

What should Parents & Teachers know about Developmental Milestones?

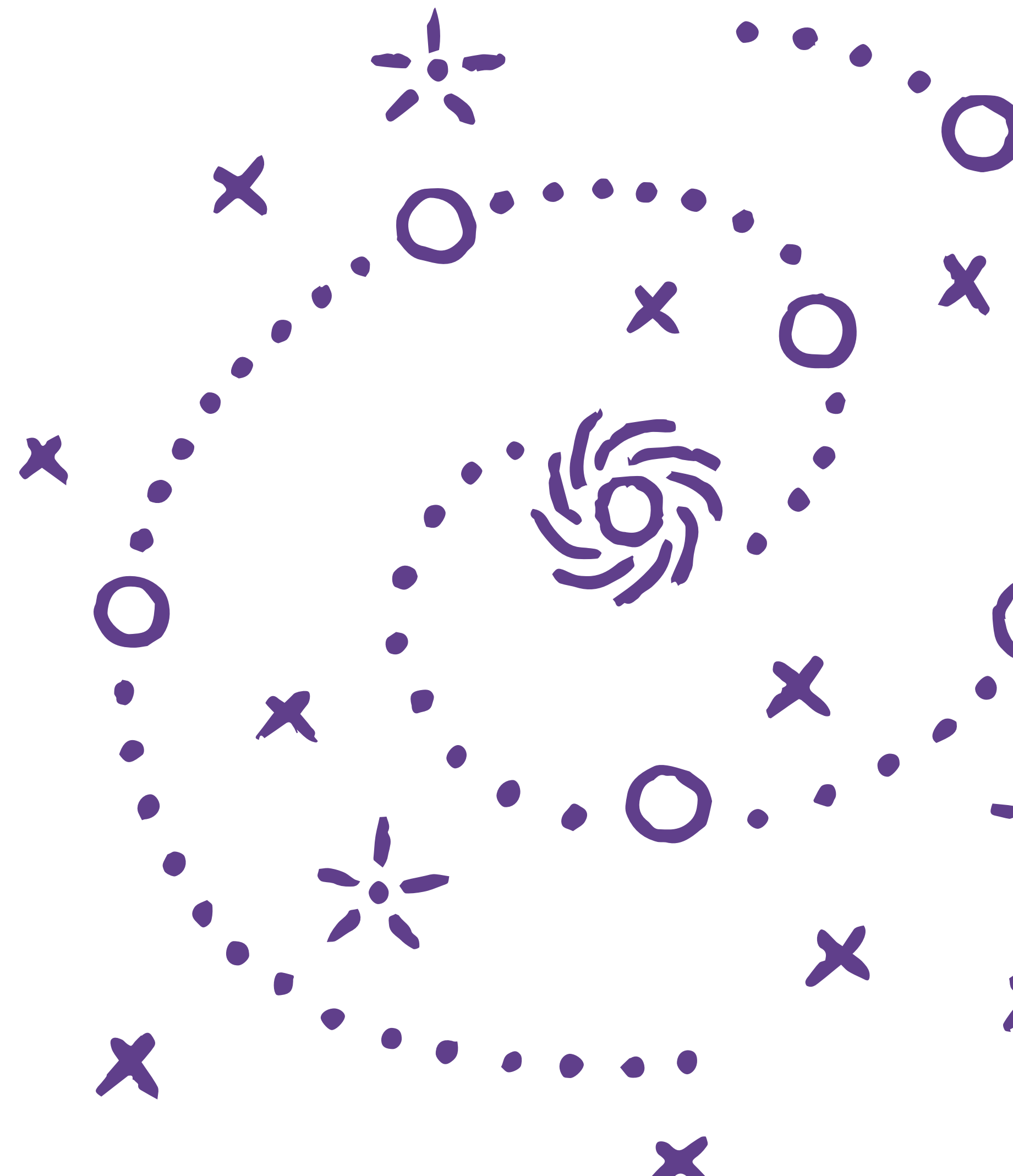
Dr. Deepika Jain
Developmental Paediatrician





All carers of children with special needs, you are the center of our universe.

Our mission is to make things easier for you.





Every child wants to thrive.
Technology could help a lot,
but without the carers,
technology is insufficient.



No one should have to
do this alone.

We bring a community
and other resources
to enable the best
chance of the child's
true potential.





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- ❖ MD, Dped, DNB, PGDDN
- ❖ Developmental Paediatrician
- ❖ Working at
 - Shishu Child Development and Early Intervention Centre
 - District Early Intervention Centre – Health and Care Foundation
 - High Risk Developmental Clinic in NICU's
 - Saarang Inclusive School
 - Kshamta Institute of Learning Disability
- ❖ Extensively trained in various International and national scales for development
 - VINELAND 3, WRAT 5 and BASC 3
 - Prechtl's General Movement Assessment
 - 3Di diagnostic tool for Autism
 - DASII, Hammersmith Neonatal Exam
 - DSM 5, ISAA
- ❖ Paper presentation in various International conferences
- ❖ Faculty in many neurodevelopmental workshops


GROWTH

DEVELOPMENT


GROWTH

THE PROCESS OF INCREASE IN SIZE

- WEIGHT
- LENGTH
- HEAD CIRCUMFERENCE



The process in which
someone or something
grows or changes and
becomes more
advanced



DEVELOPMENT

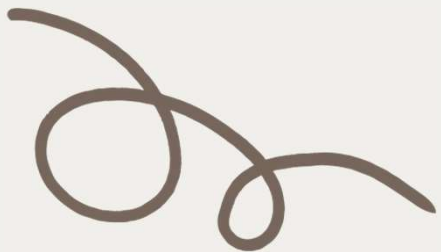
FACTORS AFFECTING GROWTH & DEVELOPMENT



ILLINGWORTH-1987



Development is continuous from conception to maturity and its sequence is the same in all children, though its rate varies from one child to another.....

