Role of Pediatricians in the Delivery Room: when and why?

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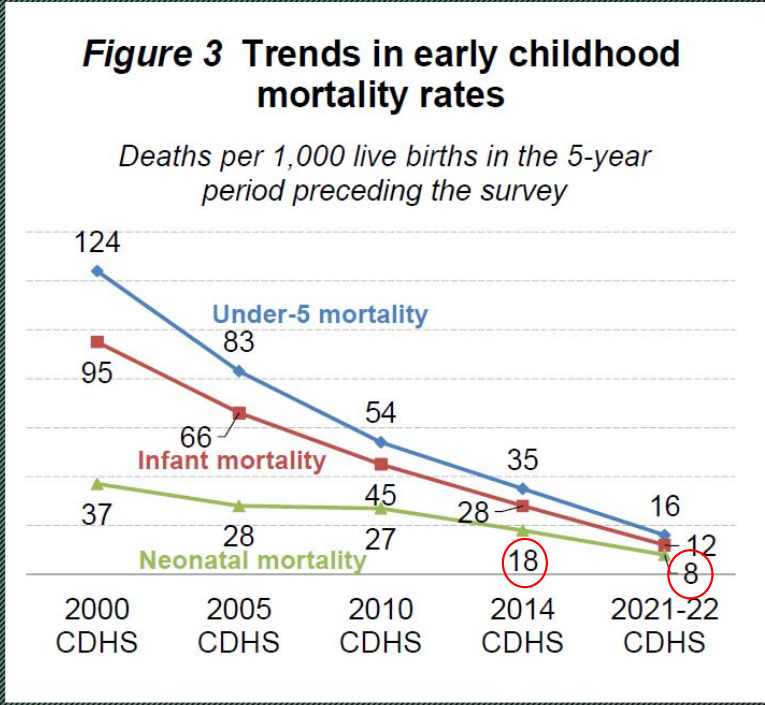
Objectives

1) To demonstrate the Actuality of Neonatal Mortality in Cambodia
2) To discuss how/where to improve newborn health
3) To demonstrate the Role of Pediatrician: why we are important or more important in the modernized Cambodia?

1) Actuality of Neonatal Mortality in Cambodia

Cambodia: Neonatal mortality decreases!



Cambodia Demographic and Health Survey. 2021-2022.

- Definition:
  - Neonatal mortality : Death <1 month of age
  - Infant : Death <1 year

↘ from 18 (2014) to **8 per 1000 live births** (2021)

The 2030 Agenda for Sustainable Development (SDG)

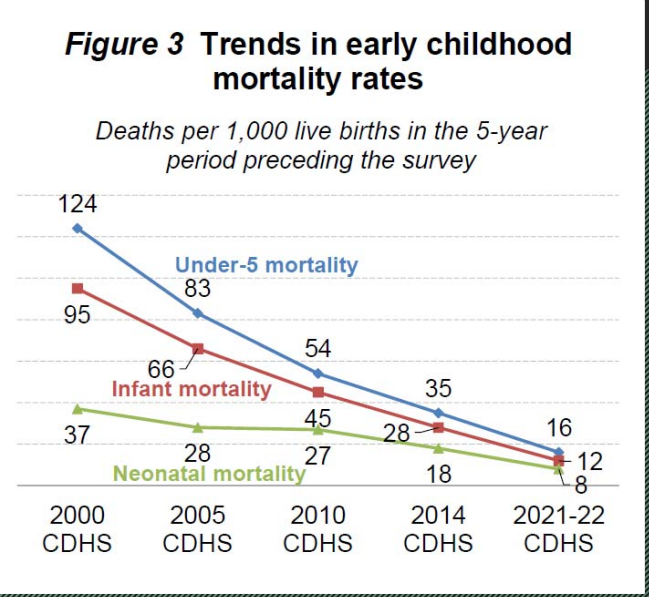
United Nations Development Program (UNDP)

