Clinical Practice Guidelines: Resuscitation/Newly born

<table>
<thead>
<tr>
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<th>CPG_RE_RNB_0620</th>
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<tr>
<td>Date</td>
<td>June, 2020</td>
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<tr>
<td>Purpose</td>
<td>To ensure consistent management of newly born patients who require resuscitation.</td>
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<tr>
<td>Scope</td>
<td>Applies to Queensland Ambulance Service (QAS) clinical staff.</td>
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<tr>
<td>Health care setting</td>
<td>Pre-hospital assessment and treatment.</td>
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<tr>
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<td>Applies to all ages unless stated otherwise.</td>
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<td>Source of funding</td>
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<tr>
<td>Author</td>
<td>Clinical Quality &amp; Patient Safety Unit, QAS</td>
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Resuscitation – Newly born

CPG: Resuscitation – newly born
applies to infants immediately post-partum. It comprises both basic and advanced life support guidelines.[1]

Very few newborns (less than 1%) require active resuscitation measures at birth.[2]
The most important actions in the resuscitation of the newly born is recognising when to actively intervene, establishing and maintaining effective ventilation and preventing hypothermia.

Clinical features

- **No signs of life:**
  - absent or poor tone
  - not breathing normally
  - no heart beat on auscultation or pulse identified on palpation of the umbilical cord, or

- **Signs of inadequate perfusion:**
  - absent or poor tone
  - failure to establish regular normal breathing
  - heart rate less than 100 bpm

Assessment of the newly born[3]
The assessment of the newly born and evaluation of whether resuscitation is required, should commence immediately after birth. If the need for resuscitation is recognised, this should be initiated and maintained without delay. The initial assessment of the newly born should address:

- **tone:** The ability for the newly born to move and flex limbs; poor tone or a floppy newly born who is not moving or is presenting with extended posture is highly likely to require active resuscitation.

- **breathing:** The newly born may initially pause breathing for a few seconds and then establish regular breaths; chest recession or retraction, expiratory grunting and nasal flaring are signs of a newly born having difficulty expanding their lungs.

- **heart rate:** The most important indicator for resuscitation, (determined via auscultation or palpation of the umbilical cord) in normal newly borns is their heart rate. At birth the heart rate is approximately 130/min, varying between 110 and 160/min. The heart rate will be consistently greater than 100 beats per minutes in the first few minutes after birth, in the uncompromised newly born.
Persistent apnoea associated with poor tone and associated floppiness, and a heart rate less than 100/min is a serious sign and the newly born urgently requires active resuscitation, commencing with IPPV (room air). CPR is indicated when the newly borns heart rate is less than 60/min.

Risk assessment

Some pre-term infants < 20 weeks will show signs of life (movement/gasp). If the baby is less than 20 weeks, then resuscitation is futile.[6] European resuscitation guidelines inform that it is feasible to identify conditions associated with high mortality where withholding resuscitation may be considered reasonable. There include gestational age < 23 weeks and/or birthweight < 400 g.[4]

If there is any uncertainty, resuscitation measures should be commenced.

If resuscitation is immediately required post-delivery consideration should be given to initiating initial resuscitative efforts by administering IPPV with a BVM, with the baby positioned between the mother’s legs prior to clamping and cutting the cord to promote placental shunt to the newly born. Only initiate if adequate and effective ventilations and warmth can be delivered safely with the baby in this position.

All newly borns will require active temperature-controlling interventions (e.g. pre-warming linen, drying and swaddling, covering with plastic or skin to skin contact with the mother and covering both with a blanket).[2]

If after initial IPPV it is determined that further resuscitation measures are required, clamp and cut the cord, position the newborn on a warm flat surface, place the newly born into a plastic bag, leaving the head exposed and dry the head, cover the head with the corner of the warm blanket to maintain warmth. Use external heat sources to warm the environment such as the vehicle heater if available.

Risk assessment (cont.)

Naloxone should not be administered to the newly born, even in the setting of suspected or identified opiate exposure/overdose, as administration of naloxone may lead to acute withdrawal and seizures.

Sodium bicarbonate and atropine are not indicated in newly born pre-hospital resuscitation.[8]

If there is any uncertainty, resuscitation should be commenced.

