

Neonatal Resuscitation in Pre-Hospital Environment & Non-Designated Delivery Sites

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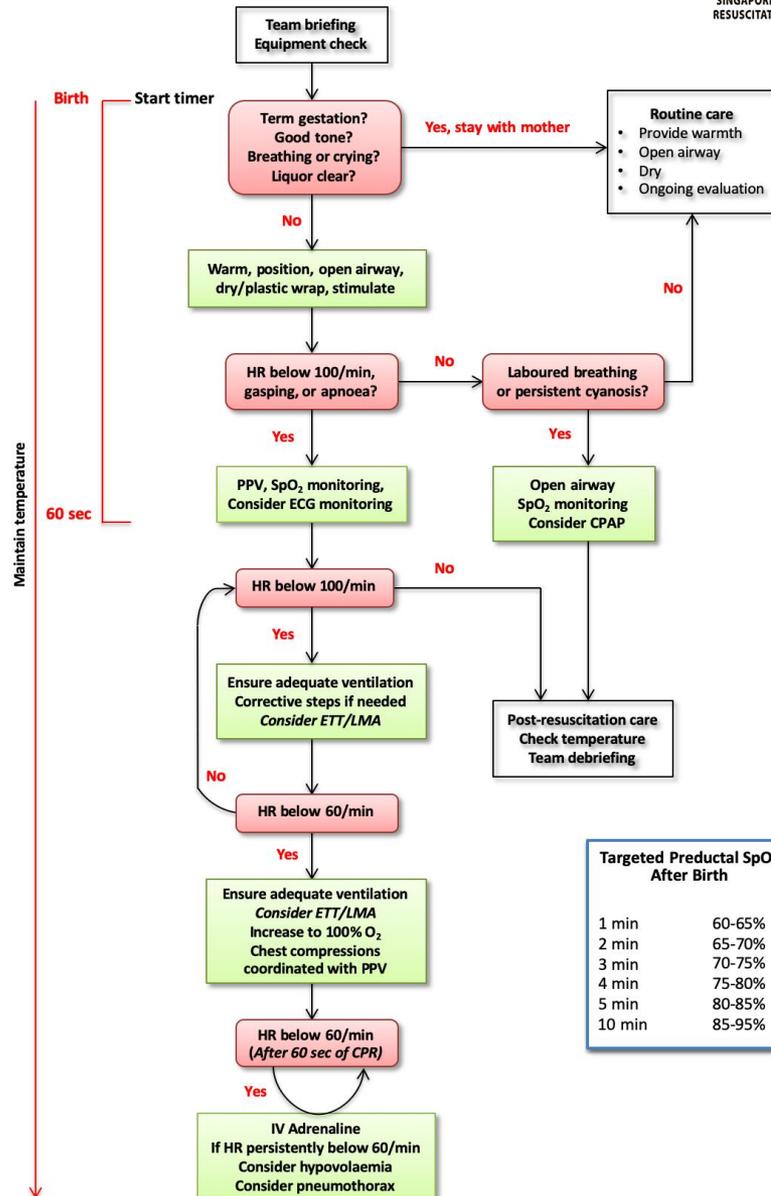
Unexpected Delivery

- Home
- Public area
- Ambulance

Neonatal Resuscitation

- **15% of term infants** at birth require some resuscitative support
 - 10% respond during drying & stimulation
 - 3% after positive pressure ventilation
 - 2% require intubation
 - 0.1% require chest compressions &/or medications

Neonatal Resuscitation: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. Circulation 2015;132(16 Suppl 1):S204-41



Targeted Preductal SpO ₂ After Birth	
1 min	60-65%
2 min	65-70%
3 min	70-75%
4 min	75-80%
5 min	80-85%
10 min	85-95%

