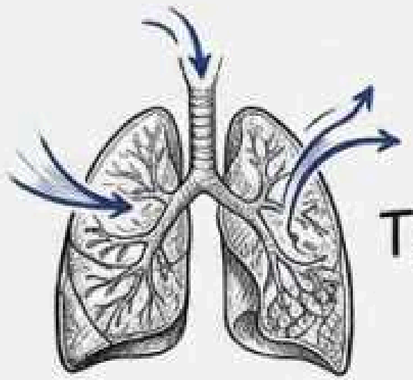
LECTURE 2: THE NEWBORN

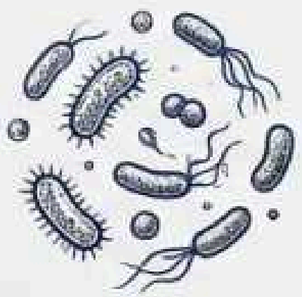
MED 543 B



TRANSITION



SIDS



INFECTION



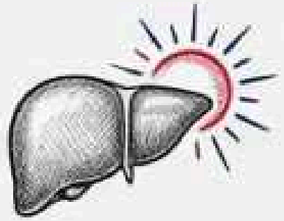


RESUSCITATION

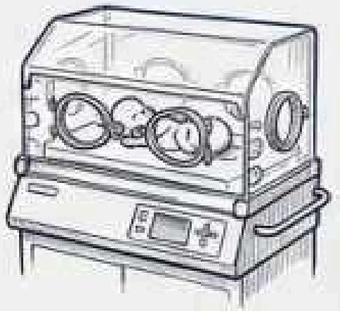
SCREENING



JAUNDICE



PRETERM



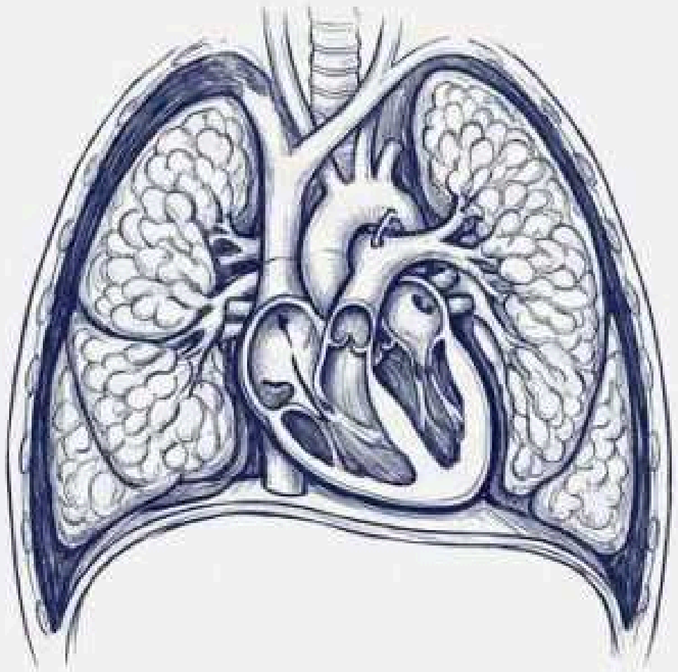
"At a glance: The critical journey from birth to stabilization."

Gemini Notebook

Most babies manage this remarkable transition without help.

¶ 2.1

In Utero

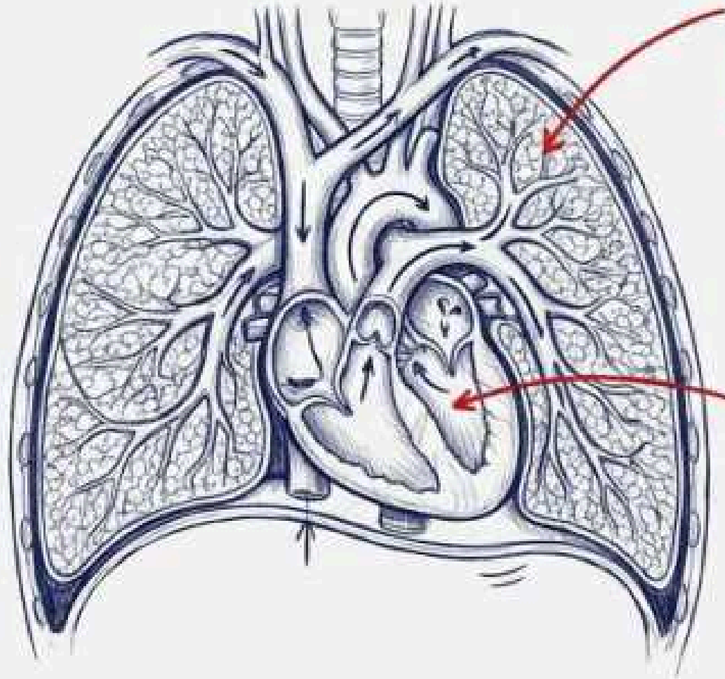


THE REMARKABLE TRANSITION

$Glucose_{neonatal} \geq 2.6\ mmol/L$

$T_{core} = 36.5° - 37.5° C$

At Birth



Lungs: Fill with air for the first time.

