

# Neonatal resuscitation

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jan 2011

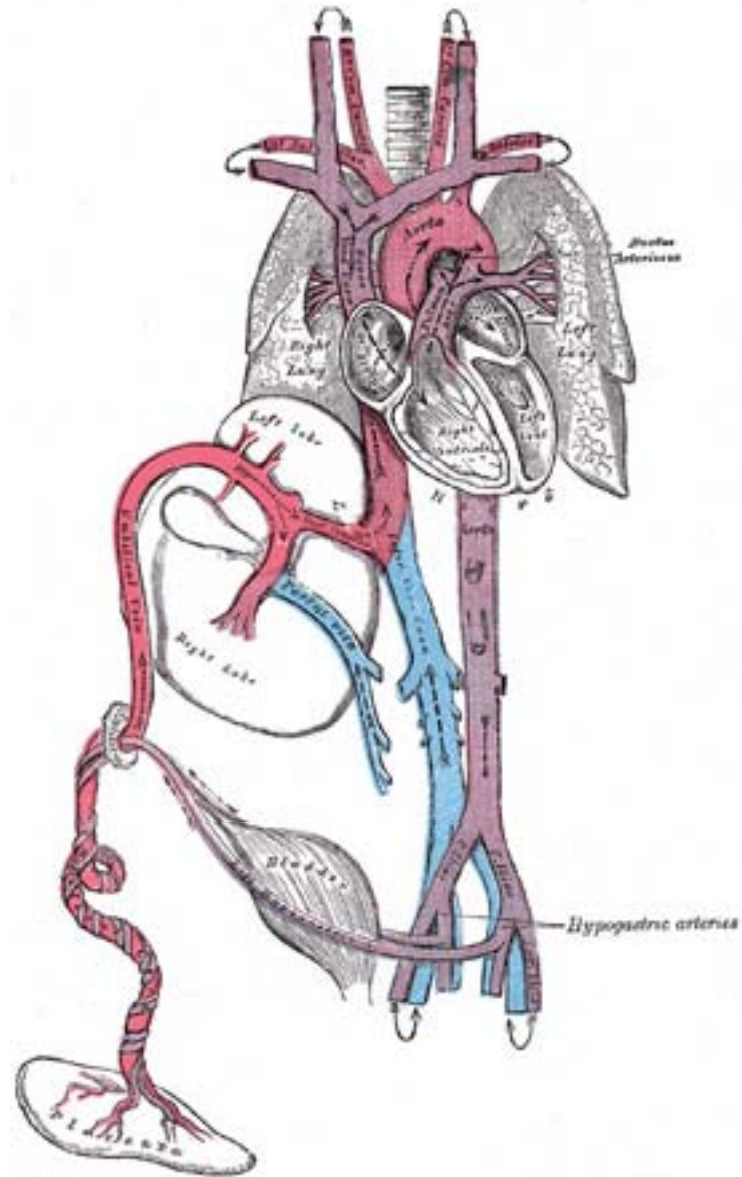
# Content

- Background
- Physiology
- Pathophysiology
- Assessment
- What to do?
- ABC
- Drugs
- Algorithm

# Background

- 3-10% of the neonates need resuscitation
- 1/5 of them need more advanced help, as chest compressions and assisted ventilation
- Encefalopathy is still, most often, due to perinatal asphyxia
- CPR to neonates differs from CPR to children

