Improving the Odds:
Healthy Child Development

Focus on the Early Years: Neuroscience and Implications for Clinical Practice

TOOLKIT: Interdisciplinary MAINPRO CME
for Family Physicians and other Primary Healthcare Providers
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Updated and Revised

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Please note that programs, services and guidelines may change, therefore the reader is encouraged to consult current sources of information.

The information herein reflects the views of the authors and no official endorsement by the government of Ontario is intended or should be inferred.

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Introduction

A Peer presenter program called "Improving the Odds: Healthy Child Development" was introduced to family physicians and other primary healthcare providers in Ontario in 2002. Many of the members of the original interdisciplinary steering committee that initially came together in the spring of 2000 to initiate the development of this program have continued to advise and support its continuance aided by new additional expertise (please see www.ocfp.on.ca for more information).

The purpose of this program is to highlight recent developments in early neurodevelopment and to explore how these developments can be incorporated into medical practice. Specific modules were developed to cover broad areas of Healthy Child Development including research evidence, risk factors, parenting, effective strategies and the role of interdisciplinary teams. This toolkit will help identify available resources to help families access support and services in a convenient, coordinated and integrated fashion. It is hoped that teams of family doctors, public health nurses, and other primary healthcare providers will be exposed to the workshop and then proceed to develop integrated, interdisciplinary programs in communities throughout Ontario. While each individual module could be a training program in itself, "Improving the Odds: Healthy Child Development" is an integrated course that considers overall child health and development and the influences on neurodevelopment.

This toolkit was developed for the interdisciplinary MAINPRO CME program in Healthy Child Development. Participants include primary healthcare providers such as physicians, nurses, nurse practitioners and midwives. The toolkit summarizes the information included in the program and can act as a reference resource following the workshop. The toolkit includes information about the Ontario Antenatal Record and the ALPHA Tool to assist in identifying and addressing concerns during pregnancy. The toolkit also describes the Rourke Record, an evidence based infant/child health maintenance guide that can be used in the primary care office setting to facilitate assessment of child development. As well, parent education tools such as the Nipissing District Developmental Screen™ are introduced to help in assessment and to provide guidance and advice to parents. Additional screening and assessment tools used by Healthy Babies Healthy Children are also discussed.

A. Long Term Consequences of Early Brain Development

Recent human development research suggests that the period from conception to age six has the most important influence of any time in the life cycle on brain development and subsequent learning, behaviour and health (Williams, 1999). Patterns that are established with the birth of the first child set the stage for long-term family cohesion and communication. Meaningful relationships require secure attachments and these are critical to the development of coping skills, competence and trust in the world. According to Dr. J. Fraser Mustard (Keating and Hertzman, 1999), "There is substantial evidence that the quality of early childhood experiences has long term effects on an individual's performance in the education system, their behaviour in adult life and their risks for chronic disease in adult life."

B. Role in Early Neurodevelopment

Family physicians and other primary healthcare providers use their understanding of human development and family and other social systems to develop a comprehensive approach for promoting health and managing disease and illness in patients and their families

throughout the life cycle. They are also adept at working to reach common ground with patients on the definition of problems, goals of treatment, and the respective roles of primary healthcare providers and the patient in management of the condition. Family doctors work together with parents and other service providers including obstetricians, pediatricians, public health nurses, family practice nurses, nurse practitioners, social workers, early interventionists, psychiatrists, psychologists, school administrators, early childhood educators, teachers and the faith community, etc. to support healthy child development. Family physicians and other primary healthcare providers are trusted professionals who can teach parents about parenting and child development while respecting parent's individual value systems, religious beliefs and cultural activities.

The philosophy of care is usually family-centred. Family Centred Services recognize the significance of family support, participation and choice. They respond to the physical, emotional and psychosocial needs of the patient and family. Care is provided within the context of the family.

Note re: Canadian Families

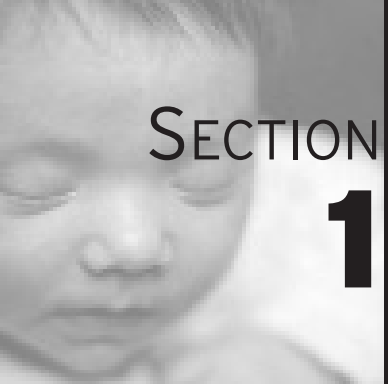
The authors recognize that family composition and the roles of family members vary widely in Canada. While we often think of a family as a father, a mother and their children, single parent families are growing in number. "Parents" may be of different or of the same gender and may involve biological parents and/or other adults. Parents may work outside the home, or may stay at home with their children. Often it is the mother who provides primary care for young children; however, the role of primary caregiver may be served by the father or extended family. For the sake of simplicity, this resource refers to the father and the mother of children in their early years, recognizing that families are often much more complex. We live in a multicultural society and customs and beliefs also influence parenting practices. Primary healthcare providers need to be sensitive to the variety of family structures and the range of roles served by individual family members.

It is important for primary healthcare providers to be aware of local child development services such as Healthy Babies Healthy Children, in order to provide appropriate referrals and to work collaboratively with other service providers. The primary healthcare provider also plays an important role in addressing client isolation and barriers to services such as language, disability and geographic location. Services that are culturally inclusive, available in different languages and offer home visits, childcare and transportation, can have a positive impact on client isolation and factors influencing child development.

C. Goals and Objectives

The goals and objectives of the "Improving the Odds: Healthy Child Development" Peer Presenter program for family physicians and other primary healthcare providers are to:

- -Foster preconception and prenatal health, recognizing that nutrition, drug use and other health issues have an impact on reproductive health and influence pregnancy outcomes
- -Provide education regarding the importance of healthy brain development during the first six years of life and its implication for learning, behaviour and health
- -Educate healthcare providers about the importance of parenting programs such as those offered through Early Years Centres and the need for "early referral" of all children during critical periods of development
- -Educate primary healthcare providers in the use of developmental screening tools to facilitate early identification of children with conditions such as autistic spectrum disorder and other physical, cognitive, social and emotional concerns
- -Assist primary healthcare providers in assessing for family problems that may interfere with the healthy development of children
- -Address the perception that early identification may be harmful where services are limited
- -Increase awareness and maximize use of local healthy child development services that meet the needs of children and families
- -Develop "opinion leaders" throughout Ontario who will continue to support the work of primary healthcare providers
- -Provide a forum for integration of new research evidence, government policy, coroner's jury recommendations and public health initiatives into guidelines for primary care practitioners



SECTION 1 THE EARLY YEARS – Research Evidence

Introduction

In the last thirty years, neuroscience has been uncovering the relationship between nature and nurture in sculpting the brain during the early years. Neurodevelopment of the fetus, infant and child is dependent on and modified by the environment. In addition, contrary to previous belief that the brain becomes more active as it grows, it is now recognized that the brain is most active during the earliest years. The quality of the early sensory experiences influences the brain's ability to think and regulate bodily functions. The effects of these experiences have implications for future physical and mental health as well as learning. In response to this newer perspective, the goal of family physicians and other primary healthcare providers must be to optimize the conditions for healthy growth and development for all children.

This section of the toolkit provides important background research evidence about early brain development, starting with a neuroscience update. Detailed information can be found in The Early Years Study (McCain and Mustard, 1999), the Early Brain and Child Development Kit (American Academy of Pediatrics, n.d.), and Early Child Development and Experience-based Brain Development: The Scientific Underpinnings of the Importance of Early Child Development in a Globalized World (Mustard, 2006) and the Ontario College of Family Physicians website (www.ocfp.on.ca).

Physicians and other primary healthcare providers need to fully understand the implications of these insights of the neurosciences. A child's environment and experiences have a long term impact on his or her emotional, social, cognitive and physical development. Brain development begins soon after conception. Plasticity is a feature of the brain throughout life, although to a more limited degree in the mature brain than in the developing brain. New discoveries also support the belief that the possibility of change continues throughout life. Nonetheless, the first few years are critical in laying a foundation for brain development.

Old Thinking

- Genetics are of prime importance
- Early experiences have a limited impact
- Secure relationship-favourable context for development
- Development is linear
- Toddler's brain is less active than a young adult's brain

New Thinking

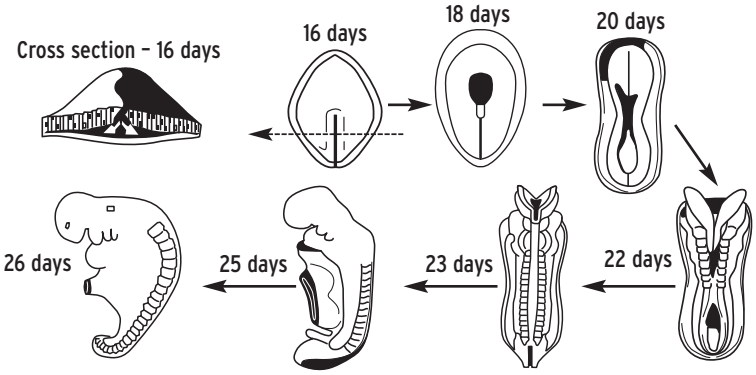
- Interplay between genes & experience
- Early experiences have an important impact
- Early interactions affect brain wiring
- Development is non-linear
- Toddler's brain is twice as active as a young adult's brain (Shore, 1997)

A. Early Neurodevelopment Processes – Neuroscience Update

Neurulation

Neurulation begins soon after conception. At 16 days, a group of ectodermal cells form a plate on the developing embryo. This neural plate folds to form a groove at 20 days and the groove fuses along the top forming a tube at 22 days. The tube is closed by 26 days, when a woman may still be unaware of the pregnancy. At the top end, the tube enlarges to form the brain.

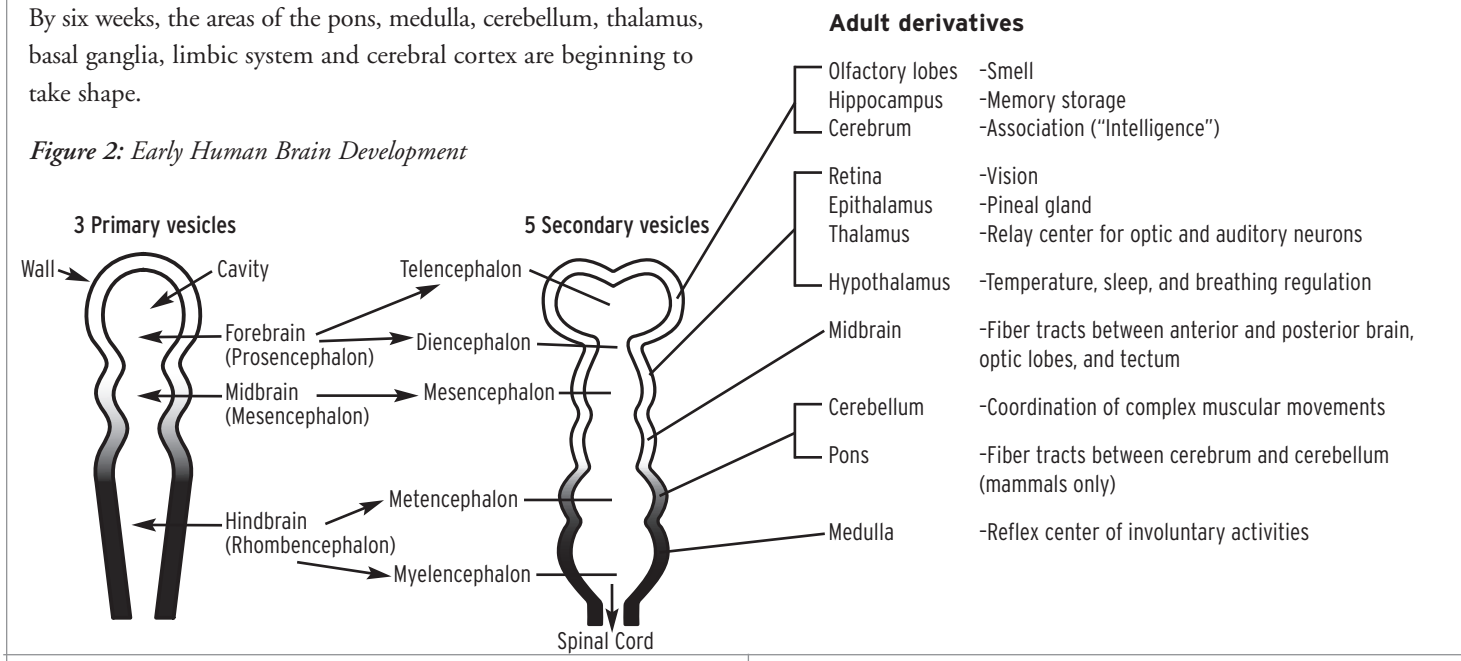
Figure 1: Formation and Closure of the Neural Tube



Neural Tube Growth

The forebrain subdivides in the fifth week into the telencephalon. By six weeks, the areas of the pons, medulla, cerebellum, thalamus, basal ganglia, limbic system and cerebral cortex are beginning to take shape.

Figure 2: Early Human Brain Development



Cerebral Cortex Development

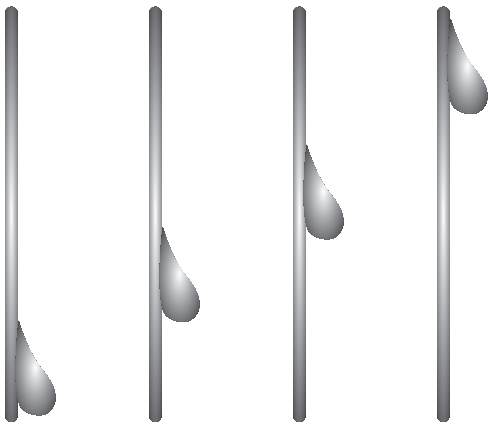
From the neuroepithelial cells lining the neural tube, neurons and glial cells are differentiated. As they are formed neurons migrate along glial cells outward, adding outer layers until there are six layers in the cerebral cortices. By five weeks the right and left hemispheres begin to develop. By the end of the first trimester, the mid and hind brain are well developed but the cerebral cortex is still smooth and undifferentiated. By 24 weeks, the beginnings of the major sulci or grooves in the cortex are becoming evident. Primary sulci are about the same in everyone's brain. There is more variation in secondary sulci. The tertiary sulci vary a lot and do not develop until the last month of gestation and through the first year of life. Each contains columns of neurons.

The Central Nervous System (CNS) is comprised of many different types of cells: neurons, glia, etc. Each type of cell is generated by a sequence of molecular-genetic events. The generative zone of origin (location on the neural tube) determines the kinds of cells that will be produced and where ultimately they will appear in the nervous system (see Figure 2).

Migration and Differentiation

In the cerebral cortex, neuroblasts are guided to their target destinations by radial glial cells.

Figure 3: Migration – Adapted from the Early Brain Development Kit, American Pediatric Society



Neurons come in many sizes and shapes. They have a long process that conducts information away from the cell body. A series of smaller processes called dendrites receives information from other nerve cells through synaptic connections. Most cells are multipolar (several dendrites and an axon). Sensory neurons receive information directly or through nonneuronal receptor cells. Motor neurons connect with muscle or glands. Most of the CNS is composed of interneurons. There are also several kinds of glial or supporting cells that perform a variety of functions from producing myelin sheaths to regulating extracellular fluid.

Intrinsic Neurons have local dendritic trees and axonal projections and do not project across multiple brain areas. Most neurons in the brain are intrinsic. Some of the most important intrinsic neurons are found in the cortex. Most of the neurotransmitter-receptor-effector systems in the cortical systems are inhibitory/refining. This means that when the neurotransmitter occupies the receptor site, changes in the membrane result in a less responsive post-synaptic neuron. The higher in the brain functionally, the more there are complex (local) regulating systems. The mature cells develop processes (axons and dendrites) and then form connections/synapses.

Figure 4: *Arborization – Adapted from the Early Brain and Child Development Kit, American Academy of Pediatrics*

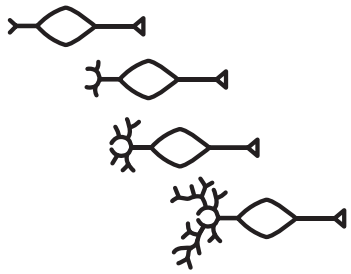
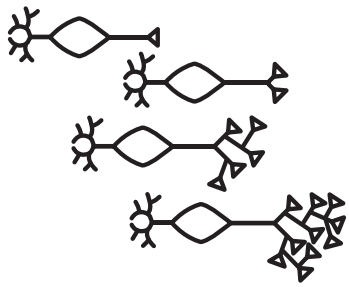
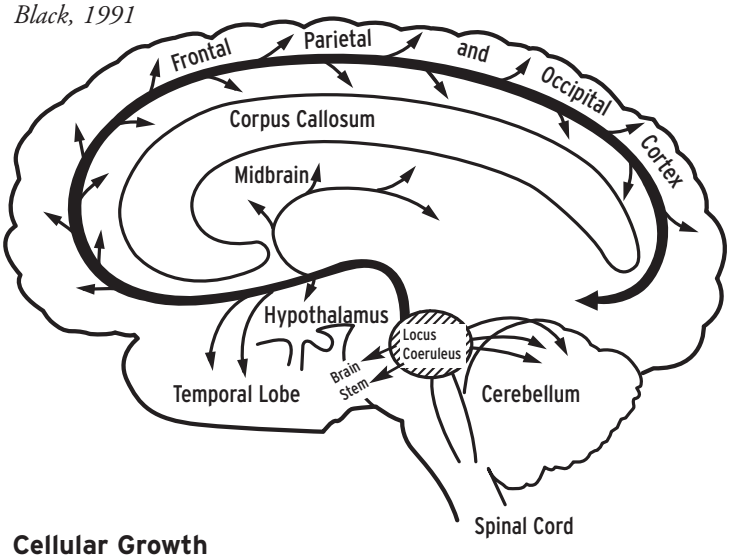


Figure 5: *Synaptogenesis – Adapted from the Early Brain and Child Development Kit, American Academy of Pediatrics*



Extrinsic Neurons project axons out of their "home" area in the brain to many areas. Extrinsic excitatory neurotransmitter systems are more common lower in the brain. These neurons play a major role in coordinating and connecting the separate areas of the brain, both physically and functionally. The brain stem monoamine systems (eg. norepinephrine, dopamine, serotonin) are key examples of the important orchestrating neurons. Serotonin is an important neurotransmitter in the limbic system and is associated with emotions and memory. Some of these important systems are active in regulating the response to stress. The stress response involves extrinsic neurons, especially the neural systems comprising the reticular activating system (RAS). This system is important in consciousness and alertness. The following figure shows the projections of the norepinephric system. The centre of this system is in the locus coeruleus. This bilateral nucleus in the floor of the fourth ventricle sends projections to virtually all other brain areas. It plays a key role in orchestrating and regulating the response to threat. The norepinephrine system is illustrated as an example. Similar systems exist for serotonin and dopamine.

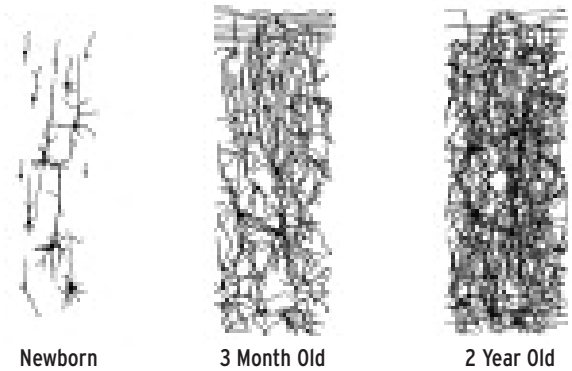
Figure 6: *Norepinephrine System – Adapted from Andreasen and Black, 1991*



Cellular Growth

Cellular growth continues furiously from birth to two years. New neurons are not added but dendritic growth and new synapses are formed. The cortex increases in size.

Figure 7: *Cellular Growth – Adapted from Neurodevelopment.html*



Synaptic Sculpting or Pruning

From birth there is a massive increase in the number of synaptic connections. All areas of the brain go through a phase of synaptic over production, followed by a phase of pruning back or retraction

of these connections. The visual area reaches a peak of over production at about the end of four months of age followed by a decline until about the fifth year. Other areas in the prefrontal area do not reach their peak until the end of the first year and gradually decline until adolescence when the adult complement of synapses is reached.

Figure 8: *Synaptic Pruning – Adapted from the Early Brain and Child Development Kit, American Academy of Pediatrics*

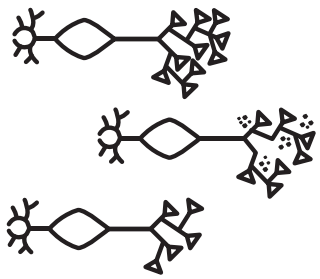
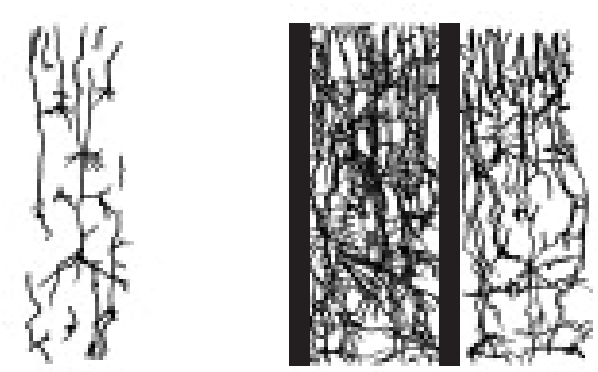


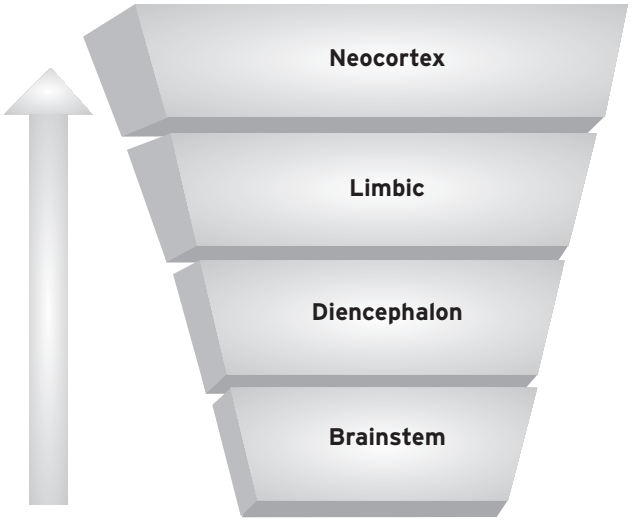
Figure 9: *: Synaptic Changes – Adapted from the Early Brain and Child Development Kit, American Academy of Pediatrics*



Hierarchy of the Brain

The brain is hierarchical; that is, it organizes from the inside out and from the bottom to the top, brainstem to cortex, with the simplest functions in the brainstem and the most complex in the cortex. As wave after wave of migrating neurons complete their cycles, eventually 6 layers of the cortex are formed. Importantly, these layers are formed in an inside-out fashion. This means that the deepest layers of the cortex are formed first, followed progressively by more superficial layers. Thus, the oldest part of the cortex is also the deepest part. Lastly, "columns" of related cells also form, many of which are thought to serve specific functions, such as the role of ocular dominance in vision.

Figure 10: *Hierarchy of the Brain – Adapted from the Early Brain and Child Development Kit, American Academy of Pediatrics*

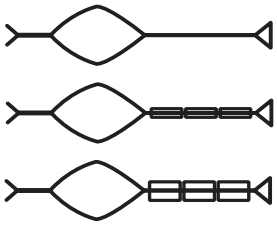


While somewhat simplified, it is clear that functional complexity correlates with the organizational complexity of the brain. The simplest regulatory functions are mediated by the lower, less-complex brainstem and the most complex functions (those that confer the most unique human properties) are mediated in the cortex. The human cortex contains approximately 40% of the total neurons in the brain. A key to understanding human behaviour is to recognize the complexity and organizational rationale of the brain. Different systems and areas of the brain mediate unique functions. The systems of the brain that allow us to "think" are different from the systems that allow us to move or to regulate our heart rate.

Myelination

In many parts of the brain the axons of neurons are myelinated. This sheath provides insulation so that the conduction is faster and smoother. Myelination is not likely completed in the prefrontal cortex until adolescence.

Figure 11: *Myelination – Adapted from the Early Brain and Child Development Kit, American Academy of Pediatrics*



B. Sensitive Periods of Early Development

Neural plasticity, that is the ability of neural systems to be modified by experience, plays a central role in brain development. It allows for adaptation from internal and external inputs. This ability is most important during the postpartum period when shaping of the neural systems is underway. As development proceeds the neural systems become more stable and patterns of function emerge. However plasticity remains a feature throughout life as evidenced by the fact that adults can learn new skills such as a second language or mount recovery after brain damage. Nonetheless the degree of flexibility is reduced with maturation and shows individual variation. Some neural systems ("experience expectant"), that is, most sensory systems, depend on experience occurring during a sensitive period of time in order for optimal functioning to occur.

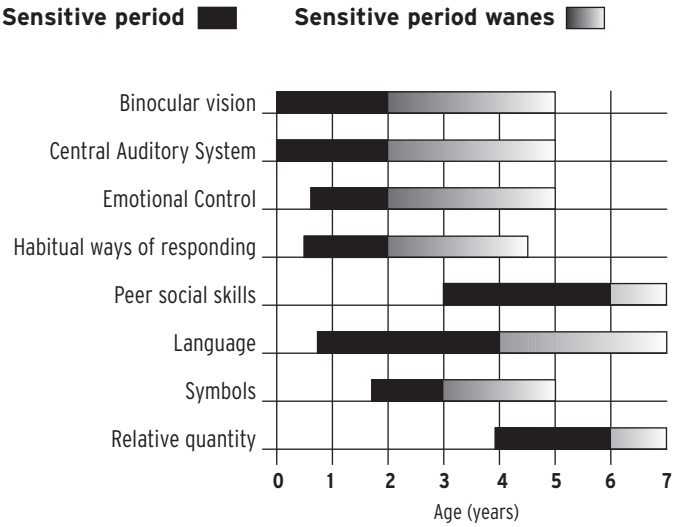
These "experience expectant" pathways require a set of signals or stimulation to be present to differentiate normally; synapses are formed after only minimal experience has been obtained. Stereoscopic vision depends on regions of the visual cortex receiving separate inputs from each eye. These inputs result in a separate column of cells for each eye. If input is absent from one eye, or is abnormal, then these columns fail to develop normally and stereoscopic vision is compromised.

There is clear evidence from neuroscience research that the sensitive period for the development of visual perception is well defined and is dependent upon visual stimulation. There is recent evidence that the auditory system has a similar sensitive period so that speech perception depends on hearing appropriate language sounds during this period.

There is much evidence that the regulatory systems that guide our emotional responses and how we respond to stresses and challenges, develop definite patterns during the very early years. There is also evidence that remediation in later life may be possible through a variety of avenues such as psychotherapy.

The neural connections of the brain are not all constructed at the same time. It appears that there may be different sensitive periods for different parts and interrelated functions of the brain. The evidence for this comes from both the biological sciences, including neuroscience, and observational human and animal development studies.

Figure 12: Sensitive Periods for Early Development – Adapted from McCain and Mustard, 1999



Some neural functions retain more plasticity and are sometimes termed "experience dependent". Many aspects of motor and somatosensory functions can be modified throughout life. Particular examples include the practicing of a musical instrument bringing about change in the motor cortex or the learning of Braille recruiting the visual cortex in a blind person.

It seems that certain aspects of cognitive development may require experience at a particular time. These may relate in some way to numeracy and literacy. However, these factors as yet remain unclear. Older preschool children seem to be in an optimal period of development to lay the groundwork for skills that are embedded in their particular cultural context. In western society, literacy and numeracy are important cultural tools. But there is no doubt that changes in cognitive function are possible throughout most of the life span.

C. Early Developmental Needs

During the first years, the infant needs to learn to modulate threat, to focus attention and to interact. Through interaction the infant achieves a sense of competence in affecting his/her surroundings and in gaining trust in relationships. The infant is also learning how to give and take and about empathy through experience. If not, the infant struggles to deal with his/her reactions and frustrations. Some children are more sensitive than others and may avoid interaction. Parents may be more or less

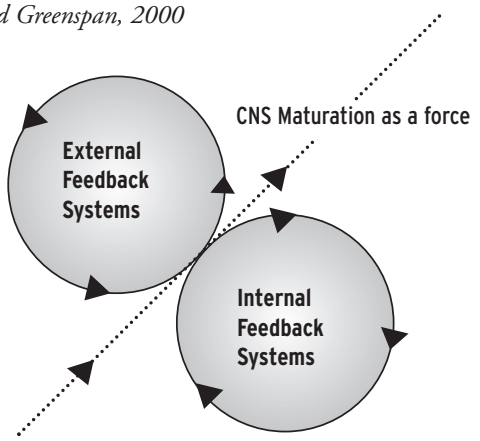
intense in their approach to the infant. Ideally, the approach becomes moderated as the child and parent adapt to each other. As the infant becomes more able to modulate his feelings and behaviour, freedom to explore and learn increases. In the process, the child develops perceptions of himself, how he fits in and can affect his environment. If the child feels heard, feels he can do things himself and feels he is valued, then he will be ready to learn, to interact with others and to be cooperative (Sutton, 1995). Early developmental needs include:

–A responsive environment attuned to the child's needs
–Support to modulate negative affect (physiological and physical)
–The presence of a consistent nurturing caregiver
–Consistent structure with the freedom to play and explore in a safe environment
–Cognitive stimulation with particular focus on experience in gross motor, fine motor, speech and other specific developmental areas

D. Reciprocity

An ongoing nurturing relationship with an infant involves the caregiver being able to read and respond to the baby's signals. A "dance" between the caregiver and infant develops which enables the infant to learn to modulate his emotions and behaviour (Berkowitz and Grych, 1998).

Figure 13: *Three Sources of Energy for Development – Adapted from Brazelton and Greenspan, 2000*



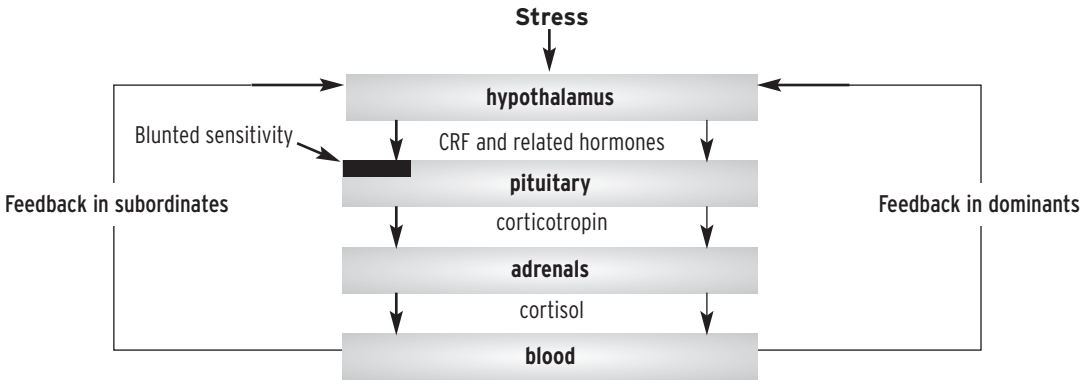
A responsive and nurturing environment helps an infant to build the neurobiological base for a flexible and adaptive stress response. The sensitive caregiver protects the newborn from over or under stimulation and helps the infant attain a steady state. The development of self-regulation in the infant is believed to start at birth. The task of the infant is to develop the capacity to maintain equilibrium in the face of internal and external stimulation. The caregiver assists the infant in this process. This self-regulation is the process whereby the infant becomes more resourceful in coping with incoming stimuli and is increasingly able to explore their world. The infant begins to understand emotional cues and to respond. The responsive caregiver provides more stimulation such as singing and sounds, with careful attention to the infant's capacity to tolerate new levels of stimulation. These interactions enable the brain cells to be recruited for particular purposes.

The process of learning to regulate behaviour and modulate affect has an important impact on how the child will handle stress and change. It is through these neural pathways that early brain development comes to affect the regulation of the autonomic nervous system and the endocrine/immune system through the hypothalamic pituitary axis.

E. Hypothalamic Pituitary Adrenal Axis (HPA)

The way the brain reacts to stressful stimuli is influenced by early brain development and affects the individual's capacity to think and regulate body function. Stressful stimuli activate arousal, stimulating the sympathetic nervous system and the HPA pathway. The initial response releases chemicals that heighten sensitivity and improve memory etc. But over stimulation or sustained stress has the opposite effect and appears to actually destroy cells in the HPA axis. Further chronic stress suppresses the immune system. The quality of sensory stimulation in the earliest years helps set the template for the brain's endocrine and immune pathways. The relationship between the brain and the endocrine system seems to be the pathway that is important for competence and coping skills. Learning skills as well as disease risks are related to these pathways (AAP, no date; Perry, 1993; Teicher, 2002).

Figure 14: Hypothalmic Adrenal Axis – Adapted from the Early Brain and Child Development Kit, American Academy of Pediatrics



Key Points – The Early Years

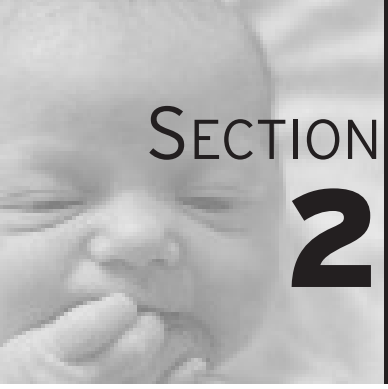
-Before age one, there is rapid and extensive neurological development.

-Brain development is very vulnerable to environmental influences.

-The influence of the early environment is long lasting.

-The early environment affects the number of cells, the number of connections and the way they are wired.

-There is scientific evidence for the negative impact of excess early stress on brain function.



SECTION 2 RISK FACTORS – Clinical Issues

Introduction

Research is providing evidence that neuromaturation is directed by genetic mechanisms whose timing is regulated by and whose unfolding is sensitive to environmental influences.

"Even the process of adaptation that follows a specific insult to the brain is complex. Many times severe disabilities highlight the limitations of the central nervous system for recovery; but on the other hand, there is equal evidence of the brain's ability to adapt to a wide variety of insults with apparently few sequelae. The young brain is more adaptive than the more differentiated mature brain; that is more changes in communicative pathways can be made (rewiring). The effect of an insult to the CNS may be insurmountable or be simply a risk factor that can be neutralized by a nurturant, caregiving environment. For the child, the interactions and relationships with caregivers are the most crucial elements in the environment. If these relationships are dysfunctional, even the most biologically resilient child will be at risk for later problems. When these relationships are supportive of adaptation, the child with severe neurological vulnerabilities may have the opportunity to thrive." (Shonkoff, and Marshall, 2000)

Developmental Vulnerability

Insults to the developing nervous system of a fetus or child may have adverse consequences for later competence. The developing nervous system is vulnerable to a wide range of risks. Factors that are present in the parents prior to conception can influence reproductive health and future pregnancy outcomes. During the prenatal and perinatal period, the nervous system of the fetus is particularly vulnerable. After delivery, factors related to the child's immediate social environment are additional concerns. It is important for the primary healthcare provider to have a good understanding of strategies to identify risks to early development, and how to prevent or moderate their influence as described in Section 4 of this toolkit. In this section, information is provided on risks that may be present in the preconception, prenatal, perinatal and postnatal periods.

A. Preconception Issues

Prior to conception, a range of factors in the mother and the father can influence fertility, reproductive health and ultimately, the health of future children. These factors can be related to lifestyle factors, genetics, the social environment and medical concerns. Preconception is an opportune time to determine and reduce risks to future progeny.

Genetic Factors

Many genetic disorders are associated with neurological, cognitive and behavioural abnormalities. In multifactorial disorders, the expression of the disorder in the individual is dependent on the interactive effect of one or more genes and specific environmental factors. Genetic disorders include:

- –Chromosomal abnormalities, for example Down syndrome or Fragile X
- –Single gene defects, for example inborn errors of metabolism such as PKU
- –Mitochondrial disorders
- –Multifactorial disorders, for example neural tube defects or schizophrenia

Pre-existing Maternal Conditions

Pre-existing conditions in the mother can pose risks to fetal neuro-development if maternal health is not well managed prior to pregnancy. Diseases such as diabetes, cystic fibrosis, lupus and epilepsy can compromise the fetus. Medications such as anti-convulsants, antihypertensives, antipsychotics and lithium can potentially present threats to the fetus during pregnancy.

The ideal time to assess and manage pre-existing conditions and medications is prior to conception. The risk to the fetus versus the risk to the mother may have to be balanced. Motherisk is a good source of information (www.motherisk.org) about pregnancy and medications (prescription or OTC), tobacco, alcohol, substance use, herbal products or occupational/environmental exposures. At Motherisk, a team of medical experts provides healthcare providers and patients with current information. See Appendix A for a more comprehensive list of preconception concerns.

B. Prenatal Developmental Vulnerability

Maternal Health Problems

Pre-existing conditions such as illness or use of medications can continue to pose risks to infant neurodevelopment if they are not well managed throughout pregnancy. Health problems that arise during pregnancy, such as eclampsia and gestational diabetes, can also pose a risk to the infant.

Maternal Nutritional Risks

Nutrition concerns that impact on neurodevelopment in the fetus include:

– ***Folic Acid:*** Folic acid can substantially reduce the risk of neural tube defects, both in a first pregnancy and after an affected pregnancy. Because the development of the neural tube is already near completion when a woman may become aware of her pregnancy, folic acid supplementation must be initiated prior to conception. At least half the cases of neural tube defects can be prevented through periconceptional supplementation with folic acid (Van Allen et al., 2002). While some Canadian foods are now fortified with folic acid, the levels are insufficient to prevent neural tube defects. The 2002 Health Canada recommendation for folic acid supplementation is 0.4 mg per day for women of childbearing age. In the case of a previous neural tube affected birth, 4.0 mg per day is recommended (Van Allen et al., 2002).

– ***Nutrition Patterns:*** Women need extra nutrients during pregnancy. Poor nutrition patterns can contribute to low birth weight. Some women aim to gain too little weight during pregnancy or adhere to ill-informed diets. Other women live in poverty and have little access to nutritious foods. Inadequate nutrition threatens both the mother and the unborn child. Calcium and iron are important dietary concerns. Iodine deficiency can also be a concern.

For comprehensive nutrition information, please refer to Nutrition for a Healthy Pregnancy: National Guidelines for the Childbearing Years at www.hc-sc.gc.ca.

Toxins

Substances that can have negative consequences on fetal neurodevelopment include:

– ***Alcohol:*** Alcohol use in pregnancy is a leading cause of birth defects and developmental delays in Canadian children. Although Fetal Alcohol Syndrome (FAS) is usually associated with heavy or binge drinking, low levels of alcohol use are associated with conditions such as low birth weight. The full syndrome includes facial anomaly, neurological concerns and growth restriction. Effects on learning and behaviour are noted even when characteristic facial features are not evident. A newer term, Fetal Alcohol Spectrum Disorder, describes the entire range of problems associated with prenatal alcohol exposure. The prudent choice for women who are or may become pregnant is to abstain from alcohol (www.healthcanada.ca/fas).

– ***Tobacco:*** The greatest concerns with tobacco use are intrauterine growth restriction and/or premature labour resulting in an increased risk for low birth weight. In addition, there is increased risk of miscarriage, tubal pregnancy and multiple other problems (see http://pregnets.org).

– ***Illicit Drugs:*** Cocaine is associated with low birth weight, intrauterine growth restriction and abnormal brain growth. It has been difficult to determine the precise influence of cannabis and other illicit drugs in pregnancy due to confounding factors such as nutrition, alcohol and tobacco use as well as other lifestyle factors.

– ***Chemicals:*** Many substances are harmful to the developing fetal brain. Exposure to these toxins can occur in the home and in the work place. Such substances include mercury, lead, organophosphates, solvents, etc. In northern communities, families may rely on wild game for food that may be contaminated by lead or mercury. Motherisk can provide important information about chemicals and pregnancy. Also see "Playing it Safe: Childproofing for Environmental Health" at http://www.healthyenvironmentforkids.ca.

Infection

During pregnancy, certain infections can lead to neurological impairment in the fetus including:

– ***Rubella:*** While Rubella effects are rarely seen in Ontario, infections in early pregnancy are associated with more severe symptoms in the infant. 25% of affected infants have CNS symptoms at birth including increased irritability, small head size and hypotonia. By one year, one third of children have psychomotor retardation. Progressive hearing loss and progressive visual deficits related to cataracts and retinitis may occur. Often new impairments appear as development progresses.

– ***HIV Infection:*** There is about a 30% transmission rate from infected mother to fetus without treatment. The infant may present with failure to thrive, subacute encephalopathy with delays in developmental milestones, apathy and spasticity. Subtle changes in behaviour, such as deterioration in play or mood may herald neurological regression. Ideally, HIV status should be determined and appropriate counselling regarding pregnancy initiated prior to conception. HIV screening must be offered to all pregnant women. Treatment of HIV during pregnancy significantly reduces the risk of transmission to the fetus. See http://hiv.medscape.com/ for more information.

– ***Toxoplasmosis:*** 40% of infected women pass on the infection to the fetus. 10% of infants with the disease show symptoms at birth. These severe symptoms include seizures, chorioretinitis and hydrocephalus. The rest of the affected infants will develop symptoms later with chorioretinitis, motor problems, deafness and retardation. Uncooked contaminated meat is the primary source. Kitty litter also presents a risk because cats carry toxoplasmosis without symptoms and excrete the protozoa in their faeces (Shuhaiber et al., unpublished).

– ***Cytomegalovirus:*** This is currently the most common cause of congenital infection that can lead to neurological impairment. Most infants are asymptomatic at birth but develop sensori-neural hearing impairment. Some infants are more severely affected. It is usually primary infection during pregnancy that is associated with congenital infection in the fetus but it can be subsequent infection (likely a different strain). In the general population, immunocompetent individuals are not seriously affected and most are seropositive. Contact with young infants (i.e. in childcare centres) and immunocompromised individuals (i.e. in hospitals) are sources of infection through body fluids. Hand washing is stressed in these environments.

– ***Other Infections:*** There are other infections of concern in the prenatal period including Malaria, Listeria and Brucella (often contracted from unpasteurized cheese), Parvovirus 19 and Varicella (commonly contracted in childcare settings).

Social Factors

Social factors such as a mother's experience of abuse and low levels of social support are predictive of higher risk pregnancies and of problems after the infant is born. In these multifactorial situations, the incidence of low birth weight and preterm births is higher. See Appendix B for the ALHA tool.

– ***Lack of Social Support:*** Even in the absence of abuse, pregnant women without support (such as women with an absent or unsupportive partner, single women, women with limited community or family supports or women living in an isolated area) are at risk for depression and unhealthy behaviours such as poor nutrition and substance use. Pregnant teens may be especially vulnerable due to isolation from peers etc.

– ***Abuse:*** Studies on violence against women show that 40% of abuse starts during pregnancy (Johnson, 1996). Abuse frequently escalates during pregnancy. Women abused in pregnancy are more likely to experience severe violence. They are also very likely to experience violence in the first three months after the baby is born. Abuse during pregnancy threatens the well being of the mother and the fetus and increases the likelihood of other risks such as substance abuse, depression, and poor nutrition (Beck et al., 2000). Physical abuse increases the risk of miscarriage, prematurity and low birth weight. Verbal abuse, isolation and neglect of pregnant women must be considered, as well as physical abuse.

C. Perinatal Developmental Vulnerability

Neonatal Risk Factors

During the perinatal period, a range of risk factors can present difficulties for the developing infant brain. These include:

– Birth Trauma
– Prematurity (low birth weight, periventricular leukomalacia (PVL), intracranial haemorrhage)
– Metabolic/endocrine e.g. hypothyroidism, hypoglycemia
– Infection
– Rh ABO incompatibility – kernicterus

Premature infants who have a low birth weight are more susceptible to neurological insults that can be related to future

neurosensorial and neurodevelopmental impairment. In the extremely premature infant, it should be remembered that the brain may not be ready for the sensory stimulation present in a normal nursery environment and the infant may require a specialized, quieter setting.

When hypothyroidism in the newborn is untreated, it can lead to irreversible neurodevelopmental impairments. In some conditions, such as PKU, neurodevelopmental harm can be ameliorated by preventive treatment (PKU through diet).

Multiple screening of newborns for numerous congenital metabolic abnormalities soon will replace present routine screening for hypothyroidism and PKU in Ontario. Early recognition and treatment for some of these problems may prevent or ameliorate subsequent developmental problems (see Appendix F).

Through the Infant Hearing Program, hearing screening is performed on all Ontario newborns, acknowledging the long-term consequences of delays in the development of language due to undiagnosed infant hearing loss.The initial screening test uses Automated Distortion Product Otoacoustic Emissions (ADPOAE) technology. Positive screening will be followed up with a subsequent test using Automated Auditory Brainstem Response (AABR) technology. Together these tests are more reliable. Babies with abnormal screening results are then referred for audiology assessment and followup. Support and counselling are provided for parents regarding the future communication needs of their infant when identified as deaf or hard of hearing.

Impact of Neonatal Issues

There are many factors that are considered risks to the infant-parent relationship because they increase the amount of care and stress involved in parenting the infant. Some infants are relatively easy to care for; others require more time and energy. While some parents may be able to manage with an easier infant, infants with complex medical and behavioural needs may overwhelm the parents. The risk of parental depression and child abuse increase when the infant requires a high level of parental care.

- ***Prematurity:*** The parent may be overwhelmed by the needs and care of the small infant. These fears may interfere with the parent-infant bonding and attachment.

- ***Health Problems in the Neonate:*** Parents may have difficulty coming to terms with a child who has congenital anomalies or is seriously ill. When a child is born with congenital anomalies, the family may be in shock and may need time to grieve. Coping can be difficult. The extra care requirements for the infant significantly alter family dynamics and may increase isolation for the family. In addition, the infant's cues may be more difficult to read.

- ***Difficult Infant Behaviour:*** The extra sensitive infant who is hard to soothe may undermine the parent's confidence. The parent's expectations about infant development may interfere with optimal responsiveness and understanding, thus hindering secure attachment.

