

ACOG/SMFM OBSTETRIC CARE CONSENSUS

Levels of maternal care



The American College of
Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS



Society for
Maternal-Fetal
Medicine

This document was developed jointly by the American College of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine with the assistance of M. Kathryn Menard, MD, MPH; Sarah Kilpatrick, MD, PhD; George Saade, MD; Lisa M. Hollier, MD, MPH; Gerald F. Joseph Jr, MD; Wanda Barfield, MD; William Callaghan, MD; John Jennings, MD; and Jeanne Conry, MD, PhD

The information reflects emerging clinical and scientific advances as of the date issued, is subject to change, and should not be construed as dictating an exclusive course of treatment or procedure. Variations in practice may be warranted based on the needs of the individual patient, resources, and limitations unique to the institution or type of practice.

Objectives

- To introduce uniform designations for levels of maternal care that are complementary but distinct from levels of neonatal care and that address maternal health needs, thereby reducing maternal morbidity and mortality in the United States
- To develop standardized definitions and nomenclature for facilities that provide each level of maternal care
- To provide consistent guidelines according to level of maternal care for use in quality improvement and health promotion
- To foster the development and equitable geographic distribution of full-service maternal care facilities and systems that promote proactive integration of risk-appropriate antepartum, intrapartum, and postpartum services

Background

In the 1970s, studies demonstrated that timely access to risk-appropriate neonatal and obstetric care could reduce perinatal mortality. In 1976, the March of Dimes and its partners

In the 1970s, studies demonstrated that timely access to risk-appropriate neonatal and obstetric care could reduce perinatal mortality. Since the publication of the *Toward Improving the Outcome of Pregnancy* report, more than 3 decades ago, the conceptual framework of regionalization of care of the woman and the newborn has been gradually separated with recent focus almost entirely on the newborn. In this current document, maternal care refers to all aspects of antepartum, intrapartum, and postpartum care of the pregnant woman. The proposed classification system for levels of maternal care pertains to birth centers, basic care (level I), specialty care (level II), subspecialty care (level III), and regional perinatal health care centers (level IV). The goal of regionalized maternal care is for pregnant women at high risk to receive care in facilities that are prepared to provide the required level of specialized care, thereby reducing maternal morbidity and mortality in the United States.

first articulated the concept of an integrated system for regionalized perinatal care in a report titled *Toward Improving the Outcome of Pregnancy*.¹ This report included criteria that stratified maternal and neonatal care into 3 levels of complexity, and recommended referral of high-risk patients to higher-level centers with the appropriate resources and personnel needed to address their increased complexity of care.

After the publication of the March of Dimes report,¹ most states developed coordinated regional systems for perinatal care. The designated regional or tertiary care centers provided the highest levels of obstetric and neonatal care, while serving smaller facilities' needs through education and transport services. Numerous studies have validated the concept that improved neonatal outcomes were achieved through

application of risk-appropriate maternal transport systems.^{2,3} A comprehensive metaanalysis has shown increased odds of neonatal mortality for very low birthweight (very LBW, also commonly known as VLBW) infants (<1500 g) born outside of a level III hospital (38% vs 23%; adjusted odds ratio, 1.62; 95% confidence interval, 1.44–1.83).⁴ Data indicate higher neonatal mortality for very low birthweight infants born in hospitals that are staffed by neonatologists in the absence of a more complete multidisciplinary team (level II), compared with those born in level III centers.⁵

Since the March of Dimes report¹ was published, the conceptual framework of regionalization of care of the woman and the newborn has changed to focus almost entirely on the newborn.^{6,7} The American College of Obstetricians and Gynecologists (ACOG) and the

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American Academy of Pediatrics (AAP) outline the capabilities of health care providers in hospitals delivering basic, specialty, subspecialty, and regional obstetric care in *Guidelines for Perinatal Care*, seventh edition.⁶ With 39% of hospital births in the United States occurring at hospitals that deliver less than 500 newborns each year and an additional 20% occurring at hospitals that deliver between 501 newborns and 1000 newborns each year,⁸ it likely is that the majority of maternal care in the United States is provided at basic-care and specialty-care hospitals. However, a recent commentary noted the need to readdress “perinatal levels of care” to focus specifically on maternal health conditions that warrant designation as high risk, and to define specific clinical and systems criteria to manage such conditions.⁹ This document is a call for an integrated, regionalized framework to identify when transfer of care may be necessary to provide risk-appropriate maternal care.

Although maternal mortality in high resource countries improved substantially during the 20th century, maternal mortality rates in the United States have worsened in the past 14 years.¹⁰ Currently, the United States is ranked 60th in the world for maternal mortality.¹¹ According to a Centers for Disease Control and Prevention study,¹² the leading causes of maternal mortality are associated with chronic conditions that affect women of reproductive age, and common obstetric complications such as hemorrhage. Moreover, maternal mortality in the United States represents a small component of the larger emerging problem of maternal severe morbidities and near-miss mortality that increased by 75% between 1998–99 and 2008–09.¹³ National increases in obesity, hypertensive disorders, and diabetes among women of reproductive age increase the risk of maternal morbidity and mortality, as does the increasing cesarean delivery rate.^{14,15} Although specific modifications in the clinical management of these conditions have been instituted (eg, the use of thromboembolism prophylaxis and bariatric beds in obstetrics), more

can be done to improve the system of care for high-risk women at facility and population levels.

