

ATI Chapter 3: Health Promotion of Infants (2 Days to 1 Year)

GENERAL MEASUREMENTS OF FULL-TERM NEWBORNS

Head circumference:

- The head circumference averages between 33 and 35 cm (13-14 in)

Crown to rump length:

- The crown to rump length is 31 to 35 cm (12.5 to 14 in)

Length:

- Head to heel length averages 48 to 53 cm (19 to 21 in)

Weight:

- Newborn weight averages 2,700 to 4,000 (6 to 9 lbs)

Newborns will lose up to 10% of their body weight by 3-4 days of age. This is due to fluid shifts, loss of meconium, and limited intake, especially in infants who are breastfed. The birth weight is usually regained by the tenth to fourteenth day of life, depending on the feeding method used.

PHYSICAL DEVELOPMENT

Fontanel:

- Posterior fontanel closes by 2 to 3 months of age
- Anterior fontanel closes by 12 to 18 months of age

Infant size is tracked using weight, height, and head circumference measurements

- **Weight:** Infants gain approximately 680 g (1.5 lbs) per month during the first 5 months of life. The average weight of a 6 month old infants is 7.26 kg (16 lbs). Birth weight is at least doubled by the age of 5 months, and tripled by the age of 12 months to an average of 9.75 kg (21.5 lbs).
- **Height:** Infants grow approximately 2.5 cm (1 in) per month the first 6 months of life. Growth occurs in spurts after the age of 6 months, and the birth length increases by 50% by the age of 12 months.
- **Head circumference:** The circumference of infants' heads increases approximately 2 cm (0.75 in) per month during the first 3 months, 1 cm (0.4 in) per month from 4 to 6 months, and then approximately 0.5 cm (0.2 in) per month during the second 6 months.

Dentition:

- Six to eight teeth should erupt in infants' mouths by the end of the first year of age. The first teeth typically erupt between the ages of 6 and 10 months (average age is 8 months).
- Some children show minimal indications of teething (sucking or biting on their fingers or hard objects and drooling). Others are irritable, have difficulty sleeping, have a mild fever, rub their ears, and have decreased appetite for solid foods.
- Teething pain can be frozen teething rings or an ice cube wrapped in a wash cloth and over-the-counter teething gels. With topical anesthetic ointments, absorption rates vary in infants; therefore, parents should be advised to apply them correctly. Acetaminophen and/or ibuprofen are appropriate if irritability interferes with sleeping and feeding, but should not be used for more than 3 days. Ibuprofen should be used only in infants over the age of 6 months.
- Clean infants' teeth using cool, wet washcloths.
- Bottles should not be given to infants when they are falling asleep because prolonged exposure to milk or juice can cause early childhood dental caries.

COGNITIVE DEVELOPMENT

Piaget: sensorimotor stage (birth to 24 months)

- Infants progress from reflexive to simple repetitive to imitative activities
- Separation, object permanence, and mental representation are the three important tasks accomplished in this stage
 - **Separation:** Infants learn to separate themselves from other objects in the environment
 - **Object permanence:** The process by which infants learn that an object still exists when it is out of view. This occurs at approximately 9 to 10 months of age.
 - **Mental representation:** The ability to recognize and use symbols

Language Development:

- Crying is the first form of verbal communication
- Infants cry for 1 to 1.5 hours each day up to 3 weeks of age and build up to 2 to 4 hours by 6 weeks
 - Crying decreases by 12 weeks of age
 - Vocalizes with cooing noises by 3 to 4 months
- Shows considerable interest in the environment by 3 months
 - Turns head to the sound of a rattle by 3 months
 - Laughs and squeals by 4 months
 - Makes single vowel sounds by 2 months
 - By 3 to 4 months, the consonants are added
- Begins speaking two-word phrases and progresses to speaking three word phrases
 - Says three to five words by the age of 1 year
- Comprehends the word "no" by 9 to 10 months and obeys single commands accompanied by gestures

