CURRENT
Diagnosis & Treatment



PEDIATRICS

nineteenth edition

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Mc Graw Hill
LANGE
INTERNATIONAL EDITION

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1 The Newborn Infant

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The newborn period is defined as the first 28 days of life. In practice, however, sick or very immature infants may require neonatal care for many months. There are three levels of newborn care. Level 1 refers to basic care of well newborns, neonatal resuscitation, and stabilization prior to transport. Level 2 refers to specialty neonatal care of premature infants greater than 1500 g or more than 32 weeks' gestation. Level 3 is subspecialty care of higher complexity ranging from 3A to 3D based on newborn size and gestational age, availability of general surgery, cardiac surgery, and extracorporeal membrane oxygenation. Level 3 care is often part of a perinatal center offering critical care and transport to the high-risk mother and fetus as well as the newborn infant.

THE NEONATAL HISTORY

The newborn medical history has three key components: (1) maternal and paternal medical and genetic history, (2) maternal past obstetric history, and (3) current antepartum and intrapartum obstetric history.

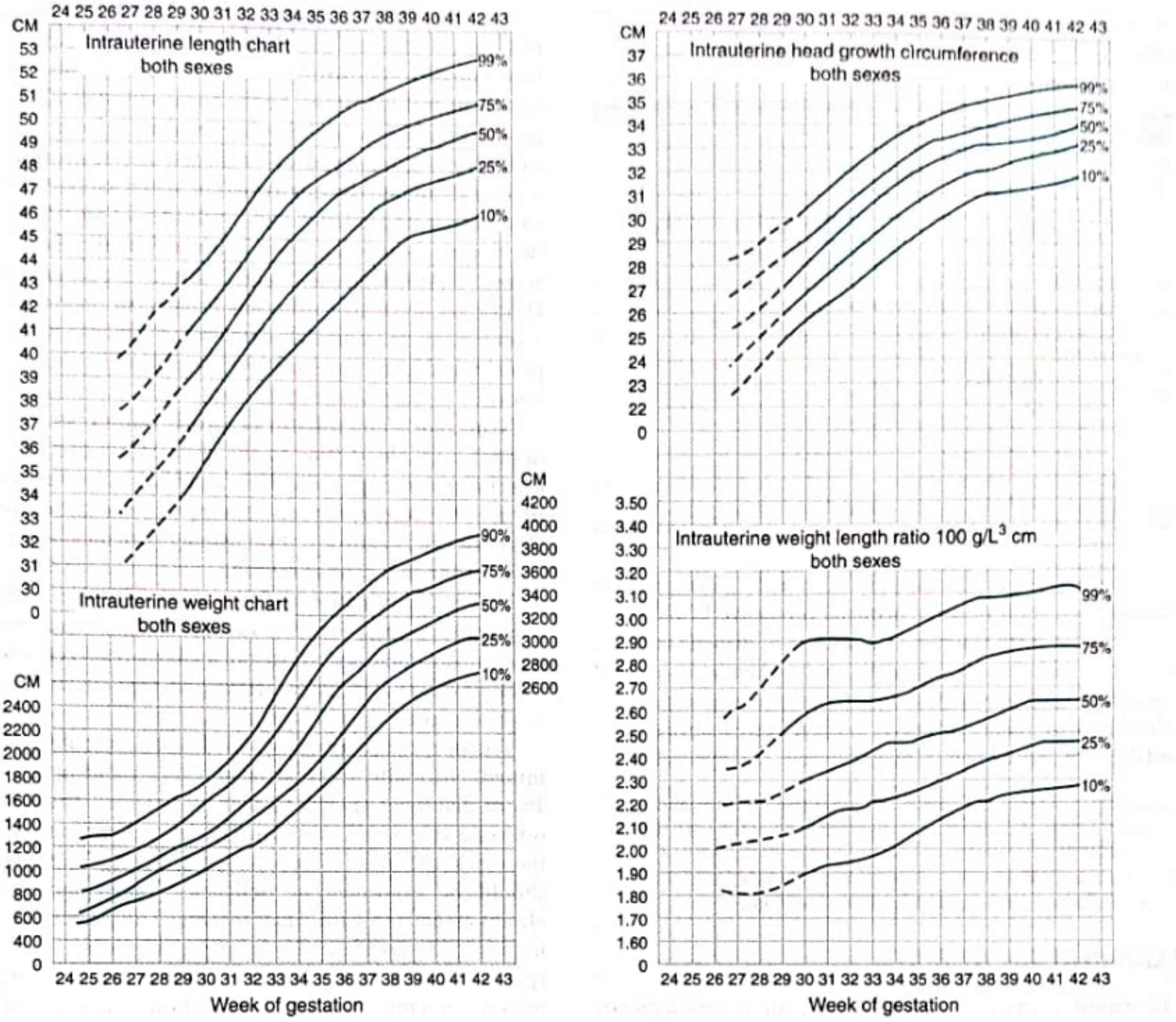
The mother's medical history includes chronic medical conditions, medications taken during pregnancy, unusual dietary habits, smoking history, occupational exposure to chemicals or infections of potential risk to the fetus, and any social history that might increase the risk for parenting problems and child abuse. Family illnesses with genetic implications should be sought. The past obstetric history includes maternal age, gravidity, parity, blood type, and pregnancy outcomes. The current obstetric history includes the results of procedures during the current pregnancy such as ultrasound, amniocentesis, screening tests (rubella antibody, hepatitis B surface antigen, serum quadruple screen for genetic disorders, HIV), and antepartum tests of fetal well-being (eg, biophysical profiles, nonstress tests, or Doppler assessment of fetal blood flow patterns). Pregnancy-related maternal complications such as urinary tract infection, pregnancy-induced hypertension, eclampsia, gestational diabetes, vaginal bleeding, and preterm labor should be documented. Significant peripartum events include duration of ruptured membranes, maternal fever, fetal distress, meconium-stained amniotic fluid, type of delivery (vaginal or cesarean section), anesthesia and analgesia used, reason for operative or forceps delivery, infant status at birth, resuscitative measures, and Apgar scores.

