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PRENATAL LACTATION ASSESSMENT

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ABSTRACT

Obstetricians and family physicians play key roles in preparing pregnant women for breastfeeding. By performing a careful prenatal lactation assessment in the third trimester, maternal and infant risk factors for lactation and breastfeeding difficulties can be identified. Anticipatory guidance and early intervention can help mothers to achieve their breastfeeding goals and can help families to follow the recommended infant feeding guidelines. This article outlines a standardized prenatal assessment protocol that can be used by physicians in their offices.

RÉSUMÉ

Les obstétriciens et les médecins de famille jouent un rôle primordial dans la préparation des femmes enceintes en matière d'allaitement. En effectuant une évaluation prénatale attentive de la lactation au troisième trimestre, il est possible d'identifier chez la mère et chez le nouveau-né tout facteur pouvant amener des difficultés de lactation et d'allaitement. Des conseils et une intervention précoces peuvent aider la mère à allaiter et la famille à se conformer aux recommandations d'alimentation du nourrisson. L'auteur décrit un protocole d'évaluation prénatale que les médecins peuvent utiliser dans leur cabinet.

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KEY WORDS: Breastfeeding, breastfeeding preparation, lactation assessment.

INTRODUCTION

Lactation can be considered the final stage of the reproductive cycle. Adequate lactation is essential for the survival of most mammalian species. Milk provides both a source of nutrients and protection against infections, and it contributes to optimal growth and development in young infants.

Most Canadian mothers choose to breastfeed, but the number of mothers who follow the recommended infant feeding guidelines are relatively small. Many mothers abandon breastfeeding after a few weeks or months and introduce artificial milk and solid foods before their infants are physiologically and neurodevelopmentally ready¹

Most studies looking at reasons for early termination have identified inadequate milk intake as the most common cause of breastfeeding termination.² It is usually reversible but occasionally irreversible. This syndrome of insufficient milk results from a variety of factors, many of which are preventable, if recognized early enough and if anticipatory guidance is given.³

All health professionals involved in the care of mothers and children have a responsibility to work together to help mothers to achieve their breastfeeding goals. This article will look at the way each member of this team can contribute towards assisting families in making informed choices about infant feeding, ensuring successful preparation for families who have chosen to breastfeed, identifying mother and infant

pairs at risk for lactation and breastfeeding difficulties, and helping to foster a positive, emotional environment among families, friends, employers, and the community.

INFORM ED CHOICE

In the prenatal period, families begin to consider methods of infant feeding. Health professionals must assist families in making an informed decision. The first step is to provide accurate, up-to-date information about the benefits of breastfeeding and breastmilk, the hazards of artificial formula, and to discuss the recommended infant feeding guidelines. The Innocenti Declaration states that “breastfeeding is the optimum way of feeding ... and all women should be enabled to practise exclusive breastfeeding and all infants should be fed exclusively on breastmilk from birth to four to six months of age. Table foods should be introduced around six months and weaning should occur in the second year of life.”⁴

The Benefits to the Infant Include:

- Human milk is species specific, it offers the ideal nutrition, the protein and fat content is suited to the needs of the infant, and it provides protection against iron and vitamin deficiencies⁵
- Breastmilk contains over 100 biologically active ingredients. It offers immunological protection to an otherwise immunodeficient neonate. The enteromammary immune cycle provides specific maternal antibodies to infant antigens. It protects against otitis media, gastroenteritis, respiratory tract infections, other bacterial and viral diseases, inflammatory bowel disease, necrotizing enterocolitis, and childhood leukaemias.⁶
- Breastfeeding provides a close interaction between mother and infant, and helps to develop a strong, positive, emotional bond which has long-term psychological advantages.⁷
- The action of breastfeeding facilitates correct jaw and dental development and the incidence of sudden infant death is lower in breastfed infants.^{8,9}

The Benefits to the Mother Include:

- Psychological satisfaction and close maternal bonding with her infant. It offers a regular opportunity to sit and relax during the early parenting period that is often exhausting.
- Exclusive breastfeeding associated with lactational amenorrhoea is an effective, reliable method of birth control and child spacing.¹⁰
- Prolonged breastfeeding decreases the risks of premenopausal breast cancer by 50 percent, ovarian cancer, and osteoporosis)^{11,12}
- It reduces post-partum anaemia.