Although there is strong evidence of more favorable neonatal outcomes with regionalized perinatal care, evidence of a beneficial effect on maternal outcome is limited. Maternal mortality is an uncommon event, and methods for tracking severe morbidity only have been proposed recently.¹³ Data indicate that obstetric complications are significantly more frequent in hospitals with low delivery volume,¹⁶ and that obstetric providers with the lowest patient volume have significantly increased rates of obstetric complications compared with high-volume providers.¹⁷ Hospital clinical volume likely is a proxy measure for institutional and individual experience that may not be available at hospitals with lower volumes.¹⁸ Also, data indicate that outcomes are better if certain conditions, such as placenta previa or placenta accreta, are managed in a high-volume hospital.^{19,20} It also has been noted that maternal mortality is inversely related to the population density of maternal–fetal medicine subspecialists at the state level,²¹ although other factors, such as the presence of obstetrician–gynecologists, nurses, and anesthesiologists who have experience in high-risk maternity care, also may contribute to this trend. Although these findings provide support for an association between availability of resources and favorable maternal outcomes, they do not prove a direct cause and effect relationship between levels of care and outcomes.

A number of states have incorporated maternal care criteria into perinatal guidelines. Indiana, Arizona, and Maryland emphasize the need for stratification of facilities based on levels of maternal care that are distinct from neonatal needs, but use inconsistent definitions and nomenclature: the Indiana Perinatal Networks guideline is modeled after the March of Dimes report and uses levels I, II, and III;²² the Arizona system defines levels I, II, IIE, and III of maternal care;²³ and the Maryland Perinatal System uses levels I, II, III, and IV.²⁴ Despite their differences, an essential component of each of these guidelines is the concept of an

integrated system in which, just as with neonatal care, level III and level IV maternal centers serve level I and level II centers by providing educational resources, consultation services, and streamlined systems for maternal and neonatal transport when necessary.

This document has 4 objectives: (1) introduce uniform designations for levels of maternal care that are complementary but distinct from levels of neonatal care and that address maternal health needs, thereby preventing further increases in maternal morbidity and mortality in the United States; (2) develop standardized definitions and nomenclature for facilities that provide each level of maternal care, including birth centers; (3) provide consistent guidelines of service according to level of maternal care for use in quality improvement and health promotion; and (4) foster the development and equitable geographic distribution of full-service maternal care facilities and systems that promote proactive integration of risk-appropriate antepartum, intrapartum, and postpartum services. This document focuses on maternal care and does not include an in-depth discussion about high-risk neonatal care capability based on gestational age or birthweight. Nevertheless, optimal perinatal care requires synergy in institutional capabilities for the woman and the fetus or neonate.

Definitions of levels of maternal care

In this document, maternal care refers to all aspects of antepartum, intrapartum, and postpartum care of the pregnant woman. In order to standardize a complete and integrated system of perinatal regionalization and risk-appropriate maternal care, a classification system should be established for levels of maternal care that pertain to birth centers (as defined in the Birth Centers section of this document), basic care (level I), specialty care (level II), subspecialty care (level III), and regional perinatal health care centers (level IV) (Tables 1 and 2). This system is in concert with ACOG and AAP *Guidelines for Perinatal Care*, seventh edition.⁶ Although data on which to base these distinctions in resources and

TABLE 1
Levels of maternal care: definitions, capabilities, and types of health care providers^a

BIRTH CENTER	
Definition	Peripartum care of low-risk women with uncomplicated singleton term pregnancies with a vertex presentation who are expected to have an uncomplicated birth.
Capabilities	<ul style="list-style-type: none"> • Capability and equipment to provide low-risk maternal care and a readiness at all times to initiate emergency procedures to meet unexpected needs of the woman and newborn within the center, and to facilitate transport to an acute care setting when necessary. • An established agreement with a receiving hospital with policies and procedures for timely transport. • Data collection, storage, and retrieval. • Ability to initiate quality improvement programs that include efforts to maximize patient safety. • Medical consultation available at all times.
Types of health care providers	<p>Every birth attended by at least 2 professionals:</p> <ul style="list-style-type: none"> • Primary maternal care providers. This includes CNMs, CMs, CPMs, and licensed midwives who are legally recognized to practice within the jurisdiction of the birth center; family physicians; and ob-gyns. • Availability of adequate numbers of qualified professionals with competence in level I care criteria and ability to stabilize and transfer high-risk women and newborns.
Examples of appropriate patients (not requirements)	<ul style="list-style-type: none"> • Term, singleton, vertex presentation
LEVEL I (BASIC CARE)	
Definition	Care of uncomplicated pregnancies with the ability to detect, stabilize, and initiate management of unanticipated maternal–fetal or neonatal problems that occur during the antepartum, intrapartum, or postpartum period until patient can be transferred to a facility at which specialty maternal care is available.
Capabilities	<p>Birth center capabilities plus:</p> <ul style="list-style-type: none"> • Ability to begin emergency cesarean delivery within a time interval that best incorporates maternal and fetal risks and benefits with the provision of emergency care. • Available support services, including access to obstetric ultrasonography, laboratory testing, and blood bank supplies at all times. • Protocols and capabilities for massive transfusion, emergency release of blood products, and management of multiple component therapy. • Ability to establish formal transfer plans in partnership with a higher-level receiving facility. • Ability to initiate education and quality improvement programs to maximize patient safety, and/or collaborate with higher-level facilities to do so.
Types of health care providers	<p>Birth center providers plus:</p> <ul style="list-style-type: none"> • Continuous availability of adequate number of RNs with competence in level I care criteria and ability to stabilize and transfer high-risk women and newborns. • Nursing leadership has expertise in perinatal nursing care. • Obstetric provider with privileges to perform emergency cesarean available to attend all deliveries. • Anesthesia services available to provide labor analgesia and surgical anesthesia.
Examples of appropriate patients (not requirements)	<p>Any patient appropriate for a birth center, plus capable of managing higher-risk conditions such as:</p> <ul style="list-style-type: none"> • Term twin gestation • Trial of labor after cesarean delivery • Uncomplicated cesarean delivery • Preeclampsia without severe features at term
LEVEL II (SPECIALTY CARE)	
Definition	Level I facility plus care of appropriate high-risk antepartum, intrapartum, or postpartum conditions, both directly admitted and transferred from another facility.
Capabilities	<p>Level I facility capabilities plus:</p> <ul style="list-style-type: none"> • Computed tomography scan and ideally magnetic resonance imaging with interpretation available. • Basic ultrasonographic imaging services for maternal and fetal assessment. • Special equipment needed to accommodate the care and services needed for obese women.