COGNITIVE DEVELOPMENT

Erikson: Trust vs mistrust (birth to 1 year)

- Achieving this task is based on the quality of the caregiver-infant relationship and the care received by the infant
- The infant begins to learn delayed gratification. Failure to learn delayed gratification leads to mistrust
- Trust is developed by meeting comfort, feeding stimulation, and caring needs
- Mistrust develops if needs are inadequately or inconsistently met, or if needs are continuously before being vocalized by the infant

Social Development:

- Social development is initially influenced by infants' reflexive behaviors and includes attachment, separation, recognition/anxiety, and stranger fear
- Attachment is seen when infants begin to bond with their parents. This development is seen within the first month, but it actually begins before birth. The process is enhanced when infants and parents are in good health, have positive feeding experiences, and receive adequate rest
- Separation-individuation occurs during the first year of life as infants first distinguish themselves and their primary caregiver as separate individuals at the same time that object permanence is developing
- Separation anxiety begins around 4 to 8 months of age. Infants will protest when separated from parents, which can cause considerable anxiety for parents. By 11 to 12 months, infants are able to anticipate the mother's imminent departure by watching the behaviors
- Stranger fear becomes evident between 6 and 8 months of age, when infants have the ability to discriminate between familiar and unfamiliar people.
- Reactive attachment disorder results from maladaptive or absent attachment between the infant and primary caregiver and continues through childhood and adulthood

Body-Image Changes:

- Infants discover that mouths are pleasure producers
- Hands and feet are seen as objects of play
- Infants discover that smiling causes others to react

AGE-APPROPRIATE ACTIVITIES

- Play should provide interpersonal contact and educational stimulation
- Infants have short attention spans and will not interact with other children during play (solitary play). Appropriate toys and activities that stimulate the senses and encourage development include the following:
 - Rattles
 - Soft stuffed toys
 - Teething toys
 - Nesting toys
 - Playing pat-a-cake
 - Playing with balls
 - Reading books
 - Mirrors
 - Brightly colored toys
 - Playing with blocks

MOTOR SKILL DEVELOPMENT BY AGE

	GROSS MOTOR SKILLS	FINE MOTOR SKILLS
1 MONTH	<ul style="list-style-type: none"> Demonstrates head lag 	<ul style="list-style-type: none"> Has a strong grasp reflex
2 MONTHS	<ul style="list-style-type: none"> Lifts head off mattress when prone 	<ul style="list-style-type: none"> Holds hands in an open position Grasp reflex fading
3 MONTHS	<ul style="list-style-type: none"> Raises head and shoulders off mattress when prone Only slight head lag 	<ul style="list-style-type: none"> No longer has a grasp reflex Keeps hands loosely open
4 MONTHS	<ul style="list-style-type: none"> Rolls from back to side 	<ul style="list-style-type: none"> Grasps object with both hands
5 MONTHS	<ul style="list-style-type: none"> Rolls from front to back 	<ul style="list-style-type: none"> Uses palmar grasp dominantly
6 MONTHS	<ul style="list-style-type: none"> Rolls from back to front 	<ul style="list-style-type: none"> Holds bottle
7 MONTHS	<ul style="list-style-type: none"> Bears full weight on feet Sits, leaning forward on both hands 	<ul style="list-style-type: none"> Moves objects from hand to hand
8 MONTHS	<ul style="list-style-type: none"> Sits unsupported 	<ul style="list-style-type: none"> Begins using pincer grasp
9 MONTHS	<ul style="list-style-type: none"> Pulls to a standing position Creeps on hands and knees 	<ul style="list-style-type: none"> Has a crude pincer grasp Dominant hand preference evident
10 MONTHS	<ul style="list-style-type: none"> Changes from a prone to a sitting position 	<ul style="list-style-type: none"> Grasps rattle by its handle
11 MONTHS	<ul style="list-style-type: none"> Cruises or walks while holding onto something 	<ul style="list-style-type: none"> Places objects into a container Neat pincer grasp
12 MONTHS	<ul style="list-style-type: none"> Sits down from a standing position without assistance Walks with one hand held 	<ul style="list-style-type: none"> Tries to build a two-block tower without success Can turn pages in a book

