

Family-Centred Maternity and Newborn Care:  
National Guidelines

— CHAPTER 2 —

# Organization of Services



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## Introduction

The *guiding principles* for family-centred care constitute the basis for the national, provincial, regional, or local organizing of services for the care of mothers and babies. Hence, pregnancy and birth are considered normal, healthy, and unique for each woman. The central objective of care for women, babies, and families is to assist women to give birth to healthy babies. This means that women should be cared for within the context of their families. As well, women and their families need to have full knowledge about the care and circumstances surrounding birth so they can make informed choices. Today, it is recognized that women have autonomy in decision making and, through respect and informed choice, are empowered to take responsibility. Mutual respect and trust must underlie the relationships between the variety of caregivers found in maternal and newborn services and women and their families. Finally, technology must be used appropriately in family-centred care.

Maternal and newborn services should be organized with:

- participation of all the stakeholders in the planning and provision of care; that is, the parents, community groups, community agencies, health care providers, health units, provider offices, and hospitals;
- consideration for the pregnant woman's health status (prior to and during pregnancy), and referral to the appropriate resources for care;
- provision of available and accessible care, with due consideration given to the geographic, demographic, and cultural conditions of the families;
- integration of appropriate institutional and community-based programs for the care of mothers, newborns, and families;
- collaboration among all participants, parents, and caregivers with regard to consultation, transport, and referral;
- provision of education for women, families, and health care professionals;
- coordination of services and supports within a community to ensure continuity of care;
- assessment of outcomes; and
- efficient and ethical use of personnel, facilities, and resources.

## Regionalization of Services

### Description of Regionalization

Regionalization of maternal and newborn care brings together a comprehensive organization of services to provide optimal care for women, babies, and families. Central to the concept of regionalization is risk assessment, combined with referral to risk-appropriate services. The system of care is broadly focused on meeting the needs for appropriate services, professional education, research, and evaluation (March of Dimes Birth Defects Foundation, 1993).

It is recommended that the regionalization of maternal and newborn services should have as an overall, planned outcome:

*that all women and their families have access to appropriate care that is responsive to their needs, and as close to home as possible* (Iglesias et al., 1998).

Regionalization of maternal and newborn care implies the development of a coordinated, cooperative system of care within a defined geographic area. The goals of such care are:

- provision of quality care for all women, newborns, and their families;
- appropriate use of personnel and facilities;
- coordination of services;
- provision of referral mechanisms;
- provision of professional education; and
- incorporation of research and evaluation.

Also central to a regionalized system of care are the mutual relationships and responsibilities of the agencies providing care. The goal here is to provide appropriate care as close to home as possible for mothers, babies, and families.

Maternal and newborn care is composed of five distinct phases: pre-conception, prenatal, labour and birth, postpartum, and the newborn period. In any one phase, while the vast majority of mothers and babies are healthy and do not experience difficulties, some may experience problems. These problems may be either simple, requiring minimal expense; or uncommon and complex, requiring costly resources. It is therefore necessary to develop coordinated maternal and newborn systems in communities

and regions, thereby ensuring accessibility to comprehensive and continuous care, as required. This chapter describes guidelines for maternal and newborn care within such a regionalized system.

The success of regionalization requires the cooperation and collaboration of a large number of agencies and professionals. Over the past two decades, progress toward regionalizing maternal and newborn care has varied across Canada. Success has resulted directly from the relationships and communication between hospitals at all levels. As well, significant contributions have been made by, among others, health units, community organizations, home care programs, and parent groups. Inclusion of community partners has varied remarkably from region to region.

### The Regional Maternal and Newborn Program

Regional maternal and newborn health care exists within a *national and provincial/territorial system*. The regional system is defined by the geography, environment, and culture of the region, as well as by its political, financial, and legal circumstances.

The regional maternal and newborn health care system is an open system of differing types and intensities of services, ranging from community-based care to acute hospital-based tertiary care. A variety of health professionals, support workers, and parent groups provide services for the perinatal health care system.

### Models of Regional Maternal and Newborn Programs

While variations do occur, certain elements are essential when establishing a regional system of maternal and newborn care. These elements can be characterized as follows.

#### DEFINITIONS OF REGIONS

A region is an area whose geographic boundaries define a catchment area for coordination and organization of care. Ideally, a region includes all necessary maternal and newborn services; that is, primary, secondary, and tertiary levels; or Levels I, II, and III. Given the differences in geography and population density, and in distribution of providers and their services, regions can vary in size and capacity. Moreover, regions defined for maternal and newborn care may include several “regions” organized for other administrative purposes. Certainly, duplication and fragmentation are best avoided when the boundaries for maternal and newborn care are clear.

**PLANNING AND COORDINATION AT THE PROVINCIAL/  
TERRITORIAL LEVEL**

Since health and social services are funded provincially/territorially, it is important to have, in each, a planning and coordination mechanism whereby maternal and newborn services are developed and coordinated from a province- or territory-wide perspective. This mechanism ensures accountability and maximizes efficient deployment of health care finances. In effect, the coordinating and planning mechanism takes many forms to ensure input from each region.

Each province or territory may designate different agencies or groups to sponsor such activities. These include the colleges of physicians, nurses or midwives, the provincial/territorial medical associations, and the reproductive care programs. The last grouping is likely to be the most effective, for reproductive care programs are usually multidisciplinary, have a broad scope of responsibility, and provide opportunities for participation of parents. They must have links with, and a mandate from, the provincial/territorial Ministry of Health. The development of a database and an information system designed to permit an annual activities report, thereby assisting with the evaluation of effectiveness and future planning, is an essential system component, requiring a collective effort.

**REGIONAL MATERNAL AND NEWBORN ADVISORY GROUP**

A regional program should have a community-based, multidisciplinary advisory group, whose role it is to provide leadership for successful care and programs. Parents must be involved in this group in a meaningful way. Group members would include maternal and newborn health care providers, parents, hospital representatives, community or public health representatives, and representatives from local support groups. (Table 2.1 suggests potential members.) It is essential that this group have a mandate from the Ministry of Health to help establish roles, responsibilities, communication procedures, and planning mechanisms. National and provincial/territorial guidelines can then be used to develop policies and procedures for the region, with due consideration as to their best implementation.



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**Table 2.1 Regional Maternal and Newborn Advisory Group Members**

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- Parents
  - Family physician
  - Midwife
  - Pediatrician
  - Obstetrician
  - Prenatal educator
  - Hospital maternal and newborn nurse(s)
  - Health unit/Community health parent-child nurse(s)
  - Breastfeeding support group
  - Lactation consultant
  - Labour support/Doula group
  - Infant development worker
  - Community health promotion and parenting groups
- 

### **THE REGION'S CONTINUUM OF MATERNAL AND NEWBORN CARE**

The continuum of care is provided by a variety of personnel who provide care for women and newborns during the preconception, pregnancy, labour, birth, and postpartum periods. It also includes those providing parenting support, long-term follow-up care, and evaluation and rehabilitation. The care is offered in a number of settings: primary care facilities, community-based organizations, and the places where women actually give birth. Professional education and support is provided via maternal and newborn outreach programs.