ACOG. Levels of maternal care. *Am J Obstet Gynecol* 2015.

(continued)

TABLE 1

Levels of maternal care: definitions, capabilities, and types of health care providers^a (continued)**LEVEL II (SPECIALTY CARE)** (continued)

Types of health care providers	<p>Level I facility health care providers plus:</p> <ul style="list-style-type: none"> • Continuous availability of adequate numbers of RNs with competence in level II care criteria and ability to stabilize and transfer high-risk women and newborns who exceed level II care criteria. • Nursing leadership and staff have formal training and experience in the provision of perinatal nursing care and should coordinate with respective neonatal care services. • Ob-gyn available at all times. • Director of obstetric service is a board-certified ob-gyn with special interest and experience in obstetric care. • MFM available for consultation onsite, by phone, or by telemedicine, as needed. • Anesthesia services available at all times to provide labor analgesia and surgical anesthesia. • Board-certified anesthesiologist with special training or experience in obstetric anesthesia available for consultation. • Medical and surgical consultants available to stabilize obstetric patients who have been admitted to the facility or transferred from other facilities.
Examples of appropriate patients (not requirements)	<p>Any patient appropriate for level I care, plus higher-risk conditions such as:</p> <ul style="list-style-type: none"> • Severe preeclampsia • Placenta previa with no prior uterine surgery

LEVEL III (SUBSPECIALTY CARE)

Definition	Level II facility plus care of more complex maternal medical conditions, obstetric complications, and fetal conditions
Capabilities	<p>Level II facility capabilities plus:</p> <ul style="list-style-type: none"> • Advanced imaging services available at all times. • Ability to assist level I and level II centers with quality improvement and safety programs. • Provide perinatal system leadership if acting as a regional center in areas where level IV facilities are not available (refer to level IV). • Medical and surgical ICUs accept pregnant women and have critical care providers onsite to actively collaborate with MFMs at all times. • Appropriate equipment and personnel available onsite to ventilate and monitor women in labor and delivery until they can be safely transferred to the ICU.
Types of health care providers	<p>Level II health care providers plus:</p> <ul style="list-style-type: none"> • Continuous availability of adequate numbers of nursing leaders and RNs with competence in level III care criteria and ability to transfer and stabilize high-risk women and newborns who exceed level III care criteria, and with special training and experience in the management of women with complex maternal illnesses and obstetric complications. • Ob-gyn available onsite at all times. • MFM with inpatient privileges available at all times, either onsite, by phone, or by telemedicine. • Director of MFM service is a board-certified MFM. • Director of obstetric service is a board-certified ob-gyn with special interest and experience in obstetric care. • Anesthesia services available at all times onsite. • Board-certified anesthesiologist with special training or experience in obstetric anesthesia in charge of obstetric anesthesia services. • Full complement of subspecialists available for inpatient consultations.
Examples of appropriate patients (not requirements)	<p>Any patient appropriate for level II care, plus higher-risk conditions such as:</p> <ul style="list-style-type: none"> • Suspected placenta accreta or placenta previa with prior uterine surgery • Suspected placenta percreta • Adult respiratory syndrome • Expectant management of early severe preeclampsia at less than 34 weeks of gestation

LEVEL IV (REGIONAL PERINATAL HEALTH CARE CENTERS)

Definition	Level III facility plus onsite medical and surgical care of the most complex maternal conditions and critically ill pregnant women and fetuses throughout antepartum, intrapartum, and postpartum care
Capabilities	<p>Level III facility capabilities plus:</p> <ul style="list-style-type: none"> • Onsite ICU care for obstetric patients. • Onsite medical and surgical care of complex maternal conditions with the availability of critical care unit or ICU beds. • Perinatal system leadership, including facilitation of maternal referral and transport, outreach education for facilities and health care providers in the region, and analysis and evaluation of regional data, including perinatal complications and outcomes and quality improvement.

TABLE 1

Levels of maternal care: definitions, capabilities, and types of health care providers^a (continued)

LEVEL IV (REGIONAL PERINATAL HEALTH CARE CENTERS) (continued)

Types of health care providers	<p>Level III health care providers plus:</p> <ul style="list-style-type: none"> ● MFM care team with expertise to assume responsibility for pregnant women and women in the postpartum period who are in critical condition or have complex medical conditions. This includes comanagement of ICU-admitted obstetric patients. MFM team member with full privileges is available at all times for onsite consultation and management. The team is led by a board-certified MFM with expertise in critical care obstetrics. ● Physician and nursing leaders with expertise in maternal critical care. ● Continuous availability of adequate numbers of RNs who have experience in the care of women with complex medical illnesses and obstetric complications; this includes competence in level IV care criteria. ● Director of obstetric service is a board-certified MFM, or board-certified ob-gyn with expertise in critical care obstetrics. ● Anesthesia services are available at all times onsite. ● Board-certified anesthesiologist with special training or experience in obstetric anesthesia in charge of obstetric anesthesia services. ● Adult medical and surgical specialty and subspecialty consultants available onsite at all times to collaborate with an MFM care team.
Examples of appropriate patients (not requirements)	<p>Any patient appropriate for level III care, plus higher-risk conditions such as:</p> <ul style="list-style-type: none"> ● Severe maternal cardiac conditions ● Severe pulmonary hypertension or liver failure ● Pregnant women requiring neurosurgery or cardiac surgery ● Pregnant women in unstable condition and in need of an organ transplant

CMs, certified midwives; CNMs, certified nurse—midwives; CPMs, certified professional midwives; ICU, intensive care unit; MFM, maternal—fetal medicine subspecialists; ob-gyns, obstetrician—gynecologists; RNs, registered nurses.