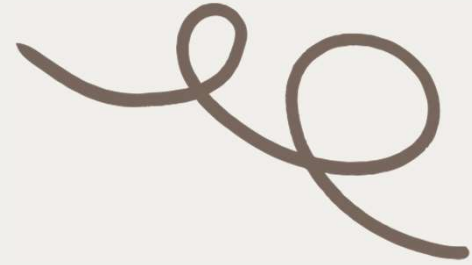


SO SHALL WE WAIT TILL THE TIME THE
PARENT ACHIEVED THE MILESTONE (ON
PARENT'S AND GRANDPARENT'S HISTORY)
FOR THE CHILD TO REACH THE MILESTONE
????



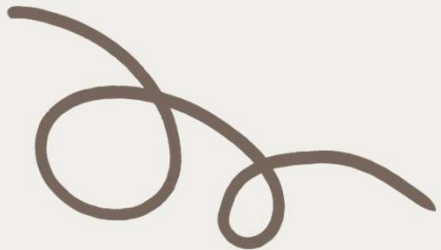
Or is the development delayed because as we hear in
developmental assessments many a times “my child not doing
because we have not taught him/ her” or no opportunity

NO- WHY!!

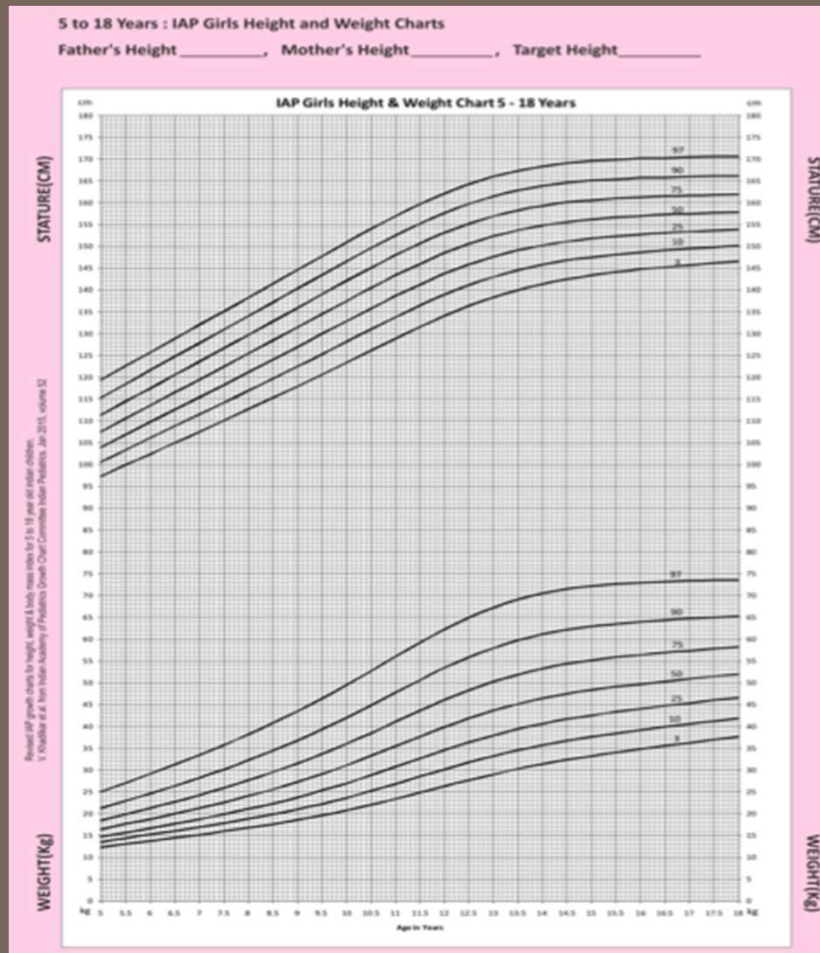


Every aspect of growth and development has an upper limit of normal, beyond which something may be going wrong and some assessment or intervention is needed.

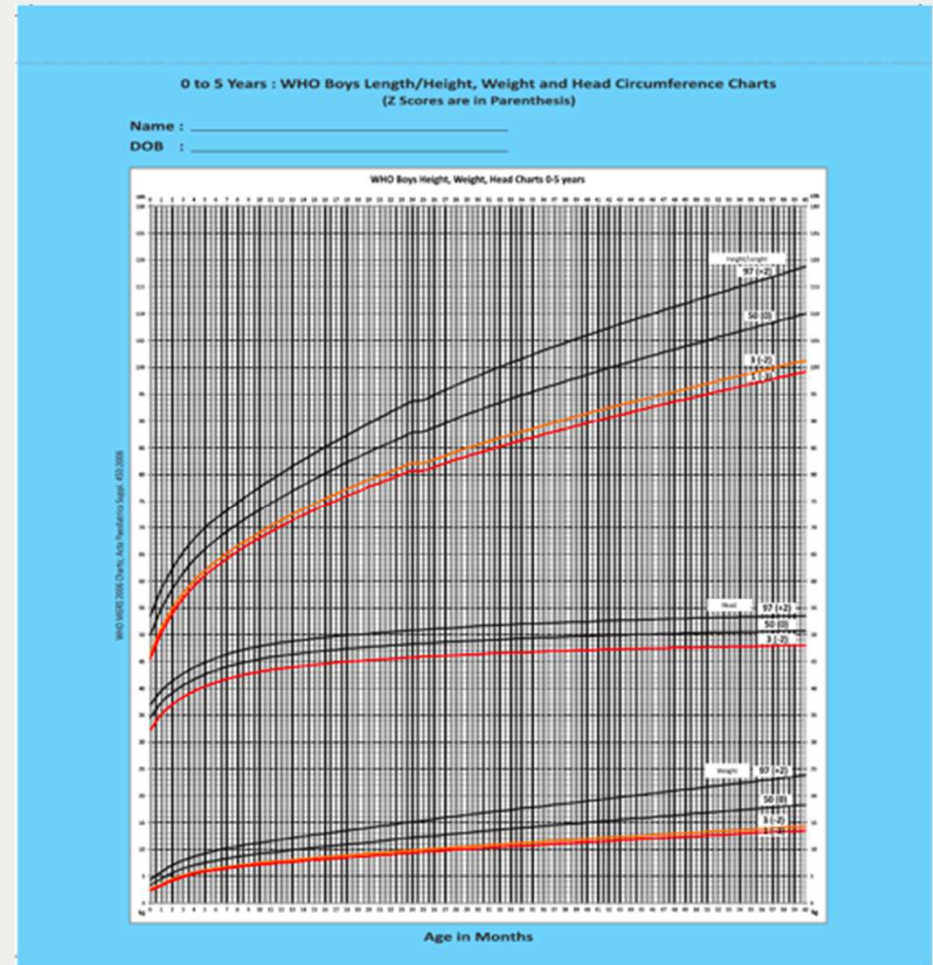
There is not a single point but an age range for when a particular milestone should be achieved.