**Primary Care.** Most preconception, prenatal, and postpartum/newborn services are provided in primary care settings, including office-based individual or group practices, community health centres or health department clinics, and the home. Offered are basic preventive and health promotion services.

**Community-based Care.** Many services are provided through community-based organizations, either non-governmental or governmental agencies. Programs include childbirth education, breastfeeding support, maternal and newborn bereavement, parent support, community-based nursing, child care, home care, family and social services, and infant development programs. As well, services are offered via health units, parent resource centres and maternity homes.

**Childbirth Care.** In Canada, the vast majority of births take place in hospital. Hospitals range in size from small units in rural or isolated communities, with fewer than 100 planned births per year; to large tertiary centres, with over 7000 births per year.<sup>1</sup> A few free-standing birth centres have emerged. Data suggest that free-standing birth centres provide a safe environment for births (Rooks et al., 1992).

Some women choose to have their babies at home. Indeed, several provinces have voiced their support for a woman's right to choose the place of birth, including the home (Eberts, 1987; Midwifery Implementation Council, 1995; Alberta Health, 1996). Home birth remains a controversial issue in Canada. Recent reviews of the literature indicate that studies to date have neither successfully nor definitively shown the superiority, in terms of safety, of either planned home births (for women at no identifiable risk) or hospital births. Home births have, however, shown better outcomes with strict screening, planning, and back-up arrangements for emergencies or referrals (Hoff and Schneiderman, 1985; Campbell and MacFarlane, 1986, 1994; Tew, 1990).

Similarities exist between free-standing birth centres, births at home, and small hospitals that provide services for those mothers and babies without identifiable risk associated with their pregnancy or birth. The basic services for such Level I facilities are summarized in the section on Level I care, found on page 14.

**Maternal and Newborn Outreach Programs.** The principal function of regional outreach programs is to assist agencies, institutions, and care providers to provide optimal care for their community through coordinated educational programs. Their responsibilities may include:

- development of continuing professional education;
- facilitation of professional interchanges and educational opportunities;
- coordination of annual conferences for the region;
- provision of advice regarding practice, care, policies, procedures, problem solving and equipment purchases;
- assistance with the collection and analysis of statistics pertaining to performance and outcome;
- provision of collaborative assistance in the introduction of new approaches to care;

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1. According to the 1993 Survey of Routine Maternity Care and Practices in Canadian Hospitals (Health Canada and Canadian Institute of Child Health, 1995), there were 201 hospitals with fewer than 100 births per year, 138 with 101 to 300, 103 with 301 to 1000, and 130 with 1001+ births per year.

- development of plans for facilities;
- preservation of quality assurance and continuous improvement;
- sharing of information, newsletters, lending libraries, and manuals;
- assistance with liaison between agencies within the region;
- provision of a supportive environment for ongoing maternal and newborn care in the community; and
- facilitation of liaison between government and professional organizations.

## Administration of Programs

Governing boards of hospitals and other health agencies that provide maternal and newborn care, administrative staff, and professional leaders within organizations must demonstrate their commitment to the implementation of family-centred care. As well as planning and setting priorities, they must implement policies, programs, and practices that address the unique physical and psychosocial needs of mothers, infants, and families.

An organization's vision and energetic leadership is translated into action, and reinforced, within the departments and on the front lines. In effect, the degree to which women and their families receive family-centred care depends primarily on the priorities and commitment of the governing board, administration, and professional leadership of an institution. Meeting this challenge needs a clearly defined and articulated vision; it requires an organizational structure that fosters interdisciplinary cooperation and collaborative relationships with families. It also requires committed and energetic leadership (Johnson et al., 1992).

Every organization should have a mission statement and a summary of philosophy or values. The mission statement sets forth the basic purpose of the organization. It answers the following questions: Who are we? What are we doing? For whom? and Why? It reflects the needs of the community, as well as the principles of family-centred maternity and newborn care. The set of values and beliefs, whether implicit or explicit, guides an institution in carrying out its mission, and in defining what is important — both to the organization and to those who work for it (Johnson et al., 1992). The mission statement and the summary of values and beliefs are important vehicles for communicating with families, and should be made available to them.

Regardless of their structure, agencies or institutions must encourage interdisciplinary cooperation and communication. In larger organizations, senior managers should represent various disciplines, thus exemplifying this interdisciplinary collaboration and respect for family and professional partnerships. An organizational chart should group departments in ways that will foster collaboration and mutual problem solving (Johnson et al., 1992).

Table 2.2 provides a checklist of the basic policies and programs that facilitate the implementation of family-centred care.

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**Table 2.2 Policies and Programs: A Checklist**

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1. Does the institution have a written philosophy (or standards of care documents) that clearly reflects the pivotal role of parents and families?
  2. Are the mechanisms clear for facilitating collaboration between families and professionals, in terms of the design and implementation of hospital policies and programs?
  3. Is there a maternal and newborn committee comprising the providers and families?
  4. Are there mechanisms for providing accurate descriptive and statistical information to the public about practices and procedures?
  5. Are there established policies and settings that provide women with unrestricted access to birth companions of their choice, and to supportive care during labour and birth, in the agencies providing those services?
  6. Are there established policies and services that enable women to make informed choices about all matters pertaining to pregnancy, labour, birth, and newborn care?
  7. Are there established policies and settings that discourage the routine application of practices and procedures that are unsupported by scientific evidence?
  8. Are there established policies and settings that encourage mothers, babies, and families to remain together?
  9. Are there established policies and settings that strive to achieve the WHO-UNICEF "Ten Steps to Successful Breastfeeding"? (See Chapter 7.)
  10. Are there clearly defined policies and procedures for collaborating and consulting with other services?
  11. Are there clearly defined policies and procedures for linking the mother, baby, and family to appropriate community resources?
  12. Are there mechanisms for receiving feedback from parents regarding their satisfaction with hospital policies and programs?
  13. Are there formal mechanisms in place for coordinating care among the hospitals, community health agencies, community support services, and primary community-based health care providers?
  14. Does the architectural and interior design of the agency and its allocation of space meet and support the needs of women and families, thereby enabling family-centred care?
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All facilities, regardless of their structure, should have a multidisciplinary maternal and newborn committee that includes parents as well as representatives of the maternal and newborn health care team. The committee should meet on a regular basis to set policies, to monitor the implementation of these policies, and to evaluate the quality of care on an ongoing basis. (See Chapter 1 for ways to facilitate parents' participation on these committees.) Depending on the size and mandate of the facility, subcommittees can be developed for mortality/morbidity reviews, education, research, and use of statistics. At times, the maternal and newborn committee should address these activities directly. Each group should keep written minutes and have other communication available to all staff and senior management.