The Benefits to Society Include:

- Breastmilk is a natural resource that is replenished and does not leave waste. The future of a society depends on the health of its children. Breastfeeding is the most health promoting, disease preventing, and cost effective activity mothers can do.

The Hazards of Infant Formula

Parents must be told about the known risks of artificially feeding a human baby.

- Nutritional differences. Infant formulae contain inadequate micronutrients such as iron, zinc, copper, manganese, calcium, and phosphorus. They lack an essential omega-3 fatty acid and other essential fatty acids known to be vital for myelination, and proper brain and retinal development. Some formula contain excess vitamin D.^{13,14}

- **Contaminants.** A variety of contaminants including life threatening bacterial contaminants, excessive aluminum, lead, and iodine have been identified, and many brands of formula have been withdrawn.¹⁵
- **Cognitive development.** Several well controlled studies have reported significantly lower Intelligence Quotient (IQ) scores and poorer development in children who lacked breastmilk in their diet.¹⁶
- **Allergies.** More formula fed infants develop wheezing, diarrhoea, prolonged colds, allergies to milk and soya than infants who were not exposed to formula early in life.¹⁷
- **Morbidity and Mortality.** The added risk of bottle-feeding can account for seven percent of all infants hospitalized for respiratory infections and, in the USA, formula-fed infants have a 10-fold risk of being hospitalized for any bacterial infection, they have more than double the risk of contracting lower respiratory tract infections, and otitis media is up to three to four times more prevalent in formula-fed infants. Formula-fed infants have a higher incidence of childhood cancers and inflammatory bowel diseases in adulthood.^{18,19} Formula feeding accounts for two to 26 percent of insulin dependent diabetes mellitus in children.²⁰
- **Costs.** It costs approximately \$150 per month to formula feed an infant fully, therefore, many infants in low income families are at risk for receiving low cost and inappropriate alternative fluids and early introduction of table foods. It is time consuming to purchase and prepare formula.

Facilitating an informed choice will begin the journey towards successful breastfeeding.

PRENATAL BREASTFEEDING PREPARATION

Once a woman has decided to breastfeed and is beginning the transition to parenthood, she must prepare, by acquiring the art of breastfeeding. Breastfeeding is a skill which is learned, similar to playing a musical instrument, and teaching and practising go hand in hand. Following childbirth, mothers may have difficulty grasping new concepts and skills, therefore, basic breast-feeding techniques should be taught before the baby is born.

A prenatal breastfeeding class offers an ideal setting in which couples can start this learning. The instructor should review briefly the physiology of lactation, stressing the importance of early first attachment after delivery in order to trigger lactation, and should explain the supply and demand phenomenon which helps to establish a good supply of breastmilk.

Women who are not used to thinking about their breasts as functional organs may need encouragement to touch and handle their rapidly changing breasts. An instructor can sympathetically talk about this changing body image and encourage positive thinking towards the new maternal role.

Many women have never watched another woman breastfeed, and they may be vague about the dynamics. A model breast and doll can be used for demonstration purposes, to illustrate different positions and latching techniques. In a prenatal breastfeeding class, women often enjoy practising breastfeeding techniques with their partner, using a doll or teddy bear supported on a pillow. The instructor should review the cradle, modified cradle, and football holds. Physicians can also use models in their offices, during a prenatal examination, to help reinforce the learning process.