Circulation: Reorganises; pulmonary blood flow surges.

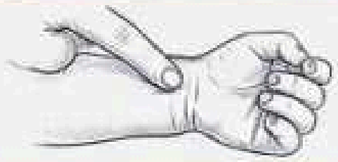
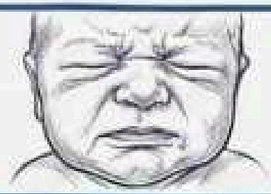
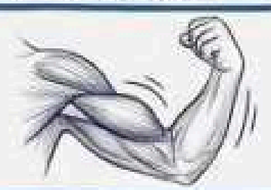
Gemini Notebook

The Apgar Score (Devised by Dr. Virginia Apgar, 1952)

¶ 2.2

Summarises how well the baby is adapting.

t = 1 min
and
t = 5 min

	Appearance (colour)	
	Pulse	
	Grimace (reflex response)	
	Activity (muscle tone)	
	Respiration	

$$\sum (A+P+G+A+R) = \text{Total Score (Max 10)}$$

Gemini Notebook

¶ 2.3

1:10 need help

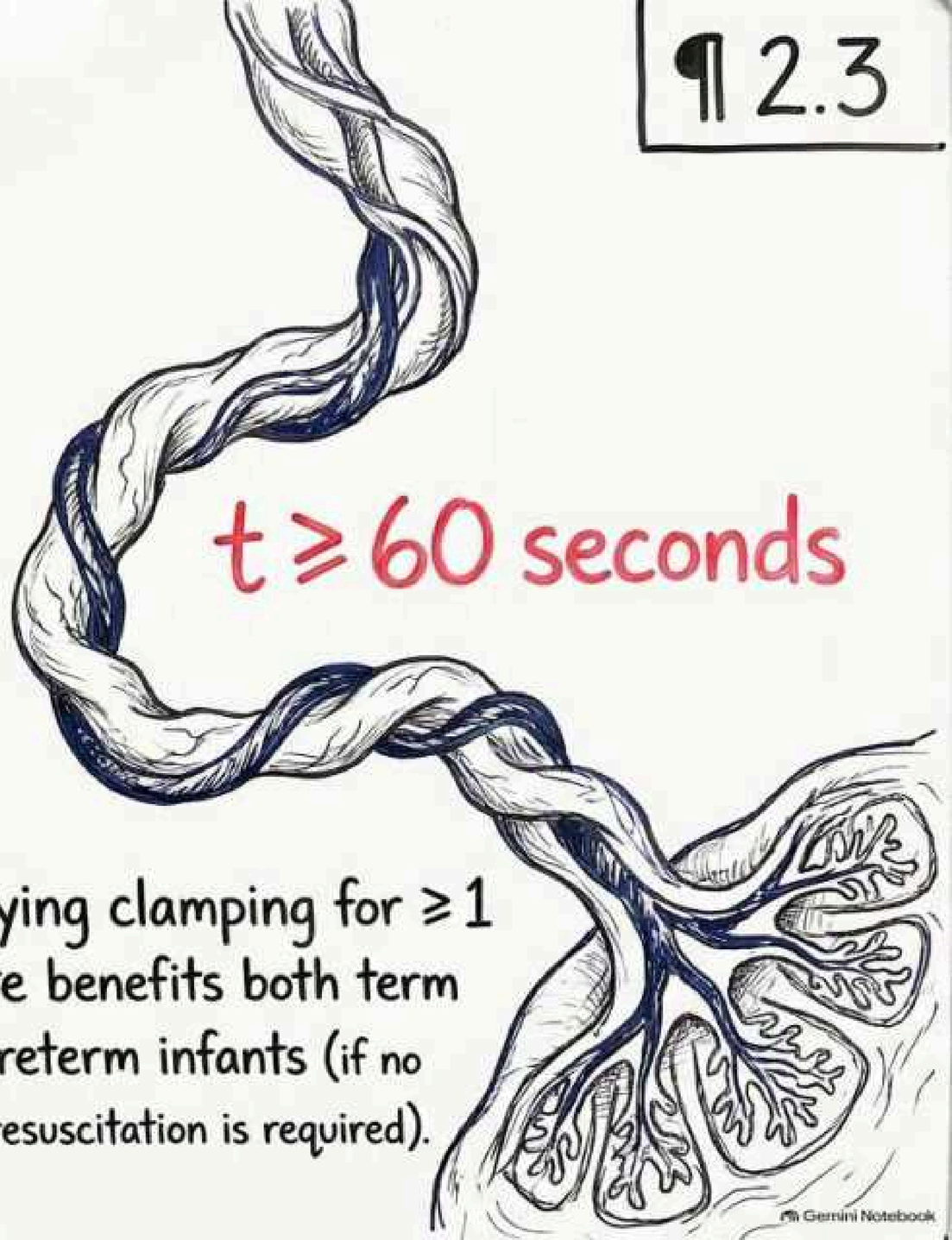
<1% need extensive resuscitation

Keep Warm

Open Airway

Inflate Lungs

Most babies respond to effective breaths alone.