## Guidelines for Care

All facilities providing maternal and newborn care are responsible for:

- promoting, at the community and society level, policies and practices that are evidence-based and facilitate the health of mothers, babies, and families;
- participating in a network of regional maternal and newborn services, in order to provide appropriate levels of care as required;
- maintaining a collaborative atmosphere between all components of the care continuum, thereby ensuring provision of comprehensive, accessible care;
- fostering an interdisciplinary model of care;
- facilitating care that incorporates the input of the women and families concerning their needs;
- evaluating the function and outcome of their programs; and
- supporting the acquisition of new knowledge to improve care and outcomes.

### Ambulatory Prenatal Care

Prenatal care is provided in a variety of settings: physicians' or midwives' offices; community health centres; and ambulatory care units in hospitals, health units, and nursing outposts. (See Chapter 4.)

**AMBULATORY PRENATAL CARE PROVIDED AT THE  
PRIMARY LEVEL: LEVEL I**

Prenatal care provided in primary-level facilities covers assessment of the normal progress of pregnancy. This includes physical examinations; routine laboratory assessments; appropriate screening tests; identification of risk with referral as necessary; prenatal information and education; and support and counselling related to pregnancy, birth, and parenting.

**AMBULATORY PRENATAL CARE PROVIDED AT THE  
SECONDARY LEVEL: LEVEL II**

Prenatal care provided in secondary-level facilities consists of primary care, care for women with frequently seen obstetrical and medical problems, and fetal diagnostic testing (biophysical profile, non-stress testing and basic ultrasound of fetus, and amniotic fluid analysis).

**AMBULATORY PRENATAL CARE PROVIDED AT THE  
TERTIARY LEVEL: LEVEL III**

Prenatal care provided in tertiary-level facilities refers to primary and secondary care; care related to complex and/or severe maternal problems; advanced fetal diagnoses (e.g. targeted ultrasound and fetal echocardiography); fetal therapy (e.g. intrauterine fetal blood transfusion and treatment of cardiac arrhythmias); and medical, surgical, and genetic consultation for fetal abnormalities (March of Dimes Birth Defects Foundation, 1993).

**Labour and Birth, Postpartum, and Newborn Care****LABOUR, BIRTH, POSTPARTUM AND NEWBORN CARE  
AT THE PRIMARY LEVEL: LEVEL I**

All facilities (e.g. hospitals, birth centres) providing planned care during labour, birth, and the immediate postpartum period for women, newborns, and families should:

- provide care for healthy mothers, babies, and families, or those with few immediate complications;
- have a family physician, obstetrician, or midwife available for birth *and* a second professional, skilled in resuscitation, available for each baby;
- have a written screening and triage policy and transfer women during the antenatal and intrapartum period accordingly;
- establish procedures and protocols for an emergency response (e.g. cesarean birth), which may include transfer, so that response occurs in a

- timely fashion and is based on the principles of that facility's risk management protocol (Iglesias et al., 1998);
- have appropriately trained individual(s) available to administer pharmacological pain relief;
  - provide guidelines for maternal/fetal assessment and care during labour, birth, newborn resuscitation, and immediate postpartum care of the mother and baby;
  - provide guidelines for common emergencies of labour and birth, including shoulder dystocia, pregnancy-induced hypertension (PIH), and postpartum hemorrhage;
  - provide emergency care for the mother or baby;
  - provide guidelines for assessment, retention, and transfer of women and newborns with antenatal and intrapartum complications;
  - initiate safe and effective transfers when required;
  - incorporate professional standards into guidelines for the care of women, newborns, and families;
  - have accessible laboratory, radiology, ultrasound, and pharmacy support on a 24-hour basis (See Ancillary Services, page 28);
  - have the ability to do blood gas analysis. The current guidelines on fetal surveillance have suggested that Level I facilities might not require blood gas analysis of cord or scalp samples. Rethinking of this issue by the working group of the Society of Rural Physicians of Canada, the College of Family Physicians of Canada, and the Society of Obstetricians and Gynaecologists of Canada (Iglesias et al., 1998) would strongly recommend that any facility conducting maternity care should have the capacity for blood gas analysis. It is recognized that this will take some time to implement; however, this time should be short;
  - have the ability to provide services related to assessment and immediate and continuing care of the mother and newborn, infant feeding (especially breastfeeding), and health education regarding the future needs of both mother and baby;
  - establish mechanisms for linking with community-based care;
  - initiate strategies to inform parents of the scope and philosophy of care being provided;
  - put mechanisms in place for regular review of all policies and procedures so they are updated according to best-practice evidence; and
  - establish mechanisms for review of outcomes of care.

**LABOUR, BIRTH, POSTPARTUM, AND NEWBORN CARE AT THE SECONDARY LEVEL: LEVEL II**

The population density, geography, and specifically the proximity of Level II facilities to a tertiary care centre will affect their scope of services. A Level II facility has the same basic requirements as a Level I facility; in addition, it should have the ability to:

- care for pregnant women at  $\geq 32$  weeks' gestation who may experience certain complications, including continuing tocolysis;
- provide induction and augmentation of labour (this service may be modified to meet regional circumstances and needs; it may also be available in Level I facilities equipped to deal with obstetrical emergencies);
- care for women with selected problems such as pre-eclampsia and simple hypertension;
- care for babies with mild to moderate respiratory distress syndrome, suspected neonatal sepsis, hypoglycemia, and postresuscitation problems of mild or moderate severity;
- establish procedures and protocols for emergency response, including emergency cesarean birth, so that physicians respond to a call within 15 minutes and are in the hospital within 30 minutes thereafter;<sup>2</sup>
- as necessary, provide continuous electronic fetal monitoring, external or internal (this service may also be available in Level I facilities equipped to deal with obstetrical emergencies);
- provide blood gas analysis (cord, scalp), non-stress testing, and ultrasound assessment. In the absence of scalp sampling, the data show a rise in the cesarean birth rate, when a health care provider is not able to be reassured in those situations where a scalp pH would enable a provider to continue following the labour. Achieving this will require having staff skilled in performing this procedure and access to appropriate laboratory services;
- care for newborns with birth weights of 1500 g or greater, including ventilation support while awaiting transport or for short term, as defined by regional policy (may be modified to meet regional circumstances and needs);
- provide continuing care of relatively stable, low birth weight babies;
- maintain a defined relationship with Level I centres in their region, including mechanisms for collaboration, consultation, transport, return transport, information sharing, and education;

2. All response times are based on practical recommendations; they are not evidence-based.



- consult, refer, and/or transport mothers and newborns with complex problems to a tertiary (Level III) centre;
- make available social work, pastoral care, nutrition, surgical, and diagnostic imaging services;
- receive and care for newborns transferred back to their community from Level III centres;
- as necessary, directly access specialty consultations from obstetricians and pediatricians;
- provide regular morbidity and mortality reviews; and
- maintain an on-site physical and organizational integration with a gynecological program/department for optimal clinical care and education in women's health.

