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How do Environmental Toxins Affect Children's Health?

¿Cómo las toxinas ambientales
afectan la salud de los niños?

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Objetivos

1. Describir los trastornos causados por los contaminantes ambientales
2. Relacionar la exposición ambiental con los efectos en la salud de niños
3. Describir cómo los niños son particularmente vulnerables

Objectives

1. To describe the conditions caused by environmental toxins
2. To relate the chemical exposures to health effects
3. To describe why children are especially vulnerable

¿Qué es la salud ambiental?

Es protección para los niños del peligro

1. Físico
2. Biológico
3. Socio-económico
4. Psicológico
5. Químico

Enfermedades ambientales

1. Asma
2. Cáncer
3. Desarrollo neurológico
4. La salud reproductora

Environmental Disorders

1. Asthma
2. Neurodevelopmental disorders
3. Cancers
4. Reproductive health
5. Immunological and endocrinological disorders

Asthma

Sulphur compounds

SO_2 , H_2SO_4 , H_2S

- coal fired power plants
- pulp and paper mills
- smelters

Asthma

NO₂, hydrocarbons

- motor vehicle emissions and diesel
- ice rinks, stoves, furnaces

Ozones, volatile organic compounds

- power plants
- gasoline
- motor vehicle emissions

Asthma

Perfumes, cosmetic sprays

Paint, cleaning agents

Pesticides - pyrethroids

Asthma

Environmental tobacco smoke

Building adhesives, insulation

Neurodevelopmental Disorders

1. ↓IQ, learning difficulties
2. ADHD, behavioral disorders

Neurodevelopmental Disorders

1. Heavy metals Pb, Hg, Mn
2. Persistent organic pollutants
- PCB's
3. Environmental tobacco smoke

Neurotoxins

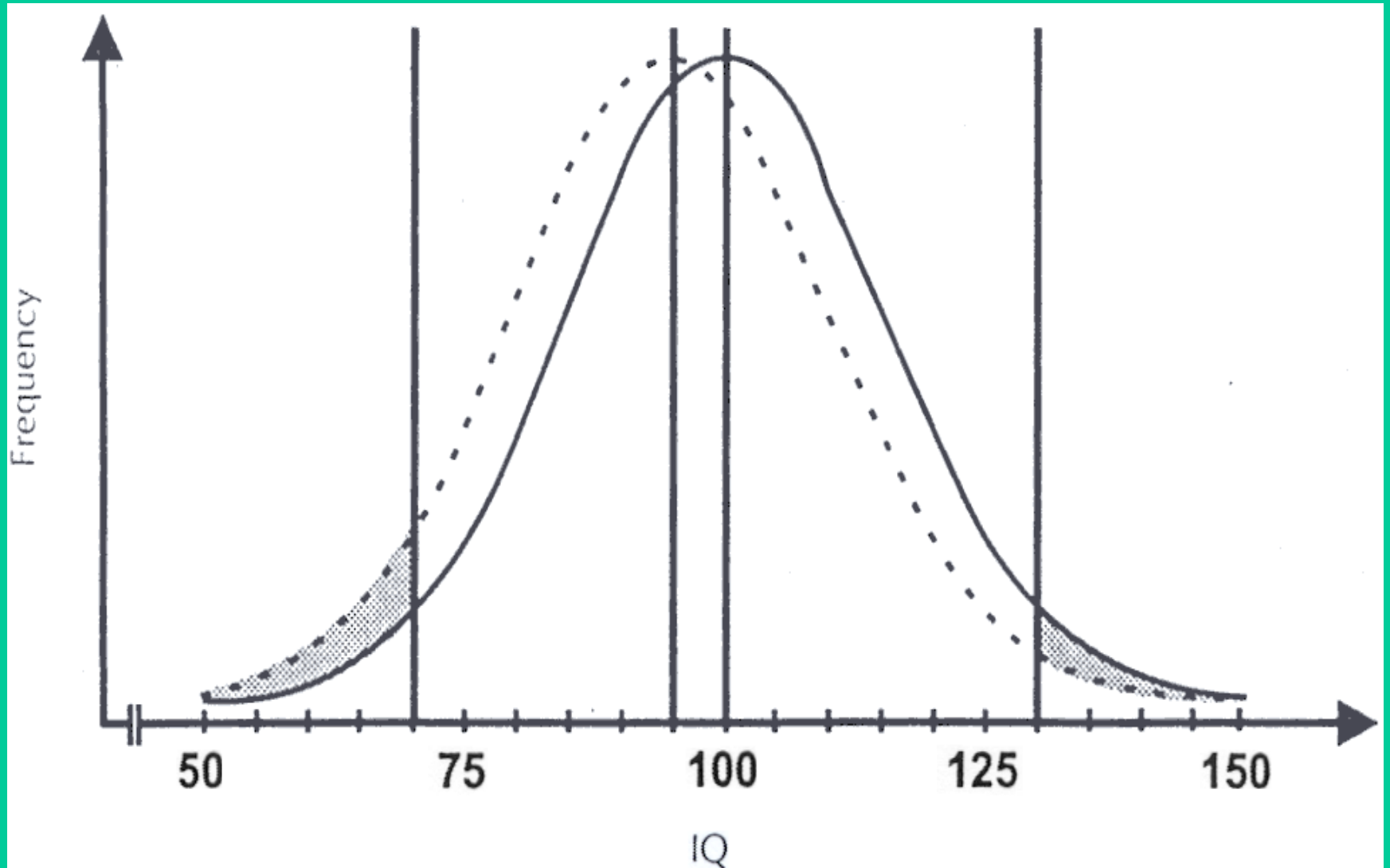
Insecticides

Organophosphates - parathion
- chlorpyrifos

Carbamates - aldicarb
- benzpyrinium

Organochlorines - chlordane
- DDT
- Lindane

Normal Distribution of IQ with a Mean of 100 (solid curve) and Decreased by Five Points (dashed curve)