Information should be repeated in many forms. The Provincial Perinatal handbooks such as "British Columbia's Baby's Best Chance" are useful patient education resources, but it must be remembered that twenty-nine percent of Canadians have difficulty in reading English. Information in other languages is a benefit. There are useful reference books and video materials on the art of breastfeeding that can be purchased or borrowed from Public Health Units and local libraries. Physicians and childbirth instructors should not distribute industry developed infant feeding literature or videotapes. The biases are blatant and give mixed messages to breastfeeding families.

PRENATAL LACTATION ASSESSMENT

Inadequate milk is the most common reason given for premature termination of breastfeeding. During the prenatal period, physicians have an opportunity to screen women for certain biological, psychological, and social risk factors that might interfere with successful lactation or breastfeeding. A formal prenatal lactation assessment should be performed in the third trimester and it ought to become a routine component of antenatal care for all women (Figure 1).²¹

FIGURE 1

PRENATAL LACTATION ASSESSMENT

INFANT FEEDING PLAN

Definitely Breastfeeding

Undecided

Definitely not Breastfeeding

PSYCHOLOGICAL RISK FACTORS

GOAL: To ASSIST FAMIUES TO MAKE AN INFORMED DECISION ABOUT EARLY INFANT FEEDING.

What do you know about infant feeding?

How are you planning to feed your baby?

What are your thoughts about breastfeeding?

How important is breastfeeding to you?

How did you make your decision?

Do you have any concerns about your ability to breastfeed?

SOCIAL RISK FACTORS

GOAL: TO HELP TO FOSTER A POSITIVE EMOITIONAL ENVIRONMENT AMONGST FAMILY, FRIENDS, AND COMMUNITY.

Who supports your decision to breastfeed?

Who does not support your decision?

Who can help you?

Do/did any of your friends breastfeed?

How do you feel about breastfeeding in public?

Do you plan to return to work?

BIOLOGICAL RISK FACTORS

GOAL: TO IDENTIFY MOTHER AND INFANT PAIRS AT RISK FOR BREAST-FEEDING DIFFICULTIES WHO NEED CLOSE POST-PARTUM FOLLOW UP.

Did you have any previous breastfeeding problems?

Have any family members had problems?

Do you have any chronic medical conditions?

Do you have psychiatric problems?

Have you had any breast surgery?

Are you taking any medications?

Do you abuse substances nicotine/alcohol/drugs?

Are you at risk for HIV/Hepatitis?

Are there any infant risk factors?

Is early maternal/infant separation likely?

PRENATAL BREAST EXAMINATION

	Normal	Abnormal
Size and symmetry	<input type="checkbox"/>	<input type="checkbox"/>
Changes with pregnancy	<input type="checkbox"/>	<input type="checkbox"/>
Nipple/areola graspability	<input type="checkbox"/>	<input type="checkbox"/>
Surgical scars	<input type="checkbox"/>	<input type="checkbox"/>

ASSESSMENT

Knowledge	<input type="checkbox"/> adequate	<input type="checkbox"/> inadequate
Attitude/beliefs	<input type="checkbox"/> positive <input type="checkbox"/> ambivalent	<input type="checkbox"/> inadequate
Maternal physical health	<input type="checkbox"/> normal	<input type="checkbox"/> abnormal
Maternal emotional health	<input type="checkbox"/> normal	<input type="checkbox"/> abnormal
Support	<input type="checkbox"/> adequate	<input type="checkbox"/> inadequate
Pregnancy breast changes	<input type="checkbox"/> normal	<input type="checkbox"/> abnormal
Breast/nipple anatomy	<input type="checkbox"/> normal	<input type="checkbox"/> abnormal
Attended breastfeeding preparation class	<input type="checkbox"/> yes	<input type="checkbox"/> no
Early maternal/infant separation	<input type="checkbox"/> likely	<input type="checkbox"/> unlikely

ANTICIPATORY GUIDANCE

GOAL.: TO EMPOWER WOMEN TO ACHIEVE THEIR GOALS.