^a These guidelines are limited to maternal needs. Consideration of perinatal needs and the appropriate level of care should occur following existing guidelines. In fact, levels of maternal care and levels of neonatal care may not match within facilities. Additionally, these are guidelines, and local issues will affect systems of implementation for regionalized maternal care, perinatal care, or both.

Data adapted from American Academy of Pediatrics Committee on Fetus and Newborn.⁷

ACOG. Levels of maternal care. *Am J Obstet Gynecol* 2015.

capacity for maternal care are limited, the definitions were created from the characteristics of successful regionalized perinatal systems in a number of states (Background section). In this context, regionalized perinatal systems represent a combination of maternal and neonatal services. Establishing clear, uniform criteria for designation of maternal centers that are integrated with emergency response systems will help ensure that the appropriate personnel, physical space, equipment, and technology are available to achieve optimal outcomes, as well as to facilitate subsequent data collection regarding risk-appropriate care. Trauma is not integrated into the levels of maternal care because trauma levels are already established. Pregnant women should receive the same level of trauma care as nonpregnant patients. This document addresses the care provided at birth centers and hospitals, but home birth is not included.

Once levels of maternal care are established, analysis of data collected from all facilities and regional systems will inform future updates to the levels of maternal care. Consistent with the levels of neonatal care published by the AAP,⁷ each level reflects required minimal capabilities, physical facilities, and medical and support personnel. Note that each higher level of care includes and builds on the capabilities of the lower levels. As with the AAP-defined levels of neonatal care, the system will be modified as analysis is completed.

The goal of regionalized maternal care is for pregnant women at high risk to receive care in facilities that are prepared to provide the required level of specialized care. Each facility should have a clear understanding of its capability to handle increasingly complex levels of maternal care, and should have a well-defined threshold for transferring women to health care facilities that offer a higher level of care. These

proposed categories of maternal care are meant to facilitate this process. These guidelines also are intended to foster the development of equitably distributed resources throughout the country. These are guidelines, not mandates, and geographic and local issues will affect systems of implementation for regionalized perinatal care. In fact, levels of maternal and neonatal care may not match within facilities. However, a pregnant woman should be cared for at the facility that best meets her needs as well as her neonate's needs. Because all facilities cannot maintain the breadth of resources available at subspecialty centers, interfacility transport of pregnant women or women in the postpartum period is an essential component of a regionalized perinatal health care system. To ensure optimal care of all pregnant women, all birth centers, hospitals, and higher-level facilities should collaborate to develop and maintain maternal and neonatal transport plans

TABLE 2
Levels of maternal care by services

Required service	Level of maternal care				
	Birth centers	Level I	Level II	Level III	Level IV
Nursing	Adequate numbers of qualified professionals with competence in level I care criteria	Continuously available RNs with competence in level I care criteria Nursing leadership has expertise in perinatal nursing care	Continuously available RNs with competence in level II care criteria Nursing leadership has formal training and experience in perinatal nursing care and coordinates with respective neonatal care services	Continuously available nursing leaders and RNs with competence in level III care criteria and have special training and experience in the management of women with complex maternal illnesses and obstetric complications	Continuously available RNs with competence in level IV care criteria Nursing leadership has expertise in maternal intensive and critical care
Minimum primary delivery provider to be available	CNMs, CMs, CPMs, and licensed midwives	Obstetric provider with privileges to perform emergency cesarean delivery	Ob-gyns or MFMs	Ob-gyns or MFMs	Ob-gyns or MFMs
Obstetrics surgeon		Available for emergency cesarean delivery	Ob-gyn available at all times	Ob-gyn onsite at all times	Ob-gyn onsite at all times
MFMs			Available for consultation onsite, by phone, or by telemedicine, as needed	Available at all times onsite, by phone, or by telemedicine with inpatient privileges	Available at all times for onsite consultation and management
Director of obstetric services			Board-certified ob-gyn with experience and interest in obstetrics	Board-certified ob-gyn with experience and interest in obstetrics	Board-certified MFM or board-certified ob-gyn with expertise in critical care obstetrics
Anesthesia		Anesthesia services available	Anesthesia services available at all times Board-certified anesthesiologist with special training or experience in obstetrics, available for consultation	Anesthesia services available at all times Board-certified anesthesiologist with special training or experience in obstetrics is in charge of obstetric anesthesia services	Anesthesia services available at all times Board-certified anesthesiologist with special training or experience in obstetrics is in charge of obstetric anesthesia services
Consultants	Established agreement with a receiving hospital for timely transport, including determination of conditions necessitating consultation and referral	Established agreement with a higher-level receiving hospital for timely transport, including determination of conditions necessitating consultation and referral	Medical and surgical consultants available to stabilize	Full complement of subspecialists available for inpatient consultation, including critical care, general surgery, infectious disease, hematology, cardiology, nephrology, neurology, and neonatology	Adult medical and surgical specialty and subspecialty consultants available onsite at all times, including those indicated in level III and advanced neurosurgery, transplant, or cardiac surgery

ACOG. Levels of maternal care. *Am J Obstet Gynecol* 2015.

