Guideline 13.8 – The Resuscitation of the Newborn in Special Circumstances

Summary

Guidelines 13.1-13.10 and the Newborn Life Support algorithm are provided to assist in the resuscitation of newborn infants. Differences from the adult and paediatric guidelines reflect differences in the anatomy and physiology and the causes of cardiorespiratory arrest for newborns, older infants, children and adults. These guidelines draw from Neonatal Life Support 2020 and 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations (CoSTR) [1, 2] the development of which included representation from ANZCOR. The 2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Care [3] and local practices have also been taken into account.

To whom do these guidelines apply?

The term 'newborn' or 'newborn infant' refers to the infant in the first minutes to hours following birth. In contrast, the neonatal period is defined as the first 28 days of life. Infancy includes the neonatal period and extends through the first 12 months of life.

ANZCOR Guidelines 13.1 to 13.10 and the Newborn Life Support algorithm are mainly for the care of newborns. The exact age at which paediatric techniques and in particular, compression-ventilation ratios, should replace the techniques recommended for newborns is unknown, especially in the case of very small preterm infants. For term infants beyond the first minutes to hours following birth, and particularly in those with known or suspected cardiac aetiology of their arrest, paediatric techniques may be used (refer to Paediatric Advanced Life Support Guidelines 12.1 to 12.7).

Who is the audience for these guidelines?

ANZCOR Guidelines 13.1 to 13.10 and the Newborn Life Support algorithm are for health professionals and those who provide healthcare in environments where equipment and drugs are

available (such as a hospital). When parents are taught CPR for their infants who are being discharged from birth hospitals, the information in Basic Life Support Guidelines (ANZCOR Guidelines 2 to 8) is appropriate.

Recommendations

The Australian and New Zealand Committee on Resuscitation (ANZCOR) makes the following recommendations:

1. For all newborns who are at high risk of needing resuscitation or subsequent neonatal intensive care, leaving at least a 3-4 cm length of umbilical cord below the cord clamp is helpful in case umbilical access is needed. [Good Practice Statement]
2. ANZCOR suggests that to maintain normothermia (body temperature between 36.5 and 37.5°C) for very preterm newborns, use a radiant warmer and place the newborn immediately after birth immediately after birth (without drying) in a polyethylene bag or under a polyethylene sheet (appropriate size, food or medical grade, heat resistant), up to the neck. [CoSTR 2015, weak recommendation, very low certainty evidence] The bag or sheet should not be removed during resuscitation and it should be kept in place until temperature has been checked and other measures (e.g., pre-warmed, humidified incubator) are ready to ensure that heat loss does not ensue. [Good Practice Statement]
3. ANZCOR suggests that additional measures that may be needed either alone or in combination include; establishing an ambient temperature of at least 26°C, exothermic warming mattresses, warmed humidified resuscitation gases, covering the head (except the face) with a hat or folded bedding. [CoSTR 2015, weak recommendation, very low certainty evidence]
4. Hyperthermia (defined in newborns as body temperature >37.5°C) should also be avoided. To prevent burns, care should be taken with external heat sources. [Good Practice Statements]
5. Gentle handling is essential for all newborns, but especially preterm infants, who are at greater risk of damage, both to skin and to internal organs. If vascular access is required, antiseptic solutions should be applied sparingly, particularly those containing alcohols, detergent excipients or chlorhexidine, which can cause serious damage to immature skin. For umbilical catheterisation, apply antiseptic solution to the cord and avoid the skin, using a sterile drape to cover other areas. Avoid letting excess solution pool around the newborn's groin and flanks. Adherence to good infection control procedures is essential. [Good Practice Statements]
6. For spontaneously breathing preterm newborns < 32 weeks' gestation who have signs of respiratory distress in the delivery room and require respiratory support, ANZCOR suggests commencing CPAP in the first minutes after birth rather than intubation and ventilation. [CoSTR 2015, weak recommendation, moderate certainty of evidence] A CPAP pressure of at least 5 cm H_2O should be used. [Good Practice Statement]
7. ANZCOR suggests against routine use of an initial sustained inflation (> 5 seconds) in preterm infants but sustained inflations may be considered in individual clinical circumstances or in research settings. [CoSTR 2020, weak recommendation, low certainty of evidence]
8. For newborns who do not commence spontaneous breathing within the first minute after

birth positive pressure ventilation is required. For those needing assisted ventilation, the optimal ventilation strategy is not known, but both animal and human studies suggest the benefits of PEEP (at least 5 cm H_2O) and avoidance of high tidal volumes, particularly in preterm infants. Administration of endotracheal surfactant should be considered very early during the stabilisation of preterm infants who have needed intubation for resuscitation. [Good practice statement, NHMRC LOE I]