GROWTH MONITORING



GROWTH CHARTS

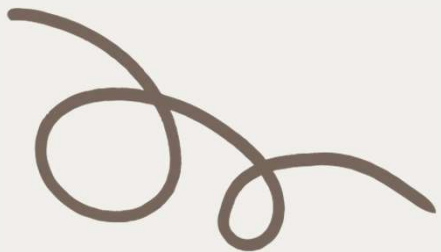


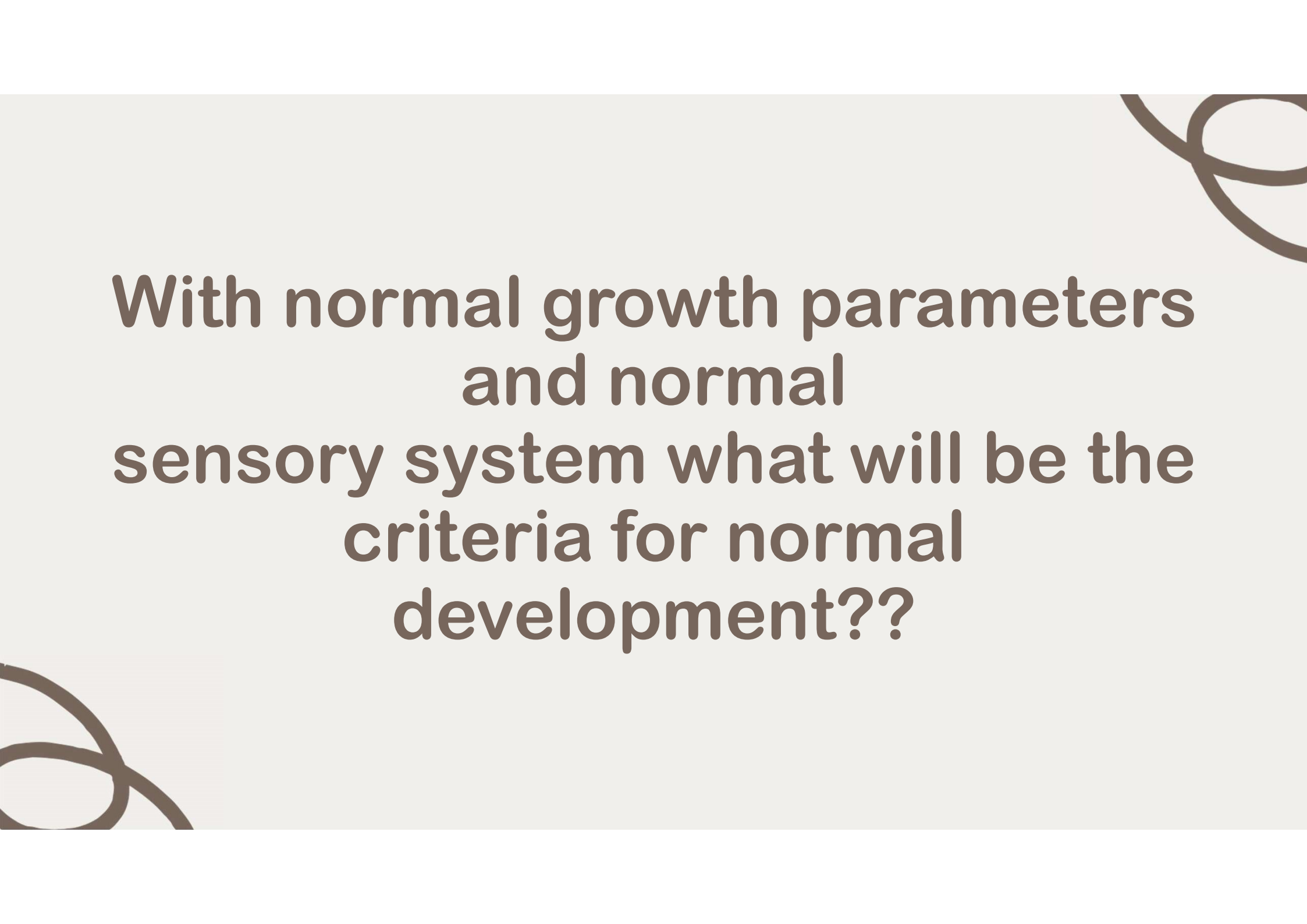
PLEASE DON'T FORGET



- VISUAL- EYES
- AUDITORY- HEARING

A child who has visual delay or difficulty in hearing and is not caught and treated at the right time is always at risk for developmental delay





**With normal growth parameters
and normal
sensory system what will be the
criteria for normal
development??**

NORMAL DEVELOPMENT



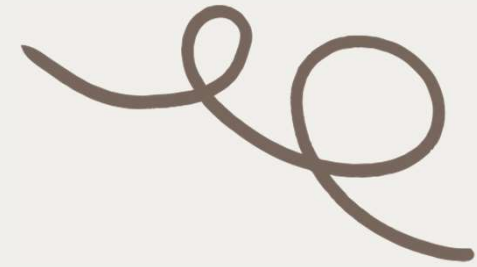
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graph TD; A[NORMAL DEVELOPMENT] --> B["IQ  
(intelligence quotient)"]; A --> C[ADAPTIVE LEVEL]
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IQ