# Physiology



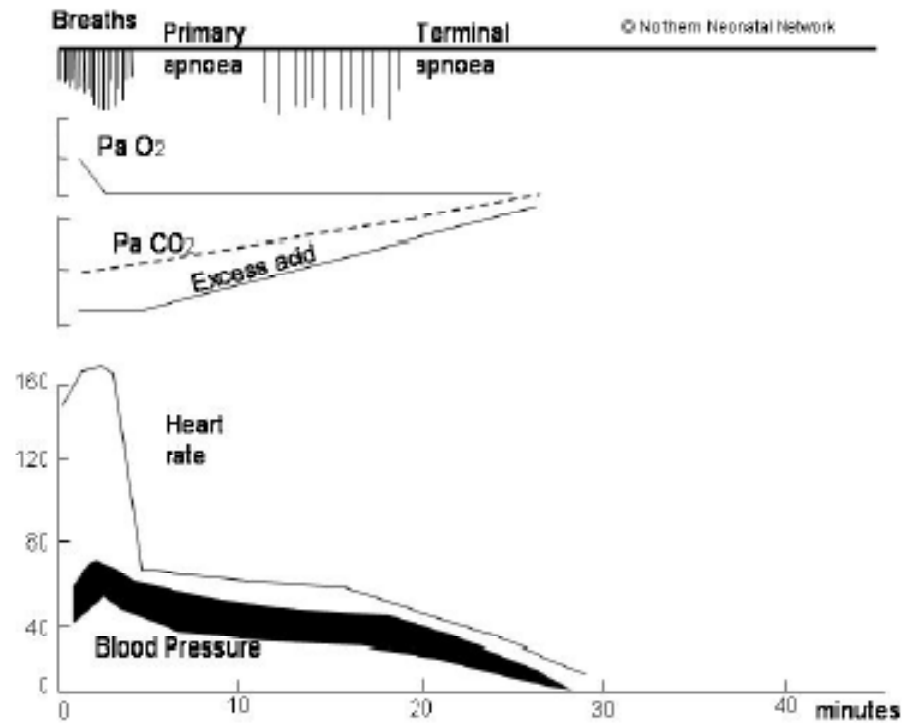
# Physiology

- Most changes are early (not – puls and BP)
- Pressure in pulmonary arteries and closure of ductus arteriosus: **hours**
- Decreased reactivity in the pulmonary arteries: **weeks**
- Anatomical closure of ductus art.: **2-4 weeks**
- Closure of foramen ovale: **one year**

# Physiology

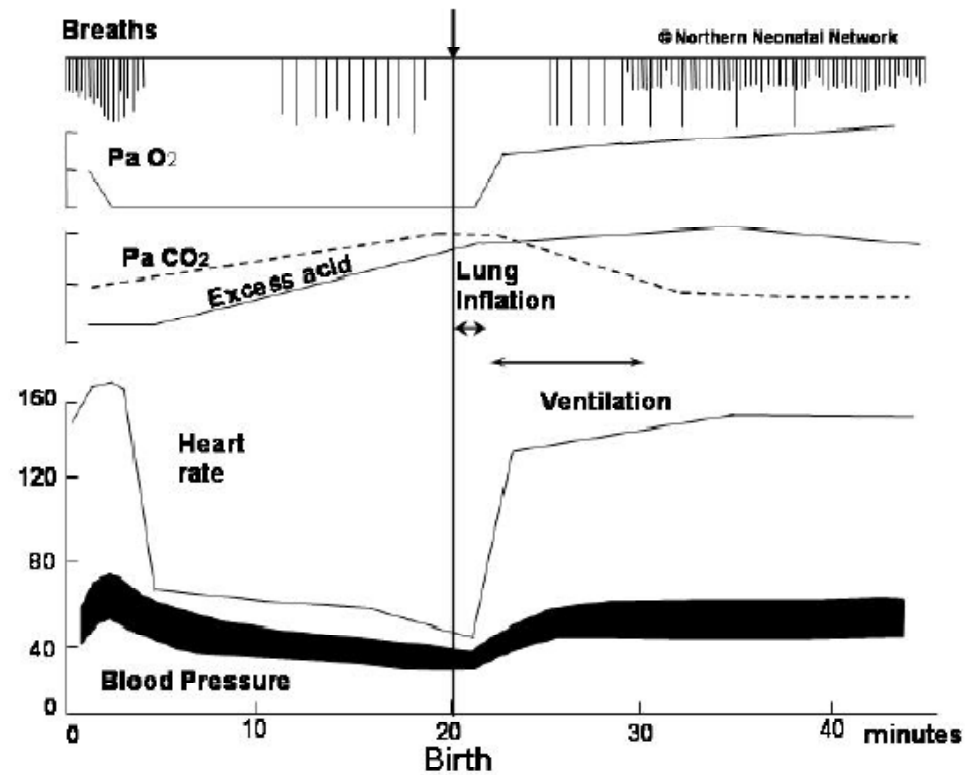
A healthy child takes the first breath with in 60-90 s. Normally 30 s.