#### **LABOUR, BIRTH, POSTPARTUM, AND NEWBORN CARE AT THE TERTIARY LEVEL: LEVEL III**

A Level III facility has, in addition to the care provided in Levels I and II:

- the ability to care for women whose pregnancies may be at risk (e.g. are less than 32 weeks' gestation, or who have premature rupture of membranes or preterm labour or bleeding, severe medical complications such as cardiac functional impairment, requirements for complex diagnostic or therapeutic procedures, pregnancies with concurrent cancer, and/or complicated antenatal genetic problems);
- the ability to care for babies with severe respiratory distress syndrome, sepsis, severe postresuscitation problems, significant congenital cardiac and other systems diseases, and babies with special needs (e.g. prolonged parenteral nutrition);
- a system for receiving as referrals women whose pregnancies are considered to be high risk;
- a neonatal transport program;
- the resources to diagnose and treat pregnant women and newborns with severe complications;
- the resources to provide assisted ventilation on a short- and long-term basis;
- access to subspecialty consultants (e.g. maternal/fetal medicine specialists, neonatologists, and other subspecialists as required);
- immediate access to adult medical, surgical, and psychiatric consultations;

- coordination of an established long-term follow-up program for babies with complications at birth, including criteria for long-term follow-up to monitor psychological, neurological, sociological, and physical outcomes. The program should have standardized assessment methods, rehabilitation programs, and research tools to evaluate costs and effectiveness of care. Requisite information made available to the units providing care on a regular basis will permit ongoing evaluation and improvement of care; and
- on-site physical and organizational integration with a gynecological program/department for optimal clinical care and education in women's health.

These classifications, however, are not absolute. Modifications may be needed to suit regional needs. For example, geographic considerations, population density, and availability of specialized personnel may dictate that certain smaller Level I and II units care for mothers and infants who, in other circumstances, would have been rapidly transferred to a higher level of care. On occasion, certain highly specialized services may require referral outside the region. These situations are best addressed by written regional policies.

## **Personnel Requirements: Labour, Birth, and Immediate Postpartum Care**

### **Core Requirements for Personnel**

Regardless of location, health professionals providing direct care for women and newborns during labour, birth, and immediate postpartum should have:

- a demonstrated understanding and practice of the principles and values of family-centred care outlined in Chapter 1;
- current certificates of registration from the relevant professional college(s);
- knowledge and skill in supportive care for labour, birth, and breast-feeding;
- skills and knowledge related to physical and psychosocial risk assessment;

- immunity to rubella and hepatitis B, or documentation of refusal;
- regular performance evaluations and/or peer reviews, providing evidence of current knowledge and skills vis-à-vis care of women and families;
- a basic understanding of, and regard for, research and the evidence-based approach to care; and
- planned learning opportunities.

It is the responsibility of all health care providers to work together to ensure that the emergent needs of mothers and babies are met.

#### **PERSONNEL FOR INFANT RESUSCITATION**

Personnel skilled in neonatal resuscitation and able to function as a team should be available for every birth. The size and composition of this team will vary with the birth rate and the designated care level of the birth site in question. The team may include nurses, family physicians, midwives, pediatricians, obstetricians, anesthetists, and respiratory therapists.

Even after a healthy pregnancy, newborns may experience sudden, unexpected difficulties in their first moments of life that require immediate intervention by skilled personnel. It is therefore recommended that, in addition to the professional responsible for the birth (i.e. the physician or midwife), a second professional be present, with primary responsibility for the baby. The second professional would have skills related to cardiopulmonary resuscitation (CPR), ventilation with a bag and mask, and chest compressions. If this person lacks the skills for more extensive resuscitation (endotracheal intubation and the use of medications), a person with these skills should be available in the facility to assist immediately when called. Each birthing area should define the risk factors that require the attendance of two people dedicated to the baby's care at birth. Until another member of the medical staff takes over, the care of the infant remains the responsibility of the obstetrician, family physician, or midwife attending the birth. To effectively exercise this responsibility, the obstetrician, family physician or midwife should be registered as a current provider of neonatal resuscitation.

Skills in neonatal resuscitation are obtained through the Neonatal Resuscitation Program (NRP) coordinated by the Canadian Paediatric Society and the Canadian Heart and Stroke Foundation. Both registration at either the provider or instructor level and periodic reregistration are essential for all personnel likely to care for babies immediately after birth.

The efforts by institutions to provide on-site programs to achieve this goal should be supported.

## Level I Personnel

### LEVEL I: LABOUR, BIRTH, AND IMMEDIATE POSTPARTUM CARE

**Minimal staffing requirements** should be established based on the following recommendation: one-to-one registered nurse, or midwifery care, for women in active labour through the completion of fourth stage.

**Nursing Care.** The registered nurse should have appropriate training commensurate to the type of women served. The nurse's responsibilities are outlined in the following table.

**Table 2.3 Registered Nurse: Responsibilities**

- Initial evaluation of women in labour
- Assessment of the presence or absence of complications and triage
- Supportive care during labour and birth (See Chapter 5.)
- Assistance with comfort and pain relief
- Continuing assessment of the woman and fetus during labour and birth\*
- Assessment of progress of labour
- Evaluation of uterine contractions
- Reporting of unusual or abnormal findings to appropriate health team members
- Response to emergencies
- Performance of maternal and infant CPR
- Stabilization of women for transfer

\* Including auscultation of the fetal heart rate and electronic fetal heart-rate monitoring where electronic fetal heart-rate monitors are used.

Facility personnel should identify a core group of nurses whose ongoing experience in caring for women during labour and birth fosters confidence. Depending on a facility's geographic location and population, staff may have to be sent to a larger centre to acquire experience.

**Physician and Midwifery Care.** All births should be attended by a physician and/or a midwife. The physician and/or midwife should be available to the birth facility in a timely fashion in accordance with the principles of

that facility's risk-management protocol. In cases of unavoidable complications of birth, emergency cesarean birth, or unexpected concerns regarding the fetus, Level I facilities should be able to obtain the services of another appropriately trained professional to assist the primary physician or midwife. Requirements as to personnel availability for newborn resuscitation are described in the previous Infant Resuscitation section. Level I facilities require appropriately trained individuals to be responsible for and administer pain relief, both non-pharmacological and pharmacological. Women who are not receiving the ongoing, established care of a physician or midwife need a plan that will provide such coverage.

#### **LEVEL I: POSTPARTUM MATERNAL/NEWBORN CARE**

**Minimal staffing requirements** should be established based on the following recommendation: one registered nurse to four healthy mother/baby dyads, 24 hours per day.

**Nursing Care.** To date, the ratios for postpartum nurse-mother/baby care have been based on practical recommendations, rather than on studies with clearly identified objectives and evaluations. Much variation obviously exists in women's situations. Hence judgment is required. The decision regarding nursing needs should be based on, among others, a concrete assessment of the immediate health of the mother and baby, the intensity of care needs, parity, the experience and skills of the parents, and the level of prenatal preparation and family support.