(continued)

TABLE 2
Levels of maternal care by services (continued)

Level of maternal care	Level I	Level II	Level III	Level IV
Required service	Birth centers			
ICU			Appropriate equipment and personnel available onsite to ventilate and monitor women in labor and delivery until safely transferred to ICU Accepts pregnant women	Collaborates actively with the MFM care team in the management of all pregnant women and women in the postpartum period who are in critical condition or have complex medical conditions Comanages ICU-admitted obstetric patients with MFM team

CMs, certified midwives; CNMs, certified nurse-midwives; CPMs, certified professional midwives; ICU, intensive care unit; MFMs, maternal-fetal medicine specialists; ob-gyns, obstetrician-gynecologists; RNs, registered nurses.
ACOG. Levels of maternal care. *Am J Obstet Gynecol* 2015.

and cooperative agreements capable of managing the health care needs of women who develop complications; receiving hospitals should openly accept transfers. The appropriate care level for patients should be driven by their medical need for that care and not limited by financial constraint. Because of the importance of accurate data for the assessment of outcomes, all facilities should have requirements for data collection, storage, and retrieval.

An important goal of regionalized maternal care is for higher-level facilities to provide training for quality improvement initiatives, educational support, and severe morbidity and mortality case review for lower-level hospitals. In those regions that do not have a facility that qualifies as a level IV center, any level III facilities in the region should provide the educational and consultation function (Table 3 and Appendix).

Birth centers

In 1995, the American Association of Birth Centers (www.birthcenters.org) defined *birth centers* as “a homelike facility existing within a healthcare system with a program of care designed in the wellness model of pregnancy and birth. Birth centers provide family-centered care for healthy women before, during and after normal pregnancy, labor and birth.” This common definition is used in this document and includes birth centers regardless of their location. Birth centers provide peripartum care to low-risk women with uncomplicated singleton term pregnancies with a vertex presentation who are expected to have an uncomplicated birth. Cesarean delivery or operative vaginal delivery are not offered at birth centers.

In a freestanding birth center, every birth should be attended by at least 2 professionals. The primary maternity care provider that attends each birth is educated and licensed to provide birthing services. Primary maternity care providers include certified nurse-midwives (CNMs), certified

midwives, certified professional midwives, and licensed midwives who are legally recognized to practice within the jurisdiction of the birth center; family physicians; and obstetrician-gynecologists. In addition, there should be adequate numbers of qualified professionals available who have completed orientation and demonstrated competence in the care of obstetric patients (women and fetuses) consistent with level I care criteria and are able to stabilize and transfer high-risk women and newborns. Medical consultation should be available at all times. These facilities should be ready to initiate emergency procedures (including cardiopulmonary and newborn resuscitation and stabilization) at all times,⁷ to meet unexpected needs of the woman and newborn within the center, and to facilitate transport to an acute care setting when necessary. To ensure optimal care of all women, a birth center should have a clear understanding of its capability to provide maternal and neonatal care and the threshold at which it should transfer women to a facility with a higher level of care. A birth center should have an established agreement with a receiving hospital and have policies and procedures in place for timely transport. These transfer plans should include risk identification; determination of conditions necessitating consultation; referral and transfer; and a reliable, accurate, and comprehensive communication system between participating facilities and transport teams. All facilities should have quality improvement programs that include efforts to maximize patient safety.

Birth center facility licenses currently are available in more than 80% of states in the United States and state requirements for accreditation for birth centers vary. Three national agencies (Accreditation Association for Ambulatory Health Care [www.aaahc.org], The Joint Commission [www.jointcommission.org], and The Commission for the Accreditation of Birth Centers [www.birthcenteraccreditation.org/]) provide accreditation of birth centers. The Commission for the Accreditation of Birth Centers is the only accrediting agency that chooses to use the national

American Association of Birth Centers Standards for Birth Centers in its accreditation process.

Level I facilities (basic care)

Level I facilities (basic care) provide care to women who are low risk and are expected to have an uncomplicated birth (Table 1). Level I facilities have the capability to perform routine intrapartum and postpartum care that is anticipated to be uncomplicated.⁶ As in birth centers, maternity care providers, midwives, family physicians, or obstetrician–gynecologists should be available to attend all births. Adequate numbers of registered nurses (RNs) are available who have completed orientation, demonstrated competence in the care of obstetric patients (women and fetuses) consistent with level I care criteria, and are able to stabilize and transfer high-risk women and newborns. Nursing leadership should have expertise in perinatal nursing care. An obstetric provider with privileges to perform an emergency cesarean delivery should be available to attend deliveries. Anesthesia services should be available to provide labor analgesia and surgical anesthesia. Level I facilities have the capability to begin an emergency cesarean delivery within a time interval that best incorporates maternal and fetal risks and benefits with the provision of emergency care.^{6,25} Support services include access to obstetric ultrasonography, laboratory testing, and blood bank supplies at all times. All hospitals with obstetric services should have protocols and capabilities in place for massive transfusion, emergency release of blood products (before full compatibility testing is complete), and for management of multiple component therapy. These facilities and health care providers can appropriately detect, stabilize, and initiate management of unanticipated maternal, fetal, or neonatal problems that occur during the antepartum, intrapartum, or postpartum period until the patient can be transferred to a facility at which specialty maternal care is available. To ensure optimal care of all pregnant women, formal transfer plans should

be established in partnership with a higher-level receiving facility. These plans should include risk identification; determination of conditions necessitating consultation; referral and transfer; and a reliable, accurate, and comprehensive communication system between participating hospitals and transport teams.⁶ All facilities should have education and quality improvement programs to maximize patient safety, provide such programs through collaboration with facilities with higher levels of care that receive transfers, or both. Examples of women who need at least level I care include women with term twin gestation; women attempting trial of labor after cesarean delivery; women expecting an uncomplicated cesarean delivery; and women with preeclampsia without severe features at term.