Principles & basic steps are same

Singapore Neonatal Resuscitation Guidelines 2016

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Anticipation, Plan, Prepare

NEWBORN RESUSCITATION ALGORITHM

Team briefing
Equipment check



4 Questions

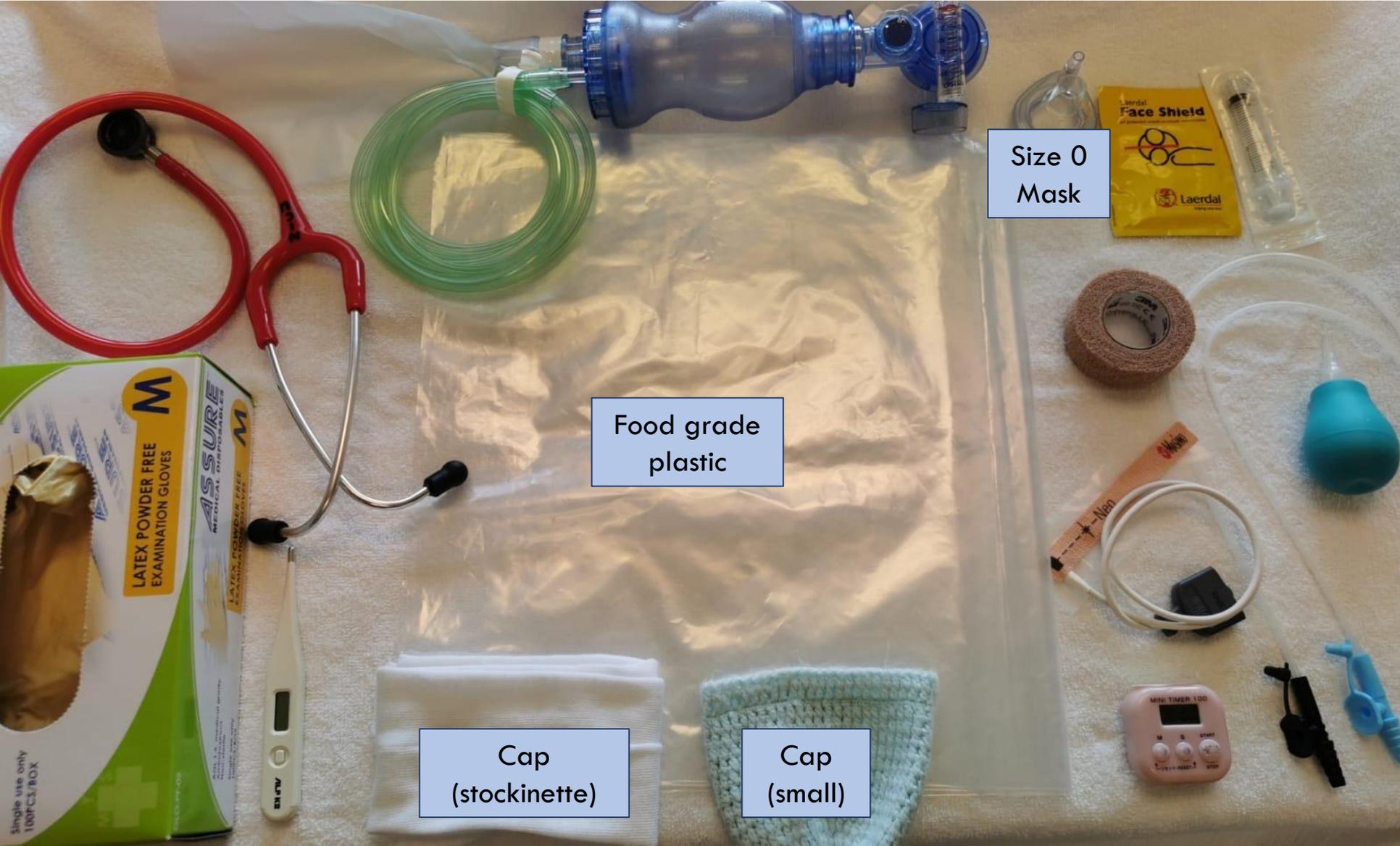
- No. of babies?
- Gestational age?
- Liquor colour?
- Risk factors?