Mother/baby dyads (pairs) should be cared for by a registered nurse with appropriate, specialized training in maternal and newborn care, care that is commensurate to the needs of both women and newborns. (See Chapter 6 for further discussion of combined mother/baby care.) Registered nurses are responsible for initial and ongoing assessment, education, transition to the community, and the organization of follow-up for mother and newborn. These nurses should have training and experience in recognizing the normal and abnormal physical and emotional characteristics of both mother and newborn. They must have the ability and commitment to assess the readiness of the woman and family to respond to new family needs. They must have the necessary skill and knowledge to assess and support breastfeeding, with training in an acknowledged program.

It is important that the mother and infant be closely observed in the first hours following birth, so that the mother's recovery can be assessed and the baby's stability monitored. To promote the mother-infant relationship, hospitals are encouraged to make initial observations while the baby is with the mother. Each facility should have a documented policy of the assessment and criteria for moving the infants to a specialized nursery area, the neonatal intensive care unit, or the healthy mother-infant care area.

**Physician and Midwifery Care.** All postpartum women and newborns should have an identified physician or midwife responsible for their care. They should be available to the hospital in a timely fashion, according to the principles of that facility's risk-management protocol. They should be able to detect physical and/or functional problems in the mother and/or newborn, and to initiate treatment needed for stabilization and other emergency care when required.

## Level II Personnel

### LEVEL II: LABOUR, BIRTH, AND IMMEDIATE POSTPARTUM CARE

**Nursing Care.** Level II care, in addition to fulfilling the care requirements of Level I, must have a registered nurse who has advanced training and experience in providing care to women with complications of pregnancy, labour, and birth in the labour and birthing area at all times. Preferably, this nurse will possess post-RN advanced preparation<sup>3</sup> in nursing during labour and birth. As well, this nurse must be skilled in the techniques of electronic fetal heart-rate monitoring, recognizing and reporting abnormalities, and supervising the performance of nurses with less training and experience.

**Physician and Midwifery Care.** In addition to the physician and midwifery care provided in Level I care, a Level II centre should offer a full range of obstetric anesthesia services by a qualified anesthetist or family physician. As well, obstetric, pediatric, and other medical, surgical, radiology, and pathology consultation should be readily available. Physicians for obstetric and pediatric consultation should respond to being called

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3. Advanced preparation can take many forms and depends on the region. It can be offered through local community colleges, regional perinatal programs, universities, or in-house.

within 15 minutes and be able to be at the hospital within 30 minutes thereafter.<sup>4</sup> There should be personnel skilled in managing maternal and newborn emergencies in the hospital, who can provide initial care under defined hospital protocols until the responsible physician arrives.

#### **LEVEL II: POSTPARTUM MATERNAL/NEWBORN CARE**

**Nursing Care.** In addition to providing all Level I care, a Level II nurse must have specialized training and experience in postpartum care for mothers and babies who experience complications, and be able to provide support for mothers and families with infants requiring intensive care. These nurses shall preferably possess post-RN advanced preparation in postpartum nursing. They are also responsible for coordinating visits and communication with the neonatal intensive care unit; and for recognizing the need for other services, including nutrition, social work and pastoral care, and for lactation consultants. As well, they should have the skills and knowledge to care for mothers and babies with common obstetrical postpartum and neonatal concerns.

**Physician and Midwifery Care.** All postpartum women and newborns should have an identified physician or midwife responsible for their care.

**Allied Health.** A registered dietician with knowledge of maternal and newborn nutrition as well as a clinical social worker should be available weekdays. An individual committed to pastoral care and a lactation consultant for breastfeeding assessment, support, and education should be available daily. Other personnel such as a physiotherapist, occupational therapist, audiologist, pharmacist, psychiatrist, and ethicist are also desirable. They should be used as their availability permits and as the needs of the women and families require.

#### **LEVEL II: NEONATAL CARE**

**Minimal staffing requirements** should be established based on the following recommended ratios: one registered nurse to two infants for more acute or unstable babies; and one nurse to three infants for those babies requiring convalescent care.

4. All response times are based on practical recommendations; they are not evidence-based.

**Nursing Care.** Registered nurses caring for ill newborns should have education or experience in neonatal nursing and in the care of ill newborns, *including a neonatal resuscitation program (NRP) or its equivalent*; they should also have post-RN advanced preparation in neonatal nursing. All nurses caring for ill newborns must possess demonstrated knowledge concerning the observation and treatment of these newborns. As well, they should have skills in monitoring, establishing, and maintaining intravenous infusion; gavage feeding; measurement of blood pressure; and management of arterial lines.

**Physician Care.** In general, all babies requiring Level II care should be under the care of a pediatrician or neonatologist. Family physicians may care for stable babies requiring convalescent care, as determined by hospital policy.

If babies are on mechanical ventilation, a physician, nurse, or respiratory therapist with intubation skills is required in-house 24 hours a day. To help maintain quality of care, many units benefit from having a neonatologist or pediatrician with specialized interest in neonatal care take overall responsibility for care of all babies in the unit. Responsibilities of this individual could include integrating and coordinating the following: a system for consultation and referral; in-service education programs; communication and coordination with a maternal and newborn team; and definition and establishment of appropriate procedures for the nursery care evaluation, research, and neonatal follow-up.

**Allied Health.** When a neonate is on mechanical ventilation, a respiratory therapist, certified laboratory technologist or blood gas technologist, and an x-ray technologist should be available in-house on a 24-hour basis.

### Level III Personnel

#### LEVEL III: LABOUR, BIRTH, AND IMMEDIATE POSTPARTUM CARE

**Nursing Care.** Level III care, in addition to fulfilling the care requirements of Levels I and II facilities, must at all times provide, within the labour and birth unit, registered nurses who are skilled in the recognition and nursing care of labour and birth complications. These nurses must also have post-RN advanced preparation in providing care to women with complications of labour and birth. In addition, the general standards of an approved



training course in high-risk fetal health surveillance must be met, as well as one-to-one nurse:patient ratios.

**Physician and Midwifery Care.** In addition to Level II care, each facility should address mechanisms to ensure that an obstetrician is available in-house on a 24-hour basis when women who have significant risk associated with their pregnancy/birth are present. This will require having sufficient human resources and appropriate financial compensation. In Level III facilities, anesthesia services should be available for obstetrics immediately upon being called.

#### **LEVEL III: POSTPARTUM MATERNAL/NEWBORN CARE**

**Nursing Care.** In addition to providing all Level II care, the Level III nurses, who must have specialized training and experience in postpartum care for mothers who have had complications of labour and birth or have ill infants, are responsible for providing support to those mothers and families whose infants require intensive care. These nurses shall have post-RN advanced preparation in postpartum nursing. They are responsible for coordinating visits and communication with the neonatal intensive care unit and for recognizing the need for consulting help in nutrition, social work, pastoral care, and lactation as well as the home/community arenas.