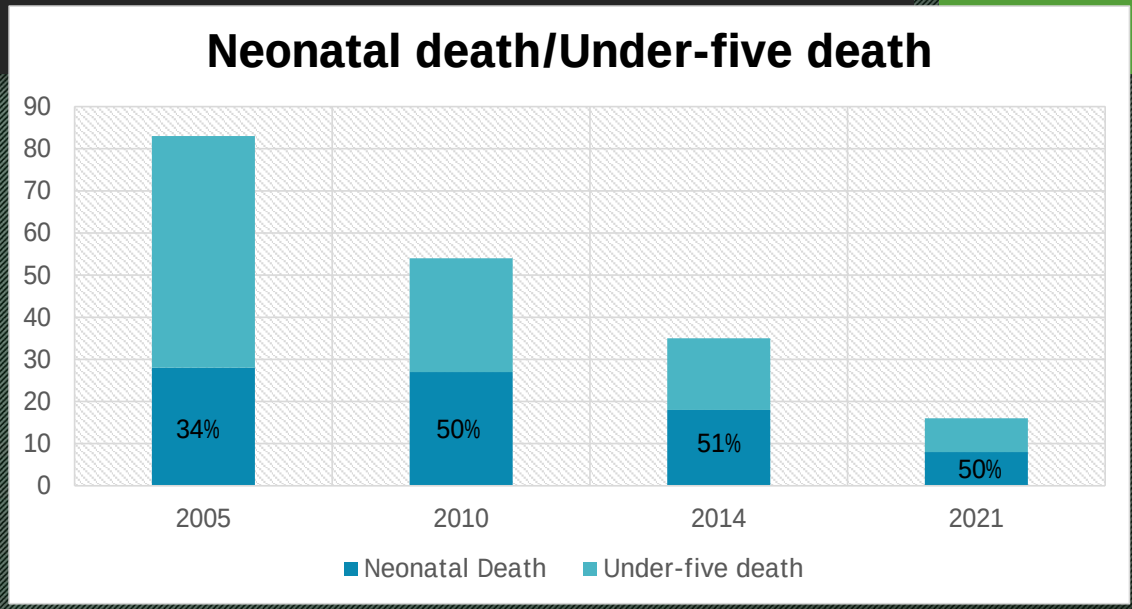
Ensure healthy lives and promote well-being for all at all ages

Ensuring healthy lives and promoting the well-being for all at all ages is essential to sustainable development. Significant strides have been made in increasing life expectancy and reducing some of the common killers associated with child and maternal mortality. Major progress has been made on increasing access to clean water and sanitation, reducing malaria, tuberculosis, polio and the spread of HIV/AIDS. However, many more efforts are needed to fully eradicate a wide range of diseases and address many different persistent and emerging health issues.

Goal 3 targets		Indicators	
3.1	By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births	3.1.1	Maternal mortality ratio
		3.1.2	Proportion of births attended by skilled health personnel
3.2	By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births	3.2.1	Under-5 mortality rate
		3.2.2	Neonatal mortality rate

Cambodia: Neonatal mortality is still a concern!





2010

27/54 = 50% of under-5 death!
27/45 = 60% of infant death!

2014

18/35 = 51% of under-5 death!
18/22 = 64% of infant death!