9. For preterm infants <35 weeks' gestation ANZCOR suggests commencing resuscitation either using room air or blended air and oxygen up to an oxygen concentration of 30% rather than higher initial oxygen concentration (60%–100%). [CoSTR 2019, weak recommendation, very low certainty of evidence]
10. For preterm infants <35 weeks' gestation ANZCOR suggests supplemental oxygen should be given judiciously, ideally guided by pulse oximetry. [CoSTR 2019 and 2020, weak recommendation, very low certainty of evidence] Both hyperoxaemia and hypoxaemia should be avoided. If a blend of oxygen and air is not available, resuscitation should be initiated with air. [Good Practice Statements]
11. In newborns with suspected choanal atresia or other upper airway obstruction, an oral airway may provide adequate relief from obstruction. For a newborn with a small mandible, prone positioning and/or placement of an endotracheal tube via the nostril into the pharynx, as a mechanical stent to prevent the tongue obstructing the airway, may improve the airway. Newborns with compromising craniofacial malformations may require a supraglottic mask airway or tracheal intubation. This can be difficult, and expert assistance may be required. [Good Practice Statements]
12. Newborns with congenital diaphragmatic hernia (CDH) who need respiratory support should not receive bag and mask ventilation. Where respiratory support is needed, early intubation or use of a laryngeal mask is recommended to minimise air entry into the gastrointestinal tract. A wide bore orogastric tube should be placed for intermittent suction. Ventilation should be gentle with low tidal volumes. [Good Practice Statements]
13. Newborns with suspected life-limiting anomalies (unless there has been prior discussion and the development of an alternative care plan with the parents) should usually receive a complete and thorough resuscitation. They are often best evaluated in the neonatal unit after resuscitation when more information will be available, and the parents can be part of management discussions. [Good Practice Statement]
14. If the clinical history suggests lung hypoplasia (which can predispose to pneumothorax) is likely, preparation (before birth) of equipment for bedside diagnosis and emergency treatment of pneumothorax may be advisable. [Good Practice Statement]
15. In the setting of congenital pleural effusions or ascites (including fetal hydrops), emergency thoracentesis or paracentesis is sometimes required. [Good Practice Statement]
16. Congenital pneumonia may result in poor lung compliance, necessitating high ventilation pressures to aerate the lungs. [Good Practice Statement]
17. For newborns with duct-dependent congenital heart defects that have been diagnosed antenatally, target saturation ranges (during resuscitation and thereafter) should be discussed with a cardiologist. Otherwise, the priorities for resuscitation are similar to those of other newborns. [Good Practice Statements]
18. For newborns with chronic heart block, heart rate thresholds for initiating ventilation and

chest compressions will usually be lower than in other newborns. Tone, respiratory effort and oxygenation should be assessed as well to determine whether resuscitation manoeuvres are needed. [Good Practice Statements]

19. Where a clinically significant arrythmia has been detected or suspected antenatally, the availability of ECG monitoring may be particularly useful in assessing heart rate. [Good Practice Statement]
20. Early NICU admission and echocardiographic evaluation in cases of suspected or antenatally diagnosed congenital heart disease is essential. [Good Practice Statement]
21. Infants born with gastroschisis or a large omphalocoele a polyethylene wrap (e.g., food wrap) or bag (e.g., a surgical "bowel bag" used to protect bowel during abdominal surgery) can be used to enclose the abdomen or the whole lower body in order to reduce drying, heat loss or contamination. Care should be taken to enclose the bowel lightly and position it so that blood flow is optimised. Caring for the newborn in a right side down, side-lying position can be helpful. A large bore orogastric tube (e.g., 8 to 10 FG) should be inserted to (repeatedly) remove swallowed air. If respiratory support is needed, CPAP or positive pressure ventilation via a facemask or nasal prongs should be avoided and a low threshold for endotracheal intubation is suggested in preference to a facemask or nasal prongs. A supraglottic airway, which promotes tracheal ventilation and oesophageal occlusion may be preferable to a facemask if respiratory support is needed and endotracheal intubation is not possible. [Good Practice Statements]
22. In the case of multiple births, there should always be at least one appropriately skilled resuscitator for each newborn. [Good Practice Statement]
23. In the case of suspected fetal blood loss for which intravenous volume expansion is required, isotonic crystalloid (0.9% sodium chloride or Hartmann's) should be used in the first instance but may need to be followed with blood products suitable for neonatal transfusion. Consider the need to activate a critical bleeding protocol that addresses both restoration of oxygen carrying capacity and the likely accompanying coagulopathy. [Good Practice Statement]
24. Cord blood gases should be measured in every resuscitated newborn as the most objective way to assess the condition just before birth. [Good Practice Statement]