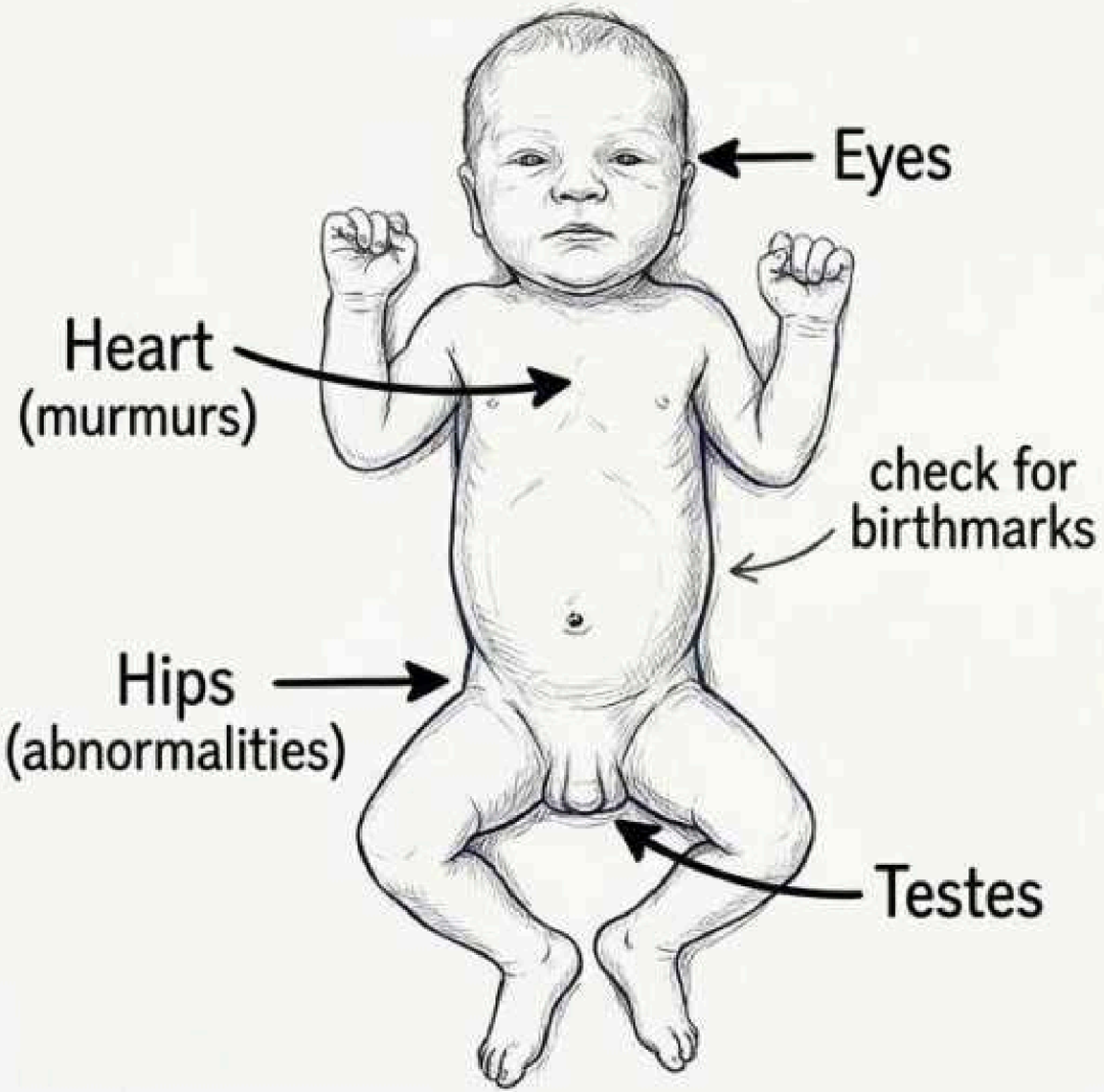


Delaying clamping for ≥ 1 minute benefits both term and preterm infants (if no immediate resuscitation is required).