Attend breastfeeding preparation class

Modify risky life style behaviours

Avoid medicated/interventional labour

Initiate breastfeeding immediately after delivery

Acquire basic breastfeeding skills

Breastfeed/pump every 3 hours

24 hour rooming/bedding in

Minimize maternal/infant separation

Avoid pacifiers

Avoid formula/supplements

Early post-partum follow up

BIOLOGICAL RISK FACTORS

Maternal Risk Factors

Maternal physical illnesses can affect the development or function of the breast that can interfere with lactation.

- Lack of breast changes may indicate inadequate mammogenesis and subsequent lactation insufficiency.
- Anatomically abnormal breasts, including hypoplastic or conical breasts, may never lactate adequately due to insufficient glandular development, possibly related to end organ unresponsiveness.
- Breast surgery including reduction mammoplasty may interfere with glandular or lactiferous duct function.
- Certain endocrinopathies including thyroid and pituitary dysfunction and relative infertility may interfere with lactation.
- Chronic maternal illnesses such as diabetes mellitus, systemic lupus erythematosus, and hypertension may all cause maternal fatigue but do not usually effect lactation.
- Complications of pregnancy such as gestational diabetes, pregnancy induced hypertension, and preterm labour may result in early maternal infant separation which can interfere with lactation.
- Maternal infections such as hepatitis, Human Immunodeficiency Virus (HIV) or cytomegatic virus may all be transmitted to the infant in utero, but the added viral load through breastmilk is probably clinically insignificant. It would seem prudent to advise HIV positive women not to breastfeed and this would include women who are at risk of acquiring HIV because of ongoing high risk life style behaviours.
- Women who abuse such substances as street drugs or alcohol should be informed about the risks and counselled about abstinence. If they continue to abuse drugs or alcohol then they should be advised not to breastfeed. Smoking is not advisable but when considering breastfeeding, the risk of contaminated breastmilk must be weighed against the benefits of human milk and the risks of artificial formula.
- Women with physical disabilities can usually breast-feed but they may have to be given guidance and assistance with regard to safe, alternative nursing positions.
- A previous unsuccessful breastfeeding experience may herald future problems.
- Previous or chronic psychiatric disorders including depression may recur in the post-partum period and interfere with maternal parenting abilities. These mothers need extra help during the early postpartum period.

These risk factors are shown in Figure 2.22

Infant Risk Factors

Infant illnesses that necessitate early infant-maternal separation and factors that interfere with sucking, swallowing or breathing, may all pose a risk to establishing successful lactation and breastfeeding. They include:

- Prematurity
- Intra-uterine growth restriction
- Congenital facial anomalies including cleft palate, cleft lip, micrognathia, ankyloglossia
- Neurological problems associated with dysfunctional sucking, swallowing or breathing.

- Respiratory distress
- Cardiovascular disorders
- Multiple births
- Admission to special care nursery

These risk factors are shown in Figure 3.^{23,24}

FIGURE 2

MATERNAL RISK FACTORS ASSOCIATED WITH BREASTFEEDING FAILURE

- Adolescent mothers
- Single mothers
- Low socio-economic status
- Certain ethnic minority groups
- Mothers who abuse substances (e.g. alcohol, illicit drug use) for which breastfeeding is contra-indicated
- Mothers who have tested positive for HIV infection or other infections for which breastfeeding is contra-indicated
- Mothers who lack knowledge, motivation, and support
- Unusual nipple or breast anatomy or a history of breast surgery
- Mothers who use some prescription drugs
- Significant maternal illness
- Antepartum obstetric complications
- Gestational diabetes
- Depression or other major psychiatric disorders
- Pregnancy-induced hypertension
- Inadequate nutrition
- Previous breastfeeding difficulties
- Early hospital discharge
- Separation of mother and infant

FIGURE 3

INFANT RISK FACTORS ASSOCIATED WITH BREASTFEEDING FAILURE

- Multiple birth
- Low birth weight
- Premature birth
- Congenital abnormalities (e.g. cleft palate)
- Medical problems, particularly neurologic, cardiac, or pulmonary abnormalities that interfere with suckling or respiration

- Admission to observation or special care nursery
- Low Apgar score
- Significant infant illness
- Prolonged separation of mother and infant
- Jaundice
- Adoption

PSYCHOLOGICAL RISK FACTORS

There is an interplay between many forces which influence a woman's choice of feeding methods.