Abbreviations

Abbreviation	**Meaning/Phrase**
ANZCOR	Australian and New Zealand Committee on Resuscitation
CDH	Congenital diaphragmatic hernia
CoSTR	International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations
CPAP	Continuous positive airway pressure
CPR	Cardiopulmonary resuscitation

FG	French gauge
INSURE	Intubation-surfactant-extubation procedure
LOE	Level of evidence
NHMRC	National Health and Medical Research Council
PEEP	Positive end expiratory pressure
RCT	Randomised controlled trial
UVC	Umbilical venous catheter

1.0 | Prematurity

1.1 | Temperature management

Very preterm newborns are at particular risk of cold stress (defined as body temperature 36.0°C to 36.4°C) and hypothermia (body temperature <36.0°C). Hyperthermia (defined in newborns as body temperature >37.5°C) should also be avoided. [4] Close attention to maintaining their body temperature is essential. To prevent burns, care should be taken with external heat sources. [Good Practice Statements]

ANZCOR suggests that to maintain normothermia (body temperature between 36.5 and 37.5°C [4]) for very preterm newborns, use a radiant warmer and place the newborn immediately after birth (without drying) in a polyethylene bag or under a polyethylene sheet (appropriate size, food or medical grade, heat resistant), up to the neck. [2, 5-9] [CoSTR 2015, weak recommendation, very low certainty of evidence] The bag or sheet should not be removed during resuscitation and it should be kept in place until temperature has been checked and other measures (e.g., pre-warmed, humidified incubator) are ready to ensure that heat loss does not ensue. [Good Practice Statement]

ANZCOR suggests that additional measures that may be needed either alone or in combination [2] include;

- establishing an ambient temperature of at least 26°C
- exothermic warming mattresses
- warmed humidified resuscitation gases
- covering the head (except the face) with a hat or folded bedding.

[CoSTR 2015, weak recommendation, very low certainty evidence.]

1.2 | Handling and skin protection

Gentle handling is essential for all newborns, but especially preterm infants, who are at greater risk of damage, both to skin and to internal organs. If vascular access is required, antiseptic solutions should be applied sparingly, particularly those containing alcohols, detergent excipients or chlorhexidine, which can cause serious damage to immature skin. [10, 11] For umbilical catheterisation, apply antiseptic solution to the cord and avoid the skin, using a sterile drape to cover other areas. Avoid letting excess solution pool around the newborn's groin and flanks. Adherence to good infection control procedures is essential. [Good Practice Statements]

1.3 | Respiratory Support

Most very preterm newborns need some respiratory support immediately after birth, but some uncertainty remains as to the best strategy.

Role of Continuous Positive Airway Pressure (CPAP)

For spontaneously breathing preterm newborns < 32 weeks' gestation who have signs of respiratory distress in the delivery room and require respiratory support, ANZCOR suggests commencing CPAP in the first minutes after birth rather than intubation and ventilation. [2] [CoSTR 2015, weak recommendation, moderate certainty of evidence] The evidence suggests reduction of the combined outcome of death and bronchopulmonary dysplasia but with no benefit to death, BPD, air leak, severe intraventricular haemorrhage, necrotising enterocolitis or severe retinopathy of prematurity. When making this suggestion it is noted that risk reduction of adverse outcomes is small and that preterm infants recruited into the trials had a high rate of antenatal steroids but value is placed on this less invasive approach. (CoSTR 2015, Values and Preferences statement)

A CPAP pressure of at least 5 cm H_2O should be used. One randomised trial (at high of bias) of 617 preterm and term newborns suggests that nasal prongs may be preferable to a facemask to deliver early CPAP for the outcome of reduced need for intubation in the birth suite. [12] CPAP cannot be administered with a self-inflating bag.

