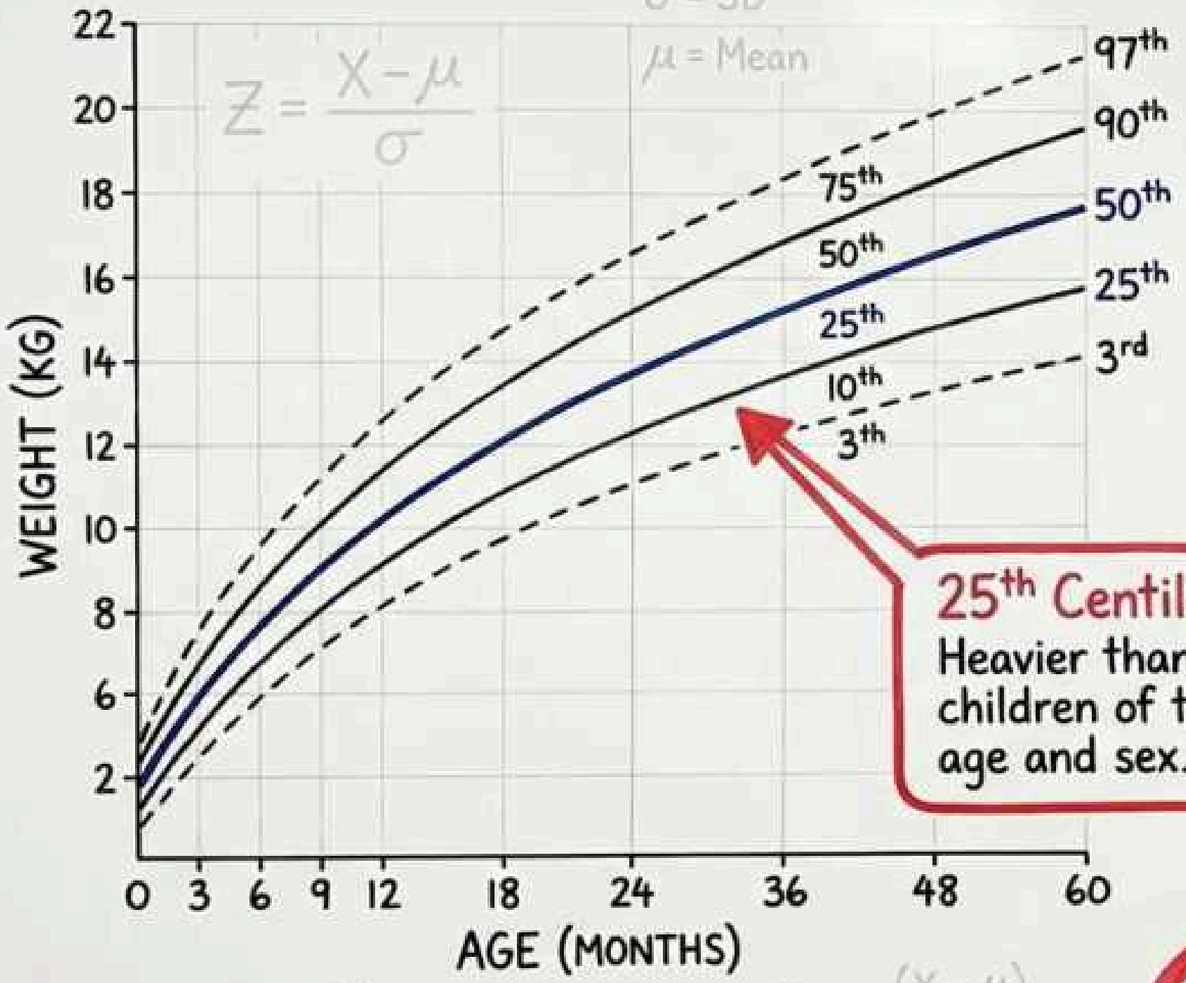
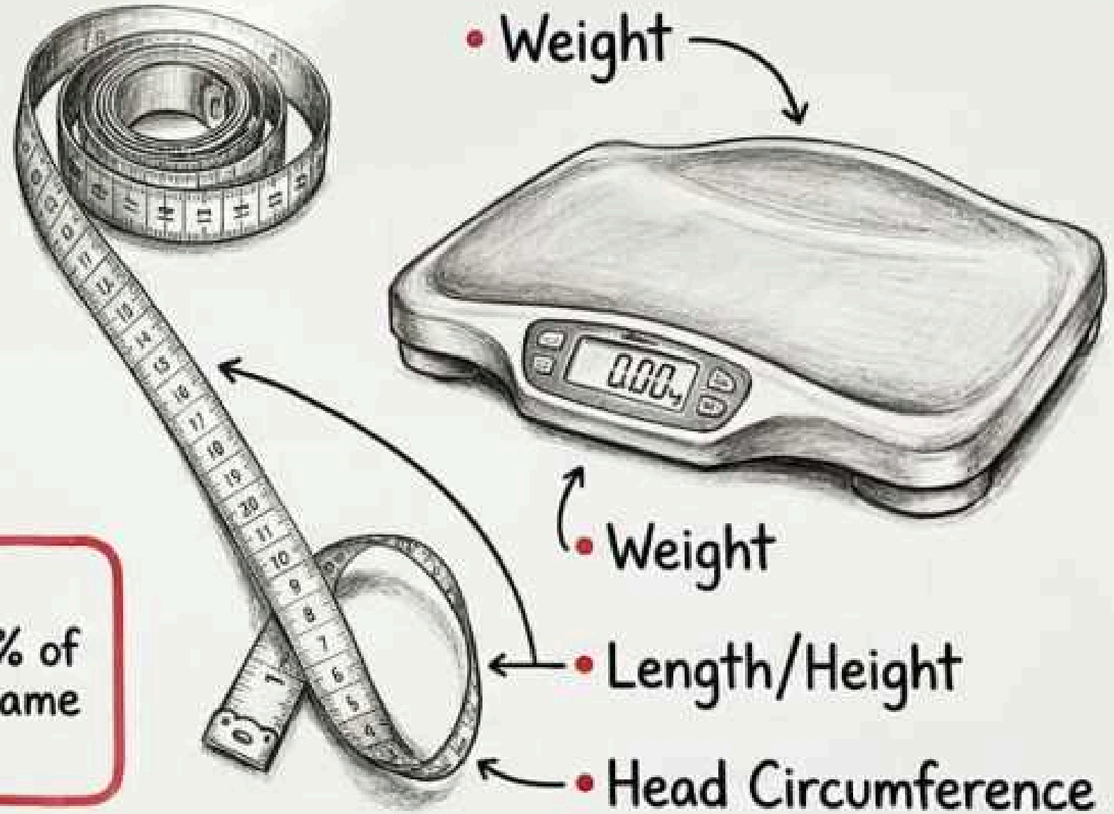
Lecture 1: Growth and Development