Cancers

Environmental tobacco smoke

Asbestos, silica

Benzene

Pesticides

Endocrine disruptors - DDT, PCB's

Arsenic, cadmium nickel salts

Cancers

Aflatoxins

Medications

Viruses

Reproductive Health

1. Infertility
2. Spontaneous abortions
3. Premature & stillbirth
4. Congenital anomalies

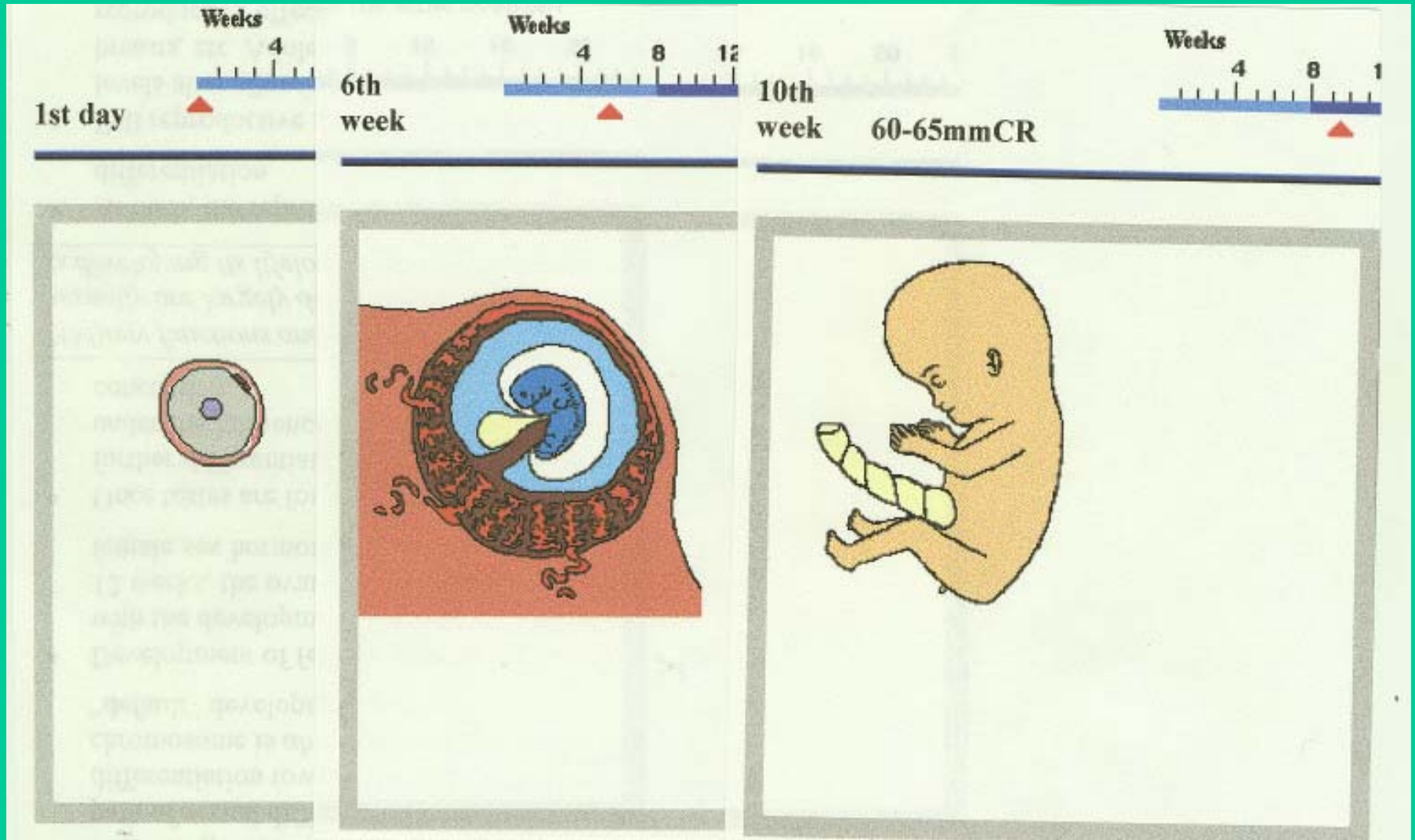
Immunological/Endocrinological

1. Susceptibility to infections
2. Diabetes

¿Cómo son vulnerables los niños?