# Pathophysiology



**Figure I.1** Response of a mammalian fetus to total, sustained asphyxia started at time 0.

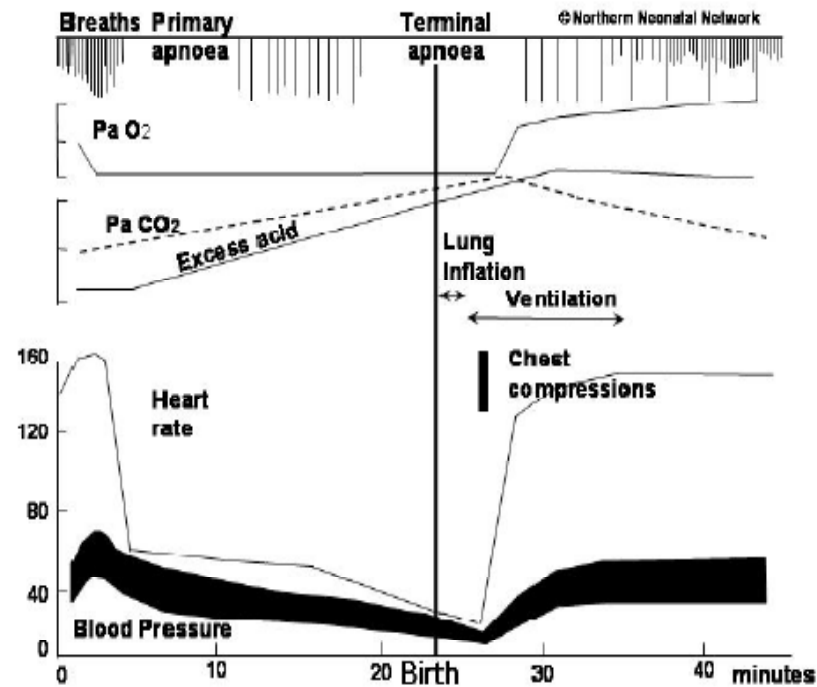
# Pathophysiology



**Figure 1.2.** Effects of lung inflation and a brief period of ventilation on a baby born in early terminal apnoea but before failure of the circulation (Reproduced with permission from the Northern Neonatal Network)



# Pathophysiology




**Figure 1.3.** Response of babies born in terminal apnoea. In this case lung inflation is not sufficient because the circulation is already failing. However, lung inflation delivers air to the lungs and then a brief period of chest compressions (CC) delivers oxygenated blood to the heart which then responds. (reproduced with permission from the Northern Neonatal Network)

# Assessment

- Two systems:
- Apgar
- ABC



## APGAR SCORING SYSTEM

	0 Points	1 Point	2 Points	Points totaled
Activity (muscle tone)	Absent	Arms and legs flexed	Active movement	
Pulse	Absent	Below 100 bpm	Over 100 bpm	
Grimace (reflex irritability)	Flaccid	Some flexion of Extremities	Active motion (sneeze, cough, pull away)	
Appearance (skin color)	Blue, pale	Body pink, Extremities blue	Completely pink	
Respiration	Absent	Slow, irregular	Vigorous cry	