Preparation

- Environmental temperature (keep warm)
 - Air-con, fans, drafts
- Term (& Preterm ≥ 33 weeks)
 - Warm towel, blanket
- Preterm (≤ 32 weeks)
 - Food-grade plastic bag / wrap
- Cap
- Suction device, bulb suction
- PPV device (manometer), mask (check), face shield
- Stethoscope (Palpation of pulse e.g. umbilical)
- Gloves
- If available – pulse oximeter & probe, thermometer, oral
gastric tube, timer

Demo

Equipment: Preterm



Size 0
Mask

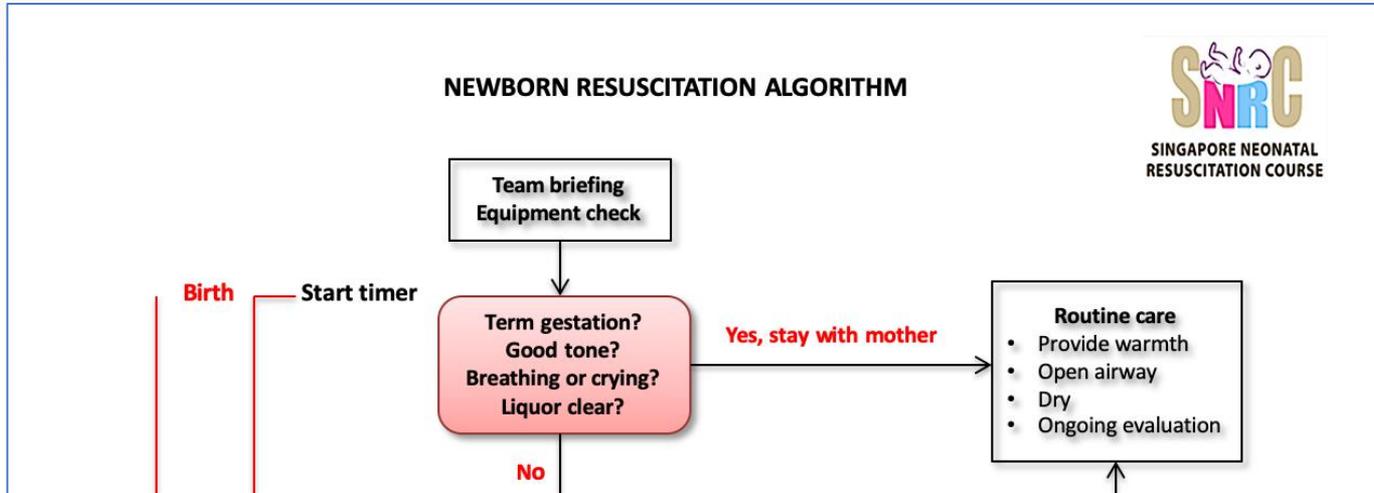
Food grade
plastic

Cap
(stockinette)

Cap
(small)

Rapid Assessment

– Is resuscitation needed?



4 Questions

• Gestational age?

• Liquor colour?

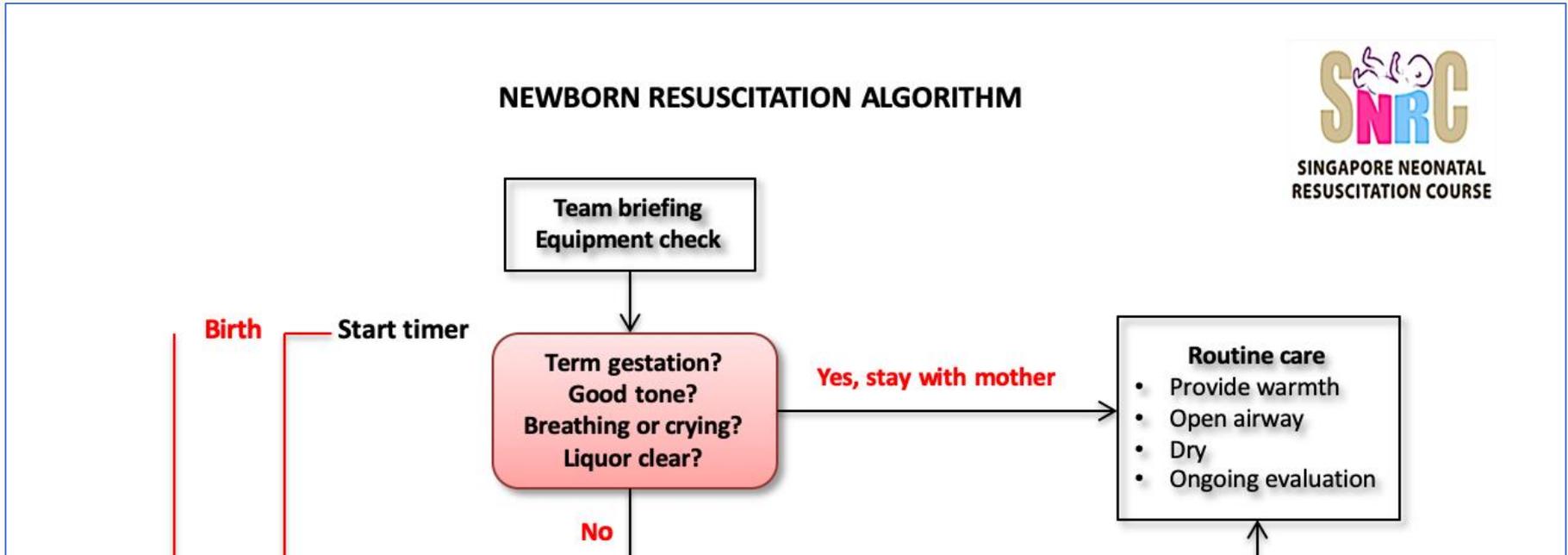
• Tone?