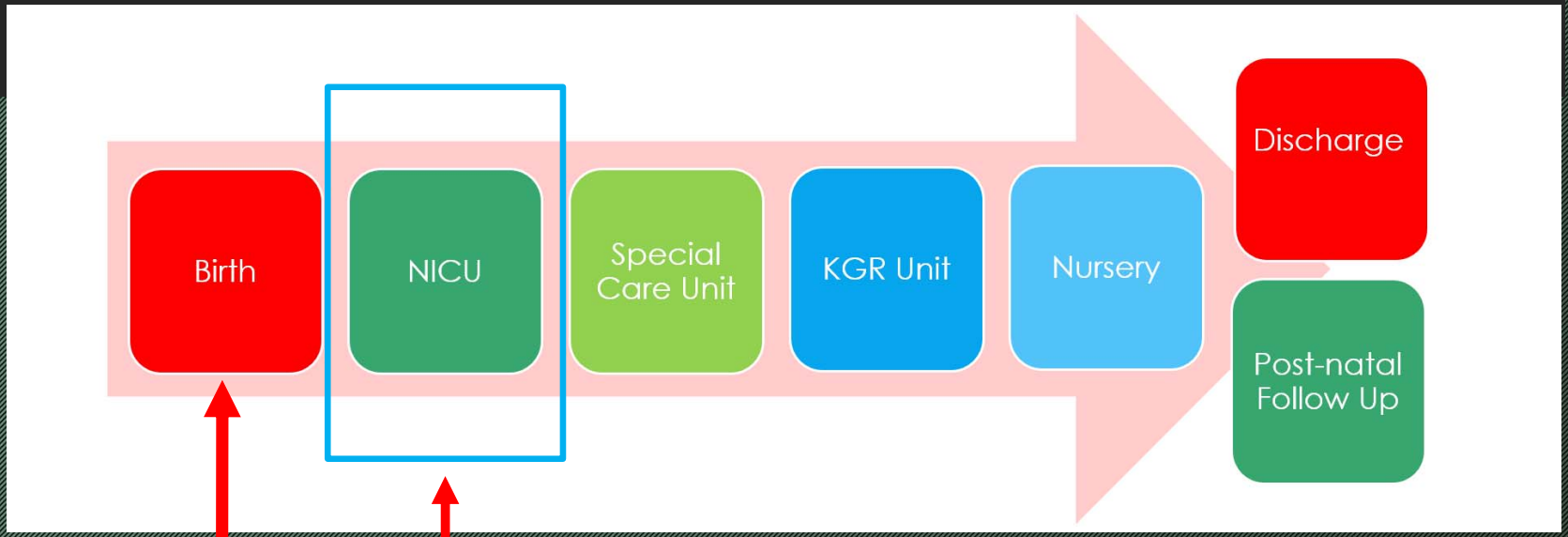
2021

8/16 = 50% of under-5 death!
8/12 = 66% of infant death!

‘To reduce overall mortality

= To reduce newborn death’

2) How/Where to improve newborn health?



Simplified workflow
Innovation Symposium, 2019
Neonatal ICU, Calmette Hospital

But where is the starting point?

They need us!

A

C

B

Textbook of Neonatal Resuscitation, 7th Edition

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®

3) Role of neonatologists

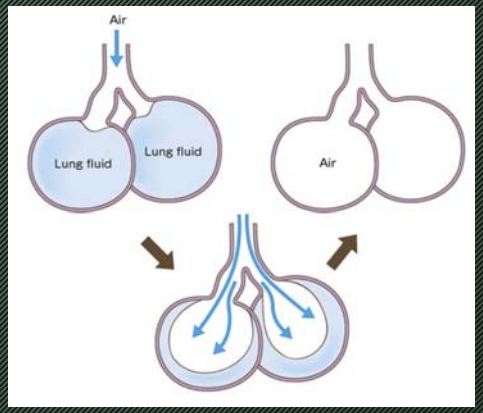
Reflective questions

1. Why neonatal resuscitation skills are important?
2. Why newborns are special?
3. Do they always need us?
4. Who do they need exactly? Obstetricians? Midwives? Pediatricians?
5. What can we offer?