¶ 1.1



25th Centile =
Heavier than 25% of children of the same age and sex.



What matters most is the pattern over time.

Growth Velocity = $\frac{\Delta Size}{\Delta Time}$

$Z = \frac{X - \mu}{\sigma}$

σ = SD

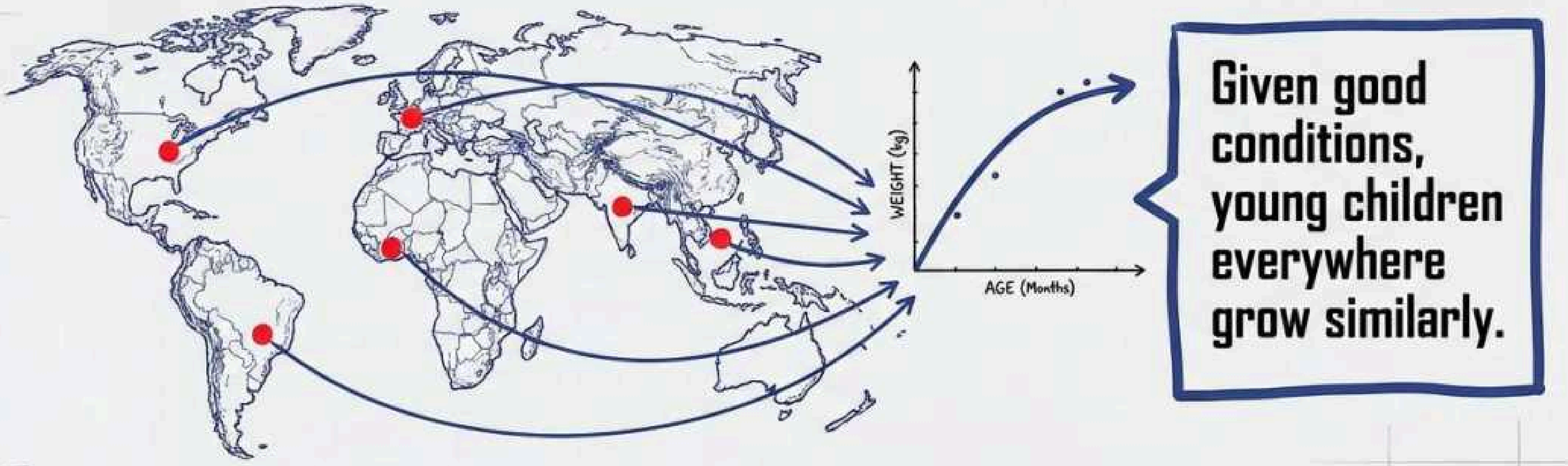
μ = Mean

Statistical formula in growth velocity of $X - \mu$)

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The WHO 2006 Standards

¶ 1.2



Given good conditions, young children everywhere grow similarly.