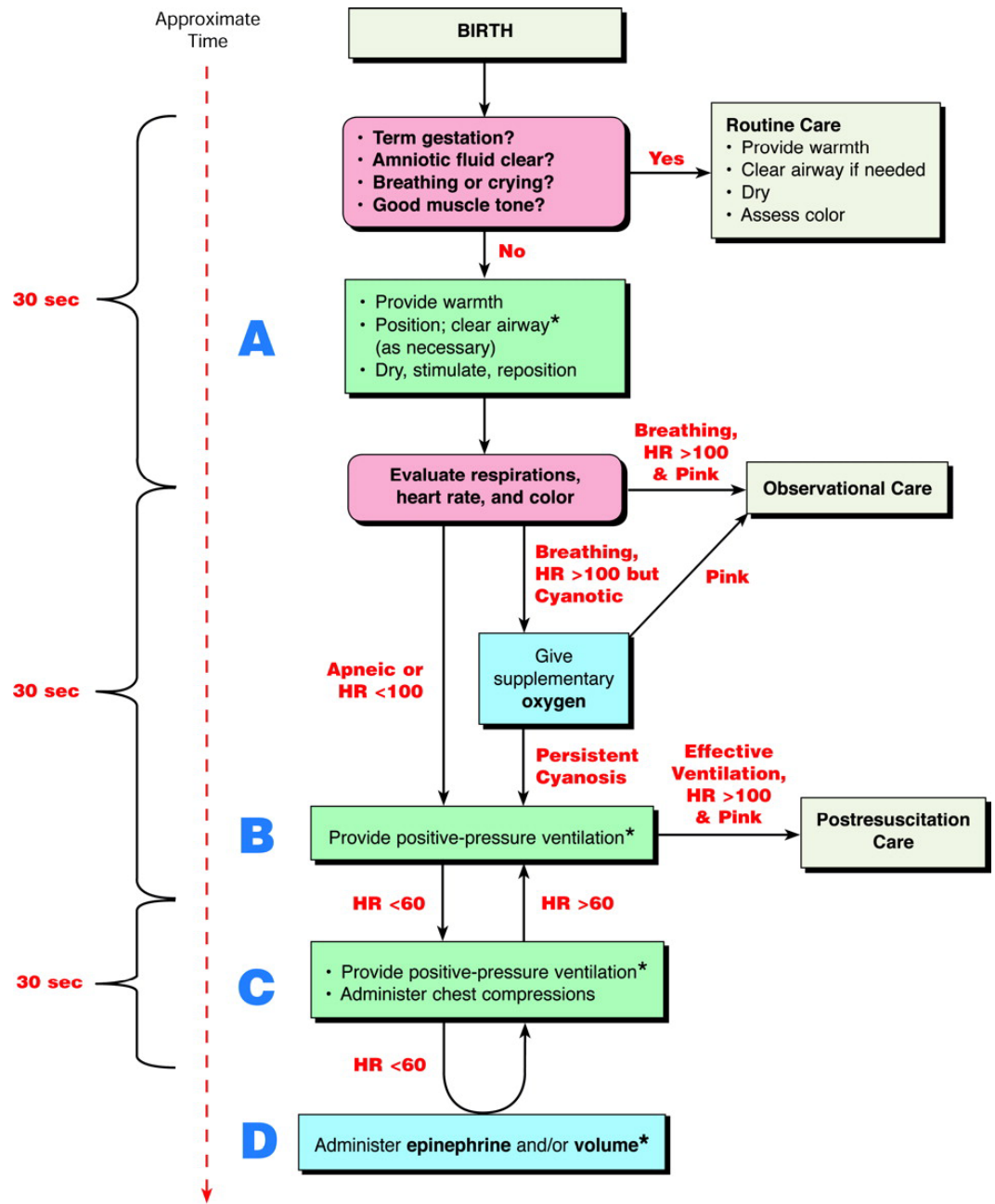
Severely depressed	0-3
Moderately depressed	4-6
Excellent condition	7-10

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What to do?



\* Endotracheal intubation may be considered at several steps

# What to do?

- Consider calling for help at all times
- Start the clock
- Radiant heater/warmth
- Stimulate
- Assess the child:

**LOOK, LISTEN, FEEL**

# What to do?

Assess ABC all at the same time

- Airway and breathing
- HR
- Color
- Tonus

Assessment, then resuscitation (ABC)



# Airway

- Positioning, picture
- the only strong indication for suction of the airways are the combination:
  - 1) A lot of meconium (thick)
  - 2) Inadequate respiration
  - 3) HR under 100 beats/min or hypotonia
- Studies have shown that only 1:500 needs to be intubated
- Oropharyngeal airway

# Airway

- Intubation may be considered at several steps

# Airway



Figure 1.4. Chin lift in infants

# Airway



Figure I.5. Jaw thrust

# Breathing

- If Apneic or  $HR < 100$  → ventilate
- O<sub>2</sub>-concentration
- First breath(assisted) 25-30 cmH<sub>2</sub>O, see pictures
- What is an adequate breath? LLF
- F<sub>q</sub>: 60/min

# Breathing

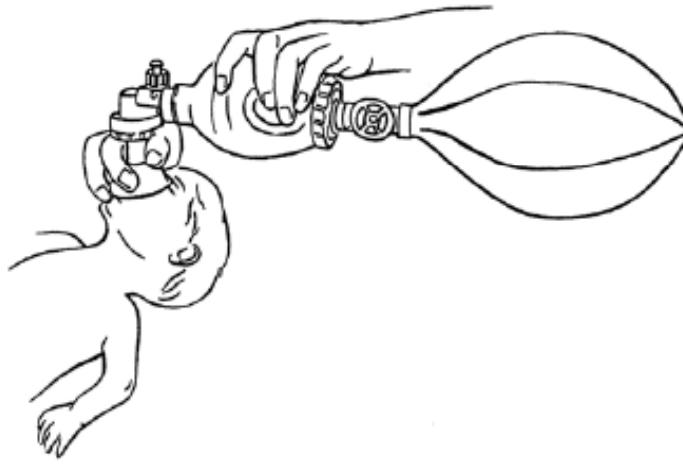


Figure I.6. Bag and mask ventilation

# Breathing



# Circulation

How to assess HR:

- Feel the puls in the umbilical cord and thorax
- Listen to the heart
- ECG?
- Pulsoximetry?