In-Uterine life

1

Lungs: fluid-filled
= not working
= no gas exchange

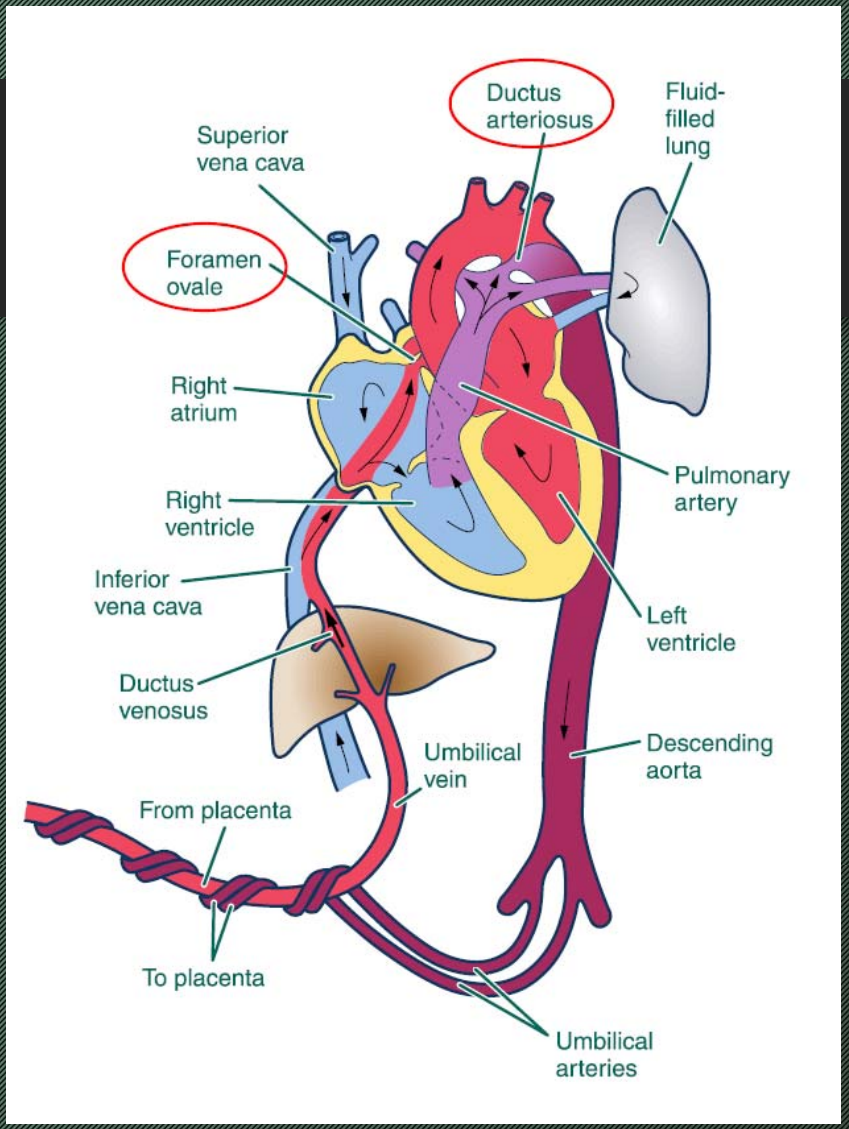


2

Oxygenated blood supply:
-solely by maternal placenta
-via umbilical vein

3

A 'right-to-left' shunt, through:
-Foramen ovale
-Ductus arteriosus



The Textbook of Neonatal Resuscitation
American Academy of Pediatrics
2023

Transition to Extra-Uterine life

They might not need us!

A

Percentage of neonates in need of resuscitation at birth

Term neonates start breathing:

- 10% after drying and stimulation
- 5% after PPV (Positive Pressure Ventilation)
- 2% after endotracheal intubation
- 0.1% after chest compressions
- 0.05% after adrenaline + ventilation + chest compressions

Skilled providers: neonatologists/pediatricians

Ersdal HL, et al. Pediatrics. 2014.
Niles DE, et al. Resuscitation. 2017.
Perlman JM, et al. Arch Pediatr Adolesc Med. 1995.
Halling C, et al. J Pediatr. 2017.

Successful resuscitation starts before birth!

⇨ ‘Anticipating/Briefing’

1) By recognizing ‘Perinatal Risk Factors’:

Antepartum Risk Factors	
Gestational age less than 36 0/7 weeks	Polyhydramnios
Gestational age greater than or equal to 41 0/7 weeks	Oligohydramnios
Preeclampsia or eclampsia	Fetal hydrops
Maternal hypertension	Fetal macrosomia
Multiple gestation	Intrauterine growth restriction
Fetal anemia	Significant fetal malformations or anomalies
	No prenatal care
Intrapartum Risk Factors	
Emergency cesarean delivery	Intrapartum bleeding
Forceps or vacuum-assisted delivery	Chorioamnionitis
Breech or other abnormal presentation	Opioids administered to mother within 4 hours of delivery
Category II or III fetal heart rate pattern*	Shoulder dystocia
Maternal general anesthesia	Meconium-stained amniotic fluid
Maternal magnesium therapy	Prolapsed umbilical cord
Placental abruption	

Textbook of Neonatal Resuscitation. 8th Edition. 2021.