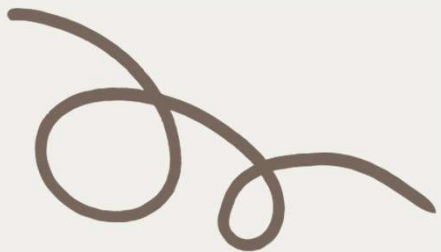
(intelligence quotient)

**ADAPTIVE
LEVEL**

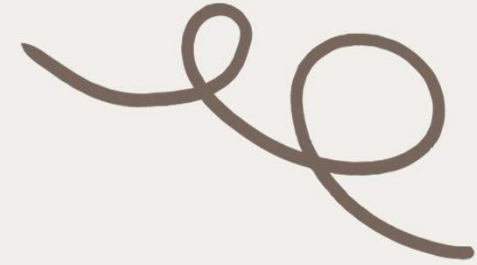
INTELLIGENCE



Intelligence has been defined in many ways: the capacity for logic, understanding, self-awareness, learning, emotional knowledge, reasoning, planning, creativity, critical thinking, and problem solving





ADAPTIVE LEVEL



- Adaptive behavior--the things that people do to function in their everyday lives.
- Adaptive level measures child's functioning compared to other children of his/her age.



- 
- GROSS MOTOR
 - FINE MOTOR
 - SPEECH & LANGUAGE
 - SOCIAL- EMOTIONAL SKILLS
 - COGNITIVE SKILLS
- 

DEVELOPMENTAL PARAMETERS

MALADAPTIVE PROFILE

```
graph TD; A[MALADAPTIVE PROFILE] --> B[INTERNAL]; A --> C[EXTERNAL]; B --> B1[overly dependent]; B --> B2[avoids social interaction]; B --> B3[eating difficulties]; B --> B4[sleep difficulties]; B --> B5[poor eye contact]; B --> B6[sad/ anxious/ nervous]; C --> C1[temper tantrums]; C --> C2[physically aggressive]; C --> C3[stubborn/sullen]; C --> C4[bullies others]; C --> C5[hyperactive]; C --> C6[attention issues];
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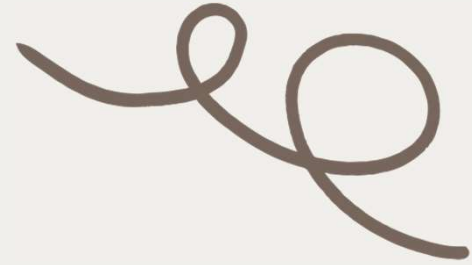
INTERNAL

overly dependent
avoids social interaction
eating difficulties
sleep difficulties
poor eye contact
sad/ anxious/ nervous

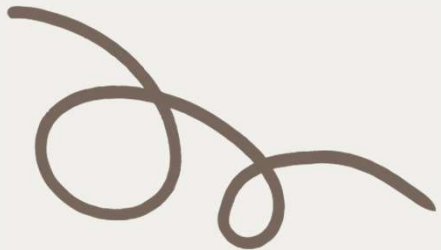
EXTERNAL

temper tantrums
physically aggressive
stubborn/sullen
bullies others
hyperactive
attention issues

WATCH FOR



Children who are showing normal developmental milestones and no maladaptive behavior yet are having difficulty with pre-reading and pre-writing concepts / difficulty with coping with class curriculum, as they may be showing early markers of Learning Disability.





IN EARLY CHILDHOOD

Early signs of any developmental delay in four areas

- Gross motor
- Fine motor
- Speech & language
- Personal social

Maladaptive Behavior:

ADHD (attention deficit hyperactivity disorder)

AUTISM

BEHAVIOUR ISSUES

Early markers of LEARNING ISSUES



MOTOR

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graph TD; MOTOR --> GROSS_MOTOR[GROSS MOTOR]; MOTOR --> FINE_MOTOR[FINE MOTOR]; GROSS_MOTOR --> walking; GROSS_MOTOR --> running; GROSS_MOTOR --> stairs; GROSS_MOTOR --> jumping; GROSS_MOTOR --> cycle; GROSS_MOTOR --> kick; GROSS_MOTOR --> throw; FINE_MOTOR --> hand_function[hand function]; FINE_MOTOR --> grip; FINE_MOTOR --> position; FINE_MOTOR --> two_hand_function[two hand function]; FINE_MOTOR --> hand_eye_coordination[hand-eye coordination];
```

GROSS MOTOR

walking

running

stairs

jumping

cycle

kick

throw

FINE MOTOR

hand function

grip

position

two hand function


hand-eye coordination



GROSS MOTOR

The acquisition of gross motor skill precedes the development of fine motor skills.

Both processes occur in a cephalocaudal fashion

- Head control preceding arm and hand control
 - Followed by leg and foot control.
- 



AGE	MILESTONE- GROSS MOTOR
3 -4 MONTHS	NECK HOLDING
5 MONTHS	ROLLS OVER
6 MONTHS	SITS IN TRIPOD POSITION
8 MONTHS	SITS WITHOUT SUPPORT
9 MONTHS	STANDS WITH SUPPORT
12 MONTHS	CRAWLS WELL, STANDS WITHOUT SUPPORT
15 MONTHS	WALKS/ TODDLES ALONE, CRAWLS UPSTAIRS
18 MONTHS	WALKS WITH COORDINATION, RUNS
2 YEARS	WALKS UP & DOWN STAIRS WITH SUPPORT OF RAILING, JUMPS
3 YEARS	ALTERNATE FEET GOES UPSTAIRS, RIDES TRICYCLE
4 YEARS	ALTERNATE FEET GOING DOWNSTAIRS, STEERS TRICYCLE
5 YEARS	MATURE HEEL TOE WALK, CATCHES BALL WELL




KEY FINE MOTOR DEVELOPMENT MILESTONE

Age	Milestone
4m	reaching out for the objects with both hands
6m	Reaching out for the objects with one hand
9m	Immature pincer graps
12m	Pincer graps mature
15m	Imitates scribbling, tower of 2 blocks
18m	Scribbles, tower of 3 blocks
2yr	Tower of 6 blocks, vertical and circular stroke
3 yr	Tower of 9 blocks, copies circle
4yr	Copies cross, bridge with blocks
5yr	Copies triangle, gate with blocks




