

DEVELOPMENTAL MILESTONES IN CHILDREN

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Chapter outline

- ▣ Gross Motor Milestones
- ▣ Fine Motor Milestone
- ▣ Language Milestone
- ▣ Social Milestone
- ▣ Emotional Milestone
- ▣ Developmental Red Flags
- ▣ Tests to Assess Developmental Milestones

- Developmental milestones are set of functional skill or age-specific task that most children can do at a certain age range.

“Infants (and children) are very orderly in their ways; they actually behave (and develop) according to laws that can be explored, discovered, confirmed, reconfirmed, and celebrated.”

—Lipsitt LP

Infancy and childhood are dynamic periods of growth and development.

The skills progress from cephalic to caudal; from proximal to distal; and from generalized, stimulus-based reflexes to specific, goal-oriented reactions that become increasingly precise.

These neurodevelopment “laws” or sequences are described in terms of the **traditional developmental milestones**.

The different types of developmental milestones include gross motor, fine motor, problem-solving, receptive language, expressive language, and social-emotional milestones.

These milestones provide a framework for observing and monitoring a child over time.

- Although neurodevelopment follows a predictable course, yet each child's developmental path is unique due to the variations produced by both the intrinsic and extrinsic forces.
- Intrinsic influences include genetically determined attributes (e.g. physical characteristics, temperament) as well as the child's overall state of wellness.
- Extrinsic influences during infancy and childhood originate primarily from the family.