During resuscitation immediately after birth, the role of an intubation-surfactant-extubation ("INSURE") approach, or other methods to administer artificial surfactant without endotracheal intubation in order to facilitate early stabilisation on CPAP soon after birth [13] compared to other strategies of respiratory support remains uncertain. [14, 15]

Role of Initial Sustained Inflation Breaths

To establish initial lung inflation in apnoeic preterm newborns, initiation of intermittent positive pressure ventilation at birth can be accomplished with or without several initial prolonged inflation

breaths. Various regimens have been suggested, from 5 breaths lasting 2 to3 seconds to one breath lasting 5 to10 seconds.

A systematic review [16] of 10 RCTs (1502 newborn preterm infants) [17-26] examining the use of sustained inflations found that in those who received positive pressure ventilation for bradycardia or ineffective respirations at birth, for death before discharge, there was no significant benefit or harm from initiating positive pressure ventilation greater than one second compared with initiating positive pressure ventilation with intermittent inflations of once second or less. No studies were identified that addressed later mortality or neurodevelopmental outcomes. Subgroups of the 10 RCTs allowed assessment of other short- and long-term outcomes and also found no benefit or harm.

However, of note, in a subgroup analysis for newborns <28 weeks' gestation providing evidence from 5 RCTs (862 newborns), [26-30] for death before discharge there was evidence of potential harm from initiating positive pressure ventilation with sustained inflation(s) >1 second compared with initiating positive pressure ventilation with intermittent inflations lasting 1 second or less. [16]

ANZCOR suggests against routine use of an initial sustained inflation (> 5 seconds) in preterm infants but sustained inflations may be considered in individual clinical circumstances or in research settings. [1] [Weak recommendation, low certainty of evidence] Recent evidence has indicated that in some circumstances, lung inflation during sustained inflation may be impaired by glottis closure. [31-33]

Positive Pressure Ventilation

For newborns who do not commence spontaneous breathing within the first minute after birth positive pressure ventilation is required. For those needing assisted ventilation, the optimal ventilation strategy is not known, but both animal [34] and human studies suggest the benefits of PEEP (at least 5 cm H_2O [35, 36]) and avoidance of high tidal volumes, particularly in preterm infants. Administration of endotracheal surfactant should be considered very early during the stabilisation of preterm infants who have needed intubation for resuscitation. [37] [Good practice statement, NHMRC LOE I]

Oxygen

Preterm infants are vulnerable to oxidative stress as a result of reduced antioxidant defences. [38] The causation of many common preterm morbidities, including bronchopulmonary dysplasia, retinopathy of prematurity and intraventricular haemorrhage can include oxygen toxicity. However, the optimal starting oxygen concentration and the most appropriate time-specific target saturations for preterm newborns remain to be determined. [39]

For preterm infants <35 weeks' gestation ANZCOR suggests commencing resuscitation either using room air or blended air and oxygen up to an oxygen concentration of 30% rather than higher initial oxygen concentration (60%–100%). [1, 39, 40] [CoSTR 2019 and 2020, weak recommendation, very low certainty of evidence] The range of 21 to 30% oxygen is suggested because it was used as the "low oxygen concentration" for all clinical trials. We place higher value on reducing oxygen burden on

pre term newborns and the absence of benefit of oxygen concentration >60% in reducing mortality or other adverse outcomes, however there is a paucity of evidence for initial oxygen concentrations between 30% and 60%.[39]As for newborn infants ≥35w , ANZCOR suggests that supplemental oxygen should be given judiciously, ideally guided by pulse oximetry. [1, 39, 40] [CoSTR 2019 and 2020, weak recommendation, very low certainty of evidence] Both hyperoxaemia and hypoxaemia should be avoided. If a blend of oxygen and air is not available, resuscitation should be initiated with air.