SPEECH & LANGUAGE

- Perhaps the most important milestone but not given due importance.
 - This is the milestone which is most commonly ignored because “father spoke late”
 - Speaking is not just about words, it is about understanding the language as spoken
 - Having a normal hearing is the pre-requisite to normal speech development.
- 




LANGUAGE

- Language is the meaning of the sounds (speech)
 - Communication is understanding of language(receptive)
 - Communication is also making others understand your language (expressive)
 - Communication can also be without sounds (non-verbal)
 - Communication can also be in form of reading and writing
- 

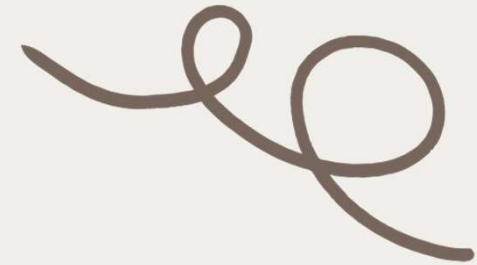


SPEECH MILESTONES

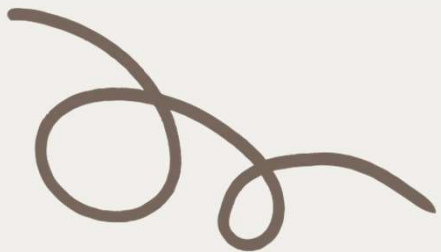
- 1-2 months: coos
 - 2-6 months: laughs and squeal
 - 8-9 months babbles: mama/dada as sounds
 - 10-12 months: “mama/dada specific
 - 15 months: pointing – needs/ interest
 - 18-20 months: 8-10 specific words
 - 22-24 months: two word sentences, >50 words, 50% of speech understood by strangers
 - 30-36 months: 3 word sentences, 75% understood by strangers, pronouns
 - 4 years: 4-5 word sentences, proper structure, 100% understood by strangers
- 

AGE- MONTHS	COMMUNICATION
0-3	Starts responding to sounds, social smile present
4-7	Coos in response to social overtures
7-12	Responds to name Syllables- 1 st monosyllables then bi syllables Lifts hands to be picked up Understands simple words like “no”
12-18	Understands simple instructions “where is mummy” Points for needs and interest Starts speaking simple words with meaning
18- 24	18 months- starts speaking 6-8 simple words with meaning Understands many words (around 50) Around 24 months- starts combining two words together
24- 36	Starts playing and trying to talk with other children Speech is clear to familiar people and 50-75% clear to outsiders
36- 48	Starts asking questions
48-60	Able to tell simple stories

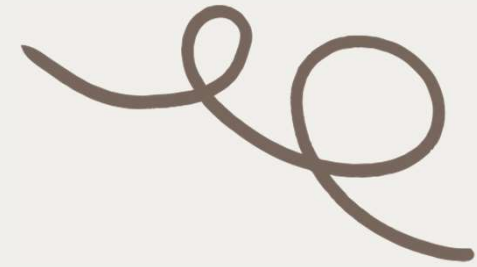
SOCIAL-EMOTIONAL



- Again a very neglected milestones, although one of the most important one.
- How often we come across children who are aloof, have difficulty with friendships?
- Most of the times they are labelled as moody
- “he/she will only do an activity/ play with others if he/she wants to”

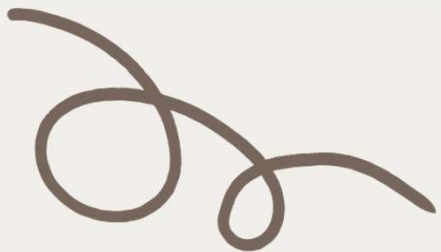


SOCIAL-EMOTIONAL




- Social-emotional domain go hand in hand with communication
It includes:

- Interpersonal relationship - responding, emotions, imitation
- Play skills - sharing, turn taking, make believe, rules of games
- Coping skills - stranger awareness, asking help, anger