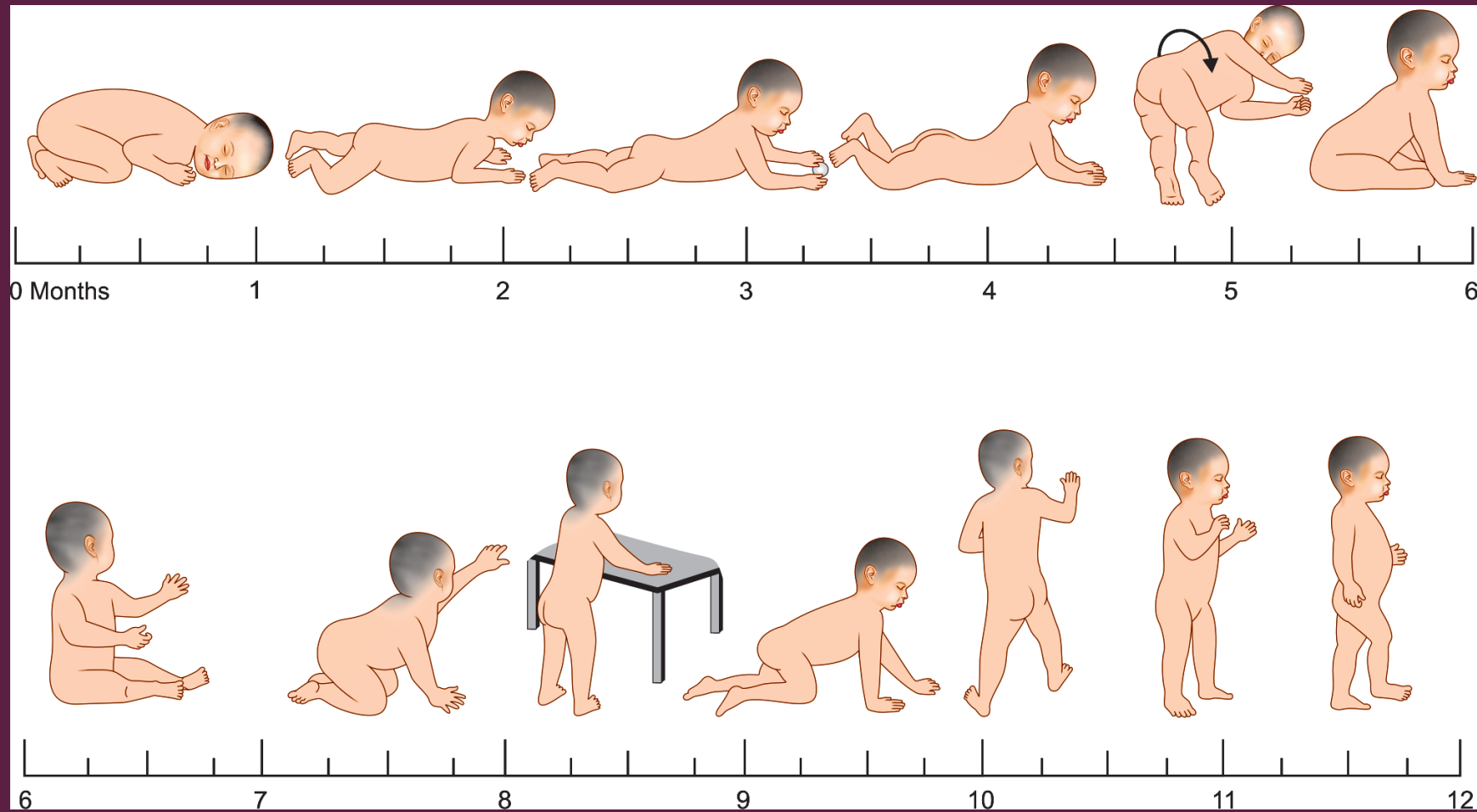
GROSS MOTOR MILESTONES

- ▣ The ultimate goal of gross motor development is to gain independent and volitional movement.
- ▣ During gestation, primitive reflexes develop and persist for several months after birth to prepare the infant for the acquisition of specific skills.
- ▣ As the central nervous system matures, these reflexes are inhibited which in turn enables the infant to make purposeful movements.

Key development milestones: Gross motor

<i>Age</i>	<i>Milestone</i>
3 months	Neck holding
5 months	Sitting with support
8 months	Sitting without support
9 months	Standing with support
10 months	Walking with support
11 months	Crawling (Creeping)
12 months	Standing without support
13 months	Walking without support
18 months	Running
2 years	Walking upstairs
3 years	Riding tricycle

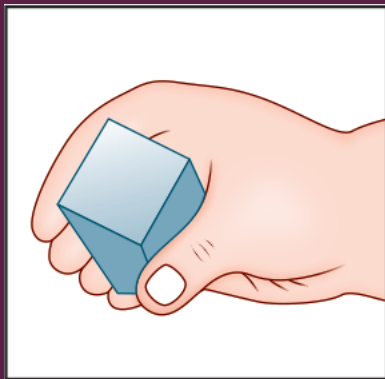
Chronologic progression of gross motor development



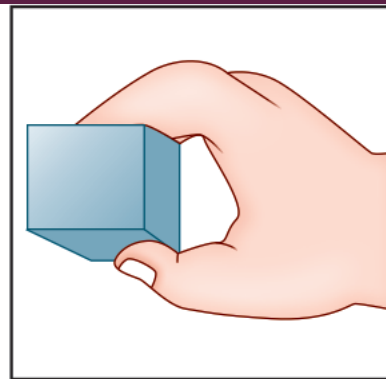
FINE MOTOR MILESTONES

- ▣ Fine motor skills are concerned with the use of the upper extremities to engage and manipulate the environment.
- ▣ These skills are necessary to perform self-help tasks, to play, and to accomplish work.

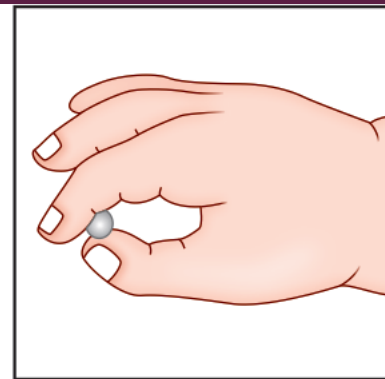
Age	Milestones
4 months	Grasps a rattle or rings when placed in hand
5 months	Reached out to an object and holds it with both hands (international reaching with bidextrous grasp)
7 months	Holding objects with crude grasp from palm (palmar grasp)
9 months	Holding small object, like a pellet, between index finger and thumb (pincer grasp)