# Circulation

- If adequate assisted ventilation and HR less than 60 beats/min, during 30 s – start compressions, picture
- Approx 100/min, 1/3 of the depth of the thorax
- 3:1
- **Nb! If the assisted ventilation do not work – the compressions will have no effect!**

# Circulation

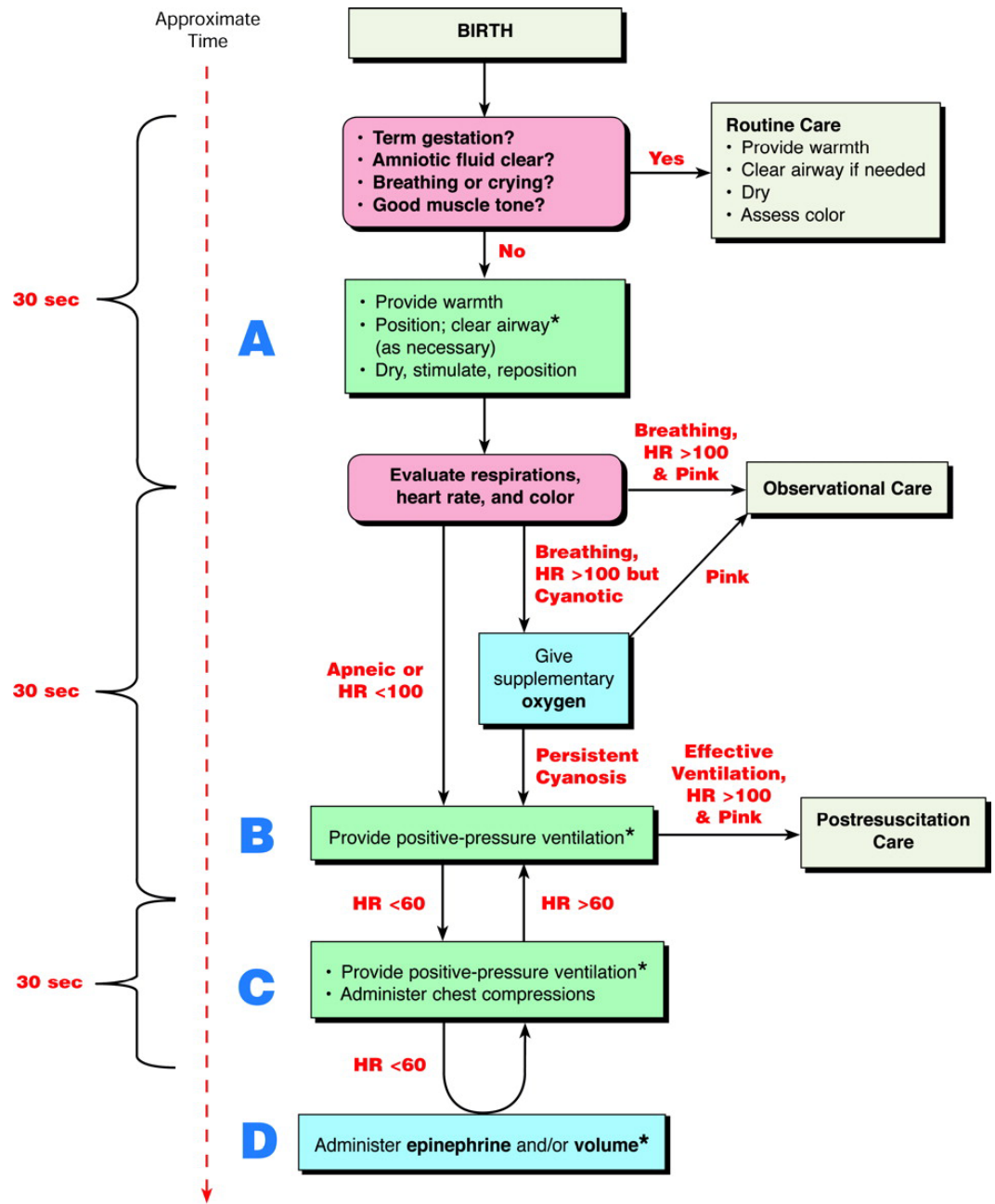


Figure I.8. Infant chest compression: hand-encircling technique

**Reassess!!**

# Drugs

- You will have no effect of the drugs if the ventilation is inadequate
- If you need drugs, it is a bad sign
- Administration
- Adrenalin, buffer, glucose & fluids
- Naloxone, Atropine & calcium



\* Endotracheal intubation may be considered at several steps