#### **LEVEL III: NEONATAL CARE**

**Minimal staffing requirements** may exceed the ratio of one registered nurse to one baby for those infants requiring extensive physiological support. The requirements may be one nurse to one to two babies for more stable babies requiring acute care. However, a nurse should not be responsible for more than one baby on a ventilator plus one other non-ventilated baby, dependent upon the condition of both babies.

**Nursing Care.** In addition to the Level II requirements, nurses working in the neonatal intensive care unit shall have demonstrable knowledge in the assessment and treatment of extremely ill neonates. This includes resuscitation (NRP) and stabilization of infants at birth; provision of support for grieving or anxious families; techniques of cardiorespiratory monitoring; care of infants on cardiorespiratory support; care of central intravenous lines for parenteral nutrition; administration of surfactant;

perioperative skills; knowledge of community resources for families; knowledge and skills in discharge and transfer planning; and skills and experience in parent education and support.

Advanced-practice nurses (clinical nurse specialists and neonatal nurse practitioners) may be required in Level III neonatal intensive care units. The number required and the actual nurse:baby ratios will depend upon the presence (or absence) and number of neonatology trainees available on the unit.

**Physician Care.** All babies requiring acute care on a 24-hour basis should be cared for by a qualified neonatologist. For purposes of communication and to obtain urgent care when required, it is highly desirable that at any one time a single neonatologist direct the care of babies requiring acute care. Infants in a Level III unit who require Level II care should be treated as previously discussed (see Level II care section). Once care has been transferred from one physician to another, it is essential to transmit all information critical to the patient's care, and to ensure that the transfer process occurs in a manner in which the physician responsible for directing care is clearly identifiable at all times.

Suggested staff:infant ratios for “hands-on” physicians and nurses with advanced preparation (e.g. advanced practice nurses, clinical nurse specialists, or neonatal nurse practitioners) may vary, based on the clinical infrastructure of the unit and the experience of the provider. The following guidelines are suggested. Note that one provider may be responsible for various different categories of patients.

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#### Ratios of Neonatologists to Babies: Guidelines

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*Days* (until care plans are determined and implemented)

- Unstable babies requiring cardiorespiratory support 1:4
- Stable babies requiring acute care 1:8 to 1:10
- Babies requiring Level II care 1:12 to 1:16

*Nights*

- Unstable babies requiring cardiorespiratory support 1:4
  - Stable babies requiring acute care 1:12 to 1:16
  - Other babies emergency care as required
-

These recommendations are specific to care in the neonatal intensive care unit. Involvement in other activities (e.g. transport, attendance at births, education, and research) will require additional coverage.

Subspecialists in cardiology, pediatric surgery, neurology, and genetics should be available for consultation 24 hours a day. On-site consultation should be available during the day from pediatric subspecialists in nephrology, endocrinology, gastroenterology, nutrition, infectious diseases, respiratory, hematology, and other identified areas. Similarly, pediatric surgical subspecialists (e.g. cardiovascular surgeons; neurosurgeons; and orthopedic, ophthalmologist, urologic and otolaryngologic surgeons) should be on hand for consultation and care. Physicians skilled in administration of neonatal/pediatric anesthesia should be available as required.

**Allied Health.** Respiratory therapists (RRTs), certified laboratory/technologist/blood gas technologist(s), and radiology technologist(s) should be available in-house on a 24-hour basis. Although numbers may vary with duties of the RRT staff, the ratio of therapists to ventilated infants should generally be 1:4-6. When numbers of babies warrant, it is highly desirable to have RRTs dedicated to the neonatal intensive care unit and its associated programs.

As well, the following personnel are needed: a registered dietitian with knowledge of parenteral/enteral nutritional care for babies at high risk; maternal and newborn social workers; lactation consultant(s); dedicated pastoral care personnel; a developmental physiotherapist; personnel with appropriate training and the support to conduct a maternal and newborn continuing education program; and an engineer with expertise in biomedical electronic monitoring and specialized pharmacy.

## Ancillary Services

The following grid outlines the requirements for ancillary services for maternal and newborn care.

	Level I	Level II	Level III
Laboratory (micro-technique for neonates)			
Within 1 hour	Hematocrit, glucose, total bilirubin, routine urinalysis, blood gases	Level I plus: electrolytes, BUN, creatinine, coagulation studies, blood from type and screening program	Levels I and II plus: special blood and amniotic fluid tests
Within 1-6 hours	CBC, platelet appearance on smear, blood chemistries, blood type and crossmatch, Coombs tests, bacterial smear	Level I plus: WBC differential, coagulation studies, magnesium, urine electrolytes and chemistries, hepatitis B screen	Levels I and II
Within 24-48 hours	Bacterial cultures and sensitivities	Level I plus: liver function tests, metabolic screening	Levels I and II plus: special tests, including plasma and urine amino acids and organic acids
Within hospital or facilities available	Viral culture and antibodies		
Radiography and ultrasound	Technicians on call 24 hours/day Portable x-ray and ultrasound equipment available to labour and delivery rooms and to nurseries	Experienced radiology technicians immediately available in hospital (ultrasound on call) Doppler ultrasound capabilities Professional interpretation immediately available Portable x-ray equipment Ultrasound equipment: in labour and delivery and/or nursery areas Equipment for emergency GI, GU, or CNS studies available 24 hours/day	Computerized axial tomography Ultrasound equipment in labour and birth area, and available in neonatal intensive care unit Magnetic resonance imaging (may require patient transfer)
Echocardiography		Available weekdays, with interpretation within 24 hours	Available with interpretation within 6 hours, 24 hours/day
Blood bank	Technologists on call 24 hours/day, availability of uncrossed negative blood for emergencies	Experienced technologists immediately available in hospital for blood-banking procedures and identification of irregular antibodies	Resources centre for network Direct communication to labour and delivery area, and nurseries
Electroencephalography		Available weekdays with interpretation within 24 hours	As above
Pathology	Prior agreement with another centre required (transfer of baby or specimen at no cost to the patient)	General pathologist to be available daily	Maternal and newborn pathologist to be available daily

## Program Administration: Levels I, II, and III

Administrative responsibilities for health care personnel participating in maternal and newborn care should be clearly identified. The services geared to mothers and babies at risk may be administratively linked or separated into different units (e.g. maternity, newborn). Each service should have a group of interdisciplinary clinicians (e.g. nurse, physician, midwife, lactation consultant, social worker, and/or other health professionals) with responsibility for development and implementation of policies, procedures, and general administration of care. Each unit should determine the administrative requirements for all health care disciplines. The staff of any one unit may include one or more managers, depending on their experience.

In the Level II maternal and newborn care units, one obstetrician with special interest and training in maternal-fetal medicine, one pediatrician with special training in neonatal-perinatal medicine, and one nurse with advanced preparation in this specific area should together act as co-directors. In Level III units, one maternal-fetal medicine physician, one neonatal-perinatal medicine physician, and potentially two nurses (one with maternal-fetal qualifications and one with neonatal qualifications) should be part of the management team. A Level III neonatal intensive care nursery situated in a children's hospital should be directed by a team of medical and nursing personnel with the appropriate clinical and administration skills. A specialist in neonatal-perinatal medicine and a nurse with advanced preparation in neonatal intensive care nursing would be part of that team.