1. Crecen rápidamente
2. Se desarrollan mucho

Pathways of Exposure



Child Development

Preconception

2 generations

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Conception

continuous

critical

complex

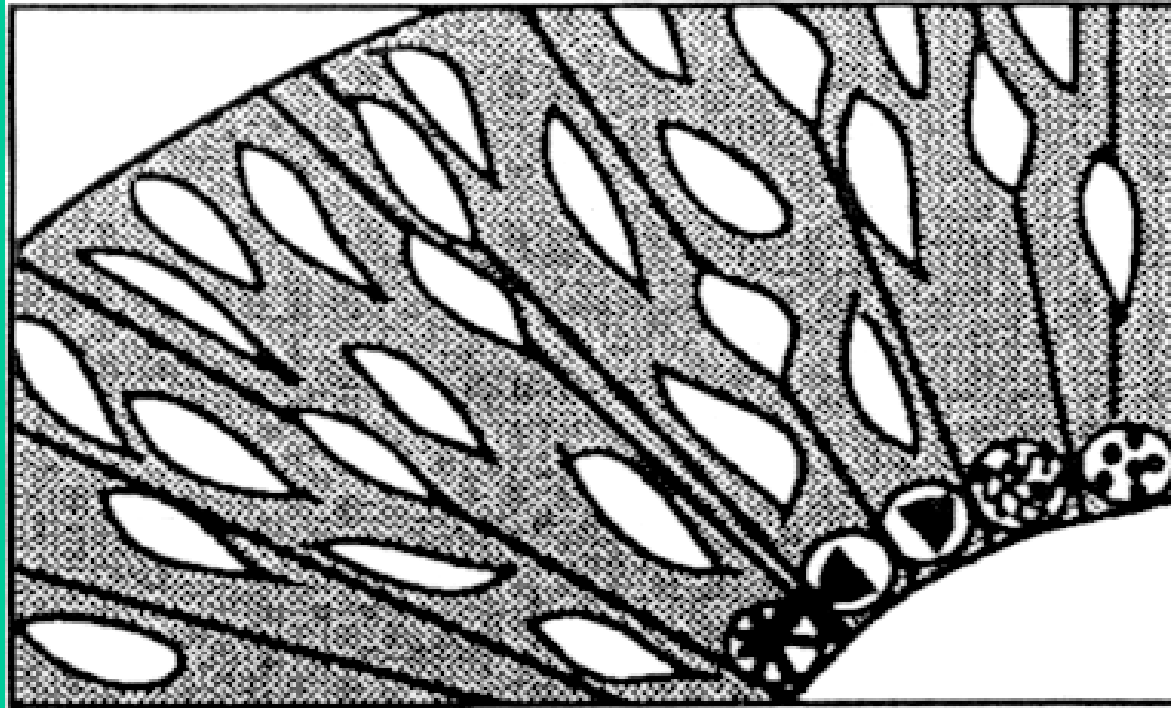
Adolescence

delicate

...steps

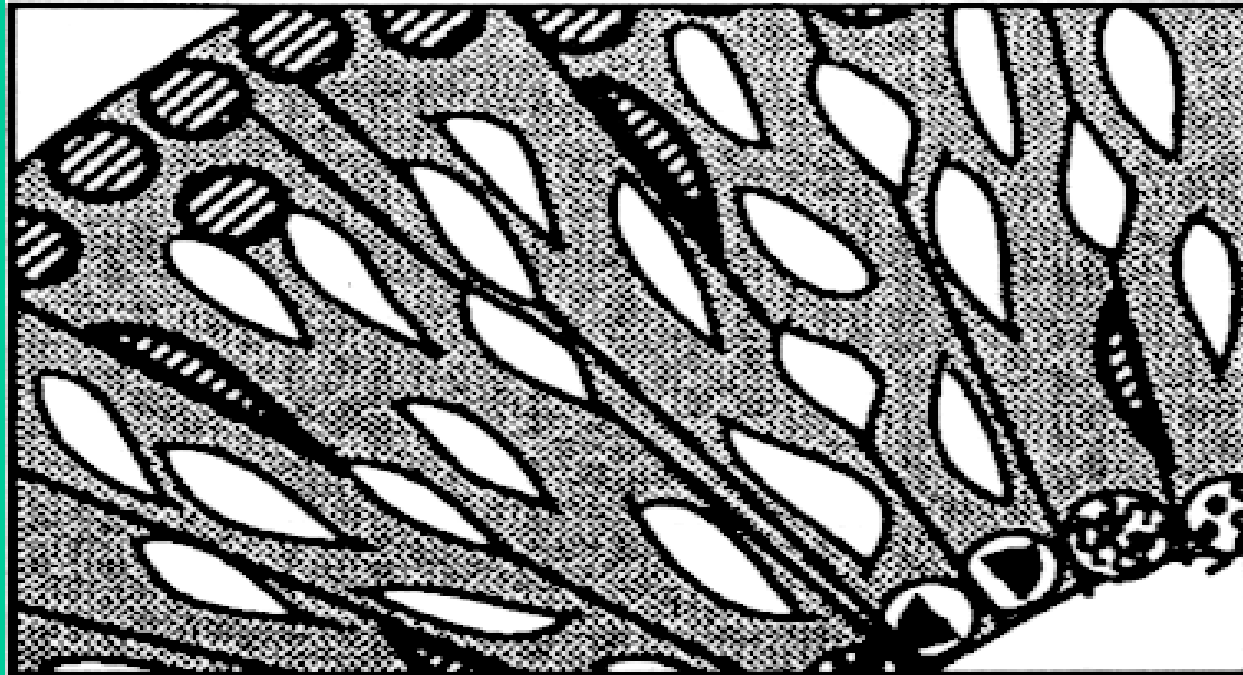