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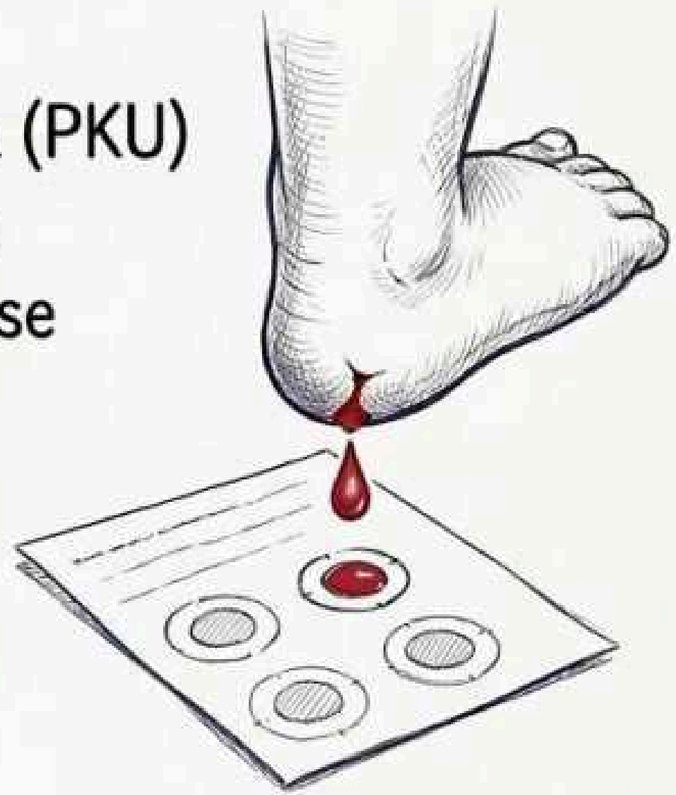
Physical Exam (First days of life).

¶ 2.4



Newborn Blood Spot Test screens for:

- Phenylketonuria (PKU)
- Hypothyroidism
- Sickle cell disease
- Cystic fibrosis

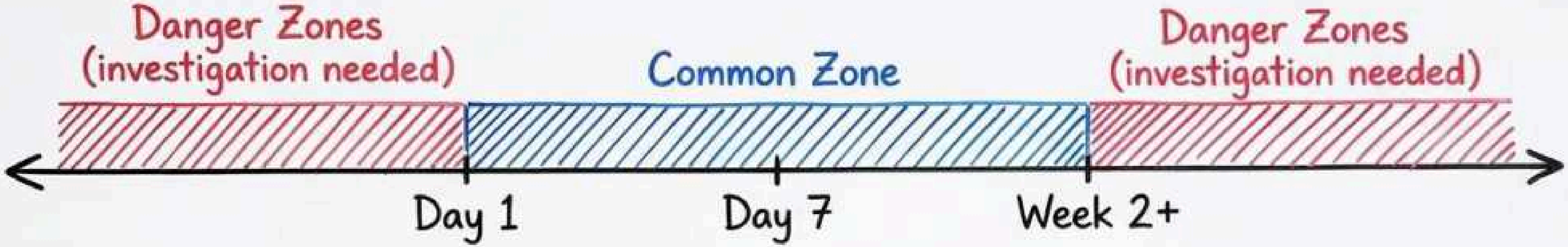


All conditions are treatable if detected early.

Devised by Robert Guthrie (early 1960s).

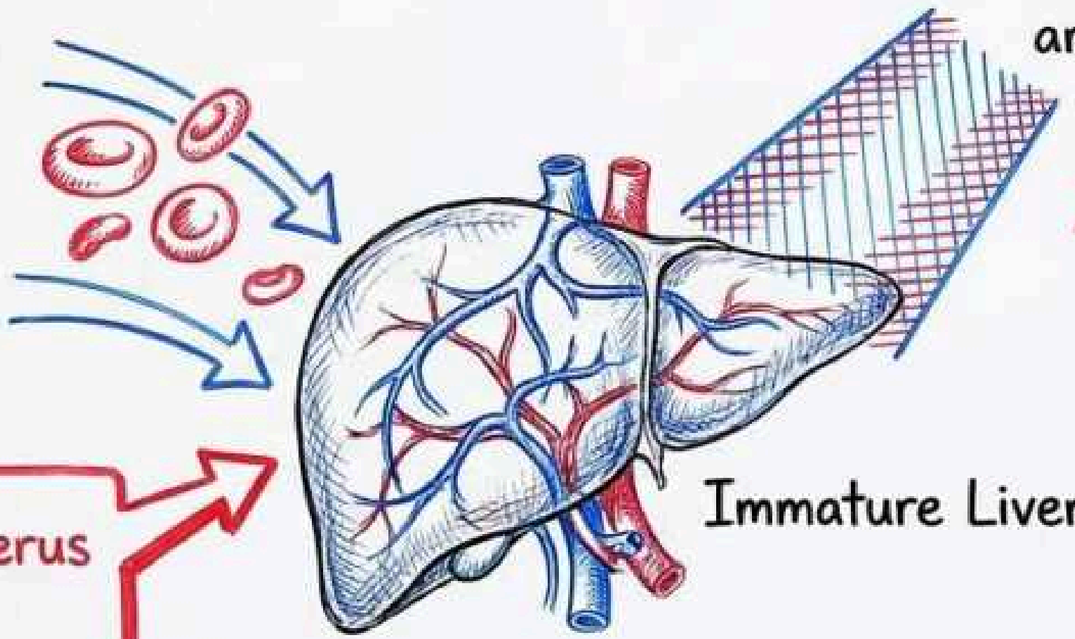
Gemini Notebook

¶ 2.5



Rapid red cell breakdown
+
Immature liver
=
Bilirubin buildup
(yellowing of skin/eyes).