Maternal Risk Factors

A mother who is able to practice good self-care is more likely to do a better job of caring for her infant. Social support continues to play an important role in the mother's ability to adopt a healthy and positive approach to parenting. For example, a mother who is breastfeeding may require information and support around her caloric needs, calcium and iron supplementation and hydration. A mother with health problems or physical disabilities may need extra supports to cope with the physical demands of caring for an infant.

In the first weeks and months after the baby is born, the mother's capacity to be involved with her infant is critical to early neurodevelopment. Information and support can help mothers to be emotionally available to the infant, to be able to read the infant's emotional cues and meet the emotional needs of the infant. Postpartum depression is a maternal risk factor of primary concern in the perinatal period.

Postpartum Depression

Postpartum depression can interfere with the mother's ability to be attentive to the baby. There are a number of predisposing factors that increase the risk for postpartum depression. Many of these also indicate possible risks for abuse. In the presence of a depressed mother, a positive infant interaction with the father and/or other family members may partially counteract the mother's decreased ability to be sensitive to the needs of her infant (Shonkoff and Meisels, 2000). Even when improved, mothers with postpartum depression tend to demonstrate less attentive behaviour towards their infants. There are reminders about postpartum depression on the Postnatal Visit Form which can be found on the reverse side of the pink copy of the Antenatal Record II. The following are risk factors for postpartum depression (Chokka, 2002a):

– ***Adolescence:*** Teen parents may be in a developmental period when their focus is more on themselves rather than others. They may have difficulty being aware of the needs of an infant. In studies of adolescent mothers, it has been found that conduct disorder is a major risk factor for early pregnancy. Poor nutrition, drug and alcohol use, and other risk taking behaviours may be of concern. Other problems relate to depression. Although about 6% of teen parents had major depression and 20% had minor depression at 6 weeks, by the time the infant was over one year of age, 54% met the criteria for depression. Other problems relate to substance abuse. Conduct disorders have been associated with insensitive mothering (mothers who are less responsive to their babies). In contrast, depressed mothers were more controlling than unresponsive. Both of these patterns have deleterious effects on the mother-infant relationship (Cassidy et al., 1996; Osofsky and Thompson, 2000). Teen parents also have a higher risk of having children with language delays. It may be useful to provide teen parents with suggestions on how they can stimulate their children's speech and language development.

– ***Previous Psychiatric Illness:*** Postpartum depression can occur in the absence of risk factors. However previous psychiatric illness carries significant risk. More than 50% of all women experience mild transient postpartum "blues" that should abate by 2 weeks, however up to 20% suffer significant depression. Postpartum depression tends to start in the first weeks after delivery and may persist for several months. If mild to moderate, it may be insidious. Healthcare providers must search carefully for symptoms. Postpartum depression is particularly important because of the effect on the quality of the mother-infant interaction.

  Postpartum psychosis also develops in the first few weeks after delivery, but is rare. Postpartum psychosis is an emergency requiring immediate treatment. Woman with postpartum psychosis may present with labile mood, disorganized behaviour with confusion, delusions or hallucinations that may involve the infant. The safety of the infant needs to be considered and at times drastic measures such as hospitalization or foster care may need to be instituted urgently. In cases of uncertainty, information and support is available from child protection services.

– ***Partner Unsupportive, Abusive, Absent:*** Changes occur in men in their anticipated or actual role as fathers. With the shift in attention from the couple to the infant, the dynamics in the relationship change. An unsupportive partner may feel threatened by the coming of the infant. Discord between partners may increase the risk for maternal depression as well as deprive the infant of the benefit of father-infant attachment. There is fair evidence (class B) of an association between child abuse and poor marital adjustment, especially if abuse is involved. Physical or other types of abuse increase the risk of maternal depression and substance use. See Appendix B for the ALPHA tool.

– ***Limited Social Networks/Support:*** Supportive social networks help a woman to feel positive about her role as a parent and less overwhelmed by the new parenting tasks. The mother with poor social supports during pregnancy is also at risk for postpartum depression. Social supports are buffers against stress, offer emotional support and physical resources. Mothers with social networks are more likely to make use of other community resources and less likely to be isolated and to feel overwhelmed.

Social isolation can occur in different ways. New immigrant families or ethnic minorities who are separated from their families and communities may be at risk. Similarly, the woman who is leaving her job to begin motherhood may also feel a loss of a support network. If a woman was abused or neglected as a child, she may have increased risk for depression and/or poor attunement to her baby especially if her social supports continue to be limited.

– ***Substance Abuse:*** The parent who abuses drugs or alcohol may be physically present but psychologically unavailable to the infant. Depression is often a factor. When a parent abuses substances, unpredictability and chaos may characterize the home. Emotional unavailability and abandonment as well as the risk of abuse are present. Children in homes where parents abuse drugs or alcohol are also at risk for issues such as inadequate parenting, poverty, excess stress and exposure to violence (Shonkoff et al., 2000). Substance use should also be considered as a possible symptom of psychiatric illness as women may self medicate for undiagnosed depression. Healthcare providers have an obligation to notify child protection services when parental substance use puts the child at risk.

Paternal Issues

The neonatal period is a period of transition for infant and family. It is a time when the patterns of bonding and attachment between the infant and parent begin. Changes also occur in the relationship between the partners. A positive mutual adjustment between parents determines the future health of the family and the child.

– ***The Changing Role of the Father:*** Often the role of the father is overlooked. Although fathers do not undergo the physical and emotional adjustments that women experience, men often experience changes in their sense of responsibility and in their relationship to their partner. Cultural differences in the perceived role of the father can create conflicts particularly for some groups who are translocated.

– ***Isolation:*** Some studies have found that the transition to fatherhood can pose a psychological risk for some men. They may feel isolated as their perspective shifts. Although their major priorities stay the same (they tend to see themselves as providers and protectors), they feel less certain regarding their role with the infant. Fathers generally recognize that a new baby implies an increased family workload; however, they still expect to receive attention and affection from their spouse, have a reasonable social life and pursue some of their own interests. They are at risk of feeling sidelined during this period. A new father who feels incompetent handling an infant may back away particularly if his spouse is perceived as critical of his attempts. Present day expectations of fathers to be nurturing may create conflict and uncertainty when many young men face parenthood without nurturing role models (Watson et al., 1995).

– ***Depression, Chronic Mental Illness:*** The mental health of the father is often overlooked yet is a critical factor in the overall health and well being of the family.

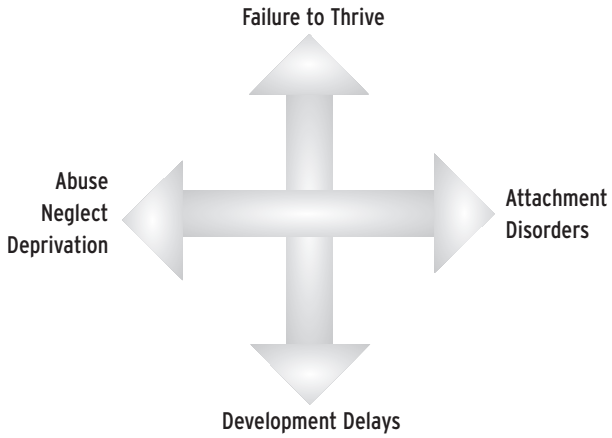
These paternal factors may compound the mother-infant issues that have been identified as risks to the care and nurturing of the infant and the development of a healthy relationship. Some of these factors are related to the mother and her social situation, and others to the infant. All the risks may be additive.

D. Infant Developmental Risks

Infant Developmental Risk Factors

As the infant begins to grow in the context of the family there are a number of factors that now present risks to the infant's further neurodevelopment.

Figure 15: Developmental Risk Interactions



The four-way arrow in this diagram indicates the strong interplay between these issues. Although problems in each area can originate independently, there is a need to be aware of the possibility of the presence or development of problems in the other areas. Problems in one area may be a factor for each of the others. The interplay can increase the risks to ongoing neurodevelopment. It is important for the primary healthcare provider to consider the following infant concerns:

– Failure to thrive – relates to physical growth and health of the child
– Developmental delays – relates to observed behaviour of the child
– Abuse, neglect, deprivation – relates to the quality of the child's environment and care
– Attachment problems – relates to the nature of the parent-infant relationship

More information on each of these developmental risk factors is provided below:

Failure to Thrive

Failure to thrive is described as a failure of the infant to grow in weight and height along an expected growth pattern. Infants that fall below the 3rd percentile are of concern as well as children who show a drop off of two major percentile lines on the growth curve or a major difference in weight and height percentiles. Although some children are simply of small stature and are otherwise healthy, failure to thrive needs careful investigation and its potential effect on neurodevelopment should be recognized. It is helpful to consider the child's failure to grow in terms of his/her nutritional intake. (Hilliard, 2000):

–Inadequate intake of nutrients or calories (inadequate supply, difficulty eating, lack of interest in food, refusal to eat)
–Increased loss of nutrients
  –From gastrointestinal tract (vomiting or lack of digestion or absorption such as occurs in coeliac disease or cystic fibrosis)
  –Other loss of nutrients (sugar in diabetes mellitus or protein in nephrotic syndrome)
–Underutilization of nutrients (such as occurs in some syndromes, chronic disease or infection)
–Overutilization (hypermetabolic states such as in hyperthyroidism or a malignancy)

This toolkit will not discuss such investigation specifically, but will focus on some of the direct and indirect effects of failure to thrive on neurodevelopment.

–***Malnutrition:*** The effects of malnutrition are particularly important from midpregnancy to the second year during the phase of rapid brain development. In the third and fourth year malnutrition has a negative impact on the rapid period of myelination and elaboration of dendritic branching and synaptic connections. The timing of any nutritional insult as it relates to the maturational state of the brain will indicate the long-term effects. Intellectual impairment as well as behavioural characteristics can occur as a result of malnutrition.

Medical disease can result in undernutrition. In some cases, even in the presence of a supportive home and appropriate stimulation, cognitive function can seem intact but there may be subtle deficiencies in short-term memory and attention present.

Deficiencies in specific nutrients can produce developmental sequelae. In particular, iron deficiency anemia in infancy has been associated with decreased motivation, shortened attention span and cognitive impairments. There is a risk of the impairment persisting after the deficiency is corrected. (Shonkoff and Marshall, 2000). Premature infants are at greater risk of developing iron deficiency than full term infants. Restriction of dietary fat is not recommended before 2 years of age because it may compromise healthy growth and development (CPS, 1998).

In developing countries, calorie and protein deprivation during the prenatal and early childhood period has resulted in cognitive delays and behaviour problems. Marasmus and Kwashiorkor, two severe forms of malnutrition that can occur in the first two to three years of life, can alter brain growth.

Malnutrition is often associated with poverty especially in developing countries. Severe diarrhoea in the young infant in these countries also contributes to malnutrition. When these children survive, not only is their physical size compromised but their impaired learning ability may persist for a lifetime. Canada is a multicultural society with many immigrants and refugees who may come to this country having experienced harsh living conditions in their country of origin. It is important to obtain a thorough history of a child's early years if malnutrition is considered a factor in the clinical presentation. There is a need to be aware of family dietary preferences such as strict vegetarianism that could cause deficiencies for the infant and toddler.

Breastfeeding provides both optimal nutrition and stimulation for newborns and infants. Breastfeeding provides opportunities for the infant to be in close contact with the mother. All attempts to encourage breastfeeding are important for the long-term positive effects that this can have on optimal child development. If breastfeeding is not possible, then feeding needs to mimic the nutritional components and the closeness of breastfeeding. For more information on breastfeeding and infant nutrition please refer to Appendix P and Health Canada's: Nutrition for Healthy Term Infants and Nutrition for a Healthy Pregnancy at www.hc-sc.gc.ca.

–***Chronic Illness:*** Inherent genetic or primordial disease such as chromosomal abnormalities, intrauterine infections and a variety of pediatric syndromes are associated with poor growth regardless of intake. Medical illness and treatments for cancer, cystic fibrosis etc. are associated with failure to thrive.

Chronic illness may interfere with the infant's interaction with the caregiver and their environment in addition to any direct effect that the disease process or its treatment may have on developing brain cells. A supportive, caring environment may ameliorate the effects of disease. Unfortunately, it is not uncommon for chronic illness to cause severe family stress. The family copes with grief over the affected child as well as the special needs of the child. The risk of dissatisfaction between parents and of marital separation is significant. Parental confidence regarding care of their children may be decreased and the incidence of depression in parents is high. These factors can impact further on children with special needs and siblings. Parental overprotection in response to

the child's illness may actually impede development rather than foster it. These children are also at increased risk for abuse and neglect, as are the siblings. Siblings' needs may be forgotten or underestimated because their needs are deemed less critical. It may be difficult for these families to find enough emotional or physical resources for all family members.

– ***Interactional:*** Situations that lack supportive interaction may result in poor infant growth, sleeping and/or eating problems, in the absence of specific disease.

– ***Environmental Toxins:*** We should be aware of the effects and sources of environmental toxins such as lead and pesticides on neurodevelopment. Environmental toxins can be present in many situations. Pesticides and herbicides are commonly used in farms and parks. Playgrounds may be situated on old dumps or factory sites (see Motherisk for more information or "Playing it Safe: Childproofing for Environmental Health" at www.healthyenvironmentforkids.ca).

Developmental Delays

With infant growth, development is expected in motor, language and communication, cognitive and psychosocial areas. Although there is variation from one infant to another, lack of progress beyond certain limits indicates that delays may be present. Any regression in skills is also important. Examples of developmental delays include:

– Motor delays, for example not sitting by seven months
– Language and communication delays, for example not babbling at seven months
– Cognitive delays, for example not looking for dropped objects by seven months
– Psychosocial delays, for example not laughing in playful situations by eight months

These delays may become apparent as part of a known problem or may represent a new issue. Such delays are important as markers of problems but are also important because they may in themselves contribute to further neurodevelopmental compromise either because of the environmental response (extrinsic) to the child or the limitations that the delay imposes on the child (intrinsic). For example, the infant who does not make eye contact and whose caregiver does not use opportunities to try to engage the infant may miss the learning of social cues.

Attachment Problems

The early parent-child relationship mediates and influences the course of a child's development. Attachment was the term first used by Bowlby in 1969 to describe the importance of the protective role of the caregiver, referred to as the "attachment figure". The infant's confidence in this person was referred to as "attachment". While attachment refers to the attitude of the infant towards the caregiver, bonding refers to the feelings of the caregiver to the infant.

Attachment behaviour was researched by Ainsworth in 1979 (Chodirker, 2001). She outlined different patterns of infant interaction with their caregiver in a structured strange environment. In her studies, a one year old infant and his/her mother were placed in a room with age appropriate toys. A friendly female stranger was present part of the time. The mother and the stranger both entered and left the room twice. The infant and parent interaction was monitored. The infant's responses when the mother returned were found to be the most informative. Three main patterns emerged:

– ***Secure:*** Infants showed a balance of attention between the mother and the toys while the mother was present. When mother left, there was a wide range of reactions in the infants. When their mother returned, the infants responded positively to the mother. If they were upset they quickly settled and returned to exploring. Observed in their homes, these mothers were quick to respond to their infant's distress.

– ***Insecure, Avoidant:*** Infants showing this pattern appeared independent and were busy with the toys when mother was present. They showed little response when mother left and tended to ignore her on her return. Observed in the home, when their infant was distressed, these mothers did not provide comfort and the infant did not appear to bring their feelings of distress to their parent. Mothers of infants with an insecure avoidant attachment may demonstrate a pattern of rejecting, ignoring care, and/or speaking to their baby in negative terms.

– ***Insecure, Resistant:*** Infants showing this pattern reacted intensely on the mother's return and were hard to comfort. They were less interested in exploring. In the home, the mothers seemed to react to distress in the infant but were less responsive to positive situations.

Attachment is affected by both maternal and infant factors. Secure attachment is not like glue but rather more like elastic. It stretches

and the infant is able to move away to explore the world. It is a condition for learning and being curious about other things and relationships.

The two categories of insecure attachment (avoidant and resistant) are considered normal patterns for infants. However more secure patterns of attachment are associated positively with sociability, cognitive development and lower incidence of future behaviour problems. Another insecure pattern has been described:

– ***Disorganized/Disoriented:*** The infant shows an inconstant pattern of behavior and has no strategy for eliciting comfort when stressed. Sometimes the infant looks secure and sometimes not. In the home the parent's reactions are described as unpredictable and sometimes hostile. Mothers are often victims of former trauma such as abuse or domestic violence and suffer from unresolved loss. The infant is frightened and so is the parent. This pattern is predictive of future behaviour, learning and mental health problems in the child.

In the presence of maternal depression, increasingly insecure patterns are seen. Depressed mothers are more intrusive and more disengaged but also less responsive. The infants are less positive and show more negative affect. Unfortunately, research is showing that even after the depression has passed there may not be an improvement in the pattern unless efforts are made to change the parent-child interaction. Early detection of depression in the parent is vital. Prolonged separation and loss of the caregiver are also threats to infant attachment.

Factors that affect attachment are both maternal and infant:

– ***Parental Factors:***
  – Attending ability and responsiveness
  – Personal experience of care
  – Perception of infant's demands
  – Capacity to set limits and console
  – Developmental expectations
  – Sense of competence

– ***Infant Factors:***

  – *Temperament* - Infants are different in their reactions from birth. Very sensitive infants may be hard to soothe and may fuss excessively. Some infants are intense and active. Others are more placid and easygoing; such infants may have cues that are hard to read. Sometimes there is a mismatch between infant and parent temperament and this situation can cause problems with attachment.
  – *Ability to use mother as a base* - Some infants have trouble with attaching and using a parent as a secure base. In this situation even a responsive parent may tend to back off or become frustrated or intrusive. A variety of problems including autism spectrum disorders may be present. Vision and hearing may need review. Physicians and other primary healthcare providers need to enquire and listen regarding infant characteristics because parents may need help and support to respond constructively to their infant.

Additional information about attachment can be found in IMPrint, the Attachment Collection, 2002.

Abuse, Neglect, Deprivation

Early brain development is adversely affected by absence of stimulation or chaotic traumatic stimulation. Deprived Romanian orphans, who were in the orphanages in their very early years and then adopted into Canadian homes, have shown persistent intellectual impairment, serious behaviour and relationship problems. If adoption occurred before four months of age, less difference from children who were born in Canada was noted as they grew. If they were adopted after eight months, the number and severity of their problems increased with the length in time they spent in an orphanage. These children who were adopted later in life showed significantly higher evening sterol levels.

Both animal and human studies are yielding new information as to the effects of abuse on neurodevelopment. The brain structure and function of adults who have suffered severe abuse as children, show a variety of differences from non-abused control adults. EEG abnormalities have been documented in the left temporal and frontal brain areas. Several studies involving MRI scans have shown reduction in the left hippocampus and amygdala, two critical areas of the limbic system related to memory formation and retrieval. The change in size in the hippocampus has not shown up in studies in abused children or adolescents. This observation is due to the fact that effects of chronic stress on the hippocampus are protracted and are not apparent until later in life.

Differences in the integration of function between the two cortical hemispheres can be detected by sophisticated EEG techniques. In recalling painful or neutral memories, subjects with a history of abuse tended to involve their right or left hemispheres exclusively,

whereas normal subjects showed a balance of activity in both hemispheres. In spite of right-handed dominance in an abused individual, there was less development in the left hemisphere when compared to their right hemisphere. In addition, the left hemisphere was less developed than in a normal subject. The corpus callosum also showed reduction in size. Here neglect exerted the most powerful effect in boys and sexual abuse, the greatest in girls (Teicher, 2002).

The infant raised in an unpredictable, abusive or neglectful environment will develop a poorly organized dysregulated CNS catecholamine system. If the environment is unpredictable, chaotic and violent, a hyper vigilant, hyper-reactive arousal system is adaptive, where survival is the goal. The ramifications for learning, social interactions, mental and physical health, are enormous (Perry, 1993). An example of an unpredictable environment is one where there is conflict or abuse between parents. A child who has been exposed to abuse may be at risk even if not abused directly.

Neurological effects of physical abuse and neglect should be mentioned. Shaken baby syndrome can be responsible for brain damage. Accidents in small infants and toddlers are often a result of carelessness or ignorance on the part of the caregiver. Less blatant neglect and deprivation can occur when overburdened parents can't respond to the child, use the television extensively as babysitter, or leave the child in non responsive childcare situations. Harsh, hurried care may not constitute abuse but is less than optimal for development. It is not unusual for suboptimal patterns to develop in all socioeconomic groups (Perry, 1993; Teicher, 2002). Healthcare providers have an obligation to report abuse and exposure to abuse to child protection services.

E. Resilience

In spite of adverse conditions, some children mature into well-adjusted competent adults. Some factors seem to make a difference. In addition to having an easy sociable temperament, these children manage to connect with some other adult in their environment, such as a grandparent or an older sibling. They appear able to handle themselves in the midst of the situation and still make significant connections in their environment. They seem able to find a social environment that reinforces and supports their coping ability (Werner, 2000).

Factors that Contribute to Resilience

–Easy going temperament
–Available caring adult
–Good self-management skills and a supportive environment

Studies around resilience are helping in the search to determine the types of interventions that might help to optimize the development of all children.

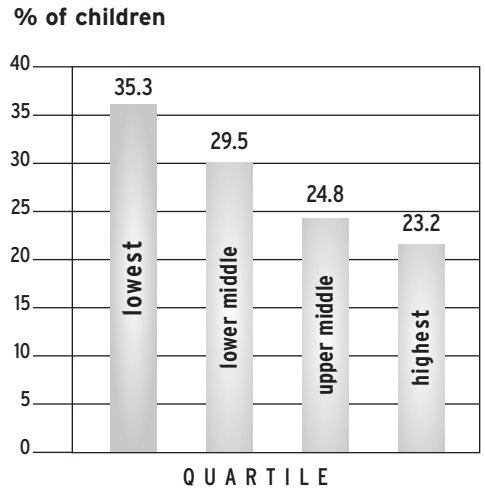
F. Social and Economic Factors

Economic factors can be risks to child development. Poverty leads to a pattern of deprivation at the personal, family and community level. Risk factors such as poverty, minority group status, and social impoverishment are known to be associated with increased infant mortality and with child maltreatment. However these factors are not causative. Not all poor communities are socially impoverished. Socially impoverished communities are not necessarily poor. There is good evidence that social environments, which are mutually supportive where "neighbours" have a sort of cultural network of mutual respect and positive interaction, provide protective factors for their children's development.

Social policies also have an impact. In societies where there are no policies to ease the impact of poverty, the correlation of poverty and poorer child outcomes is higher. Thus, socioeconomic status is a more important predictor of child maltreatment in the USA than some European countries as well as Canada where more universal social support programs exist (Garbarino and Ganzel, 2000).

In the National Longitudinal Study of Children and Youth, children were identified with difficulties on the basis of learning or behaviour problems. Family income is not the most powerful influence on how well children are doing. Socioeconomic status of the family has an effect on children. However, the gradient makes it clear that other factors must be involved. If not, all the well-off children would do well and all the poorest children would have difficulties. This is not the case.

Figure 16: Prevalence of Children with Difficulties by Family Income – Adapted from Wilms, 1999



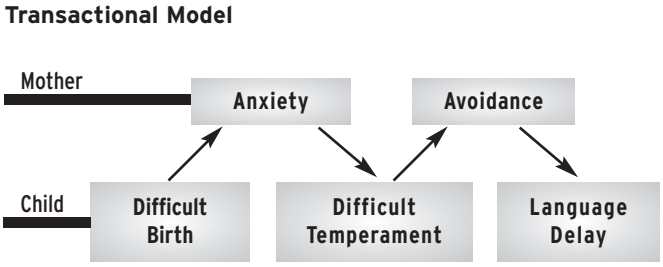
The chart summarizes the relationship between children with difficulties (verbal skills, mathematics and/or behaviour) and family income. Note that 35% of the children in the bottom quartile are in difficulty while more than 20% of the top quartile are in difficulty. The majority of children who are not doing as well as they could are in lower-middle and upper-middle income families. Such findings support the need for universal programs that encompass all populations.

The research findings from the National Longitudinal Survey of Children and Youth point to parenting practices as a powerful influence on how well children are doing. Reading to children, responding to questions and concerns, and setting limits seem to make a big difference. Both positive and negative parenting practices are found across all socioeconomic sectors (Wilms, 1999).

G. Transactional Model

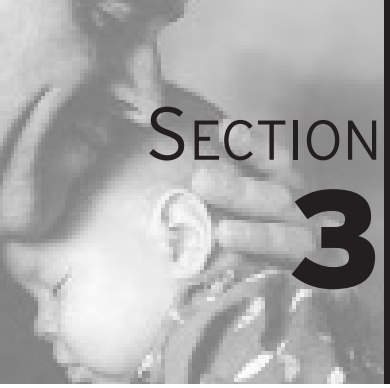
Another way of understanding the interplay between environmental factors is to view the outcome as a product of the ongoing dynamic interactions between the child and his/her family and social context. This understanding is important because it emphasizes the fact that the child's individual differences play a part in what the child triggers in his/her environment and what the child is able to take from this environment. Understanding this transactional process makes it easier to recognize the complex nature of interactions and may assist in developing strategies that may improve outcomes. Happily, the evidence that early intervention makes a difference in outcomes for children has a solid research base and is growing rapidly (Sameroff and Fiese, 2000).

Figure 17: Transactional Model – Adapted from Sameroff and Fiese, 2000



Key Points – Risk Factors

- Risks to neurodevelopment can occur in the preconception, prenatal, perinatal and postnatal periods.
- Neurodevelopmental risk factors are additive, compounding their effects.
- Neurodevelopmental delays become risk factors themselves both because of the direct effect on the infant and the indirect effect on the family.
- Nature and nurture are continuously interacting and changing in response to the ongoing interaction between the infant and his environment for positive or negative outcomes.
- Children and families can become "at risk" at any time as circumstances change.
- Early detection and intervention to reduce risks is of paramount importance.



SECTION 3 PARENTING – Key Concepts

Introduction

Most people would agree that children are a country's most important resource. In spite of this belief, preparation for parenthood is given less attention than most other tasks performed including driving a car. Most people rely on their own past experiences of being parented and on intuition. This perspective is still prevalent in a society that has changed a great deal over the past 50 years. Over recent decades there has been growing interest regarding the effect of societal changes on young children and their families. There has been a steady increase in the number of families with preschool children in which both parents work outside the home, as well as the number of children in single parent family situations. Shift work and family mobility have decreased the support systems for families. At present, there are concerns that our youngest citizens are at increased risk.

The increase in problem behaviour and violence among young people has brought more attention to the importance of these early years. The school system is concerned about the increase in the number of children with a variety of learning, emotional and behavioural problems. It is not sufficient to wait until a child reaches school age to assess issues and to address needs. In addition, the expanding information regarding brain development has spurred efforts to pay more heed to early childhood needs. Countries that have invested more resources into young children and their parents are experiencing better outcomes in their children in some measurable parameters such as literacy, school achievement, etc. (McCain and Mustard, 1999). The commitment to put more resources and effort into this developmental period of life is being made by government, professional groups, communities and parents.

Primary healthcare providers are in an ideal position to create links that support and improve parenting. Recent information on the importance of the early years to neurodevelopment makes it imperative that primary healthcare providers provide all families with information and services about parenting. Parents provide the major and most important environment for a child in the first few months and years. Therefore primary healthcare providers who naturally encounter children, parents and families need to learn as much as possible about the parenting process during this critical period of life. Primary healthcare providers can also take advantage of parenting experts in the community both to increase their own knowledge and for the benefit of their patients. Physicians and other primary healthcare providers can be a catalyst of improvement for children. A catalyst does not do the work but facilitates the action. The ongoing, trusting relationship with families during the prenatal period, at birth and during the early period of life puts the family practice team in an important position to contribute to this task.

A. Parents Poll

"Invest in Kids" sponsored a national survey in 1999 of 1,645 families with at least one child under six. This group was representative of Canada by region, language and income. The purpose of the poll was to determine what parents know about the importance of the first five years of life, the pivotal role parents play during that time and whether parents feel confident in their ability to care for their children. Most importantly, the parents poll showed that 61% of mothers turned to their child's doctor as the top source of information on parenting.

Results

–92% believed the parent's role to be very important
–85% believed babies learn from birth
–50% believed nurturing influences development
–Parents had low levels of knowledge about physical, emotional and social development

–Parents believed they had the most influence over emotional development and the least influence over the development of knowledge
–Parents felt most insecure around the birth of their first child
–Parents wanted to improve their parenting skills
–55% of fathers and 70% of mothers tried to prepare for parenting by reading, asking advice, etc.
–Only 52% of parents had enough emotional support
–Only 56% had enough practical support
–40% believed that Canada values parenting

From this poll it seems that many parents feel unprepared and unsupported in their role. However, parents may be disturbed by a recommendation to participate in parenting programs. Instead of seeing this as an opportunity to improve skills, they may feel that the healthcare provider is suggesting that they are inadequate parents. In our society, prenatal classes are considered routine and helpful for everyone. It is hoped that this same attitude toward education about parenting will be the norm in the future (see website #6, page 51). Primary healthcare providers can facilitate this attitude by making parenting training part of the routine recommendations for new parents.

B. Goals of Parenting

How many parents sit down and consider their long-range goals as parents? Many parenting programs encourage parents to do so. Parents often have specific dreams or expectations for their children that may be unrealistic or burdensome to the child. Examining their goals may help parents to delineate realistic and supportive goals for their parenting. They may recognize the dangers of short-term goals and plans that make the parent's immediate life easier. Instead they may develop strategies to achieve more long-term child-centred goals.

One parenting program sums up parent goals, reflecting on the nurturing as well as the training role of parenting and alluding to the fact that parenting takes place in a cultural context:

"The purpose of parenting
To protect and prepare children
To survive and thrive
In the kind of society in which they live"
Active Parenting

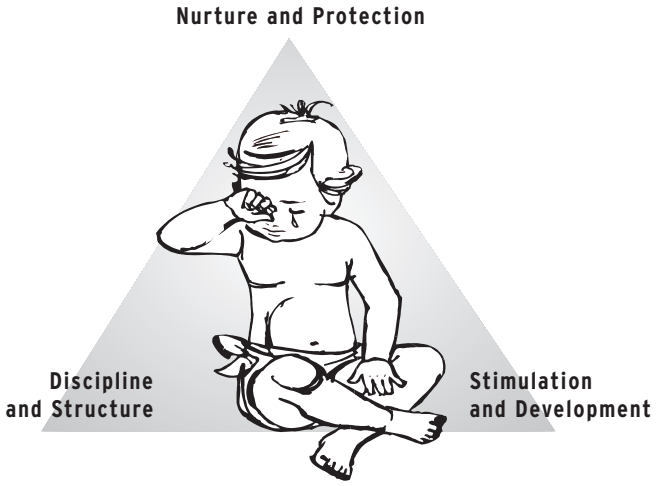
Parenting is Difficult

Parenting can be challenging. No other job is really fulltime. The nurturing of a young child is demanding emotionally, physically and socially. Most new parents find that their world is completely changed and the child dominates the scene. As the child grows and starts to move around, the need for parental supervision and the ability to set and enforce reasonable limits becomes increasingly important.

Nurturing and Setting Limits

These two sides of parenting are both important. Without nurturing, caring and support, the child withers. Without positive discipline, the child's behaviour may become increasingly problematic. Parenting provides many opportunities to practice and improve this balancing act. Parenting styles reflect differences in the balancing of these two poles and are reflected in outcomes. Consistency within and between parents is important.

Figure 18: *Parenting – A Process*



Stimulating and Encouraging Development

Stimulating and encouraging development is another important part of parenting. The parent needs to learn to pick up the child's cues, to be sensitive to the child's learning style and to be stimulating without overwhelming the child. Singing, talking, reading and playing with a small child provides both nurturing and stimulation. Helping the child learn to do gradually more complex tasks increases the child's sense of self-esteem and accomplishment. Parents can help a child deal with the frustration of struggling to master skills and tasks by being patient and encouraging (Dwivedi, 1997).

C. Parenting Style

Types of Parenting Styles

–***Authoritarian Parenting:*** This style of parenting tends to be controlling and rigid. Parents are less sensitive to the child's perspective. They set firm limits and do not negotiate rules. They value obedience and respect, but show low levels of nurturing, warmth and empathy. This parenting style often leads to rebellion.

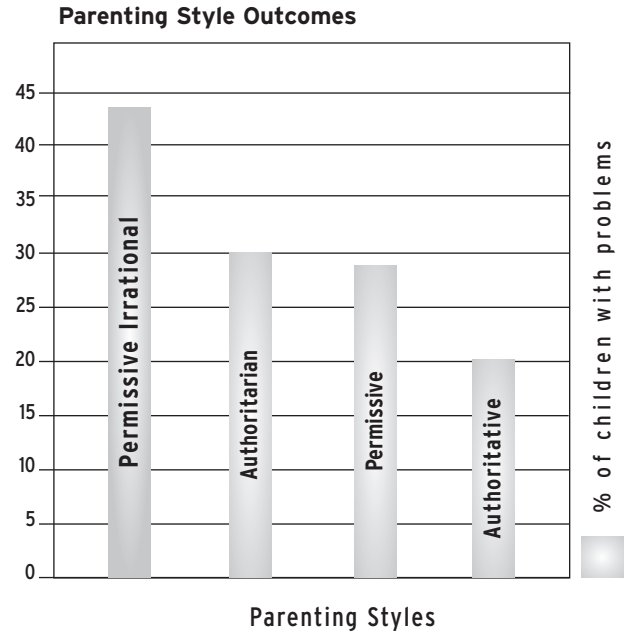
–***Permissive Parenting:*** This style of parenting can be more nurturing or can be disinterested. The child has the control. Parents have trouble setting limits. Often this style can lead to conflicts as a child becomes older and increasingly demanding. Setting limits at that point becomes very difficult.

–***Permissive Irrational Parenting:*** This style of parenting is unpredictable. It is at times supportive, at other times not. Parent-child interactions are not related to the child's need but to the parental mood or need. It may be associated with parental substance abuse, parental psychopathology or violence in the home. The incidence of child problems is close to 50% in this style of parenting. Of course child abuse or neglect is a frequent concern in such a situation.

–***Authoritative Parenting:*** Parents are responsive to their child's needs, and nurture and support their child. Parents have realistic goals and rules for behaviour and communicate these expectations to children. They set age appropriate limits and demands. In addition they support the adherence of these behaviours in consistent, positive ways. These parents acknowledge their children's thoughts and feelings but do not give in to demands. They listen and give explanation for the limits but do not engage in endless discussion about limits. This approach helps to establish a warm, mutually positive basis for interaction. Such interaction is linked to secure attachment and self-esteem. Children feel valued and loved, but can delay gratification and acknowledge responsibility for their behaviour. It also fosters the perception that people deserve respect and teaches empathy. This style is considered optimal. This style of parenting is associated with higher levels of child cooperation.

In the National Longtitude Study (see Figure 19), one third of parents had an authoritative style, one quarter was authoritarian and one quarter was permissive. About fifteen percent were permissive-irrational. Children seemed more affected by parenting style than by socioeconomic status. Other studies support this conclusion (AAP, no date; Shonkoff and Meisels, 2000).

Figure 19: *Parenting Style Outcomes – Adapted from McCain and Mustard, 1999*



D. Enhancing Parenting Skills

There is a wide range of parenting programs and services, ranging from informal playgroups to formal instruction on parenting techniques. Some programs provide general parenting information, others enhance specific skill areas, or are designed with a specific audience in mind, such as new fathers. Parenting programs and services have many things in common, including principles and techniques.

Principles of Intervention and Parent Support

–Respect for parents
–Sensitivity regarding cultural issues
–Improving social supports
–Increasing parental confidence
–Increasing parental pleasure in children
–Supporting and improving parenting skills – "adding to the toolbox"

(Baron-Cohen et al., 2000)

Parenting Prerequisites

–***Motivation:*** Most parents want to be good parents as indicated by the parents poll. However sometimes parents have other problems that need to be acknowledged and addressed before their parenting ability can improve. Parents may need additional support and resources if they have a mental illness such as depression, bipolar disorder, schizophrenia, personality disorders or post-traumatic stress disorder, or if there is conflict between partners or other problems are present. Concern for their child's well being may provide the motivation for some parents to tackle certain problems. Parents may be prepared to try to solve problems for their child's sake when they might not do it for themselves. If parents are so troubled or burdened that they are not able to be concerned about their children, then intensive intervention may be needed. Are the children at risk? Should child protection services be consulted?

–***Resources:*** In assessing parent's needs, consideration of physical, emotional, financial, social, family, spiritual, socio-economic, housing and cultural resources is important. If a family has limited resources, then assistance in these areas may be most important to enable parents to perform their task.

–***Opportunity:*** Parents need time and opportunity to perform their parenting role. If a parent has limited ability to expend much effort with a child then this parent may feel unable to fulfill suggested activities. Then such information may add further burden to this stressed parent. Extra responsibilities, illness, or other situations may severely restrict a parent's opportunities. Different kinds of support may be needed for a child in this type of family situation. Childcare or respite services may bring the child more support and bring relief for the parent.

–***Knowledge:*** In the poll, parents indicated that they needed more information about parenting especially regarding emotional development. They also needed education about issues such as development, childcare, safety and health.

In order to assist parents, physicians and other primary healthcare providers need to consider these issues in order to determine what kinds of supports will assist parents to do their job at any given time (Baron-Cohen et al., 2000; Shonkoff and Meisels, 2000).

Parenting Programs

Parenting skills can be improved through:
–Home visiting programs, e.g. HBHC Program
–Parent support groups, e.g. Baby Talk
–Parent training programs, e.g. Nobody's Perfect
–Family Resource Programs e.g. drop in programs for parents and children (Ontario Early Years Centers)
–Books, videos, websites etc.
–Peer support e.g. self help groups

Parenting enhancement and support can occur in a variety of ways depending on the needs of a family. All parents can benefit from some of these programs. Many of these efforts have been started in order to help high risk families, however enhancing the skills of all parents provides a more positive focus in a community and enables parents to help each other without the stigma of labels. These options will vary from one community to another. Some may be community programs, others may be offered through professional services. It is helpful to know about options that are available in your community.

Some of these programs are specialized to deal with specific risks or problem areas. Home visiting may be provided to a new mother who has risk factors identified during pregnancy or at the time of delivery. For example, in Ontario, the Healthy Babies Healthy Children program provides a trained visitor to support the mother/family in caring and bonding with the baby in their home. Such intense programs have been shown to decrease the incidence of abuse. Other home visiting programs may help parents learn the extra parenting skills needed to help a child with a developmental delay or a behavioural problem.

The same is true of parent support groups and parent training programs. These types of groups may be general and provide support or training for all parents. Other groups may be specialized for parents with special concerns such as autistic spectrum disorder, attention deficit hyperactivity disorder or the adolescent parent.

The venue through which parents can achieve their goals may vary as well. Some parents would enjoy the support of a group, while others are not prepared to participate in a group. More than one venue may be used at once, for example a parent may take their child to a parent-child play group and may also have an infant development worker coming to provide training in the home. Healthcare providers who know their families well may

consider which venue may suit a particular family.

Parenting programs may involve:
–Small groups of parents
–Group of parents and children, with child centred activities
–One to one with or without the child
–In the home with parent/s and child
–One to one with parent and child

Parenting Program Goals

Although parenting programs vary in their focus, the following encapsulates the goals of most parent programs. The overall aim is to increase parent's satisfaction in their role and enjoyment of their children as well as their skill in managing and supporting their child's development. Most parenting programs are designed to:

–*Increase Knowledge about Development:* Parenting programs work to increase parent's knowledge, especially in the areas of developmental stages, care and protection, aiming to reinforce the importance of stimulation and parenting in brain development.

–*Foster Secure Attachment:* Parenting programs strive to increase parent's sensitivity and understanding of the child's perspective, empathy for the child and awareness of the child's cues, needs and temperament. The programs help parents become more responsive to the child, explore a wider range of response options and increase self-awareness in difficult situations.

–*Examine Parenting Styles:* Parenting programs share information about the positive and negative consequences of different parenting styles, including the impact on children's emotional and behavioural outcomes. The possible outcomes of increased confidence and control in dealing with their children's behaviour as well as increase in compliance and decreased conflict from their children can provide the motivation for trying out changes in style.

–*Improve Parenting Skills:* Parenting programs address a wide range of parenting skills including:
  –Discipline techniques such as setting limits and following through
  –Communication skills, including positive listening and clear messages
  –Problem solving skills for prevention of problems and teaching responsibility
  –Stimulating development in an age appropriate manner
  –Teaching values by sharing family tasks and beliefs

–*Foster Parental Self Care and Support:* Parenting programs aim to improve parent self-care and support by sharing information on parental boundaries, fostering parent's relationships, and community supports for parents and their children.

Parenting Program Techniques

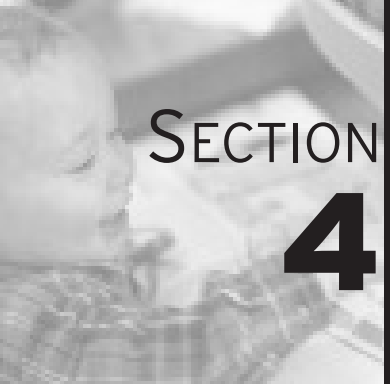
Parenting training can use a variety of techniques to facilitate learning and to make the process interesting, understandable and pleasurable. Some techniques are as follows:

–Discussions about parental issues
–Videos
–Role playing
–Problem-based discussions
–Modeling
–Additional resources such as literature and websites

If physicians and other primary healthcare providers are personally involved in their own parent training, it provides a good basis to recommend the same experience for patients.

Key Points – Parenting

-Be knowledgeable about parenting.
-Encourage all parents to take advantage of opportunities to enhance parenting skills.
-Assess parent-child interaction.
-Be aware of risks to parenting and consider proactive intervention.
-Advocate for parenting needs.
-Be trained for parenting yourself.



SECTION 4 IMPROVING THE ODDS – Clinical Strategies

Introduction

What role do physicians and other primary healthcare providers play in "improving the odds" for optimal neurodevelopment in children? As part of the team, what can we do to ensure the child has the chance to reach optimal potential? Although there are many unknown factors regarding neurodevelopment and factors over which we have no control, there are interventions that can make a significant difference.

Parents and society provide the environment in which children are conceived, delivered and nurtured. Young women frequently attend clinics seeking advice and treatment for birth control to avoid pregnancy. These visits provide opportunities to share preconception information that can improve outcomes. The prenatal visit allows the health professional to continue this process, monitoring for risk factors and encouraging healthy practices to foster fetal health and future infant care. The process continues through careful monitoring of the mother and infant through labour and delivery. The ongoing assessment of infant and family continues through the well baby examination program. Physicians and other primary healthcare providers may have substantial contact with parents during these critical times of infant development. Hence it is important that primary healthcare providers are knowledgeable and apply evidence based practices in their work with infants/families. In addition, it is incumbant on physicians and other primary health care providers to become familiar with local resources that foster healthy child development.

Families with different cultural backgrounds and parents whose first language is not English may require additional services including translation, or may benefit from referral to culturally specific services. The parent's cultural beliefs about child development and child rearing and the degree of parent-child interaction may impact the healthcare provider's interaction with the client. Additional client intervention may be necessary to ensure that the parent is aware of the determinants for healthy child development.

A. Important Roles for Primary Healthcare Providers

Level of Intervention

-Society
-Community
-Individual family/child

Target Groups

-All children
-Children at risk
-Children with delay
-Children with special needs

Interventional goals in neurodevelopment may be described as **risk reduction** and **developmental enhancement** activities. Although there are some clear-cut prevention issues such as the treatment of PKU with a restrictive diet or thyroid insufficiency with hormone replacement therapy, most developmental issues are not simple. Because neurodevelopment has so many inter-relating factors that can affect outcomes, the aim of intervention may not be to prevent a specific outcome but to reduce the influence of a particular negative risk factor. Intervention may target a community rather than an individual child. Some interventions (risk reduction) aim to decrease the effect of those factors known to negatively affect development. Other interventions (developmental enhancement) promote factors that are known to support better outcomes.

The major focus of these efforts varies, based on local needs. In developing countries maternal and infant health, nutrition or safe water could be major concerns. Parents may need help with basic infant and child care. In a developed country, there are social factors affecting individuals and families that may create different kinds of problems that impact children. Although as primary healthcare providers we usually treat individual children, we need to be aware that development is contextual, taking place within a family, within a community, within a larger society. Thus, in order to improve the situation for children, the patterns of their development, both positive and negative need to be understood within a broader context. Interventions need to be contextual as well. At the societal level, it may be a decision to increase maternity benefits or provide a media campaign regarding safe sex. At the community level, it may be the decision to build a playground. At the family level, it may mean teaching parents to help their child with speech or it may be removing the child from an abusive home.

As a primary healthcare provider functioning in a community, it is important to know what other professionals, agencies or community activities, may be available to contribute to reducing the risks and enhancing development. Active communication and referral between all these participants will improve the interventional efforts and aid in assessing their effectiveness (Shonkoff and Meisels, 2000). Risk reduction and developmental enhancement can be aimed at different levels or target groups:

Specific Examples of Risk Reduction

Risk reduction aims to decrease the impact of those factors known to negatively affect development. Folic acid is a simple example of risk reduction:

- –All women are recommended to take 0.4 mg of folic acid prior to pregnancy and in the early stages of pregnancy.
- –For women at higher risk due to diabetes or epilepsy, or a prior child with a history of neural tube defect, the recommendation is to take 4 mg of folic acid.

Risk reduction can also have a role in reducing the risk of further problems in a child:

- –For children born with spina bifida, risk reduction involves assessment of the extent of the defect and the investigation for the hydrocephalus that may complicate the problem. This problem may need treatment to prevent further neurological damage (Hack et al., 2000).
- –Risk reduction for children with special needs may include support for the family to deal with the physical needs of the child and the emotional/social effects on the family unit. The child and family may need special help to access school, community and other supports.

Development Enhancement

Developmental enhancement promotes factors that support better outcomes, and is important for all children and their families, not just those with known risks. For example:

- –All children will benefit from good early childhood educational experiences and opportunities to interact with other children as well as nurturing experiences with one or both parents.
- –For children at risk because of limited supportive stimulation, early childhood educational experience and play may be even more important.
- –To enhance the development of children with delays, more specialized early childhood experiences may improve their outcomes.
- –Enhancement efforts with children who have special needs may focus on any special abilities they have and also the family to enhance their coping skills (e.g. respite care).

