

POLICY STATEMENT

Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of All Children

Committee on Fetus and Newborn

Age Terminology During the Perinatal Period

ABSTRACT. Consistent definitions to describe the length of gestation and age in neonates are needed to compare neurodevelopmental, medical, and growth outcomes. The purposes of this policy statement are to review conventional definitions of age during the perinatal period and to recommend use of standard terminology including gestational age, postmenstrual age, chronological age, corrected age, adjusted age, and estimated date of delivery. *Pediatrics* 2004;114:1362–1364; *gestational age, postmenstrual age, chronological age, menstrual age, conceptional age, postconceptional age, corrected age, adjusted age, estimated date of delivery, estimated date of confinement.*

INTRODUCTION

Consistent definitions to describe the length of gestation and age in neonates are needed to compare neurodevelopmental, medical, and growth outcomes. The terms “gestational age,” “postmenstrual age,” “corrected age,” and “postconceptional age” have frequently been defined unconventionally,^{1,2} misapplied,^{3–5} or left undefined.^{6,7} Inconsistent use of terminology limits the accurate interpretation of data on health outcomes for newborn infants, especially for those born preterm or conceived using assisted reproductive technology. The purposes of this statement are to review conventional definitions of age during the perinatal period and to recommend standard terminology.

“Gestational age” (or “menstrual age”) is the time elapsed between the first day of the last normal menstrual period and the day of delivery (Fig 1).^{8–10} The first day of the last menstrual period occurs approximately 2 weeks before ovulation and approximately 3 weeks before implantation of the blastocyst. Because most women know when their last period began but not when ovulation occurred, this definition traditionally has been used when estimating the expected date of delivery. As long as menstrual dates are remembered accurately, this method of estimating the date of delivery is reliable.¹¹ Minor inaccuracy (4–6 days) in the expected date of delivery determined from menstrual dates is attributable to inherent biological variability in the relative timing of onset of the last menstrual period, fertilization of the egg, and implantation of the blastocyst.¹² Additional inaccuracy (weeks) may occur in women

who have menstrual cycles that are irregular or variable in duration or if breakthrough bleeding occurs around the time of conception. Gestational age is conventionally expressed as completed weeks. Therefore, a 25-week, 5-day fetus is considered a 25-week fetus. To round the gestational age of such a fetus to 26 weeks is inconsistent with national and international norms.² The term “gestational age” should be used instead of “menstrual age” to describe the age of the fetus or newborn infant.

“Chronological age” (or “postnatal” age) is the time elapsed after birth (Fig 1). It is usually described in days, weeks, months, and/or years. This is different from the term “postmenstrual age.” Postmenstrual age is the time elapsed between the first day of the last menstrual period and birth (gestational age) plus the time elapsed after birth (chronological age). Postmenstrual age is usually described in number of weeks and is most frequently applied during the perinatal period beginning after the day of birth. Therefore, a preterm infant born at a gestational age of 33 weeks who is currently 10 weeks old (chronological age) would have a postmenstrual age of 43 weeks. When postmenstrual age is quantitated in weeks and days for postnatal management reasons, a 33-week, 1-day gestational age infant who is 10 weeks, 5 days chronological age would have a postmenstrual age of 43 weeks, 6 days.

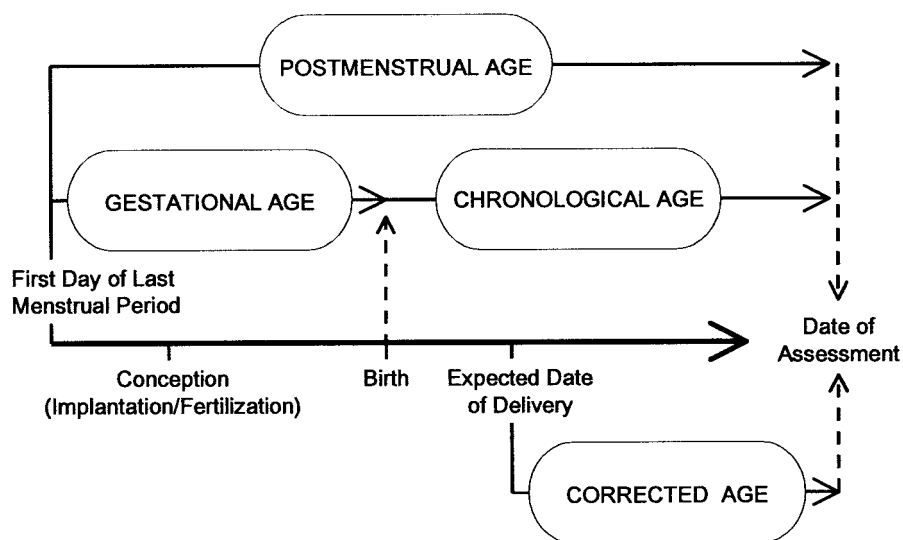
“Corrected age” (or “adjusted age”) is a term most appropriately used to describe children up to 3 years of age who were born preterm (Fig 1). This term is preferred to “corrected gestational age” or “gestational age” and represents the age of the child from the expected date of delivery.^{13,14} Corrected age is calculated by subtracting the number of weeks born before 40 weeks of gestation from the chronological age. Therefore, a 24-month-old, former 28-week gestational age infant has a corrected age of 21 months according to the following equation:

$$24 \text{ months} - [(40 \text{ weeks} - 28 \text{ weeks}) \\ \times 1 \text{ month}/4 \text{ weeks}]$$

Corrected age and chronological age are not synonymous in preterm infants. Additionally, the term “corrected age” should be used instead of “adjusted age.”