Based on a study of healthy, breastfed children across 6 different countries.

↳ Universal gold standard widely used for children under five.

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¶ 1.3





Birth

6+ Months

0-6 Months: Exclusive Breastfeeding

- Provides optimal nutrition & protective antibodies.
- Infant formula is the established alternative for non-breastfed infants.

6+ Months: Transition Phase

- Introduction of solid foods alongside continued breastfeeding.

Vitamin D supplementation is recommended for many babies and young children.

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¶ 1.4

Faltering Growth (Failure to Thrive)



Weight gain slower than expected, crossing down through centiles.

$$BMI = \frac{W}{H^2}$$

$$z\text{-score} = \frac{x - \mu}{\sigma}$$

$$Growth\ Rate = \frac{\Delta W}{\Delta t}$$

* **1. Low Intake (Most Common)**
- Feeding difficulties
- Social factors

2. Poor Absorption
- Coeliac disease
- Cystic fibrosis

3. Increased Needs
- Driven by underlying chronic illness

4. Genetic Conditions

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The Dual Burden of Malnutrition

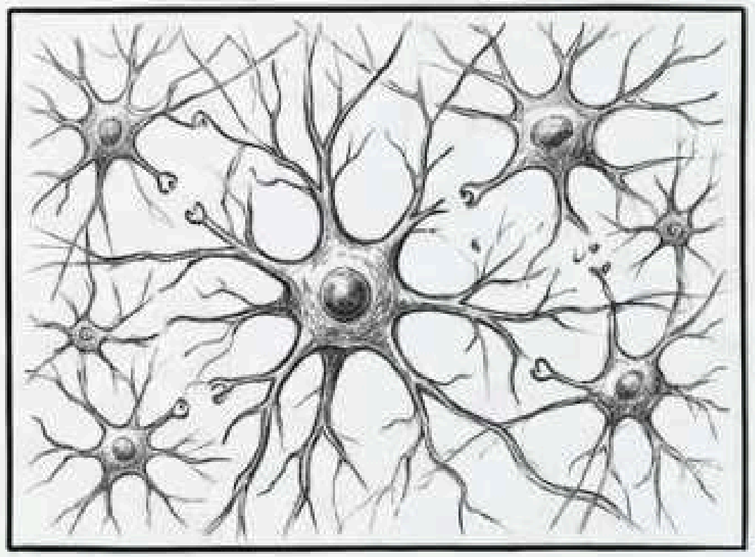
¶ 1.5

* Undernutrition remains a major cause of child deaths globally.

$$\mu = \frac{n.x}{n-k!}$$

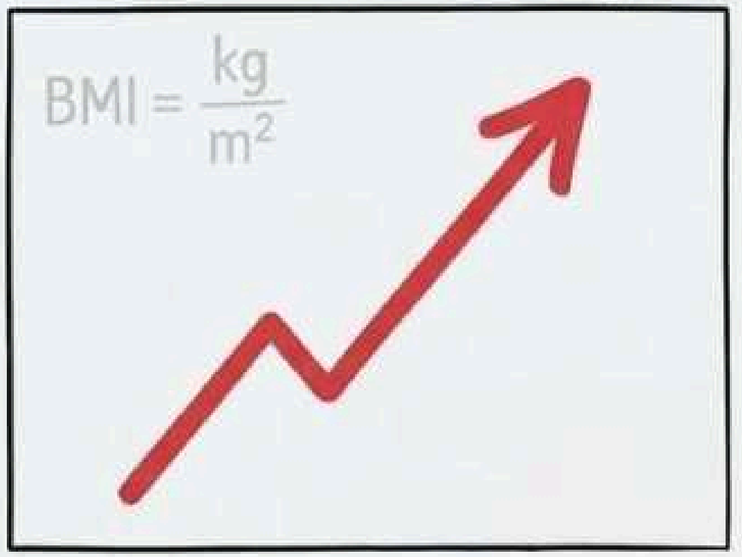
$$BMI = \frac{kg}{m^2}$$

Stunting





Childhood Obesity



- Low height-for-age from chronic undernutrition.
- Affects >100 million children under five.
- Directly linked to impaired brain development.