Level II facilities (specialty care)

Level II facilities (specialty care) provide care to appropriate high-risk pregnant women, both admitted and transferred to the facility. In addition to the capabilities of a level I (basic care) facility, level II facilities should have the infrastructure for continuous availability of adequate numbers of RNs who have demonstrated competence in the care of obstetric patients (women and fetuses). Orientation and demonstrated competence should be consistent with level II care criteria and include stabilization and transfer of high-risk women and newborns who exceed level II care criteria. The nursing leaders and staff at a level II facility should have formal training and experience in the provision of perinatal nursing care and should coordinate with respective neonatal care services. Although midwives and family physicians may practice in level II facilities, an attending obstetrician–gynecologist should be available at all times. A board-certified obstetrician–gynecologist with special interest and experience in obstetric care should be the director of obstetric services. Access to a maternal–fetal medicine subspecialist for consultation should be available onsite, by phone, or by telemedicine as needed. Anesthesia services should be available at all times to provide

labor analgesia and surgical anesthesia. A board-certified anesthesiologist with special training or experience in obstetric anesthesia should be available for consultation. Support services include level I capabilities plus computed tomography scan and, ideally, magnetic resonance imaging with interpretation available; basic ultrasonographic imaging services for maternal and fetal assessment; and special equipment needed to accommodate the care and services needed for obese women.⁶ Medical and surgical consultants should be available to stabilize obstetric patients who have been admitted to the facility or transferred from other facilities. Examples of women who need at least level II care include women with severe preeclampsia and women with placenta previa with no prior uterine surgery.

Level III facilities (subspecialty care)

Level III facilities (subspecialty care) provide all level I (basic care) and level II (specialty care) services, and have subspecialists available onsite, by phone, or by telemedicine to assist in providing care for more complex maternal and fetal conditions. Level III facilities will function as the regional perinatal health care centers for some areas of the United States if there are no level IV facilities available. In these areas, the level III facilities will be responsible for the leadership, facilitation of transport and referral, educational outreach, and data collection and analysis outlined in the Regionalization section discussed later in this document.

Designation of level III should be based on the demonstrated experience and capability of the facility to provide comprehensive management of severe maternal and fetal complications. An obstetrician–gynecologist is available onsite at all times and a maternal–fetal medicine subspecialist is available at all times, either onsite, by phone, or by telemedicine, and should have inpatient privileges. The director of the maternal–fetal medicine service should be a board-certified maternal–fetal medicine subspecialist. A board-certified obstetrician–gynecologist with special

TABLE 3

Summary and recommendations for levels of maternal care

Summary and recommendations	Grade of recommendations
In order to standardize a complete and integrated system of perinatal regionalization and risk-appropriate maternal care, a classification system should be established for levels of maternal care that pertain to birth centers (as defined in the Birth Centers section of this document), basic care (level I), specialty care (level II), subspecialty care (level III), and regional perinatal health care centers (level IV).	1C Strong recommendation, low quality evidence
Introduce uniform designations for levels of maternal care that are complementary but distinct from levels of neonatal care.	1C Strong recommendation, low quality evidence
Establishing clear, uniform criteria for designation of maternal centers that are integrated with emergency response systems will help ensure that the appropriate personnel, physical space, equipment, and technology are available to achieve optimal outcomes, as well as to facilitate subsequent data collection regarding risk-appropriate care.	1C Strong recommendation, low quality evidence
Each facility should have a clear understanding of its capability to handle increasingly complex levels of maternal care, and should have a well-defined threshold for transferring women to health care facilities that offer a higher level of care. To ensure optimal care of all pregnant women, all birth centers, hospitals, and higher-level facilities should collaborate to develop and maintain maternal and neonatal transport plans and cooperative agreements capable of managing the health care needs of women who develop complications; receiving hospitals should openly accept transfers.	1C Strong recommendation, low quality evidence
Higher-level facilities should provide training for quality improvement initiatives, educational support, and severe morbidity and mortality case review for lower-level hospitals. In those regions that do not have a facility that qualifies as a level IV center, any level III facilities in the region should provide the educational and consultation function.	1C Strong recommendation, low quality evidence
Facilities and regional systems should develop methods to track severe maternal morbidity and mortality to assess the efficacy of utilizing maternal levels of care.	1C Strong recommendation, low quality evidence
Analysis of data collected from all facilities and regional systems will inform future updates to the levels of maternal care.	1C Strong recommendation, low quality evidence
Follow-up interdisciplinary work groups are needed to further explore the implementation needs to adopt the proposed classification system for levels of maternal care in all facilities that provide maternal care.	1C Strong recommendation, low quality evidence

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interest and experience in obstetric care should direct obstetric services. Anesthesia services should be available at all times onsite. A board-certified anesthesiologist with special training or experience in obstetric anesthesia should be in charge of obstetric anesthesia services. A full complement of subspecialists, including subspecialists in critical care, general surgery, infectious disease, hematology, cardiology, nephrology, neurology, and neonatology should be available for inpatient consultations. An onsite intensive care unit (ICU) should accept pregnant women and have critical care providers onsite to actively collaborate with maternal–fetal specialists at all times. Equipment and personnel with expertise must be available onsite to ventilate and monitor women in

the labor and delivery unit until they can be safely transferred to the ICU.

