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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 (<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 < 100 bpm

Assessment of the newly born[3]

The evaluation and requirement for resuscitation of the newly born should commence immediately after birth, and continue should resuscitation be initiated. The initial assessment of the newly born should address:

- **tone**, ability for the newly born to move and flex limbs, poor tone or a floppy newly born not moving or 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, recession or retraction, expiratory grunting, 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 born 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 > 100/min 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 < 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 born heart rate is < 60/min.

**Risk assessment**

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 administering IPPV with BVM between the mother’s legs prior to clamping and cutting the cord, promoting placental shunt to the newly born. Only initiate if adequate and effective ventilations and warmth can be delivered safely in this position.

All newly born will require active temperature-controlling interventions (e.g. pre-warming linen, drying and swaddling, covering with plastic or skin to skin contact with 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 plastic bag, leaving the head exposed and dry the head, cover the head with corner of warm blanket to maintain warmth. Use external heat sources to warm the environment such as the vehicle heater if available.

**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.[7]

Blood Glucose levels should be checked immediately post resuscitation.[8]

If there is any uncertainty, resuscitation should be commenced.

**Pre-term newly borns (< 37 weeks gestation)**

- early CCP assistance should be requested when pre-term birth is considered a possibility
- immature stiff lungs that may be more difficult to ventilate and more vulnerable to barotrauma[2]
- thin skin and large surface area leading 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
- increased risk of infection, hypovolaemia[4,5]
- PEEP can improve functional reserve capacity particularly with the preterm newly born

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.[7]

Blood Glucose levels should be checked immediately post resuscitation.[8]

If there is any uncertainty, resuscitation should be commenced.
### Additional information

#### Airway
- place the head in the neutral position 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 [5,6]
- if suctioning required the mouth should be suctioned followed by the nose
- gentle wiping of the mouth and nose may be appropriate to remove secretions [6]
- if birth sack/membranes over the face, tear and gently remove
- 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 only if needed. [5]
- Administration of oxygen to newly borns:  
  - no active intervention or supplementary O₂ administration is required if the newly born is uncompromised
- healthy newly borns may appear cyanosed until their SpO₂ reaches extra uterine values up to ten minutes after delivery [2]. If central cyanosis persists > 10 mins post birth commence O₂ @ 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 heart rate is still < 100/min, supply high concentration O₂
- assist ventilation (IPPV) at rate of 40–60 breaths per minute with target heart rate > 100/min
- when available use 5 cm H₂O PEEP valve attached to BVM during IPPV
- when available pulse oximetry may assist during resuscitation to indicate SpO₂ and heart rate

#### Circulation
- bradycardia (heart rate < 100) in the newly born is usually due to hypoxia [3]
- only initiate compressions after minimum of 30 seconds of effective IPPV and the heart rate remains < 60/min
- prompt improvement of the heart rate > 100/min, is the primary indicator of adequate ventilation and overall patient improvement
- only attach electrodes/pads to the newly born in emergency 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 access for medication administration

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This page includes additional information on resuscitation guidelines for newborns, focusing on the management of airway, breathing, and circulation. Key points include the importance of gentle suctioning and the use of pulse oximetry during resuscitation. The document also highlights the potential for delayed oxygenation and the need for effective ventilation and circulation support.
Newly born full term gestation?
AND
- good tone
- breathing
- crying

HR > 100/min and breathing adequately?

IPPV with room air rate @ 40–60/min until HR > 100/min
Reassess after 30 seconds

HR > 100/min and adequate breathing?
Discontinue IPPV

HR 60–100/min and adequate breathing?

HR < 60/min

Consider:
- Advanced airway
- Reversible causes

Consider:
- Transportation to hospital with pre-notification as required

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