Very high levels → Kernicterus
(brain damage).



Phototherapy: Most cases are harmless and settle.

$\lambda \approx 460\,\text{nm}$

Gemini Notebook

Preterm = Gestational Age (GA) < 37 weeks

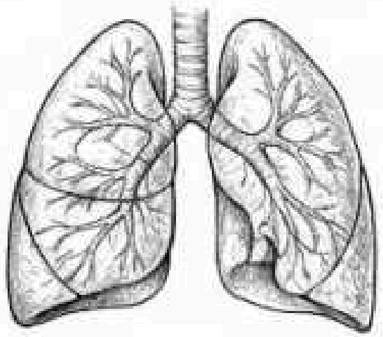
$$\text{Risk} \propto \frac{1}{\text{Gestational Age}}$$

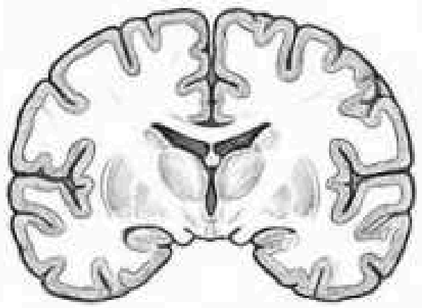
¶ 2.6

The earlier the birth, the greater the risks.

Risk Distribution

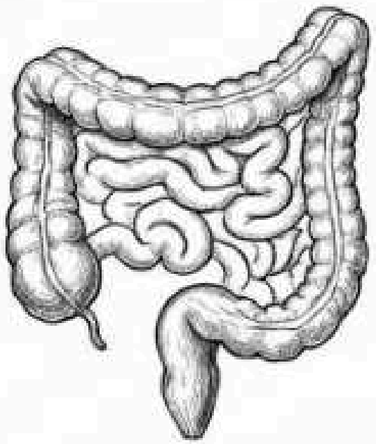
Lungs
(immature / breathing difficulties)

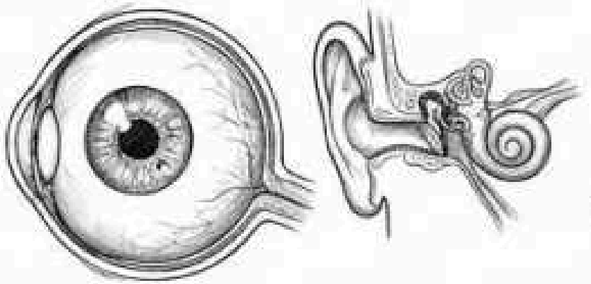




Brain
(risk of bleeding)

Bowel
(necrotising enterocolitis)





Eye/Ear
(long-term vision/hearing/development)

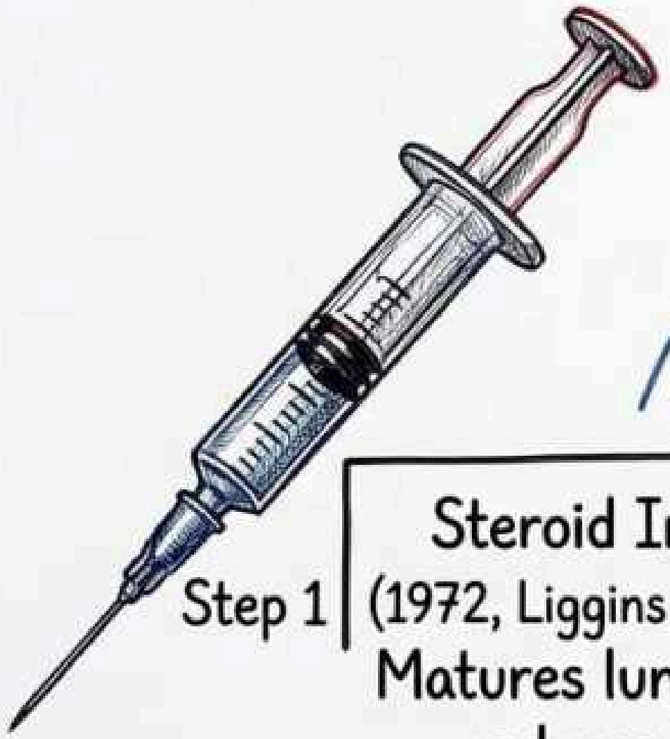
The leading cause of death in children under five worldwide.

Gemini Notebook

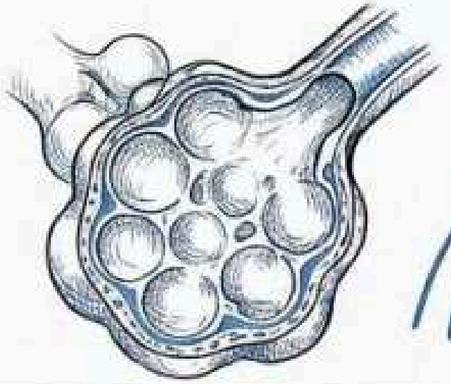
ADVANCES TRANSFORMING PRETERM SURVIVAL.