Successful resuscitation starts before birth!

⇨ ‘Anticipating/Briefing’

2) By preparing team and materials:

Warm	• Preheated warmer • Warm towels or blankets • Temperature sensor and sensor cover for prolonged resuscitation • Hat • Plastic bag or plastic wrap (< 32 weeks' gestation) • Thermal mattress (< 32 weeks' gestation)
Clear airway	• Bulb syringe • 10F or 12F suction catheter attached to wall suction, set at 80 to 100 mm Hg • Tracheal aspirator
Auscultate	• Stethoscope
Ventilate	• Flowmeter set to 10 L/min • Oxygen blender set to 21 % (21 %-30% if < 35 weeks' gestation) • Positive-pressure ventilation (PPV) device • Term- and preterm-sized masks • 8F orogastric tube and 20-ml syringe • Laryngeal mask (size 1) and 5-ml syringe (if needed for inflation) • 5F or 6F orogastric tube if insertion port is present on laryngeal mask • Cardiac monitor and leads
Oxygenate	• Equipment to give free-flow oxygen • Pulse oximeter with sensor and cover • Target Oxygen Saturation Table
Intubate	• Laryngoscope with size 0 and size 1 straight blades (size 00, optional) • Stylet (optional) • Endotracheal tubes (sizes 2.5, 3.0, 3.5) • Carbon dioxide (CO_2) detector • Measuring tape and/or endotracheal tube insertion depth table • Waterproof tape or tube-securing device • Scissors
Medicate	Access to • Epinephrine (0.1 mg/ml= 1 mg/10 ml) • Normal saline (100-ml or 250-ml bag, or prefilled syringes) • Supplies for placing emergency umbilical venous catheter and administering medications • Table of pre-calcuated emergency medication dosages for babies weighing 0.5 to 4 kg

Textbook of Neonatal Resuscitation. 8th Edition. 2021.

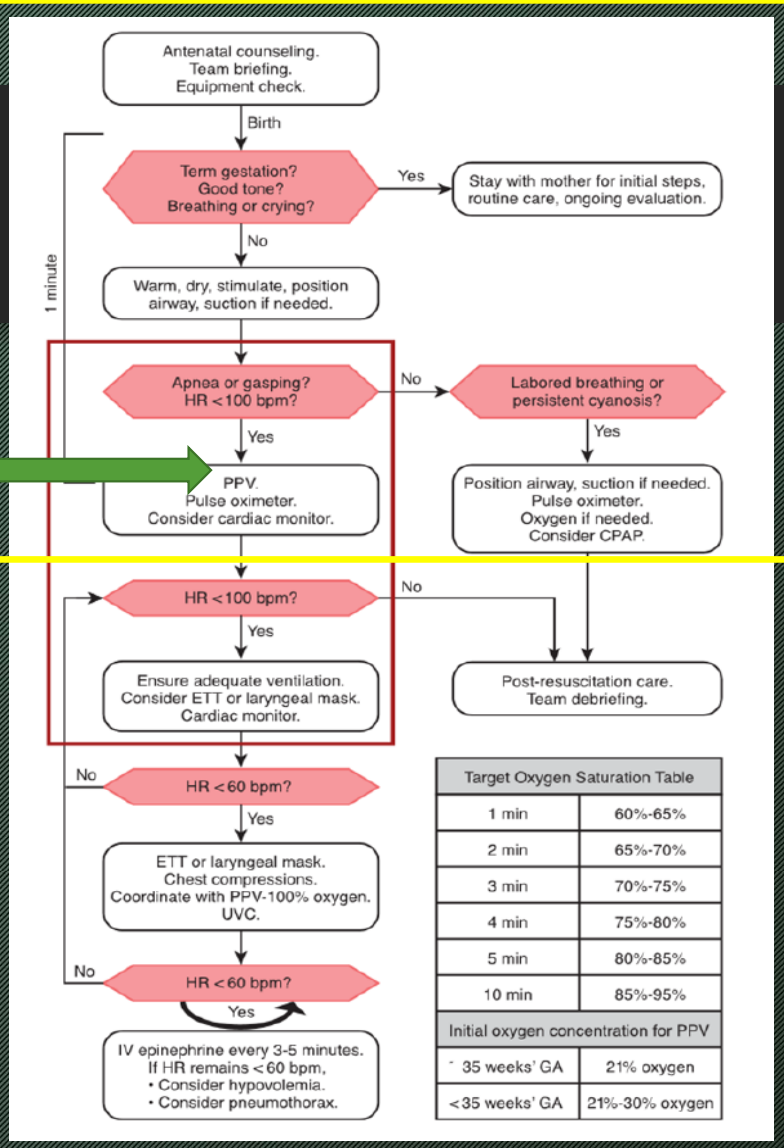
Neonatal Resuscitation Program Algorithm (2021)