Clinical Opportunities for Primary Healthcare Providers

There are many times in practice when there are specific opportunities to screen, assess and act. During these critical periods primary healthcare providers (i.e. midwives, obstetricians, family physicians, pediatricians and nurses) see women, infants and families and are in a position to promote optimal development. A planned approach for specific developmental periods will make these activities thorough, efficient and practical in the practice setting.

Roles for primary healthcare providers include:
Screening
–Identification of risk
–Identification of developmental problems
Risk reduction
–Education/Support
–Treatment/Referral
Monitoring/Ongoing care
Advocacy and Developmental Enhancement
–Education
–Community awareness and interaction
–Community involvement and advocacy

Many screening opportunities are shared. Communication and collaboration are important in sharing information, in complementing each other's scope of services as well as in reducing duplication of services.

Screening opportunities include:
–Preconception – Well Female Visit
–Prenatal
–Peripartum
–Well Baby Visit

B. Preconception

All women of childbearing age (from 16 to 45 years of age) should be screened for problems that might cause a concern for a future pregnancy and infant. If a young woman is asked about childbearing as an anticipated life goal, she may consider how her lifestyle and health may affect her future children and not just herself. The knowledge regarding early brain development needs to be available prior to conception. Women need to know that brain development is well underway by the time that a woman realizes that she is pregnant. A preconception perspective can be built into the annual health examination that many women have for birth control. For example, the risks of alcohol to the fetus are ideally covered in a preconception visit, rather than a prenatal visit several weeks into the pregnancy. All topics need not be covered completely at one specific visit, but can be covered over several visits (see Appendix A).

Planned pregnancies are predictive of better adjustment to parenthood and provide the opportunity to assess and reduce risks prior to conception (Cefalo and Moos, 1995). In the preconception period, there are many areas that are worthy of review:

–***Genetic Background:*** Are there any genetic or other health problems in the family such as Down syndrome, cystic fibrosis, Tay Sachs disease, haemoglobinopathies, muscular dystrophy, haemophilia, neural tube defects, etc.? Discussing these issues may help a woman to consider in advance if she and her partner may need further advice prior to becoming pregnant. Woman may have questions about these issues but may be uncertain as to when it is appropriate to discuss them.

–***Health Problems:*** Women with health problems, such as diabetes, hypertension, heart disease, epilepsy, thyroid disease or mental health concerns, should be aware of the need to discuss pregnancy issues and plan healthcare during pregnancy. For example, changes in medications such as anticonvulsants, antipsychotics, antihypertensives, etc. should be discussed and initiated prior to pregnancy.

–***Immunization:*** If there is any doubt about immunization or immunity, then titres for rubella and hepatitis B etc. can be done and appropriate immunization given.

–***STD/HIV Screening:*** Screening for STD/HIV gives an opportunity to discuss safe sex and assess risk. Discovering if the woman is comfortable discussing use of condoms with her partner and if he is willing to use them will give some insight regarding the patient and her relationship.

–***Nutrition:*** Does the woman have eating patterns or an eating disorder that may affect her childbearing? Assess all women for nutritional status and ask about folic acid supplementation. The desire to have children may assist in motivating change. Women should be given information about the risks to future pregnancies.

–***Violence Screening:*** Asking about a woman's history of abuse at this time may facilitate her gaining any needed support, before she is dealing with a pregnancy. Sometimes women seek pregnancy believing that having a child will improve the relationship. It may be helpful to have her recognize that abuse often gets worse during pregnancy and puts a child at risk. See Appendix B for the ALPHA tool.

Preconception evaluation may include the following:
–Haemoglobin testing and blood typing, further testing for haemoglobinopathies if indicated
–Rubella titre, Hepatitis B, and HIV testing
–STD testing
–Other testing indicated in the individual situation

Anticipatory Guidance should include information about taking folic acid when pregnancy is a possibility. Woman should be encouraged to eliminate tobacco and alcohol prior to conception and to avoid other possible toxic environmental substances either in the home or workplace. Information about prenatal care and the timing of their first prenatal visit is appropriate.

SALLY AND BRAD'S CASE

Sally, age 24 years has come for a visit with her fiancé, Brad. They are planning to get married in the next few months and want to discuss future pregnancies. Susan has been diabetic since age fourteen and although she had a rough time adjusting to her illness, she now follows her diet fairly well and checks her blood sugars once a week. She admits that maybe she should do it more often. She takes 30 units of NPH insulin in the morning and 22 units at suppertime. She uses regular insulin at times.

QUESTIONS TO PONDER: What special care might Sally need before and during pregnancy? What are the risks to the fetus and how can they be reduced? How can you introduce the option of delaying pregnancy until her blood sugar levels are controlled? How can you foster support from Brad?

DISCUSSION: *Recognition of preplanning as a strength is important. Exploring both their family histories for any genetic problems, diabetes or other family illness may be an important part of the discussion at this visit. Sally needs a review of her diabetes because of her rather high insulin dose and her fairly lax attention to her blood sugars. Any complication of diabetes should be investigated prior to proceeding to try to become pregnant. She needs to learn of the importance of tight control of her blood sugar before and during pregnancy and for the need for folic acid. She should be advised about a plan for prenatal care regarding obstetrical and medical consultations. She now may be willing to go to a diabetic clinic for retraining. Of course other issues related to HIV, HepB testing etc. should be discussed with them both as well. If Brad has come because he is motivated to encourage Sally and support her in her care, the positive outcome of a pregnancy will be enhanced for this couple.*

C. Prenatal

The goals of prenatal care are a healthy term infant and a healthy mother. Prenatal roles include antenatal care, prevention, risk detection, intervention to reduce risks and treatment of intercurrent problems. The Society of Obstetricians and Gynaecologists website provides valuable information about prenatal care: www.sogc.org.

Antenatal Visits and Records

–Forms such as the Ontario Antenatal Record can be very helpful aids in providing care if they reflect evidence based practice, are easy to use, comprehensive and updated to reflect current practice. The Ontario Antenatal Record is used almost universally (Beck et al., 2000; Schuurmans et al., 1998). See Appendix C for more information about the Antenatal Record.

–The Antenatal Record reminds the primary healthcare provider to follow the physical developments and concerns of the pregnancy and also to assess the psychosocial risks for the mother and the expected infant. If intervention is initiated prior to delivery for some problems, there is the potential to improve the outcome for the infant.

–The Antenatal Psychosocial Health Assessment (ALPHA) can supplement the enquiry. There is a provider version and a patient self report questionnaire. If psychosocial risks are present, extra supports and interventions can be sought ahead of time. The early neonatal period is a critical time for the infant-parent interaction. It is no longer reasonable to wait until problems arise and waste valuable time (Wilson et al., 1996). See Appendix B for more information about ALPHA.

–Involving the father as much as possible in prenatal visits and classes is associated with less anxiety and more involvement after the birth. Encouraging his active participation may facilitate his partner's recognition of his role and facilitate communication between partners during this period. Special prenatal classes or sessions for expectant fathers provide the opportunity to review and discuss common issues and unique perspectives (Watson et al., 1995).

–The prenatal period is the optimal time to promote prenatal education, and to review infant feeding plans, community supports and parenting adjustments with both partners.

–Prospective parents who need additional support would benefit from a referral to the Healthy Babies Healthy Children Program early in the pregnancy, particularly teen parents.

MARY AND CARL'S CASE:

Mary comes in for her first prenatal examination late in the first trimester of pregnancy with her husband Carl. This is Mary's first pregnancy and while it was unexpected, the couple appears delighted at the prospect of having a child. Everything appears routine except for an extended discussion around alcohol use. Mary and Carl indicate that they party with their friends on a weekly basis. When questioned about alcohol use, Mary mentions that she usually has 4 or 5 drinks at each social event. She also indicates that during the week she will have a drink or two in the evening to unwind. Mary wonders if this is OK, or if she should cut back. She also asks if it is OK to drink wine coolers since they are "mild drinks".

QUESTIONS TO PONDER: Is Mary's level of alcohol use a risk to the fetus? Are some types of alcohol safer than others? How can you provide accurate advice about the risks to the fetus, without raising undue fear in the couple?

DISCUSSION: *It is a priority to address Mary's current alcohol use and to assess the risks to the fetus. The healthcare provider should keep in mind that alcohol use may be under reported due to comfort levels or lack of knowledge about standard drink sizes. Mary could contact Motherisk for accurate personalized information about her risks. Mary and Carl will then need support in making decisions based on this information. Mary may also need support and advice during the process of addressing her alcohol use. Ask her how confident she is of her ability to stop drinking. Carl can play an important role in assisting and encouraging her through this process. Mary should be informed that the safest choice is not to drink any alcohol and that coolers are not "mild drinks".*

D. Perinatal

Maternal/ Family Assessment

Assessment of the mother-infant dyad begins at delivery and should be reviewed prior to discharge and within the first week after birth. These early encounters should provide time for exploration of problems and creation of solutions in areas such as breastfeeding, fatigue, family stresses, or worries about the baby's neonatal behaviour. Early strategies may prevent developing problems and enhance parental confidence.

–Review the mother's/parent's perception of the delivery and the infant. Does either parent have any concerns about the infant? If there are infant problems, what is the parent's understanding of the problem? Do they need help in coming to terms with the infant's difficulty?

–Review the progress of breastfeeding and respond to questions regarding care. Is a lactation consultant needed? Assistance with breastfeeding may help prevent premature cessation of breastfeeding. The support may also help allay depressive tendencies by aiding early maternal competence.

–Review mother's health and supports at home. Assess the resources that will foster a healthy interaction between mother/parents and the infant. This early period is a critical time. The presence of the father at labour and delivery as well as in discussions about the baby may improve bonding of the mother and infant (Wilson et al, 1996, Wilson et al, 2005).

In Ontario, Healthy Babies Healthy Children uses the Larson Prenatal Screening Tool during pregnancy and the Postpartum Screening Tool (Parkyn) following delivery. These tools are used with the mother's consent and can alert staff to risk factors for future problems including concerns related to the child, the mother, the labour or delivery, the bonding or the social situation. The screening tools can identify women who would benefit from an assessment by a public health nurse. For detailed information on these tools, see Appendices D and E.

Public Health nurses follow up with a postpartum phone call to all consenting mothers within 48 hours of discharge from the hospital. This call is an important marker of the need for further assessment and intervention/support. All mothers are offered an initial home visit. Ongoing visits may be offered if sufficient risk is indicated. Early intense visitation programs have been shown to decrease the incidence of child abuse, increase parental support and increase infant development measures (Shonkoff and Meisels, 2000). Referral to these programs can be made if concerns arise

after the initial postpartum period. Such programs are designed to help support the mother, encourage positive childcare and help both parents enjoy the infant. Ongoing communication between Healthy Babies Healthy Children staff and the family physician, obstetrician or pediatrician is important. Additional services can be accessed as needed. See Section 5 for more information about the Public Health Programs.

Neonatal Assessment

A detailed physical exam at each well baby visit in the first month of life including a neurological exam is very important in establishing a baseline of postnatal development. As described in Section 2, prematurity, illness or abnormality in the newborn can be risk factors inhibiting the early bonding process. Coupled with the presence of other risks, careful monitoring or intervention may be indicated. Public Health visitation as well as more frequent reviews by a physician could be important to support and/or detect the need for further help. See Appendix G for information on Neurological Examination of the Newborn.

SUSAN'S CASE:

Susan is two months old and in your office for the first time. She was discharged from hospital one week ago. She was born by Caesarean section at 33 weeks gestation. Her mother had an abruptio placenta in a twin pregnancy that precipitated the Caesarean section. Twin A was a stillbirth. Susan had a separate placenta but required resuscitation and intubation after birth. Within two days she was extubated. Her birth weight was 1250 grams. There were no other major complications during her stay and she was discharged at 2500 grams at seven weeks and was breastfeeding. Her hearing was screened in hospital and she has an appointment for followup with the Infant Hearing program audiologist. Susan's mother already has had a call and a visit from the public health nurse. Susan's mother understands that immunization starts at two months of age.

QUESTIONS TO PONDER: What further information or investigation would you pursue? What feelings or issues regarding Susan might her parents be facing? How might you go about addressing their concerns and discussing a plan for Susan's ongoing care? What services and support systems might be available in your community to assist Susan and her family?

DISCUSSION: *At this visit, the family doctor needs to be sure that all the records regarding Susan are obtained and a clear picture of the follow up recommendations and plan from the neonatal unit is forthcoming. A thorough physical and neurological examination is needed for a base line knowledge of Susan. Some discussion with the parents regarding their understanding of the problem and their present comfort level caring for Susan is appropriate now. Exploring the stress of the difficult beginning for Susan and the loss of the other twin may help to bring out any depressive or anxious symptoms as well as provide support. Both parents should be encouraged to attend visits as much as possible. The normal Well Baby Visit plans and immunizations as well as modifications to accommodate Susan may be discussed. The importance of attending the audiology assessment should be stressed because of the importance of identifying hearing loss as soon as possible. Support for the role of Healthy Babies Healthy Children is warranted so that parents understand how this program can assist in obtaining optimal care for Susan through further early intervention, assessment and guidance. After the visit, communication with Healthy Babies Healthy Children and other professionals will be important to be sure that Susan's care is well coordinated. If Susan is found to have a hearing loss, a referral for medical investigation will be made. The family doctor should expedite the process so Susan can receive all of the Infant Hearing Services as soon as possible. A referral to the Infant Development Program for early intervention is also warranted as Susan is at high risk for developmental delays. Susan is at risk for early childhood hearing loss, even if her hearing is normal now. She will be followed by the Infant Hearing Program, but should also be monitored at visits for signs of hearing loss. The parents may also benefit from support for dealing with their grief through local bereavement services.*

E. Infant/Child Health Surveillance Using the Rourke Record

After the baby goes home, in most situations, ongoing care continues at regular infant visits and as deemed necessary. These visits usually are frequent in the first months and gradually spaced farther apart as infant development proceeds. Because of the scope and depth of the issues to be addressed at these surveillance visits, a systematic approach is needed for efficiency and comprehensiveness. The Rourke Record provides both age appropriate screening reminders as well as a convenient record for charting early child development.

During the early visits particular attention needs to be paid to the infant-parent-family adjustment. A family check as well as an infant check is vital. Specifically inviting fathers to attend well baby visits and parent groups may give added incentive. Support groups for new fathers are available in some communities and have been deemed helpful by participants.

Process of Infant Health Visit – This Follows the Rourke Record

Goals of the Infant Health Visit:
–Address parental concerns
–Monitor physical growth and development
–Assess parent-child interactions and family health
–Counsel about development, safety, nutrition and community resources
–Encourage parents
–Provide immunization and other preventive care
–Identify risks/problems for action

–***Parent's Concerns:*** Parents should be specifically asked about their concerns about their children and these concerns need to be taken seriously. Common parent concerns relate to sleeping and nutrition. Parental concerns related to developmental problems have been shown to be accurate. It is also clear that unless the parental concerns are addressed, other information or guidance may not be heard. If the background of parent's questions or problems is probed carefully, more information about the infant, family problems or parental stresses may be gleaned. Such discussions can help in understanding family values, parental expectations and cultural issues. This information will be helpful in addressing the parent's real concerns and in tailoring other information and advice to the family situation.

While asking parents about their concerns encourages parents to discuss the issues that they are finding difficult, parents are not necessarily aware of a wider range of issues that may apply to their child. Parents are usually the best and most reliable sources of information regarding their child's development.

Parent questionnaires or screening tools regarding their child's development and behaviour can assist parents in reviewing their child's progress. Such questionnaires can be quite precise in asking about specific behaviours and tasks and can help parents to clarify difficulties in each developmental area. Using such tools to screen all children for difficulties is shown to be more reliable than relying only on clinical judgement. In addition, they are not reliant on the cooperation of a child who is tired, afraid or ill and can be filled out when the parent has time to focus on the questions (Glascoe, 2000). They can help identify areas for further evaluation by the primary care professional.

One such parent tool is the Nipissing District Developmental Screen™. This screen provides the basis of the developmental screening portion of the Rourke Record and is described in detail in the next section on monitoring growth and development.

The Rourke Record:
–Addresses parental concerns
–Provides evidence-based guidelines and record
–Covers birth to age six
–Incorporates developmental screening - "red flags"
–Serves as a reminder of age appropriate issues to cover in enquiry and advice
–Is easy to use
–Will soon be computerized

The Rourke Baby Record is used to document preventative infant care. Developed originally the mid 80's, the most recent revision was made in 2006. It incorporates the most current evidence based recommendations for infant/ child health surveillance. It can function as an aide-memoire to foster efficient, comprehensive well baby/child care. As such it is an ideal teaching tool as well a clinical record. To date it has been

widely adopted by primary health care professionals (family physicians, nurse practitioners). See Appendix H for the Rourke Baby Record 2006 (available in English and French).

The Healthy ABC's, a health maintenance guide for Well Baby Visits, was developed at the University of Montreal. It is similar to the Rourke Record and has been used in the province of Quebec since 1997. This tool is available in English and has undergone recent revisions.

–***Monitoring Growth and Development:*** Recommended physical screening procedures for specific ages are included in the Rourke Record. Developmental screening can be done through interview or by having the parent check the developmental screening tool (Nipissing) prior to the examination and then reviewing their responses during the examination. The goal is to review all the areas of development:
  –Physical – including height and weight
  –Vision (see www.cps.ca/english/statements/CP/cp98-01.htm for vision screening tools)
  –Hearing (Universal Newborn Hearing Screening is provided through the Infant Hearing Program, but physicians should continue to monitor for hearing loss later on in life)
  –Motor – gross and fine
  –Communication – including speech and language (See Appendix K for more information)
  –Cognitive – e.g. looking for a dropped object, naming colours
  –Socio-emotional – e.g. smiling, eye contact, pointing (see Appendix J and K for more information)

–***Nipissing District Developmental Screen™:*** The Nipissing District Developmental Screen™ is a series of age appropriate developmental checklists (13 different age levels) designed for use by parents with children between the ages of 1 month and six years. The questions cover seven areas of development: vision, hearing, speech-language, gross motor, fine motor, cognitive and self-help skills. Evidence-based indicators for autism have been incorporated into the screen. It is sensitive to the varying cultural values in child-rearing and allows for alternate experiences. The skills in each screen are expected to be mastered by most children by the age shown. Recent validation **testing indicates that two NO's on the screen are significant for further action**, including continued attentive surveillance, health teaching and/or referral for assessment (ARC, 2002). A "wait and see" approach only further delays appropriate intervention. The forms can be filled out by parents in the waiting room or can be sent home with parents to be completed for the next visit. The Nipissing can also provide a conversation template to highlight ways to provide quality experiences that can support development either in the home or in childcare situations as it includes suggested activities designed to encourage a child's overall development at specific ages. See Appendix I for more information about the Nipissing District Developmental Screen™ or http://www.ndds.ca/Pages/evaluation.html.

It is important to be aware of "red flags" that may indicate risk for developmental problems. For more information on developmental monitoring see Appendix J. For an additional case of an older child with developmental delays, see Appendix O.

–***Enhanced 18 Month Well Baby Visit (Rourke 2006):*** An "enhanced" eighteen month well baby visit is a critical and timely strategy for helping parents and caregivers to identify children who may not be meeting developmental milestones, and to take steps to help them with developmental skills they will need when they enter school. In Ontario, the enhanced 18 Month Well Baby Visit refers to:
  –a consistent, focused, developmental review and evaluation at 18 months of age completed by the primary health care provider (usually a family physican or nurse practitioner), in collaboration with parents.
  –use of standardized tools. These tools include a parent tool, the Nipissing District Developmental Screen™ (NDDS) and a professional tool, the revised Rourke Baby Record (RBR).
  –a process to support discussion with parents on healthy child development, providing information on parenting and community programs that promote healthy child development and early learning and when needed, provide referrals to specialized community services for those children identified with potential issues, needs and risks.

MARTIN'S CASE

Martin is in for his six month checkup and his mother mentions that other members of the family are concerned. He is a cheery responsive baby but he does not sit up alone and still seems to have trouble holding up his head. He feels like a "sack of potatoes" when you pick him up. He is beginning to coo and imitate sounds and reach to grasp things. On reviewing his history you have noted that he was full term and with normal apgars. His mother was treated for hyperthyroidism during her pregnancy. He has tended to be a floppy baby and was delayed in holding his head up well. Otherwise there were no concerns.

QUESTIONS TO PONDER: What would be your approach to this developmental delay? What specific concerns might you have regarding the infant? What further investigation would you pursue? What referrals or interventions would you instigate?

DISCUSSION: *Martin is lagging in motor development and has persistent hypotonia. Further inquiry into family history for developmental problems is needed. A number of genetic problems may need to be considered. You learn that there is no specific family history except that his father, a lawyer, did not walk until 16 months. A neurological assessment and planning for further developmental assessment would be warranted. A full workup for the causes of this child's motor delay is important. Education for the parents and referral for early intervention can be initiated in the meantime. Some inquiry into daily care and stimulation opportunities for Martin may be useful. In addition to assessment, early intervention in the form of physiotherapy (accessed through Infant Development Programs) could be taught to Martin's caregivers to stimulate his muscle development. A careful follow up plan is important to monitor his progress.*

–***Assessing Parent-Child Interactions***

- –*Observation:* How comfortable does the parent seem to be with the child? If upset, how easily does the infant settle? Observing the mother feeding can be helpful. Is the parent responsive to the infant? Is the infant difficult to handle? The nursing and other staff may provide valuable information from their encounters with the parent and child. How does the mother appear? Does she look excessively tired? Tearfulness is frequently a sign of postpartum depression.
- –*Expectations:* A gentle exploration of the parent's expectations of the young child, parenting and "how things are going" may facilitate the discussion of problems. Mothers may have a difficult time admitting negative feelings about the parenting experience. Excessive concern about the baby may also be an indicator of depression. Comfort with caring for the baby can also be checked.
- –*Support systems:* How is the mother caring for herself? Is she eating and sleeping well? How is the family adjusting to the baby? How are the partner and other members involved? Are there outside supports? Are there other family stressors?
- –*Parental Mood:* Indicate that there are often difficult feelings around this transition time. Direct questions about depressive symptoms including suicidal ideation are important if the mother's mood is affected.
- –*Siblings:* Discussing other children and their reactions to the infant is also an important part of looking at the family system.

Postpartum psychiatric disorders are important problems to identify during the early neonatal period. It can be difficult because the early signs of fatigue and insomnia are hard to distinguish from the normal effects of caring for a neonate. A new mother may find it difficult to admit to her feelings and thoughts or may under report her depressive symptoms due to shame, fear or confusion.

Some preventative tactics include targeting women who are at risk and educating woman in advance to monitor themselves for symptoms. Women can be educated about the early signs of postpartum depression and what they should do if they have any symptoms. However it may still be difficult for women to recognize the symptoms. Over-concern for the child may be a sign to consider. Ask women about their mood, coping ability, family supports, eating, sleeping and getting out. Problems in these areas warrant further investigation. It is not usual in the postpartum period to

BRIAN'S CASE

Brian is in with his mother for his 2 month well baby visit. Mother states that she stopped breastfeeding two weeks ago because she is arranging to go back to her office manager job much earlier than she originally planned and because she did not feel that the breastfeeding was going well. Brian's examination is normal and he looks well cared for. Upon further assessment of the mother it is learned that she is finding it hard to be at home. She misses the contacts at work. Her husband works long hours and has little time for her or the baby. She has no contact with her family. Her parents live in another city; her mother has had some mental health problems and her father is an alcoholic. She is alone, isn't enjoying the mothering experience and feels that a babysitter could look after the baby better. The baby is easygoing and content to sit in the swing most of the time.

QUESTIONS TO PONDER: Do you have any specific concerns this situation? Is a return to work likely to provide an adequate solution to this mother's problem? Do you have any concerns for the infant? Are there any "red flags" in the situation to pursue? What further steps will you plan at this visit?

DISCUSSION: *There are a number of concerns in this situation. The mother isn't happy and the baby may not be getting much positive interaction with his mother both because of his temperament and his mother's mood. There is the need to question the mother regarding depressive symptoms including thoughts of self-harm or negative thoughts regarding the baby or her care of the baby. If these symptoms are severe, then urgent measures may be needed to address a postpartum depressive/psychotic problem, including emergency psychiatric intervention. If the father is out of town and no reliable family members are available, then consideration for calling child protection services may be necessary to ensure the safety of the infant. If the symptoms are less severe, then a complete assessment of the mother's physical and emotional status is warranted as soon as possible. Her partner ideally should be included in this assessment. Together with the patient and her partner, further treatment decisions including assessment regarding the need for antidepressant medication and psychotherapy will be important. A referral to Healthy Babies Healthy Children and early parent programs may help mom to get some outside support immediately and some ideas as to how to engage with the baby. Involving the father may help him recognize the important role he can play for the baby and his wife. Some communities may have a fathers' program to aid this process. If she continues her plan to return to work, then some guidance in choosing adequate childcare may be important.*

have consistent difficulty getting back to sleep after the baby has settled. More common "postpartum blues" should pass in the first 2 weeks. Be on the lookout for feelings of confusion and for thoughts regarding harm to the baby. Involvement of patient and family is most important in planning treatment of depression, and attention to attachment issues for the baby (Chokka, 2002a; Chokka, 2002b; Yonkers and Steiner, 1999).

–***Counseling Parents***

Counsel parents about:
–Development – anticipatory guidance
–Parenting concerns
–Safety
–Nutrition
–Community resources

Parents need information around all of these issues. For many topics it is useful to have printed information to review with parents so they can read it again at home.

–It is important to have information about local parent support resources. Parental supports can improve parenting skills and improve outcomes for children. Know what is available in your community, including parenting programs, and where parents can call for suppport, information or recorded messages about common parenting concerns.

–Encourage parents to enjoy their children, to watch their development, and to play, talk, read and sing with them. Parents can be encouraged to recognize that the baby can give them cues as to what he/she is ready to do.

JOANNE'S CASE:

Joanne is 1 year old and comes in with her mother for a regular check up and to have her 12 month shot. The Nipissing Screen indicates that Joanne has met all her milestones and in a few cases, exceeded them. The Rourke Record does not indicate any concerns. Joanne is growing well, seems content, interested and healthy. She responds to her mother's requests and uses a few words while in the office. She is not quite walking on her own, but pulls to a stand and moves around, steadying herself on the furniture. When Joanne is given her shot, she whimpers a bit, but is quickly comforted by her mother. Mom indicates that she started back to work on a part-time basis 3 weeks ago. Childcare has been arranged with Joanne's grandmother.

QUESTIONS TO PONDER: Do you have any concerns for this child? Is the visit over, or is there further information that you could provide? Are there any ways you can support early neurodevelopment?

DISCUSSION: *Joanne appears to be a healthy, happy child who is developing well. With no health concerns to act on, it may appear that there is no reason to continue the appointment. However, the early years are a period of rapid neurodevelopment. Advice and information should be given to all parents, not just the parents of children with medical concerns or developmental delays. Joanne is at an age where physical and social skills are developing rapidly. Suggest ways that the parents and the grandmother can increase stimulation and interaction with other children. This family could be linked with programs such as an Ontario Early Years Centre, that include drop in services, parent support and activities for children. Grandma could use the program to meet other parents and caregivers and to provide additional opportunities for Joanne. Ask Mom how the return to work is going and suggest that she inquire about parent groups that might meet at hours that accommodate her work schedule. Because of Joanne's increasing mobility and interest in her surroundings, you may also want to provide information for the family and grandmother on general safety and child proofing measures. You can also ensure that the grandmother has the number of the doctor's office so she can call if she has any questions or concerns. An information sheet about the 12 month shot should be given to the mother, as well as information about the upcoming 18 month needle. The healthcare provider could also encourage the mother to involve the father and/or the grandmother at her next visit.*

–Monitor psychosocial issues experienced by parents, including changes in the relationship. Parents may benefit from referrals and support. Marital satisfaction can drop between six and eighteen months for the mother and after eighteen months for the father. An infant with difficulties may aggravate this trend. Some studies find that 15% to 20% of couples are separated or divorced by the time the first child is four years old (Watson et al., 1995).

–Advice on optimizing development can be given for all children, even those that may be advanced or developing typically. Every child can profit from early educational experiences and all parents can benefit from participation in parenting supports that enhance parenting skills. Parents should be encouraged to use community resources such as:

  –Ontario Early Years Centres
  –Parenting groups
  –Books, tapes, phone lines, websites
  –Play groups
  –Library programs
  –Toy lending programs
  –Healthy Babies Healthy Children

–***Encouraging Parents:*** Parents need encouragement in their job. Recognizing positive interactions and positive aspects of their infants is appreciated and supportive. They also need understanding regarding the difficult aspects of parenting. Building up the parent's confidence to care for the child is known to improve their parenting.

–*Providing Immunization*

Recommended immunizations include:
–Pertussis (acellular), Diphtheria, Polio, Tetanus vaccine (aPDT)
–Haemophilus influenza B vaccine (HIB)
–Measles, Mumps, Rubella vaccine (MMR)
–Varicella vaccine
–Hepatitis B vaccine if indicated
–Pneumococcus, Meningococcus

–The schedule of immunization for each child should follow the most current public health recommendations. The (2006) Rourke record edition provides a separate immunization record sheet.

–Please note that providing immunization also means providing information about vaccines. When counselling parents it is important to give information about the risks and side effects of the vaccines as well as the benefits of preventing the diseases.

–Pneumococcus streptococci, varicella and meningococcal vaccines have been added to the Ontario provincial immunization plan as of January 2005. Specific recommendations and availability information can be obtained from the local public health department as for other vaccines.

–Parents must be informed about the risk of not having their child vaccinated.

–***Identifying Risks and Problems:*** When problems are detected, the help of other professionals, agencies and groups may be needed to assess and provide specific interventions. Access to different services can be confusing for parents. In Ontario, many regions have central numbers that provide information to help find appropriate services. The Public Health department is always a good place to enquire regarding regional children's services. See Section 5 for information about other services.

See Appendix N for information on the 18 Month Visit and a suggested flowchart for evaluation and management of specific types of developmental delay

Identified risks or problems:
–Failure to thrive
–Developmental delays/behaviour problems
–Attachment problems
–Family, social problems including abuse, neglect, deprivation
–Hearing loss
–Vision problems

In the past, there has been a tendency to take a "wait and see" attitude toward some developmental problems rather than look for early interventions. In view of the new understanding about brain development, physicians and other primary healthcare providers will need to be more proactive in instigating interventions. Referrals and intervention can be started even before diagnosis, as parent education can often help the situation. For example, a referral to the Infant Development Program can occur before the cause of the delay has been determined. Suggestions for interim action on the part of parents while waiting for a visit often can be obtained from the service. For some specialized assessments, a long waiting period may be the reality. This fact makes a proactive response all the more important.

See Section 5 for more information about some of these services:

–Pediatric Services (Developmental or other)
–Healthy Babies Healthy Children (Public Health Early Childhood Services)
–Infant Developmental Program (IDP)
–Ontario Early Years Centres
–Preschool Speech and Language Program
–Infant Hearing Program
–Physiotherapy and occupational therapy – may be accessed through IDP
–Family and Children's Services (FACS)
–Community Care Programs
–Women's Shelters and programs
–Autism Intervention Services
–Many local services such as nursery schools and toy lending programs that may also help children and parents

MICHAEL'S CASE:

Michael is in for his 18 month checkup. His father indicates that he is a little concerned because he thinks that Michael isn't doing as much as he used to do. Michael is using fewer words than he did a few months ago. The father assumes that it is related to the birth of their second child two months ago. The mother indicates that she is also concerned, but she has been very busy with the new baby. However, in filling out the Nipissing District Developmental Screen™, the parents note that a number of other issues may be important. Michael does not bring things to show his parents and uses few gestures to communicate. The parents have trouble getting Michael to look at them. Tantrums are frequent if Michael is interrupted in his activity.

QUESTIONS TO PONDER: Could the change in Michael's behaviour be due to the arrival of the new baby? Is this degree of regression typical of older siblings? Do you have any concerns about Michael? Would you address them now or would you wait until you see Michael at the next regular checkup at age 2? What do you do next?

DISCUSSION: *Regression is always important. While minor behavioural changes can occur with the birth of a new baby, a thorough evaluation is required before reassuring the parents. A review of family, prenatal and developmental history is indicated along with a physical and neurological examination. Hearing tests and referral to Preschool Speech and Language may be initiated while awaiting specialist consultation (developmental pediatrics-autism spectrum disorder needs to be considered). Early intervention could be enlisted now through an Infant Development Program. This home-based program will give the parents support as well as suggestions to help them start some strategies to engage Michael. In the meantime, suggestions on the Nipissing activity side and visiting a parent-child program such as an Ontario Early Years Centre may also provide support and other stimulation for Michael. Michael and his parents should be seen again soon to review his progress, the assessment process and the family's coping with the situation. If Michael is diagnosed with Autism Spectrum Disorder, referrals for the new baby to Public Health and Ontario Early Years may also improve the odds and prevent delay in the younger sibling (see Appendix L).*

F. Early Intervention

Early Action for Delays/Risks/Behaviour Issues

Early action for concerns can involve:
–An in depth family assessment
–Further assessment/monitoring
–Early infant/child intervention programs
–Speech and language referral
–Referral to paediatrician and/or developmental paediatrician
–Audiology referral
–Ontario Early Years Centre
–Informal play groups etc.

–It may take time to determine the basis of delays; however by acting early, it may be possible to help parents adapt their pattern of interacting with the child. This intervention may help the child, even before a specific diagnosis has been made.

–Healthy Babies Healthy Children can help connect families to appropriate early intervention (i.e. home visiting).

–If families are not involved in playing or reading with their children, then suggestions regarding these activities may help while waiting for referrals, which often take some time. Referral to nursery school, library, play groups or a parent-child program may also help.

–These early measures may prove to be all the interventions that are needed for some children and can be instigated while waiting for further consultations to occur.

–Have printed suggestions to give parents available in the office. Websites, infant development programs and public health can provide suggestions or materials.

–Communication and social development are areas where primary healthcare professionals may be reluctant to label a child prematurely. In the past physicians especially have tended to take a "wait and see" approach. However there is

increasing evidence that delays of language and socialization are important and can be detected earlier than expected in the past. More importantly, there is solid evidence that early intervention can make a difference and can alleviate some common secondary problems. Parents can be educated regarding this approach.

–Even mild forms of Autism Spectrum Disorder may be detected by eighteen months. Clues are delays in communication skills such as eye contact, response to name, joint attention, pointing to share interest and language delay. Failure to develop social skills such as pretend play or showing something of interest may be early signs. Regression in these skills at any time is also cause for concern. It is important for primary healthcare providers to become more aware of the developing skills of communication, language and social behaviour. Some physicians and primary healthcare providers may be willing to do further investigations themselves. The CHAT (Checklist for Autism in Toddlers) is a screening tool for toddlers, eighteen months old that can be done in the office and is fairly simple to complete. However, it is not a diagnostic tool (Baron-Cohen et al., 2000; Ho, 2001; Kagan-Kushnir and Zwaigenbaum, 2001). See Appendices L and M for more information on Autism Spectrum Disorder and CHAT.

–Behavioural problems also warrant early referral. Children with Oppositional Behaviour and Attention Deficit problems often have preceding histories of being difficult toddlers. Parents may benefit from early help to develop firm, calm but nurturing approaches to the behaviour. This may abort the escalation of problems and help prepare these children for school. Unfortunately these issues are not often addressed before school. Lack of a specific diagnosis does not preclude intervention and supplementing parenting skills.

BRITTANY'S CASE:

Brittany, age three, has come in with her mother to have stitches removed. The emergency department had stitched a small cut on her knee after she fell when running on the ice. This family is new to the community and this is their first visit to your office. After removing the stitches, you ask basic questions regarding Brittany's past health and immunization record. You notice that Brittany is running around the room looking into everything. She is interrupting constantly during the discussion. Brittany is offered toys but she just scatters them and does not play with them. Brittany's mother comments that she is often frustrated by Brittany's behaviour.

QUESTIONS TO PONDER: Would you do anything at this point or just be glad when they leave? What issues might you want to pursue in the future regarding this child and her family situation?

DISCUSSION: *Plan a follow up well child checkup (initial assessment and 3 year checkup) to review Brittany's behaviour and development and to indicate your concerns to Brittany's mother. Give the mother the Nipissing screen for 3 year olds to complete before the next visit. At the next visit it will be important to learn more about the family constellation and interaction. It may be useful to identify Brittany as challenging (as opposed to the mother lacking parenting skills) and explore mother's experience with the child. If she is finding Brittany difficult to manage, then being supportive and helping her connect with added resources may be well received. It would be important to suggest that routines and rules might help to prepare Brittany for school and to learn to focus on a task. Early educational opportunities such as Ontario Early Years Centres, nursery school or other peer programs could be suggested. Brittany would benefit from some structured programming and Mom may learn from other mothers. Parenting training may help Mom to add more structure and learn ways to gain Brittany's attention and cooperation, in addition to providing some support for herself. An exploration of the pregnancy history (any illness, alcohol or drug use), family history (psychiatric illness, learning disabilities, Attention Deficit Hyperactivity Disorder), Brittany's past history of injuries (any fractures or unusual injuries) and whether any psychosocial risks are present (domestic violence) is important. If you suspect abuse or dangerous substance use, child protection services must be informed.*

ALICIA'S CASE:

Alicia is in for her two-year old checkup with her parents. Her mother expresses concern that she is not talking as well as the other children in the play group, who are stringing words together. Although Alicia has about twenty words that the family deciphers, they are not clear. She uses lots of gestures and grunts to make her needs known and is very interactive with parents and peers. When not understood, she has tantrum behaviour, which is frustrating to her parents. They feel she understands well but cannot get out what she wants to say. The parents also noticed that their nine-month old daughter is already babbling, mimicking and making sounds, something Alicia did not do although her birth history and other milestones were normal. Alicia's father thinks that she is just a late talker as he was, but wanted to be sure that there was not a problem.

QUESTIONS TO PONDER: If "late talking" is a family characteristic, does it need to be addressed? Or will it resolve in time without intervention? What plan of action might you pursue?

DISCUSSION: *Audiological testing confirmed Alicia's hearing was normal and referral was made to the Preschool Speech and Language Program. All areas of communication were assessed by a speech language pathologist, including language comprehension and expression, nonverbal communication and speech production. Assessment indicated that Alicia seemed to have a specific speech production disorder (possibly Developmental Apraxia of Speech). Although she seemed to have no other problems related to oral musculature (i.e. no drooling or feeding problems, etc.), further neurological testing may be indicated to rule out specific neurological problems. Referral to appropriate pediatric specialist (developmental, neurological) should be made. The speech language pathologist will involve the parents in therapy, teaching them to support her speech development through play and everyday routines. Parenting training may be recommended to help parents better understand and cope with Alicia's communication problem, such as dealing with her tantrums of frustration. Individual or group treatment may also be recommended. Early intervention with speech and language problems is most important; in fact, it's never too early to start. The family may benefit from participation in a parent-child program, and this may stimulate the speech development of the younger sister as well.*

Early Intervention for Children with Specific Disabilities

There is growing evidence that early intervention has a positive effect on development for children under the age of three who have disabilities (Shonkoff and Meisels, 2000). Effective programs include both parents and children. Specific structured programs work the best. Parents can become trained in special techniques to help their children. Research is limited, needed and ongoing.

One example of new research in this area is the Early Development Instrument (EDI) which is a measure of children's early development at school entry. This instrument is administered in the second half of the senior kindergarten year of school. This is a population-based measure that reflects the impact of community services such as preschool play programs on the children's "readiness to learn". The EDI can be integrated with other health and developmental indicators to measure the impact of new programs on the community.

Collaboration and partnership between families and a broad network of professionals (from education, social services and health care) is important for all children. When children have specific disabilities, there is a need for smooth transition between the preschool years to the education system. When special assistance or therapy is required, it is hoped there will not be any disruption of required support services and programs. Liaison work involving reciprocal sharing of information will identify students' needs prior to the start of the school year. Families will need to be supported as they become familiar with school requirements. Individual teachers and school administrators are encouraged to take a proactive role in developing good relationships with parents. Healthcare professionals in the community are encouraged to support and build on such strategies with local school boards.

G. Special Needs

Children with Special Needs and their Families

A major concern for children with special needs and their families is secondary problems that put the child and family at further risk. Therefore, there are still preventative interventions as well as treatment interventions to consider for these situations (OCFP, 2000).

Children with special needs may require:
–Ongoing monitoring, collaboration and case management
–Intervention for psychosocial concerns
–Encouragement
–Resources
–Advocacy

–Because these families may need the help of several different services, no one service may keep the whole picture of the child and family in view. Collaboration and communication between the professionals and agencies involved is essential for the child/family. It is important to review the total picture on a regular basis and to determine if the needs of the whole family are being considered. Service coordination meetings including all professionals and the family are an important mechanism to identify specific roles, to review progress and future plans, to reduce duplication of service and to ensure that all necessary services are in place.

–Wraparound Care is a new style of service coordination for families who have complex care needs and are involved with multiple service providers. Informal providers (i.e. faith community, neighbours, friends and cultural groups) can be integrated into the long term treatment plan alongside the therapists and social workers involved in the case. A Wraparound facilitator works with the community service providers and informal supports to help meet the needs of the family. The family is encouraged to be part of the planning process and to take an active role in learning to coordinate their own treatment teams. This process can help empower parents and often reduces the confusion that can develop with poor communication between different agencies.

–If the family is overwhelmed, the child too is at further risk. These families need encouragement for the efforts they are making. It may be difficult to see their efforts in a positive light when problems are ongoing. The need for recognition and support is real.

–With the stress of caring for a child with special needs, the use of respite services may provide a parent with relief. Parents may need encouragement to seek or use respite services.

–The family of a child with special needs has many stresses that can affect the immediate and extended family. The burden of care can be heavy and may lead to isolation, depression, relationship problems, sibling problems, etc. It is important to assess the needs of the whole family. Children with special needs may require periods of separation from caregivers due to hospitalization. Parents may need to be at home with their other children. While this often cannot be avoided, care should be taken to ensure that when the caregiver is present, they are well supported by healthcare professionals in their efforts to nurture their children with special needs.

–Siblings often end up assisting with care giving, carrying more responsibility and receiving less care themselves. The outcomes of this responsibility can be positive but there are risks for these siblings. Their own needs may not be met and they may not have optimum stimulation for growth and development.

–Social isolation is a risk because of care requirements. Special training is needed for anyone staying with the child, so therefore disabilities may limit the socialization opportunities for the family.

–Parents are at risk for medical as well as psychological illness because of inadequate sleep, poor nutrition and inadequate self-care.

–Physical and financial needs are often increased. Parental ability to work may be hampered by the child's care, etc. Anticipate needs, ask families and know where to look for help.

–Unfortunately children with special needs are at particular risk for abuse and neglect, often because of the extra family burdens. Health professionals need to be alert to this possibility and to act proactively. Sometimes a positively planned approach with child protection services for temporary foster services may provide a much needed break for parents and families. This process would be preferable to an emergency situation.

–Completing forms, making calls and supporting a family may be part of an advocacy function.

–The Association for Community Living, Public Health or a social worker from the Community Care Access Centre (CCAC) can be consulted about financial resources and strategies that may be available for families. For additional resources and services, see page 51 as well as Appendix Q.

–Once parents become more knowledgeable, they can become advocates for their children and the children of other parents.

Key Points – Improving the Odds

-Look for opportunities to reduce risks and offer enhancement of neurodevelopment for all children.

-Assess for factors that may pose risks to child neurodevelopment and for developmental delays.

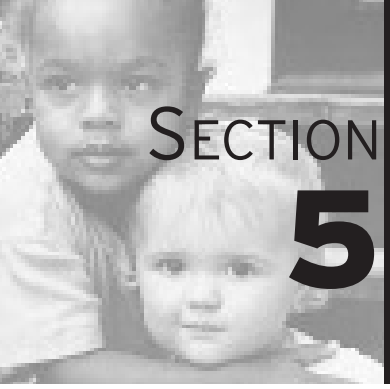
-Do not take a "wait and see attitude"!

-Be proactive by informing parents, initiating further investigation, providing referrals and continuing to monitor both child and family.

-Learn about supports available in your community.

-Incorporate a plan to encourage all parents to seek training and support for their task.

-Stress the importance of early childhood educational experiences for all children.



SECTION 5 WORKING TOGETHER – Interdisciplinary Teams

Introduction

A wide range of provincial programs and services have a profound influence on healthy child development and the early years in Ontario. Family physicians and other primary healthcare providers offer valuable contributions to the health of children and families. However, they are not able to meet all needs or address all concerns. Knowledge of available programs and services can help primary healthcare providers support families. Some programs and services such as Ontario Early Years Centres may benefit all families. Others, related to developmental, mental health or speech issues such as Infant Development Programs, Children's Mental Health Programs or Preschool Speech and Language, are designed for children with special needs or concerns. Public Health programs, such as Healthy Babies Healthy Children, deliver important services for families, including the postnatal screen, the postpartum phone call, home visits and linking families to needed services. In addition through Ontario's Best Start strategy every community in Ontario has formed a Best Start network that is working toward bringing services together in a comprehensive, flexible, integrated and seamless way so children and parents can access them at familiar neighbourhood locations. Physicians and other providers are encouraged to link with their local Best Start network and support the planning and development of the comprehensive services for families; and to understand how their services fit within the broader system of supports and service for families.

A. Public Health Programs

In Ontario, public health programs obtain their legal authority from the Health Protection and Promotion Act. The *Mandatory Health Programs and Services Guidelines* lay out the minimum requirements to be provided by boards of health through public health units. The promotion of healthy child development is a fundamental service of Public Health departments across the province. Public Health programs provide a continuum of care for all age groups, from preconception to the end of adolescence. Strategies include disease prevention, health promotion and health protection. The Reproductive Health and Child Health mandates use population health approaches to promote preconception health, healthy pregnancies, proper nutrition, healthy child development and parenting. Multiple health promotion strategies include: increasing awareness through media campaigns and workshops, promoting healthy child and family public policy, building coalitions, and providing small group interventions such as prenatal and parenting classes.

Prenatal and early childhood experiences have a profound effect on health and well being in later life. The Family Health Program is directed at children, youth, parents, caregivers and people in their reproductive years who are making choices about future family life. The program is intended to protect and promote the health of families, prevent disease and assist in the attainment of an optimal level of health.