- Sharp, contrasting rise in childhood obesity across most countries globally.

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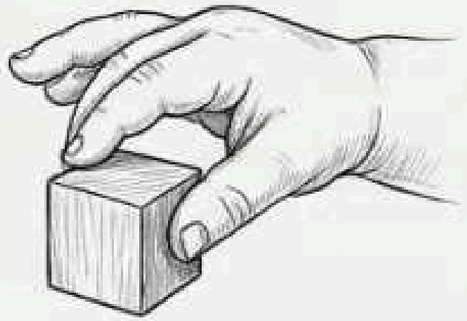
¶ 1.6

Development follows a predictable sequence, though exact timing varies.

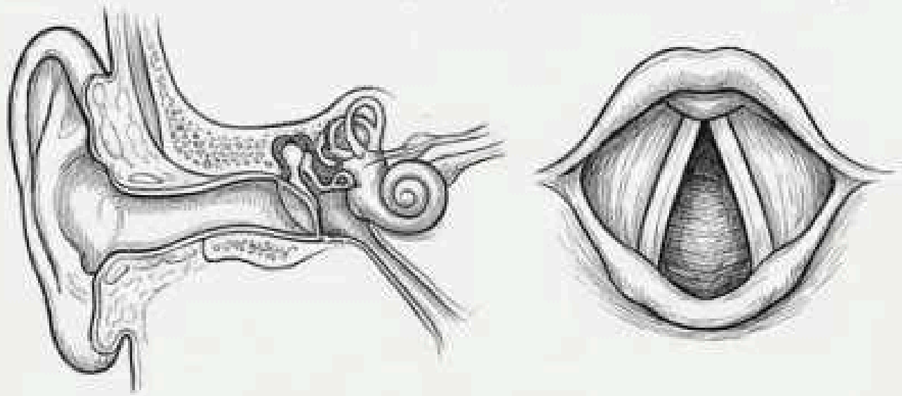
Gross Motor



Fine Motor & Vision



Speech, Language & Hearing



Social, Emotional & Behavioural



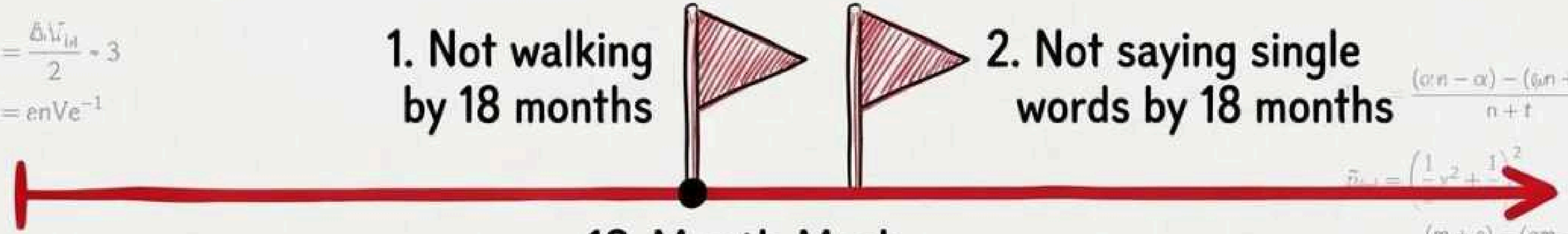
Social smile (~6 weeks) → Sit without support (~7–9 months) → Walk (~12–18 months)

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Limit Ages: The absolute maximum age by which a milestone MUST be achieved; failure warrants immediate clinical assessment.

¶ 1.7

ANY LOSS OF SKILLS ALREADY GAINED IS ALWAYS CONCERNING.