The 1st golden minute matters!

- Warm
- Dry
- Stimulate
- Suction
- Ventilate (PPV)

After M1 of life:

- Intubate?
- Chest compression?
- Epinephrine?



Target Oxygen Saturation Table	
1 min	60%-65%
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	80%-85%
10 min	85%-95%
Initial oxygen concentration for PPV	
≥ 35 weeks' GA	21% oxygen
<35 weeks' GA	21%-30% oxygen

Preterm Infants

C

Reflective questions:

- Can you intubate? ETT and blade: right side?
- Do you have mobile x-ray?
- Do you have ventilator? Is it newborn mode (LPV)?
- What if you need surfactant?
- What if nurses fail to get IV line? Can you do Umbilical Vein Catheterization (UVC)?
- Imagine: you can do them all! But is your nursing team familiar with premature care? <1000g or <28WGA?

- Knowing your local setting plays important role in providing better care for preterm infants.
- Acknowledging your strength and limitation increases the chance of survival.

→ In-Utero Transfer matters!

Our NICU team might not be best.
But we are very passionate!

Simplified workflow
Innovation Symposium, 2019
Neonatal ICU, Calmette Hospital

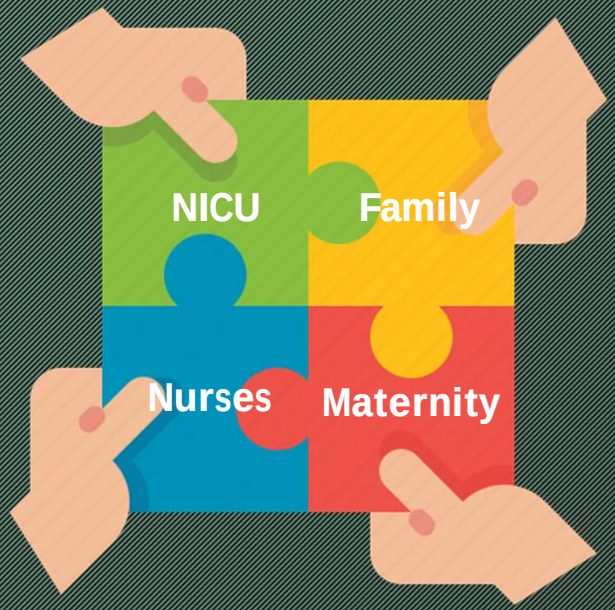
- Mechanical ventilation:
  - Babylog/conventional
  - HFVO
- Surfactant
  - ENSURE
  - Conventional (ventilated)
- Bedside heart US
  - Ibuprofen IV for PDA
- Central lines
  - PICC line
  - UVC
- A good follow-up flow
- Bedside cranial US: on-going
- To be continued…

Reflective questions

- Do neonates always need help? ⇨ Yes!

- But do YOU need **US**?
  1. Do you (obgyn/midwives/MD) need us (pediatricians)?
  2. Do you (provincials/private) need us (public sectors with PICU or NICU)? After successful stabilization (with or without) intubation?
  3. Do you (pediatricians/neonatologists) need us (NICU at Calmette Hospital)? After resuscitating a premie of 28WGA or 900g?

Our Components of SUCCESS:



TEAMWORK

T Together
E Everyone
A Achieves
M More

Thank you for the attention!