The components of the program are Sexual Health, Reproductive Health and Child Health. The primary focus of Sexual Health is on the establishment of healthy sexual relationships and personal responsibility. The focus of Reproductive Health is on planning for a healthy pregnancy and promoting healthy behaviours and environments before and during pregnancy. Child health is focussed on promoting healthy development through parenting practices and supportive environments. Many health and social service providers work collaboratively to implement public health programming. For more information, contact your local public health unit at http:// www.health.gov.on.ca/english/public/contact/phu/phuloc_mn.html

Children In Need Of Treatment (CINOT) Dental Program

The Children In Need Of Treatment (CINOT) dental treatment program is part of the Child Health Program. The objective of CINOT is to provide a basic level of dental care to children, from birth to Grade 8 or their 14th birthday (whichever is later), who have identified dental conditions requiring urgent care. Children are eligible for this program if they have no dental insurance or other form of coverage (e.g., Ontario Works, Ontario Disability Support Program, Federal Government coverage for refugee claimants, etc.) and the parent/guardian has signed a written declaration that the cost of the necessary dental treatment would result in financial hardship. NB: Parents may be asked to prove financial hardship.

To determine if a child is eligible for CINOT call the health unit, in the area where the child lives, to arrange for a dental screening. Health units will offer a screening appointment within five working days of your call. All children identified as CINOT-eligible are tracked to ensure they receive the needed care. If they do not receive the care, health unit staff will refer the child to the local Children's Aid Society for suspected (dental) neglect. Preventive dental services, including topical fluoride application and fissure sealants, will also be offered to children who would benefit from these services.

When a child is identified as CINOT eligible, health unit staff makes inquiries regarding younger siblings and other family needs. Appropriate referrals to health unit programs (e.g., to the Healthy Babies Healthy Children program, pre-natal classes, parenting classes, counseling, immunization, etc.) or other community programs are facilitated.

B. Healthy Babies Healthy Children Program

Healthy Babies Healthy Children is a prevention/early intervention initiative designed to help families promote healthy child development and help their children achieve their full potential. Introduced in 1998 by the Ontario Government, Healthy Babies Healthy Children is an integrated program of the Ministry of Children and Youth Services.

Healthy Babies Healthy Children is about healthy child development. Early childhood experiences make a critical and long-term difference in children's development, and in their health and well-being during childhood and as adults (Hertzmann and Keating, 1999). Each year in Ontario, babies are born into families where a number of factors affect their ability to achieve their full physical, mental and emotional potential.

A child's ability to develop to his or her full potential is affected by a broad range of economic, psychosocial, behaviourial, and lifestyle factors. Healthy Babies Healthy Children focuses on behavioral and lifestyle issues, by providing parenting skills and support. In addition, all Boards of Health manage Healthy Babies Healthy Children and are actively involved in advocating for the full range of social, housing, education, mental health and other services required to promote healthy child development. The involvement of the Ministry of Children and Youth Services in Healthy Babies Healthy Children helps link the program with other services, which can address broader psychosocial issues. Healthy Babies Healthy Children offers all families in Ontario: screening services for children from prenatal to age 6, postpartum support services, and information about resources in the community.

Healthy Babies Healthy Children was originally intended only to serve families at "high risk", but in 1999 it evolved into a program that offers both universal services (i.e., services available to all families in Ontario) and targeted services (i.e., services available to families who meet certain criteria). The program offers families at risk more detailed assessment services and referrals to community services. The program offers families at high risk home visiting services, service co-ordination, referrals and other supports.

The program is designed to:

- –Give children a healthy start in life
- –Provide more intensive services and supports for families with children who may not reach their full potential (i.e. at high risk).

Program components include:

- –***Larson Prenatal Screen:*** A prenatal screen (Larson tool) is completed on all pregnant women who access the Healthy Babies Healthy Children program prenatally, and may be used by other service providers in the community. The Larson prenatal screen consists of three questions designed to identify factors that are associated with parenting difficulties and problems with child development. Screeners may administer only the three required questions, or they may integrate the questions into a longer, more detailed prenatal assessment. The screen is administered as early as possible during pregnancy. It is designed to identify a small number of factors associated with low birth weight and parenting problems including:
  - –The mother's smoking habits
  - –The mother's level of education
  - –The mother's attendance at prenatal classes or effort to seek out prenatal information

  The period between conception and birth lays the foundation for a child's well-being. It is the time when the child's basic neural structures are established and these structures have a direct impact on the child's development. It is also the time when the attachment between mother and child begins. For mothers at risk, the pre-natal period is a critical time and the optimal starting point for Healthy Babies Healthy Children services. The relationship that

develops after the baby's birth is often enhanced if the home visitor gets to know the mother in the prenatal period.

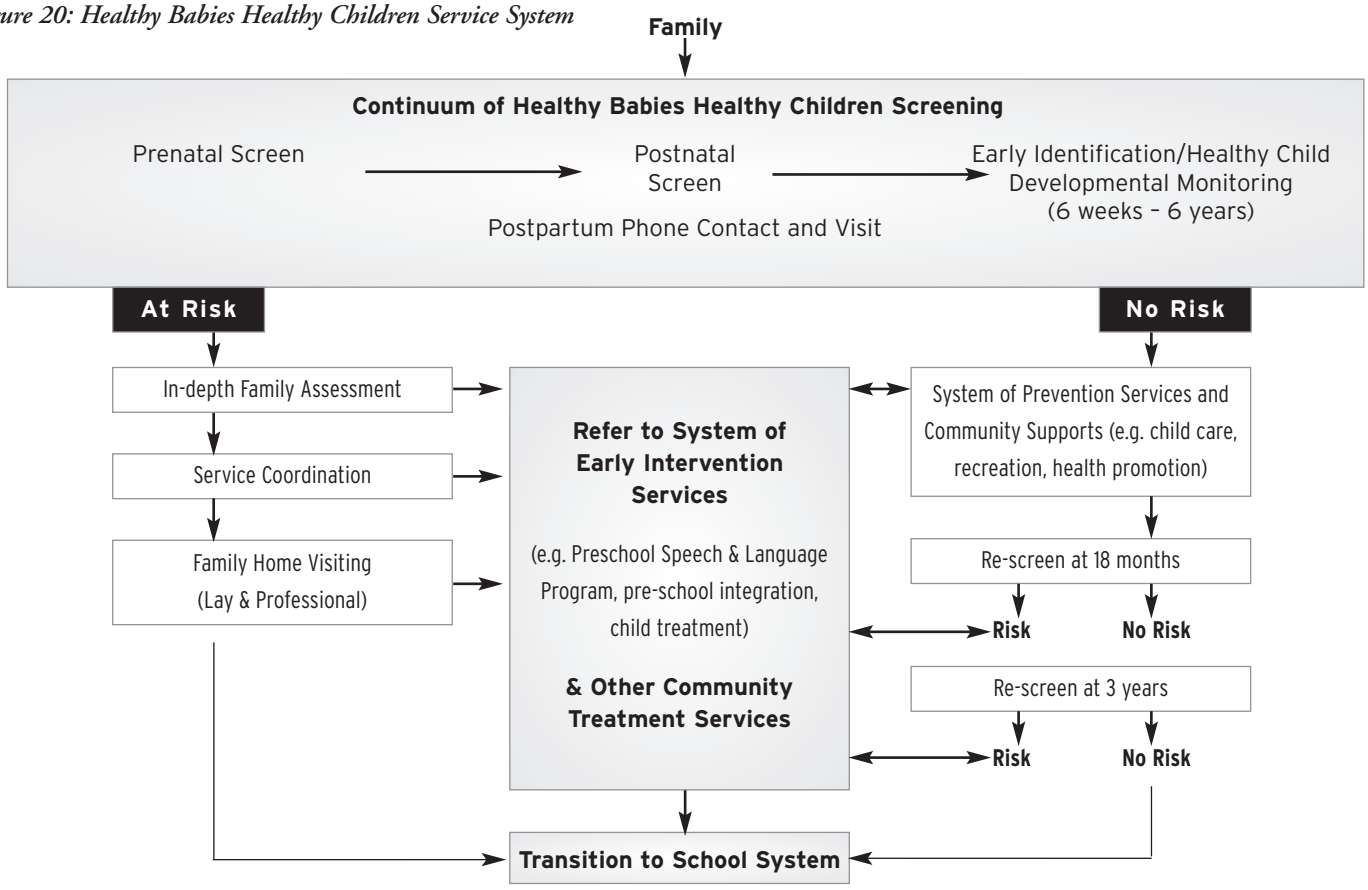
–*Postpartum Tool, Healthy Babies Healthy Children (Parkyn):* Healthy Babies Healthy Children Postpartum screening aims to reach all consenting women who give birth in Ontario, identify those who may be at risk, and link them to services. It consists of a series of questions designed to identify factors associated with risk of parenting problems. The Parkyn postpartum screen is administered before the mother leaves hospital either by a labour delivery nurse, a postpartum nurse or a public health nurse. Physicians are encouraged to fill in the sections of the Parkyn tool during visits for postpartum or newborn care. Postpartum screening is an efficient, effective way to have contact with almost all families with new babies in Ontario, and to identify those who may be at risk, early in the child's development.

As part of the postpartum screen, hospital staff and midwives ask mothers for permission to share the results of the screen with the Board of Health, and whether they wish to receive a postpartum phone call and home visit from a public health nurse. Healthy Babies Healthy Children works with hospitals and midwives to establish procedures and protocols for notifying the Board of Health of all births and obtaining results of all postpartum screens, providing the mother/parent consents.

The Parkyn screen can help determine whether a child and family is at risk. A brief assessment and an in depth assessment may then be completed with families identified as at risk.

–*Nipissing District Developmental Screen™:* A parent completed developmental checklist designed to assist parents, health care and child care professionals with a convenient and easy-to-use method of recording the development and progress of infants and children

Figure 20: Healthy Babies Healthy Children Service System



NOTE: Families and Children may become "at risk" and require supports/services at any stage of a child's development. Families can enter the system at any time and benefit from whatever services are required.

within certain age groupings. Age appropriate activities which are designed to promote overall development accompany the Screens. It is not a diagnostic tool and it is not meant to be a formal assessment of the child's skills but rather a quick survey to determine any areas that may require some extra help.

–Areas of development covered by the screens include vision, hearing, and communication, gross and fine motor, cognitive, social/emotional, and self-help. The Screens coincide with immunization schedules as well as key developmental stages up to age six.

–Availability: Ontario residents, programs and providers, including primary health care providers can access the NDDS™ website www.ndds.ca to download both PDF copies of the NDDS™ screen and the interactive online NDDS™, at no charge.

–***Parent Education and Support:*** All consenting families are called forty-eight hours after discharge to offer support and education. Healthy Babies Healthy Children links families to parenting groups that offer information on healthy growth and development, attachment, play based learning activities, and other parenting resources in their local community. Healthy attachment behaviours are promoted in the mother-child relationship through individual and group intervention. A telephone service is provided that accepts referrals and provides consultation to parents and professionals. All families are offered an initial home-visit. At risk families are offered ongoing home-visits.

–***Referral and Service Coordination:*** Children with developmental concerns are referred to early intervention services and other community resources to support and strengthen family functioning and to promote healthy child development. The case manager generally acts as a service coordinator with families involved with the home-visiting program. The public health nurse plans services in collaboration with the family, the lay home visitor, other health unit staff and other community services, to ensure continuity of care.

See Appendices D and E for the Larson and Parkyn tools

C. Other Services

There are many additional services and service providers that are important resources for families of young children. Public health units can help primary healthcare professionals become more aware of the range of services available in the community, providing a complete directory of local services. Some services assist all parents in their important and challenging job of raising young children, while others support children and families who face specific challenges. Services may be accessed and delivered uniquely in different communities, however central access numbers as provided by the Healthy Babies Healthy Children should simplify the situation. Healthcare professionals are encouraged to work together to improve access and communication between services in their communities and region.

Unfortunately, specialized services are not always available, or there may be a long waiting list. It is not sufficient to diagnose a concern. Diagnosis needs to be followed by appropriate interventions, supports, treatment and care. Healthcare professionals are opinion leaders who may need to take on an advocacy role. Issues and concerns about access and availability of services should be documented. All healthcare providers can and should advocate to improve service delivery and resources.

Areas of Service

–***Mental Health Services and Supports:*** Mental health services and supports are delivered to children and youth by numerous community agencies throughout the province. Mental health services and supports range from health promotion, illness prevention and early identification, such as parent education and school-based programs, to highly specialized treatment, such as cognitive behavioral therapy and intensive home-based interventions. These services and supports are delivered by providers with specialized training in child and youth mental health, in mental health, or in serving child and youth populations.

–***Developmental Services:*** Developmental services can assist children who have developmental delays. The services may be accessed through a formal program such as a Child Development Centre or a Children's Treatment Centre, or through a healthcare provider such as a developmental pediatrician. Infant Development Programs and Autism Intervention Program are services of special note (see next page).

–***Early Learning and Child Care:*** Child care plays a key role in promoting healthy child development and helping children arrive at school ready to learn. It is also an essential support for many parents, helping them to balance the demands of career and family while participating in the workforce, or pursuing education or training. The early learning and care system consists of both unlicensed and licensed child care. Unlicensed or informal child care may be provided by relatives, friends, neighbours, or nannies. Licensed child care consists of private home day care agencies (also called home

child care) and day nurseries (also called child care centres). Day nurseries may include nursery schools, full day programs, programs providing supports to children with special needs and their families and before and after school programs.

– ***Parent-Child Services:*** Parent-child programs promote healthy child development and well-being of families. These include Community Action Programs for Children, Ontario Early Years Centres and Family Resource Programs. Most provide drop-in programs, toy lending, parenting classes and information and activities for children, depending on the unique needs of the communities they serve. Some communities have family wellness clinics for parents to have on-the-spot assessments for their preschool children.

– ***Speech and Language Services:*** Speech and language services help children with communication delays or concerns. Speech and Language Pathologists, the Infant Hearing Program, the Preschool Speech and Language Program and other community audiological services work together to maintain, develop or restore the child's highest potential for communication (see next section for a description of the Preschool Speech and Language Program and Infant Hearing Program).

– ***Therapists:*** Therapy may address physical and/or cognitive issues. Occupational therapists and physiotherapists play an important role in improving children's ability to perform certain tasks. Play therapists conduct play therapy assessment and treatment with young children who do not have the language skills to benefit from cognitive therapy. Clinical psychologists can provide individual therapy, family therapy, marital therapy, group therapy, behaviour management and educational sessions for parents and families.

– ***Healthcare Services:*** There is a wide range of healthcare services that can be coordinated to support healthy child development. Midwives, family physicians, developmental and special service pediatricians, nurse practitioners and nurses all have an important role to play in promoting and supporting health in the preconception, prenatal and postpartum periods.

– ***Child Protection Services:*** Family and Children's Services (previously called the Children's Aid Society) supports families in their central role of caring for and nurturing children. It advocates for children and provides coordinated, quality services for children, families and individuals. The primary service focus is on children in need of counselling, support and protection from abuse and neglect. They often administer and run group homes and offer foster care.

– ***Social Workers:*** Social workers counsel families, with a focus on parent training. They support the family in managing the mental health issues of their child.

– ***Financial Supports:*** The stress of poverty can create additional challenges for parents. Families may benefit from referrals to programs that address financial concerns such as food banks and emergency shelters. Certain professionals, such as social workers may be quite knowledgeable about programs that are available in the local area. Community Care Action Centres may also be a resource, depending on the region.

– ***Supports for Pregnant and Parenting Teens:*** Pregnant and parenting teens have specific needs and concerns and may be more comfortable if referred to programs specifically designed for adolescents. Programs may include teen prenatal classes or teen parent support groups. In addition, Learning, Earning and Parenting (LEAP) can assist and support teen parents so that they can finish high school, obtain assistance with childcare, improve parenting skills and achieve economic self-sufficiency.

– ***Programs for Fathers:*** Fathers have unique needs and perspectives on parenting, and often benefit from programs for fathers. There are many excellent programs available, including Dads Can and Focus on Fathers.

– ***Informal Supports:*** Keep in mind that informal supports are also very important to child development. These can include parent self help groups, neighbours, the faith community, friends and extended family.

Programs of Special Note:

– ***Preschool Speech and Language:*** Preschool Speech and Language Services provides services for children from birth to senior kindergarten entry for communication problems. Services include speech-language assessment, therapy, consultation, home programming and parent education.

– ***Infant Hearing Program:*** The Infant Hearing Program provides Universal Newborn Hearing Screening for all babies prior to discharge from hospital and provides audiology assessments for babies referred from the pre discharge screening and for any preschool child for permanent hearing loss. It provides follow up family support, hearing aid evaluation, and communication development services for preschool children identified as deaf or hard of hearing.

– *Infant Development Program:* This program provides early intervention for families with children who are developing more slowly than expected, or whose development is at risk because of birth or medical problems, genetic disorders, low birth weight or for reasons unknown. The services include developmental assessments and home visiting where the therapist recommends adaptations to the environment and teaches the parent how to use their home environment to encourage their child's development.

– *Autism Intervention Program:* This is a program for children who have a diagnosis of Autism. The program provides support services and training to families, intensive behavioral intervention (IBI) to promote development and address behaviours; and transition services to help children with autism integrate into new environments.

– *Ontario Early Years Centres:* These centres offer services that are accessible by all families with children from ages 0 to 6 regardless of socioeconomic background, culture, geography or special needs. They help parents link with other organizations that provide services such as childcare, healthcare and recreation programs. Ontario Early Years Centres promote healthy child development and readiness to learn through:
  – Programs and services for parents/caregivers and children from ages 0 to 6
  – Services designed to support the early years service community
  – Initiatives designed to educate the community at large and encourage the community to play an active role in healthy child development

Best Start: Helping Young Children Get the Best Start in Life

We all want the best for Ontario's babies and children. That means making sure they get the best possible start in life. That's why the Ontario government launched Best Start. It's a plan to strengthen healthy development, early learning and child care services during a child's first years so children in Ontario are ready and eager to learn by the time they start Grade 1.

The goals of Best Start

Best Start is Ontario's strategy to expand quality and affordable child care and invest in children's healthy early development – all in a convenient and easily accessible location for parents. The Ministry of Children and Youth Services is working with community partners – school boards, public health units, child care and children's service providers, and municipalities to ensure that:

  – many more children and parents have access to services and supports, regardless of individual economic or social circumstances
  – pre-school, kindergarten, quality child care, public health and parenting programs are integrated into a seamless system that supports families and children
  – early and on-going screening of Ontario's children to identify potential issues, needs and risks is strengthened
  – early learning and care hubs are centrally established in Ontario's communities to provide families with a single, integrated, seamless point of access to services and supports based on local needs and available resources.

Enhancements to Ontario's ongoing prevention and early intervention programs means we can identify babies at risk early and help families get the advice and services they need to give their newborns the best chance for healthy development and to help children with language and hearing disorders develop the communication skills they'll need to succeed in school.

Ontario is building a system of early learning and child care that will give our children the best chance at future success. That system is Best Start.

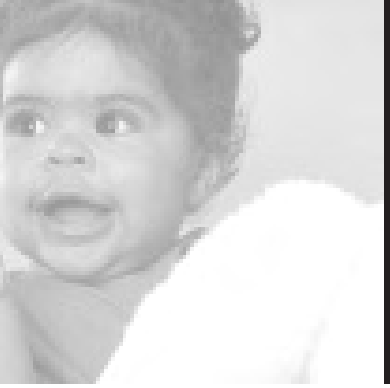
Key Points – Service Providers

–Primary healthcare providers do not need to provide all services and meet all needs of a family.

–Family physicians and other primary healthcare providers should be aware of local services and referral systems.

–The Healthy Babies Healthy Children program can help families find needed services.

–Link families as early as possible to appropriate services to help the child have the opportunity to reach full potential.



Concluding Remarks

The nature versus nurture debate is not new. What is new is the realization of the importance of the early years in neurodevelopment. While many parents are expecting a perfect healthy baby, despite our best efforts, this does not always happen. What healthcare providers can do is improve the odds. Further research is expected to provide more insights into early brain development, structure and function and how it influences behavior. Research will help us revisit and refine our approaches to support neurodevelopment, with a continued emphasis on the importance of the early years.

The "Healthy Child Development: Improving the Odds" CME workshops and this associated toolkit were designed to increase knowledge of the implications of recent information about neurodevelopment. The role of primary healthcare providers is critical to early neurodevelopment. There is extensive brain development in utero and in the first year of life. Many things influence early wiring processes in the fetus, infant and young child, including factors such as genetics, nutrition, care and nurturing. The early period of neurodevelopment has an important influence on future learning capacity, emotional regulation and risks for mental and physical disease.

Family physicians and other primary healthcare providers need to be aware of the challenges of parenting and of effective interventions. All parents need assistance, information and guidance. All children can benefit from early childhood education experiences. Primary healthcare providers can promote healthy child development by supporting parents, paying special attention to issues of attachment and parent-child interaction. Early recognition and intervention is critical in all developmental delays. Interdisciplinary coordination provides a comprehensive approach to screening, assessment and intervention for developmental delays in infants and young children. A familiarity with local resources and services will help the healthcare provider support all families, while providing extra supports for families at risk.

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Additional Resources

Websites

1. www.motherisk.org
2. www.ChildTrauma.org/
3. http://sogc.medical.org/SOGCnet/index_e.shtml
4. www.earlychilddevelopment.ca/
5. www.investinkids.ca
6. http://www.pbso.ca/ (Perinatal Bereavement Services Ontario)

Many maternal, newborn and early child development resources and services are available from:
Best Start: Ontario's Maternal, Newborn and Early Child Development Resource Centre
c/o OPC
180 Dundas Street West, Suite 1900
Toronto ON M5G 1Z8
Telephone: 416.408.2249 / 1.800.397.9567
Fax: 416.408.2122
beststart@beststart.org
www.beststart.org

Appendix A: Preconception Checklist

Issues to Consider in Preconception Include:

Nutrition

- ❑ Calcium and Vitamin D
- ❑ Folic Acid
- ❑ Iron
- ❑ Zinc
- ❑ Vitamin A
- ❑ Poverty
- ❑ Body weight
- ❑ Caffeine
- ❑ Vegetarian Considerations
- ❑ Herbal Products

Substance Use

- ❑ Paternal and/or Maternal Tobacco Use
- ❑ Alcohol Use
- ❑ Drug Dependency

Medications

- ❑ Accutane
- ❑ ACE Inhibitors
- ❑ Aminopterin, methotrexate
- ❑ Carbamazepine
- ❑ Coumadin, Warfarin
- ❑ Daunorubicin
- ❑ Lithium
- ❑ Metformin
- ❑ Phenytoin
- ❑ Propylthiouracil, methimazole
- ❑ Quinolones
- ❑ Retinoic Acid
- ❑ Tetracycline
- ❑ Trimethadione
- ❑ Valporic Acid

Infections

- ❑ CMV
- ❑ Human parvovirus B 19
- ❑ Rubella
- ❑ Toxoplasmosis
- ❑ Varicella (HSV-1)

Sexually Transmitted Diseases

- ❑ Chlamydia
- ❑ Genital Human Papillomavirus
- ❑ Gonorrhea
- ❑ Hepatitis B
- ❑ Herpes (HSV-2)
- ❑ HIV/AIDS
- ❑ Syphilis

Chronic Illness

- ❑ Cancer
- ❑ Cardiovascular Disease
- ❑ Diabetes
- ❑ Epilepsy
- ❑ Lupus
- ❑ Maternal PKU
- ❑ Psychiatric Illness
- ❑ Thyroid Problems

Other Issues

- ❑ Abuse
- ❑ Genetics
- ❑ Home and Leisure Activities
- ❑ Hot Tubs and Saunas
- ❑ Infertility
- ❑ Previous Outcomes
- ❑ Social Support
- ❑ Workplace Concerns

For more information on preconception issues, see the "Preconception and Health: Research and Strategies Manual" at www.beststart.org/resources

Appendix B:
Antenatal Psychosocial Health Assessment

Antenatal Psychosocial Health Assessment (ALPHA)

Antenatal psychosocial health assessment is a vital component of prenatal care. A long process has led to the development of unique assessment forms: the provider-completed and self-report ALPHA forms. These structured antenatal assessment forms are being used on P.E.I. and are recommended by Health Canada in its Family-Centred Maternity Care Guidelines. Ontario has included the ALPHA headings in its 2000 Ontario Antenatal Record, thereby giving official recognition to these important topics. The ALPHA Form has been endorsed by the following groups: the Canadian Pediatric Association, the Canadian Psychiatric Association, the College of Family Physicians of Canada, the Ontario Association of Midwives, the Ontario Medical Association, the Royal College of Physicians and Surgeons of Canada, the Society of Obstetricians and Gynecologists of Canada.

The original provider-completed ALPHA was developed so that obstetrical providers could ask and document the responses of pregnant women to 32 questions relating to maternal, family, substance use and family violence issues. The form guides providers in their assessment of antenatal factors associated with the following poor postpartum outcomes: child abuse, woman abuse, postpartum depression and couple dysfunction and physical illness

The ALPHA self-report, developed through a consensus process of the research team, reflected feedback from women in the original ALPHA pilot who indicated they wanted a written form to complete. Some providers also preferred a self-report for time efficiency. The self-report mirrors the provider form and consists of a 33 questions, either open-ended or with a five-point rating scale. If the woman reports psychosocial issues, the woman and her provider can discuss them during a prenatal visit.

Content validity of the forms was established through an extensive evidenced-based literature review and pilot testing. Further validity and reliability testing in Ontario indicates that the ALPHA does pick up more psychosocial issues. The self-report and the provider ALPHA were trialed on P.E.I. by public health nurses and family physicians and found to yield comparable amount of psychosocial data. The ALPHA Provider's Guide provides information on interventions should antenatal factors be disclosed. An ALPHA provider training video is also available. See http://dfcm19.med.utoronto.ca/research/alpha/

Tips on using the ALPHA Forms

- Introduce the form as part of standard prenatal care given to all women
- Complete or have the woman complete after 20 weeks gestation
- Complete the provider ALPHA in one longer visit (20 minutes) or over several prenatal visits
- Bill for counselling/psychotherapy when appropriate
- Be sensitive to different cultural norms if issues are disclosed
- Remember that associations do not imply causality
- Ask the woman to complete the self-report alone, without her partner present
- Maintain confidentiality and discuss with the woman before sharing information

Self-report published in: Midmer D, Carroll J, Bryanton J, Stewart D. From research to application: The development of an antenatal psychosocial health assessment tool. CJPH 2002; 93(4):291-6.

Provider version published in: Reid A, Biringer A, Carroll J, Midmer D, Wilson L, Chalmers B, Stewart D. Using the ALPHA Form in practice to assess antenatal psychosocial health. CMAJ, 1998; 159(6): 677-684.

Carroll J, et al, Effectiveness of the Antenatal Psychosocial Health Assessment (ALPHA)Form in detecting psychosocial health concerns: a randomized controlled trial. CMAJ 2005;173(3):253 -9

Antenatal Psychosocial Health Assessment (ALPHA)

Antenatal psychosocial problems may be associated with unfavorable postpartum outcomes. The questions on this form are suggested ways of inquiring about psychosocial health. Issues of high concern to the woman, her family or the caregiver usually indicate a need for additional supports or services. When some concerns are identified, follow-up and/or referral should be considered. Additional information can be obtained from the ALPHA Guide. **Please consider the sensitivity of this information before sharing it with other caregivers.*

ANTENATAL FACTORS	CONCERN	COMMENTS / PLAN
FAMILY FACTORS		
Social support (CA, WA, PD) How does your partner/family feel about your pregnancy? Who will be helping you when you go home with your baby?	☐Low ☐Some ☐High	
Recent stressful life events (CA, WA, PD, PI) What life changes have you experienced this year? What changes are you planning during this pregnancy?	☐Low ☐Some ☐High	
Couple's relationship (CD, PD, WA, CA) How would you describe your relationship with your partner? What do you think your relationship will be like after the birth?	☐Low ☐Some ☐High	
MATERNAL FACTORS		
Prenatal care (late onset) (WA) First prenatal visit in third trimester? (check records)	☐Low ☐Some ☐High	
Prenatal education (refusal or quit) (CA) What are your plans for prenatal classes?	☐Low ☐Some ☐High	
Feelings toward pregnancy after 20 weeks (CA, WA) How did you feel when you just found out you were pregnant? How do you feel about it now?	☐Low ☐Some ☐High	
Relationship with parents in childhood (CA) How did you get along with your parents? Did you feel loved by your parents?	☐Low ☐Some ☐High	
Self esteem (CA, WA) What concerns do you have about becoming/being a mother?	☐Low ☐Some ☐High	
History of psychiatric/emotional problems (CA, WA, PD) Have you ever had emotional problems? Have you ever seen a psychiatrist or therapist?	☐Low ☐Some ☐High	
Depression in this pregnancy (PD) How has your mood been during this pregnancy?	☐Low ☐Some ☐High	

ASSOCIATED POSTPARTUM OUTCOMES

The antenatal factors in the left column have been shown to be associated with the postpartum outcomes listed below. ***Bold Arabic*** indicates *good* evidence of association. Regular text indicates fair evidence of association.
CA – Child Abuse CD – Couple Dysfunction PI – Physical Illness
PD – Postpartum Depression WA – Woman Abuse

ANTENATAL FACTORS	CONCERN	COMMENTS / PLAN
SUBSTANCE USE		
Alcohol/drug abuse (WH, CA) (1 drink=1½ oz liquor, 12 oz beer, 5 oz wine) How many drinks of alcohol do you have per week? Are there times when you drink more than that? Do you or your partner use recreational drugs? Do you or your partner have a problem with alcohol or drugs? Consider CAGE (Cut down, Annoyed, Guilty, Eye opener)	☐ Low ☐ Some ☐ High	
FAMILY VIOLENCE		
Woman or partner experienced or witnessed abuse (physical, emotional, sexual) (CA, WA) What was your parents' relationship like? Did your father ever scare or hurt your mother? Did your parents ever scare or hurt you? Were you ever sexually abused as a child?	☐ Low ☐ Some ☐ High	
Current or past woman abuse (WH, CA, PD) How do you and your partner solve arguments? Do you ever feel frightened by what your partner says or does? Have you ever been hit/pushed/slapped by a partner? Has your partner ever humiliated you or psychologically abused you in other ways? Have you ever been forced to have sex against your will?	☐ Low ☐ Some ☐ High	
Previous child abuse by woman or partner (GI) Do you/your partner have children not living with you? If so, why? Have you ever had involvement with a child protection agency (ie. Children's Aid Society)?	☐ Low ☐ Some ☐ High	
Child discipline (GI) How were you disciplined as a child? How do you think you will discipline your child? How do you deal with your kids at home when they misbehave?	☐ Low ☐ Some ☐ High	

FOLLOW UP PLAN

- ❑ Supportive counselling by provider
- ❑ Additional prenatal appointments
- ❑ Additional postpartum appointments
- ❑ Additional well baby visits
- ❑ Public Health referral
- ❑ Prenatal education services
- ❑ Nutritionist
- ❑ Community resources / mothers' group
- ❑ Huttacare
- ❑ Parenting classes / parents' support group
- ❑ Addiction treatment programs
- ❑ Smoking cessation resources
- ❑ Social Worker
- ❑ Psychologist / Psychiatrist
- ❑ Psychotherapist / marital / family therapist
- ❑ Assaulted women's helpline / shelter / counseling
- ❑ Legal advice
- ❑ Children's Aid Society
- ❑ Other: _____
- ❑ Other: _____
- ❑ Other: _____
- ❑ Other: _____

COMMENTS:

_____

_____

_____

Date Completed _____ Signature _____

THE ALPHA SELF-REPORT QUESTIONNAIRE FOR WOMEN

Name _____ Date _____ Months Pregnant _____

Having a baby usually means changes in your family life. You may wish to discuss some of these topics with your healthcare provider. She/he may help you with these changes. Please answer the questions the best way you can. Your answers are confidential and will be kept private.

Please answer the questions by circling a number on the scale, writing an answer in the space, or marking "yes" or "no". If some of the questions do not apply to you, please circle NA (not applicable).

YOUR FAMILY LIFE Please answer the following questions about your family life.

Family Factors

1. About this pregnancy, my partner feels	very happy	1	2	3	4	5	very unhappy	
2. About this pregnancy, my family feels	very happy	1	2	3	4	5	very unhappy	
3. I feel supported in this pregnancy	very much	1	2	3	4	5	not at all	
4. My partner will be involved with the baby	a great deal	1	2	3	4	5	not at all	

5. When I am home with the baby I will have help from (your relationship) _____

Comments: _____

Recent Life Stresses (moving, job change or loss, family illness or death, money troubles, and so on)

6. Over the past year, my life has been	very relaxed	1	2	3	4	5	very stressful	
7. I am making life changes during this pregnancy	❑ No ❑ Yes	If yes, describe: _____						

Comments: _____

Relationship With Partner (if this applies)

8. My relationship with my partner is usually	very happy	1	2	3	4	5	very unhappy	
9. After the baby, I expect my partner and I will get along	very well	1	2	3	4	5	not at all	

Comments: _____

YOUR OWN LIFE Please answer the following questions about your own life and feelings.

10. In this pregnancy, I first came for care when I was ___ months pregnant. This is my ___1st ___2nd ___3rd ___ [indicate number] child.

11. I am planning to take prenatal classes ❑ Yes ❑ No Reasons, if no, _____

Comments: _____

Feelings About Being Pregnant

12. My feelings about this pregnancy at first	very happy	1	2	3	4	5	very unhappy	
13. My feelings about this pregnancy now	very happy	1	2	3	4	5	very unhappy	

Comments: _____

Relationship With Parents

14. When I was a child, I got along with my parent(s)	very much	1	2	3	4	5	not at all	
15. As a young child, I felt loved by my mother	very much	1	2	3	4	5	not at all	NA
16. As a young child, I felt loved by my father	very much	1	2	3	4	5	not at all	NA

Comments: _____

Feelings About Becoming/Being a Mother

17. I have concerns about becoming/being a mother	none at all	1	2	3	4	5	very many	

Comments: _____

Emotional Health

18. I have had some emotional problems ❑ No ❑ Yes

19. I have seen a psychiatrist/therapist ❑ No ❑ Yes

20. In this pregnancy, my mood has been usually	happy/up	1	2	3	4	5	sad/down	

Comments: _____

CONCERNS IN YOUR LIFE Please answer the following questions about stress in your life.

Alcohol and Drug Use During Pregnancy

21. Each week I drink _____ drinks. (1 drink = 1½ oz liquor, 12 oz beer, 5 oz wine)
22. There are times when I drink more during the week ☐ No ☐ Yes If yes, describe _____
23. Sometimes I've felt: *I need to cut down my drinking* ☐ No ☐ Yes *Annoyed by people criticizing my drinking* ☐ No ☐ Yes
Guilty about my drinking ☐ No ☐ Yes *A need for a drink first thing in the morning* ☐ No ☐ Yes
24. I use recreational drugs, e.g., marijuana never 1 2 3 4 5 very often
25. I have some drug problems ☐ No ☐ Yes If yes, describe _____
26. My partner uses recreational drugs, e.g., marijuana never 1 2 3 4 5 very often
27. My partner has some drug problems ☐ No ☐ Yes If yes, describe _____
Comments: _____

Parent's Relationship (when you were a young child)

28. My parents usually got along very well 1 2 3 4 5 not at all N/A
29. My father sometimes scared or hurt my mother never 1 2 3 4 5 very often N/A
30. My parents sometimes scared or hurt me never 1 2 3 4 5 very often N/A
31. As a child I was sexually abused ☐ No ☐ Yes
Comments: _____

Relationship With Partner (if this applies)

32. My relationship with my partner usually has no tension 1 2 3 4 5 a lot of tension N/A
33. We work out arguments with no difficulty 1 2 3 4 5 great difficulty N/A
34. I've sometimes felt scared by what my partner says or does never 1 2 3 4 5 very often N/A
35. I've been hit/pushed/slapped by a partner never 1 2 3 4 5 very often
36. I've sometimes been put down or humiliated by my partner never 1 2 3 4 5 very often N/A
37. I've been forced to have sex against my will ☐ No ☐ Yes
Comments: _____

Raising Children

38. I have children not living with me ☐ No ☐ Yes
39. My partner has children not living with him ☐ No ☐ Yes
40. As a child, I was involved with Children's Protective Services (Children's Aid) ☐ No ☐ Yes
41. Children in my care have been involved with Children's Protective Services ☐ No ☐ Yes
Comments: _____

42. As a child, I was harshly disciplined by parents/family never 1 2 3 4 5 very often
43. I think spanking is necessary never 1 2 3 4 5 very often
Comments: _____

44. Overall, how concerned are you about your emotional and family life?

not at all concerned 1 2 3 4 5 6 7 extremely concerned

45. What issues in your life are most concerning to you?

_____

_____

46. What help, if any, would you like?

_____

Appendix C: Ontario Antenatal Record


Ontario Medical Association

In conjunction with the

Ontario

Ministry of Health and Long-Term Care

Antenatal Record 1

Patient's Last Name | Patient's First Name

Address – number, street name | Apt/Suite/Unit

City/Town | Province | Postal Code | Partner's Last Name | Partner's First Name

Telephone - Home | Telephone - Work | Language | Partner's Occupation | Partner's Educational level | Age

Date of birth YYYY/MM/DD | Age | Occupation | Educational level | Ethnic or Racial backgrounds Mother / Father

OHIP No. | Patient File No. | Marital status | Birth attendant | Newborn care | Family Physician

Allergies or Sensitivities (describe reaction details) | Medications/Herbals

Pregnancy Summary

LMP YYYY/MM/DD | Certain Yes ☐ No ☐ | EDB (by dates) | Final EDB | Dating Method

Cycle q ____ | Regular Yes ☐ No ☐ | ☐ Dates

Contraceptive type | Last used YYYY/MM/DD | ☐ T_1 US | ☐ T_2 US | ☐ ART (e.g. IVF)

Gravida | Term | Premature | Abortuses | Living

Obstetrical History

No. | Year | Sex M/F | Gest. age (weeks) | Birth weight | Length of labour | Place of birth | Type of delivery | Comments regarding pregnancy and birth

Medical History and Physical Exam (provide details in comments)

Current Pregnancy: 1. Bleeding, 2. Nausea, vomiting, 3. Smoking ___ cig/day, 4. Alcohol, street drugs, 5. Occup/Environ. risks, 6. Dietary restrictions, 7. Calcium adequate, 8. Preconceptual folate

Medical History: 9. Hypertension, 10. Endocrine, 11. Urinary tract, 12. Cardiac/Pulmonary, 13. Liver, hepatitis, GI, 14. Gynaecology/Breast, 15. Hem/Immunology, 16. Surgery, 17. Blood transfusion, 18. Anaesthetic compl., 19. Psychiatric, 20. Epilepsy/Neurological, 21. Other

Genetic History: 22. At risk population, Family history of: 23. Developmental delay, 24. Congenital anomalies, 25. Chromosomal disorders, 26. Genetic disorders

Infectious Disease: 27. Varicella susceptible, 28. STDs / HSV / BV, 29. Tuberculosis risk, 30. Other

Psychosocial: 31. Poor social support, 32. Relationship problems, 33. Emotional/Depression, 34. Substance abuse, 35. Family violence, 36. Parenting concerns, 37. Relig. / Cultural issues

Family History: 38. At risk population

Physical Examination: Ht. ___ Wt. ___ BMI ___ BP ___; 39. Thyroid, 40. Chest, 41. Breasts, 42. Cardiovascular, 43. Abdomen, 44. Varicosities / Extrem., 45. External genitals, 46. Cervix, vagina, 47. Uterus, 48. Size ___ weeks, 49. Adnexae, 50. Other

Initial Laboratory Investigations

Test | Result | Test | Result: Hb, MCV, ABO, Rh, Antibody Screen, Rubella immune, HBsAg, VDRL, Sickle Cell; HIV, ☐ Counselled and test declined, Last Pap YYYY/MM/DD, GC/Chlamydia, Urine C&S

Prenatal Genetic Investigations | Result

Comments

Signature | Date | Signature | Date

Canary – Mother's chart – forward to hospital   Pink – Attendant's copy   White – Infant's chart

A Guide to Pregnancy Assessment

In the event of maternal transfer, please photocopy the front sheet and send to referral hospital.

This assessment system is intended as a basis for planning the on-going management of the pregnancy and should reflect local resources. The risk factors or problems listed below are intended as examples only.

Healthy Pregnancy, no predictable risk:

- ❑ No pregnancy complications now or in the past
- ❑ No significant maternal medical disease
- ❑ No prior perinatal morbidity or mortality
- ❑ Fetal growth adequate

Pregnancy at risk:

The fetus/mother may be at risk. Closer observation of the pregnancy may be necessary. In addition, consultation with an appropriate specialist (obstetrician, internist, pediatrician, etc.) may also be necessary. These patients may be managed by continuing collaborative care and birth in an obstetrical unit with intermediate level nursing facilities OR they may be returned to the care of the referring provider with a suggested plan of management for the remainder of the pregnancy.

Maternal factors:

- ❑ Diabetes, White Classes B, C, or D
- ❑ Chronic hypertension
- ❑ Other significant medical illness
- ❑ Obesity (BMI ≥ 35)
- ❑ Significant tobacco, alcohol, drug use
- ❑ Severe psychosocial issues
- ❑ Family history genetic disease or congenital anomalies
- ❑ Other significant family history, esp. DVT/PE and recurrent pregnancy losses

Prior pregnancy history of:

- ❑ Preterm labour < 36 weeks
- ❑ Stillbirth or neonatal death
- ❑ Intrauterine growth restriction
- ❑ Previous uterine surgery including lower segment Cesarean section
- ❑ Cervical incompetence

Current pregnancy complicated by:

- ❑ Gestational hypertension
- ❑ Placenta previa (with or without bleeding)
- ❑ Other significant antepartum hemorrhage
- ❑ Twin pregnancy
- ❑ Gestational diabetes (White Class A)
- ❑ Abnormal fetal growth (suspected intrauterine growth restriction or large for dates)
- ❑ PROM 32-36 weeks
- ❑ Preterm labour 32-36 weeks
- ❑ Rh or atypical blood group sensitization
- ❑ Hydramnios or oligohydramnios
- ❑ Fetal malposition (breech, transverse) at 36 weeks
- ❑ Postdates ≥ 41 weeks
- ❑ Anemia not responding to Fe (Hb <100 g/l)
- ❑ _____

Pregnancy at high risk:

Pregnancies which are so complicated that the fetus and/or mother are obviously in danger. If at all possible, these patients should be transferred to a regional perinatal centre (level III) for intensive care and birth. Clearly, there are patients who deserve to be placed in this risk category (with problems such as excessive antepartum bleeding, cord prolapse, or advanced uncontrolled premature labour) who cannot be transferred safely or in time to benefit the fetus or mother.

- ❑ High order multiple gestation (triplets or greater)
- ❑ Fetal congenital anomaly
- ❑ Diabetes beyond Class D (end-organ involvement)
- ❑ Renal disease with hypertension ± ↓ function
- ❑ Heart disease, especially with failure
- ❑ Other significant severe medical illness
- ❑ _____

Pregnancy < 32 weeks with:

- ❑ Preterm labour and/or premature rupture
- ❑ Gestational hypertension with adverse conditions
- ❑ Antepartum hemorrhage ongoing
- ❑ Oligohydramnios
- ❑ IUGR, ≤10th %, reverse flow Doppler

Two or more risk problems can combine to produce a high pregnancy risk. Such a patient may need to be placed in a higher risk category

Ontario Medical Association

In conjunction with the

Ontario
Ministry of Health and Long-Term Care

Antenatal Record 2

Patient's Last Name	Patient's First Name
Birth attendant	Newborn care

Family Physician	**Final EDB**	**Allergies or Sensitivities**	**Medications / Herbals**
G / T / P / A / L			

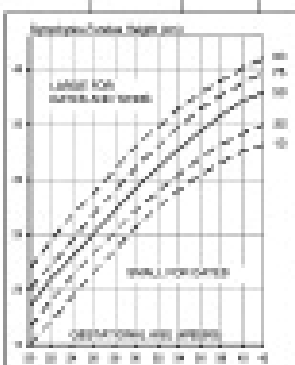
Identified Risk Factors	**Plan of Management**

Recommended Immunoprophylaxis

Rh neg. ☐ **Rh IG Given:** YYYY/MM/DD **Rubella booster postpartum** ☐ **Newborn needs: Hep B IG** ☐ **Hep B vaccine** ☐

Subsequent Visits

Date	GA (weeks)	Weight	B.P.	Urine Prot.	SFH	Pres. Posn.	FHR/FM	Comments
								IPS, FTS, NT best done between 11w0d and 13w6d
								MSS best done between 15w0d and 17w6d
								Ultrasound for fetal anatomy best done between 18 and 20 weeks
								Antenatal 1 to L&D when final EDB known and initial Laboratory Investigations complete
								Arrange for Prenatal Education Classes
								24-28 week blood work with 1 hr. GCT
								Rh immunoprophylaxis at 28 weeks
								Group B Strep. screening best done between 35 and 37 weeks
								Antenatal 2 to be sent to Labour and Delivery
								Review Labour and Delivery plans:
								-pain management in labour
								-admission and discharge timing
								-postpartum contraception



Ultrasound

Date	GA	Result
		Dating scan (if done)
		18-20 weeks for morphology

Additional Lab Investigations

Test	Result
Hb	
ABO/Rh	
Repeat ABS	
1 hr. GCT	
2 hr. GTT	
GBS	

Discussion Topics

- ☐ Exercise
- ☐ Work plan
- ☐ Intercourse
- ☐ Travel
- ☐ Prenatal classes
- ☐ Birth plans
- ☐ On call providers
- ☐ Preterm labour
- ☐ PROM
- ☐ APH
- ☐ Fetal movement
- ☐ Admission timing
- ☐ Pain management
- ☐ Labour support
- ☐ Breastfeeding
- ☐ Circumcision
- ☐ Discharge planning
- ☐ Car seat safety
- ☐ Depression
- ☐ Contraception
- ☐ Postpartum care

Signature	Date	Signature	Date

4294-64 (03/05) Canary – Mother's chart – forward to hospital Pink – Attendant's copy White – Infant's chart 7530-5635

Postnatal Visit

No of weeks postpartum	Date (YYYY/MM/DD)

History

Review of birth
☐ Vaginal ☐ Operative ☐ Cesarean

Baby's Health / Concerns | Baby's Name

Breastfeeding ☐ Yes ☐ No | Breastfeeding concerns

Bladder function | Lochia / Menses

Bowel function | Perineal discomfort

Rubella immune ☐ Yes ☐ No ☐ Vaccinated | Smoking history

Pap smear status

Physical Examination

Weight lb / kg | B.P. mm Hg

Affect | Thyroid

Breast exam

Abdomen

Perineum

Pelvic exam

Discussion Topics

Emotional problems / depression

Preconceptual folate to begin prior to next pregnancy

Contraception

Sexual / Relationship concerns

Social support

Family violence

Follow-up and advice re: future pregnancies and risks

Signature of physician or midwife

Appendix D: Larson Prenatal Screening Tool

Larson Prenatal Screening Tool – 3 Questions Used by Healthy Babies Healthy Children

Question	Response	Score
1. Mother's education	0 – 7 years	19
	8 – less than h.s. degree	13
	high school degree	9
	college – no degree	6
	college – degree or more	0
2. Has mother ever attended a prenatal course (3 or more attendances)?	No	6
	Yes	0
3. Mother's present smoking habit (cigarettes/day)	20	7
	16 – 20 years	6
	11 – 15 years	4
	6 – 10 years	3
	1 – 5 years	1
	0	0

NOTE: if a mother scores 13 or more she would receive a more detailed assessment. (Larson, et.al, 1987)

Appendix E: Parkyn Postpartum Screening Tool

Postpartum Tool, Healthy Babies Healthy Children (Parkyn Screen)

Mother's Name:..... Fathers Name:.....