Level III facilities have nursing leaders and adequate numbers of RNs who have completed orientation and demonstrated competence in the care of obstetric patients (women and fetuses) consistent with level III care criteria, including transfer of high-risk women and newborns who exceed level III care criteria, and who have special training and experience in the management of women with complex maternal illnesses and obstetric complications. These nursing personnel continuously are available. Level III facilities should be able to provide imaging services including basic interventional radiology, maternal echocardiography, computed tomography, magnetic resonance

imaging, and nuclear medicine imaging with interpretation should be available at all times. Level III facilities should have the ability to perform detailed obstetric ultrasonography and fetal assessment, including Doppler studies. These facilities also should provide evaluation of new technologies and therapies. Examples of women who need at least level III care include those women with extreme risk of massive hemorrhage at delivery, such as those with suspected placenta accreta or placenta previa with prior uterine surgery; women with suspected placenta percreta; women with adult respiratory distress syndrome; and women with rapidly evolving disease, such as planned expectant management of severe preeclampsia at less than 34 weeks of gestation.

Level IV facilities (regional perinatal health care centers)

Level IV facilities (regional perinatal health care centers) include the capabilities of level I, level II, and level III facilities with additional capabilities and considerable experience in the care of the most complex and critically ill pregnant women throughout antepartum, intrapartum, and postpartum care. Although level III and level IV may seem to overlap, a level IV facility is distinct from a level III facility in the approach to the care of pregnant women and women in the postpartum period with complex and critical illnesses. In addition to having ICU care onsite for obstetric patients, a level IV facility must have evidence of a maternal–fetal medicine care team that has the expertise to assume responsibility for pregnant women and women in the postpartum period who are in critical condition or have complex medical conditions. The maternal–fetal medicine team collaborates actively in the comanagement of all obstetric patients who require critical care and ICU services. This includes comanagement of ICU-admitted obstetric patients. A maternal–fetal medicine team member with full privileges is available at all times for onsite consultation and management. The team should be led by a board-certified maternal–fetal medicine subspecialist with expertise in critical care obstetrics. The maternal–fetal medicine team must have expertise in critical care at the physician level, nursing level, and ancillary services level. A key principle of caring for critically ill pregnant and peripartum women is the facility's recognition of the need for seamless communication between maternal–fetal medicine subspecialists and other subspecialists in the planning and facilitation of care for women with the most high-risk complications of pregnancy. There should be institutional support for the routine involvement of a maternal–fetal medicine care team with the critical care units and specialists. There also should be a commitment to having physician and nursing leaders with expertise in maternal intensive and critical care, as well as adequate

numbers of available RNs in level IV facilities who have experience in the care of women with complex medical illnesses and obstetric complications; this includes completed orientation, demonstrated competence in the care of obstetric patients (women and fetuses) consistent with level IV care criteria. The director of obstetric services is a board-certified maternal–fetal medicine subspecialist or a board-certified obstetrician–gynecologist with expertise in critical care obstetrics. As in level III facilities, anesthesia services are available onsite at all times. A board-certified anesthesiologist with special training or experience in obstetric anesthesia should be in charge of obstetric anesthesia services. Level IV facilities should include the capability for onsite medical and surgical care of complex maternal conditions (eg, congenital maternal cardiac lesions, vascular injuries, neurosurgical emergencies, and transplants) with the availability of critical (or intensive) care unit beds. There should be adult medical and surgical specialty and subspecialty consultants (a minimum of those listed in level III) available onsite at all times to collaborate with the maternal–fetal medicine care team. The designation of level IV also may pertain only to a particular specialty in that advanced neurosurgery, transplant, and cardiovascular capabilities may not all be available in the same regional facility. Examples of women who would need level IV care (at least at the time of delivery) include pregnant women with severe maternal cardiac conditions, severe pulmonary hypertension, or liver failure; pregnant women in need of neurosurgery or cardiac surgery; or pregnant women in unstable condition and in need of an organ transplant.

Regionalization

Regional centers, which include any level III facility that functions in this capacity and all level IV facilities, should coordinate regional perinatal health care services; provide outreach education to facilities and health care providers in their region; and provide analysis and evaluation of regional data,

including perinatal complications and outcomes, as part of collaboration with lower-level care facilities in the region. Community outreach and data analysis and evaluation will require additional resources in personnel and equipment within these facilities.

Although specific supporting data are not currently available in maternal health, it is believed that concentrating the care of women with the most complex pregnancies at designated regional perinatal health care centers will allow these centers to maintain the expertise needed to achieve optimal outcomes. Regionalization of maternal health care services requires that there be available and coordinated specialized services, professional continuing education to maintain competency, facilitation of opportunities for transport and back-transport, and collection of data on long-term outcomes to evaluate the effectiveness of delivery of perinatal health care services and the safety and efficacy of new therapies. Because the health statuses of women and fetuses may differ, referral should be organized to meet the needs of both. In some cases with specific care needs, optimal coordination of care will not be delineated by geographic area, but rather by availability of specific expertise (eg, transplant services or fetal surgery).

Measurement and evaluation of regionalized maternal care

Implicit in the effort to establish levels of maternal care is the goal to provide the best possible maternal outcomes, as well as ongoing quality improvement. If levels of maternal care improve care, then ensuring that appropriate transfer of women occurs should be associated with a decrease in preventable maternal severe morbidities and mortality. There also should be a shift toward less severe morbidity in lower-level care facilities. Therefore, facilities and regional systems should develop methods to track severe maternal morbidity and mortality to assess the efficacy of utilizing maternal levels of care.

Operational definitions are needed to compare data and outcomes

between levels of maternal care. However, waiting for the precise measure before establishing tiered levels of care invites unnecessary delay. Therefore, two constructs to implement with the utilization of levels of maternal care are proposed: (1) identify women at extreme risk of morbidity and (2) identify severe morbidity outcomes that may improve with appropriate use of maternal levels of care. Some women at extreme risk of severe morbidities, such as stroke, cardiopulmonary failure, or massive hemorrhage, can be identified during the antepartum period and should give birth in the appropriate level hospital. Examples of such women include those with suspected placenta accreta or placenta percreta; prior cesarean birth and current anterior previa; severe heart disease such as complex cardiac malformations and pulmonary hypertension, coronary artery disease, or cardiomyopathy; severe preeclampsia with uncontrollable hypertension; and preterm HELLP syndrome (hemolysis, elevated liver enzymes, low platelet count).