• Breathing / Crying?

} Confirm

} Baby's state

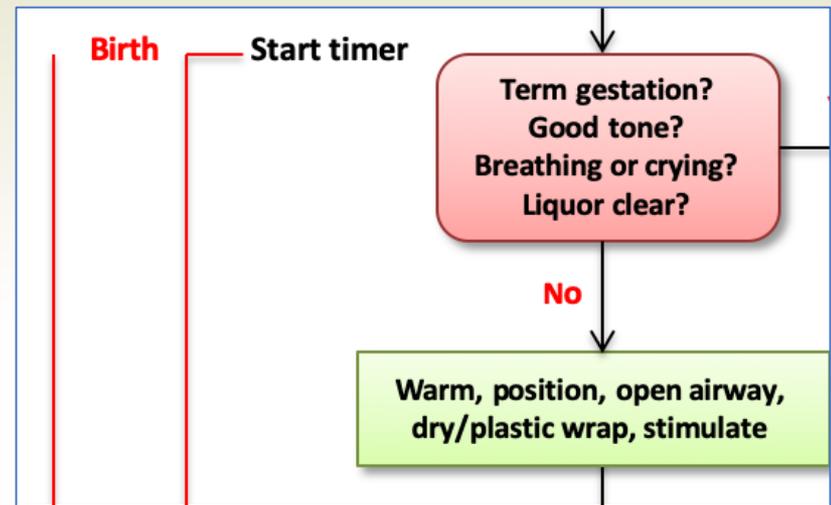
Routine Care



- Use mother's body as heat source
- Skin-to-skin on mother's chest, cover with blanket or plastic sheet