A. Children with Congenital or acquired Health Challenge:

1.	Major (probability of permanent disability) e.g.: down's syndrome, cerebral palsy	9
2.	Moderate (correction may be possible) e.g.: cleft palate, loss of limb	6

B. Development Factors:

3.	Low birthweight:	a) 0-1499 gm	9
		b) 1500-1999 gm	8
		c) 2000-2499 gm	6
4.	Complications of pregnancy:		
	a) Infections that can be transmitted in utero and may damage the fetus (e.g.: AIDS, rubella)		9
	b) Drugs (e.g.: alcohol or drug abuse diagnosed in mother)		9
5.	Complications of labour and delivery:		
	a) Labour requiring mid forceps including breech delivery or emergency caesarean		4
	b) Infant trauma or illness (e.g.: convulsions, respiratory distress syndrome)		6
	c) If Apgar less than 7 at 5 min., deduct score from 10		__
6.	Family history of a genetic health challenge (e.g.: deafness, mentally challenged)		4

C. Family Interaction Factors

7.	Age of mother	a) 15 and under	9
		b) 16 or 17	8
		c) 18 or 19	5
8.	Social situation:		
	a) One parent family with adequate support		2
	b) One parent family - no support		7
	c) Two parent family - no social support and/or severe isolation related to culture, language or geography		4
9.	Financial difficulties		3
10.	No prenatal care before sixth month		4
11.	Mental illness/mental challenge in mother and/or father: Double score if both parents positive in a) or c)		
	a) Schizophrenia or bipolar affective disorder		7
	b) Postpartum depression or psychosis		9
	c) Mentally challenged parent		6
12.	Prolonged postpartum maternal separation (5 days or more):		
	a) With frequent infant contacts (visits or phone as feasible)		2
	b) Little or no contact		6
13.	Assessed lack of bonding (e.g.: minimal eye contact or touching)		6
14.	> 3 hospitalizations in 1 year in absence of known chronic illness or condition		6
15.	Other e.g.: marital distress, low education status, failure to thrive, parenting difficulties, family violence, prenatal class attendance, maternal smoking during pregnancy (Score 0 to 9).....		

Specify reason:.....

Priority score: 9 and over = high, 6 to 8 = moderate, 3 to 5 = low, 0 to 2 = minimal **TOTAL SCORE**.....

.....

Signature **Date**

ADAPTED FROM PARKYN'S PRIORITY ASSESSMENT (Parkyn, 1985)

Appendix F: Metabolic Screening of the Newborn

Information on the Ontario Newborn Screening Program
November 27, 2006

Important changes are occurring to the Ontario Newborn Screening Program. Beginning April 2006, new tests are being added to the newborn screening program. The first change to occur was the screening for an additional disorder called medium chain acyl-CoA dehydrogenase (MCAD) deficiency, as well as the usual screening for congenital hypothyroidism, phenylketonuria (PKU), and deafness that is offered to all newborns in Ontario. The immediate change is that a superior technology, tandem mass spectrometry, will be substituted for the outdated Guthrie test for PKU. This technology has increased sensitivity and specificity and will allow testing for multiple conditions concurrently. You should already have received the *Information for Health Care Providers* booklet and patient pamphlet from the Ontario Ministry of Health and Long Term Care.

What is new?
By the end of 2006, it is anticipated that newborn screening (NBS) will be expanded to include 27 disorders. These will include 20 inborn errors of metabolism (9 organic acid disorders, 5 fatty acid oxidation disorders, 6 amino acid disorders), 3 hemoglobinopathies (sickle cell anemia and related disorders), 2 endocrine disorders (congenital hypothyroidism and congenital adrenal hyperplasia), biotinidase deficiency and galactosemia. These are listed in Table 1. Screening for cystic fibrosis will begin in late 2007, increasing the total number of tests to 28. Screening will pick up an additional approximately 20 disorders as secondary targets.

What is the same?
Samples are collected through heel prick between 24 hours and 7 days after birth. The best time for sample collection is between 48-72 hours after birth. If a baby is tested before 24 hours of age, the sample should be repeated within 5 days. This has not changed from the previous newborn screening program.

Special Considerations:
- Prematurity or illness
  - If <37 weeks or ill, collect the specimen at 5-7 days old and indicate this on the NBS card
- Total parenteral nutrition and antibiotics – indicate on NBS card
- Transfusion – ideally complete NBS before transfusion

How likely is a positive test?
The disorders being screened for are very rare. The overall prevalence of a metabolic disorder is about 1/2400. The overall specificity of NBS is about 99.7% and overall sensitivity is close to 100% for classic forms of these disorders and about 92.6% for variants. The false positive rate is about 0.33%. It is estimated that about 1/4100 newborns will benefit from screening and treatment.

(Reference: Schulze A, Lindner M, Kohlmuller D, Olgemoller K, Mayatepek E, Hoffmann GF. Expanded newborn screening for inborn errors of metabolism by electrospray ionization-tandem mass spectrometry: results outcome and implications. Pediatrics 2003; 111:1399-1406.)

What are these disorders and what value is screening?
Babies born with these disorders may appear healthy at birth. The benefit of screening is that early identification may allow early treatment, decreasing or preventing consequences such as recurrent illness and/or developmental disability and/or death. Parents can be informed of the diagnosis and be counselled about the risk for future children. In the case of the inborn errors of metabolism, treatment may include special formulas and diets, vitamin supplements, and avoiding fasting.

The benefit of early identification of sickle cell disease is that prophylactic penicillin and vaccination have been shown to be effective in reducing infections and reducing morbidity.

The risks of newborn screening include parental anxiety, especially in the case of false positive tests, and potentially in those healthy individuals identified as carriers or diagnosed with benign conditions. There is also the risk of unanticipated outcomes such as misattributed paternity.

What is the responsibility of primary care providers?

It is your responsibility to discuss newborn screening with expectant parents.

- Offer newborn screening
- Discuss the benefits of screening
- Discuss how testing is done
- Discuss timing of testing
- Discuss the need for a repeat sample in some situations
- Discuss difference between a screening test and diagnostic test
    - A screening test determines if there is a high or low risk that the infant has the condition. A further diagnostic test is needed to determine with certainty if the infant has the condition.
- Discuss possible results of screening
    - Screen negative: A report will be issued by mail to the health care provider/referring hospital. More than 99% will be negative.
    - Screen positive for a disorder: This does not necessarily mean the infant has the disorder. Further investigation is needed. The Newborn Screening Laboratory will contact your regional treatment centre, which will notify the baby's health care provider and/or parents about the result and arrange for confirmatory testing. If the diagnosis is confirmed, the treatment centre will provide management and follow up.
- Answer questions and give parents the newborn screening brochure.

Where can you get additional information?

- Ontario Ministry of Health web site: www.health.gov.on.ca/newbornscreening
  - For parents: handouts in multiple languages, video
  - For health care providers: 1-page fact sheets on each disorder
- To order free educational materials: www.health.gov.on.ca or call 1-877-844-1944
- Educational web sites:
  - AAFP site: http://www.aafp.org/x4295.xml
  - March of Dimes: www.marchofdimes.com
  - Genetests: www.genetests.org
  - National Newborn Screening & Genetics Resource Center: genes-r-us.uthscsa.edu

Respectfully submitted,

June C Carroll MD CCFP FCFP
Principal Investigator, The Genetics Education Project
Member of the Ontario Advisory Committee on Newborn and Childhood Screening

Table 1: Disorders Screened by the Expanded Ontario Newborn Screening Program (by end of 2007)

Category	Disorders
Organic Acid Disorders	isovaleric acidemia (IVA), glutaric acidemia type 1 (GA1), HMG-CoA lyase deficiency (HMG), multiple carboxylase deficiency (MCD), methylmalonic acidemia (MUT, Clb A,B), 3-methylcrotonyl-CoA carboxylase (3MCC) deficiency, propionic acidemia (PROP), β-ketothiolase (BKT) deficiency
Fatty Acid Oxidation Disorders	medium chain acyl-CoA dehydrogenase (MCAD) deficiency, very long chain acyl-CoA dehydrogenase (VLCAD) deficiency, long chain 3-Hydroxyacyl-CoA dehydrogenase (LCHAD) deficiency, trifunctional protein (TFP) deficiency, carnitine uptake defect (CUD)
Amino Acid Disorders	phenylketonuria (PKU), tyrosinemia (TYR), homocystinuria (HCY), citrullinemia (CIT), argininosuccinic acidemia (ASA), maple syrup urine disease (MSUD)
Blood Disorders	Sickle Cell Disease and variants Other Hemoglobinopathies
Endocrine Disorders	Congenital hypothyroidism (CH) Congenital Adrenal Hyperplasia (CAH)
Other Disorders	Biotinidase deficiency (BIOT) Galactosemia (GALT) Cystic fibrosis (CF)

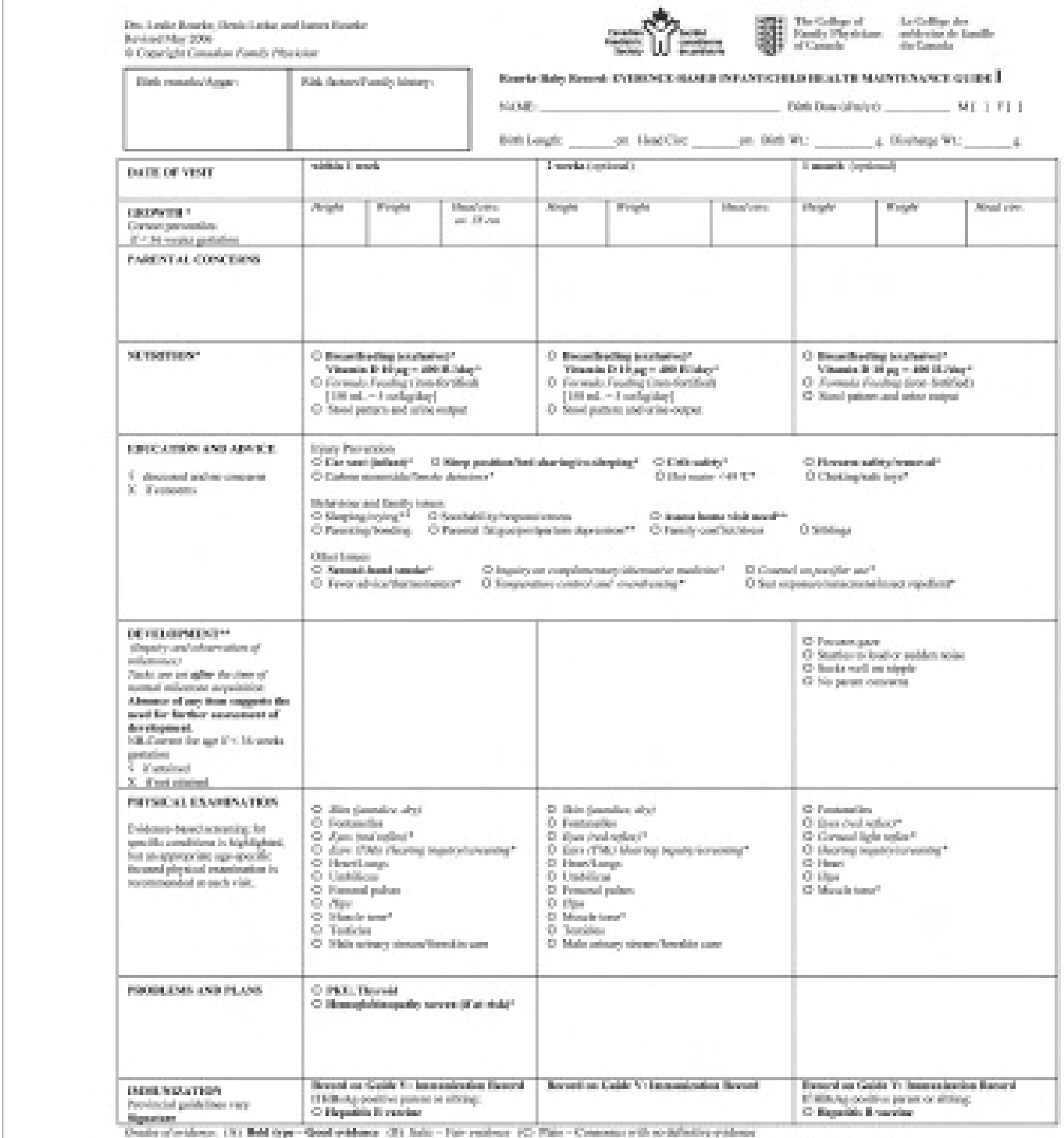
Appendix G: Neurological Examination of the Newborn

Neurological Signs	Description	Significance	Developmental change
Posture	All limbs flexed	Asymmetry or extension -hypotonia suspected	Hyperflexion past 2 months suspect spasticity
Motor Activity	Vigorous, constant motor activity alternating limb flexion and extension	Asymmetry or minimal-CNS or PNS problem	
Passive Tone *	Resistance to passive stretch	Best indicator of CNS maturation Earliest sign of neurologic dysfunction	
	Upper limb: Extend both upper limbs by pressing on forearms. Hold – release a brisk symmetrical flexion not forceful nor clonus	Absent or poor: Hypotonia or muscle weakness Exaggerated: spasticity	
	Lower limb: Hold feet and flex over abdomen then pull to extension. Hold then release. A symmetrical flexion should occur	As for upper limbs	
	Scarf sign: Hold baby's hand and bring to opposite shoulder: elbow should be in line with sternum	Wraps around neck may be hypotonia Resists before midline -may be spasticity	
	Adductor's angle – Hold knee in extension and abduct until resistance -note asymmetry – measure angle with pubis and midline 40-80 degrees	A wider angle – hypotonia. Less-spasticity	Gradually increases to 100-140 degrees by 6-9 months
	Popliteal Angle – Flexing of the thighs over abdomen, then gently extending the leg until resistance – measure angle between the thigh and leg and compare sides – 80-100 degrees	Early sign of spasticity -hemiplegia or diplegia	By six months – 120-140 degrees -baby can put feet in his mouth
	Active neck muscle tone – 1. Hold baby in sitting position allow head to extend backwards by moving his trunk back. Infant should move head to vertical axis and hold briefly. 2. Ventral extension: hold baby in prone position hold under trunk and abd. – should straighten back and redress head. Limbs in flexion	1. Headlag may indicate CNS depression or hypotonia 2. In hypotonia the infant hangs limp exaggerated spinal curve-limbs more extended, no extensor neck activity. Spacticity may show exaggerated response	***Landau response:*** By 3 months more sustained straightening of head and trunk. Increasing from head downwards -response complete by 4-6 months. Now forced flexion of the head causes flexion of all the limbs. By 12 months the infant can inhibit the Landau response.

	Deep tendon reflexes: Biceps, knee and ankle jerks present in newborn. Up to **two months** knee jerk causes crossed adduction response and the ankle jerk has a few clonic beats	Responses should be brisk and symmetrical to be normal	Triceps; present after a few weeks
Developmental Primitive Reflexes		The response to a single reflex not very significant but a poor response to 2 or 3 may be important neurologically. Absence of habituation is also important.	The persistence beyond appropriate time may signify pathology They should be checked until one year
	Moro Reflex: Lift baby by hands to raise shoulders off the bed about 3 cm – release-extension and abduction of arms with opening of hands then smooth adduction and flexion and a cry	An asymmetrical response possible focal defect eg brachial plexus palsy. Prolongation of phases – may indicate brain damage	After three months a positive Moro response is abnormal
	Palmar Grasp: Slight stimulation to palm leads to strong grasp		Between three and four months, this response lessens. After this period a positive response is abnormal.
	Foot Grasp: Light pressure on sole of foot -flexion and grasp response in the toes		This reflex disappears after 9 months
	Rooting Reflex: Light stroke on corner of mouth – leads to rotation of head in the direction plus sucking movements		Response disappears after 3-4 months when awake and 7-8 months when drowsy.
	Sucking Reflex: Placing a finger in infant's mouth produces sustained sucking. Weaker if fed.	Absence or weak response in presence of feeding problem – may mean brain involvement	Same as rooting *Poor sucking and latch can be associated with future speech and language problems
	Crossed Extension Reflex: Stroke the sole of infants foot – flexion and abduction then extension and adduction and other leg crossing over the extended one.	Full response in full term infant – a test of maturity of the nervous system	Disappears after 1st month
	Tonic Neck Reflex: Lying on back rotate baby's head to one side – arm on same side extends and other arm flexes- rotate the other opposite way to obtain similar response.	This reflex appears at 1-2 months – important if sustained	Disappears by 7-8 months
	Placing reaction: Hold baby by trunk in upright – one leg touching table. Baby steps on the table then takes step with other		Response should disappear by 5-6 weeks

From: Larbrisseau, A. Neurologic Examination of the newborn,. Diagnosis, June: 69 – 79, 1986

Appendix H: **Rourke Record**



Dr. Leslie Rourke, Denis Leduc and James Rourke
Revised May 2006
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Birth remarks/Apgar:	Risk factors/Family history:

Rourke Baby Record: EVIDENCE-BASED INFANT/CHILD HEALTH MAINTENANCE GUIDE

NAME: _____ Birth Date (d/m/y): _____ M F I

Birth Length: _____cm Head Circ: _____cm Birth Wt: _____g Discharge Wt: _____g

DATE OF VISIT	within 1 week			2 weeks (optional)			4 month (optional)		
GROWTH † Current percentiles If < 34 weeks gestation	Height	Weight	Head circ. cm / cm	Height	Weight	Head circ.	Height	Weight	Head circ.
PARENTAL CONCERNS									
NUTRITION*	○ **Breastfeeding (exclusive)*** **Vitamin D 10 µg = 400 IU/day*** ○ Formula Feeding (iron-fortified) [150 mL = 1 oz/kg/day] ○ Stool pattern and urine output			○ **Breastfeeding (exclusive)*** **Vitamin D 10 µg = 400 IU/day*** ○ Formula Feeding (iron-fortified) [150 mL = 1 oz/kg/day] ○ Stool pattern and urine output			○ **Breastfeeding (exclusive)*** **Vitamin D 10 µg = 400 IU/day*** ○ Formula Feeding (iron-fortified) ○ Stool pattern and urine output		
EDUCATION AND ADVICE √ discussed and/or concern X if concern	Injury Prevention ○ **Car seat (infant)*** ○ **Sleep position/bed sharing/co-sleeping*** ○ Crib safety* ○ Firearm safety/removal* ○ Carbon monoxide/Smoke detectors* ○ Hot water <49 °C* ○ Choking/safe toys* Relationships and Family Issues ○ Sleeping/crying** ○ Toothbrushing/exposure/caries ○ **trauma home visit need**** ○ Parenting/bonding ○ Parental fatigue/postpartum depression** ○ Family conflict/stress ○ Siblings Other Issues ○ **Second-hand smoke*** ○ Inquiry re complementary/alternative medicine* ○ Counsel on pacifier use* ○ Fever advice/thermometer* ○ Emergency contact card / meds/screening* ○ Sun exposure/sunscreen/wide-brimmed hat/shirt*								
DEVELOPMENT** Enquiry and observation of milestones Tasks are on or before the time of normal milestone acquisition **Absence of any item suggests the need for further assessment of development.** NB Correct for age if < 36 weeks gestation √ if attained X if not attained							○ Focuses/gazes ○ Startles to bright or sudden noise ○ Tracks well on nipple ○ Vocalizes to parent		
PHYSICAL EXAMINATION Evidence-based screening for specific conditions is highlighted, but an appropriate age-specific focused physical examination is recommended at each visit.	○ *Skin (jaundice, dry)* ○ Fontanelles ○ *Eyes (red reflex)†* ○ *Ears (TM) (hearing inquiry/screening)** ○ Heart/Lungs ○ Umbilicus ○ Femoral pulses ○ *Hips* ○ Muscle tone* ○ Testicles ○ Male urinary stream/foreskin care			○ *Skin (jaundice, dry)* ○ Fontanelles ○ *Eyes (red reflex)†* ○ *Ears (TM) (hearing inquiry/screening)** ○ Heart/Lungs ○ Umbilicus ○ Femoral pulses ○ Hips ○ Muscle tone* ○ Testicles ○ Male urinary stream/foreskin care			○ Fontanelles ○ *Eyes (red reflex)†* ○ Corneal light reflex† ○ *Hearing inquiry/screening** ○ Heart ○ Hips ○ Muscle tone*		
PROBLEMS AND PLANS	○ **PKU, Thyroid** ○ **Hemoglobinopathy screen (if at risk)***								
IMMUNIZATION Provincial guidelines may differ	Record on Guide V: Immunization Record If HBsAg-positive parent or sibling: ○ **Hepatitis B vaccine**			Record on Guide V: Immunization Record			Record on Guide V: Immunization Record If HBsAg-positive parent or sibling: ○ **Hepatitis B vaccine**		

Grades of evidence: (A) **Bold type – Good evidence** (B) Italic – Fair evidence (C) Plain – Controversial or insufficient evidence
(*) see Infant/Child Health Maintenance Selected Guidelines on reverse of Guide I (**) see Healthy Child Development Selected Guidelines on reverse of Guide IV

Disclaimer: Given the continually evolving nature of evidence and changing recommendations, the Rourke Baby Record-EB is meant to be used as a guide only.
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BOURKE BABY RECORD INFANT/CHILD HEALTH MAINTENANCE SELECTED GUIDELINES/RESOURCES - Dec 2006

GROWTH

Measuring growth - Serial measurements of recumbent length (birth to age 3 or 2) or height (2 to age 20), weight, and head circumference (birth to age 2) should be part of scheduled well-baby and well-child health visits in order to identify infants and children with disturbances in rates of weight gain or physical growth. Until internationally-driven growth charts are available and have been reviewed for use in Canada, the growth charts from the American Centers for Disease Control and Prevention (CDC) are recommended (use 2 with 3rd and 97th percentiles).

Important: Correct age if < 36 weeks gestation

- www.ask.gov.bc.ca/about.asp?p=/about/gprovbc/charts/clinical_charts.html#CDnPAGG
- Use of growth charts - www.cps.ca/english/statements/PP/pp04-01.htm
- Guide to growth charts - www.cps.ca/english/statements/N/Nutrition/Growth.htm

NUTRITION

- Pediatric nutrition guidelines – Nutrition for Healthy Term Infants
  - www.hc-sc.gc.ca/fn-an/pubs/infant-nourrisson/nut_infant_nourrisson_term_e.html
- **Breastfeeding:** Exclusive breastfeeding is recommended for the first six months of life for healthy term infants. Breast milk is the optimal food for infants, and breastfeeding (with complementary foods) may continue for up to two years and beyond unless contraindicated. Breastfeeding reduces gastrointestinal and respiratory infections. Maternal support (both antepartum and peripartum) increases breastfeeding and prolongs its duration. Early and frequent nursing in late summer, warming in, and learning handlers of first infant formula increase breastfeeding rates.
- Routine **Vitamin D supplementation** of 10 µg = 400 IU/day (20 µg = 800 IU/day in northern communities) is recommended for all breastfed full term infants until the diet provides a sufficient source of Vitamin D (about 1 year of age).
  Breastfeeding - www.cps.ca/english/statements/N/Breastfeeding/default.htm
  Weaning - www.cps.ca/english/statements/P/pp04-01.htm
  Vitamin D - www.cps.ca/english/statements/B/vitD-02.htm
  Colic - www.cps.ca/english/statements/N/Newborn/ConAnge04.htm
  Allergy/hypersensitivity and breastfeeding - www.cps.ca/english/statements/CP/pp02-02.htm
  Maternal medications during breastfeeding – Medications and Mothers' Milk by T. Hale (2002).
  Motherisk - www.motherisk.org
- Transition to lower-fat diet. A gradual transition from the high-fat infant diet to a lower-fat diet (max 30% fat / 10% saturated fat) begins after age 2 years.
  - www.cps.ca/english/statements/N/pp04-01.htm
- Encourage healthy diet as per Canada's Food Guide
  - www.hc-sc.gc.ca/fn-an/food-guide-aliment/index_e.html

INJURY PREVENTION

In Canada, unintentional injuries are the leading cause of death in children and youth. Most of these preventable injuries are caused by motor vehicle collisions, drowning, burns, choking, and falls.

Motor vehicle collisions

- Transport Canada 2000 recommendations for **Car seats:**
  Children < 13 years should sit in the rear seat. Keep kids away from all airbags.
  Use rear-facing infant seat until 10 kg (22 lb.) - birth to at least 1 year old
  Use forward-facing child seat from 10 kg (22 lb.) to 18-22 kg (40-49 lb.)
  - about 1-4½ years old - as per manufacturer seat model
  Use booster seat from 18-22 kg (40-49 lb.) to 27 kg (60 lb.) – about 4½-8 years old
  Use lap and shoulder belt in the rear seat for older children
  - www.tc.gc.ca/roadsafety/childsafety/menu.htm, www.smartdriving.ca/english/safetyfirst/SFCT.htm
- **Bicycle** wear **blue helmets**

Drowning

- *Bath safety:* Never leave a young child alone in the bath. Do not use infant bath rings or bath seats.
- *Water safety:* Encourage swimming lessons (after age 4 years). Encourage pool, diving, and boating safety to reduce the risk of drowning.
  - www.cps.ca/english/statements/PP/PP04-01.htm

Burns: *Install smoke detectors in the home on every level*

Keep hot water at a temperature < 49°C.

Choking: Use safe toys and safe food (avoid hard, small and round, smooth and slippery solid foods until age 3 years).

Falls: Assess home for hazards, e.g. never leave baby alone on change table or other high surface, do not use baby walkers, use window guards and stair gates.

Poisons: Keep medicines and cleaners locked up and out of child's reach.

Have Poison Control Centre number handy. *Use of ipecac is contraindicated in children.*

Safe sleeping environment: www.cps.ca/english/statements/CP/pp04-02.htm

- **Sleep position and SIDS/Positional plagiocephaly:** Healthy infants should be positioned on their backs for sleep. Their heads should be placed in different positions on alternate days. While awake, infants should have supervised tummy time. Counsel parents on the dangers of other contributory causes of SIDS such as overheating, maternal smoking or second-hand smoke.
- Positional plagiocephaly – www.cps.ca/english/statements/F/fpt01-02.htm
- **Bed sharing:** advise against bed sharing.
- **Cosleeping:** Encourage nursing infant in a parent-room separate crib in parents' room for the first 6 months of life. Room sharing is protective against SIDS.

Firearm safety/removal: There is evidence-based association between a firearm in the home and increased risk of unintentional firearm injury, suicide, or homicide.

For more safety information: www.safekidscanada.ca
www.cps.ca/english/injuryprevention/InjuryPrevWorks.htm

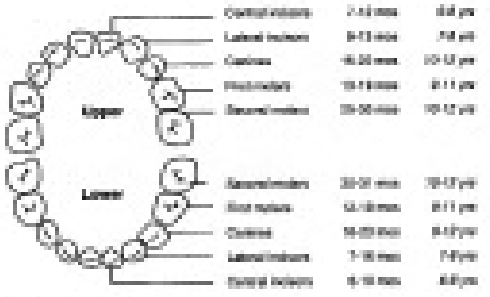
PROBLEMS AND PLANS (SCREENING)

Hemoglobin screening: All infants from high-risk groups for iron deficiency anemia require Hgb determination between 6 and 12 months of age, e.g. Lower SES; Asian; First Nations children; low-birth-weight infants; and infants fed whole cow's milk during their first year of life.

Hemoglobinopathy screening: Screen all neonates from high-risk groups, e.g. Asian, African, and Mediterranean.

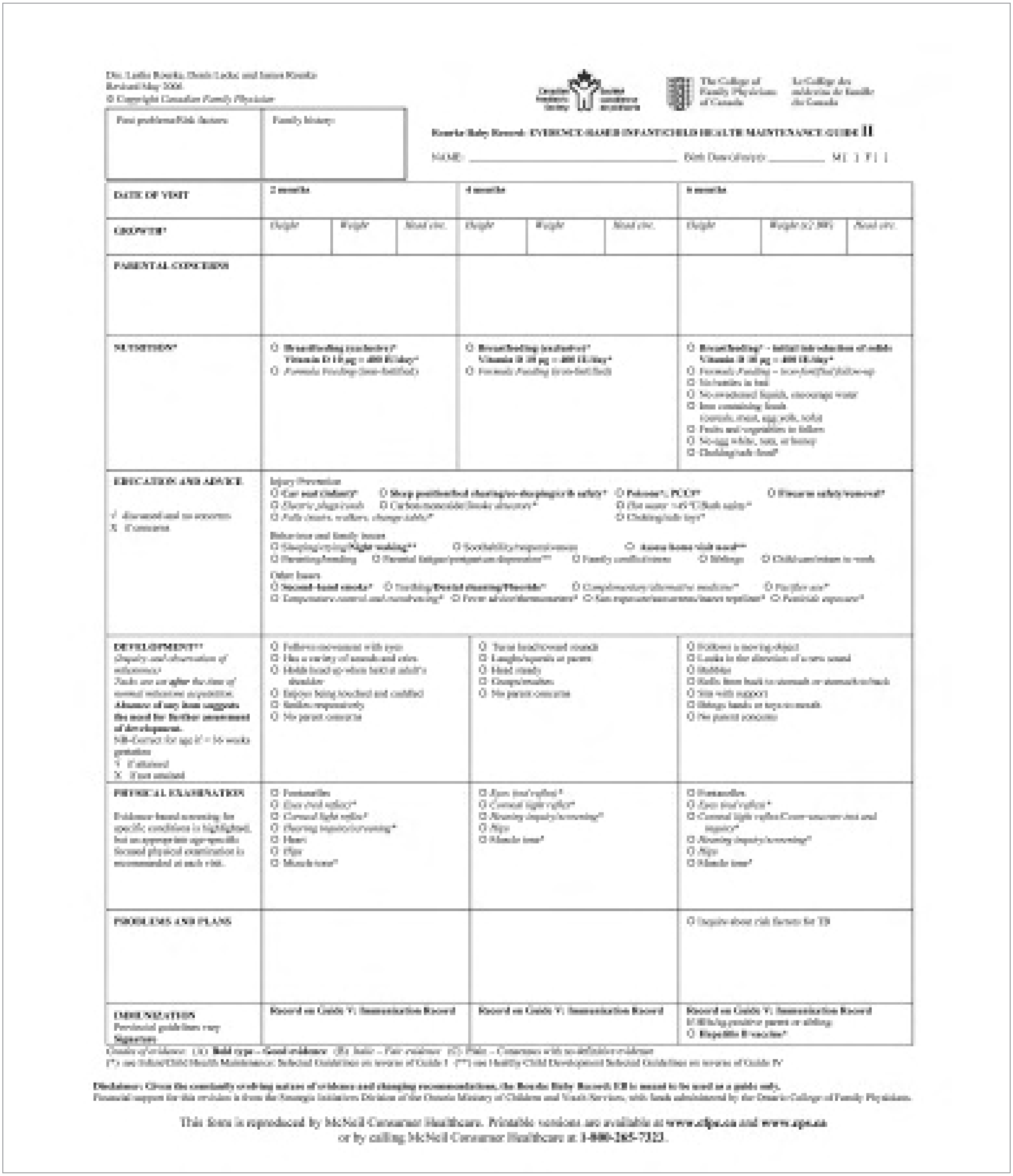
OTHER

- **Second-hand smoke exposure:** contributes to childhood illnesses such as URTI, middle ear infection, persistent cough, pneumonia, asthma, and SIDS.
- *Complementary and alternative medicine (CAM)* – Questions should be routinely asked on the use of homeopathy and other complementary and alternative medicine therapy or products, especially for children with chronic conditions.
  - www.cps.ca/english/statements/DE/DE98-01.htm
  - Homeopathy – www.cps.ca/english/statements/CP/cp00-01.htm
- *Pacifier use* is a personal choice. Pacifier use may decrease risk of SIDS, but may lead to breastfeeding difficulties, and should be restricted in children with chronic and recurrent otitis media. – www.cps.ca/english/statements/CP/cp00-01.htm
- **Fever advice/thermometers:** Rectal temperature is the method of choice in those < 5 years and oral temperature thereafter. Fever ≥ 38°C in an infant < 3 months needs urgent evaluation. Acetaminophen remains the first choice for antipyresis. Ibuprofen is a second choice therapy for children > 2 years.
  - Temperature measurement - www.cps.ca/english/statements/CP/cp00-01.htm
- Footwear: Shoes are for protection, not correction. Walking barefoot develops good toe gripping and muscular strength - www.cps.ca/english/statements/CP/cp98-01.htm
- Healthy Active Living: Encourage increased physical activity and decreased sedentary positions with parents as role models.
  - www.cps.ca/english/statements/HAL/HALG-01.htm
  - Media use - www.cps.ca/english/statements/PP/pp01-01.htm
- Sun exposure/sunscreen/insect repellents: Minimize sun exposure. Wear protective clothing, hats, properly applied sunscreens with SPF ≥ 30 for those > 6 months of age. No DEET in < 6 months; 6-12 months 10% apply sunscreen once daily.
- *Pesticides*: Avoid pesticide exposure. Encourage pesticide-free foods.
  - Pesticides/herbicides - www.sofe.ca.ca/english/environmentalissues/publicissuesdefault.asp?s=1#Environmentalhealth
- *Lead Screening* is recommended for children who:
  - in the last 6 months lived in a house or apartment built before 1950;
  - live in a home with recent or ongoing renovations or peeling or chipped paint;
  - have a sibling, housemate, or playmate with a prior history of lead poisoning;
  - have been seen eating paint chips.
- Websites about environmental issues:
  - Canadian Partnership for Children's Health & Environment (CPCHE) - www.healthyenvironmentforkids.ca/
  - Health and housing - www.cmhc-schl.gc.ca/
  - Environmental health section of CDC - www.cdc.gov/nceh/default.htm
  - Commission for Environmental Cooperation – www.cec.org/children
- **Dental Care:**
  - **Dental cleaning:** After the eruption of the first teeth, clean with only water using a washcloth or soft brush until age 2 years; thereafter using only a pea-sized amount of fluoridated dentifrice, independent brushing should occur under parental supervision.
  - **Fluoride** supplements are recommended where ingestion from all sources is low. Sources include fluoridated dentifrice and all home/child-care water sources. Fluoride is to be started only after the eruption of the first primary teeth. Dose for those at high risk for dental caries with water < 0.3 ppm fluoride is 0.25 mg for children 6 months to 3 years, 0.50 mg for age 3 to 6 years, and 1 mg for children > 6 years.
  - *To prevent dental caries, avoid sweetened liquids and constant sipping of milk or natural juices in both bottle and cup.*



PHYSICAL EXAMINATION

- *Eyes – Corneal light reflex/Cover-uncover test and inquiry for strabismus:*
  With the child focusing on a light source, the light reflex on the cornea should be symmetrical. Each eye is then covered in turn, for 2-3 seconds, and then quickly uncovered. The test is abnormal if the uncovered eye "wanders" and when uncovered moves forward or outward to focus on "Air" on the light source.
- *Vision screening* – Children should be screened in their preschool years for amblyopia or its risk factors, as well as for serious ocular diseases, such as retinoblastoma and cataracts.
  - www.cps.ca/english/statements/CP/cp98-01.htm
- *Hearing screening/inquiry* – Questions on hearing acuity are recommended for all infants and children. In the absence of universal newborn screening, formal audiology testing should be performed in all high-risk infants. Older children should be screened if clinically indicated.
  - http://happyday.ampublications.org/cgi/content/full/pediatrics;111/2/436
- Muscle tone – Evaluation for spasticity, rigidity, and hypotonia should occur.
- Adenotonsillar hypertrophy and presence of sleep disordered breathing warrants assessment for obstructive sleep apnea.
  - http://happyday.ampublications.org/cgi/reprint/pediatrics;109/4/704.pdf



Rourke Baby Record: EVIDENCE-BASED INFANT/CHILD HEALTH MAINTENANCE GUIDE II

NAME:

DATE OF VISIT	2 months	4 months	6 months
GROWTH*			
PARENTAL CONCERNS			
NUTRITION*			
EDUCATION AND ADVICE			
DEVELOPMENT**			
PHYSICAL EXAMINATION			
PROBLEMS AND PLANS			
IMMUNIZATION	Record on Guide V: Immunization Record	Record on Guide V: Immunization Record	Record on Guide V: Immunization Record

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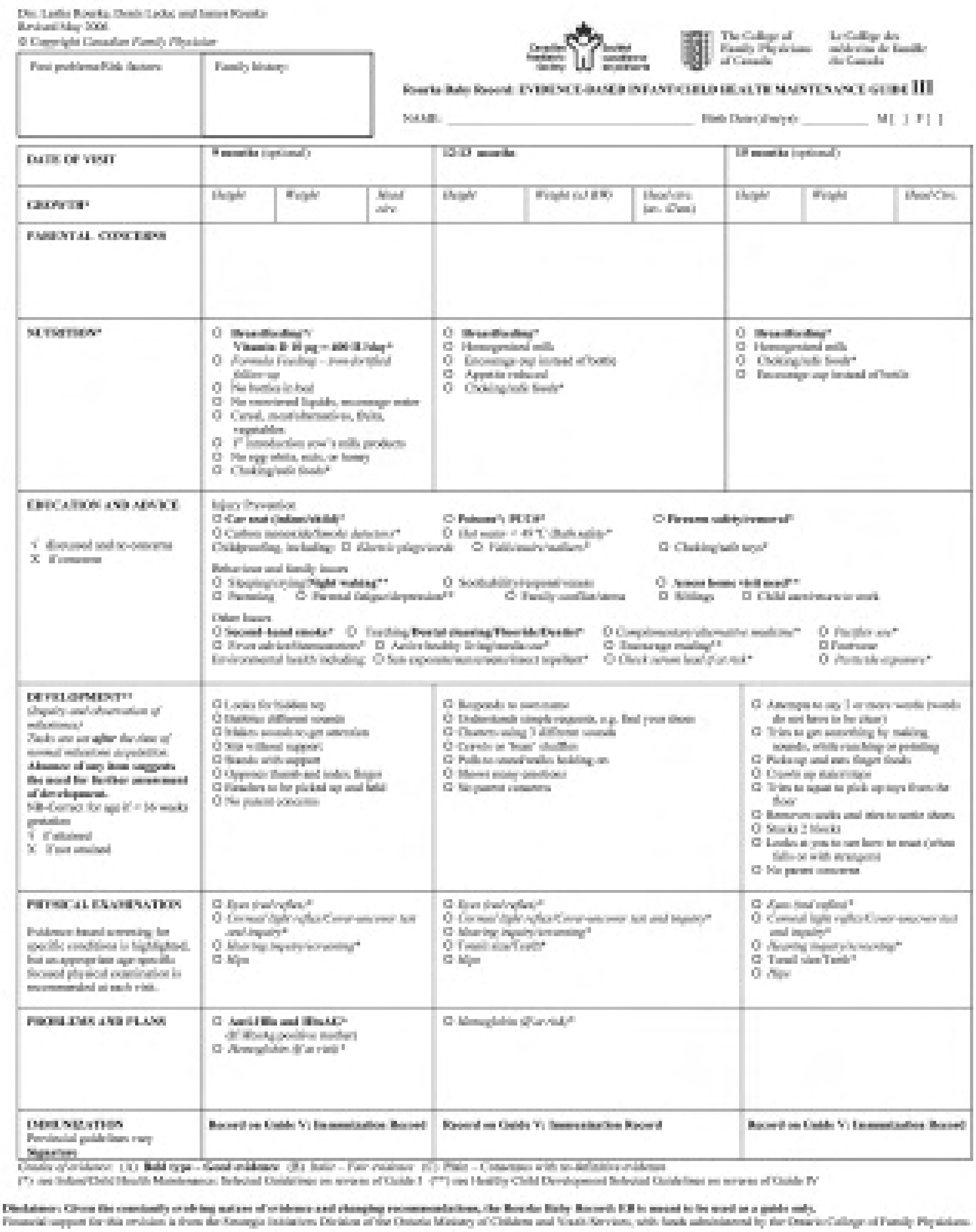
Rourke Baby Record: EVIDENCE-BASED INFANT/CHILD HEALTH MAINTENANCE GUIDE III

NAME: ______________________ Birth Date (d/m/yr) __________ M [ ] F [ ]

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	9 months (optional)	12-13 months	15 months (optional)
DATE OF VISIT			
GROWTH*	Height / Weight / Head circ.	Height / Weight / Head circ.	Height / Weight / Head Circ.
PARENTAL CONCERNS			
NUTRITION*			
EDUCATION AND ADVICE			
DEVELOPMENT**			
PHYSICAL EXAMINATION			
PROBLEMS AND PLANS			
IMMUNIZATION	Record on Guide V: Immunization Record	Record on Guide V: Immunization Record	Record on Guide V: Immunization Record

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Drs. Ladis Rourke, Doris Lickte and James Rourke
Revised May 2006

The College of Family Physicians of Canada | Le Collège des médecins de famille du Canada

Past problems/Risk factors:	Family history:

Rourke Baby Record: EVIDENCE-BASED INFANT/CHILD HEALTH MAINTENANCE GUIDE IV

Birth Date (dd/mm/yy): _____ NAME: _____

M [ ] F [ ]

DATE OF VISIT	18 months			2-3 years			4-5 years	
GROWTH*	Height	Weight	Head circ.	Height	Weight	Head circ. if prior abnormal	Height	Weight
PARENTAL CONCERNS								
NUTRITION*	☐ **Breastfeeding*** ☐ Homogenized milk ☐ No bottles			☐ Homogenized or 2% milk ☐ Gradual transition to lower fat diet* ☐ Canada's Food Guide*			☐ 2% milk ☐ Canada's Food Guide*	
EDUCATION AND ADVICE Injury Prevention Behaviour Family Other √ discussed and no concerns X if concerns	☐ **Car seat (rear)*** ☐ Bath safety** ☐ Clothing/bath toys* ☐ Parent/child interaction ☐ Discipline/Limit setting** ☐ Parental fatigue/stress/depression** ☐ High-risk children** ☐ Socializing/peer play opportunities ☐ **Dental Care/Fluoride*** ☐ Toilet learning**			☐ **Car seat (child/booster)*** ☐ Bike/Helmet* ☐ **Firearm safety/removal*** ☐ Carbon monoxide/Smoke detectors* ☐ Matches ☐ Water safety ☐ Parent/child interaction ☐ Discipline/Limit setting** ☐ High-risk children** ☐ Parental fatigue/depression** ☐ Family conflict/stress ☐ Siblings ☐ **Second-hand smoke*** ☐ **Dental cleaning/Fluoride/Routine*** ☐ Complementary/alternative medicine* ☐ Toilet learning** ☐ Active healthy living/media use* ☐ Socializing opportunities ☐ Encourage reading** ☐ Access day care/preschool needs/school readiness** Environmental health including: ☐ Sun exposure/sunscreen/insect repellent* ☐ Pesticide exposure* ☐ Chest screen/hearing/car seat*		
DEVELOPMENT** (Inquiry and observation of milestones) *Risks are in addition to those of normal milestone acquisition.* ***Absence of any item suggests the need for further assessment of development.*** NB-Correct for age if < 36 weeks gestation √ If attained X If not attained.	Social/Emotional ☐ Child's behaviour usually manageable ☐ Usually easy to soothe ☐ Comes for comfort when distressed Communication Skills ☐ Points to 1 of 3 (Nose/body parts) ☐ Tries to get your attention to see something of interest ☐ Personal play with toys and figures (e.g., feeds doll/animal) ☐ Turns when name is called ☐ Imitates speech sounds regularly ☐ Produces 3 consonants, e.g. P M B W H N Motor Skills ☐ Walks backward 2 steps without support ☐ Feeds self with spoon with little spilling Adaptive Skills ☐ Removes hat/socks without help ☐ No parent concerns			**2 years** ☐ At least 1 new word/week ☐ 2-word sentences ☐ Tries to use ☐ Puts objects into small container ☐ Copies adult's actions ☐ Continues to develop new skills ☐ No parent concerns **3 years** ☐ Understands 2 step direction ☐ Tries to take off jars or turns knobs ☐ Turns pages one at a time ☐ Shares some of the time ☐ Listens to stories for 5-10 minutes with adults ☐ No parent concerns	**4 years** ☐ Understands related 3 part directions ☐ Asks lots of questions ☐ Stands on 1 foot for 1-5 seconds ☐ Enjoys a person with at least 3 body parts ☐ Toilet trained during the day ☐ Tries to wash or dress self ☐ No parent concerns **5 years** ☐ Counts to 10 and knows common colours and shapes ☐ Speaks clearly in sentences ☐ Throws and catches ball ☐ Hops on 1 foot ☐ Shares willingly ☐ Works alone at an activity for 20-30 minutes ☐ Separates easily from parents ☐ No parent concerns
PHYSICAL EXAMINATION Evidence-based screening for specific conditions is highlighted, but an appropriate age-specific focused physical examination is recommended at each visit.	☐ *Eyes tested/ref.** ☐ Corneal light reflex/Cover-uncover test and inquiry* ☐ Hearing inquiry ☐ Tonsil size/Teeth*			☐ *Blood pressure* ☐ *Eyes tested/ref/Visual acuity** ☐ Corneal light reflex/Cover-uncover test and inquiry* ☐ Hearing inquiry ☐ Tonsil size/Teeth*			☐ *Blood pressure* ☐ *Eyes tested/ref/Visual acuity** ☐ Corneal light reflex/Cover-uncover test and inquiry* ☐ Hearing inquiry ☐ Tonsil size/Teeth*	
PROBLEMS AND PLANS								
IMMUNIZATION Provincial guidelines may differ Signature	**Record on Guide V: Immunization Record**			**Record on Guide V: Immunization Record**			**Record on Guide V: Immunization Record**	

Grades of evidence: (A) **Bold type - Good evidence** (B) Italic - Fair evidence (C) Plain - Consensus with no definitive evidence
(*) see Ontario Child Health Maintenance: Selected Guidelines on reverse of Guide I (**) see Healthy Child Development: Selected Guidelines on reverse of Guide IV

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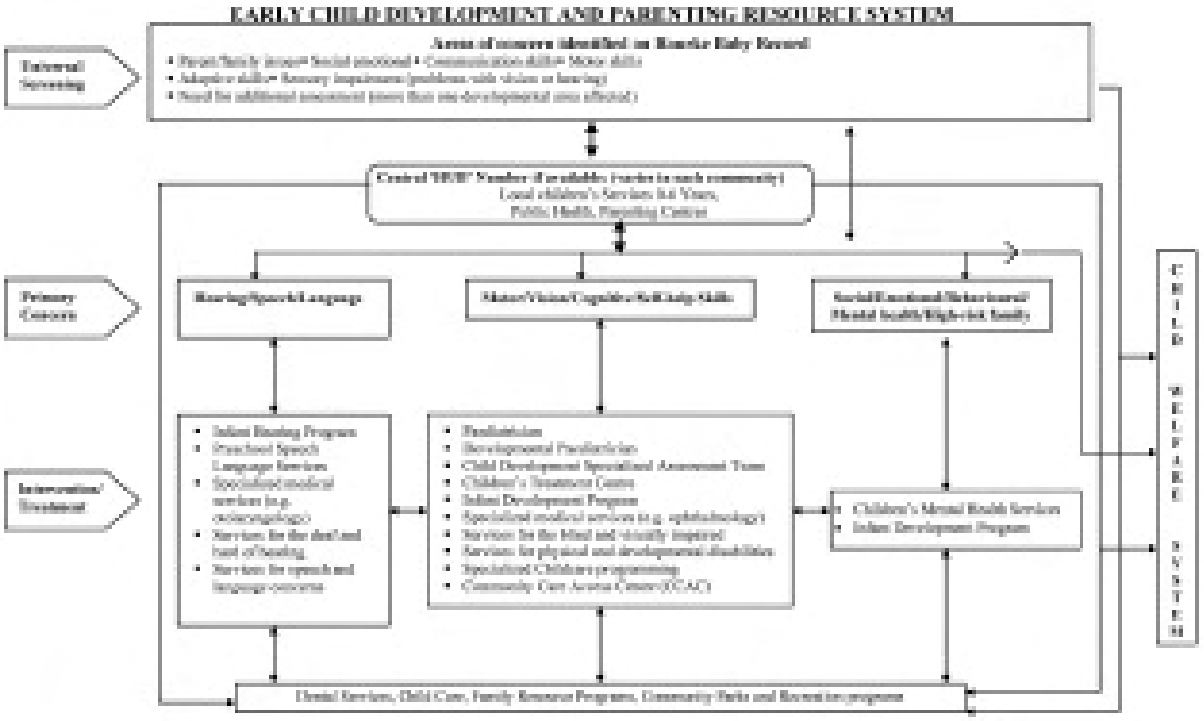
BOURKE BABY RECORD HEALTHY CHILD DEVELOPMENT SELECTED GUIDELINES/RESOURCES - May 2006
DEVELOPMENT
SLEEP/REST
PARENTING/DISCIPLINE
TOILET LEARNING
LITERACY
AUTISM SPECTRUM DISORDER
PARENTAL/FAMILY ISSUES AFFECTING DEVELOPMENT
Risk factors for physical abuse:
Risk factors for sexual abuse:


EARLY CHILD DEVELOPMENT AND PARENTING RESOURCE SYSTEM
Universal Screening
Primary Concern
Intervention/ Treatment
CHILD SERVICE SYSTEM

Drs. Leslie Rourke, Doris Louka and James Rourke
Revised May 2006

The College of Family Physicians of Canada | Le Collège des médecins de famille du Canada

Rourke Baby Record: EVIDENCE-BASED INFANT/CHILD HEALTH MAINTENANCE GUIDE V

NAME: _____ Date of birth(yr) _____ M F

Childhood Immunization Record: as per NACI Recommendations (as of March 2006)

For additional information, refer to the National Advisory Committee on Immunization website: www.phac-aspc.gc.ca/naci-coni/

Provincial guidelines are available online: www.phac-aspc.gc.ca/im/information-provinces/table-1_e.html

Date given	NACI recommendations	Injection site	Lot number	Expiry date	Initials	Comments
DTaP/IPV/ Hib	4 doses: (2, 4, 6, 18 months) dose #1 (2 months)					
	dose #2 (4 months)					
	dose #3 (6 months)					
	dose #4 (18 months)					
Pneu-Conj	4 doses: (2, 4, 6, 12-15 months) dose #1 (2 months)					
	dose #2 (4 months)					
	dose #3 (6 months)					
	dose #4 (12-15 months)					
Men-Conj	3 doses(2, 4, 6-month) OR 1 dose (12 months OR 14 - 16 years)					
Hepatitis B	3 doses (0, 1, 6 months) 2-3 doses: prior to birth dose #1					
	dose #2					
	± dose #3					
MMR	2 doses (12 months, 18 months OR 4 years) dose #1 (12 months)					
	dose #2 (18 months OR 4 years)					
Varicella	1 dose (12 months - 12 years) OR 2 doses (12 years) dose #1					
	± dose #2					
DTaP/IPV	1 dose (4-6 years)					
dTap	1 dose (11-16 years)					
Influenza	1 dose annually (6-23 months and high risk > 2 years) First year only for > 9 years – give 2 doses one month apart					
Other						

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ROURKE BABY RECORD INFECTIOUS DISEASES AND IMMUNIZATION SELECTED GUIDELINES/RESOURCES - May 2006

ROUTINE IMMUNIZATION
National Advisory Committee on Immunization (NACI) recommended immunization schedules for infants, children and youth can be found at the following website: www.phac-aspc.gc.ca/naci-ccni/.

