

Indian Academy of Pediatrics (IAP)



## GUIDELINES FOR PARENTS

# Normal Development and When to Suspect Abnormal Development?



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### 10 FAQs on NORMAL DEVELOPMENT AND WHEN TO SUSPECT ABNORMAL DEVELOPMENT?

1. My little baby will one day become a grown-up person. What are the stages she will pass through and how will she acquire all the abilities?
2. When and how do all these changes occur?
3. I want to raise a bright and smart child. What are the factors that can influence a child's development?
4. What are the common achievements (milestones) in development that parents should note in their children?
5. What all will my baby learn to do in the first 3 years of life?
6. When should I suspect delay in my child's development?
7. What all may go wrong and what are the problems that may come up?
8. What is my role as a parent to support my child's development?
9. Can I stimulate/augment my child's development?
10. When and where can I get my child's development assessed? Where do we go if we suspect a developmental delay in our child?

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# Normal Development and When to Suspect Abnormal Development?

Development is the process by which children attain multiple skills necessary for optimal functioning. Development occurs simultaneously in various domains (**Box. 1**).

- *Gross motor* skills relate to movement and posture (sitting, standing, walking, etc.).
- *Fine motor* skills involve precision work and eye-hand coordination, using small muscles of the hands and eye movement.
- *Social skills* include interaction with others, interpersonal relationships, feeling and understanding, empathy, and control of emotions.
- *Communication skills* include to-and-fro interaction with others, verbally or nonverbally (gestures).
- *Cognitive* or intellectual skills relate to learning and understanding (concepts of numbers, colors, letters, and problem-solving).

**Box 1:** Domains of development.

#### **Multidimensional Development of a Child**

- *Gross motor:* Movements and posture
- *Fine motor:* Finer movements and skills
- *Cognitive:* Intelligence and understanding
- *Personal-social:* Interaction with environment and relations
- *Communication:* Verbal and nonverbal

Q1

**My little baby will one day become a grown-up person. What are the stages she will pass through and how will she acquire all the abilities?**

Yes, your baby will pass through various stages of life:

- Up to 1 year of age, as an *infant*, she will learn to manipulate her own body and react to her immediate environment.
- As a *toddler* (1–3 years), she learns to move around and explore the surroundings.
- In *preschool age*, her cognitive and communication skills will flourish.
- *School-going period* (5 years onward): The child develops academic and social skills (**Fig. 1**).
- *Adolescence* (10–19 years): Lots of physical and emotional changes will occur and your little girl finally emerges as a mature young adult.



**Fig. 1:** Few stages of development.

## Q2

### When and how do all these changes occur?

Development starts in the mother's womb and continues throughout life. Maximum brain development occurs from conception to 2 years of age, i.e., the first 1,000 days of life. Huge number of skills are learnt and the most rapid changes in skill acquisition are observed in the first 3 years of life. This is referred to as early childhood development.

Development in each domain occurs in a specific sequence and at specific ages running parallel to the maturational changes occurring in the brain. Complex skills are laid down on a foundation of simpler ones that have been acquired earlier.

Brain development is dependent not only on the child's genetic constitution but also on his/her health status, nutrition and most importantly, his environmental stimulation. Learning any skill is based on experiences and the environment. Consistent and predictable response to the child's cues helps him to learn a particular behavior. Good environmental stimulation will promote brain development and better acquisition of skills.

In this way, a completely dependent baby who merely produced sounds, gradually transitions into an ambulatory child who can express thoughts and look after himself.

## Q3

### I want to raise a bright and smart child. What are the factors that influence a child's development?

Brain development is influenced by numerous factors. Every child is born with a genetic disposition which determines the potential for development. It is like a blueprint for a house, on which the ultimate development occurs depending on the impact of various modifying factors. These factors may be biological or social; some are risk factors, others are promoting factors (**Flowchart 1**).

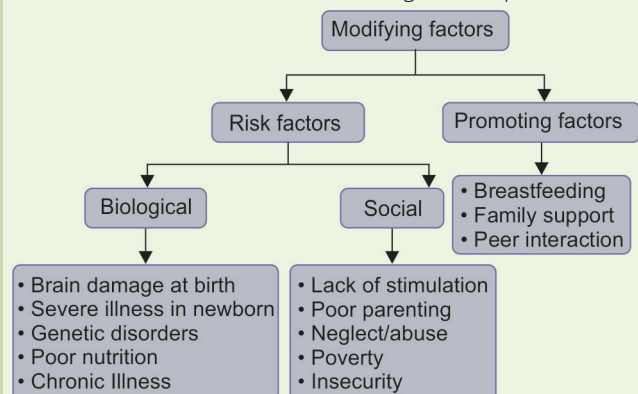
The newborn's brain is highly vulnerable. Care during pregnancy, delivery, and newborn period is essential to prevent later brain damage.

Exclusive breastfeeding for first 6 months and a nutritious diet thereafter helps in brain development.

The newborn baby should be provided adequate stimulation in the form of soft touch, gentle massage, music and talking, bright, colorful surroundings, a warm smile and eye contact, etc. Then as the child grows, he/she needs to be stimulated to learn new skills. Parents have to be consistently responsive. Allow the child to interact with peers. Try to give the child a secure environment, without exposure to any abuse or neglect.