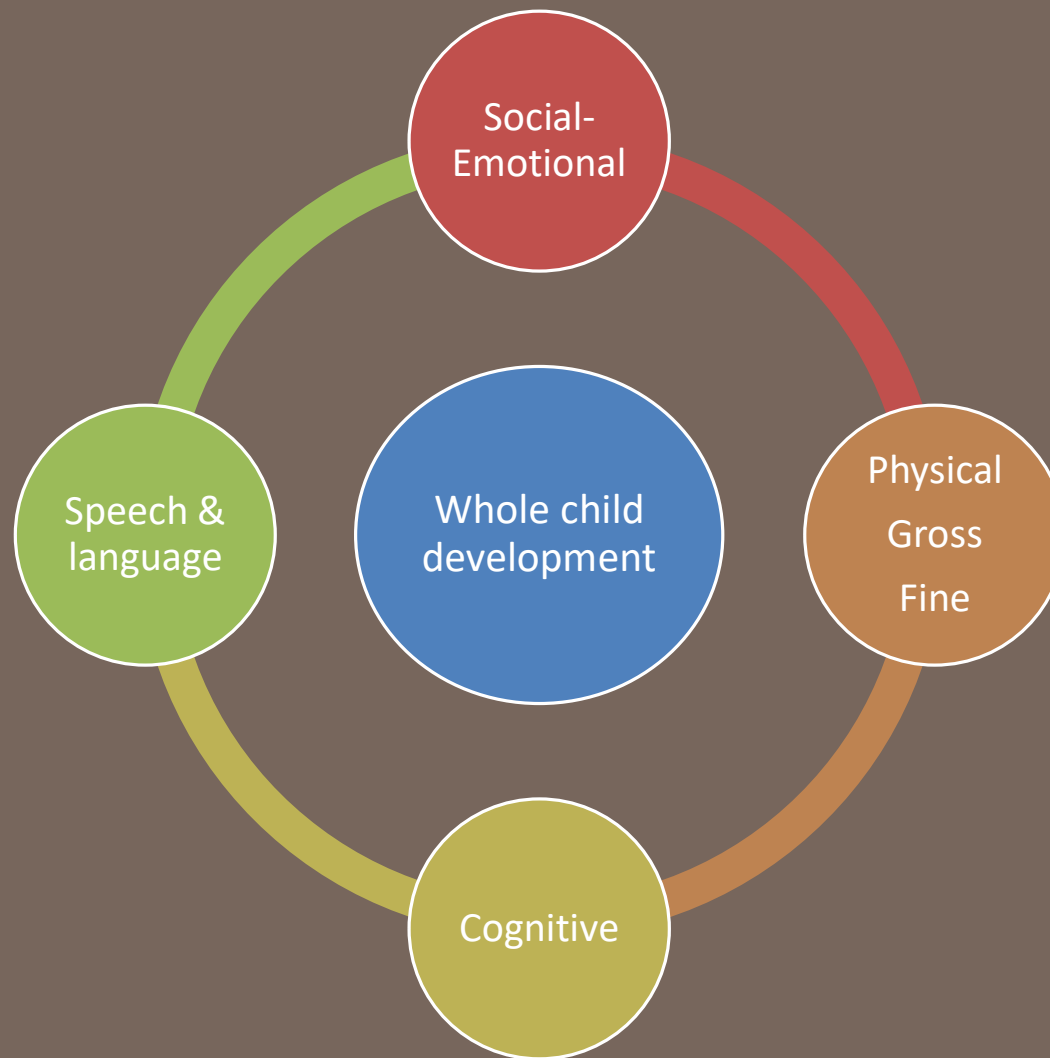


PERSONAL SOCIAL

- Social skills which allows a child to become independent socially in doing his/ her own work
 - Includes:
 - Eating
 - Dressing
 - Toileting
- 


KEY SOCIAL AND ADAPTIVE MILESTONE


Age	Milestone
2m	Social smile
3m	Recognizes mother
6m	Recognizes strangers, stranger anxiety
9m	Waves “bye bye”
12m	Comes when called, plays simple ball game
15m	Jargon
18m	Copies parents in tasks
2yr	Asks for food, drink, toilet
3yr	Shares toys, knows full name and gender
4yr	Plays cooperatively in a group, goes to toilet alone.
5yr	Helps in household tasks, dressing and undressing






DEVELOPMENTAL SCREENING

- ❖ It is early identification of children at risk for cognitive, motor, communication, or social-emotional delays.
 - ❖ These are delays that may interfere with expected growth, learning, and development and may warrant further diagnosis, assessment, and evaluation.
- 



DEVELOPMENTAL OBSERVATION CARD (DOC)

DOC -- Major Milestones

- Social Smile: achieved by completed 2 months
(baby smiles back in response to your smile)
 - Head Holding: achieved by completed 4 months
(keeping head steady when baby is held upright)
(lifts head & shoulder supported on forearms in prone position)
 - Sitting Alone: achieved by completed 8 months
(baby is able to sit with back straight, no support)
 - Standing Alone: achieved by completed 12 months
(baby is able to stand bearing weight on both legs with minimal or no support)
 - Make sure that the child can see, hear and listen
 - Those who fail these simple milestones must have a formal developmental assessment
- 


RED FLAG SIGNS DOMAIN	3 MONTHS	4- 6 MONTHS	7- 9 MONTHS
GROSS MOTOR	<ul style="list-style-type: none"> • Head lag on being made to pull to sit • Doesn't pull up head on forearms when on tummy 	<ul style="list-style-type: none"> • Not able to hold head up with control when made to sit with support • Not elevating head and shoulders on forearms when lying on tummy 	<ul style="list-style-type: none"> • No rolling • Doesn't sit with back straight and without support • Doesn't creep/ crawl • Doesn't hold on to his weight on made to stand
FINE MOTOR	<ul style="list-style-type: none"> • Doesn't try to reach for objects using both hands • Doesn't mouth hands 	<ul style="list-style-type: none"> • Does not bring hand together at midline to reach for objects • Does not mouth or explore objects with hands • Frequent fisting of hands 	<ul style="list-style-type: none"> • Does not hold on to objects • Doesn't try to manipulate objects or move from one hand to other • Doesn't bang objects to make sounds
COMMUNICATION	<ul style="list-style-type: none"> • Doesn't respond to sounds • doesn't coo on being talked to 	<ul style="list-style-type: none"> • Doesn't babble sounds (aahh, oohh) • Doesn't respond to being called 	<ul style="list-style-type: none"> • Doesn't speak syllables like ba-ba, pa-pa, da-da to try to communicate • doesn't use some gestures like showing by hands, waving to communicate
SOCIAL EMOTIONAL	<ul style="list-style-type: none"> • Doesn't smile back on being socially stimulated • Doesn't give eye contact 	<ul style="list-style-type: none"> • Does not give eye contact, smile or interact with caregivers 	<ul style="list-style-type: none"> • Doesn't try to share enjoyment with others using eye contact or facial expression • Doesn't try to attract others attention to self

RED FLAG SIGNS DOMAIN	10- 12 MONTHS	18 MONTHS	By 24 MONTHS
GROSS MOTOR	<ul style="list-style-type: none"> • Not able to crawl or cruise (walk holding on to furniture) • Not able to pull self to standing position • Not able to stand without support- 12 months 	<ul style="list-style-type: none"> • Not attempting to walk without support • Not able to walk without support- 18 months 	<ul style="list-style-type: none"> • Not able to walk independently with good coordination • Not able to walk up- down stairs with support
FINE MOTOR	<ul style="list-style-type: none"> • Not able to pick up small items using thumb and two finger or thumb- finger • Does not feed finger food to self or try to hold own Sippy cup/ bottle 	<ul style="list-style-type: none"> • Thumb- finger grasp not developed • Doesn't scribble with crayon in fist • Doesn't try to stack 2-3 blocks after demonstration 	<ul style="list-style-type: none"> • Does not attempt to feed self using spoon/ fingers • Does not help with dressing • Doesn't try to make tower of 5-6 cubes
COMMUNICATION	<ul style="list-style-type: none"> • Doesn't respond to familiar words like "mummy, papa, bottle" etc • Doesn't try to speak ba-ba, pa-pa, ma-ma specifically 	<ul style="list-style-type: none"> • No clear words • Doesn't understand simple requests like "where is your shoe" 	<ul style="list-style-type: none"> • Doesn't understand around 50 words • Doesn't learn new words • Doesn't try to use 2 word phrases "mumma water"
SOCIAL EMOTIONAL	<ul style="list-style-type: none"> • Doesn't notice someone new • Does not play games like peek- a boo, throw ball 	<ul style="list-style-type: none"> • No pointing for needs • Doesn't look if pointed to for interest • Doesn't show for interest • Lack of interest in playing or interacting with others 	<ul style="list-style-type: none"> • Doesn't use toys purposely • Doesn't do basic pretend play-eg feed the doll • Prefers to play alone