¶ 2.7

Milestones of Survival



Step 1 Steroid Injections (1972, Liggins & Howie, NZ). Matures lungs; greatly reduces deaths.



Step 2 Surfactant (1990s). Keeps air sacs open.

$$P = \frac{2\gamma}{r}$$

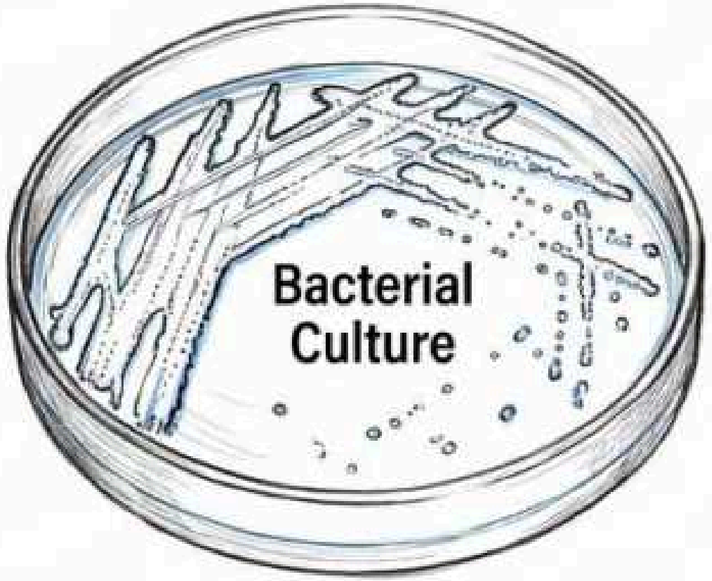


Step 3 Kangaroo Mother Care. Vital where incubators are scarce.

Gemini Notebook

¶ 2.8

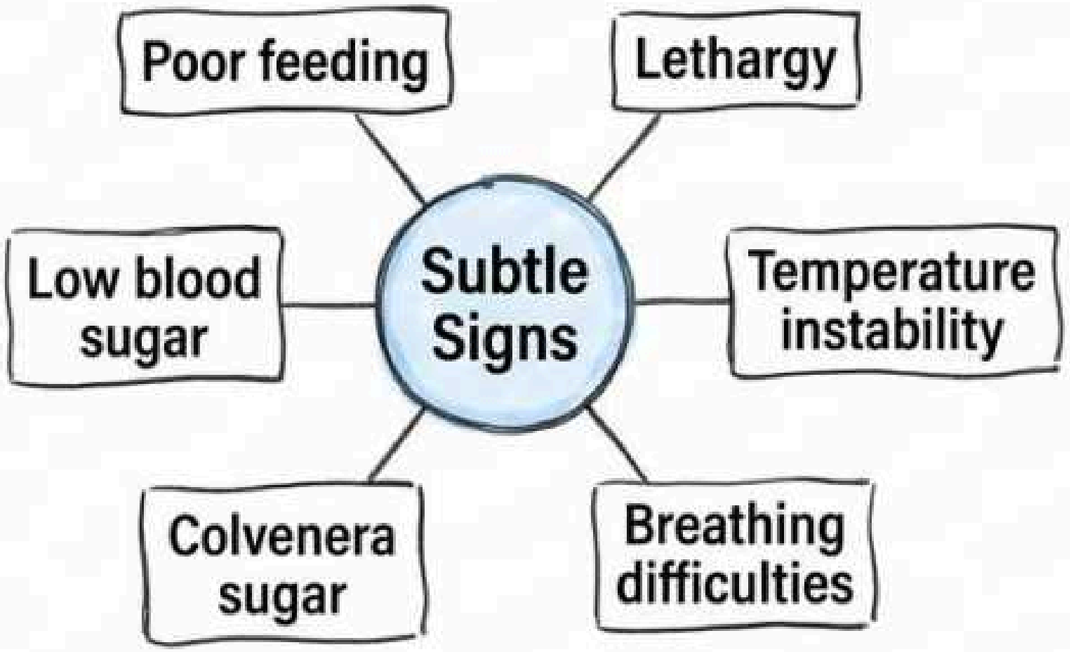
Microscopic Cause



Group B Streptococcus (GBS)

Prevention: Antibiotics during labour for known GBS-carrier mothers.

Macroscopic Symptoms



Infection progresses rapidly.