Neurodevelopmental Processes

Proliferation



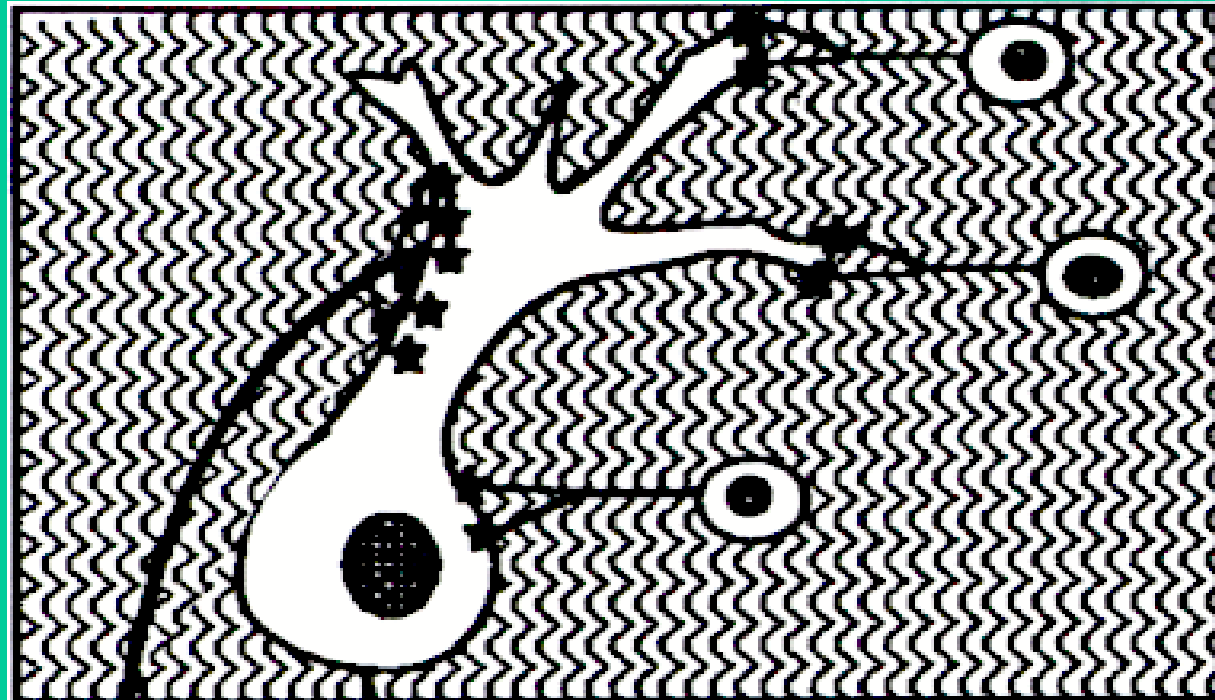
Neurodevelopmental Processes

Migration



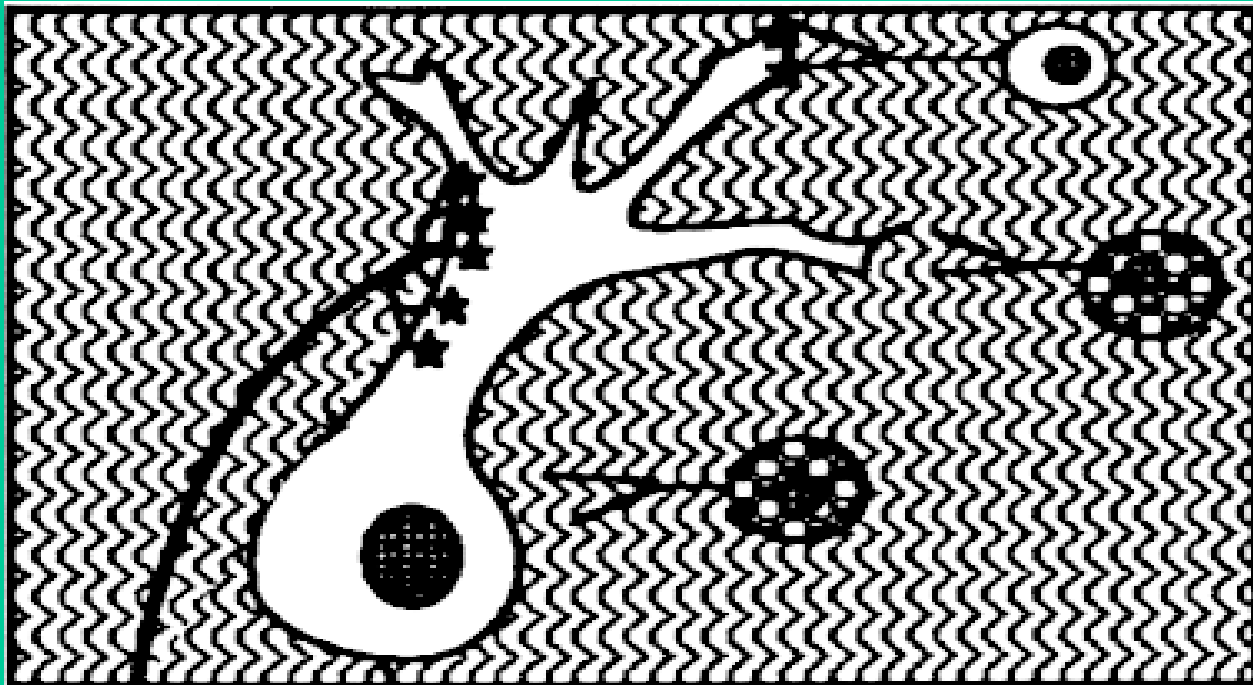
Neurodevelopmental Processes

Synaptogenesis



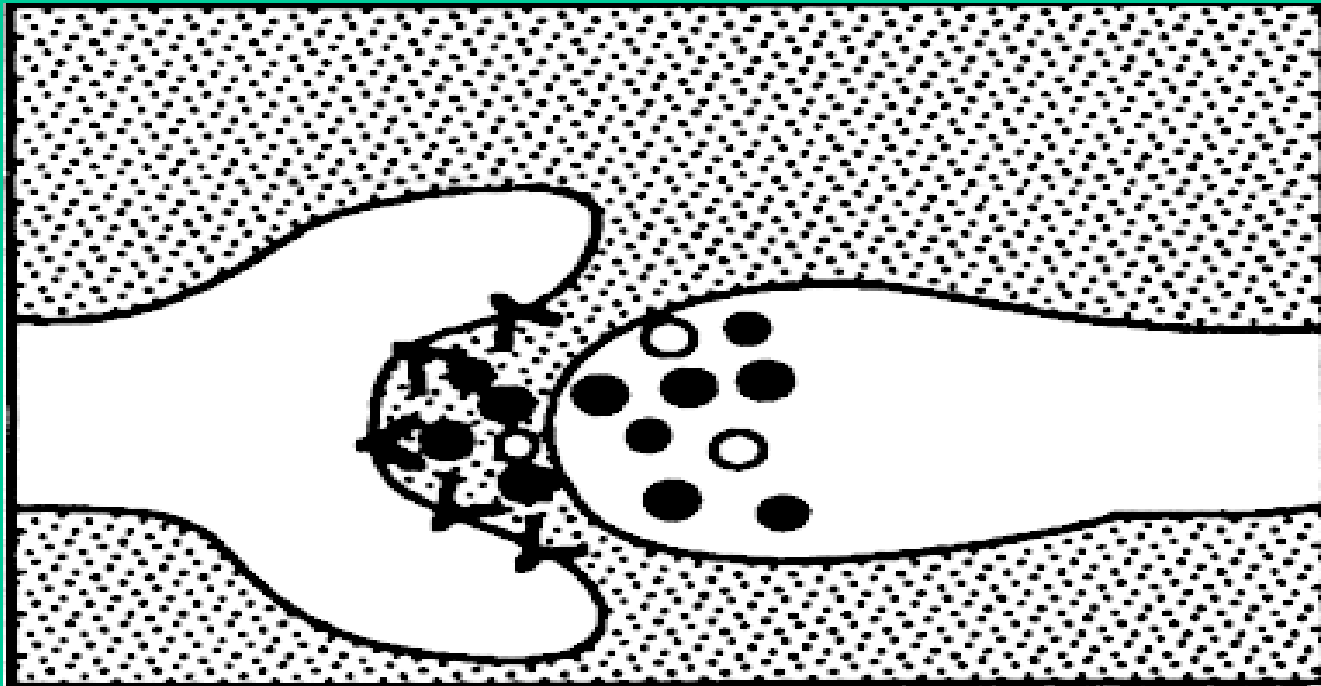
Neurodevelopmental Processes