RED FLAG SIGNS DOMAIN	2- 3 years	3- 4 years	4- 5 years
GROSS MOTOR	<ul style="list-style-type: none"> • Not able to walk up- down stairs independently- two feet per step • Not able to run smoothly • Not able to jump • Not able to ride tricycle 	<ul style="list-style-type: none"> • Not able to walk, run, climb up- down stairs confidently • Not able to climb up stairs alternating feet • Not able to ride and steer tricycle 	<ul style="list-style-type: none"> • Not able to walk, run, climb stairs, jump confidently • Not able to come down stairs alternating feet • No mature heel- toe walk
FINE MOTOR	<ul style="list-style-type: none"> • Difficulty manipulating small objects- like threading the beads • Does not attempt everyday self care skills like feeding and dressing 	<ul style="list-style-type: none"> • Doesn't hold pencil in 3-4 finger grip • Not toilet trained during day • Not able to draw line and circles 	<ul style="list-style-type: none"> • Not able to draw simple pictures like stick man • Not able to independently complete simple dressing and eating routines
COMMUNICATION	<ul style="list-style-type: none"> • Not using simple 3 word sentences • Speech significantly unclear and difficult to understand • Not able to follow one point direction • Answers simple questions 	<ul style="list-style-type: none"> • Unclear speech to outsiders • Not able to follow two point instructions • Not able to answer "what, where" questions • Not using pronouns 	<ul style="list-style-type: none"> • Not asking simple "what, where," questions • Difficulty telling a parent what is wrong • Answers "why" questions
SOCIAL EMOTIONAL	<ul style="list-style-type: none"> • Not interested in pretend play or interacting with other children • Doesn't recognize own and other's emotions (happy, sad) 	<ul style="list-style-type: none"> • Not able to play with other children cooperatively • Prefers to play alone 	<ul style="list-style-type: none"> • Not able to play in a group • Not able to understand rules of simple games



RED FLAG SIGNS AT ANY AGE

- ❖ STRONG PARENTAL CONCERNS
 - ❖ POOR RESPONSE TO SOUND AND VISUAL STIMULUS
 - ❖ POOR EYE CONTACT
 - ❖ POOR SOCIAL RESPONSE TO CAREGIVERS
 - ❖ LOSS OF SKILLS AT ANY AGE
 - ❖ NO GAINING OF NEW SKILLS
 - ❖ DIFFERENCES BETWEEN LEFT & RIGHT SIDE OF BODY IN STRENGTH & MOVEMENT
 - ❖ SIGNIFICANTLY LOW BODY TONE (FLOPPY) OR HIGH BODY TONE (STIFF) IMPACTING FUNCTIONAL MOTOR SKILLS
- 

AUTISM

Persons with autism may possess the following characteristics in various combinations and in varying degrees of severity.



Inappropriate laughing or giggling



No real fear of dangers



Apparent insensitivity to pain



May not want cuddling



Sustained unusual or repetitive play; Uneven physical or verbal skills



May avoid eye contact



May prefer to be alone



Difficulty in expressing needs; May use gestures



Inappropriate attachments to objects



Insistence on sameness



Echoes words or phrases



Inappropriate response or no response to sound



Spins objects or self



Difficulty in interacting with others

M-CHAT-R™ (Modified Checklist for Autism in Toddlers Revised)

Please answer these questions about your child. Keep in mind how your child usually behaves. If you have seen your child do the behavior a few times, but he or she does not usually do it, then please answer no. Please circle yes or no for every question. Thank you very much.

- | | | |
|--|-----|----|
| 1. If you point at something across the room, does your child look at it?
(FOR EXAMPLE , if you point at a toy or an animal, does your child look at the toy or animal?) | Yes | No |
| 2. Have you ever wondered if your child might be deaf? | Yes | No |
| 3. Does your child play pretend or make-believe? (FOR EXAMPLE , pretend to drink from an empty cup, pretend to talk on a phone, or pretend to feed a doll or stuffed animal?) | Yes | No |
| 4. Does your child like climbing on things? (FOR EXAMPLE , furniture, playground equipment, or stairs) | Yes | No |
| 5. Does your child make <u>unusual</u> finger movements near his or her eyes?
(FOR EXAMPLE , does your child wiggle his or her fingers close to his or her eyes?) | Yes | No |
| 6. Does your child point with one finger to ask for something or to get help?
(FOR EXAMPLE , pointing to a snack or toy that is out of reach) | Yes | No |
| 7. Does your child point with one finger to show you something interesting?
(FOR EXAMPLE , pointing to an airplane in the sky or a big truck in the road) | Yes | No |
| 8. Is your child interested in other children? (FOR EXAMPLE , does your child watch other children, smile at them, or go to them?) | Yes | No |
| 9. Does your child show you things by bringing them to you or holding them up for you to see – not to get help, but just to share? (FOR EXAMPLE , showing you a flower, a stuffed animal, or a toy truck) | Yes | No |
| 10. Does your child respond when you call his or her name? (FOR EXAMPLE , does he or she look up, talk or babble, or stop what he or she is doing when you call his or her name?) | Yes | No |
| 11. When you smile at your child, does he or she smile back at you? | Yes | No |
| 12. Does your child get upset by everyday noises? (FOR EXAMPLE , does your child scream or cry to noise such as a vacuum cleaner or loud music?) | Yes | No |
| 13. Does your child walk? | Yes | No |
| 14. Does your child look you in the eye when you are talking to him or her, playing with him or her, or dressing him or her? | Yes | No |
| 15. Does your child try to copy what you do? (FOR EXAMPLE , wave bye-bye, clap, or make a funny noise when you do) | Yes | No |
| 16. If you turn your head to look at something, does your child look around to see what you are looking at? | Yes | No |
| 17. Does your child try to get you to watch him or her? (FOR EXAMPLE , does your child look at you for praise, or say "look" or "watch me"?) | Yes | No |
| 18. Does your child understand when you tell him or her to do something?
(FOR EXAMPLE , if you don't point, can your child understand "put the book on the chair" or "bring me the blanket"?) | Yes | No |
| 19. If something new happens, does your child look at your face to see how you feel about it?
(FOR EXAMPLE , if he or she hears a strange or funny noise, or sees a new toy, will he or she look at your face?) | Yes | No |
| 20. Does your child like movement activities?
(FOR EXAMPLE , being swung or bounced on your knee) | Yes | No |