Being aware of the factors influencing brain development, you can surely modify your child-rearing practices accordingly to raise a child to achieve his/her best.

**Flowchart 1:** Factors affecting development.



## Q4

### What are the common achievements (milestones) in development that parents should note in their children?

Developmental milestones are specific skills that are expected to be attained within a certain age range. It is a good practice for parents to know what to look for and mark them when they are achieved. Some important milestones include:

- *Gross motor*: Head-control, rolling over, sitting, crawling, standing, walking, running, climbing up- and down-stairs, riding a tricycle, jumping, hopping, and skipping.
- *Fine motor*: Looking fixedly at something, regarding one's hand, reaching out, thumb and finger grip (pincer), scribbling, drawing shapes, building towers with blocks, and buttoning shirt.
- *Social*: Social smile, recognizing mother, expressing pleasure/displeasure, stranger anxiety, waving bye-bye, enjoying mirror, playing "peek-a-boo", playing meaningfully with toys and imitating, simple rule-based games.
- *Language*: Cooing (single vowels), monosyllables (single consonants), bisyllables (double consonants), babbling (multiple consonants), meaningful words, two to three word phrases, full sentences, asking questions, and narrating incidents. Also note when the child communicates through gestures and shares his/her interest with others.
- *Cognitive*: Imitating facial expressions, stretching arms to be picked up, responding to "No", identifying body parts, colors, identifying numbers, letters and shapes, counting, following simple one-step instructions to three-step instructions.

Q5

## What all will my baby learn to do in the first 3 years of life?

At every age, a child learns some new skills. Below is a short-list of things, you can expect your child to do at different ages:

**2 months:** Smiles on social contact, listens to voice, and coos. Follows objects with eyes.

**3–6 months:**

- Holds head steady. Turns over. Sits with support.
- Reaches out; grasps large object. Enjoys mirrors.
- Laughs aloud. Makes sounds. Shows joy, interest, fear, and surprise.

**6–9 months:**

- Sits unsupported, crawls
- Observes, picks, transfers from hand to hand, and bangs and drops large objects.
- Notices small objects → raking movement → immature grasp → mature pincer grasp with thumb and index finger (9 months)
- Waves bye-bye, separation anxiety

**9–12 months:**

- Stands without support.
- Plays with objects, enjoys inserting and dumping out.
- Retrieve hidden toy, Enjoys “peek-a-boo”.
- Point to body parts.

- Respond to his name and to “No”.
- Two to three words with meaning.
- Nonverbal gestures.

**15 months:**

- Walks alone
- Follows simple commands; names familiar object

**18 months:**

- Runs stiffly
- Explores
- Scribbles
- 10 words; names pictures

**24 months:**

- Runs well, climbs stairs; jumps
- Tower of seven cubes; imitates horizontal stroke
- Three words sentences
- Handles spoon; helps to undress.

**36 months:**

- Rides tricycle; throws ball.
- Copies circle; imitates cross.
- Knows age and sex; counts three objects; speeches fluently. Listens to stories.
- Plays simple games; pretends.
- Helps in dressing; washes hands.

**Q6**

**When should I suspect delay in my child's development?**

For every skill, there is an acceptable age range for acquisition. If a child fails to attain a skill beyond that range, we consider it a delay. There are some red flag signs of delay in different domains we should all be aware of. The common age cut-offs are given in **Table 1**.

**TABLE 1:** Age cut-offs for common milestones

Domain	Inability to	By age (months)
<b>Gross Motor</b>	Hold head	4
	Roll over	6
	Sit without support	9
	Stand without support	12
	Walk alone	15
	Balancing, running	36
<b>Fine motor</b>	Mature grasp	12
	Manipulate large objects	12
	Self-dressing	36
	Using crayons or scissors	48
	Buttoning shirt	60
<b>Speech</b>	Babbling	12
	Gestures	12
	Two words	24
<b>Hearing</b>	Response to sounds	Any age
	Response to commands	Any age
<b>Vision</b>	Play with own hands	3
	Follow object	3
	Eye contact	3
	Motor delay, clumsiness, and stumbling	Any age

*Red flags of cognitive delay and behavioral problems:*

- Difficulty in following simple instruction and learning new skills
- Slow in daily activities
- Poor recall
- Poor expressive language
- Little interest in surroundings and other children
- Poor eye-contact/smiling
- Limited use of words or gestures to communicate needs
- Repetitive, parrot-like speech
- Repetitive, nonpurposeful play
- No pretend or imaginary play

**Red Flag Signs at 18 months**

- Has trouble seeing or hearing
- Does not say a single word
- Does not point, wave or use gestures
- Does not follow simple commands
- Does not enjoy eye contact or cuddles
- Is not walking alone
- Prefers to use one hand

**Red Flag Signs at 2 years**

- Does not see or hear properly
- Does not run or climb stairs
- Not using two words together
- Poor emotional expression
- No pretend play
- Does not copy actions
- Does not scribble



## Q7

### What all may go wrong and what are the problems that may come up?

Factors affecting pregnancy, childbirth, and later childcare may affect development. During pregnancy poor weight gain, nutritional deficiencies, illnesses such as high blood pressure, diabetes, bleeding, infection, stress, injury can affect baby's development. Good antenatal care and nutrition with early treatment of complications are crucial in ensuring a healthy baby.