ASSESSMENT OF GROWTH & GESTATIONAL AGE

It is important to know the infant's gestational age because normal behavior and possible medical problems can be predicted on this basis. The date of the last menstrual period is the best indicator of gestational age. Uterine fundal height and early fetal ultrasound provide supporting information. Postnatal physical characteristics and neurologic development are also clues to gestational age. Table 1–1 lists the physical and neurologic criteria of maturity used to estimate gestational age by the Ballard score method. Adding the scores assigned to each neonatal physical and neuromuscular sign yields a score corresponding to gestational age.

Disappearance of the anterior vascular capsule of the lens is also helpful in determining gestational age. Until 27–28 weeks' gestation, the lens capsule is covered by vessels; by 34 weeks, this vascular plexus is completely atrophied. Foot length, from the heel to the tip of the longest toe, also correlates with gestational age in appropriately grown infants. The foot measures 4.5 cm at 25 weeks' gestation and increases 0.25 cm per week until term.

If the physical examination indicates a gestational age within 2 weeks of that predicted by the obstetric dates, the gestational age is as assigned by the obstetric date. Birth weight and gestational age are plotted on standard grids (Figure 1–1) to determine whether the birth weight is appropriate for gestational age (AGA), small for gestational age (SGA) or large for gestational age (LGA). Another term for SGA is intrauterine growth restriction (IUGR). Birth weight for gestational age in normal neonates varies with



▲ **Figure 1–1.** Intrauterine growth curves for weight, length, and head circumference for singleton births in Colorado. (Reproduced, with permission, from Lubchenco LO et al: Intrauterine growth in length and head circumference as estimated from live births at gestational ages from 26 to 42 weeks. Pediatrics 1966;37:403.)

race, maternal nutrition, access to obstetric care, and environmental factors such as altitude, smoking, and drug and alcohol use. Whenever possible, standards for newborn weight and gestational age based on data derived from the local or regional population should be used. Birth weight related to gestational age is a screening tool that should be supplemented by clinical data when entertaining a diagnosis of IUGR or excessive fetal growth. These data include the infant's physical examination and other factors such as parental size and the birth weight–gestational age of siblings.

An important distinction, particularly in SGA infants, is whether a growth disorder is symmetrical (weight, length, and occipitofrontal circumference [OFC] all ≤ 10%) or asymmetrical (only weight ≤ 10%). Asymmetrical growth restriction implies a problem late in pregnancy, such as pregnancy-induced hypertension or placental insufficiency. Symmetrical growth restriction implies an event of early pregnancy: chromosomal abnormality, drug or alcohol use, or congenital viral infections. In general, the outlook for normal growth and development is better in asymmetrically growth-restricted infants whose intrauterine brain growth has been spared (Table 1–2).

The fact that SGA infants have fewer problems (such as respiratory distress syndrome) than AGA infants of the same birth weight but a lower gestational age has led to the misconception that SGA infants have accelerated maturation. SGA infants, when compared with AGA infants of the same gestational age, actually have increased morbidity and mortality rates.



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ISBN 978-0-07-164003-9
MHID 0-07-164003-7