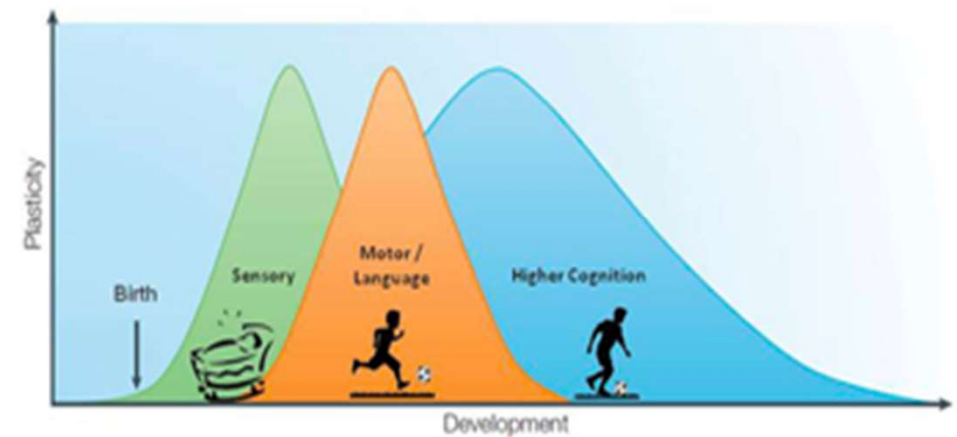


**Why is it important to know
about
early child development???**

BRAIN PLASTICITY

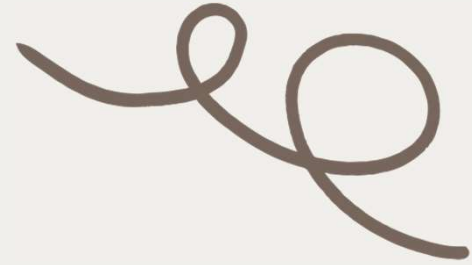
- Plasticity -- it is the ability of the brain to change with learning as a result of experience
- It is most efficient and effective during infancy/ early childhood

Fig 1: Windows of plasticity in brain development

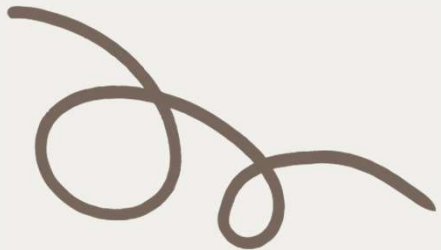


Adapted from Hensch, T.K. (2005). Critical period plasticity in local cortical circuits. *Nature Reviews Neuroscience*, 6(11), 877-888.

EARLY INTERVENTION




Early intervention is about taking action as soon as possible to tackle problems for children and families before they become more difficult to reverse

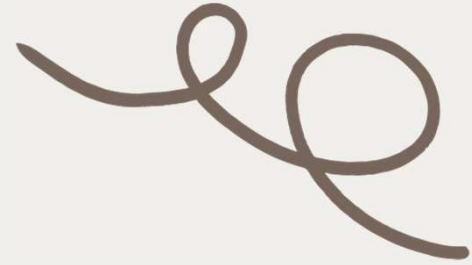




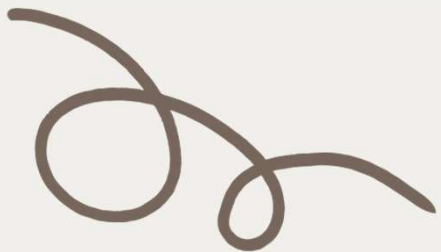
DEVELOPMENTAL DISABILITY

- Developmental disability is a diverse group of chronic conditions that are due to mental or physical impairments.
 - They may or may not be detected early on and persist throughout individual's lifespan. They include chromosomal/genetic disorders like Down's syndrome, Static Encephalopathy's like Cerebral Palsy, Intellectual Disability with IQ below 70, Autism Spectrum Disorders, ADHD, Learning Disabilities etc.
 - According to CDC USA the prevalence of developmental disabilities in children in USA is 1/6 or 15%
 - A study done in USA on "Trends in Prevalence of Developmental Disabilities in US Children from 1997 to 2008" has shown an increase in developmental disabilities from 13.87% to 17%
 - What is alarming is that ASD has shown an increase of 289.5%, ADHD an increase of 33% and Learning Disabilities an increase of 30%. Autism latest statistics shows a prevalence of 1:54
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SO!!!



It is very important for all those be its parents, teachers, doctors or any one else dealing with young children to have a basic knowledge of development to be able to assess whether a child has achieved reasonable age appropriate milestones or not



BE AWARE

**OF ANY DEVELOPMENTAL DELAY/DEVIATION IN
THE CHILDREN WE ARE TEACHING/SEEING**

REMEMBER

**TIMELY INTERVENTION CAN PREVENT A LOT OF
HEARTACHE AND FRUSTRATION LATER ON FOR
BOTH THE CHILD AND PARENT**