Guideline 13.2 – Planning for Newborn Resuscitation and Identification of the Newborn at Risk

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. All those who may need to provide resuscitation of the newborn should undertake training that specifically includes the necessary individual and teamwork skills. [Good Practice Statement]
2. ANZCOR suggests that training of resuscitation instructors should incorporate timely, objective, structured, individually targeted, verbal and/or written feedback. [CoSTR 2015, weak recommendation, low certainty of evidence]
3. ANZCOR suggests that training should occur more frequently than annually. This retraining may consist of specific tasks and/or behavioural skills depending on the needs of the trainee. [CoSTR 2015, weak recommendation, low certainty of evidence]
4. A person trained in newborn resuscitation should be available for normal, low-risk births and someone trained in advanced resuscitation should attend all births considered at high risk for newborn resuscitation. If it is anticipated that the newborn is at high risk of requiring advanced resuscitation more than one experienced person should be present at the birth. Local guidelines should be developed specifying who should attend which births with allocation of roles within the team such as leadership, airway management, circulation, monitoring and support (including documentation). [Good Practice Statements]
5. Whenever the need for resuscitation is anticipated, there should be a consistent and coordinated approach from the obstetric and paediatric/neonatal teams in applying these guidelines and when possible, communicating with the parents to develop a management plan. [Good Practice Statement]

Abbreviations

Abbreviation	**Meaning/Phrase**
ANZCOR	Australian and New Zealand Committee on Resuscitation
CoSTR	International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations
CPR	Cardiopulmonary resuscitation
CTG	Cardiotocograph

1.0 | Training and improving resuscitation team performance

All those who may need to provide resuscitation of the newborn should undertake training that specifically includes the necessary individual and teamwork skills. [Good Practice Statement] Additional recommendations are provided in ANZCOR Guideline 10.2 – Advanced Life Support Training.

Simulation is a methodology in resuscitation education that allows multiple participants to practice and be assessed in these skills without risk to vulnerable patients. Use of simulation as an adjunct to traditional education methodologies may enhance performance of healthcare professionals in actual clinical settings. The most effective interventions and evaluation methodologies for training, and for training of resuscitation instructors remain to be defined. [4] ANZCOR suggests that training of resuscitation instructors should incorporate timely, objective, structured, individually targeted, verbal and/or written feedback. [2] [CoSTR 2015, weak recommendation, low certainty of evidence]

Training requires regular reinforcement in clinical practice, and/or refresher courses. ANZCOR suggests that training should occur more frequently than annually. This retraining may consist of specific tasks and/or behavioural skills depending on the needs of the trainee. [2] [CoSTR 2015, weak recommendation, low certainty of evidence]

Briefings and debriefings during learning activities while caring for simulated patients, and during clinical activities may also be helpful in improving individual and team skills. [1]

2.0 | Anticipation

A person trained in newborn resuscitation should be available for normal, low-risk births and someone trained in advanced resuscitation should attend all births considered at high risk for newborn resuscitation. If it is anticipated that the newborn is at high risk of requiring advanced resuscitation more than one experienced person should be present at the birth. Local guidelines should be developed specifying who should attend which births with allocation of roles within the team such as leadership, airway management, circulation, monitoring and support (including documentation). [Good Practice Statements] The list below contains examples of maternal, fetal, and intrapartum circumstances that place the newborn at risk of needing resuscitation.

The list is not exhaustive, and the magnitudes of these risks vary considerably, but the list is included to encourage planning. The need for an advanced resuscitation expert at the birth will depend on the number and severity of problems.

Whenever the need for resuscitation is anticipated, there should be a consistent and coordinated approach from the obstetric and paediatric/neonatal teams in applying these guidelines and when possible, communicating with the parents to develop a management plan. [Good Practice Statement]

3.0 | Risk Factors

3.1 | Maternal Risk Factors

1. Prolonged rupture of membranes (> 18 hours)
2. Bleeding in second or third trimester
3. Pregnancy-induced hypertension
4. Chronic hypertension
5. Substance abuse
6. Drug therapy (e.g., lithium, magnesium, adrenergic blocking agents, narcotics, selective serotonin reuptake inhibitors)
7. Diabetes mellitus
8. Chronic illness (e.g., anaemia, cyanotic congenital heart disease)
9. Maternal pyrexia
10. Maternal infection
11. Chorioamnionitis
12. Heavy sedation
13. Previous fetal or neonatal death
14. No antenatal care

3.2 | Fetal Risk Factors

1. Multiple gestation (e.g., twins, triplets, etc.)
2. Preterm gestation (especially <35 weeks)
3. Post-term gestation (>41 weeks)
4. Large for dates
5. Fetal growth restriction
6. Alloimmune haemolytic disease (e.g., anti-D, anti-Kell, or other antibody known to cause haemolytic disease of the fetus and newborn, especially if fetal anaemia or hydrops fetalis is present)
7. Polyhydramnios, oligohydramnios
8. Reduced fetal movement before onset of labour
9. Congenital abnormalities which may affect breathing, cardiovascular function or other aspects of perinatal transition
10. Intrauterine infection
11. Hydrops fetalis

3.3 | Intrapartum Risk Factors

1. Non-reassuring fetal heart rate patterns on cardiotocograph (CTG)
2. Abnormal presentation
3. Prolapsed cord
4. Prolonged labour (or prolonged second stage of labour)
5. Precipitate labour
6. Antepartum haemorrhage (abruption, placenta praevia, vasa praevia)
7. Meconium in the amniotic fluid
8. Narcotic administration to mother within 4 hours of delivery
9. Forceps delivery
10. Vacuum-assisted (ventouse) delivery
11. Maternal general anaesthesia

References

1. Wyckoff MH, Wyllie J, Aziz K, de Almeida MF, Fabres JW, Fawke J, et al. Neonatal Life Support 2020 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. Resuscitation. 2020;156:A156-A87.
2. Wyllie J, Perlman JM, Kattwinkel J, Wyckoff MH, Aziz K, Guinsburg R, et al. Part 7: Neonatal resuscitation: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations. Resuscitation. 2015;95:e169-201.
3. Aziz K, Lee HC, Escobedo MB, Hoover AV, Kamath-Rayne BD, Kapadia VS, et al. Part 5: Neonatal Resuscitation: 2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation. 2020;142(16_suppl_2):S524-s50.
4. Perlman JM, Wyllie J, Kattwinkel J, Atkins DL, Chameides L, Goldsmith JP, et al. Special Report--Neonatal Resuscitation: 2010 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. Pediatrics. 2010.

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	Update to include suggestion for role allocation in anticipation of need for newborn resuscitation. No major changes to other clinical recommendations. 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:

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