Managers and senior staff should be aware of, participate in, and initiate objectives for the unit related to quality assurance; educational activities, including local, provincial/territorial, national, and international conferences; and research activities. They should also encourage co-worker support of, and participation in, local and multicentre studies and trials.

## Policies and Procedures

Policies and procedures need to be written, reviewed, and updated regularly. They should be available for reference by all facility staff members. A mechanism should be put into place for the regular review of all policies and procedures; when new evidence becomes available, they can be updated accordingly.

Written policies and procedures include, but are not limited to, those described in Table 2.4.

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**Table 2.4** Written Policies

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Policies that deal with the following topics should be documented:

- communication and linkages with the community for the care and support of women, infants, and families
  - admission of women, infants, and families
  - assessment and criteria for discharge of women and babies
  - referral to community services
  - identification and referral of women and/or infants in actual or potentially abusive situations
  - emergency transfer of mothers and babies, including the requirement that prior arrangements for the care of the mother and baby be made with a receiving health facility in the event of an emergency
  - newborn resuscitation
  - breastfeeding support
  - maintenance of health records
  - infection control and biohazard precautions
  - storage of medications and emergency drugs
  - development of an information system pertaining to safety practice and workplace hazardous materials
  - response to maternal/newborn emergencies
  - evaluation of care and quality improvement
  - internal disaster procedures, including fire
  - personnel policies
- 

## Records

Health records provide a format for continuity of care and documentation of legible, uniform, complete, and accurate maternal and newborn information. The goal is to provide readily accessible information to health care providers via a system that protects confidentiality and provides for storage, retrieval, and prevention of loss.

Health records need to be maintained in a confidential and secure manner. Every entry in a mother's or newborn's health record should be dated and signed.

Objectives related to health record keeping are as follows:

- to facilitate communication;
- to facilitate transfer of accurate information to different levels of care (for mother and neonate);
- to make health care more effective with regard to outcomes and costs;
- to facilitate quality assurance processes;
- to avoid duplication of information collection; and
- to promote information sharing with families that may require assistance in decision making, review of childbirth events, and education.

The Canadian Perinatal Surveillance System (CPSS), Laboratory Centre for Disease Control, Health Canada, is preparing a perinatal surveillance system for data collection and analysis. Standardized health records for antenatal, birth, and newborn care will serve both as documentation for clinical care and as an instrument for data collection that facilitates consistency and avoids duplication. (See description in Appendix 1.)

## Education

Ongoing learning in the maternal and newborn care area is essential as new information and best-practice evidence continues to emerge. All caregivers and parents need opportunities to learn and should exercise their personal responsibility in this area. Any educational endeavour must take into account people's differing learning styles, the time available for learning, the content, the skills to be shared, and the financial and personnel resources available.

### Health Education for Women and Families

Just as parents play an active role in decisions regarding care and lifestyle, caregivers have a responsibility to ensure that women and their families have sufficient information to make decisions. Strategies include prenatal classes, written material, commercial books, community support groups, telephone help lines, and audiovisual materials. Information of varying quality is also available from television, friends and family, the Internet, and culturally based traditions. Health care providers should spend time with parents, helping them not only to identify good sources of information but also to determine its value and meaning.

Wherever or however education takes place, whether in a class or group setting, or in the care provider's private office, the critical guiding principles should be those of adult learning; that is, a learner-centred perspective. The principles of adult learning are summarized in Table 2.5.

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**Table 2.5 Adult Learning Principles**

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- The care provider has the role of a facilitator, not a teacher.
  - The facilitator emphasizes recognizing the validity of the learner's background and experiences.
  - The facilitator shares control of the content, or what the learner should or needs to know, so that the content means something to the learner.
  - The facilitator shares control of the process; that is, how the learner will learn.
  - An emphasis is placed on interdependence in the learning situation.
  - The learner develops as a result of having her or his learning needs met.
  - Both facilitator and learner accept responsibility for the learning situation.
  - The learner is involved in every aspect of the learning content and process.
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Regardless of the topic or the strategy used to convey the information, certain principles of health education must be inherent in all developed or recommended material. These principles should be considered for all information provided to parents, including consents and research information. Table 2.6 describes these principles.



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**Table 2.6 Principles for Educational Materials**

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***Readability***

The literacy of different populations varies, based on education, learning differences, and exposure. For written materials geared to the general population, a Grade 5 reading level is considered desirable. More (or less) sophisticated material may be required for certain groups. The best way to determine readability is to pretest material with the target population.

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***Amount of information***

Limited content should be presented at one time and with regard to a given piece of written material. The more diverse the material, the more difficult it is for individuals to remember. For instance, a videotape that deals with all aspects of breastfeeding is less likely to be remembered than material focused on the one particular aspect needed at the time. Written information can be limited by covering only one topic per handout.

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***Consistency of information***

Development of written and audiovisual material in collaboration with community groups and agencies, other facilities, and a multidisciplinary team ensures increased likelihood of validity, consistency, and applicability.

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***Accuracy of information***

Information requires regular review and team consensus. A process should be put into place to ensure that the content and attitude conveyed in the material reflects current evidence, practice, and availability.

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***Timing of information***

Evaluation of how and when to provide information is key. The “teachable” moment is often alluded to in educational literature. Ideally, health care providers should be available at the teachable moment: that time period when the learning need is most apparent.

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***Documentation and related legalities***

An important part of the health record is the health professional’s documentation of the health education provided directly to, or being obtained by, the women and families. A form for health education documentation may be helpful. Maintaining a copy of educational material is important.

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## **Education for Health Professionals**

The agency and the professional will usually share responsibility for maintaining competency and skills; however, there is an increasing trend toward personal responsibility. Whereas some of the specific competencies and behaviours needed are delineated by professional colleges, others reflect the needs and standards of the clinical care unit or agency. Documentation of participation, achievements, and future learning objectives regarding education should be a component of annual performance reviews and/or renewal of privileges.

Learning opportunities must be multidisciplinary, with all responsible personnel participating. This includes physicians, nurses, social workers, nutritionists, lactation consultants, respiratory therapists, and many more. Identification of topics may stem from new treatments, changing systems, clinical concerns, or research evidence. Varying levels of education are appropriate: from evidence-based care for healthy mothers and babies, to advances in care for mothers and babies who are at high risk.

Opportunities for learning may include rounds, workshops, conferences, learning packages, formal education programs, distance learning, self-study, and/or participation on new committees or in new projects or research. For maternal and newborn regions, coordination of educational efforts through organized regional programs allows for consistency of information and reduced duplication of efforts. Increasingly, facilities and agencies are using email, multisite conferencing, and/or Web site communication.

Certification courses, available locally or at a distance, are becoming the basis for upgrading and performance/competency standards.