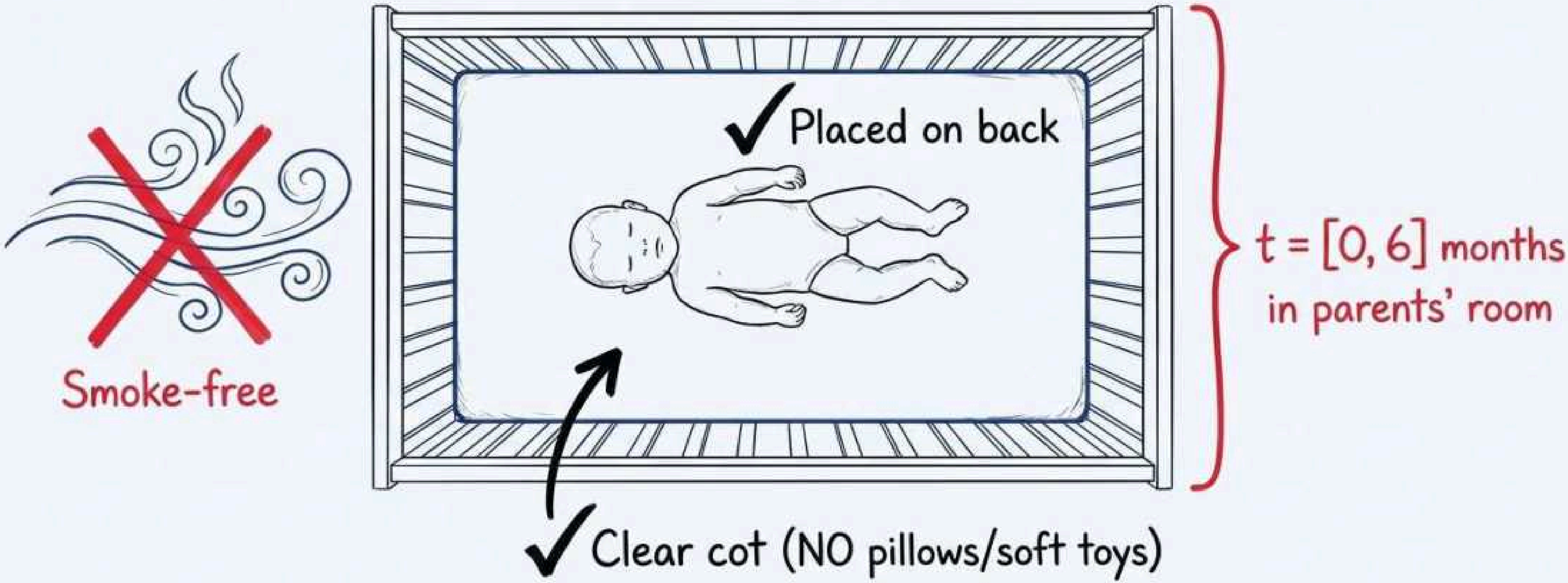
Treatment: Any newborn with signs is treated promptly with antibiotics.

Gemini Notebook

¶ 2.9

Sudden infant death syndrome: unexplained death of an apparently healthy baby during sleep.

Dramatic drop following early-1990s campaigns (Back to Sleep).