Provincial/territorial immunization schedules may differ based on funding differences. For provincial/territorial immunization schedules, see Canadian Nursing Coalition on Immunization chart on the website of the Public Health Agency of Canada: www.phac-aspc.gc.ca/im/ptimprog-progimpt/table-1_e.html.

For review, see "Immunization update 2003: Stepping forward" available on-line at www.cps.ca/english/statements/ID/PIDNotes/immunization2003.htm.

Vaccine Notes (Adapted from NACI)

Diphtheria, Tetanus, acellular Pertussis and inactivated Polio virus vaccine (DTaP-IPV): DTaP-IPV vaccine is the preferred vaccine for all doses in the vaccination series, including completion of the series in children < 7 years who have received ≥ 1 dose of DPT (whole cell) vaccine (e.g., recent immigrants).

Haemophilus influenzae type b conjugate vaccine (Hib): Hib schedule shown is for the Haemophilus b capsular polysaccharide – PRP conjugated to tetanus toxoid (Act-HIB™) or the Haemophilus b oligosaccharide conjugate - HBOC (HIBTITER™) vaccines. This vaccine may be combined with DTaP in a single injection.

Measles, Mumps and Rubella vaccine (MMR): A second dose of MMR is recommended, at least 1 month after the first dose for the purpose of better measles protection. For convenience, options include giving it with the next scheduled vaccination at 18 months of age or at school entry (4-6 years) (depending on the provincial/territorial policy), or at any intervening age that is practical. The need for a second dose of mumps and rubella vaccine is not established but may benefit (given for convenience as MMR). The second dose of MMR should be given at the same visit as DTaP-IPV (± Hib) to ensure high uptake rates. MMR and varicella vaccines should be administered concurrently (at different sites) or separated by at least 4 weeks.

Varicella vaccine: Children aged 12 months to 12 years who have not had varicella should receive one dose of varicella vaccine. Unvaccinated individuals ≥ 13 years who have not had varicella should receive two doses at least 28 days apart. Varicella and MMR vaccines should be administered concurrently (at different sites) or separated by at least 4 weeks.

Hepatitis B vaccine (Hep B): Hepatitis B vaccine can be routinely given to infants or preadolescents, depending on the provincial/territorial policy. For infants born to chronic carrier mothers, the first dose should be given at birth (with Hepatitis B immune globulin), otherwise the first dose can be given at 2 months of age to fit more conveniently with other routine infant immunization visits. The second dose should be administered at least 1 month after the first dose, and the third at least 2 months after the second dose, but again may fit more conveniently into the 4- and 6-month immunization visits. A two-dose schedule for adolescents is an option. (See also SELECTED INFECTIOUS DISEASES RECOMMENDATIONS below.)

Pneumococcal conjugate vaccine - 7-valent (Pneu-C-7): Recommended schedule, number of doses and subsequent use of 23 valent polysaccharide pneumococcal vaccine depend on the age of the child, if at high risk for pneumococcal disease, and when vaccination is begun.

Meningococcal C conjugate vaccine (Men-Conj): Recommended schedule and number of doses of meningococcal vaccine depend on the age of the child. If the provincial/territorial policy is to give Men-Conj after 12 months of age, 1 dose is sufficient.

Diphtheria, Tetanus, acellular Pertussis vaccine - adult/adolescent formulation (dTap): a combined adsorbed "adult type" preparation for use in people ≥ 7 years of age, contains less diphtheria toxoid and pertussis antigens than preparations given to younger children and is less likely to cause reactions in older people. This vaccine should be used in individuals ≥ 7 years receiving their primary series of vaccines.

Influenza vaccine (Flu): Recommended for all children between 6 and 23 months of age, and for older high-risk children. Previously unvaccinated children up to 9 years of age require 2 doses with an interval of at least 4 weeks. The second dose is not required if the child has received one or more doses of influenza vaccine during the previous immunization season.

SELECTED INFECTIOUS DISEASES RECOMMENDATIONS

See CPS position statements of the Infectious Diseases and Immunization Committee: www.cps.ca/english/publications/InfectiousDiseases.htm.

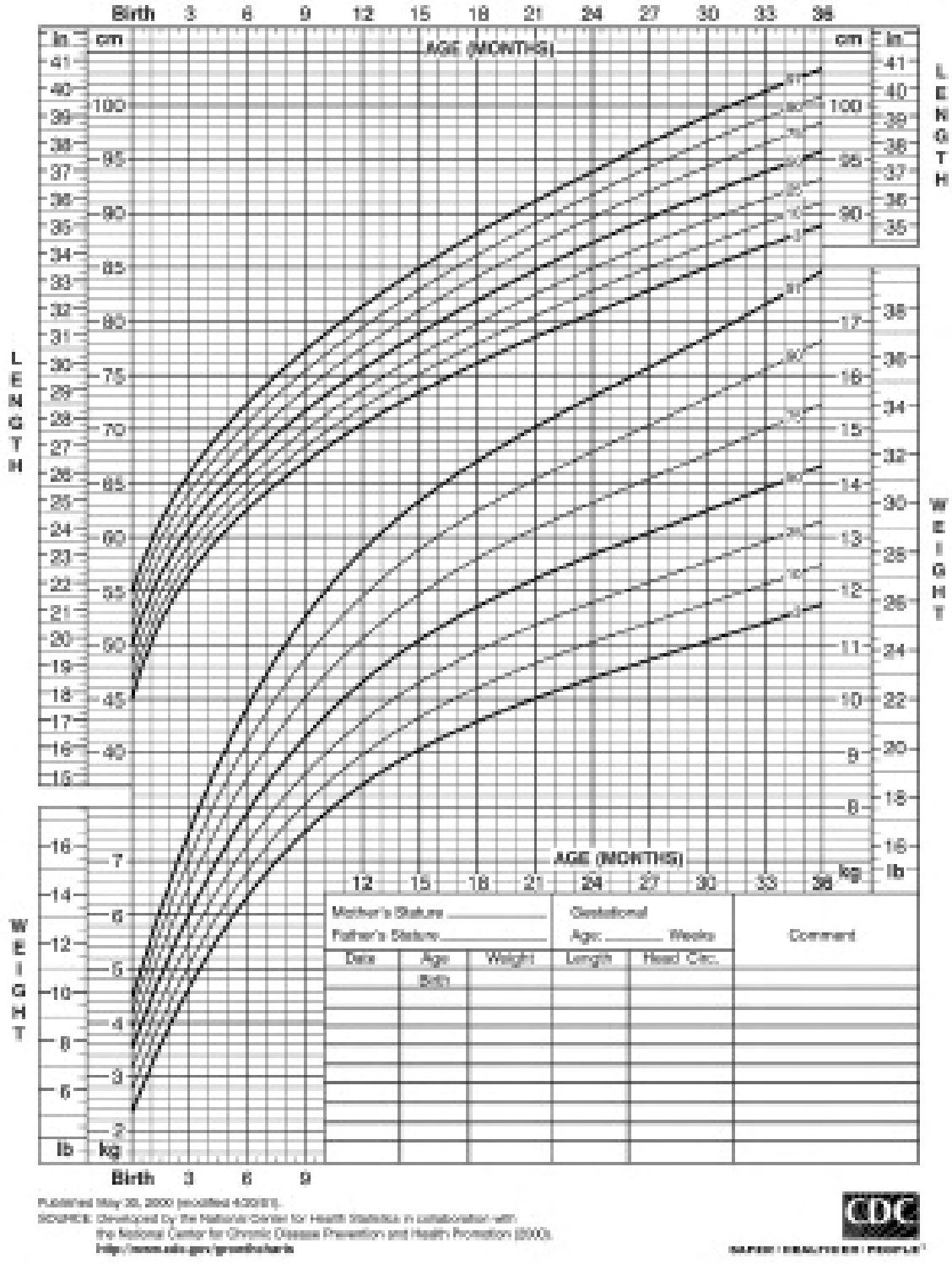
- **Hepatitis B immune globulin and immunization:**
  Infants with HBsAg-positive parents or siblings require Hepatitis B vaccine at birth, at 1 month, and 6 months of age.
  Infants of HBsAg positive mothers also require Hepatitis B immune globulin at birth.

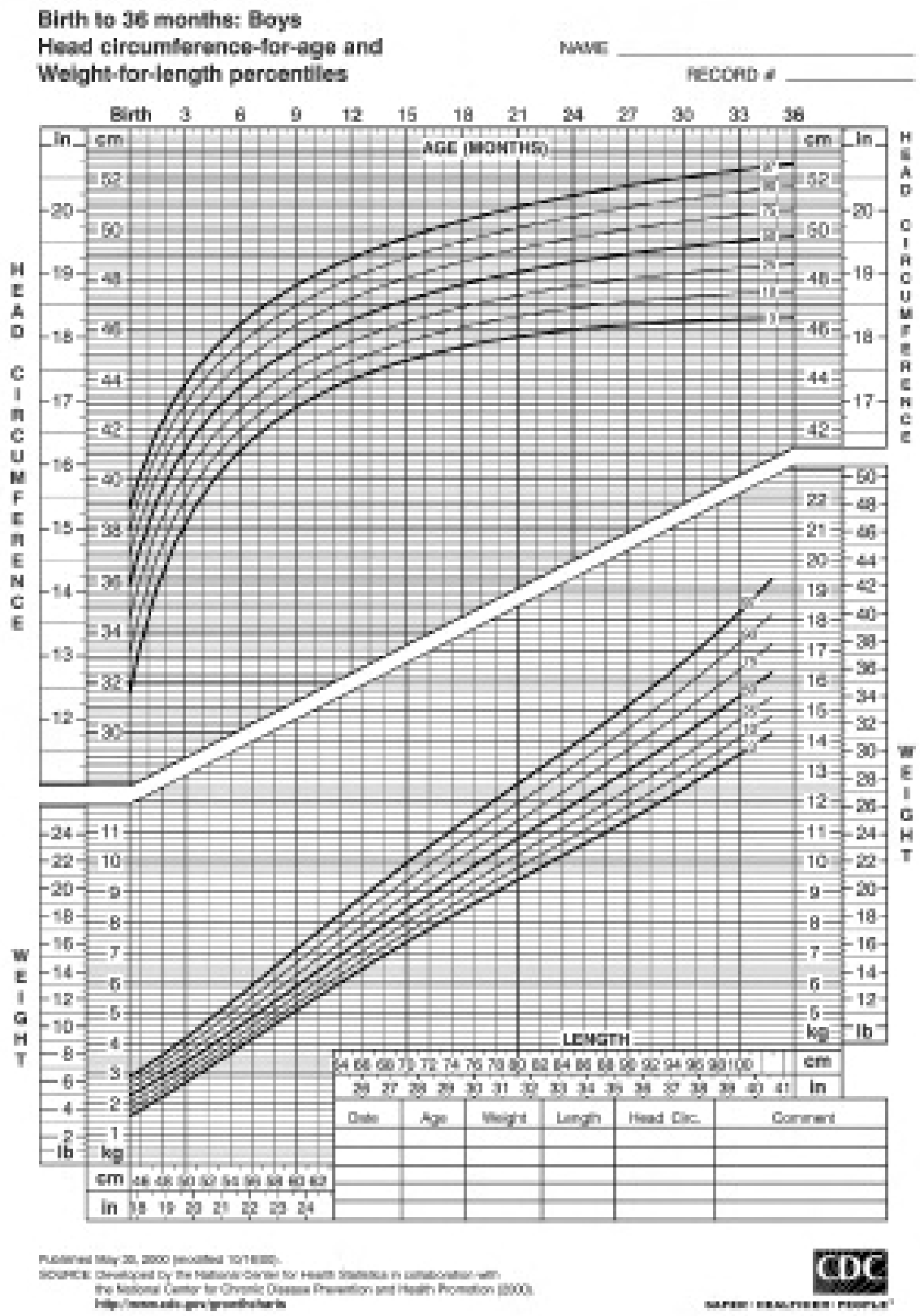
  Hepatitis B vaccine should also be given to all infants from high-risk groups, such as:
  - infants where at least one parent has emigrated from a country where Hepatitis B is endemic;
  - infants of mothers positive for Hepatitis C virus;
  - infants of substance-abusing mothers.

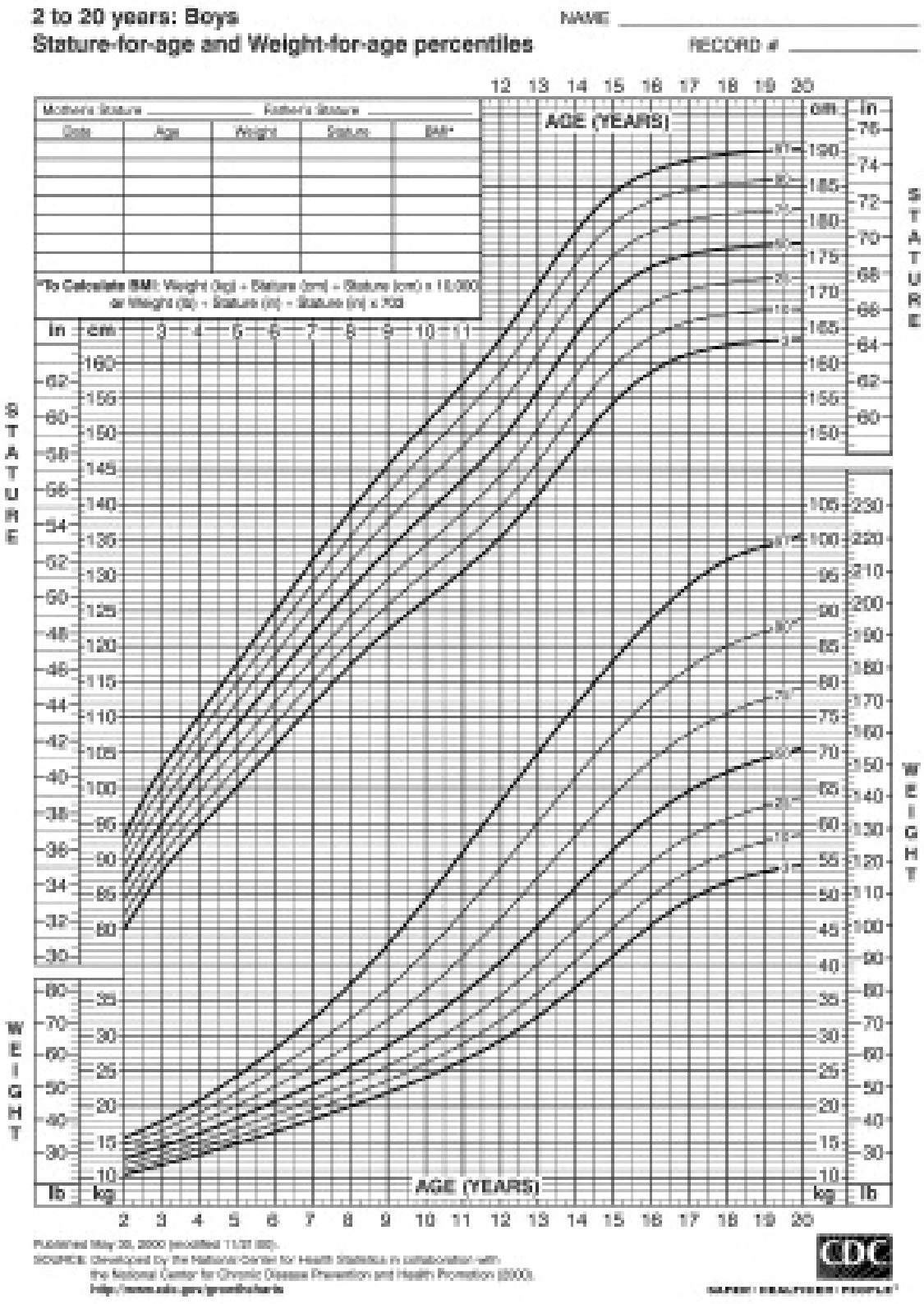
- **Human Immunodeficiency Virus type 1 (HIV-1) maternal infection:**
  Breastfeeding is contraindicated for an HIV-1 infected mother even if she is receiving antiretroviral therapy.

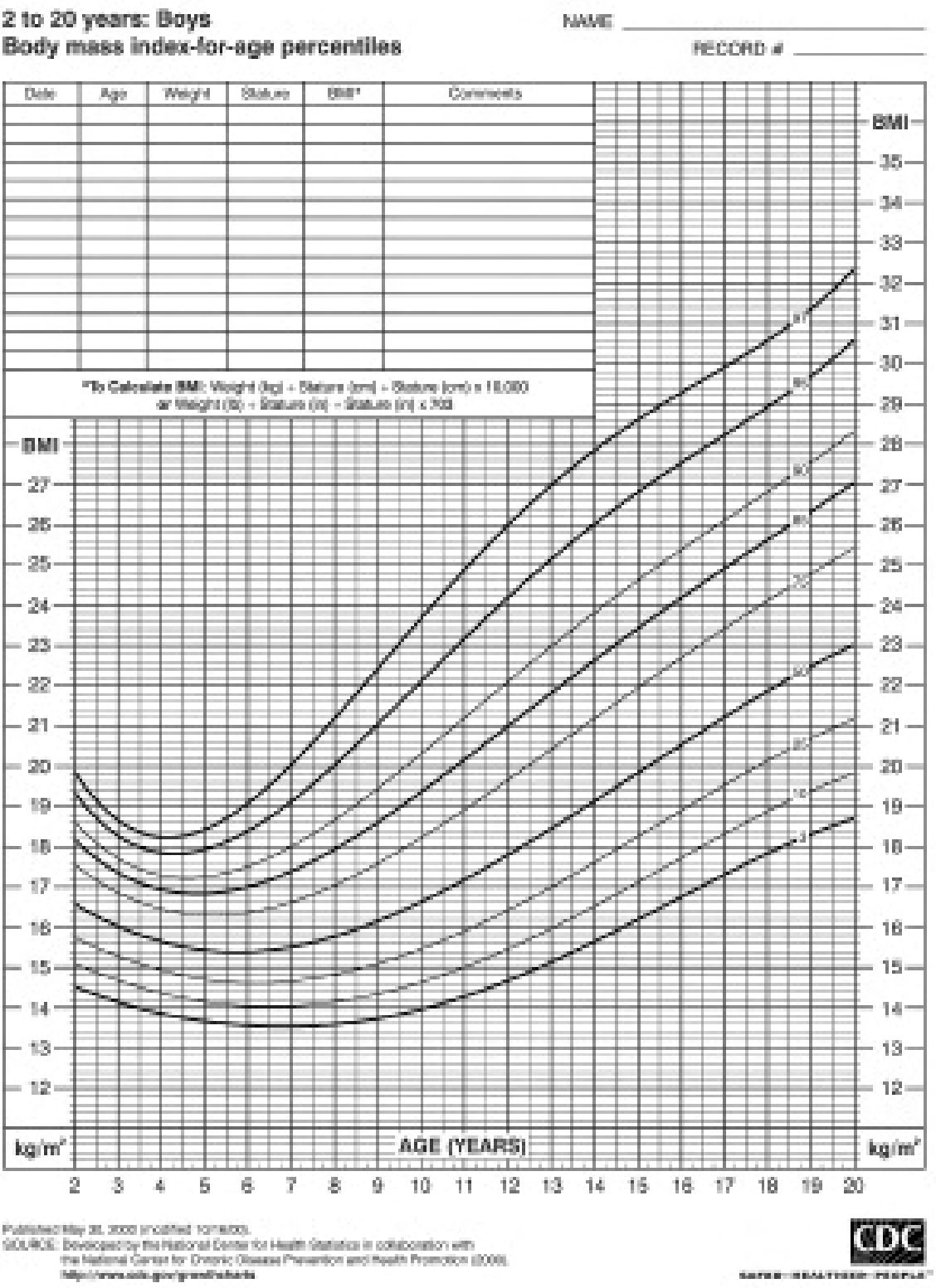
- **Hepatitis A or A/B combined (when Hepatitis B vaccine has not been previously given):**
  These vaccines should be considered when traveling to countries where Hepatitis A or B are endemic.

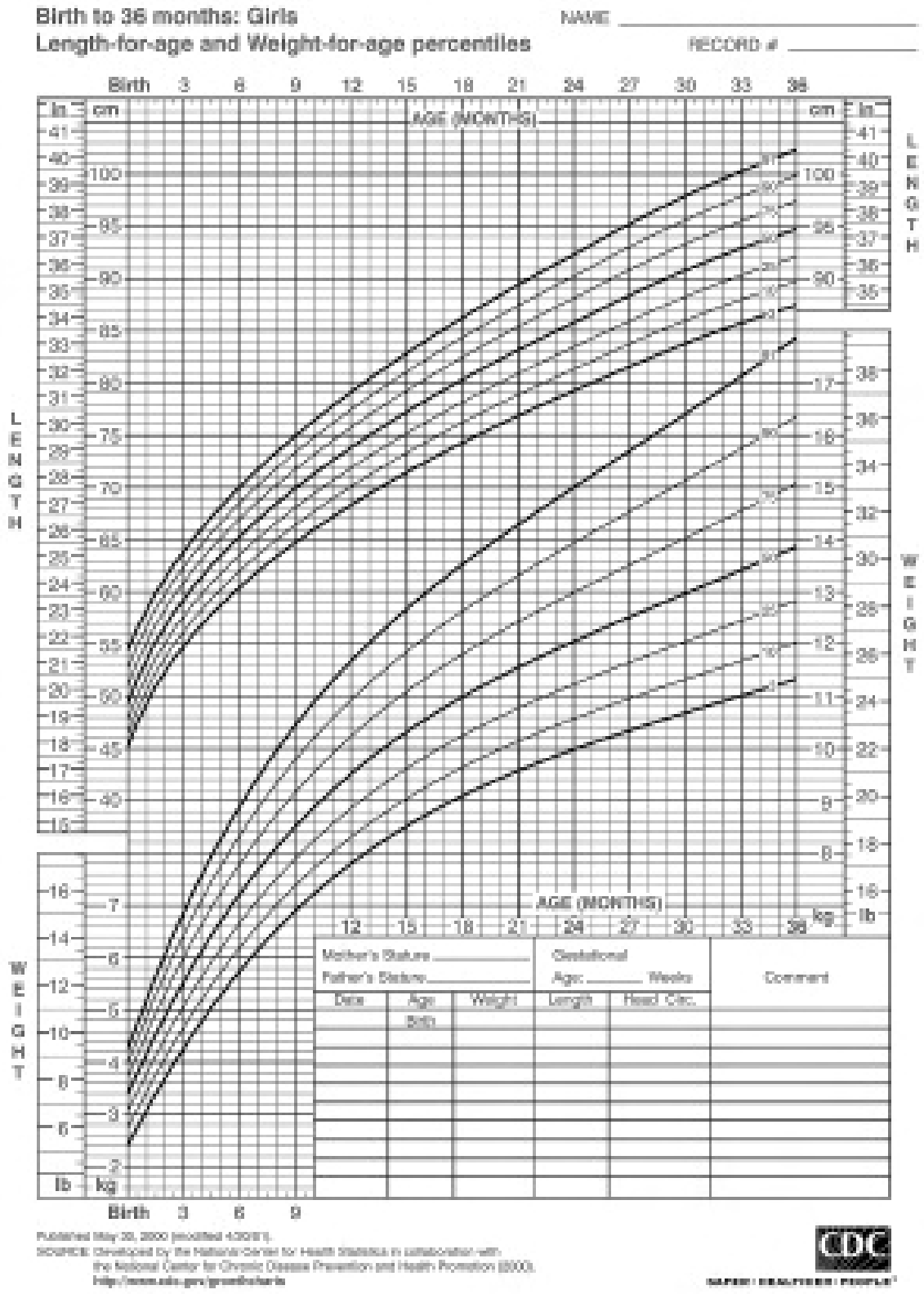
- **Tuberculosis - TB skin testing:**
  TB skin testing should be done if the infant is living with anyone being investigated or treated for TB. TB skin testing should also be considered in high-risk groups, including Aboriginal people, immigrants and long-term travellers from areas with a high prevalence of TB.

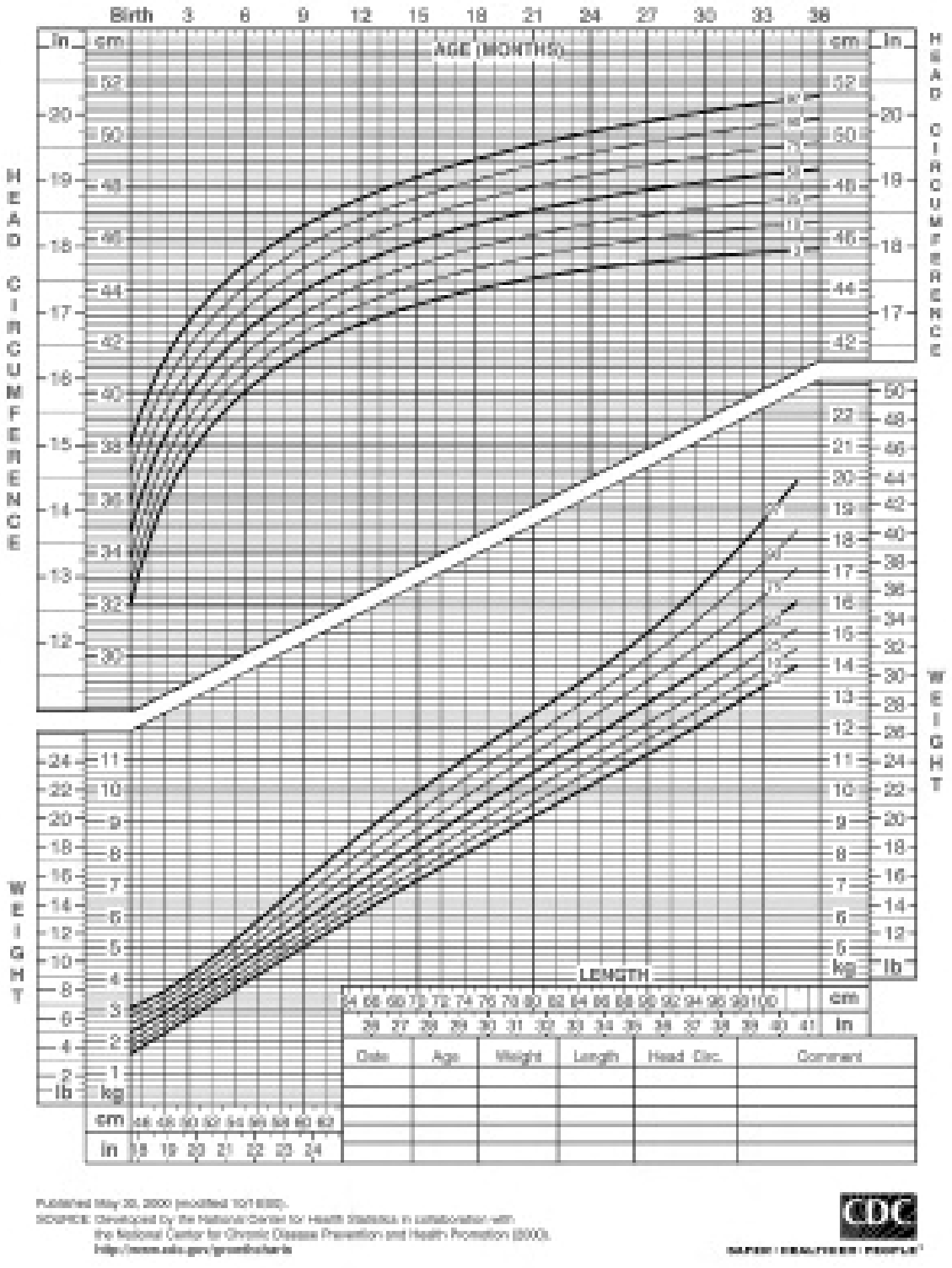

Birth to 36 months: Boys
Length-for-age and Weight-for-age percentiles
NAME
RECORD #
AGE (MONTHS)
LENGTH
WEIGHT
Mother's Stature
Father's Stature
Gestational Age: Weeks
Comment
Date
Age
Weight
Length
Head Circ.
Birth
CDC

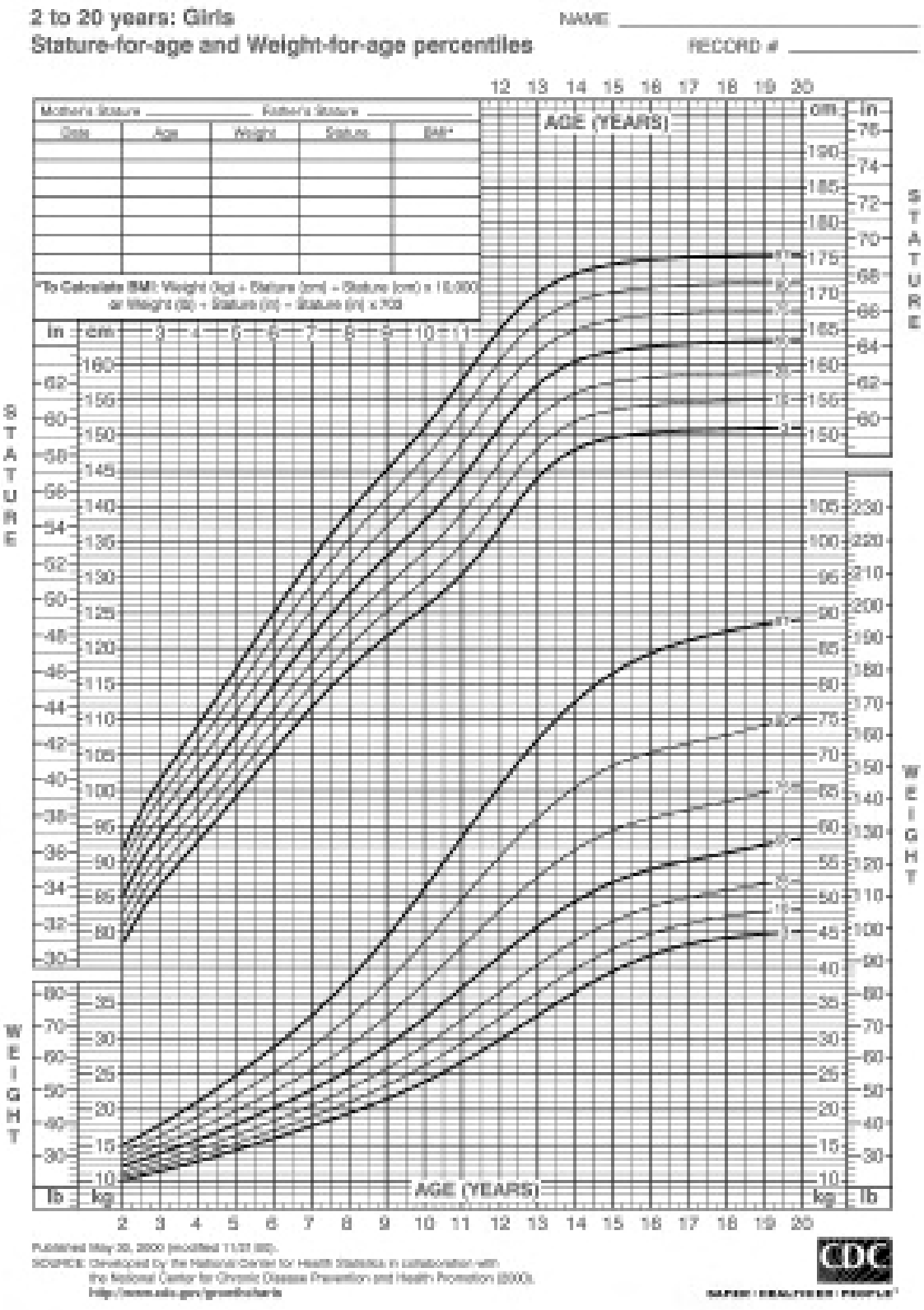

Birth to 36 months: Boys
Head circumference-for-age and
Weight-for-length percentiles
NAME
RECORD #
AGE (MONTHS)
HEAD CIRCUMFERENCE
WEIGHT
LENGTH
Date
Age
Weight
Length
Head Circ.
Comment
CDC

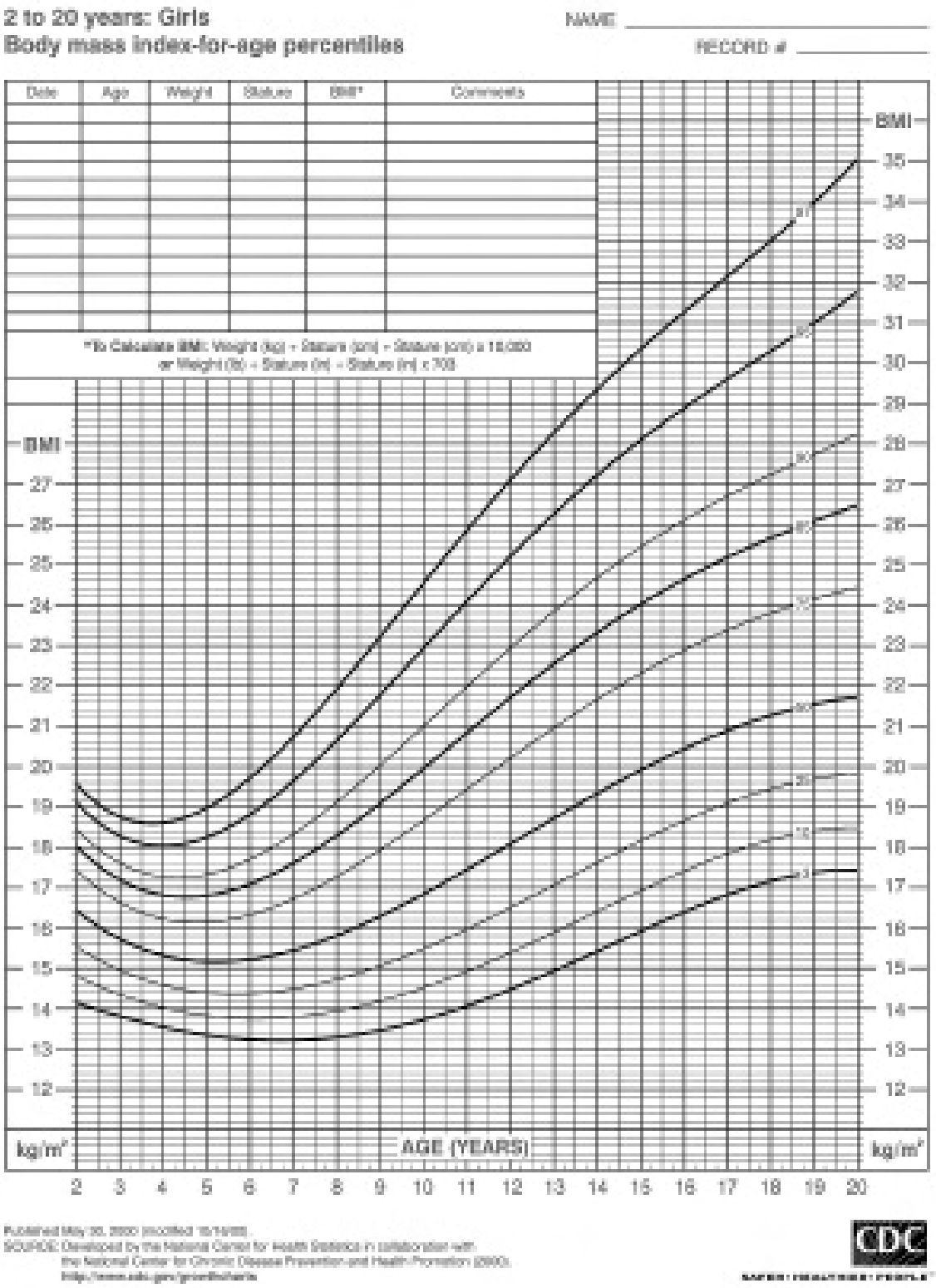

2 to 20 years: Boys
Stature-for-age and Weight-for-age percentiles
NAME
RECORD #
Mother's Stature
Father's Stature
Date
Age
Weight
Stature
BMI*
*To Calculate BMI: Weight (kg) ÷ Stature (cm) ÷ Stature (cm) x 10,000
or Weight (lb) ÷ Stature (in) ÷ Stature (in) x 703
AGE (YEARS)
STATURE
WEIGHT
in
cm
lb
kg
Published May 30, 2000 (modified 11/21/00).
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts
CDC


2 to 20 years: Boys
Body mass index-for-age percentiles
NAME
RECORD #
Date
Age
Weight
Stature
BMI*
Comments
*To Calculate BMI: Weight (kg) ÷ Stature (cm) ÷ Stature (cm) x 10,000
or Weight (lb) ÷ Stature (in) ÷ Stature (in) x 703
BMI
kg/m²
AGE (YEARS)
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
95
85
75
50
25
10
5
Published May 30, 2000 (modified 10/16/00).
SOURCE: Developed by the National Center for Health Statistics in collaboration with
the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts
CDC


Birth to 36 months: Girls
Length-for-age and Weight-for-age percentiles
NAME
RECORD #
Birth 3 6 9 12 15 18 21 24 27 30 33 36
AGE (MONTHS)
LENGTH
WEIGHT
Mother's Stature
Father's Stature
Gestational Age: Weeks
Comment
Date
Age
Weight
Length
Head Circ.
Published May 30, 2000 (modified 4/30/01).
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts
CDC


Birth to 36 months: Girls
Head circumference-for-age and
Weight-for-length percentiles
NAME
RECORD #
AGE (MONTHS)
HEAD CIRCUMFERENCE
WEIGHT
LENGTH
Date
Age
Weight
Length
Head Circ.
Comment
Published May 30, 2000 (modified 10/16/00).
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts
CDC
HEALTHY PEOPLE


2 to 20 years: Girls
Stature-for-age and Weight-for-age percentiles
NAME
RECORD #
Mother's Stature
Father's Stature
Date
Age
Weight
Stature
BMI*
*To Calculate BMI: Weight (kg) ÷ Stature (cm) ÷ Stature (cm) x 10,000 or Weight (lb) ÷ Stature (in) ÷ Stature (in) x 703
AGE (YEARS)
STATURE
WEIGHT
cm
in
kg
lb
3
5
10
25
50
75
90
95
97
Published May 30, 2000 (modified 11/01/00).
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts
CDC


2 to 20 years: Girls
Body mass index-for-age percentiles
NAME
RECORD #
Date
Age
Weight
Stature
BMI*
Comments
*To Calculate BMI: Weight (kg) ÷ Stature (cm) ÷ Stature (cm) x 10,000
or Weight (lb) ÷ Stature (in) ÷ Stature (in) x 703
BMI
kg/m²
AGE (YEARS)
95
90
85
75
50
25
10
5
Published May 30, 2000 (modified 10/16/00).
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts
CDC

Appendix I:
Nipissing District Developmental Screen™

NIPISSING DISTRICT DEVELOPMENTAL SCREEN ORDER FORM™

Name

Organization

Address

City — Province / State

Country — Postal Code / Zip

Telephone — E-mail

Please MAIL this form along with cheque or money order made payable to:

Nipissing District Developmental Screen Inc.
P.O. Box 1400, North Bay, ON Canada P1B 8K6
Phone (705) 753-8080 • 1.888.581.0044
Fax (705) 753-6247

Visit us on the web: www.ndds.ca

SCREEN SETS

A complete set of Screens consists of 13 pads of 50 sheets with detachable activity sheets.

English .... Set Price $90
French .... Set Price $90
Spanish .... Set Price $90
Chinese .... Set Price $90

SPECIFIC SCREENS

A Specific Screen consists of one pad of 50 sheets with detachable activity sheets for one of the following ages:

1 & 2 Months, 4 Months, 6 Months, 9 Months,
12 Months, 15 Months, 18 Months, 2 Years,
30 Months, 3 Years, 4 Years, 5 Years and 6 Years.