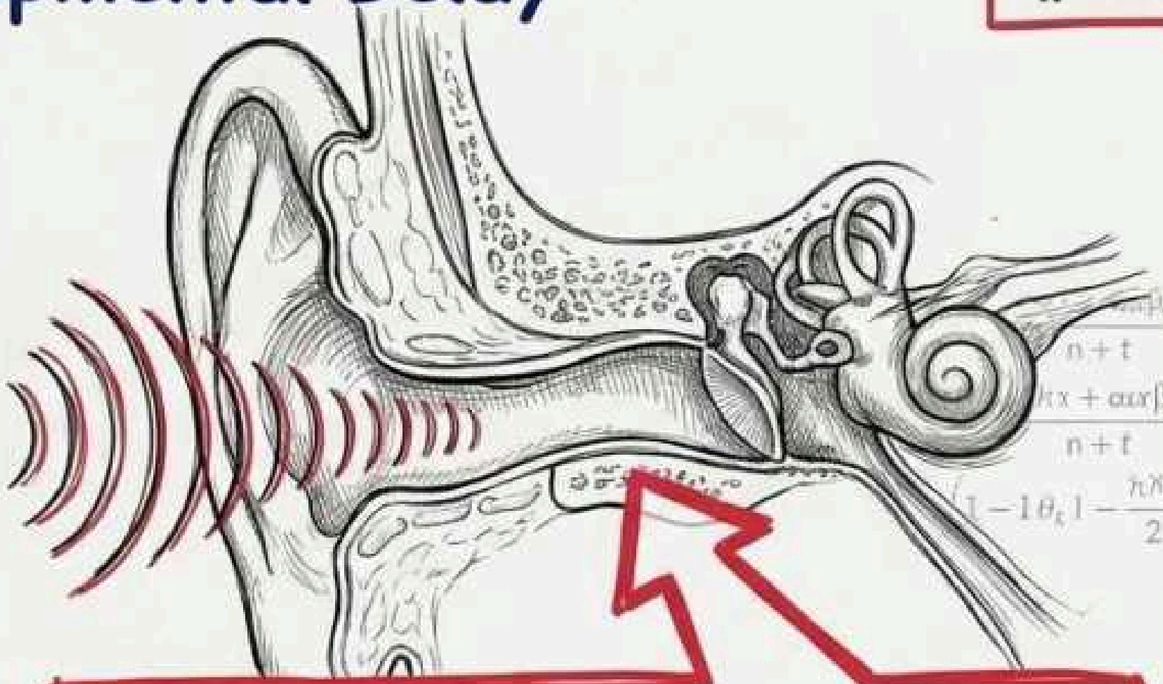


Causes of Developmental Delay

¶ 1.8

1.	Genetic Conditions	Down syndrome, Fragile X syndrome
2.	Pregnancy/Birth	Complications during gestation or delivery
3.	Infections	Pre/postnatal infectious diseases
4.	Environment	Severe deprivation

(Note: Delay can affect one area or many)



Always check hearing in delayed speech.

- Hearing loss is common and highly treatable.
- Many countries preemptively utilize newborn hearing screens.

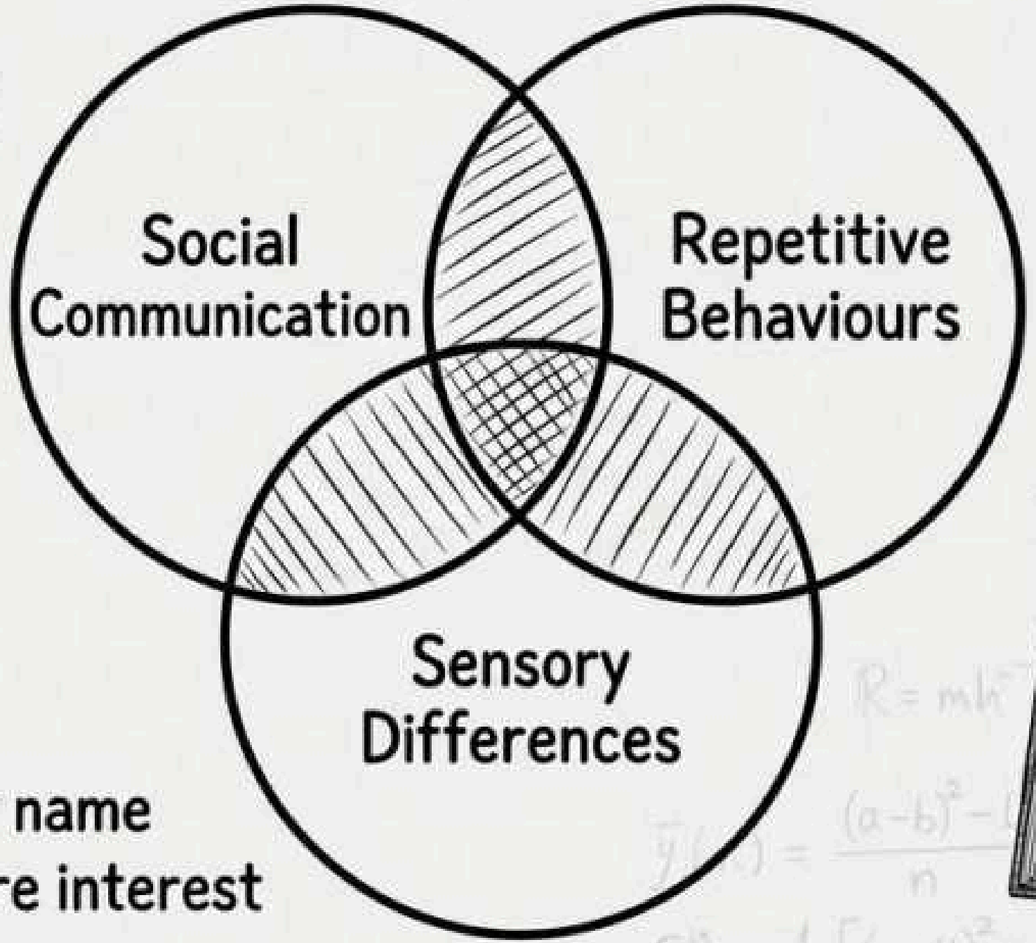
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¶ 1.9