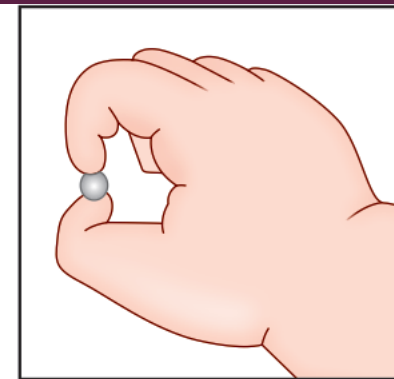
7 months



9 months



10 months



12 months

- ▣ By 10 months of age, infants can release a cube into a container or drop things onto the floor.
- ▣ By 15 months of age, voluntary release has developed further to enable stacking of three to four blocks and releasing small objects into containers
- ▣ By 36 months of age, they can draw a circle, put on shoes, and stack 10 blocks. They make snips with scissors by alternating between full-finger extension and flexion.
- ▣ By the age of 5 years, child can dress and undress independently and brush the teeth well.

LANGUAGE MILESTONES

- ▣ Infants communicate long before they speak their first words or phrases.
- ▣ At birth, crying is the primary form of communication.
- ▣ It is nonspecific but very effective in initiating a response from a caregiver.
- ▣ In a trial-and-error process, the infant begins making vowel and consonant sounds that she can put together into “mama” and “dada” by 9 months of age.

Key development milestones: Language

Age	Milestones
1 month	Turns head to sound
3 month	Cooing
6 month	Monosyllables ('ma', 'ba')
9 month	Bisyllables ('mama', 'baba')
12 month	Two words with meaning
18 month	Ten words with meaning
2 year	Simple sentence
3 year	Telling a story

SOCIAL MILESTONES

- ▣ Children are born with an inherent drive to connect with others and share feelings, thoughts, and actions.
- ▣ Earliest social milestone – bonding with caregiver ; Discriminates mothers voice after 1 month.
- ▣ SMILE – First measurable social milestone
 - by 2 months

- ▣ 3 months – visual skills develops.
Recognize his mother.
- ▣ 6 months – Ability to distinguish between familiar and unfamiliar people.
- ▣ 9 months – waves ‘bye -bye’.
- ▣ 12 months – plays with simple ball.
- ▣ 2 years – plays with others of his own age .
- ▣ 4 year - Masters the difference between real and imaginary.

They become interested in tricking others and concerned about being tricked.

EMOTIONAL MILESTONES

- ▣ Coinciding with the development of social skills.
- ▣ Emotional development involves three specific elements:
 1. Neural processes to relay information about the environment to the brain,
 2. Mental processes that generate feelings
 3. motor actions that include facial expressions, speech, and purposeful movements
- ▣ Three distinct emotions are present from birth: Anger, Joy, and Fear.
- ▣ All infants demonstrate universal facial expressions that reveal these emotions, although they do not use these expressions discriminately before the age of 3 months.

- ▣ At 15 months, a child demonstrates empathy by looking sad when she sees someone else cry.
- ▣ She also develops self-conscious emotions (embarrassment, shame, pride).
- ▣ By age 2 years, he starts to mask emotions for social etiquette.

DEVELOPMENTAL RED FLAGS

- ▣ The interaction of the child with the caregiver or examiner often is measured against what is expected. In case, this development is lacking in any aspect this is identified as developmental red flag.
- ▣ Motor red flags

Age	Red flag
4 month	Lack of steady head control while sitting
9months	Inability to sit
18 months	Inability to walk independently