Initial Steps

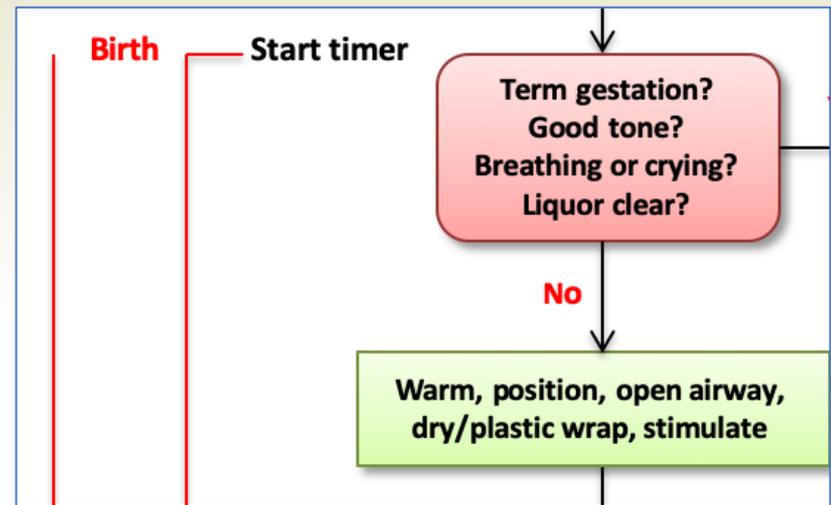
- Warm



Demo

Initial Steps

- Airway
 - 'Sniffing' position

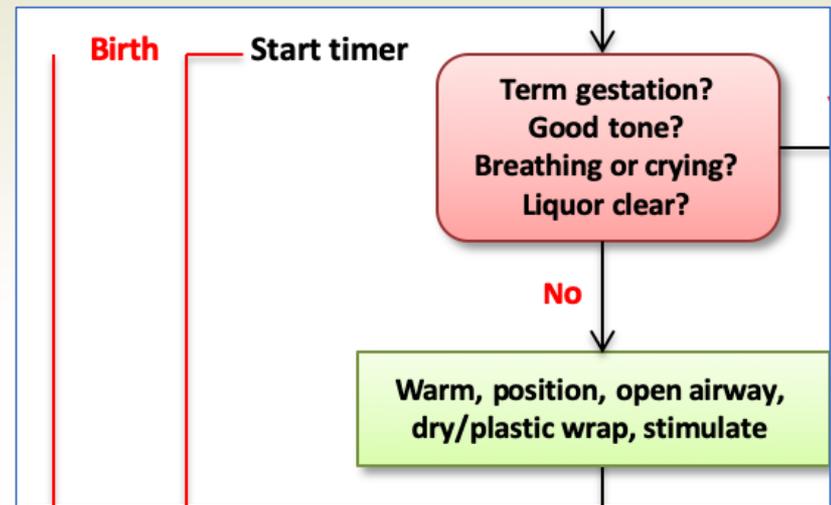


- Bulb suction
- Wipe mouth & nose with clean cloth wrapped around finger

Demo

Initial Steps

- Stimulate to breathe



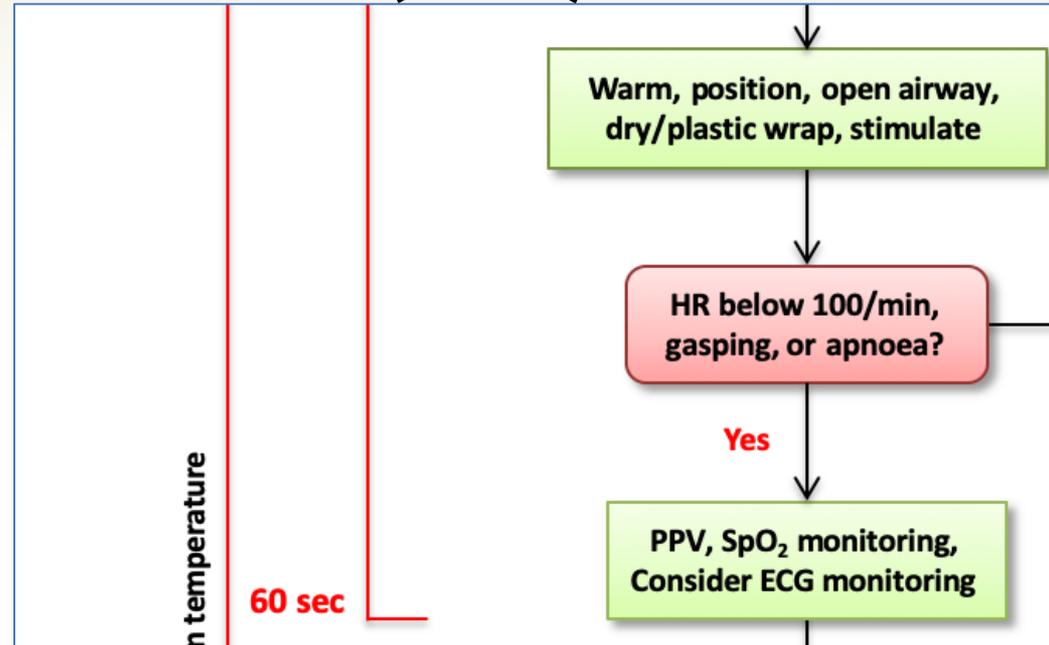
- Assess – HR, Breathing



Demo

Positive Pressure Ventilation (PPV)