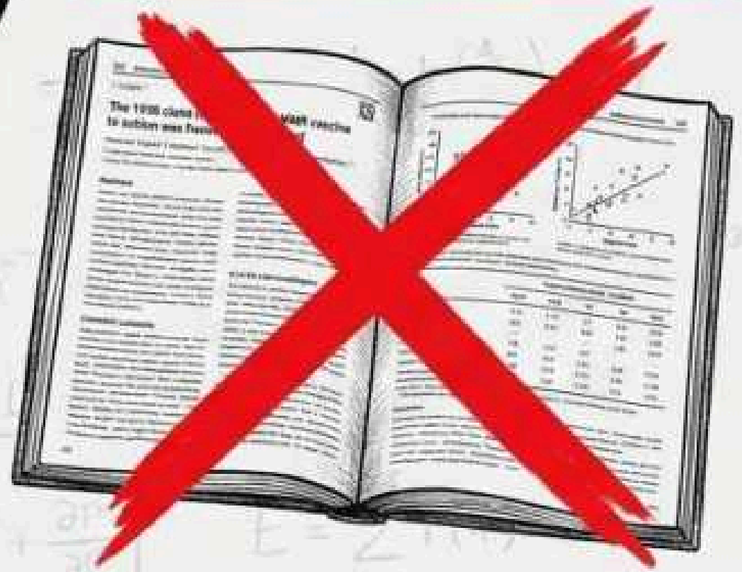
Autism Spectrum Disorder (ASD)

Prevalence: Affects ~1 in 100 children. Lifelong developmental condition.





The 1998 claim linking the MMR vaccine to autism was fraudulent and retracted. Large-scale studies confirm NO LINK.