2.0 | Congenital Upper Airway Obstruction

A newborn who is pink when crying but cyanotic, with or without laboured breathing when quiet, should be evaluated for choanal atresia or other upper airway obstruction. An oral airway may provide adequate relief from obstruction. For a newborn with a small pharynx, such as occurs when there is a small mandible, prone positioning and/or placement of an endotracheal tube via the nostril into the pharynx, as a mechanical stent to prevent the tongue obstructing the airway, may improve the airway. Newborns with compromising craniofacial malformations may require a supraglottic mask airway or tracheal intubation. This can be difficult, and expert assistance may be required [Good Practice Statements]

3.0 | Congenital Diaphragmatic Hernia

Newborns with congenital diaphragmatic hernia (CDH) who need respiratory support should not receive bag and mask ventilation. Where respiratory support is needed, early intubation or use of a supraglottic airway device is recommended to minimise air entry into the gastrointestinal tract. [Good Practice Statements] Breath sounds following tracheal intubation may be asymmetrical, depending on the location of the CDH (and the endotracheal tube). A wide bore orogastric tube should be placed for intermittent suction to avoid air accumulation in intrathoracic small bowel and minimise lung compression caused by it. As many of these infants only have one functioning lung the ventilation needs to be gentle with low tidal volumes. [41] [Good Practice Statements]

4.0 | Newborn with Unexpected Congenital Anomalies

Unless there has been prior discussion and the development of an alternative care plan with the parents, usually all newborns should receive a complete and thorough resuscitation.

Those infants with life-limiting congenital anomalies are often best evaluated in the neonatal unit after resuscitation when more information will be available, and the parents can be part of management discussions (refer to ANZCOR Guideline 13.10). [Good Practice Statement]

5.0 | Pneumothorax

Pneumothorax is a rare cause of failure to respond to resuscitation immediately after birth. Chest recession/retraction, tachypnoea, unilaterally decreased breath sounds, bulging of the chest wall on one side, especially in the setting of deterioration after initial response to resuscitation, may indicate the presence of a pneumothorax. The diagnosis is best confirmed by chest radiograph, but emergency treatment may be required. Transillumination can be helpful in premature newborn, but in term newborn it may be falsely negative. If the clinical history suggests lung hypoplasia (which can predispose to pneumothorax) is likely, preparation (before birth) of equipment for bedside diagnosis and emergency treatment of pneumothorax may be advisable. [Good Practice Statement]

6.0 | Pleural Effusions or Ascites (Including Fetal Hydrops)

Severe body wall oedema, pleural effusions and ascites at birth can cause lung hypoplasia and interfere with initial lung expansion. Ventilation can usually be established by using higher pressures, allowing thoracentesis to be done after radiographic and/or ultrasound examination, with cardiorespiratory monitoring and with control of ventilation. However, emergency thoracocentesis or paracentesis is sometimes required. [Good Practice Statement] If fluid is obtained, laboratory analysis is sometimes helpful in diagnosing the cause.

7.0 | Pneumonia/Sepsis

Congenital pneumonia can result in very poor lung compliance, necessitating high ventilation pressures during resuscitation to aerate the lungs. [Good Practice Statement] It presents like severe respiratory distress syndrome.

8.0 | Congenital Heart Disease

Newborns who remain cyanotic despite adequate ventilation, oxygenation and circulation may have cyanotic congenital heart disease or persistent pulmonary hypertension. For newborns with duct-dependent congenital heart defects that have been diagnosed antenatally, target saturation ranges (during resuscitation and thereafter) should be discussed with a cardiologist. Otherwise, the priorities for resuscitation are similar to those of other newborns. [Good Practice Statements]

Very rarely, congenital heart block is the cause of persistent bradycardia. For newborns with chronic heart block, heart rate thresholds for initiating ventilation and chest compressions will

usually be lower than in other newborns. Tone, respiratory effort and oxygenation should be assessed as well to determine whether resuscitation manoeuvres are needed. [Good Practice Statements]

Where a clinically significant arrythmia has been detected or suspected antenatally, the availability of ECG monitoring may be particularly useful in assessing heart rate. [Good Practice Statement]

Early NICU admission and echocardiographic evaluation in cases of suspected or antenatally diagnosed congenital heart disease is essential. [Good Practice Statement]

9.0 | Abdominal Wall Defects

Infants born with gastroschisis or a large omphalocoele require special consideration to protect the exposed abdominal contents from trauma, drying, heat loss or contamination and to prevent expansion of the extra-abdominal bowel with air. A polyethylene wrap (e.g., food wrap) or bag (e.g., a surgical “bowel bag” used to protect bowel during abdominal surgery) can be used to enclose the abdomen or the whole lower body in order to reduce drying, heat loss or contamination. Care should be taken to enclose the bowel lightly and position it so that blood flow is optimised. Caring for the newborn in a right side down, side-lying position can be helpful. A large bore orogastric tube (e.g., 8 to 10 FG) should be inserted to (repeatedly) remove swallowed air. [Good Practice Statements]