▣ Cognitive red flags

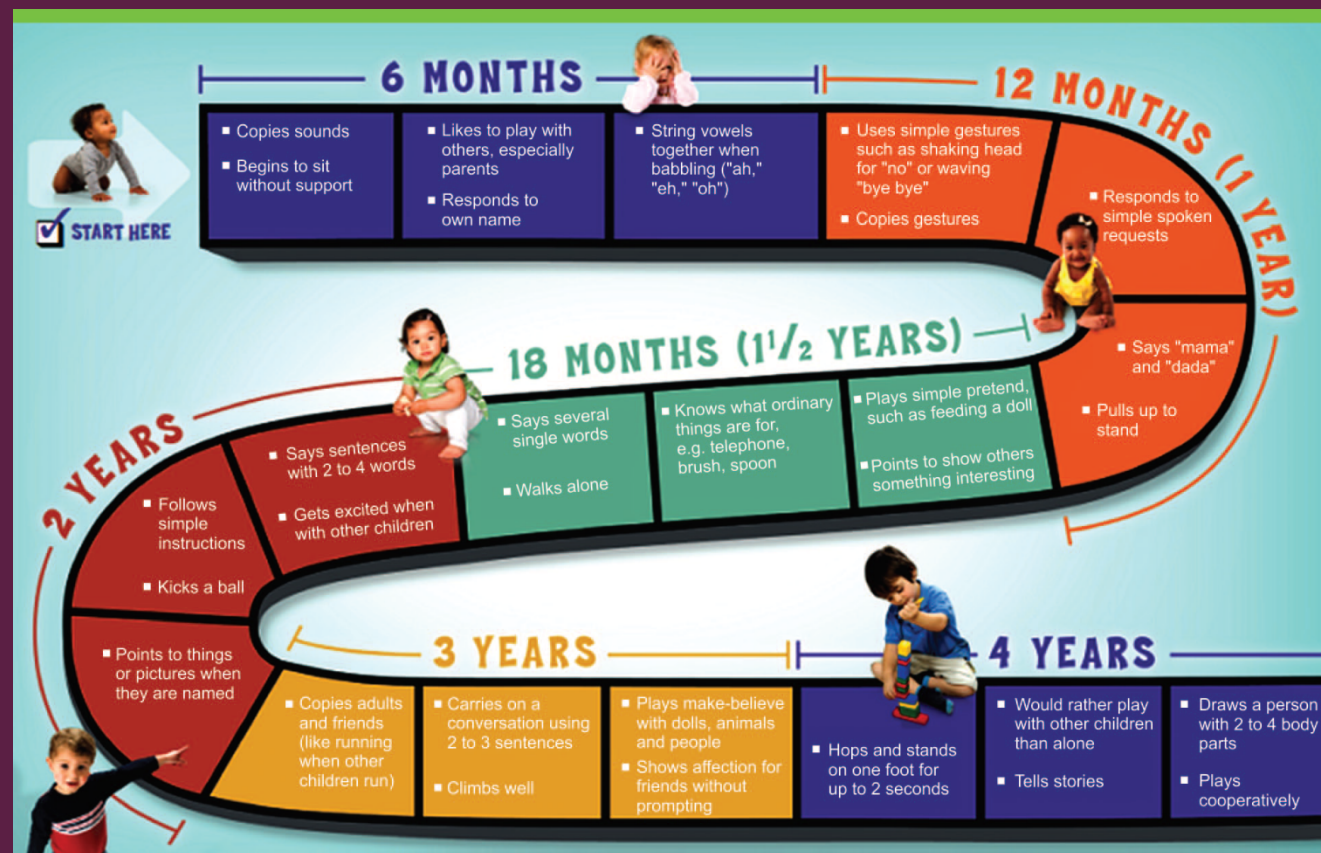
Age	Red flags
2 months	Lack of fixation
4 months	Lack of visual tracking
6 months	Failure to turn to sound or voice
9 months	Lack of babbling consonant sounds
24 years	Failure to use single words
36 months	Failure to speak in three-word sentences

Social and emotional red flags

Age	Red Flags
6 months	Lack of smiles or other joyful expressions
9 months	Lack of reciprocal (back-and-forth sharing of) vocalizations, smiles, or other facial expressions
12 months	Failure to respond to name when called Absence of babbling Lack of reciprocal gestures (showing, reaching, waving)
15 months	Lack of protodeclarative pointing or other showing gestures Lack of single words
18 months	Lack of simple pretend play Lack of spoken language/gesture combinations
24 months	Lack of two-word meaningful phrases (without imitating or repeating) Any age loss of previously acquired babbling, speech, or social skills

TESTS TO ASSESS DEVELOPMENTAL MILESTONES

Developmental milestones in children can be assessed by various activities which are performed by children in the respective ages.



Neonatal reflexes

- ▣ A reflex is a response to a stimulus and that occurs without conscious thought.
- ▣ Neonatal reflexes or primitive reflexes are the inborn behavioral patterns that develop during uterine life.
- ▣ They should be fully present at birth and are gradually inhibited by higher centers in the brain during the first three to 12 months of postnatal life.
- ▣ These reflexes are essential for a newborn's survival immediately after birth,

Rooting reflex

- ▣ Gently stroke the infant from the lips to the cheek and the normal response of the infant is to turn his head toward the stimulated side with the mouth opening
- ▣ Appears at birth
- ▣ Inhibited between 6 and 12 months of age



Moro reflex

- ❑ This is stimulated by a sudden movement or loud noise. The neonate will respond by throwing out the arms and legs and then pulling them towards the body
- ❑ Emerges in 8–9 weeks in utero.
- ❑ Inhibited by 16 weeks of age.