“Conceptional age” is the time elapsed between the day of conception and the day of delivery. (The term “conceptual age” is incorrect and should not be

Fig 1. Age terminology during the perinatal period.



used.) Because assisted reproductive technologies accurately define the date of fertilization or implantation, a precise conceptional age can be determined in pregnancies resulting from such technologies. Much of the variability inherent in other methods of gestational age determination,^{11–13} except for that attributed to timing of implantation, is eliminated when the date of conception is determined during assisted reproductive procedures. The convention for calculating gestational age when the date of conception is known is to add 2 weeks to the conceptional age.¹⁰ Therefore, gestational age is 2 weeks longer than conceptional age; they are not synonymous terms. When describing the age of a fetus or neonate, “gestational age” is the term conventionally applied. This is particularly important for interpreting outcome studies of preterm infants. As an example, a preterm infant conceived using assisted reproductive technology who has a conceptional age of 25 weeks has a gestational age of 27 weeks. Outcomes for this infant should be compared with those of 27-week gestational age infants, not 25-week gestational age infants. To avoid confusion, the term “gestational age” should be used. The terms “conceptional age” and “postconceptional age,” reflecting the time elapsed after conception, should not be used.

Gestational age is often determined by the “best obstetric estimate,” which is based on a combination of the first day of last menstrual period, physical examination of the mother, prenatal ultrasonography, and history of assisted reproduction. The best obstetric estimate is necessary because of gaps in obstetric information and the inherent variability (as

great as 2 weeks) in methods of gestational age estimation.^{8,10,14–19} Postnatal physical examination of the infant is sometimes used as a method to determine gestational age if the best obstetric estimate seems inaccurate. Therefore, methods of determining gestational age should be clearly stated so that the variability inherent in these estimations can be considered when outcomes are interpreted.^{8,10,14–19}

RECOMMENDATIONS

1. Standardized terminology should be used when defining ages and comparing outcomes of fetuses and newborns. The recommended terms (Table 1) are:
 - Gestational age (completed weeks): time elapsed between the first day of the last menstrual period and the day of delivery. If pregnancy was achieved using assisted reproductive technology, gestational age is calculated by adding 2 weeks to the conceptional age.
 - Chronological age (days, weeks, months, or years): time elapsed from birth.
 - Postmenstrual age (weeks): gestational age plus chronological age.
 - Corrected age (weeks or months): chronological age reduced by the number of weeks born before 40 weeks of gestation; the term should be used only for children up to 3 years of age who were born preterm.
2. During the perinatal period neonatal hospital stay, “postmenstrual age” is preferred to describe

TABLE 1. Age Terminology During the Perinatal Period

Term	Definition	Units of Time
Gestational age	Time elapsed between the first day of the last menstrual period and the day of delivery	Completed weeks
Chronological age	Time elapsed since birth	Days, weeks, months, years
Postmenstrual age	Gestational age + chronological age	Weeks
Corrected age	Chronological age reduced by the number of weeks born before 40 weeks of gestation	Weeks, months

the age of preterm infants. After the perinatal period, "corrected age" is the preferred term.

3. "Conceptional age," "postconceptional age," "conceptual age," and "postconceptual age" should not be used in clinical pediatrics.
4. Publications reporting fetal and neonatal outcomes should clearly describe methods used to determine gestational age.

COMMITTEE ON FETUS AND NEWBORN, 2003–2004
 Lillian R. Blackmon, MD, Chairperson
 Daniel G. Batton, MD
 Edward F. Bell, MD
 Susan E. Denson, MD
 *William A. Engle, MD
 William P. Kanto, Jr, MD
 Gilbert I. Martin, MD
 Ann Stark, MD

LIAISONS

Keith J. Barrington, MD
 Canadian Paediatric Society
 Tonse N. K. Raju, MD, DCH
 National Institutes of Health
 Laura E. Riley, MD
 American College of Obstetricians and Gynecologists
 Kay M. Tomashek, MD, MPH
 Centers for Disease Control and Prevention
 Carol Wallman, MSN, RNC, NNP
 National Association of Neonatal Nurses