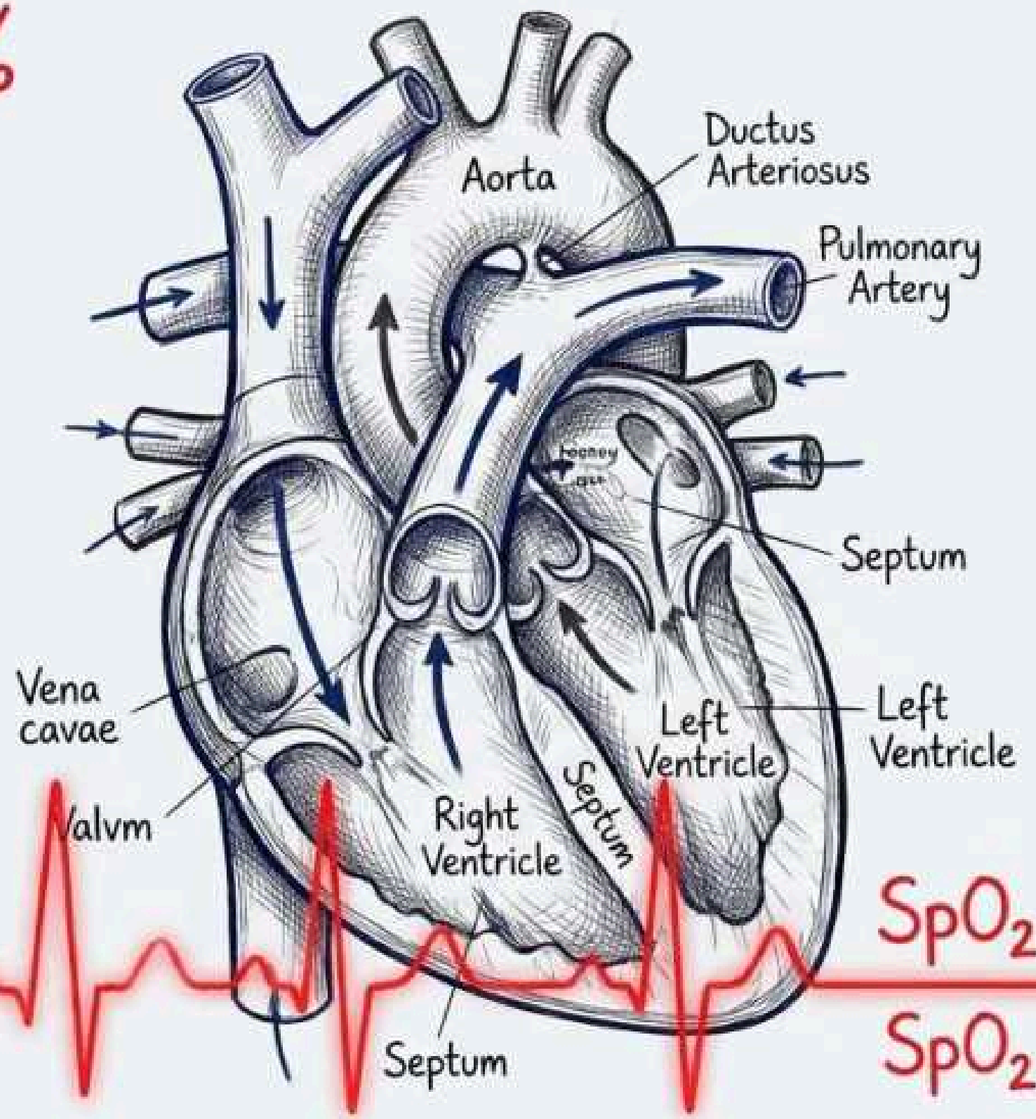


Gemini Notebook

¶ 2.10

$\frac{1}{100}$ babies = 1%

Detection:
Pregnancy scans
OR
pulse oximetry
screening.



Clinical Signs:
Murmur,
breathlessness,
poor feeding,
blueness (cyanosis).

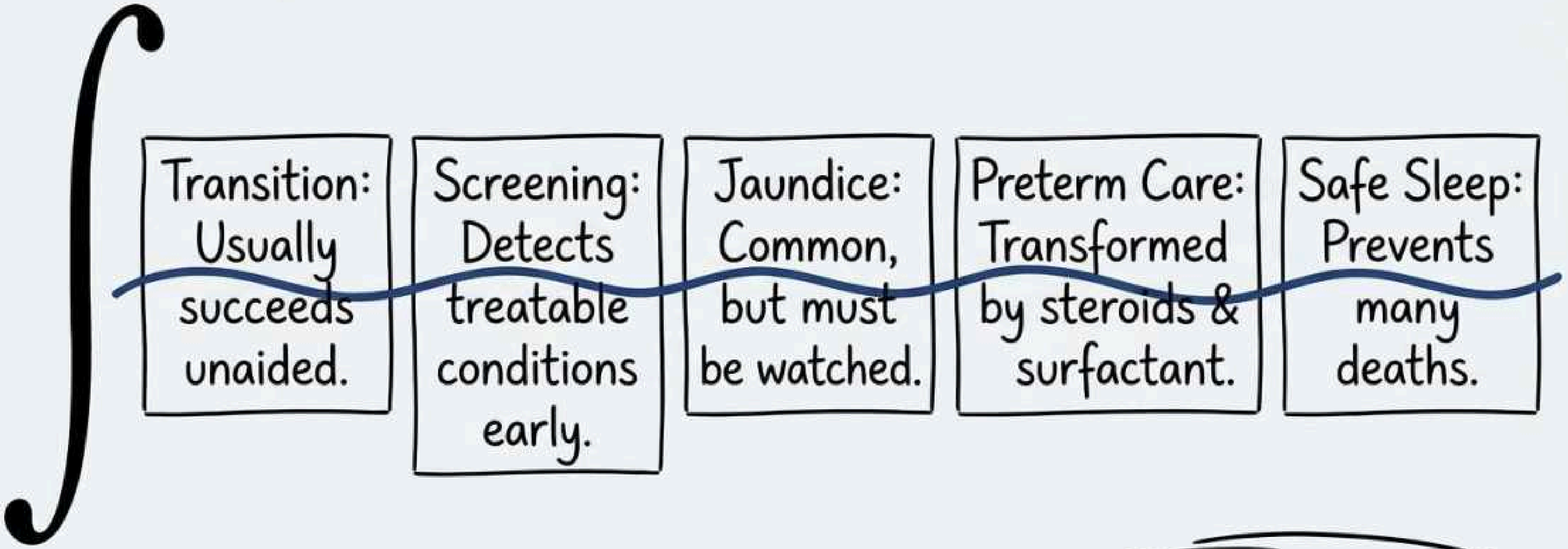
SpO_2 screening

SpO_2 screening

Prognosis: Many serious defects can now be repaired, often in infancy.

Gemini Notebook

¶ 2.11



→ Next Lecture:
The acutely unwell child.

Gemini Notebook