision) of this popular handbook has important information on more than 70 key topics.

You can access more information at:

The Healthy Families BC Website
This website is filled with up-to-date and practical information, useful tools and resources for women, expectant parents and families.

www.healthyfamiliesbc.ca

HealthLink BC
British Columbians have trusted health information at their fingertips with just a phone call or a click away with HealthLink BC. HealthLink BC gives you quick and easy access to non-emergency health information and services.

You can speak with a nurse about your symptoms, talk to a pharmacist about your medication questions, get information about physical activity from a qualified exercise professional, or get healthy eating advice from a dietitian. You can also find the health services and resources you need that are close to you.

Dial 8-1-1 or visit ***www.healthlinkbc.ca***

For deaf and hearing-impaired assistance (TTY), call 7-1-1.

Translation services are available in over 130 languages on request.

BRITISH COLUMBIA

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FACT SHEET
Child Care Licensing Regulation
Community Care and Assisted Living Act

Lead in Drinking Water

Section 48 of the Child Care Licensing Regulation requires a licensee to ensure that safe drinking water is available to children.

Lead in drinking water is not a new issue; however recent testing in many communities has shown higher concentrations in tap water than previously expected.

What is Lead in drinking water? Lead was once a commonly used product in the plumbing system of buildings. Under certain conditions, lead particles from older plumbing systems can dissolve into drinking water.

Why do I need to be aware of lead in drinking water? Consuming even low amounts of lead may be harmful to brain development of infants and children. They are more vulnerable to negative effects of lead than adults. People may ingest lead from many sources, such as food, drinking water, soil, paint and dust. Caregivers should take steps to reduce children's exposure to lead from all sources, including drinking water.

How can I find out if my drinking water contains too much lead?

Older buildings are at higher risk of lead in drinking water because older plumbing rules allowed the use of lead in plumbing. The amount of lead released into the water depends on the plumbing materials used, the properties of the water, and how the long water sits in the plumbing. However, to know exactly what comes out of your tap, you need to do a water test. Drinking water experts (such as environmental health officers who work for health authorities) can direct you to information about whether your facility's water supply is at risk of having lead. Your local licensing officer can put you in touch with local health authority drinking water contacts for information, including how and when to test.

What can I do about lead in my drinking water? There are several things you can do to help reduce lead from drinking water. This includes: flushing pipes, using bottled water, adding filters or replacing lead plumbing.

To flush your pipes, let your cold water tap run for one to five minutes – or until the water turns colder. The amount of time required will depend on many factors, including the size and use of the building your facility is in. Larger buildings need to be flushed longer, particularly if the water has not been used for a long period (i.e., overnight.) Flushing should be done before drinking or cooking first thing in the morning or any other time the plumbing system has not been used for several hours.

Household water filters and treatment devices that are certified to remove lead from drinking water are also effective. For best results, install these filters and devices at the tap that is most commonly used for drinking water, such as the kitchen tap, and ensure they are maintained as per the manufacturer's instructions.

You can also address the problem permanently by removing or replacing any sources of lead plumbing pipes.

As lead from drinking water is not well absorbed by the skin, showering, bathing or cleaning is not a concern.

Note: Always use cold tap water for drinking or cooking as hot water increases the release of lead. Boiling the water will not remove lead.

Where can I get more information about water testing and treatment? If you would like more information or have specific questions about drinking water safety, please contact your local licensing officer who can put you in touch with your health authority drinking water experts.

BC Health Files: Lead in Drinking Water