STAFF

Jim Couto, MA

*Lead author

REFERENCES

1. Malloy MH, Hoffman HJ. Prematurity, sudden infant death syndrome, and age of death. *Pediatrics*. 1995;96:464–471
2. Bernstein IM, Horbar JD, Badger GJ, Ohlsson A, Golan A. Morbidity and mortality among very-low-birth-weight neonates with intrauterine growth restriction. The Vermont Oxford Network. *Am J Obstet Gynecol*. 2000;182:198–206
3. Ellenhorn MJ, ed. Toxicokinetics. In: *Ellenhorn's Medical Toxicology: Diagnosis and Treatment of Human Poisoning*. 2nd ed. Philadelphia, PA: Williams and Wilkins; 1997:128–148
4. DeVivo DC, Koenigsberger MR. Intracranial hemorrhage. In: Rudolph AM, ed. *Rudolph's Pediatrics*. 20th ed. Stamford, CT: Appleton & Lange; 1996:1877
5. Moriette G, Paris-Llado S, Walti H, et al. Prospective randomized multicenter comparison of high-frequency oscillatory ventilation and conventional ventilation in preterm infants of less than 30 weeks with respiratory distress syndrome. *Pediatrics*. 2001;107:363–372
6. Ramanathan R, Corwin MJ, Hunt CE, et al. Cardiorespiratory events recorded on home monitors: comparison of healthy infants with those at increased risk for SIDS. *JAMA*. 2001;285:2199–2207
7. Pierrat V, Duquennoy C, van Haastert IC, Ernst M, Guille N, deVries LS. Ultrasound diagnosis and neurodevelopmental outcome of localized and extensive cystic periventricular leucomalacia. *Arch Dis Child Fetal Neonatal Ed*. 2001;84:F151–F156
8. American Academy of Pediatrics, American College of Obstetricians and Gynecologists. *Guidelines for Perinatal Care*. 5th ed. Washington, DC: American College of Obstetricians and Gynecologists; 2002:378–379
9. Cunningham FG, Gant NF, Gilstrap LC III, Hauth JC, Wenstrom KD, Leveno KJ, eds. *Williams Obstetrics*. 21st ed. New York, NY: McGraw-Hill; 2001:129–165
10. Craven C, Ward K. Embryology, fetus and placenta: normal and abnormal. In: Scott JR, DiSaia PJ, Hammond CB, Spellacy WN, eds. *Danforth's Obstetrics and Gynecology*. 8th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 1999:29–46
11. Rossavik IK, Fishburne JL. Conceptional age, menstrual age, and ultrasound age: a second-trimester comparison of pregnancies dated of known conception date with pregnancies dated from last menstrual period. *Obstet Gynecol*. 1989;73:243–249
12. Shepherd TH. Developmental pathology of the embryonic and previable fetal periods. In: Avery GB, Fletcher MA, MacDonald MG, eds. *Neonatology: Pathophysiology and Management of the Newborn*. 4th ed. Philadelphia, PA: JB Lippincott Co; 1994:109–125
13. Bennett FC. Developmental outcome. In: Avery GB, Fletcher MA, MacDonald MG, eds. *Neonatology: Pathophysiology and Management of the Newborn*. 4th ed. Philadelphia, PA: JB Lippincott Co; 1994:1367–1386
14. DiPietro JA, Allen MC. Estimation of gestational age: implications for developmental research. *Child Dev*. 1991;62:1184–1199
15. Sohaey R, Branch DW. Ultrasound in obstetrics. In: Scott JR, DiSaia PJ, Hammond CB, Spellacy WN, eds. *Danforth's Obstetrics and Gynecology*. 8th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 1999:213–242
16. American Academy of Pediatrics, American College of Obstetrics and Gynecology. *Guidelines for Perinatal Care*. 5th ed. Washington, DC: American College of Obstetrics and Gynecology; 2002:199–202
17. Goldenberg RL, Davis RO, Cutter GR, Hoffman HJ, Brumfield CG, Foster JM. Prematurity, postdates, and growth retardation: the influence of use of ultrasonography on reported gestational age. *Am J Obstet Gynecol*. 1989;160:462–470
18. Berg AT. Menstrual cycle length and calculation of gestational age. *Am J Epidemiol*. 1991;133:585–589
19. Mustafa G, David RJ. Comparative accuracy of clinical estimate versus menstrual gestational age in computerized birth certificates. *Public Health Rep*. 2001;116:15–21

All policy statements from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.

Age Terminology During the Perinatal Period

Pediatrics 2004;114;1362

DOI: 10.1542/peds.2004-1915

Updated Information & Services

including high resolution figures, can be found at:
<http://pediatrics.aappublications.org/content/114/5/1362>

References

This article cites 10 articles, 3 of which you can access for free at:
<http://pediatrics.aappublications.org/content/114/5/1362#BIBL>

Subspecialty Collections

This article, along with others on similar topics, appears in the following collection(s):

Current Policy

http://www.aappublications.org/cgi/collection/current_policy

Committee on Fetus & Newborn

http://www.aappublications.org/cgi/collection/committee_on_fetus_newborn

Fetus/Newborn Infant

http://www.aappublications.org/cgi/collection/fetus:newborn_infant_sub

Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:

<http://www.aappublications.org/site/misc/Permissions.xhtml>

Reprints

Information about ordering reprints can be found online:

<http://www.aappublications.org/site/misc/reprints.xhtml>

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Age Terminology During the Perinatal Period

Pediatrics 2004;114;1362

DOI: 10.1542/peds.2004-1915

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/114/5/1362>

Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2004 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 1073-0397.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