## Evaluation of Care

In all facilities, personnel offering maternal and newborn care should provide appropriate statistical documentation and the requisite background data for analytic studies. If maternal or newborn deaths occur, consent should be sought for an autopsy to confirm the diagnosis. A death certificate should be completed so that immediate cause(s) of death can be identified, along with important antecedent factors.

Evaluation of care involves careful documentation of both the process and outcome indicators of quality care. It also involves thoughtful review and analysis of the information.

Evaluation of maternal and newborn care is often considered the responsibility of regional and national organizations. Each unit and service provider, however, should participate in the evaluation to determine success in ensuring available, accessible, appropriate, and affordable care for mothers, babies, and families. As mentioned earlier, the multidisciplinary maternal and newborn committee fulfils this function.

Evaluation of care includes, but is not limited to, the following:

- continuous quality improvement, which involves feedback and audit activities;
- policies and procedures based on current information, which are reviewed on a regular basis;
- education of all staff, including self-education;
- assessment of the outcome, which should include at least a review of maternal and newborn mortality, major morbidity, and significant incidents;
- use of hospital services; and
- assessment of the mother's and baby's integration into the community, including breastfeeding support.

Evaluation of care may take many forms:

- mortality/morbidity/incident reviews
- consumer feedback
- epidemiologic analyses of problems and outcome
- assessment of commonly used investigations or treatment
- investigation into the mechanisms of disease and/or prevention
- studies of education and learning (including parents)
- studies related to resource usage.

Each agency/unit should have a written policy, including the current evaluation methods employed and a mechanism by which new evaluations may be approved for use.

### **Evaluating New or Existing Treatments, Technology, and Policies**

Research studies related to new or existing treatments and technologies are strongly encouraged. All centres and individuals should contribute to this evaluation. Multicentred, multiagency collaboration builds upon the skills of many; it also strengthens the goals, relations, and consistent practices of the maternal/newborn network.

Before a new investigation or treatment or a change in policy and practice is introduced, the following questions should be considered:

**Questions to Consider Before Implementing Changes**

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- Is there clear evidence of the benefits and/or risks?
  - Should the treatment or policy be rigorously evaluated prior to full implementation?
  - What is the nature of the problem for which a change is being considered?
  - Is there need for consumer input?
  - Are issues of compliance, education, and/or short- or long-term costs present?
  - What outcomes must be monitored to measure the anticipated change?
  - How will the findings be used and disseminated to staff in the agency or unit, the region, and beyond?
- 

**Because consequences of the care provided to mothers and newborn babies last for many years, all program managers must continue to evaluate and improve the care given the babies and their families. As an integral part of maternal and newborn services, evaluation and quality-improvement programs should be included within the context of the general administration and funding.**

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## APPENDIX 1

## Canadian Perinatal Surveillance System

The Canadian Perinatal Surveillance System (CPSS) is part of Health Canada's initiative to strengthen national health surveillance capacity. The CPSS is an ongoing national health surveillance program delivered through the Bureau of Reproductive and Child Health in the Laboratory Centre for Disease Control (LCDC). Its mission is to contribute to improved health for pregnant women, mothers, and infants in Canada. The CPSS is guided by a multidisciplinary and multisectoral Steering Committee that provides guidance to the Bureau of Reproductive and Child Health with respect to the development and operation of the CPSS. Steering Committee members include expert representatives of national health professional associations, the provincial and territorial governments, consumer and advocacy groups, and federal government departments, as well as Canadian and international experts in perinatal health and epidemiology.

The CPSS is based on the concept of health surveillance as a systematic, ongoing process that provides timely, relevant information about trends and patterns in the health status of a population and the factors that influence health status. The components of surveillance are data collection, expert analysis and interpretation, and response (communication of information for action).

The aim of the CPSS is to collect and analyze data on all recognized pregnancies, regardless of their outcome — abortion, ectopic pregnancy, stillbirth or live birth — and on health during the first year of life. Currently, the CPSS uses data from multiple existing sources (mainly administrative) such as national vital statistics and hospitalization data. These data are analyzed collaboratively with perinatal health surveillance partners.

The response component of the CPSS consists of communication of information that will serve as an evidence base for action to improve the effectiveness and efficiency of clinical care and guide the development of public health policies and programs for maternal and infant health. The mechanisms and vehicles for information dissemination vary according to the target audience (which includes policy makers, health care providers,

the public, researchers), and include fact sheets, peer-reviewed publications and the World Wide Web.

The CPSS has established short-, medium-, and long-term goals. In the short and medium term, the CPSS will:

- Continue to analyze and report on existing national perinatal health data — vital statistics, hospitalization databases and national surveys (e.g. National Longitudinal Survey of Children and Youth) — using a set of national perinatal health indicators.
- Work collaboratively with partners to standardize definitions of perinatal health variables across the country, and promote the addition of key variables to existing databases.
- Strengthen and expand surveillance in priority areas (e.g. congenital anomalies; and women's knowledge, perspectives, practices and experiences in pregnancy, birth, and parenthood).

The long-term goal of the CPSS is to establish a comprehensive national perinatal database through electronic transfer of data from vital event registration, hospital services, and community-based services.

If additional information is required, please contact:

**Canadian Perinatal Surveillance System**

Bureau of Reproductive and Child Health

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## APPENDIX 2

## ICD-9 and 10 Coding Interpretation and Diagnosis of Asphyxia

The Canadian Institute for Health Information (CIHI) has produced coding instructions for Canadian health care workers in regard to fetal asphyxia. These recommendations are based on recommendations received from the Society of Obstetricians and Gynaecologists of Canada (SOGC) and the American College of Obstetricians and Gynecologists (ACOG) regarding fetal asphyxia. The diagnosis of fetal asphyxia must be substantiated by a documented abnormal acid-base status on the basis of cordocentesis antenatally, fetal scalp sampling during labour and cord blood pH pCO<sub>2</sub> at birth. Without this evaluation, the diagnosis of fetal asphyxia cannot be entertained.

The low Apgar score, fetal bradycardia, fetal heart pattern variation, fetal tachycardia, non-reassuring fetal heart rate, and meconium cannot by themselves be identified or be the diagnosis of asphyxia. Health workers should only use the term “asphyxia” in the newborn for the clinical context of damaging acidemia, hypoxemia, and metabolic acidosis. The following criteria will apply for the diagnosis of birth asphyxia:

- profound metabolic or mixed acidemia, pH less than 7.0 on umbilical cord arterial blood sample;
- persistent Apgar score of 0 to 3 for longer than five minutes; and
- evidence of neonatal neurological sequelae (e.g. seizures, coma, hypotonia and one or more of the following: cardiovascular, gastrointestinal, hematological, pulmonary, or renal system dysfunction).

The SOGC and the ACOG recommend that all of these criteria be present for the diagnosis of asphyxia to be consigned in the chart.

A series of horizontal dotted lines for writing, consisting of 25 lines.