Birth is a stressful process for both mother and child. Common problems during childbirth such as prolonged labor, difficult delivery, delayed cry of baby after birth, etc. may cause brain damage in the newborn. Supervised hospital delivery with adequate baby-care facilities will ensure safety for both.

The baby is most vulnerable during the initial few days after birth. All babies need to be breastfed, kept warm and safe in a clean room with adequate stimulation. Premature and very small babies need special care. Babies with breathing difficulty, infections, jaundice, convulsions or otherwise very sick require intensive care in the hospital. All of these may impact the growing brain and present as delayed milestones.

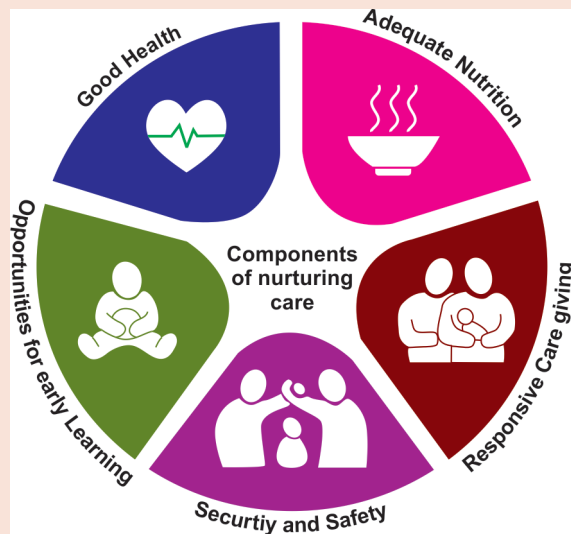
Impaired brain development may present variously as:

- *Cerebral palsy*: Predominantly movement and posture disorder
- *Intellectual disability*: Poor intelligence and social adaptation
- Hearing impairment and speech delay
- Visual impairment
- Learning disability
- *Behavioral problems*: Attention deficit hyperactivity disorder (ADHD)
- Autism

Q8

## What is my role as a parent to support my child's development?

Parents have immense influence on the child's development. Many factors influence brain development and they need to be addressed simultaneously for best results. So global experts have come up with the "Nurturing Care Framework" with five interlinked components. As parents you can work on each of the five components:



1. Good health
2. Adequate nutrition
3. *Responsive caregiving:*
  - Respond to child's cues and needs
  - Be attentive
  - Be consistent
  - Be predictable
4. *Opportunity for early learning:*
  - Enrich home environment
  - Psychomotor stimulation
  - Interactive parenting
  - Play
5. *Safety and security:*
  - Protect from all hazards
  - Provide safe environment
  - Protect from severe stressful situation (physical or mental abuse, neglect)

If you can provide your child with a secure, loving, and nurturing environment, the little one will bloom to his fullest potential. Provide a stimulating environment where the child enjoys learning. Your responses need to be encouraging, consistent, and predictable. Provide optimum support, neither overwhelming stimulation nor reluctance and neglect. Punitive discipline must be avoided. As caring parents if you can provide adequate learning opportunity in a stimulating environment which is safe, secure and consistent, your child will achieve his best.

**Q9**

**Can I stimulate/augment my child's development?**

Brain development means increase in number of brain cells and numerous interconnections between these cells, forming a network. When a child is given a certain stimulus a specific part of the brain is stimulated and it directs the child to perform an act. As this repeats, the child acquires a skill. The part of the brain that is constantly stimulated grows while unused parts die out or are pruned. This reorganizing and forming new connections between neurons is termed as "neuroplasticity" in medical language, which largely depends on the stimulation we provide.

As a parent you have ample scope to stimulate your child right from birth to augment development. This is called early stimulation. This can be provided through play and various age appropriate activities. The parents can enhance speech, language, cognitive and social development by speaking to the children, exploring, modeling, problem-solving, and playing with them.

Every response to your child's cues will stimulate him/her to perform a skill. If you are clear, consistent, and predictable in your responses, the child's learning process will be precise and stable.

Early intervention through good stimulation is effective in augmenting development in normal children as well as children with delays.

**Q10**

**When and where can I get my child's development assessed? Where do we go if we suspect a developmental delay in our child?**

Parent should be aware of developmental milestones in all the domains and check them periodically. Unless parents are vigilant, they may miss mild delay.

Parents should report their concerns to a pediatrician who can screen for developmental delay and may also ask for some tests, if needed. Your Pediatrician will also advise you on initial management of the problem. He/she will refer you to a specialized center with developmental specialists (Developmental Pediatrician, Physiotherapist, Occupational Therapist, Speech Therapist, Psychologist and Special Educators) or to a Government run 'District Early Intervention Center (DEIC)' for complete care for the developmental problem, if required.

Now-a-days online consultation has increased the outreach for parents and is extremely helpful in obtaining expert opinion.