HEALTH PROMOTION

CARE OF NEWBORN AFTER DISCHARGE

- Newborn infants should be placed in a federally approved car seat at a 45 degree angle to prevent slumping and airway obstruction. The car seat is placed rear facing in the rear seat of the vehicle and secured using the safety belt. The shoulder harnesses are placed in the slots at or below the level of the infant's shoulders. The harness should be snug and the retainer clip placed at the level of the infant's armpits.
- Instruct parents that their newborn will require a checkup by a provider within 7 hrs of discharge. This is especially important for breastfed newborns to evaluate weight and hydration status.

IMMUNIZATIONS

The Centers for Disease Control and Prevention (CDC) immunization recommendations for healthy infants less than 12 months of age include:

- Birth:** hepatitis B (hep B)
- 2 months:** diphtheria and tetanus toxoids and pertussis (DTaP), rotavirus vaccine (RV), inactivated poliovirus (IPV), Haemophilus influenzae type B (Hib), pneumococcal vaccine (PCV), and Hep B
- 4 months:** DTaP, RV, IPV, Hib, PCV
- 6 months:** DTaP, IPV (6 to 18 months), PCV, and Hep B (6 to 18 months), RV, Hib
- 6 to 12 months:** seasonal influenza vaccination yearly (the trivalent inactivated influenza vaccine is available as an intramuscular injection)

SLEEP AND REST

- Nocturnal sleep pattern is established by 3 to 4 months of age
- Infants sleep 14 to 15 hours daily and 9 to 11 hours at night around the age of 4 months
- Infants sleep through the night and take one to two naps during the day by the age of 12 months

NUTRITION

- Feeding alternatives**
 - Breastfeeding provides a complete diet for infants during the first 6 months
 - Iron-fortified formula is an acceptable alternative to breast milk. Cow's milk is not recommended
 - It is not recommended to begin vitamin D supplements within the first few days of life to prevent rickets and vitamin D deficiency
 - Iron supplements are recommended for infants who are being exclusively breastfed after the age of 4 months
 - Alternative sources of fluids (juice and water) are not needed during the first 4 months of life. Excessive intake of water could result in hyponatremia and water intoxication
 - After the age of 6 months, 100% fruit juice should be limited to 4 to 6 oz per day
- Solids are introduced around 6 months of age**
 - Indicators for readiness include interest in solid foods, voluntary control of the head and trunk, and disappearance of the extrusion reflex.
 - Iron-fortified cereal is typically introduced first due to its high iron content
 - New foods should be introduced one at a time, over a 5- to 7-day period, to observe for manifestations of allergy or intolerance, which might include fussiness, rash, vomiting, diarrhea, and constipation
 - Vegetables or fruits are started first between 6 and 8 months of age. After both have been introduced, meats may be added
 - Citrus fruits, meat, and eggs are not started until after 6 months of age
 - Breast milk/formula should be decreased as intake of solid foods increased, but should remain the primary source of nutrition through the first year
 - Table foods that are well-cooked, chopped, and unseasoned are appropriate by 1 year of age
 - Appropriate finger foods include ripe bananas, toast strips, graham crackers, cheese cubes, noodles, firmly-cooked vegetables, and raw pieces of fruit (except grapes)
- Weaning can be accomplished when infants show signs of readiness and are able to drink from a cup (sometime in the second 6 months)**
 - Gradually replace one bottle or breastfeeding at a time with breast milk or formula in a cup with handles
 - Bedtime feedings are the last to be stopped

INJURY PREVENTION

Aspiration of foreign objects

- Hold the infant for feedings; do not prop bottles
- Small objects that can become lodged in the throat (grapes, coins, candy) should be avoided
- Age-appropriate toys should be provided
- Clothing should be checked for safety hazards (loose buttons)