- Indications:
 - HR < 100/min
 - Apnoeic, gasping



- Bag & Mask
- Mouth-to-Mouth-&-Nose



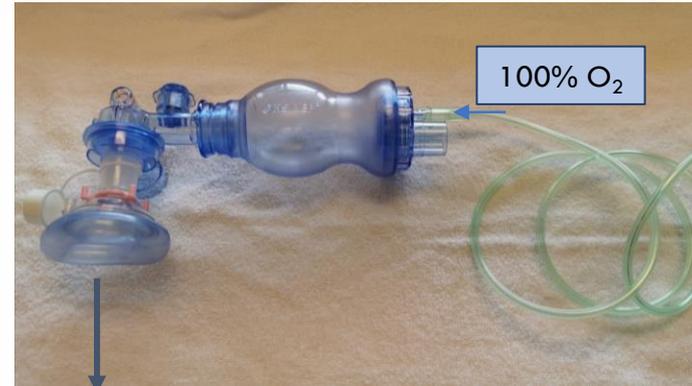
Ventilation

- **Ventilation of lungs** most important step in resuscitation of newborn
- Avoid delay
- PPV should be initiated within 1 min (Golden Minute)

PPV device: Self-inflating bag

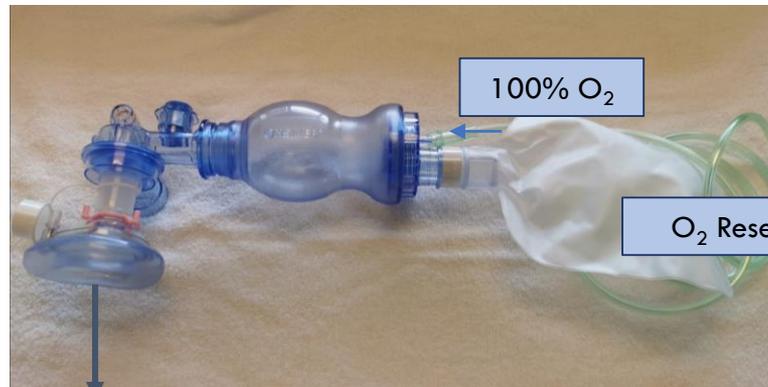


21% Room Air



100% O₂

40% Oxygen



100% O₂

O₂ Reservoir

90-100% Oxygen

Demo

Positive Pressure Ventilation (PPV)

- Sniffing position, appropriate-sized mask, good face-mask seal
- Pulse oximetry



- 40-60 breathes/min

Breathe Two Three Breathe Two Three
(squeeze) (release)(squeeze) (release)

- Ensure effective ventilation
 - Bilateral chest rise, breathe sounds

Demo

- Rising HR indicator of effective PPV

Positive Pressure Ventilation (PPV)

Ventilation Corrective Steps (MR - SO - P - A)

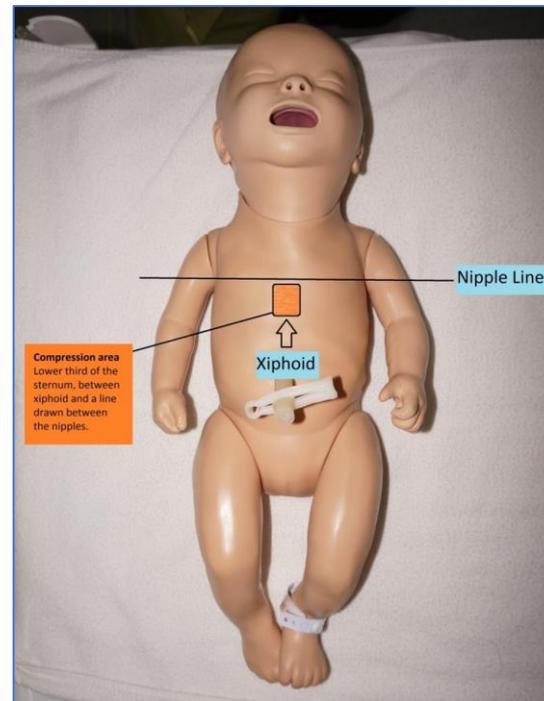
	Corrective Steps	Actions
M R	Mask adjustment	Ensure good seal
	Reposition airway	Head in sniffing position
S O	Suction mouth & nose	Check for secretions, <u>ktiv</u> suction
	Open mouth	Ventilate with baby's mouth slightly open & lift jaw forward
P	Pressure increase	Gradually increase pressure every few breaths until bilateral breath sounds & visible chest movement
A	Airway alternative	Consider intubation or laryngeal mask airway