English .... Unit Price $7
French .... Unit Price $7
Spanish .... Unit Price $7
Chinese .... Unit Price $7

Special orders of screens without activities available upon request. Call for a quotation.

Product Description	Age (Specific Screens Only)	Quantity	Set / Unit Price	Total (Quantity X Price)

SEE LIMITATION OF LIABILITY AND INSTRUCTIONS ON REVERSE.

Screens Total
Shipping*
Subtotal
GST**
PST***
TOTAL

Nipissing District Developmental Screen Inc. Product License

Nipissing District Developmental Screen Inc. Order Form Copyright Notice

Prices subject to change.

Instructions for the Nipissing District Developmental Screen™

The Nipissing District Developmental Screen™ (NDDS) is a tool designed to provide an easy-to-use method of recording the development and progress of infants and children. The areas of development covered by the Screen Forms include vision, hearing, communication (note: the language items refer to the child's ability in his/her first language), gross and fine motor, cognitive, social/emotional, and self-help. The Screens coincide with immunization schedules as well as key developmental stages up to age six. The ages are noted at the top of each Screen. The child's chronological age will determine which Screen to use. If the child falls between two ages, use the earlier Screen (e.g. for a 4 1/2 year old use the Screen for a 4 year old).

The skills in each Screen are expected to be mastered by most children by the age shown. **If two or more "No" responses are marked a referral to a health care and/or child care professional is recommended.** While the NDDS was designed to be completed by a parent or caregiver, the Screen Forms are not meant to be a substitute for professional advice, assessment and/or treatment from a health care and/or child care professional.

Parents should always talk to their health care and/or child care professional if they have questions or concerns about their child's development or well being.

Additional information is available on our website. Visit us at www.ndds.ca.

Activities for Your Baby/Child

The "Activities for Your Baby/Child" section of the Screen Forms is intended to provide parents and other caregivers with some information and activities to enhance their infant's/child's development. Each activity is coded with an icon to represent a primary area of development. **If parents have questions or concerns about the appropriateness of any activity for their infant/child they should contact a health care or child care professional.**

Limitation of Liability

Nipissing District Developmental Screen Inc. (NDDS Inc.) has created and provides the Screen Forms to assist parents, health care and child care professionals (users) with a convenient and easy to use method of recording the development and progress of infants and children within certain age groupings. The Screen Forms are not meant to be a substitute for the advice and/or treatment of health care and child care professionals trained to properly and professionally assess the development and progress of infants and children. As such, the Screen Forms are not intended or designed to be "do it yourself" substitutes for proper and professional advice and/or treatment.

Although the Screen forms may help users to determine when they need to seek out the advice and/or treatment of health care and child care professionals, it must be clearly understood by users that the Screen Forms can not substitute for the advice and/or treatment of health care and child care professionals.

Users of the screen forms should consult with competent health care and child care professionals for advice and/or treatment respecting specific children and their particular needs.

Users should bear in mind the following when using the Screen Forms:

(i) The needs of each infant/child are unique. Each infant/child will develop differently and as such, any perceived limitations in development must be reviewed by a health care and/or child care professional to be properly assessed;

(ii) While every effort has been made to make the Screen Forms as culturally, economically and geographically neutral as possible, it must be understood by users that they may still reflect some cultural, economic or geographic prejudices. As such, these prejudices may affect a specific infant's/child's results in a Screen Form without actually reflecting a developmental limitation. Again, users should contact a health care and/or child care professional to review the needs of an individual infant/child;

(iii) The Screen Forms cannot contain every possible indicator of developmental limitations or goals to be met. As such, the Screen Forms are not designed for and should not be used to diagnose or treat perceived developmental limitations or other health needs.

Every effort has been made to ensure that the Screen Forms have been formulated with a reasonable standard of care. Except for this representation, and as otherwise specifically provided in the Screen Forms, NDDS Inc. make no representation or warranties, express or implied. This includes, but is not limited to, any implied warranty or merchantability of fitness for a particular use or purpose, and specifically disclaims any such warranties and representations. NDDS Inc. expressly disclaims any liability for loss, injury or damages incurred or occasioned as a consequence, directly or indirectly, of the use of the Screen Form.

The Screen Forms are sold with the understanding that NDDS Inc. is not engaged in rendering medical or child care advice or other professional services.

Nipissing District
Developmental Screen™

Child's Name _____

Birth Date _____ Today's Date _____

The Nipissing District Developmental Screen™ is a checklist designed to help monitor your child's development.

✔ Yes	✔ No		*By **Eighteen Months** of age, does your child...*
☐	☐	1.	Identify pictures in a book (e.g. "Show me the baby")?
☐	☐	2.	Use familiar gestures (e.g. waving, pushing away)?
☐	☐	3.	Follow directions when given without gestures (e.g. "Throw me the ball", "Bring me your shoes")?
☐	☐	4.	Use common expressions (e.g. "all gone" or "oh-oh")?
☐	☐	5.	Point to at least three different body parts when asked (e.g. "Where is your nose?")?
☐	☐	6.	Say five or more words? (Words do not have to be clear.)
☐	☐	7.	Hold a cup to drink?*
☐	☐	8.	Pick up and eat finger food?
☐	☐	9.	Help with dressing by putting out arms and legs?*
☐	☐	10.	Crawl or walk up stairs/steps?
☐	☐	11.	Walk alone?
☐	☐	12.	Squat to pick up a toy without falling?
☐	☐	13.	Push and pull toys or other objects while walking? (Picture A)
☐	☐	14.	Stack three or more blocks?
☐	☐	15.	Show affection towards people, pets or toys?
☐	☐	16.	Point to show you something?
☐	☐	17.	Look at you when you are talking or playing together?

A

* Items may not be common to all cultures

Always talk to your health care or child care professional if you have any questions about your child's development or well being. See reverse side for instructions, limitation of liability, and product license.

18 MONTHS

ACTIVITIES FOR YOUR CHILD...

Emotional · Fine Muscle · Large Muscle · Learning/Thinking · Self-Help · Social · Speech/Language

Nipissing District
Developmental Screen™

The following activities will help you play your part in your child's development.

Help me to notice familiar sounds, such as birds chirping, car or truck motors, airplanes, dogs barking, sirens, or splashing water. Imitate the noise you hear and see if I will imitate you. Encourage me by smiling and clapping.

I am learning new words every day. Play games to help me learn the names of things. Put pictures of familiar things such as toy animals, people or objects in a bag and say "One, two, three, what do we see?" and pull a picture from the bag.

Pretend to talk to me on the phone or encourage me to call someone.

Don't be afraid to let me see what I can do with my body. I need to practise climbing, swinging, jumping, running, going up and down stairs, and going down slides. Stay close to me so I don't get hurt.

Play some of my favorite music. Encourage me to move to the music by swaying my arms, moving slowly, marching to the music, hopping, clapping my hands, tapping my legs, etc. Let's have fun doing actions while listening to the music.

Let me play with balls of different sizes. Take some of the air out of a beach ball. Watch me kick, throw, and try to catch it.

I like toys that I can pull apart and put back together: large "LEGO", containers with lids, or plastic links. Talk to me about what I am doing using words like "push" and "pull".

I'm not too little to play with large crayons. Let's scribble and talk about our art work.

I like simple puzzles with two to four pieces and shape-sorters with simple shapes. Encourage me to match the pieces by taking turns with me.

I want to do things just like you. Let me have toys so I can pretend to dress up, have tea parties, and play mommy or daddy.

I feel safe and secure when I know what is expected of me. You can help me with this by following routines and setting limits. Praise my good behaviour.

I like new toys so find the local toy lending library or play groups in our community.

I enjoy exploring the world but I need to know that you are close by. I may cry when you leave me with others, so give me a hug and tell me you will be back.

Always talk to your health care or child care professional if you have any questions about your child's development or well being. See reverse side for instructions, limitation of liability, and product license.

18 MONTHS

INSTRUCTIONS FOR THE NIPISSING DISTRICT DEVELOPMENTAL SCREEN™

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The skills in each Screen are expected to be mastered by most children by the age shown. **If two or more "No" responses are marked a referral to a health care and/or child care professional is recommended.** While the NDDS™ was designed to be completed by a parent or caregiver, the Screen Forms are not meant to be a substitute for professional advice, assessment and/or treatment from a health care and/or child care professional.

Parents should always talk to their health care and/or child care professional if they have questions or concerns about their child's development or well being.

Additional information is available on our website. Visit us at www.ndds.ca.

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LIMITATION OF LIABILITY

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(ii) While every effort has been made to make the Screen Forms as culturally, economically and geographically neutral as possible, it must be understood by users that they may still reflect some cultural, economic or geographic prejudices. As such, these prejudices may affect a specific infant's/child's results in a Screen Form without actually reflecting a developmental limitation. Again, users should contact a health care and/or child care professional to review the needs of an individual infant/child.

(iii) The Screen Forms cannot contain every possible indicator of developmental limitations or goals to be met. As such, the Screen Forms are not designed for and should not be used to diagnose or treat perceived developmental limitations or other health needs.

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The Screen Forms are sold with the understanding that NDDS™ is not engaged in rendering medical or child care advice or other professional services.

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(i) Each page of the Screen Form shall only be used in relation to an individual infant/child.

(ii) When a Screen Form page has been used for an individual, infant the completed Screen Form page may be copied for archival purposes only, or in order to provide a copy to a health care and child care professional in order to assist in the advice or treatment given by the recipient professional for the individual infant/child.

(iii) The user shall not make copies of the Screen Form pages in any form except as provided in (ii) above.

(iv) The user shall not modify the Screen Forms, either in whole or in part, and shall not remove any of the trademarks, trade names or copyright notices of Nipissing™ from the Screen Forms, either in whole or in part.

(v) The user does not acquire any proprietary or other interest in the Screen Forms.

Appendix J: Developmental Monitoring in Primary Care – Journal Article

Developmental monitoring in primary care

CYNTHIA E. GOLDSMITH, MD, FRCPC
WENDY ROBERTS, MD, FRCPC

SUMMARY

Monitoring child development is an essential part of primary health care. Successful surveillance depends on physicians' thorough knowledge of normal progress along the four developmental streams: motor, language, cognitive, and social and emotional. Being alert to "red flags" that suggest problems is important. Effective interventions can minimize developmental problems.

RÉSUMÉ

La surveillance du développement de l'enfant est une composante essentielle des soins de première ligne. La réussite de cette surveillance dépend du niveau de connaissances que possèdent les médecins de la croissance normale en fonction des quatre axes de développement : moteur, langage, cognitif, et développement social et émotionnel. Il est important d'être vigilant pour bien identifier les « drapeaux rouges » indiquant la présence de problèmes. Les interventions efficaces peuvent minimiser les problèmes de développement.

Can Fam Physician 1996;42:1132-1138.

EARLY DETECTION OF DEVELOPMENTAL problems is increasingly being identified as one of the important tasks of physicians providing primary care to children. Emerging evidence supports the efficacy of early intervention. Recent statements by the American Academy of Pediatrics[1] and the British Joint Working Party of Child Health Supervision[2] recommend that developmental monitoring be an integral part of child health supervision. Both organizations suggest that monitoring be done by the process of "developmental surveillance."

Developmental surveillance is a flexible, continuous process in which knowledgeable professionals observe children during all health care encounters.[3] It encompasses both identification and anticipatory guidance and can be accomplished by monitoring developmental milestone attainment, eliciting parental concerns, informally observing age-appropriate tasks, and sometimes using screening tests. Effective surveillance requires physicians to have thorough knowledge of normal child development, to understand factors that might interfere with it, and to be actively monitoring for symptoms that should elicit concern.

This article focuses on the background knowledge essential for developmental surveillance. Some general guidelines for dealing with detected delays are outlined.

Dr Goldsmith *is a Fellow in Child Development at the Hospital for Sick Children in Toronto, Ont.* **Dr Roberts**, *a Developmental Pediatrician, is Education Program Director in Developmental Pediatrics and an Associate Professor in Pediatrics at the University of Toronto.*

Getting started

The process of development can be conceptualized as the result of interaction between a child and his or her environment, each profoundly influencing the other. Development proceeds along four basic streams: motor, language, cognitive, and social and emotional development. While these are clearly interdependent, they should be assessed individually in each child. The skills we use when we listen to heart sounds or examine cranial nerves (focusing attention on a series of objective findings) can be applied to developmental assessment.

Equally important to the process of surveillance are the skills of good listening and sensitive questioning. These lead to trusting relationships with parents that facilitate sharing concerns. This atmosphere is conducive to early discovery of developmental problems and to a more thorough understanding of the environmental factors (eg, psychosocial, health, economic) that affect child development.

Although most physicians find assessing child development enjoyable and often enriching, many

Table 1. "Red flags" indicating risk of developmental problems

AREA and AGE	FINDINGS
MOTOR	
4½ mo	Does not pull up to sit
5 mo	Does not roll over
7-8 mo	Does not sit without support
9-10 mo	Does not stand while holding on
15 mo	Not walking
2 y	Not climbing up or down stairs
2½ y	Not jumping with both feet
3 y	Unable to stand on one foot momentarily
4 y	Not hopping
5 y	Unable to walk a straight line back and forth or balance on one foot for 5 to 10 seconds
FINE MOTOR	
3½ mo	Persistence of grasp reflex
4-5 mo	Unable to hold rattle
7 mo	Unable to hold an object in each hand
10-11 mo	Absence of pincer grasp
15 mo	Unable to put in or take out
20 mo	Unable to remove socks or gloves alone
2 y	Unable to stack five blocks, not scribbling
2½ y	Not turning a single page of a book
3 y	Unable to stack eight blocks or draw a straight line
4 y	Unable to stack 10 blocks or copy a circle
4½ y	Unable to copy a square
5 y	Unable to build a staircase of blocks or copy a cross
LANGUAGE	
5-6 mo	Not babbling
8-9 mo	Not saying "da" or "ba"
10-11 mo	Not saying "dada" or "baba"

AREA and AGE	FINDINGS
LANGUAGE (continued)	
18 mo	Has less than three words with meaning, unable to achieve shared attention
2 y	No two-word phrases or repetition of phrases
2½ y	Not using at least one personal pronoun
3½ y	Speech only half understandable
4 y	Does not understand prepositions
5 y	Not using proper syntax in short sentences
COGNITIVE	
2-3 mo	Not alert to mother with special interest
6-7 mo	Not searching for dropped object
8-9 mo	No interest in peek-a-boo
12 mo	Does not search for hidden object
15-18 mo	No interest in cause-and-effect games
2 y	Does not categorize similarities (eg, animals vs vehicles)
3 y	Does not know own full name
4 y	Cannot pick shorter or longer of two lines
4½ y	Cannot count sequentially
5 y	Does not know colours or any letters
5½ y	Does not know own birthday or address
PSYCHOSOCIAL	
3 mo	Not smiling socially
6-8 mo	Not laughing in playful situations
1 y	Hard to console, stiffens when approached
2 y	Kicks, bites, and screams easily and without provocation. Rocks back and forth in crib. No eye contact or engagement with other children or adults
3-5 y	In constant motion. Resists discipline. Does not play with other children

Adapted from Frost and Phillips[6]

dread detecting abnormalities because they are unsure how to intervene effectively in the face of diminishing community resources. This is particularly true for physicians in isolated or remote communities that lack medical specialists and ancillary services, such as speech pathologists, psychologists, physiotherapists, and occupational therapists. Finding whatever local resources are available, private and public, is the first step to being able to make recommendations that can be carried out.

Many areas in Canada now have, or will soon have, access to early interventionists, professionals from many backgrounds (such as speech therapy, nursing, and early childhood education) who are trained to work with parents and preschool staff to provide optimal developmental programming. Some local day-care centres and preschools have highly skilled professionals, and interested nurses can be trained to administer formal developmental assessment tools such as the DISC[4] (Diagnostic Inventory for Screening Children). Where no intervention services are readily available, family members can be taught how to stimulate a child's development. Physicians can advocate for their communities by lobbying for improved developmental intervention services.

A physician's role in dealing with developmental problems goes well beyond referral for assessment and therapy by other professionals. Having a child with a developmental problem can cause parents grief, a sense of loss, and feelings of helplessness. As the child develops, new issues and concerns are likely to arise. Appreciating this and providing ongoing support and guidance can improve the quality of life of the whole family.

Making objective observations, creating a setting in which parents are comfortable sharing concerns, finding the best available resources, and providing support are important aspects of surveillance, regardless of which stream of development is being examined. Each stream has unique features relevant to the surveillance process.

Motor development

When parents boast about a child's early ability to sit, crawl, or walk, or fearfully mention that a child seems behind in these skills, they convey the widely held belief that a close connection exists between motor development and intelligence. Of all the streams of development, however, gross motor development is the least predictive of cognitive potential.[3] Monitoring motor development is important primarily because of the many underlying medical conditions that can manifest as motor delays.

For genetic counseling or therapeutic intervention, such conditions should be identified as early as possible. A range of normal variation in the development of gross and fine motor skills makes it necessary for physicians to recognize "red flags" that suggest problems (*Table 1*[5]).

Physicians should be concerned if an infant is not sitting independently at 7 to 8 months, or is unable to hold an object in each hand at that age. A 15-month-old should be walking and well able to put objects in and out of large containers. Attention is warranted if a 2-year-old cannot climb up or down stairs or scribble or if a 3-year-old cannot stand briefly on one foot or draw a straight line. A 4-year-old should be able to hop and copy a circle, and a 5-year-old should be able to walk a straight line and copy a cross.

Even if normal milestones are being attained, more subtle clinical findings might suggest underlying motor problems: persistent fisting of the hands (more than 50% of the time) at 3 months is not normal and might be an early sign of cerebral palsy; development of hand dominance before 15 months is unusual, and might reflect neurologic impairment of the contralateral side; precocious ability to elevate the head and neck in ventral suspension (before 3 months) might suggest hypertonia.

What to do if motor delay is detected

Delays in motor development might indicate underlying disease. Problems of the central nervous system, such as cerebral palsy, or the peripheral nervous system, such as muscular dystrophy, must be considered. Metabolic conditions (eg, hypothyroidism) and genetic syndromes (eg, fragile X syndrome) might be responsible. Clues to underlying etiology should be sought through a thorough history and physical examination. Particular attention to birth history, family histo-

ry, and developmental history could yield valuable information.

Abnormal physical findings, such as dysmorphic features; persistent primitive reflexes; asymmetric deep tendon reflexes; or abnormal muscle bulk, tone, or strength, are all especially relevant. If an underlying neurologic or medical condition is suggested, referral to a pediatrician or neurologist for further evaluation might be warranted.

Whether or not disease is suspected, referral for early intervention is indicated. Local availability and local practice patterns will dictate whether this is to an occupational therapist, physical therapist, early intervention therapist, or other professional. Children with no specific etiology for delays should be monitored every 3 to 4 months to ensure continued progress and to detect the emergence of new factors. Because many families believe that motor delays imply diminished intelligence, educating them about the nature of a child's difficulties can often be highly reassuring. Families also often underestimate the important role they have in creating an environment conducive to optimal motor development. Being taught specific techniques for helping motor skills develop can be both empowering for parents and therapeutic for children.

Figure 1. Shared attention: *Children should be able to direct the attention of another person to share their interest in something they have noticed.*

Language development

The fascination of baby with parent and parent with baby ensures attachment in the baby's first social relationship and facilitates the natural emergence of language in normal babies. Within a few years, a child progresses from a few words to virtual mastery of language. This magical process follows a predictable pattern, but has considerable normal variation in the rate and quality of its unfolding.

Significant deviations from normal development can be identified early if doctors are familiar with prelinguistic and linguistic milestones. Some physicians keep a checklist of milestones nearby; others use formal instruments, such as the Early Language Milestone Scale.[1] This tool has been shown to have relatively good sensitivity and specificity for children younger than 3 years.[8,9]

Red flags that signal a need for further evaluation include not beginning to babble by 8 months and having fewer than three meaningful words at 18 months. By 1 ½ years, a child should be able to achieve shared attention (*Figure 1*). A 2-year-old should be putting two words together, and a 3 ½-year-old's speech should be almost fully understandable. We should be concerned if a 4-year-old cannot use prepositions or if a 5-year-old is not speaking in grammatically correct, albeit short, sentences.

Physicians should remember some other important points.

- Recurrent otitis media rarely produces long-term language delays.[10,11]
- Congenitally deaf children typically have normal motor, cognitive, and psychological development in the first year of life and reach essentially normal language milestones in the first 6 to 8 months of life.[3] Examiners must assess auditory responses in young infants very carefully. Up to two thirds of congenitally deaf children can be

identified if all infants on the High Risk Registry (Table 2[17]) are screened early.[13]

- Deterioration or plateauing of language skills at 18 to 24 months is cause for serious concern.[14] In the past, parents reporting this were often ignored. However, it is now well recognized that, when combined with flat affect, social withdrawal, or poor engagement, this pattern can signify the onset of pervasive developmental disorder (PDD).

What to do if language delay is detected

Language is a complex skill; its development can have aberrations ranging from dysfluencies and articulation deficits to pure expressive or receptive delays to aberrant nonfunctional use of language, as in PDD. Possible causes include structural or functional abnormalities of the oromotor apparatus, hearing impairment, global developmental delay, pure language disorders, and PDD. History or physical examination sometimes suggest that referral to speech pathologists, audiologists, psychologists, neurologists, or psychiatrists could help.

Whether or not a child has a specific, intrinsic abnormality, the environment strongly influences development of language skills. Assessing such influence can help identify avenues for intervention, or, less commonly, actually determine the cause of language delay. Factors that can render a parent ineffective at teaching language include poverty, substance abuse, depression, and cognitive impairment.[15]

Reliable audiology is indicated for all children with language delay, as is referral to local early intervention services. In areas where speech and language evaluation is accessible, refer early. Putting a child into nursery school can usually be achieved fairly quickly and some children benefit greatly. Some communities have the Hanen program, a course of short workshops designed to teach parents how best to foster language development in their children.

Physicians can make practical suggestions for promoting language skills and enhancing cognitive and social skills that parents can implement immediately.

- When you have a young infant's gaze or obvious attention, make noises and sounds or sing softly.
- Repeat sounds or words the child utters.
- Repeat simple nursery rhymes in a predictable way.
- Ask questions or make comments that naturally lead to response.
- Label concrete objects in a child's environment.
- Emphasize action words in conversation with the child.
- Read to the child, and let the child see you reading for pleasure.
- Use simple language delivered slowly.

Table 2. High Risk Registry of risk factors for sensorineural hearing loss

Family history of hearing loss
Congenital infection
Craniofacial anomalies
Birth weight less than 1500 g
Hyperbilirubinemia at level exceeding indication for transfusion
Ototoxic medications used for more than 5 days
Bacterial meningitis
Asphyxia or low Apgar score at birth
Prolonged mechanical ventilation
Findings associated with a syndrome known to include sensorineural hearing loss (eg, Waardenburg or Usher's syndrome)

Adapted from American Speech-Language-Hearing Association.[17]

Cognitive development

Most parents delight in watching their children learn to understand the world and marvel as they acquire basic intellectual skills. One of the greatest fears parents have is that a child might be cognitively impaired. The tremendous emotional overlay associated with cognitive deficits might lead to confusion regarding terminology. The term "mental retardation" has much more serious social and prognostic implications than the term "developmental delay." The latter term

implies that a child will continue to make cognitive gains throughout development. This is often reassuring to parents, but they must understand that with time the gap between global delay and the norm typically widens.

Detecting cognitive impairment in children can be difficult. While profound mental retardation is hard to miss, milder forms can be subtly manifested in young children. Most globally delayed children achieve gross motor milestones at approximately normal times. Red flags for cognitive impairment include not alerting to mother by 3 months or not looking for dropped objects by 7 months. By 1 year babies should be searching for hidden objects, revealing a well established concept of object permanence. Two-year-olds should be able to categorize similarities (eg, big, red), and 3-year-olds should be able to say their full names when asked. By 4 ½ years a child should be able to count, and by 5 years should know several colours and some letters. Psychological testing can usually be attempted by 3 years, but might not be predictive of later outcome until a child is older than 5 years.

What to do if cognitive delay is detected

Differential diagnosis of global developmental delay is vast and is well documented elsewhere.[16] A detailed history and physical examination are essential for finding causative factors. History should particularly include prenatal factors, such as exposure to toxins or infection, and perinatal factors, such as complicated deliveries. Although birth events are generally poor predictors of developmental problems,[17] reviewing birth records can help parents who have unresolved concerns about that period. Family history should be probed for similarly affected relatives, possibly suggesting inherited conditions (eg, neurofibromatosis or fragile X syndrome). History can also clarify the adequacy of a child's environment and identify factors that might prevent a child from reaching maximum potential.

Physical examination must likewise be thorough. Focus should be on head growth, neurologic findings, and associated dysmorphic or neurocutaneous features. While investigations will be guided by historical and physical findings, hearing and vision should also be assessed. If the child is not microcephalic, DNA might be analyzed for the fragile X syndrome mutation.[18] Doing karyotype, lead level, metabolic screen,[6] or thyroid-stimulating hormone tests should be based on findings. Computed tomography is rarely clinically useful; magnetic resonance imaging sometimes aids diagnosis.

Cognitive impairment in a child is usually devastating for parents. Physicians can help immeasurably in an advocacy role. Helping families find appropriate preschools and ensuring that the child is properly identified by the school is helpful. If the community has an Association for Community Living, a family might benefit from contact with it. Parents sometimes feel deceived if a referral is made without fully explaining the child's diagnosis to them first.

Primary care physicians can help families access support groups, ministry-funded social workers, respite care, and government benefits and tax credits. Although no clear evidence indicates that globally delayed children's intelligence quotients can be improved by early intervention, children can be helped to function better and avoid secondary behavioural problems, and parents could experience less stress.[19]

Most families require emotional support and ongoing guidance as they come to terms with having a cognitively impaired child, work out plans for the future, and deal with the still-present social stigma.

Social and emotional development

The relationship between parent and child that develops in the first years of life is the springboard for the child's future interactions with other people, the template of how he or she views himself or herself, and the raw material for functioning in society, achieving happiness, and being emotionally intact.

Sadly, disruptions to this process are all too common. Countless examples of undesirable

social conduct and people with emotional disability are easily found. Primary prevention and pre-empting development of these problems has profound ramifications for both individuals and society. Understanding a child's biological endowment (ie, temperament) and knowing a child's psychosocial environment are key to successfully monitoring social and emotional development.

Since the landmark work of Chess and Thomas,[20] we have recognized that an infant's mind, far from being a tabula rasa, has a complex, unique pattern of responsiveness innate to his or her personality. Differences between infants are termed temperament and include a baby's activity level, rhythmicity, mood, and intensity and threshold of responding. Infants typically have been classified as "easy," "difficult," or "slow to warm up."

A child's temperament influences the parents' attitude and behaviour toward him or her; a child's temperament, and the degree to which it matches the parents' temperament, mediates a child's response to parental practices. Helping parents understand the role that temperament plays in a child's behaviour can be very useful. For example, if the parents of a "slow to warm up" child, who is reluctant to start a new preschool, view the behaviour as part of the child's normal style, they will allow him or her time to adapt positively and will not be concerned. If they do not appreciate this, they might view the child as timid or anxious and, instead of being patient, pressure the child to join the group, resulting in an even more difficult situation.

Among the myriad environmental variables that affect social and emotional development are family, health, economics, and culture. Children born into poverty, for example, experience not only economic deprivation but different psychological and social experiences from their better off peers.[21] Families under stress from marital conflict, parental depression, extended family problems, and so on often have difficulty nurturing their children's psychological development.

At the heart of social and emotional development lies the foundation upon which all future interactions with the social world rest: attachment of child to primary caregiver. This should be well established and evident by 12 to 14 months and is characterized by proximity-seeking behaviour, separation anxiety, and fear of strangers. Office visits are often ideal for witnessing these phenomena. Ample evidence now supports a link between secure attachment and later social development.[21]

Problems in social and emotional development are shown through a child's temperament, environmental factors, and attachment experience. Red flags include not developing a social smile by 3 months or not laughing in playful situations by 8 months. Poor eye contact or inability to be comforted by a parent is worrying at any age, as are excessive aggression, repetitive movements, and lack of interest in people.

Pervasive developmental disorders, characterized by impaired social interaction and communication and restricted, repetitive, and stereotypical patterns of behaviour, are being shown increasingly to respond to intervention, which should be sought early.[16] These conditions are biologically based, and are not the result of suboptimal social circumstances.

What to do if social and emotional problems are detected

Early intervention is essential. If a child's environment is highly disturbed, abusive, or neglectful, physicians must advocate for the child and might need to enlist child protection services.

In less severe social situations, physicians could support and guide families to remove obstacles preventing children from reaching maximum potential. Pointing out the child's temperament, and providing basic information on common behavioural challenges at different stages could help parents give better care.

Many children with social or emotional problems, even those with PDDs, appear to benefit from increased contact with other children, perhaps through play groups or library programs. Extended family members playing and reading with a child can provide the extra attention that parents sometimes cannot give.

Finally, children with social or emotional problems should be referred to early intervention therapists, if available. Some communities have more

specific supportive or therapeutic programs that might be appropriate, such as groups for depressed parents and their children or nursery programs for autistic children.

Conclusion

Watching over children as they grow and develop is one of the most rewarding, enjoyable, and challenging aspects of medical practice. Having a solid knowledge of the four streams of development enables physicians to take on the task with confidence and pleasure. Knowing the spectrum of normal and the indicators of serious delays is an ongoing learning process and is key to managing developmental surveillance effectively. Because developmental disabilities are so common (up to 10% prevalence[3]), physicians who look for them are likely to find them. Putting needed services into place in a timely fashion can be frustrating and time-consuming, particularly for those in rural areas. Once you are familiar with the services in your area, advocating for improved services might be necessary.

Despite the frustrations, watching the process of development, establishing supportive and trusting relationships with parents, and being able to make early developmental diagnoses that result in effective interventions are uniquely satisfying and enjoyable aspects of primary care medicine. ■

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Assessment of Developmental Delay

Developmental Area	Significant Red Flags	Intervention
Growth Growth charts are designed for typically developing children in North America. They may be misleading for children from other countries or children with a specific concern such as Down syndrome or premature delivery.	-Weight and height below 3rd percentile -Growth velocity less than expected -crosses 2 percentile lines -Weight less than 80% expected for age and height -Weight below 5th percentile on weight for height chart	-Examine re intake, output -Physical examination and tests to rule out syndromes, chronic disease -Psychosocial – eating and sleeping behaviour -Referral: pediatric, public health -Growth charts are available for children with Down syndrome
Motor Motor delay is not a reliable predictor of cognitive development	-41/2 mo not pulling to sit -5 mo not rolling over -7-8 mo not sitting unsupported -9-10 mo not standing holding on -15 mo not walking	-Look for neurological signs -Clues from birth history, family history -Abnormal physical findings? -Referral: pediatric or neurological, early infant development, physiotherapy -No specific cause – monitor and educate family, encourage motor development
Cognitive	-2-3 mo not alert to mother -6-7 mo not searching for dropped object -8-9 mo no interest in peek a boo -12 mo doesn't search for hidden object	-Detailed history and physical – prenatal, review birth records (not usually significant), family history -Child's environment -Support for parents re diagnosis -Advocate for support for parents and family -Look to avoid secondary problems
Language and Communication	-5-6 mo not babbling -8-9 mo not saying da or ba -10-11 mo not saying dada or baba -12 mo not gesturing – pointing or waving -24 mo no 2 word phrases -Loss of language at any age	-Audiology testing -Environment strongly influences language skills. Assess these influences – parental time, substance abuse, depression etc -Referral: speech and language evaluation, psychology, neurology, psychiatry -Possible problems: hearing problem, global delay, pure language disorders, autism spectrum disorder -Practical suggestions -Nursery school, Hanen programs etc
Social and Emotional	-3 mo not smiling socially -6-8 mo not laughing in playful situations -1 year hard to console, stiffens -2 years bites, kicks, screams easily, poor eye contact or engagement	-Early intervention needed – is child's environment abusive, neglectful, disturbed – child protection issue? -Parent training – re difficult behaviour -Increase contact with other children, extended family, extra attention -Referral: early intervention therapist – public health, developmental pediatrics etc

The Key to Developmental Surveillance is the knowledge of the spectrum of normal and the indicators of serious delays – this is an ongoing learning process. Developmental delays are common and occur in up to 10% of children.

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Appendix K: Speech, Language and Hearing

Facts about Speech, Language and Hearing

What is Communication?

Communication is the sending and receiving of information. There are four main aspects to communication:

1. Hearing is essential for the acquisition of oral communication, speech and language.
2. Language is the coded system which enables understanding, organization and expression of meaning, thoughts and ideas. It takes the form of words and patterns of words in grammatical structures. Language can be conveyed in an oral, written or gestural/sign form. It can be further subdivided into expressive language (how we express ourselves using words, gestures, etc.) and receptive language (how we understand words, gestures, etc.).
3. Speech is the production of sounds and sequences of sounds. This can be further subdivided into voice quality, fluency and articulation that all contribute to the intelligibility of what is said.
4. Pragmatics is the social aspect of turn-taking and joint attention that facilitates communication.

Causes of Speech and Language Problems

Historically causes of most communication disorders have not been known. Genetic research in the past decade has linked the most common disorder, specific language impairment, to inherited cerebral structure and function. Other speech, language and hearing disorders have been attributed to a variety of factors including maternal infection, genetics, traumatic brain injury, maxillo-facial anomolies such as cleft lip/palate, birth trauma, or syndromes (e.g. Autism Spectrum Disorder, Down Syndrome).

The home environment is also a factor to consider. Limited stimulation and family stressors can cause delay in speech/language development, but do not cause disorders. Delays due to environmental factors can be reversed with good language stimulation.

When a family member has a speech/language/hearing disorder, the children are at higher risk for communication difficulties. Pay special attention if there is a positive family history for: learning disabilities, permanent early childhood hearing loss, congenital syndromes, or if the parent indicates concern.

Key Warning Signs

Emotion and Use of Eye Gaze

–Limited ability to share attention and/or emotions with eye gaze and facial expressions
–Limited use of eye gaze shifts between people and objects
–Delayed ability to understand and follow others' eye gaze and finger pointing

Use of Communication

–Limited use of gestures and/or vocalizations to communicate
–Low rate of communication using gestures and/or vocalization
–Limited number of reasons for communication (e.g., child only communicates to protest and request food, but not to greet, label objects, etc.)
–Limited use of communication to share interest/attention with another

Use of Gestures

–Limited number of gestures (e.g., giving, showing, reaching, pointing)
–Limited use of symbolic gestures (e.g., waving, nodding head, gesture for talking on phone)
–Reliance on gestures and a limited use of vocalizations to communicate

Use of Sound

–Limited number of consonants
–Immature syllable structure (e.g., uses only consonant plus vowel combinations to represent words of varying lengths, such as na/banana or wa/water)

Understanding and Use of Words

–Delayed in understanding language and using language

Use of Objects

–Limited use of symbolic play (e.g., use of toy object to represent real object - phone, feed baby)
–Delayed spontaneous use of actions on objects in symbolic play
–Limited ability to imitate actions on objects

Other

–Positive family history
–Heightened parental concern

When to Refer

Refer all children to the Preschool Speech and Language System when the parent expresses concern or the child presents with high risk indicators or does not meet developmental milestones on the Rourke Record or Nipissing District Developmental Screen™.

Developmental Milestones The skills listed below mark children's progress as they learn to communicate and gain speech and language abilities. If your child is not meeting one or more of these milestones or if you have concerns about your child's hearing, please contact your local Preschool Speech and Language Program, listed on the back of this brochure	*By 6 months* Orients to sounds Startles in response to loud noises Makes different cries for different needs (i.e. hungry, tired) Watches your face as you talk Smiles/laughs in response to your smiles and laughs Imitates coughs or other sounds (e.g. "ah", "oh", buh")
By 9 months Responds to his/her name Responds to the telephone ringing or a knock at the door Understands being told "no" Gets what s/he wants through gestures (e.g. reaching to be picked up) Plays social games with you (e.g. "Peek-A-Boo") Enjoys being around people Babbles and repeats sounds such as "bababaha" or "dahdahdah	*By 12 months* Follows simple one-step directions (e.g. "sit down") Looks across the room to a toy when adult points at it Consistently uses 3 to 5 words Uses gestures to communicate (e.g. waves hi/bye, shakes head "no") Gets your attention using sounds, gestures and pointing while looking at your eyes Brings you toys to show you "Performs" for social attention and praise Combines lots of sounds together as though talking (e.g. "ahada badah abee") Shows an interest in simple picture books
By 18 months Understands the concepts of "in & out", "off & on" Points to several body parts when asked Uses at least 20 words consistently Responds with words or gestures to simple questions (e.g. "Where's teddy?", "What's that?") Demonstrates some pretend play with toys (e.g. gives teddy a drink, pretends a bowl is a hat) Makes at least 4 different consonant sounds (e.g. p, b, m, n, d, g, w, h) Enjoys being read to and sharing simple books with you Points to pictures using one finger	*By 24 months* Follows two-step directions (e.g. "Go find your teddy bear and show it to Grandma") Uses 100-150 words Uses at least two pronouns (e.g. "you", "me", "mine") Consistently combines 2 to 4 words in short phrases (e.g. "Daddy hat", "truck go down") Enjoys being around other children Begins to offer toys to peers and imitate other children's actions and words Words are understood by others 50% to 60% of the time Forms words/sounds easily and effortlessly Holds books the right way up and turns pages "Reads" to stuffed animals or toys Scribbles with crayons

By 30 months Understands the concepts of size (big/little) and quantity (a little/a lot, more) Uses some adult grammar (e.g. "two cookies", "bird flying", "I jumped") Uses over 350 words Uses action words (e.g. run, spill, fall) Begins taking short turns with peers, using both words and toys Demonstrates concern when another child is hurt/sad Combines several actions in play (e.g. feeds doll and then puts her to sleep, puts blocks in train then drives train, drops blocks off) Puts sounds at the start of most words Produces words with two or more syllables or beats (e.g. "ba-na-na", "com-pu-ter", "a-pple") Recognizes familiar logos and signs involving print (e.g. golden arches of McDonalds, "Stop" sign) Remembers and understands familiar stories	*By 36 months* Understands "who", "what", "where" and "why" questions Creates long sentences (e.g. using 5 to 8 words) Talks about past events (e.g. trip to Grandparents' house, day at childcare) Tells simple stories Shows affection for favourite playmates Engages in multi-step pretend play (e.g. pretending to cook a meal, repair a car, etc.) Understood by most people outside of the family most of the time Aware of the function of print (e.g. in menus, lists, signs) Beginning interest in, and awareness of, rhyming
By 48 months Follows directions involving 3 or more steps (e.g. "First get some paper, then draw a picture, last give it to Mom") Uses adult-type grammar Tells stories with a clear beginning, middle and end Talks to try to solve problems with adults and other children Demonstrates increasingly complex imaginative play Understood by strangers almost all of the time Able to generate simple rhymes (e.g. "cat-bat") Matches some letters with their sounds (e.g. "letter T says 'tuh'")	*By 60 months* Follows group directions (e.g. "*All the boys* get a toy") Understands directions involving "if…then" (e.g. "*If* you're wearing runners, *then* line up for gym") Describes past, present and future events in detail Seeks to please his/her friends Shows increasing independence in friendships (e.g. may visit neighbour by him/herself) Uses almost all of the sounds of their language with few to no errors Knows all the letters of the alphabet Identifies the sounds at the beginning of some words (e.g. "Pop starts with the 'puh' sound")

Appendix L: Autism Spectrum Disorder

Developmental Surveillance: Focus on 18–36 Months: Approach to Children with Identified Developmental Difficulty
By Wendy Roberts and Anita Jethwa

When a child has specific delays in communication and is not using verbal or nonverbal means to share interest with other people by 12 months of age there is cause for concern, and a careful diagnostic appraisal needs to be done from a developmental point of view. Similarly, any child who loses the use of language or social skills, particularly between the age of 9 and 24 months, needs to be looked at very carefully. When the absolute indicators for immediate evaluation are met, consideration must be given as to whether the child could have an Autism Spectrum Disorder (ASD).

The term Autism Spectrum Disorder is now replacing the term Pervasive Developmental Disorder (PDD) since Pervasive Developmental Disorder has become a confusing term for parents. Some parents have been given the diagnosis of PDD, and are then shocked a couple of years later to find out that, in fact, their child has autism. The use of the term Autism Spectrum Disorder allows the idea of progress and skill development during the initial labelling process, shifting the child in a positive direction along the spectrum. Parents may be less likely to feel that the autistic label is a permanent life sentence. Research has shown that even experienced professionals are not reliably able to differentiate between the various types of Pervasive Developmental Disorder particularly in the preschool years. The term "high functioning" has become confusing becasue it may be used to describe a child who is either intellectually high functioning or who has less autistic symptoms.

Early identification of an Autism Spectrum Disorder is critical since outcome has been shown to be quite different if children have intensive input in the preschool years. Many high functioning children have been missed in the past because, particularly with parent's scaffolding and support, observed interactions between the child and parent during a short visit to the clinic have failed to show any outstanding abnormality. A prolonged period of observation (e.g., 5–10 minutes) of the child in a play situation is needed.

Glascoe has shown that parent's concerns are in fact very accurate and need to be paid attention to. The current 1 to 3 -year lag, documented between the time when parents are first worried and when a physician first gives a diagnosis, must be reduced.

Early Parental Concerns in Autism

- -Extremes in temperament (passive to irritable)
- -Poor eye contact
- -Lack of or inconsistent response to name
- -Difficult to engage in social play

Early Identified Behavioural Manifestations of Autism (Zwaigenbaum et al, 2005)

- -Atypical early temperament (passive to extreme reactions)
- -Atypical eye contact
- -Atypical orientation to name
- -Atypical social interest and affect
- -Poor imitation skills

Some of the more classical features of autism and those seen in older children may be missing in the early years. There is not the same degree of stereotypic and compulsive behaviours. There is not the same insistence on routines and rituals. Many children are quite affectionate both in accepting and in looking for affection, and many will have eye contact particularly to get their needs met, although not sustaining eye contact for social interaction. The absence of the more typical signs has led in many cases to people making incorrect definitive statements such as, "this is definitely not autism."

When autism is suspected the best current measure is still the Checklist for Autism in Toddlers (CHAT) developed by Simon Baron-Cohen. This checklist documents parent reports of social interest, social play, pretend play, pointing to show, and bringing an object to share interest. The CHAT is the best tool that we have for specifically looking at autism at a screening level so far, although there are some limitations in its use. The CHAT has been shown to have high specificity, in that children who failed three key items on the CHAT at 18 months were shown to maintain their diagnosis of autism after 3 years. However, 50 percent of children diagnosed with autism at 3 years were not detected by the CHAT at 18 months when it was carried out in a larger population study. So the sensitivity is not nearly as good as the specificity possibly because certain features may emerge over time. As a result, if autism is suspected, further diagnosis and repetition of the CHAT must be done on a regular basis during subsequent visits.

When a child is referred on for a diagnostic assessment usually by a Developmental Paediatrician or a Psychiatrist, the clinician must be experienced and up-to-date in the assessment of autism. A diagnostic interview and observation scale must be used, in addition to either questionnaires or observing videotapes from home and a community setting. The specific use of DSM-IV criteria in children under 3 is not a reliable way to make a diagnosis. Using the DSM-IV criteria as a checklist is particularly unreliable in younger children; clinicians need to be able to interpret DSM-IV criteria and apply them in an informed age-specific manner during the history-taking process.

A unique difference in younger children with ASD is unusual sensory interests. This can include seeking of tactile input such as rubbing surfaces, squeezing balls that have different textures; dropping objects and watching them fall, or listening to them fall; watching unusual light patterns; flicking light switches on and off; and looking through their fingers at a light in the background. Sensory peculiarity may greatly limit food intake and some children will only eat very crisp food or very cold food. Many will not accept any mixtures at all. Sensory limitations from diet can lead to quite significant iron deficiency, particularly after the 18-month period.

Younger children have less of the typical autistic repetitive behaviours such as jumping, spinning, or running around in circles. Many will have subtle hand flapping or flicking and hyperextension of fingers.

Medical investigations should always include an audiological assessment with ABR's if there is any doubt about hearing. Most chromosome assessments will not reveal particular abnormalities unless there are significant dysmorphic features. The research is focusing particularly on chromosome 7 and 15, but there is no diagnostic test yet. Children will usually be screened through DNA analysis for Fragile X syndrome. If there is a history of pica, a lead level is suggested; if there is dietary restriction, look for decreased ferritin. If there is any history suggestive of a metabolic disorder then a metabolic screen should be done. Many children, especially those with disturbed sleep and those with significant regression, will have abnormalities on an overnight EEG. An awake EEG is not helpful, and most sleep deprived EEG's are difficult to interpret.

When autism is suspected, intervention must be urgent and intrusive. It involves the working together of a team that must include parents. If a child is under 2 years, a referral to the Infant Development Program so that work can start in home in terms of teaching skills to parents and working with the child to develop social reciprocity and communication. The Preschool Speech and Language Initiative needs to be involved with the speech pathologist being a key member of the team. The Hanen Parent Program "More Than Words" has been very helpful to give parents intensive education and modeling of intrusive interaction leading to the understanding of communication starting in the child. The Regional Autism Services Program and the Preschool Behavioural Autism Program should be contacted so that the child can be assessed for eligibility. Parent support and education programs run through the Geneva Centre in Toronto, which is a Children's Mental Health Centre for children with autism, as well as local autism services, such as Autism Ontario can be helpful.

During the last few years we have learned more about autism and have seen the results of early intervention. It is clear that children can do better when they are detected at an earlier age, when families are able to access more support and more financial aid for both their child's education and respite care when it is needed. In the long term, society will pay less as children do better and families cope better.

Appendix M: Checklist for Autism in Toddlers (CHAT)

The Checklist for Autism in Toddlers (CHAT)

How to Use the CHAT

1) Ask parents the 9 questions in Section A (Box 1). **2)** Complete the 5 questions in Section B by direct observation (Box 1) **3)** The 5 key items in Sections A and B (box 2) are concerned with joint attention and pretend play. The key items in Section B validate (by cross-checking) the parent's answers to the key items in Section A. The remaining non-key items (Box 2) assist in distinguishing autism from other global developmental delays, and provide an opportunity for all parents to answer "yes" to some questions. The degree of risk for autism depends on which items a child fails. See Box 3 for risk assessment.