Bodily harm

- Sharp objects should be kept out of reach
- Anchor heavy objects and furniture so they cannot be overturned on top of the infant
- Infants should not be left unattended with any animals present

Burns

- Avoid warming formula in a microwave; check temperature of liquid before feeding
- The temperature of bath water should be checked
- Hot water thermostats should be set at or below 49 degree Celsius (120 degrees Fahrenheit)
- Working smoke detectors should be kept in the home
- Handles of pots and pans should be kept turned to the back of stoves
- Sunscreen should be used when infants are exposed to the sun
- Electrical outlets should be covered

Suffocation

- Plastic bags should be avoided
- Balloons should be kept away from infants
- Crib mattresses should fit snugly
- Crib slats should be no farther apart than 6 cm (2.375 in)
- Crib mobiles and/or crib gyms should be removed by 4 to 5 months of age
- Pillows should be kept out of the crib
- Infants should be placed on their backs for sleep
- Toys with small parts should be kept out of reach
- Drawstrings should be removed from jackets and other clothing

Drowning

- Infants should not be left unattended in bathtubs or around water sources (toilets, cleaning buckets, or drainage areas)
- Secure fencing around swimming pools
- Close bathroom doors

Falls

- Crib mattresses should be kept in the lowest position possible with the rails all the way up
- Restraints should be used in infant seats
- Infant seats should be placed on the ground or floor if used outside of the car, and they should not be left unattended or on elevated surfaces
- Place safety gates at the top and bottom of stairs

Poisoning

- Exposure to lead paint should be avoided
- Toxins and plants should be kept out of reach
- Safety locks should be kept on cabinets that contain cleaners and other household chemicals
- The phone number for poison control center should be kept near the phone
- Medications should be kept in childproof containers, away from the reach of infants
- A working carbon monoxide detector should be kept in the home

Motor-vehicle injuries

- Infant-only and convertible infant-toddler car seats are available
- Infants and toddlers remain in a rear-facing car seat until the age of 2 years or the height recommended by the manufacturer
- The safest area for infants and children is the backseat of the car
- Do not place rear-facing car seats in the front seat of vehicles with passenger airbags
- Infants should not be left in parked cars

PRACTICE QUESTIONS

- 1. A nurse is assessing a 12-month-old infant during a well-child visit. Which of the following findings should the nurse report to the provider?**
 - A. Closed anterior fontanel
 - B. Eruption of six teeth
 - C. Birth weight doubled
 - D. Birth length increased by 50%
- 2. A nurse is performing a developmental screening on a 10-month-old infant. Which of the following fine motor skills should the nurse expect the infant to perform? (Select all that apply.)**
 - A. Grasp a rattle by the handle
 - B. Try building a two-block tower
 - C. Use a crude pincer grasp
 - D. Place objects into a container
 - E. Walks with one hand held
- 3. A nurse is conducting a well-baby visit with a 4-month-old infant. Which of the following immunizations should the nurse plan to administer to the infant? (Select all that apply.)**
 - A. Measles, mumps, rubella (MMR)
 - B. Polio (IPV)
 - C. Pneumococcal vaccine (PCV)
 - D. Varicella
 - E. Rotavirus vaccine (RV)
- 4. A nurse is providing education about introducing new foods to the guardians of a 4-month-old infant. The nurse should recommend that the caregiver introduce which of the following foods first?**
 - A. Strained yellow vegetables
 - B. Iron-fortified cereals
 - C. Puréed fruits
 - D. Whole milk
- 5. A nurse is providing teaching about dental care and teething to the caregiver of a 9-month-old infant. Which of the following statements by the caregiver indicates an understanding of the teaching?**
 - A. "I can give my baby a warm teething ring to relieve discomfort."
 - B. "I should clean my baby's teeth with a cool, wet wash cloth."
 - C. "I can give Advil for up to 5 days while my baby is teething."
 - D. "I should place diluted juice in the bottle my baby drinks while falling asleep."

ANSWERS:

1. C
2. A, C
3. B, C, E
4. B
5. B