- ❑ Other Name : Startle Reflex
Embrace Reflex



Sucking reflex

- ▣ When a finger or nipple is placed in the infant's mouth, it responds by rhythmical sucking.
- ▣ Onset is 28 weeks gestation



Palmer reflex

- ▣ Stimulated when an object is placed into the baby's palm. Neonate responds by grasping the object.
- ▣ This reflex emerges 11 weeks in utero.
- ▣ Inhibited 2-3 months after birth



Babinski reflex

- ▣ Stimulated by stroking the sole of the foot, which results in toes of the foot should fan out and the foot itself should curl in.
- ▣ Emerges at 18 weeks in utero .
- ▣ Disappears by 6 months after birth.



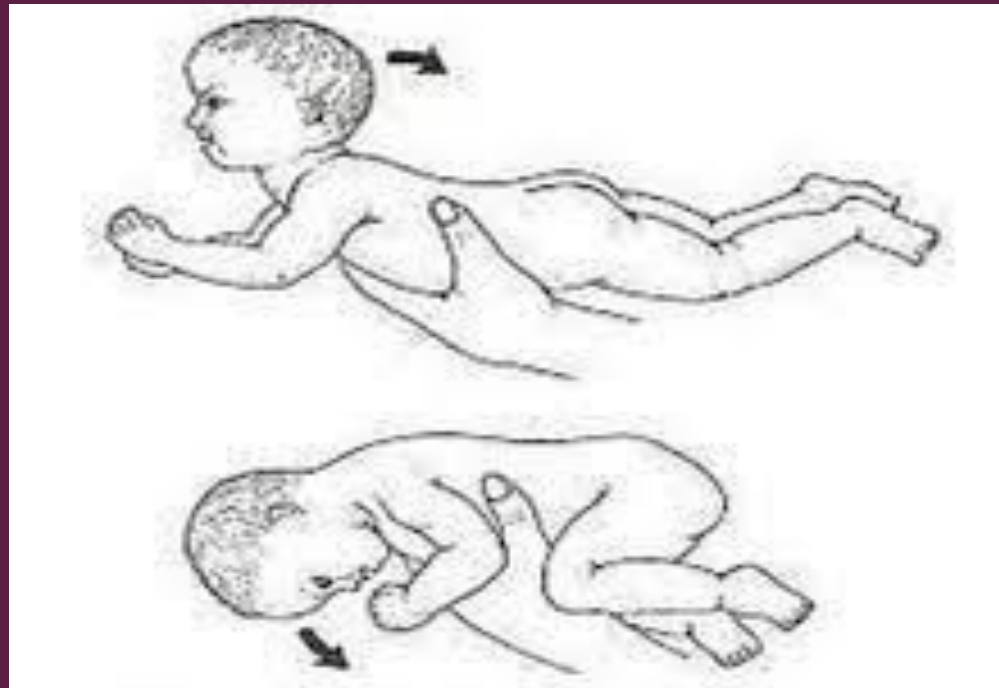
Asymmetric tonic neck reflex

- ▣ As the head is turned, the arm and leg on the same side will extend, while the opposite limbs bend.
- ▣ This reflex is present at 18 weeks in utero.
- ▣ Disappears by 6 months after birth.



Tonic labyrinthine reflex

- ▣ Arms and legs extend when head moves backward (away from spine), and will curl in when the head moves forward
- ▣ Emerges in utero until four months postnatally



Galant reflex

- ▣ When the neonates back is stimulated, their trunk and hips should move toward the side of the stimulus.
- ▣ This reflex emerges 20 weeks in utero.
- ▣ Inhibited by 9 months.



Landau's reflex

- ▣ When neonate is placed on stomach, their back arches and head raises.
- ▣ Emerges at 3 months postnatally.
- ▣ lasts until the child is 12 months old.