Beliefs

Many women have preconceived ideas about feeding babies, they may have anxieties and concerns over their ability to breastfeed, they may feel that their breasts are too small, nipples too large or fear the consequences of altered breast appearance. They may have had previous unsuccessful breastfeeding experiences or have family members who offer negative advice. It is important to clarify beliefs surrounding breastfeeding, find out how a woman made her decision, and ask if she has any concerns about her ability to breastfeed.

Attitudes

The physician should explore the woman's attitudes towards breastfeeding, returning to work, and breast-feeding in public. Prenatal exploration of these areas helps families to start addressing their own attitudes. Grandmothers are very influential and they play a key role in infant feeding. Some emphasis must be placed on ensuring their positive cooperation.

Knowledge and Skills

The physician should explore the woman's knowledge by finding out what she knows about infant feeding and how she is planning to feed her infant.

SOCIAL RISK FACTORS

Women are more likely to succeed in breastfeeding if they have support from their family and friends. Prenatally, the goal is to help to foster a positive emotional environment among family, friends, and community.

Family Support

Throughout history, women have been supported in their decision to breastfeed. Either a grandmother, sister, close friend or a doula would help a new mother. Nowadays, with the disintegration of the traditional family, mothers often live in communities away from close family, and partners may not have adequate paternity leave to help in the home. This lack of support often culminates in abandonment of breastfeeding. With advanced planning, it may be possible for family members to become more active in offering help at home.

Peer Support

Single, teenage mothers experience considerable peer pressure to continue the carefree life of youth, and they may opt for the freedom of bottlefeeding rather than the commitment to breastfeeding. Peer support programmes have been shown to be an effective way of helping to increase the duration of breastfeeding. Prenatal classes tailored to the needs of different groups must be developed. A physician can ask if any friends have breastfed or can explore what the woman thinks her friends might feel about breastfeeding.

Community Support

Many women feel shy, embarrassed or uncomfortable about breastfeeding in public. They may breast-feed for a few weeks, but as they resume their lives outside the home, they stop breastfeeding. Communities are not well equipped to offer privacy, and society gives mixed messages about the appropriateness of breastfeeding in shops and restaurants.

A prenatal discussion around the issue of breast-feeding in public may help. This should include the partner because he can play a pivotal role in helping the mother to breastfeed with more confidence.

Returning to work is another common reason given for stopping breastfeeding. Employment outside the home need not be a reason for stopping breastfeeding. Planning, flexibility, and good child care can go a long way towards enabling a mother to maintain lactation during prolonged hours of separation.²³ Prenatally, a women may be able to discuss options with her employer, including extended maternity leave, shorter or flexible work hours, or job sharing. Lactation breaks or a place to express her milk may be possible to arrange with advanced planning.

Early hospital discharge has necessitated a review of community post-partum care. Pregnant women should be informed about their local community resources including community health nurses, family physicians, La Leche League, and other breastfeeding support groups.

PRENATAL BREAST EXAMINATION

After reviewing the woman's history, a careful breast examination should be performed.

Size and Symmetry

During puberty, the breast tissue matures, developing rudimentary ducts and some glandular tissue. The rapid increase in breast size is mainly in fatty and connective tissue. It is not until pregnancy that the full maturation of the mammary glands occurs. Lactogenic hormones including estrogen, progesterone, prolactin, insulin, thyroid, and growth hormones trigger the development of the mammary epithelial cells, acinar glands, and lactiferous ducts. By 16 weeks of gestation, lactation can occur.

Successful mammogenesis is indicated by an increase in breast size. The best time to examine breasts for lactation is in the last trimester. The breasts should have enlarged by at least one or two bra sizes. Variations in breast appearance or symmetry may indicate lactation insufficiency, and, therefore, should be noted, and future milk synthesis closely monitored. Scars give clues to potential glandular, ductal or nerve disruption.