- Effective ventilation 30 secs
- Assess - HR, Breathing, Oxygenation (Colour)

Demo

Chest Compressions

- Indication
 - HR < 60/min despite at least 30 secs of effective PPV
- Ensure adequate ventilation
- FiO₂ 100%

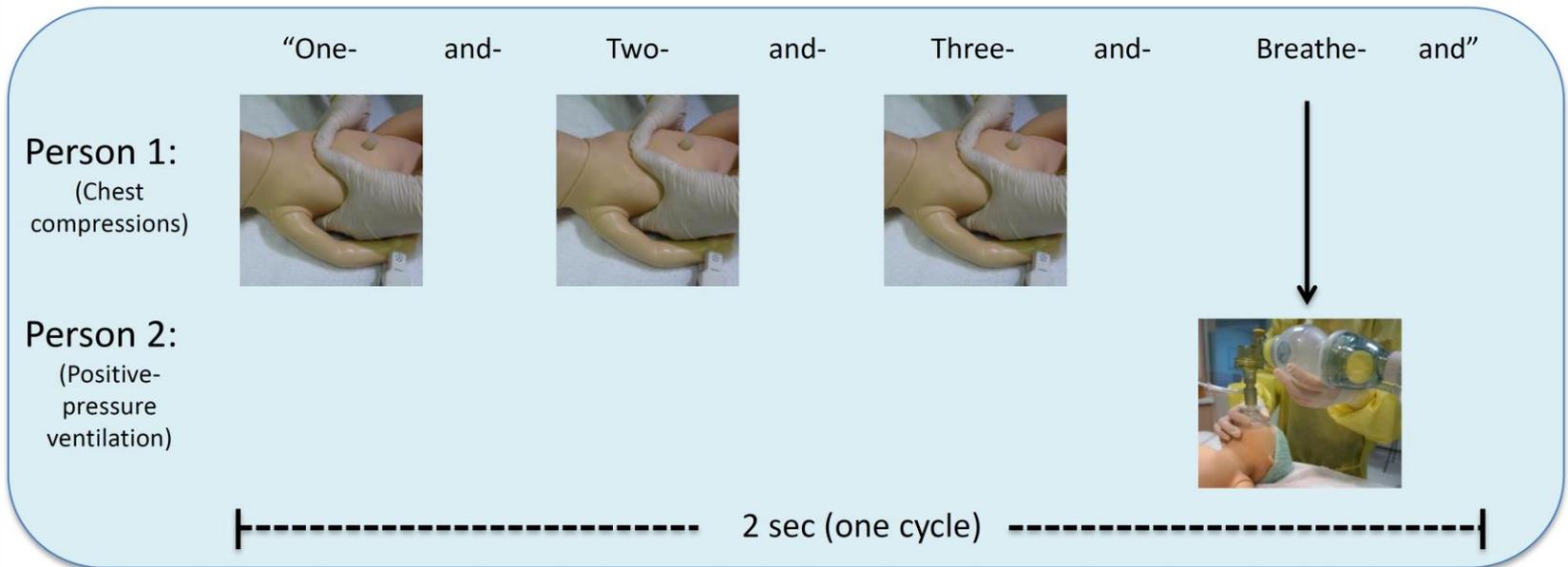


Position:-
Lower $\frac{1}{3}$ of sternum

Compression depth:-
 $\frac{1}{3}$ anterior-posterior diameter of chest

Chest Compressions

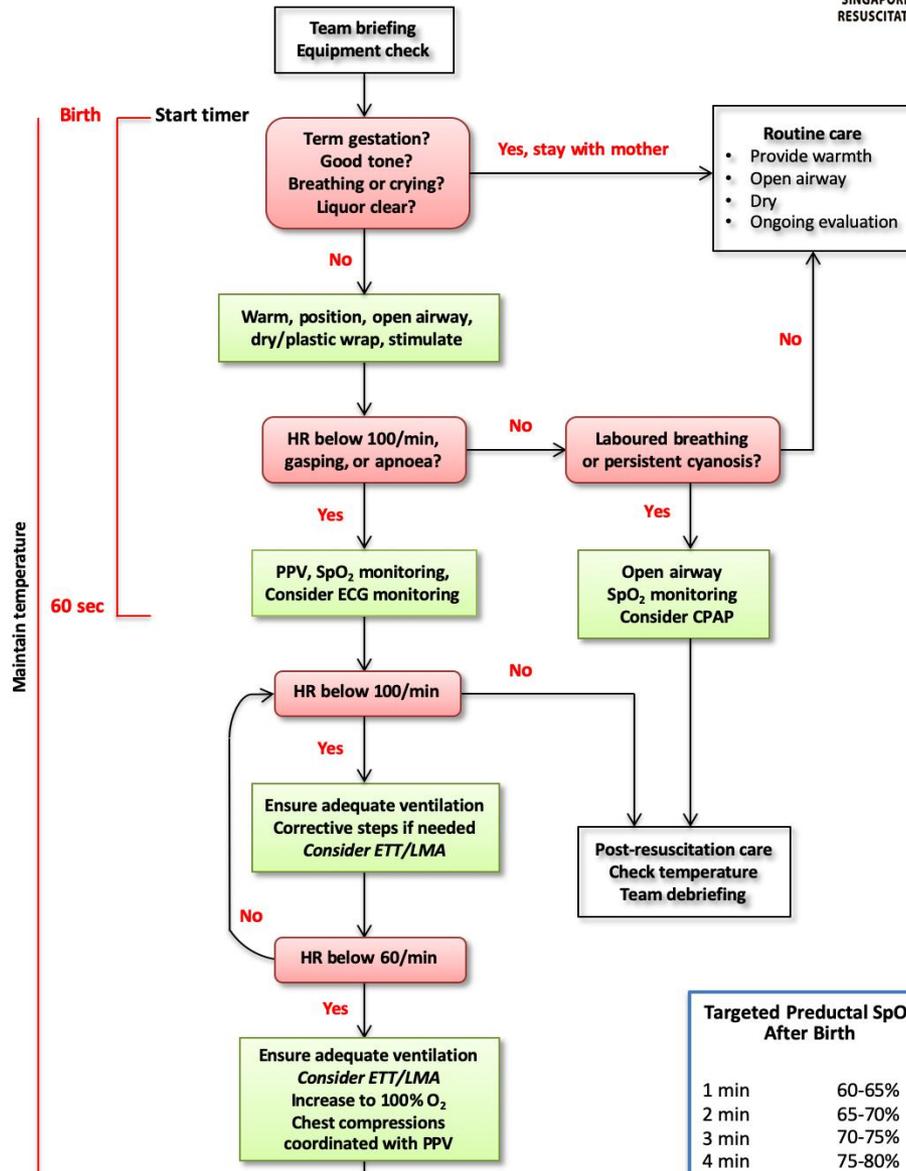
- 2-thumb technique, hands encircling
- Coordinated 3 compression : 1 ventilation



- 1 minute (90 compressions, 30 ventilations)
- Assess - HR, Breathing, Oxygenation (Colour)

Demo

NEWBORN RESUSCITATION ALGORITHM



HR > 100/min, breathing, oxygenation (pink)
 -> Stop PPV, free flow O₂, airway, warm

HR > 60/min
 -> Stop Chest Compressions

Targeted Preductal SpO ₂ After Birth	
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Key Points

- Ensure warmth
- Differences between term & preterm
- Airway patent
- Ensure adequate ventilation
- Coordinated chest compressions with ventilation
- Assess – HR, Breathing, Oxygenation (Colour)

SNRC

- Provider, Recertification Courses



- Academia - Institute of Medical Simulation (SGH)

- sims@singhealth.com.sg

- KK Hospital Simulation Centre (KKH)

- lily.suzanna@kkh.com.sg

- NUS Centre for Healthcare Simulation (NUH)

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SINGAPORE NEONATAL
RESUSCITATION COURSE

THANK YOU