Outcome morbidities that may improve with appropriate use of levels of maternal care include stroke, returns to the operating room, massive transfusions, severe maternal morbidity, and potential ICU admissions. The incidence of these outcomes could decrease or be shifted from lower-level to higher-level hospitals. For example, known placenta accreta has the potential for massive blood loss and need for advanced surgical services, which are best available at facilities with a high designated level of care. Expectant management of severe early preeclampsia, septic shock, and pulmonary hypertension are other examples of conditions that require considerable resources likely best available at facilities with a high designated level of care. Although the development of comprehensive lists of what conditions comprise extreme morbidity risks and what outcomes ought to be measured currently is an evolving process, prospective measurement with continuous monitoring and evaluation of any regionalized maternal care system is critical to improvement in care processes and outcomes.

Determination and implementation of levels of maternal care

Many barriers to the implementation of levels of maternal care may need to be overcome. The development of the classification system is the first step; the next step, is the implementation of this concept in all facilities that provide maternal care. The questions of whether to have state-level or national-level accrediting bodies establish and set these proposed levels of maternal care, as well as how to provide the financing needed to run them, are unanswered. Follow-up interdisciplinary work groups are needed to further explore the implementation needs to adopt the proposed classification system for levels of maternal care in all facilities that provide maternal care.

The determination of the appropriate level of care to be provided by a given facility should be guided by local and state health care regulations, national accreditation and professional organization guidelines, and identified regional perinatal health care service needs.⁶ State and regional authorities should work together with the multiple institutions within a region to determine the appropriate coordinated system of care. ■

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American Association of Birth Centers
American College of Nurse-Midwives
Association of Women's Health, Obstetric and Neonatal Nurses
Commission for the Accreditation of Birth Centers
The American Academy of Pediatrics leadership, the American Society of Anesthesiologists leadership, and the Society for Obstetric Anesthesia and Perinatology leadership have reviewed the opinion and are supportive of the Levels of Maternal Care.

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Appendix

Society for Maternal–Fetal Medicine grading system: grading of recommendations assessment, development, and evaluation (GRADE) recommendations

Obstetric Care Consensus documents will use Society for Maternal–Fetal Medicine grading approach: <http://www.ajog.org/article/S0002-9378%2813%2900744-8/fulltext>.

Recommendations are classified as either strong (grade 1) or weak (grade 2), and quality of evidence is classified as high (grade A), moderate (grade B), and low (grade C).^a Thus, recommendations can be 1 of following 6 possibilities: 1A, 1B, 1C, 2A, 2B, 2C

Grade of recommendation	Clarity of risk and benefit	Quality of supporting evidence	Implications
1A. Strong recommendation, high-quality evidence	Benefits clearly outweigh risk and burdens, or vice versa.	Consistent evidence from well-performed randomized controlled trials or overwhelming evidence of some other form. Further research is unlikely to change confidence in estimate of benefit and risk.	Strong recommendations, can apply to most patients in most circumstances without reservation. Clinicians should follow a strong recommendation unless a clear and compelling rationale for an alternative approach is present.
1B. Strong recommendation, moderate-quality evidence	Benefits clearly outweigh risk and burdens, or vice versa.	Evidence from randomized controlled trials with important limitations (inconsistent results, methodological flaws, indirect or imprecise), or very strong evidence of some other research design. Further research (if performed) is likely to have impact on confidence in estimate of benefit and risk and may change estimate.	Strong recommendation, and applies to most patients. Clinicians should follow strong recommendation unless clear and compelling rationale for alternative approach is present.
1C. Strong recommendation, low-quality evidence	Benefits appear to outweigh risk and burdens, or vice versa.	Evidence from observational studies, unsystematic clinical experience, or from randomized controlled trials with serious flaws. Any estimate of effect is uncertain.	Strong recommendation, and applies to most patients. Some of evidence base supporting recommendation is, however, of low quality.
2A. Weak recommendation, high-quality evidence	Benefits closely balanced with risks and burdens.	Consistent evidence from well-performed randomized controlled trials or overwhelming evidence of some other form. Further research is unlikely to change confidence in estimate of benefit and risk.	Weak recommendation, best action may differ depending on circumstances or patients or societal values.
2B. Weak recommendation, moderate-quality evidence	Benefits closely balanced with risks and burdens; some uncertainty in estimates of benefits, risks, and burdens.	Evidence from randomized controlled trials with important limitations (inconsistent results, methodological flaws, indirect or imprecise), or very strong evidence of some other research design. Further research (if performed) is likely to have effect on confidence in estimate of benefit and risk and may change estimate.	Weak recommendation, alternative approaches likely to be better for some patients under some circumstances.
2C. Weak recommendation, low-quality evidence	Uncertainty in estimates of benefits, risks, and burdens; benefits may be closely balanced with risks and burdens.	Evidence from observational studies, unsystematic clinical experience, or from randomized controlled trials with serious flaws. Any estimate of effect is uncertain.	Very weak recommendation, other alternatives may be equally reasonable.
Best practice	Recommendation in which either: (i) there is enormous amount of indirect evidence that clearly justifies strong recommendation (direct evidence would be challenging, and inefficient use of time and resources, to bring together and carefully summarize), or (ii) recommendation to contrary would be unethical.		

Modified from grading guide. In: UpToDate, Basow, DS (Ed), UpToDate, Waltham, MA, 2013. Available at: <http://www.uptodate.com/home/grading-guide>. Retrieved October 9, 2013.

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