Nipple Graspability

In order for infants to latch and suckle effectively, they should be able to grasp the nipple/areola tissue and form a teat. The areola can be gently pinched to assess its elasticity and graspability. Nipples may protrude, pseudoprotrude, remain flat, pseudo-invert or truly invert. They may be large or small.

There is no evidence to support nipple preparation such as nipple stretching exercises or the use of nipple shells. The anatomy of the nipple and areola is not altered by prenatal exercises. The action of sucking by the infant helps to draw out the nipple and form a teat during the process of breastfeeding. It is only true inverted nipples that may impede correct latching and suckling. The nipplette (R) has been designed to help correct inverted nipples prenatally. A simplified version of this can be made by cutting off the needle end of a 20 ml syringe and reversing the plunger. The flange end of the syringe can be placed over the nipple and gentle suction applied to draw out the nipple slowly. There are no good data to confirm that the nipplette or syringe truly work, but clinical experience suggests that they may be useful in helping to make the nipple area more graspable.²⁵

There is no need to apply lotions or oils to the breasts to soften the skin, and normal daily bathing with soap is recommended.

ANTICIPATORY GUIDANCE

After completing a careful history and physical examination and having elucidated potential factors that might interfere with successful breastfeeding, the following anticipatory guidance should be offered.²⁶

- Avoid medicated or interventional labour. Soon after natural childbirth, infants exhibit an instinctive rooting behaviour to locate and latch on to the breast. Medications and complications of childbirth may interfere with this neurodevelopmental behaviour.
- Initiate breastfeeding or breast pumping following complete delivery of the placenta because it is this early breast stimulation that initiates lactation.
- Breastfeed or pump on demand, every two to three hours, because regular breast drainage and stimulation facilitates lactogenesis.
- Practise rooming/bedding in for 24 hours per day. Maternal/infant separation impedes regular breast drainage and stimulation.
- Combined mother and infant nursing care enables patient-centred teaching to be instituted.
- Relieve engorgement early to prevent involutinal atrophy of acinar cells.
- Avoid routine supplementation because it causes “breast confusion” by removing an infant’s hunger drive, thereby, decreasing breast stimulation and drainage.
- Avoid rubber nipples and pacifiers. If infants are demonstrating hunger cues by sucking, they are hungry. Offering a pacifier is not an appropriate maternal response to these infants’ cues. The infant should suckle on the breast frequently in order to establish successful lactation.
- Exclusive breastfeeding ensures that the infant receives adequate colostrum, including secretory IgA and other unique hormonal factors which contribute to the infant’s health, growth, and development.
- Avoid formula because it predisposes the neonate to potential allergies and other risk factors associated with artificial foods. The immature gut is not designed to digest cow milk or soya milk.
- Review the availability of community resources postpartum, as close follow-up in the post-partum period is crucial for successful breastfeeding.

Throughout the perinatal period, continuity of care for the patient is threatened, particularly if her family physician does not practise obstetrics. Prenatally, the physician should stress the importance of having the first post-partum medical appointment for mother and baby within the first week. Family physicians, obstetricians, or paediatricians can do this. An early naked weight measurement is an objective way of assessing successful establishment of breastfeeding.

Breastfeeding Passport

Ultimately, the responsibility for breastfeeding success lies with the mother herself. She must be given some guidelines about the steps she should take to ensure successful prenatal breastfeeding preparation, how to initiate lactation in hospital, and how to establish successful ongoing breastfeeding. These simple steps will carry the mother a long way towards achieving her own goals, but she will still need the help of her physician, hospital nurse, and community health nurse to achieve them. Therefore, all health professionals must recognize the value of breastfeeding and actively promote it, establish procedures and protocols that protect it, and become more knowledgeable in order to support and encourage mothers to continue to breastfeed,²⁷

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