Cell Death



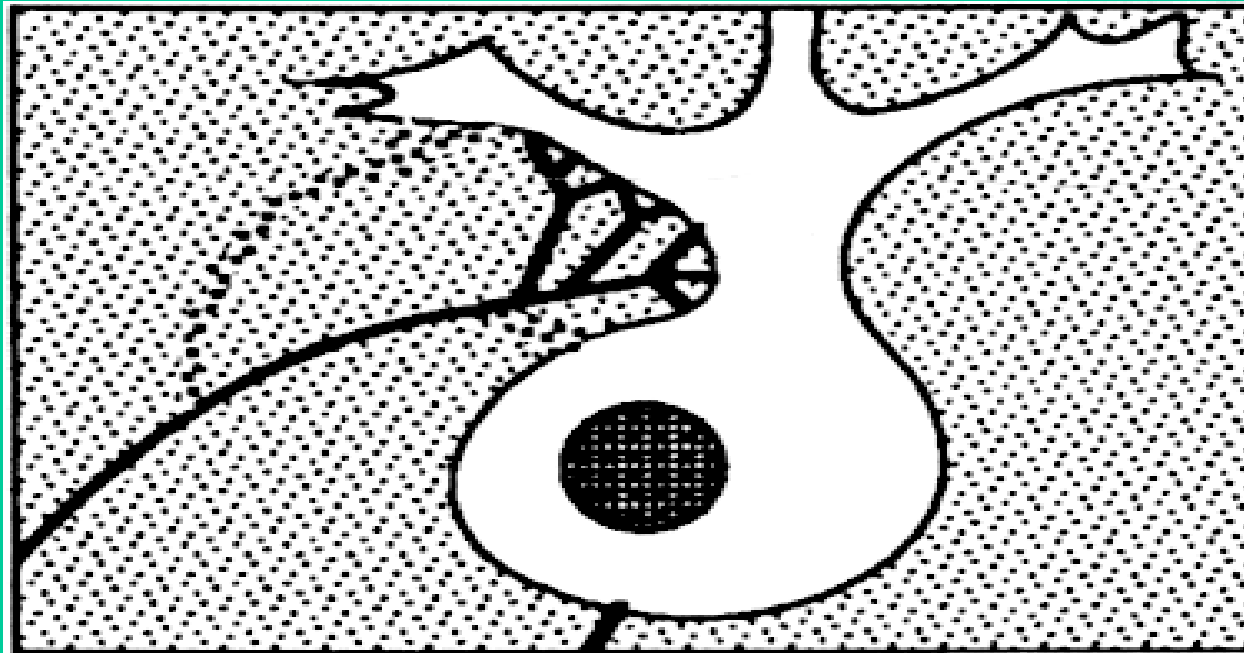
Neurodevelopmental Processes

Transmitters and Receptors



Neurodevelopmental Processes

Trimming of Connections



Los niños tienen

1. Ambientes diferentes
2. Fisiología única
3. Conductas extraordinarias









Infant Developmental Physiology

- ↑ surface to vol^e ratio - skin permeable
- ↑ metabolic rate
- ↑ O₂ consumption

- ↑ lung absorption
- ↑ GI absorption
- degradation pathways
- ↓ renal excretion
- ↓ blood brain barrier

Infant Developmental Physiology

↑ H₂O intake

(infant 150 mls/kg/day)

(adult 2-3 L/day)

↑ calories/kg/day

- limited dietary variety





Neurobehavioral Stages

- hand to mouth activity
- play, fun
- limited judgment









Conclusion

If we set our standards to ensure healthy children - we shall be exercising caution!

Finalmente

Proteger a los niños es nuestra inversión para el futuro. Los niños son el recurso más precioso.