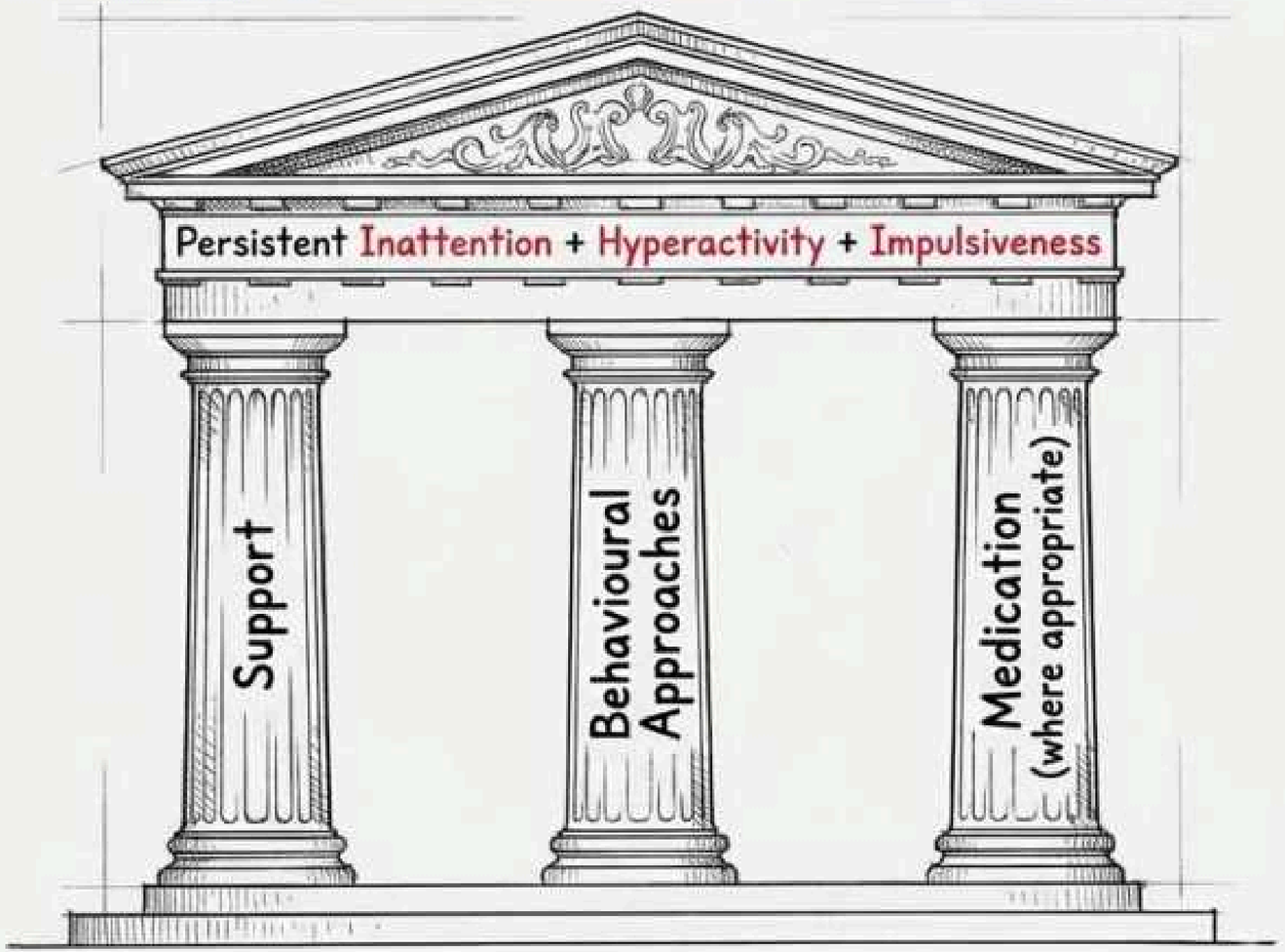
Early Signs:

- Limited eye contact
- Not responding to their name
- Lack of pointing to share interest

$$\sigma^2 = \sigma^2_{genetic} + \sigma^2_{environment}$$

¶ 1.10

Must affect functioning in more than one setting.
It is common and often persists into adulthood.