If respiratory support is needed, CPAP or positive pressure ventilation via a facemask or nasal prongs should be avoided because they may increase intra-abdominal gas, which can imperil the blood supply to the exterior gut and can increase the difficulty in reducing the bowel into the abdomen later. If respiratory support is required, a low threshold for endotracheal intubation is suggested in preference to a facemask or nasal prongs. There is no literature and little experience in relation to use of a supraglottic airway in these circumstances, but because it promotes tracheal ventilation and oesophageal occlusion, it may be preferable to a facemask if respiratory support is needed and endotracheal intubation is not possible. [Good Practice Statements]

10.0 | Multiple Births

Multiple births are more frequently associated with a need for resuscitation because of prematurity, abnormalities of placentation, compromise of cord blood flow, and/or mechanical complications during delivery. Monozygotic multiple fetuses may have discrepant blood volumes from twin-to-twin transfusion syndrome and rarely, one twin may need urgent transfusion, usually after initial resuscitation. There should always be at least one skilled resuscitator for each newborn. [Good Practice Statement]

11.0 | Fetal Haemorrhage

Maternal vaginal bleeding before birth may be a sign of placental abruption, placenta praevia or vasa praevia as the source of the bleeding. Although most commonly, the majority of blood loss will be maternal, if even a small portion is fetal, the newborn may be hypovolaemic. Major transplacental haemorrhage into the mother's circulation (feto-maternal haemorrhage) can cause neonatal hypovolaemia or normovolaemic anaemia with no apparent antenatal bleeding.

Exsanguinated newborns are typically very pale even after a good heart rate has been restored. They may be difficult to resuscitate and intravenous fluid is often required before the newborn will respond fully to resuscitative measures. Refer to ANZCOR Guideline 13.7, that advises isotonic crystalloid (0.9% sodium chloride or Hartmann's) should be used in the first instance but may need to be followed with blood products suitable for neonatal transfusion. Some newborns have lost a large proportion of their blood volume and may require activation of a critical bleeding protocol that addresses both restoration of oxygen carrying capacity and the likely accompanying coagulopathy. [42] [Good Practice Statement]

12.0 | Umbilical Artery Cord Blood Gases

Cord blood gases should be measured in every resuscitated newborn as the most objective way to assess the condition just before birth. [Good Practice Statement] They are also one of several important criteria for assessing whether there was sufficient depression at birth to initiate screening for hypoxic ischaemic encephalopathy and the possible initiation of therapeutic hypothermia after resuscitation. [43] Comparison of paired samples drawn from both vein and artery is advisable, because of the risk that the umbilical artery has not been correctly identified. Normal umbilical artery values are given in the following table.[44] The effect of deferred cord clamping procedures on these values is uncertain.[45-48]

	2.5th centile	**Mean**	**97.5th centile**
pH	7.1	7.27	7.38
Base excess	-11	-4	1
pO_2 (mm Hg [kPa])	6 [0.8]	17 [2.3]	30 [4]
pCO_2 (mm Hg, kPa)	35 [4.7]	52 [6.9]	74 [9.8]

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About this Guideline

Search date/s	ILCOR literature search details and dates are available on the CoSTR page of the ILCOR website (https://costr.ilcor.org) and the relevant CoSTR documents. [1, 2]
Questions/PICOs:	Are described in the CoSTR documents (https://costr.ilcor.org)
Method:	Mixed methods including ARC NHMRC methodology before 2017 and ILCOR GRADE methodology described in ILCOR publications since 2017.
Principal reviewers:	Helen Liley, Lindsay Mildenhall, Marta Thio and Callum Gately
Main changes	Changes in recommendations for sustained inflation breaths and initial concentration of oxygen. Additional good practice statements for infants with congenital heart disease. Updating of review evidence, references, and terminology to increase consistency with GRADE terminology.
Approved:	April 2021

Referencing this guideline

When citing the ANZCOR Guidelines we recommend:

ANZCOR, 2026, Guideline 13.8 – The Resuscitation of the Newborn in Special Circumstances, accessed 29 September 2026, https://www.anzcor.org/home/neonatal-resuscitation/guideline-13-8-the-resuscitation-of-the-newborn-in-special-circumstances