Pre-term newly borns (< 37 weeks gestation) special considerations

- Early CCP assistance should be requested when pre-term birth is considered a possibility.
- Immature stiff lungs may be more difficult to ventilate and more vulnerable to barotrauma.[2]
- Thin skin and large surface area lead to rapid heat loss; consider immediately placing the newly born (excluding the head), in a plastic bag without drying beforehand, then dry the head and implement warming techniques.
- There is an increased risk of infection and hypovolaemia.[5,6]
- PEEP can improve functional reserve capacity, particularly with the preterm newly born.
**Additional information**

**Airway**
- Place the head in the neutral position and avoid neck flexion and extension.
- Oropharyngeal/nasopharyngeal suctioning is only indicated in airway obstruction, or if the newly born is birthed through meconium stained amniotic fluid.
- Suctioning can delay oxygenation, cause laryngeal spasm and trauma to soft tissues, and therefore must be gentle and brief.\[^{[6,7]}\]
- If suctioning is required, the mouth should be suctioned first, followed by the nose.
- Gentle wiping of the mouth and nose may be appropriate to remove secretions.\[^{[6]}\]
- If the birth sack or membrane are over the face, tear and gently remove them.
- CCPs may consider tracheal suctioning in the intubated newly born.

**Breathing**
- The first priority is to ensure adequate inflation of the lungs, followed by increasing the concentration of inspired oxygen, but only if needed.\[^{[6]}\]
- Administration of oxygen to newly borns:
  - no active intervention or supplementary O\(_2\) administration is required if the newly born is uncompromised.
  - healthy newly borns may appear cyanosed until their SpO\(_2\) reaches extra uterine values up to ten minutes after delivery\[^{[2]}\]. If central cyanosis persists for longer than 10 mins post birth, commence O\(_2\) @ 2 LPM until centrally pink.
- Resuscitation of the newly born with IPPV should begin without the use of supplemental oxygen for at least the first 30 seconds; if the heart rate remains less than 100/min, administer high concentration O\(_2\).
- Assist ventilation (IPPV) at rate of 40–60 breaths per minute with a target heart rate greater than 100/min.
- When available use 5 cm H\(_2\)O PEEP valve attached to the BVM during IPPV.
- When available pulse oximetry may assist during resuscitation to indicate SpO\(_2\) and heart rate.
- Clinicians should note however, that SpO\(_2\) readings may be lower than normal immediately following birth. The following table gives the expected SpO\(_2\) reading in full term newborns during the first ten minutes following birth.

<table>
<thead>
<tr>
<th>Time After Birth</th>
<th>Expected SpO(_2) Median (IQR)</th>
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<tr>
<td>1 minutes</td>
<td>68 (60 – 77)</td>
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<tr>
<td>3 minutes</td>
<td>81 (71 – 90)</td>
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<tr>
<td>6 minutes</td>
<td>94 (86 – 97)</td>
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<tr>
<td>10 minutes</td>
<td>97 (94 – 98)</td>
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**Circulation**
- Bradycardia (heart rate less than 100) in the newly born is usually due to hypoxia.\[^{[3]}\]
- Only initiate compressions after a minimum of 30 seconds of effective IPPV if the heart rate remains less than 60/min.
- Prompt improvement of the heart rate to greater than 100/min, is the primary indicator of adequate ventilation and overall patient improvement.
- Only attach electrodes/pads to the newly born in emergency resuscitation circumstances, as they may result in damage to their skin.
- Pulseless VT or VF is unlikely to be observed in resuscitation of the newly born. Should these rhythms be detected, defibrillate at joule settings for children.
- IV/IO access is preferred for prehospital medication administration.
CPG: Clinician safety
CPG: Standard cares

Newly born full term gestation AND • good tone • breathing • crying

Manage as per:
CPG: Physiological cephalic birth (care of the newly born)

• Continually and closely assess tone, breathing, heart rate
• If central cyanosis is present 10 min post birth commence O₂ at 2 LPM until centrally pink

HR > 100 and breathing adequately?

Y

IPPV with room air rate at 40–60/min until HR > 100/min REASSESS AFTER 30 SECONDS

N

Discontinue IPPV

Y

HR > 100/min and adequate breathing?

Y

N

HR < 60/min

Y

Adrenaline (epinephrine)

Consider:
Volume expansion

N

Consider:
Transport to hospital with pre-notification as required

N

N

HR < 60/min

N

IPPV with high flow O₂ REASSESS AFTER 30 SECONDS

Y

HR 60–100/min and adequate breathing?

Y

N

IPPV with room air rate at 40–60/min until HR > 100/min REASSESS AFTER 30 SECONDS

Y

N

Note: Clinicians are only to perform procedures for which they have received specific training and authorisation by the QAS.

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