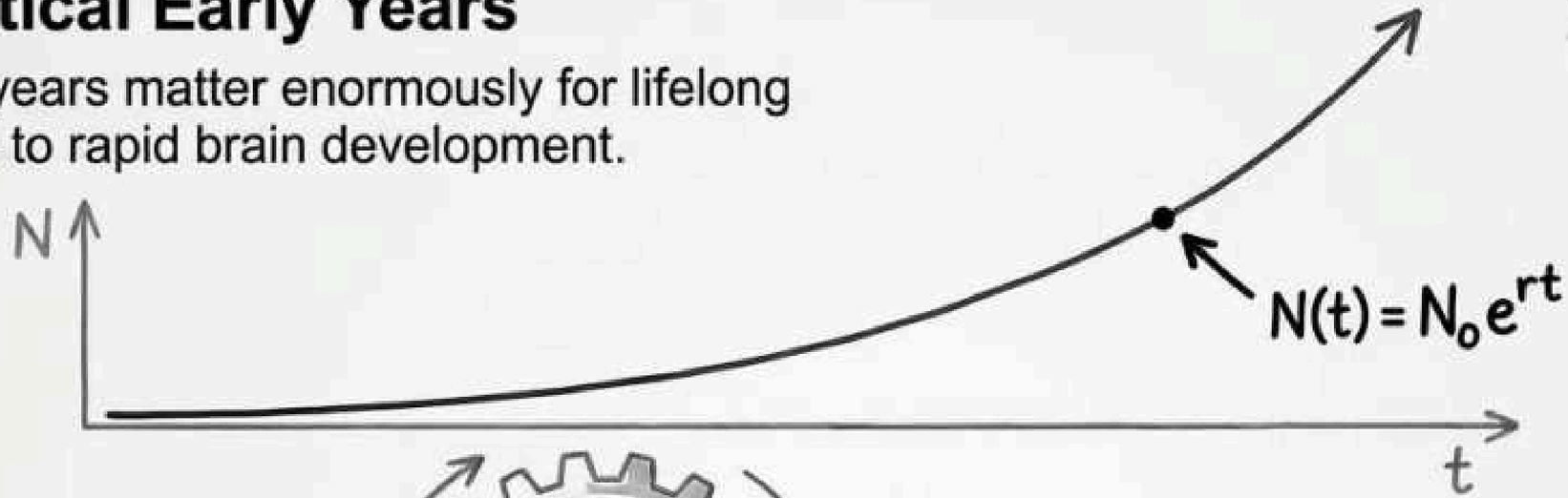


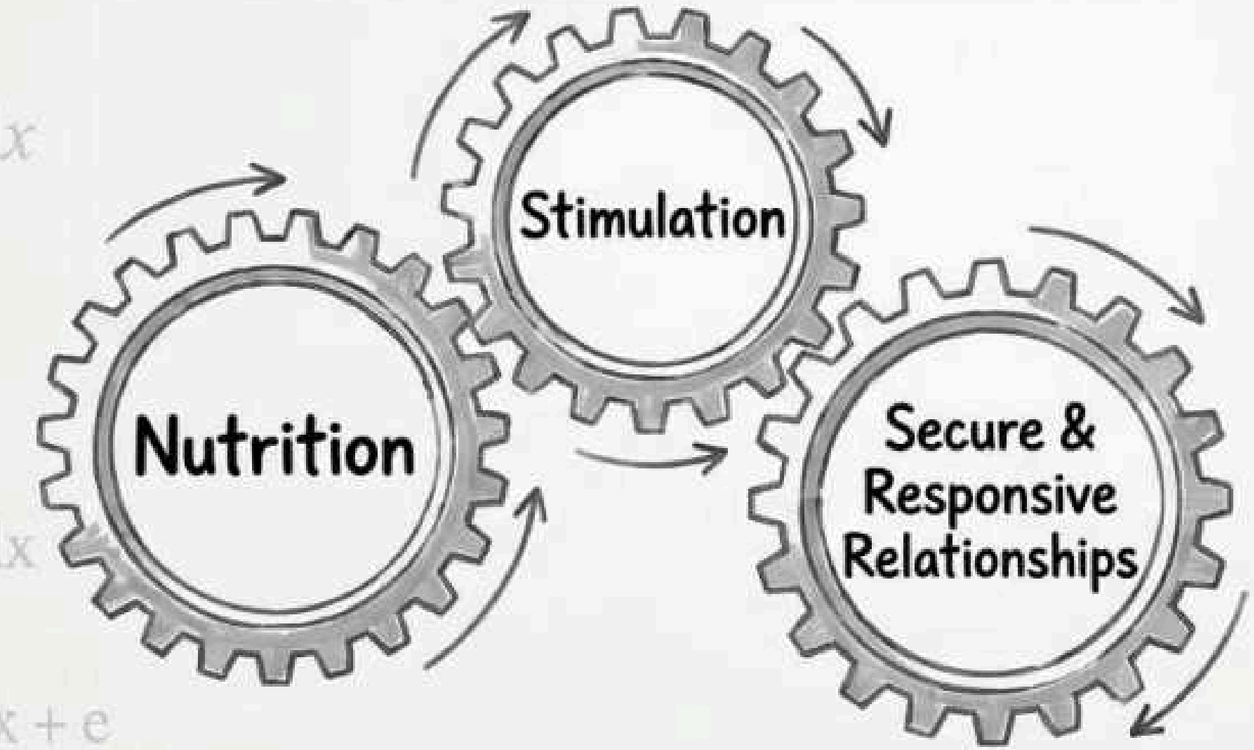
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The Critical Early Years

¶ 1.11

The early years matter enormously for lifelong health due to rapid brain development.





The ROI of Early Intervention

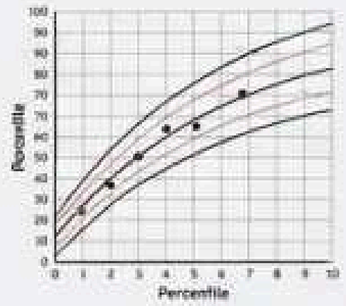
Programmes supporting parents and early education yield lasting, compounded benefits for: Health, Education, and Earnings.

Lecture Synthesis

¶ 1.12

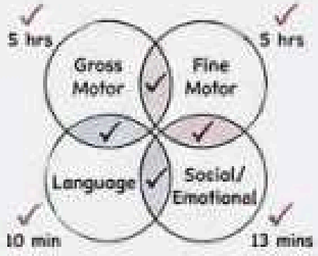
1. Physical

Growth is tracked on statistical charts over time.



2. Neurological

Development is assessed across four domains against expected expected milestones and strict limit ages.



3. Lifelong

Early Childhood acts as the foundational bedrock for lifelong health, education, and prosperity.



Next: The Newborn.

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