POLITICAL SUPPORT

SCIENCE

**Science is essential but
not sufficient**

INTEREST GROUPS

AGENCY SPONSORSHIP

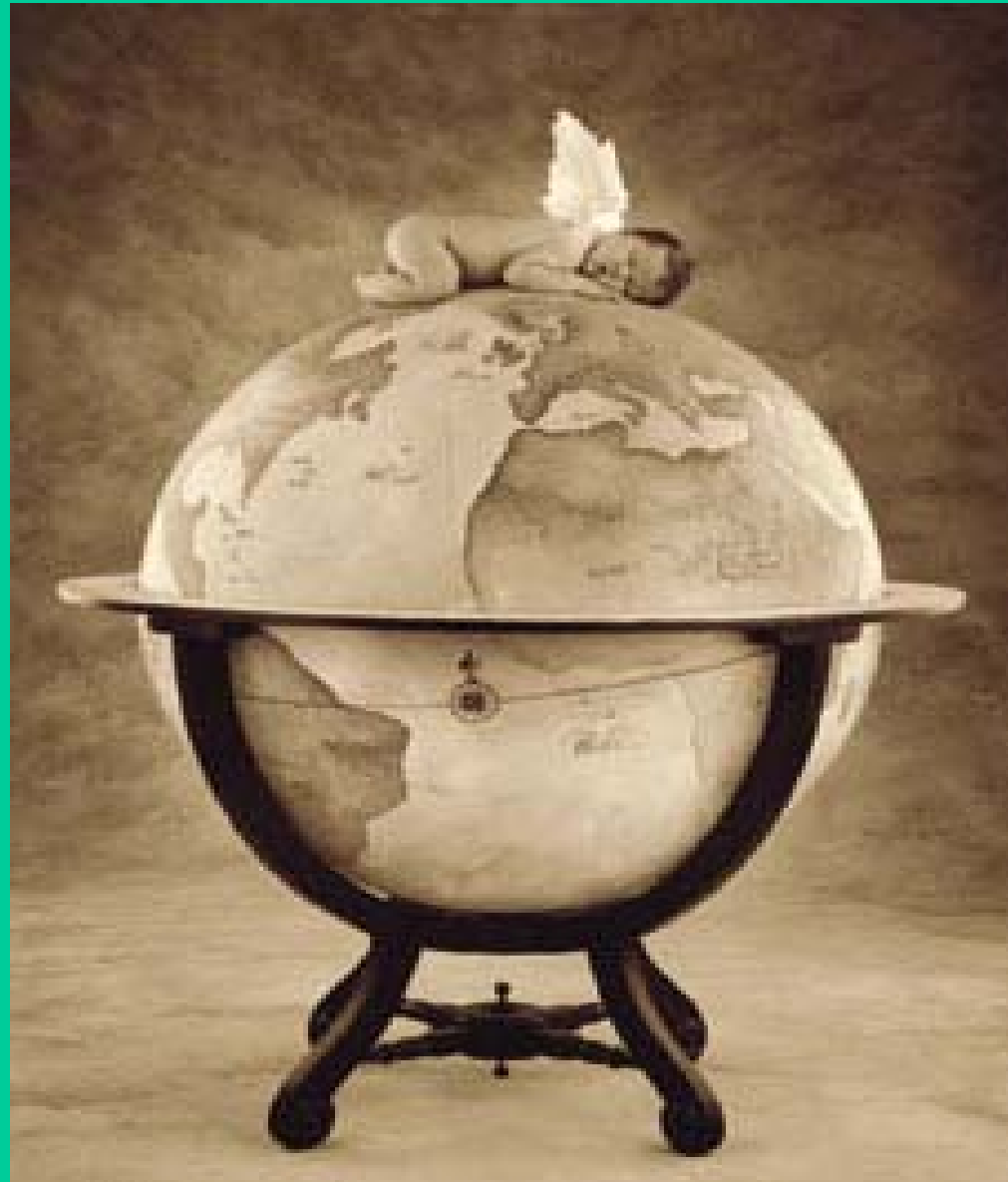
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Local Communities**

Professional Groups





















100 SHOTS





















WEB SHOTS