Box 1: The CHAT – Section A: Ask Parent

1.	Does your child enjoy being swung, bounced on your knee, etc.?	Yes	No
2.	Does your child take an interest in other children?	Yes	No
3.	Does your child like climbing on things, such as up stairs?	Yes	No
4.	Does your child enjoy playing peek-a-boo/hide-and-seek?	Yes	No
5.	Does your child ever PRETEND, for example, to make a cup of tea using a toy cup and teapot, or pretend other things?	Yes	No
6.	Does your child ever use his/her index finger to point, to ASK for something?	Yes	No
7.	Does your child ever use his/her index finger to point, to indicate INTEREST in something?	Yes	No
8.	Can your child play properly with small toys (e.g. cars or bricks) without just mouthing fiddling or dropping them?	Yes	No
9.	Does your child ever bring objects over to you (parent) to SHOW you something?	Yes	No

Section B: General Practitioner or health visitor observation

I.	During the appointment, has the child made eye contact with you?	Yes	No
II.	Get child's attention, then point across the room at an interesting object and say 'Oh look! There's a (name of toy)!' Watch child's face. Does the child look across to see what you are pointing at?*	Yes	No*
III.	Get the child's attention, then give child a miniature toy cup and teapot and say 'Can you make a cup of tea?' Does the child pretend to pour out tea, drink it, etc.?**	Yes	No**
IV.	Say to the child 'Where's the light?', or 'Show me the light'. Does the child POINT with his/her index finger at the light?***	Yes	No***
V.	Can the child build a tower of bricks? (If so how many?) (Number of bricks:.....)	Yes	No

***** To record YES on this item, ensure the child has not simply looked at your hand, but has actually looked at the object you are pointing at. ****** If you can elicit an example of pretending in some other game, score a YES on this item. ******* Repeat this with 'Where's the teddy?' or some other unreachable object, if child does not understand the word 'light.' To record YES on this item, the child must have looked up at your face around the time of pointing.

Box 2: Key and non-key items

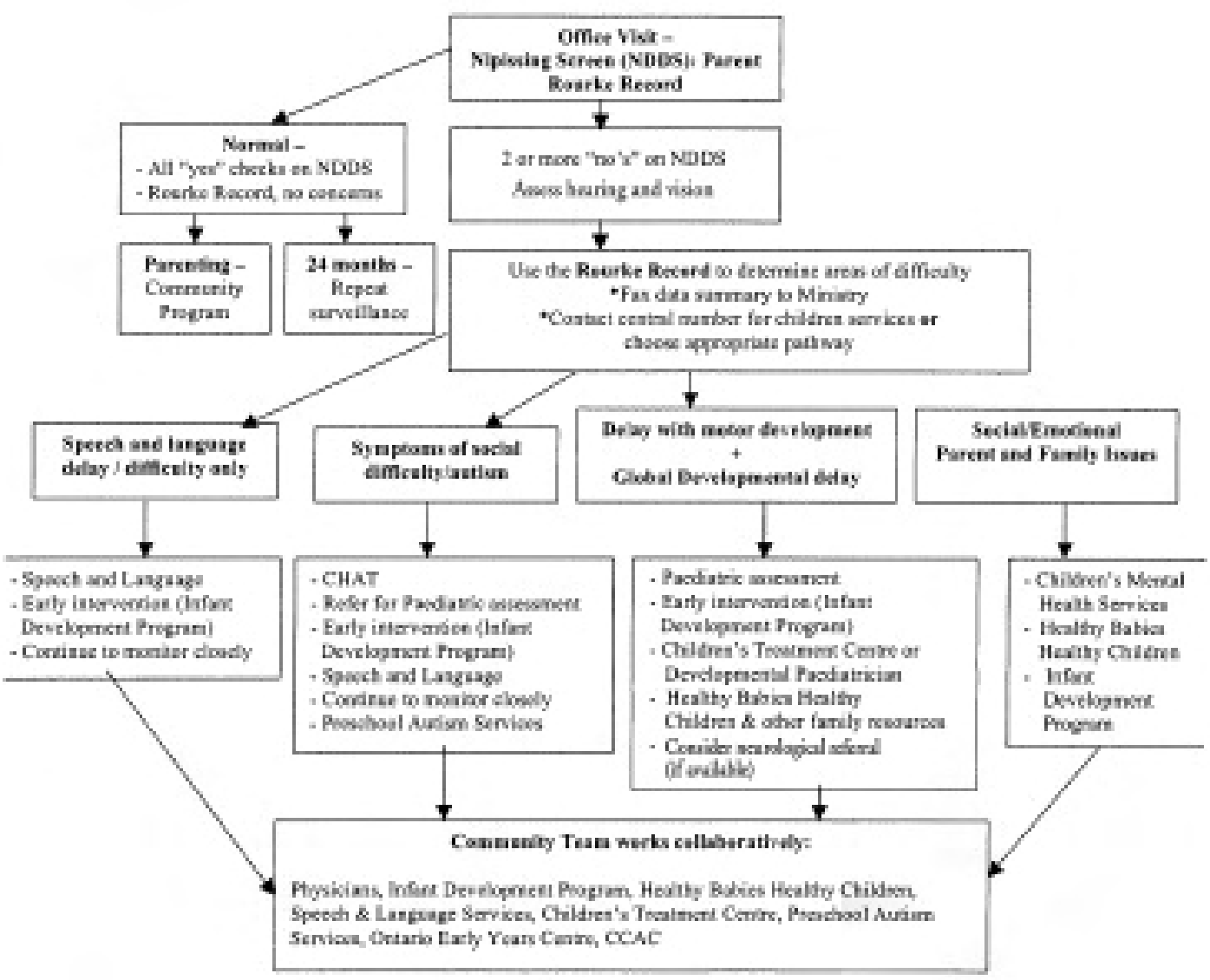
CHAT key items Section A	CHAT non-key items	CHAT key items Section B	CHAT non-key items
A5: Pretend Play	**A1:** Rough and tumble play	**BII:** Follow a point	**BI:** Eye Contact
A7: Protodeclarative pointing	**A2:** Social interest	**BIII:** Pretending	**BV:** Tower of bricks
	A3: Motor development	**BIV:** Producing a point	
	A4: Social play		
	A6: Protoimperative pointing		
	A8: Functional play		
	A9: Showing		

Box 3: Risk Assessment

High risk for autism group	Fail A5, A7, BII, BIII, BIV
Medium risk for autism group	Fail A7, BIV (but not in maximum risk group)
Low risk for autism group	Not in other 2 risk groups

Source: Baron-Cohen, S, Wheelwright, S, Cox, A et al. Early identification of autism by the Checklist for Autism in Toddlers (CHAT). J of Roy. Soc. Of Med., Vol. 93, Oct. 521-525, 2000.

Appendix N: 18 Month Visit Flowchart



Prepared by: Elizabeth Thompson, Tara Kennedy, Wendy Roberts, Nadia Hall, Steven Cohen and Rhonda Schwartz

Adapted from: Getting it Right at 18 Months... Making it Right for a Lifetime. Report of the Expert Panel on the 18 Month Well Baby Visit. Ontario Children's Health Network, Ontario College of Family Physicians. September 2005.

Appendix O: Developmental Issues in an Older Child

TEACHING CASE REPORT

Why every office needs a tennis ball:

a new approach to assessing the clumsy child

The Case: A 7-year-old boy is brought to your office by his mother at the urging of his school. Although he reads extremely well and seems to understand material that is taught, he has great difficulty producing written work, initiating and finishing tasks and participating in gym class. He has trouble sitting still, often bumps into things and other people, and his behaviour is interfering with his academic progress. Socially he is isolated, especially on the school playground, where he avoids physical activity. After educational testing, the learning resource teacher concludes that there is no evidence of a learning disability. The patient appears to be a healthy, communicative boy who slouches noticeably in his chair. His mother is teary and anxious when describing his continuing difficulties.

What is your differential diagnosis? How would you assess this child?

Motor coordination problems in otherwise healthy children of normal intelligence are common. Such children are often noted by parents, caregivers and teachers to have problems with daily tasks such as dressing themselves, to trip when they run, to spill things frequently and to have messy handwriting and drawing. They may be labelled as "clumsy," "awkward" and "lazy." Research has shown that children with these motor coordination problems often end up with serious academic and social impairments and problems with self-esteem. Developmental coordination disorder (DCD) is the term used when a child's delayed motor skill development affects his or her ability to perform age-appropriate daily activities (Box 1).

A total of 5%–6% of children meet the criteria for DCD.[1] This means that, on average, at least 1 child in every primary school classroom is affected. Children with DCD are more likely than their peers to experience learning, emotional and behavioural problems (including learning disabilities, anxiety and attention-deficit hyperactivity disorder). Further, the deficits of DCD usually persist through adolescence and into adulthood. Early recognition of the condition by primary care providers may reduce its ultimate academic, emotional and behavioural impact.

Epidemiology and natural history

DCD is commonly diagnosed after age 5, when minor motor problems (often noted when the child was young) are highlighted by the structured demands of a school environment.[1] The ratio of boys to girls varies from 2:1 to 5:1, depending on the group studied. The cause of DCD is poorly understood, since the results of genetic studies, imaging tests and other laboratory investigations are all inconclusive.

Children with DCD may appear to be inattentive because they have difficulty stabilizing their bodies and joints, so they look restless. They may also actively avoid tasks that require motor skills and become anxious in social situations. DCD and attention-deficit hyperactivity disorder frequently occur together, but the contribution of the motor difficulties to children's academic and social problems is often overlooked.

Although the pathophysiology is unknown, affected children appear to have underlying difficulties in *motor planning* (planning movements such as sitting down on a chair or figuring out how to jump), the *timing and amount of force* needed during movement (e.g., using too much or too little force to pick things up, being late reaching to catch a ball), and the *integration* of information from sensory and motor systems (e.g., relying heavily on visual information to climb stairs or fasten buttons).[1] Children may also show poor balance, slow reaction and movement times, and difficulty executing fine motor skills needed for performing self-care activities, handwriting and drawing.[2]

The natural history of DCD is of con-

Box 1: Diagnostic criteria for developmental coordination disorder[1]

A. Performance in daily activities that require motor coordination is substantially below that expected, given the person's chronological age and measured intelligence. This may be manifested by:
- Marked delays in achieving motor milestones (e.g., walking, crawling, sitting)
- Dropping things
- Clumsiness
- Poor performance in sports
- Poor handwriting

B. The disturbance in criterion A significantly interferes with academic achievement or activities of daily living

C. The disturbance is not due to a general medical condition (e.g., cerebral palsy, hemiplegia or muscular dystrophy) and does not meet criteria for a pervasive developmental disorder

D. If mental retardation is present, the motor difficulties are in excess of those usually associated with it

Note: For a comprehensive review of the examination of clumsiness in children, please refer to the article by Hamilton.[1]

DCD as a problem of motor planning

orm, not because of the motor coordination problem itself but because of its impact on everyday activities and participation. Parents express concern about coordination difficulties when the child is young, but by early school age, these concerns are more evident as problems with self-care and academic activities. By the end of elementary school, social isolation, poor self-image and victimization are evident. Physical health concerns (childhood obesity and reduced physical fitness) and mental health problems (anxiety and depression) are commonly noted by early adolescence (Fig. 1).

Screening

Annual health examinations are ideal times to screen for DCD. Parents can be asked to complete a self-administered questionnaire (see example in Appendix 1, available at www.cmaj.ca/cgi/content/full/179/5/471/DC1), or the physician can conduct a structured interview, listening for difficulties commonly associated with DCD. In addition, the physician can assess the child using simple screening activities administered in his or her office (see Appendix 2, available at www.cmaj.ca/cgi/content/full/179/5/471/DC1). Children with symptoms or signs of a motor coordination disorder require further evaluation.

An assessment that takes into account the differential diagnosis of DCD (Box 1) is necessary, since DCD is a diagnosis of exclusion. Elements of the child's history, physical examination and laboratory test profile that would make alternate diagnoses more likely are indicated.

Referral and treatment

Early referral to an occupational therapist or pediatric multidisciplinary team can help confirm the diagnosis and rule out comorbid conditions such as speech or language difficulties, attentional problems, learning difficulties and mental health problems. This type of team can also help devise early management plans that may improve the child's developmental outcomes. Successful treatment approaches involve various allied health professionals, and the child's parents, physician and teachers.[13]

Armed with a diagnosis of DCD, parents are in a position to advocate for their child and to adapt their child's environment to encourage independence and self-esteem. Children with DCD lack confidence in situations where motor

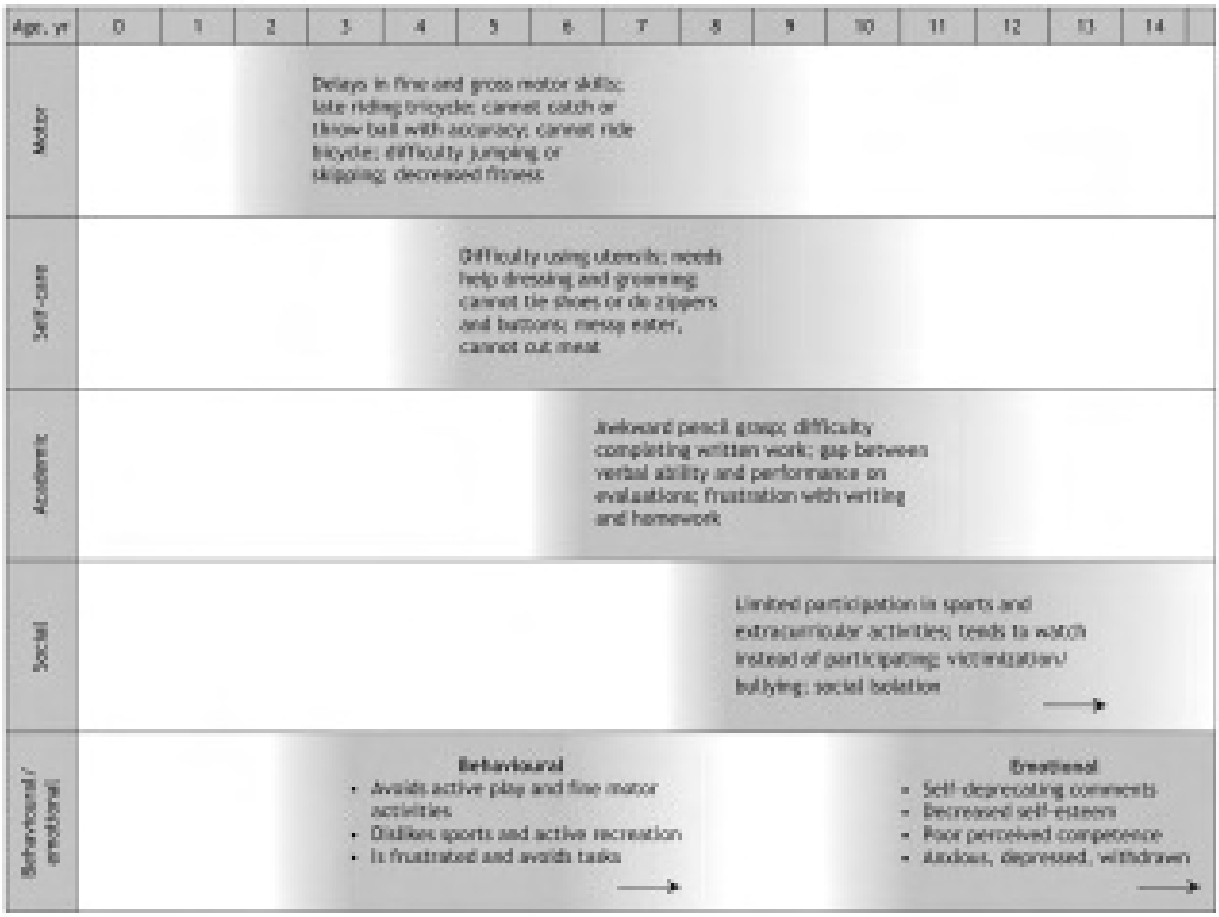


Fig. 1: Concerns typically noted by parents of children with developmental coordination disorder at different ages.

skills are required. Simple changes such as Velcro fasteners instead of buttons and laces can speed up dressing. Physical activities that naturally incorporate repetition and a constant environment, such as swimming, can be encouraged rather than team games. Teachers can reduce a child's stress and encourage academic progress by "matching" the child's abilities to the task. For example, reducing writing requirements, giving more time to complete tasks and encouraging different roles in physical education class can be helpful." Resources containing teaching tips and strategies for parents and educators can be found at the CanChild Centre for Childhood Disability Research (www.canchild.ca).

The case revisited

Physical examination reveals that the patient has normal hearing and vision, is slightly overweight and has low muscle tone (slouches and has unstable posture in sitting and standing positions). Administration of the screening activities shows that the boy's one-legged balance is poor. His pencil grasp is awkward, he uses excessive pressure, and his printing is slow. His sitting posture at the desk is "floppy" and he props his head upright by leaning on his other hand. The patient is unable to bounce and catch a tennis ball (see video clip, available at www.cmaj.ca/cgi/content/full/175/5/471/DC2).

In the parent questionnaire, the mother indicates that her son has great difficulty with many motor-based activities, is slow to learn new motor skills and becomes easily frustrated. Further questions about his disruptive behaviour in the classroom reveal that he misbehaves only when written work is required; he is not otherwise inattentive.

DCD is diagnosed. The physician provides the boy's parents with a variety of educational materials and suggests a referral to an occupational therapist and a review in 3 months.

Box 2: Differential diagnosis of developmental coordination disorder (DCD)

The physician should systematically establish the presence or absence of other disorders that can be associated with motor incoordination, including:

- Genetic disorder (e.g., Down syndrome)
- Neurologic disorder (e.g., cerebral palsy)
- Degenerative condition (e.g., Duchenne's muscular dystrophy, brain tumour)
- Musculoskeletal disorder (e.g., Legg-Perthes disease)
- Physical impairment (e.g., impaired visual acuity)
- Cognitive impairment (e.g., developmental delay)
- Pervasive developmental disorder (e.g., autism)
- Injury (e.g., traumatic brain injury)
- Environmental contaminant (e.g., lead, pesticides)

If any of the following are present, the coordination difficulties are probably not DCD:

- History of recent head injury or trauma
- History of deterioration (child has "lost" motor skills that he or she used to have)
- History of headaches, eye pain, blurred vision
- History of global developmental delays
- Increased muscle tone, fluctuating tone or significant hypotonia
- Asymmetry of tone or strength
- Musculoskeletal abnormality
- Neurocutaneous lesion
- Avoidance of eye contact, unwilling to engage socially
- Gowers' sign (difficulty rising to a standing position)
- Ataxia, dysarthria
- Absence of deep tendon reflexes
- Dysmorphic features
- Visual impairment (untreated)

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ADDITIONAL RESOURCES

- CanChild Centre for Childhood Disability Research (www.canchild.ca): educational material for parents, teachers, service providers and members of the community available free
- DCD-PACE — Physician Allied Health Collaboration Kit (www.dcdpack.ca [enter "dcdpack" as username and "dcdchild" as password]): educational material for primary care physicians

Appendix P: Pediatric Nutrition Guidelines for Primary Health Care Providers

When a child presents with several red flags, it may be beneficial to refer the caregiver to a Registered Dietitian for a nutritional assessment. Caregivers may contact their local public health unit to speak with a Public Health Dietitian or Public Health Nutritionist.

Age	Developmental Characteristics	Guideline	Red Flag
Birth to 4 months	• Sucks well on nipple (2). • Extrusion reflex causes tongue to protrude when solid food or spoon is put in mouth (1). • Feeds every 2-4 hours during the day by 2 months (2). • Finishes each feeding within 45 minutes by 4 months (2).	• Breastfeeding is the optimal method of feeding infants. • If an infant is not breastfed, or partially breastfed, iron fortified commercial formula is the most acceptable alternative (1,4). • There is no link between iron-fortified formula and constipation (1,4). • Specialty formulas are indicated only for detected or suspected pathology (1,4). Avoid unnecessary switching of formula types/brands. (No link between iron-fortified formula and constipation). • Under normal circumstances, water is not needed (1). • Soy-based formula is not indicated for cow's milk allergy; hypoallergenic formulas are indicated (1,4). • Do not use honey in the feeding of infants under one year (1,4).	• Diet includes anything other than breast-milk or iron fortified infant formula. • Exclusively breastfed infant is not receiving a vitamin D supplement. • Water for infant formula, for drinking or other foods are not being boiled for two minutes. (Water for drinking and other foods is not recommended at this age). • Infant formula is not being mixed correctly (i.e. correct dilution). • Infant formula not prepared using aseptic technique and refrigerated. • Infant formula not discarded within one hour of starting a feeding. • Breastmilk or infant formula is not being fed on demand. • Formula fed baby is not held during feeding to ensure infant safety and promote parent/child bonding. • Feeding a baby using a propped bottle. • Honey is given under 1 year of age.
4-6 months	**Signs of Readiness for Solid Food** • Holds head steady when supported in a sitting position (1). • Indicates disinterest in food by leaning back, keeping mouth closed and turning head away (1). • Loses extrusion reflex. • Indicates desire for food by watching spoon, opening mouth for spoon, closing lips over spoon and swallowing (1).	• At about six months (6,7,8)*, offer small amounts of iron-fortified cereal. Start with 1-3 teaspoons once per day and gradually increase to approximately 2-4 tablespoons twice per day. • Identify signs of readiness. • Establish healthy feeding relationship, e.g., parent recognizes hunger cues, feeding is a pleasant, interactive experience for parent and child. • Iron fortified formulas are recommended for formula fed infants (1,4). • There is no link between iron-fortified formula and constipation (1,4). • Do not use honey in the feeding of infants under one year (1,4). * Guidelines for the introduction of complementary foods published in Nutrition for Healthy Terms Infants (4) are under review.	• Infant formula is not iron fortified. • Solid foods have been introduced prior to infant displaying readiness to feed (good head control, can turn away if food is not wanted, opens mouth wide when food is seen coming, keeps food in mouth instead of squeezing it out). • Infant is drinking fruit juice, fruit drink or soft drinks. • Exclusively breastfed infant is not receiving a vitamin D supplement. • Honey is given under one year of age.

Age	Developmental Characteristics	Guideline	Red Flag
6-9 months	• Eats soft food from a spoon or adult's fingers (2). • Sits with support or alone (1). • Feeds at regular times (2). • Can hold a bottle and sippy cup(1). • Drinks from a cup held by adult (1). • Tongue has increased movement and allows for more manipulation of food (3). • Begins chewing with up and down movements (1). • Teething begins (1).	• Gradual introduction of increased thickness to puree and then to mashed by 9 months. • Introduce one new food at a time. If a new food is rejected, accept the refusal calmly and offer it again in a few weeks (3). • Baby may join family mealtimes at the table. • Do not use honey in the feeding of infants under one year (1,4).	• Complementary foods have not been introduced after six months (iron fortified cereal recommended). • Breastfed baby is not receiving a vitamin D supplement. • Has not doubled birth weight by six months. • Infant is drinking more than _ cup of fruit juice per day (9). • Infant is consuming fruit drinks or soft drinks. • Honey is given under one year. • Formula fed baby is not held during feeding. • Feeding baby using a propped bottle.
9-12 months	• Tries to use a spoon (3). • Fine motor skills improve (1). Can pick up small items using thumb and first finger (2). • Rotary chewing movements develop (1). • Licks food from lower lip(1). • Can hold cup, but may spill contents (1). • Picks up foods in fingers or palms and puts in mouth (1). • Conscious of what others do and imitates (3).	• Whole cow's milk may be introduced if the infant is consuming a variety of other foods. • Soy milk not recommended under age 2 because of low fat content. • If goat's milk is introduced, use whole goat's milk product fortified with vitamin D. • Promote motor skills by offering finger foods. • Include baby at family mealtimes and invite self-feeding. • Begin self-feeding by offering soft finger foods, such as pieces of banana, dry cereal and toast (3). • Do not use honey in the feeding of infants under one year (1,4).	• If receiving cow's milk, a low fat version (skim, 1% or 2%) is provided before age 2. • Breastfed baby not receiving a vitamin D supplement and not receiving 16 oz (2 cups) of cow's milk or formula. • Refuses mashed or chopped foods. • Drinking more than 1/2 cup per day of fruit juice (9). • Consuming fruit drinks or soft drinks. • Parents or caregivers not allowing child to self-feed. • Honey is given under one year of age.

Age	Developmental Characteristics	Guideline	Red Flag
12-18 months	• Understands simple questions and requests such as "no" (2). • Holds, bites and chews crackers (2). • Picks up small items using tips of thumb and first finger (2). • Picks up and eats finger foods by 15 months (2). • Wants food others are eating (3).	• After one year of age, children should be eating a diet containing foods from each of the four food groups listed in Canada's Food Guide to Healthy Eating. • Vitamin and mineral supplements should not be necessary. • The role of parents is to ensure that all foods a child can choose to eat are nutritious and appealing. • Parents use family meal times to set behavioural limits, e.g., appropriate length of time to stay at the table, no throwing food. • Snacks become important because of decreased appetite after 12 months. • Messiness and awkwardness during feeding are a part of the learning process. • Avoid foods with the potential to cause choking. Unsafe foods are those that do not dissolve in saliva and can block an infant's airway. They include round, hard, smooth and sticky foods such as nuts, hot dogs, grapes, raw carrots, apple pieces, raisins, seeds, candy and popcorn. Peanut butter is potentially unsafe because it can cause a sticky bolus (1).	• Not eating a variety of table foods. • Has not tripled birth weight by 12 months. • Drinking more than 6 oz (3/4 cup) per day of juice (9). • Drinking fruit drinks or soft drinks. • Food is used as a reward or punishment. • A low fat version of cow's milk is provided before age 2. • Parents or caregivers not allowing child to self-feed.
18-24 months	• Holds a cup to drink (by 18 months) (2). • Appetite decreases (3). • Likes eating with hands (3). • Rituals become important (3). • Distracts easily (3). • Displays food preferences (1).	• Parents should be reassured that they are responsible for what the child is offered to eat and where and when it is presented. The child is responsible for how much food he eats. An occasional skipped meal is not cause for concern (1).	• Drinking more than 6 oz (_ cup) per day of juice (9). • Consuming fruit drinks or soft drinks. • Drinking less than 16oz (2 cups) or more than 24oz (3 cups) of milk per day. • Still drinking from a bottle. • A low fat version of cow's milk is provided before age 2. • Food is used as a reward or punishment. • Parents or caregivers not allowing child to self-feed.

Age	Developmental Characteristics	Guideline	Red Flag
2-3 years	• Eats most foods without coughing and choking by age 2 (2), but choking remains a hazard (3). • Eats with a utensil with little spilling by age 2 (2). • Copies caregiver's actions by age 2 (2). • Likes to do some things without help by age 2 (2). • Recognizes familiar objects (2). • Lifts and drinks from a cup and replaces it on the table (2). • Definite "likes" and "dislikes" (3). • Insists on doing it "myself" (3). • Dawdles (3). • Food jags – refusal of all but one or two favourite foods over an extended period (3). • Demands food in certain shapes, whole foods (3). • Likes to help in the kitchen (3).	• Different preschoolers need different amounts of food depending on age, body size, activity, growth rate, and appetite (5). • Preschoolers can determine how much to eat. Appetites increase during growth spurts or increased activity and fall when the preschooler is overly tired or excited (5). • When milk is not consumed, discuss alternate sources of calcium and vitamin D with a dietitian. • Fruit drinks and soft drinks are not recommended as they displace nutrient dense foods and beverages.	• Drinking less than 16 oz (2 cups) or more than 24 oz. (3 cups) of milk per day. • Drinking more than 6 oz (_ cup) per day of juice. • Still being spoon-fed. • Not eating a variety of table foods from four food groups (Canada's Food Guide to Healthy Eating). • Does not eat at regular times throughout the day (breakfast, lunch, and supper and 2-3 between meal snacks). • Food is used as a reward or punishment. • Still drinking from a bottle.
Preschoolers (age 3-6 years)	• Holds handle on cup (3). • Uses fork by age 4 (3). • Uses fork and knife by age 5 (3). • Good self-feeder by age 4 to 5 (3). • Improved appetite and interest in food (3). • Favourite foods requested (3). • Likes shapes and colours (3). • Influenced by TV commercials (3). • Peer influences increase by age 4 (3). • Less suspicious of mixtures, but still prefers plain foods by age 5 (3). • Food is an important part of special occasions by age 5 (3).	• Parents can involve children in meal preparation, e.g., stirring, adding pizza toppings, and setting the table. • Parents can use foods to teach children about colours, shapes, sizes, numbers, etc. • Fruit drinks and soft drinks are not recommended as they displace nutrient dense foods and beverages. • Limit TV watching to one hour or less per day (10).	• Drinking more than 6 oz (_ cup) of fruit juice per day. • Drinking less than 16 oz (2 cups) or more than 24 oz. (3 cups) of milk per day (soft drinks and fruit drinks not recommended). • Still drinking from a bottle. • More than 3 hours of TV watching per day.

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General Risk Factors that indicate the intervention of a dietitian and other primary health care providers:

- Weight growth curve is not following expected pattern. Too little gain or too much as related to height growth curve.
- If infant or toddlers has medical problems that make eating or drinking a problem such as swallowing issues, gagging, choking, etc.
- If infant/toddler has other health problems that may be related to diet such as iron deficiency anemia, constipation, etc.
- The family has different beliefs related to foods – ie the use of herbal products, exclusion of food groups such as meat products, use of unsafe products such as unpasteurized milk, choking hazards.
- Family is experiencing problems around feeding – mealtimes are unpleasant; infant refuses many foods or drinks during day and won't eat at mealtimes. Possibly parents can be force feeding or offering inappropriate amounts of food.
- Family has problems with adequate food storage/cooking facilities or provision of adequate amounts of food because of lack of information or financial constraints.

Important Nutrition Issues Often Overlooked:

- Spitting up in small amounts is normal for young infant and does not necessarily indicate a need for a change in formula.
- Lactose intolerance is rare in infants.
- Portion sizes for toddlers and preschoolers range from 1/4 to 1/2 of an adult portion e.g. 2 – 4 tablespoons of cooked vegetable.
- Eating breakfast is important for cognition/concentration.
- Establishing a healthy feeding relationship and healthy eating habits is critical to the long-term prevention of obesity.
- When making food choices, families will only consider the nutritional value of foods when they experience food security. Food security exists when people, at all times, have access to sufficient nutritious, safe, personally acceptable and culturally appropriate foods that can be obtained in a manner that maintains human dignity (OPHA).

Ontario Society of Nutrition Professionals in Public Health

Prepared by the Healthy Babies Healthy Children Workgroup of the Ontario Society of Nutrition Professionals in Public Health (OSNPPH) – June 2003. Revised February 2004

Appendix Q: Key Resources and Services in Ontario

This is a selection of key healthy child development resources and services that are available across Ontario to service providers and/or the general public. A range of supports is provided, including helpful websites, documents, programs and phone lines. The emphasis is on linking to critical supports, rather than providing an extensive list of all resources and services. Resources and services are organized by category, in alphabetical order.

Bereavement Services/Supports

Contact Information	Brief Description
Perinatal Bereavement Service Ontario Phone: 888-301-7276 Website: www.pbso.ca	Support services tailored specifically to meet the special needs of perinatally bereaved families.
Canadian Foundation for the Study of Infant Deaths Phone: 800-363-7437 Website:www.sidscanada.org	Education and support services for parents and families affected by Sudden Infant Death Syndrome (SIDS).

Breastfeeding

Contact Information	Brief Description
Breastfeeding Committee for Canada Website: www.breastfeedingcanada.ca	The national authority for the WHO/UNICEF Baby-Friendly™ Hospital Initiative in Canada.
Health Canada Website: www.phac-aspc.gc.ca/dca-ea/publications/pdf/bf_workbook_e.pdf	Resources and information about breastfeeding
La Leche League Canada Phone: 800-665-4324 Website: www.lalecheleaguecanada.ca	Assistance to breastfeeding women through support and education.
Ontario Hospital Association Phone: 416-205-1300 Website: www.oha.com	Contact information for hospital based breastfeeding clinics.

Child and Youth Mental Health

Contact Information	Brief Description
Children's Mental Health Ontario Website: www.kidsmentalhealth.ca	A provincial umbrella association representing over 80 children's mental health services.
Provincial Centre of Excellence for Child and Youth Mental Health, Children's Hospital of Eastern Ontario (CHEO) Website: www.onthepoint.ca	An organization dedicated to improving the child and youth mental health care system in Ontario through knowledge sharing and partnership building.

Child Health & Development – General

Contact Information	Brief Description
Canadian Association of Pediatric Health Centres Website: www.caphc.org	Information, knowledge & expertise, best practices, resources related to health and welfare of children, youth and their families.
Canadian Health Network – Children's Affiliate Website: www.canadian-health-network.ca/1children.html	Searchable database on child health and development, including information on play, learning, behaviour, parenting, nutrition, safety, immunization, illness and special needs.
Canadian Institute of Child Health Phone: 613-230-8838 Website: www.cich.ca	Publications and resources for parents.

Healthy Babies, Healthy Children Info line: 800-268-1154, TTY 800-387-5559 Website: www.health.gov.on.ca/english/public/pub/child/hbabies/hbabies.html	Prevention and early intervention for families with children from before birth up to six years of age, including support and services.
Infant Mental Health Promotion Program Phone: 416-813-6062 Website:www.sickkids.on.ca/imp	Education, information, networking, and advocacy to support best practices for enhancing infant mental health.
Nipissing District Developmental Screen Phone: 705-752-5081 or 888-582-0944 Website:www.ndds.ca	Screening method for identifying problem areas in child development.
Public Health Units Info line: 800-268-1154, TTY 800-387-5559 Website: www.health.gov.on.ca/english/public/contact/phu/phu_mn.html	Range of preconception, prenatal and child health services.
Rourke Baby Record Website: http://www.cfpc.ca/English/cfpc/programs/patient%20care/rourke%20baby/default.asp?s=1	System of care for well baby and child from birth to 5 years of age.

Dental Health

Contact Information	Brief Description
Ontario Government Website on Dental Health: www.health.gov.on.ca/english/hlinks/dental.html	Publications on oral health for pregnant women and children.

Fetal Alcohol Spectrum Disorder

Contact Information	Brief Description
FASD Information and Consultation Service Phone: (613) 235-4048 / 800-559-4514 Website: www.ccsa.ca/index.asp?ID=17	Information and resources about Fetal Alcohol Spectrum Disorder (FASD).
Health Canada Website: www.phac-aspc.gc.ca/fasd-etcaf/index.html	Resources and information about Fetal Alcohol Spectrum Disorder
Motherisk Alcohol and Substance Use in Pregnancy Helpline: 877-327-4636 Website: www.motherisk.org	Information and guidance to pregnant or lactating patients and health care providers regarding the fetal risks associated with alcohol and drug use during pregnancy.

Immunization

Contact Information	Brief Description
Canadian Coalition for Immunization Awareness and Promotion Website: www.immunize.cpha.ca	Information and resources for parents and health care providers about immunization.
Health Canada, Immunization Division Website: www.phac-aspc.gc.ca/irid-diir/index.html	Immunization schedules and answers to questions about immunization.
Ontario Government www.health.gov.on.ca/english/public/pub/immun/immunization.html	Information on immunization.

Multiple Births

Contact Information	Brief Description
Multiple Births Canada Phone: 705-429-0901, 866-228-8824 Website: www.multiplebirthscanada.org	Health information and support networks for multiple birth individuals and their families.
Society of Obstetricians and Gynaecologists of Canada's Multiple Births Website: http://sogc.medical.org/index_e.asp	Information and links related to multiple births.

Nutrition Resources

Contact Information	Brief Description
Canada Prenatal Nutrition Program Website: www.phac-aspc.gc.ca/dca-dea/programs-mes/cpnp_goals_e.html#what	Information and nutrition supplements during pregnancy and breast feeding.
Health Canada Infant Nutrition Information Website: www.phac-aspc.gc.ca/dca-dea/prenatal/nutrition_e.html	Information and links related to infant nutrition.
How to Feed your Growing Child Website: www.beststart.org/resources/nutrition/index.html	Resource on nutrition for 1-5 year old children.

Parenting

Contact Information	Brief Description
Canadian Child Care Federation Website: www.cccf-fcsge.ca/	Information and resources related to child care.
Caring for Kids, Canadian Paediatric Society Website: www.caringforkids.cps.ca	Information on caring for newborns, immunization, healthy eating, common childhood illnesses, behaviour and development, etc.
Child and Family Canada Website: www.cfc-efc.ca	Information and resources about children and families.
Community Action Programs for Children Website: www.phac-aspc.gc.ca/dca-dea/programs-mes/capc-strongfamilies1_e.html	Community based programs for families with young children.
Family Resource Programs Phone: 866-637-7226 Website: www.frp.ca	Drop-in programs, parenting groups, parent relief, toy libraries and information on caring for children, child development, health and safety, healthy eating, recreation and literacy.
Family Service Canada Phone: 800-668-7808 Website: www.familyservicecanada.org	Links to family service agencies across Canada that provide programs to help families in day-to-day living, in times of crisis, and in strengthening relationships.
Growing Healthy Canadians: A Guide to Positive Child Development Website: www.growinghealthykids.com	Information on healthy child development
Invest in Kids Phone: 877-583-5437/ 416-977-1222 Website: www.investinkids.ca	Resources and information for parents about healthy child development and parenting.
One Parent Families Association of Canada Phone: 877-773-7714 or 905-83 7098 Website: http://hometown.aol.com/opfa222/index.html	Social activities and emotional support for single parents and their children, including sports and other activities.
Ontario Early Years Centres Phone: 866-82 7770 Website: www.ontarioearlyyears.ca	Support and information for parents on learning, development, and health of children birth to six years old. Links parents to needed services.
Ontario Federation of Indian Friendship Centres Phone: 416-956-7575 Website: www.ofifc.org	Support and programs for Aboriginal people on health, justice, family, and employment and training.
Vanier Institute of the Family Website: www.vifamily.ca	Information and commentary about families.

Physical Activity

Contact Information	Brief Description
Canadian Society for Exercise Physiology Website: www.csep.ca/main.cfm?cid=574	Guidelines on physical activity in pregnancy
Canada's Physical Activity Guide Phone: 888-334-9769 Website: www.phac-aspc.gc.ca/pau-uap/paguide/index.html	Information about physical activity including its benefits, risks of being inactive and ideas about various ways to increase levels on a daily basis.
Mothers in Motion Website: www.caaws.ca/mothersinmotion/home_e.html	Information for mothers with young children on how lead an active lifestyle and how to encourage children to do the same.
Society of Obstetricians and Gynecologists of Canada Guidelines Website: www.csep.ca/pdfs/joint%20sogc_csep%20guidelines.pdf	Clinical Practice Guideline: Exercise in Pregnancy and the Postpartum Period.

Postpartum Depression and Mood Disorder Services

Contact Information	Brief Description
Canadian Mental Health Association Website: www.cmha.ca/bins/index.asp	Postpartum depression resource.
Our Sisters' Place Website: www.oursistersplace.ca	Support network for women, with a focus on mood disorders associated with hormonal changes throughout the lifespan.
Pregnancy and Depression Website: www.pregnancyanddepression.com	Website for professionals.

Preconception and Prenatal Services

Contact Information	Brief Description
Association of Ontario Midwives Phone: 416-425-9974 or 866-418-3773 Website: www.aom.on.ca	List of midwifery practices available in Ontario
Best Start Resource Centre Website: www.beststart.org	Range of resources on preconception and prenatal issues.
Doulas Website: www.canadiandoulas.com/ontario.htm	Contact information for Doulas, prenatal educators, breastfeeding support and midwives in Ontario.
Healthy Babies Healthy Children Info line: 800-268-1154, TTY 800-387-5559 Website: www.health.gov.on.ca/english/public/pub/ministry_reports/healthy_babies_report/hbabies_report.html	A prevention and early intervention initiative to provide support and services to families with children from before birth up to six years of age. Includes prenatal components.
Motherisk Phone: 416-813-6780 Alcohol and Substance Use in Pregnancy Helpline: 877-327-4636 Nausea and Vomiting in Pregnancy Helpline: 800-436-8477 HIV Treatment in Pregnancy: 888-246-5840 Website: www.motherisk.org	Information and guidance to pregnant or lactating patients and their health care providers regarding the fetal risks associated with drug, chemical, infection, disease and exposure(s) during pregnancy, as well as nausea and pregnancy.
Prenatal HIV Testing Website: www.health.gov.on.ca/english/providers/program/hivaids/prenatal/prenatal_mn.html	Ontario government discussion guide and checklist on prenatal HIV testing.
Society of Obstetricians and Gynaecologists of Canada Website: www.sogc.org	Information on care before, during and after pregnancy.
Women's Health Matters Pregnancy Resource Centre Website: www.womenshealthmatters.ca/centres/pregnancy/index.html	Information for expectant families about healthy pregnancy.

Pregnancy and Parental Leave

Contact Information	Brief Description
Human Resources Development Canada Website: hrdc-drhc.gc.ca/ae-ei/menu/faq/faq3_e.shtml	Information about pregnancy and parental benefits.
Ontario Government Website: Website: http://www.gov.on.ca/ont/portal/!ut/p/.cmd/cs/.ce/7_0_A/.s/7_0_252/_s.7_0_A/7_0_252/_l/en?docid=012214	Fact sheet on pregnancy and parental leave.
Ontario Human Rights Commission Phone: 800-387-9080 Website: www.ohrc.on.ca/english/index.shtml	Information about rights related to pregnancy and breastfeeding.

Safety & Protection

Contact Information	Brief Description
Lifesaving Society Phone: 416-490-8844 Website: www.lifesavingsociety.com	Information on how to prevent drowning and other water-related injuries as well as training in emergency rescue skills.
Ontario Association of Children's Aid Societies Phone: 416 987-7725 Website: www.oacas.org	Help, support and protection for children. Information on how to report child abuse.
Ontario Poison Centre Toll-free: 800-268-9017 or 416-813-5900 Website: www.sickkids.on.ca/Poison/default.asp	Hotline for parents' questions and concerns about a product their child may have eaten, drank or otherwise ingested. **24 hour service.**
Safe Kids Canada Phone: 888-723-3847 Website: www.safekidscanada.ca	Information about how to prevent injuries in children.

Smoking Cessation

Contact Information	Brief Description
PREGNETS Website: http://pregnets.org	Health care provider and patient resources about the negative consequences of smoking and environmental tobacco smoke on women, fetuses, and children.
Health Canada Smoking Information Website: www.hc-sc.gc.ca/hecs-sesc/tobacco/quitting/mothers.html	Fact sheets and resources on smoking cessation and pregnancy.
Canadian Cancer Society Smokers' Helpline Phone: 877-513-5333 Website: www.smokershelpline.ca	Phone line and website with smoking cessation advice.

Special Needs

Contact Information	Brief Description
Autism Society Ontario Website: www.autismontario.com/	Support and information for parents on learning, development, Information and referral sources on autism.
CanChild Centre for Childhood Disability Research Website: www.fhs.mcmaster.ca/canchild	Information and current research on children with disabilities and their families.
Hanen Centre Website: www.hanen.org	Helps young children to communicate to the best of their abilities through programs and resources for parents, educators etc.
Intensive Early Intervention Program for Children with Autism Website: www.children.gov.on.ca/CS/en/programs/SpecialNeeds/earlyInterventionAutism.htm	Information about assessment, training and intervention for autism.
Ontario Association of Children's Rehabilitation Services Website: www.oacrs.com	Services for children with multiple disabilities and their families, including assessment, diagnosis, treatment and community programs.

Ontario Ministry of Children's Services – Children with Special Needs Website: www.children.gov.on.ca/CS/en/programs/SpecialNeeds/default.htm	Information and services for children with special needs.

Speech, Language and Hearing

Contact Information	Brief Description
Infant Hearing Program Website: http://www.children.gov.on.ca/CS/en/programs/BestStart/InfantHearing/default.htm	Information and services for families of children with permanent hearing loss.
Ontario Association of Speech Language Pathologists and Audiologists Website: www.osla.on.ca	Links to service providers and groups working to address issues surrounding hearing loss and communications impairments
Preschool Speech and Language Program Website: http://www.children.gov.on.ca/CS/en/programs/BestStart/PreschoolSpeechLanguage/default.htm	Information and services related to preschool speech and language.

Woman Abuse

Contact Information	Brief Description
Assaulted Women's Helpline Phone: 866-863-0511 or 416-863-0511 866-863-7868 (TTY)	Crisis line for assaulted women across Ontario with simultaneous translation into 150 languages. 24 hour service.
Education Wife Assault Website:www.womanabuseprevention.com/	Information and education about physical, psychological, emotional and sexual violence against women.
National Clearinghouse on Family Violence Website: www.hc-sc.gc.ca/hppb/familyviolence/	Links to resources about violence within the family and how to address it.
Shelternet Website: www.shelternet.ca	Lists of shelters and helplines related to woman abuse.

Vision

Contact Information	Brief Description
Canadian Paediatric Society Website:www.cps.ca/english/statements/CP/cp98-01.htm	Vision screening information.

Appendix R: Resources and Referral Services Form

Your Guide to Local Services

Preconception and Prenatal Resources •Groups: •Information: •Programs for teens: •Programs for fathers:	**Contact:**
Parenting Resources •Groups: •Tapes: •Phone lines: •Counselling: •Programs for teens: •Programs for fathers:	**Contact:**
Early Education Experiences •Play groups: •Nursery school: •Library programs: •Toy lending services:	**Contact:**
Hearing Services •Infant Hearing Program – Birth to 2 years •Audiological Services	**Contact:**
Preschool Speech and Language Program – Birth to S.K. •Local contact number	**Contact:**
Autism •Autism Society •Preschool Autism Services	**Contact:**
Other Developmental Programs and Services •Developmental Pediatrician •Child and Family Assessment •Child Development Centre •Children's Services •Central Dispatch Number •Infant Development Program •Learning Disability Association	**Contact:**
Nutrition Services: •Canada Prenatal Nutrition Programs •Breastfeeding information and services •School Breakfast programs •Nutrition assessment and counselling •Food banks and other emergency food programs	**Contact:**
Other Local Services: •Bereavement Services •Postpartum Depression Support Services •Children in Need of Dental Treatment (CINOT)	**Contact:**

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