

Newborn Infants with Respiratory Maladaptation to Birth - Observation and Management

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Clinical/ Patient Services - Maternity

Summary Observation and management of newborn infants with respiratory maladaptation to birth, including infants exposed to intrapartum opioids administered to the mother during labour.

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Applies to Area Health Services/Chief Executive Governed Statutory Health Corporation, Board Governed Statutory Health Corporations, Affiliated Health Organisations - Non Declared, Divisions of General Practice, NSW Ambulance Service, NSW Dept of Health, Private Hospitals and Day Procedure Centres, Public Hospitals

Distributed to Public Health System, Divisions of General Practice, Health Associations Unions, Health Professional Associations and Related Organisations, NSW Ambulance Service, NSW Department of Health, Public Hospitals, Private Hospitals and Day Procedure Centres

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Director-General

This Policy Directive may be varied, withdrawn or replaced at any time. Compliance with this directive is **mandatory** for NSW Health and is a condition of subsidy for public health organisations.

CIRCULAR

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OBSERVATION AND MANAGEMENT OF NEWBORN INFANTS WITH RESPIRATORY MALADAPTATION TO BIRTH, INCLUDING INFANTS EXPOSED TO INTRAPARTUM OPIOIDS ADMINISTERED TO THE MOTHER DURING LABOUR

This Circular updates and supersedes Circular 95/ 41 issued on 7 June 1995.

This Circular provides guidelines on a recommended minimum level of care and observation of the newly born infant with respiratory maladaptation to birth¹, including infants born after the administration of narcotics during labour.

This Circular has been prepared by the NSW Pregnancy & Newborn Services Network (NSW PSN). It has been endorsed by the NSW Maternal and Perinatal Committee and is now issued as policy by NSW Health.

All hospitals are required to have written protocols in place for the observation of newly born infants with respiratory maladaptation to birth from any cause, including exposure to intrapartum parenteral administration of opioids such as pethidine.

1. Background

- 1.1 Maladaptation to birth is the disturbed or delayed physiological transition from the fetal to the neonatal state. The cardiovascular and respiratory systems are particularly involved, with changes in heart rate and breathing effort reflected in the Apgar score. This most commonly occurs in babies of pregnancies complicated by conditions associated with prematurity or with impaired placental reserve, such as hypertensive disease of pregnancy, intrauterine growth restriction. Examples include premature placental detachment, fetal anaemia (eg rhesus incompatibility), post-maturity and unphysiological labour (eg induction).¹
- 1.2 Physiological maladaptation to birth may also be caused by administration of intramuscular or intravenous opioids to the mother in the four hours prior to birth.² Respiratory maladaptation to birth has not been reported after the smaller amounts of opioid used in epidural anaesthesia.
- 1.3 As respiratory maladaptation to birth is most likely to occur in preterm infants, administration of parenteral opioids to mothers in preterm labour should be avoided.

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In accordance with the provisions incorporated in the Accounts and Audit Determination, the Board of Directors, Chief Executive Officers and their equivalents, within a public health organisation, shall be held responsible for ensuring the observance of Departmental policy (including circulars and procedure manuals) as issued by the Minister and the Director-General of the Department of Health.

2. Management of newly born infants at risk of maladaptation to birth

- 2.1 A health professional trained in neonatal advanced life support (as described in Circular 2002/30) should attend the birth if the mother has any antepartum or intrapartum condition associated with risk to the newly born infant. This includes administration of opioids within four hours of delivery.
- 2.2 Clinical signs of maladaptation after birth should be anticipated in all deliveries where any of the following criteria is met:
- intubation is required for resuscitation
 - cord pH (arterial) less than 7.1 or cord pH (venous) less than 7.2
 - base excess greater than minus 12
 - 5 minute Apgar score less than 7
 - babies thought to be affected by maternal narcotic administration during labour, regardless of whether naloxone hydrochloride (Narcan) has been administered to the baby or not.
- 2.3 If an infant has clinical signs as in 2.2 above, Basic Life Support measures should be the first steps instituted, as per Circular 2002/30 *Framework for Area Health Services to develop policy and procedures relating to clinical care and resuscitation of the newly born infant*.
- 2.4 Observations of the infant for respiratory rate, heart rate, colour and chest recession or retraction should be made **and recorded** every 15 minutes for the first hour, then at intervals determined by the condition of the infant for at least four hours after birth, where any one of the criteria in 2.2 is met. It is important that these observations are carried out in an area with adequate lighting.
- 2.5 A medical officer should review the infant and the clinical management plan as soon as possible if any one of the following is observed for more than a few minutes after the steps in 2.3 have been instituted:
- one or more episodes of apnoea
 - central cyanosis
 - expiratory grunting
 - chest recession
 - respiratory rate greater than 60 respirations per minute

Depending on the clinical state of the infant, observation and/or treatment in a special care nursery may be required.

3. Use of opioid antagonists

- 3.1 If clinical signs of maladaptation to birth as measured by the Apgar score persist **after** basic and advanced life support measures (as described in Circular 2002/30) have been instituted **and** the mother has been given intravenous or intramuscular opioids during labour, administration of an opioid antagonist to the infant **may** be indicated.

NOTE: The majority of infants born following intrapartum maternal opioid administration do not require administration of an opioid antagonist. Opioid antagonists should not be used as a substitute for provision of usual methods of clinical care and resuscitation of the newly born infant.²

WARNING: Narcan should not be administered to babies whose mothers are known or suspected to be addicted to opioids. In such cases, an abrupt and complete reversal of opioid effects may precipitate an acute withdrawal syndrome.³

- 3.2 Always establish and maintain adequate respiration before administration of naloxone to a newborn infant.²
- 3.3 Naloxone hydrochloride should be administered intramuscularly or, for more rapid action, intravenously or via an endotracheal tube.
- 3.4 The initial recommended dose of Narcan is 100 micrograms per kg bodyweight^{2, 5}. Two preparations of naloxone are available: Narcan 400 micrograms per mL (one mL ampoules) and Narcan Neonatal 20 micrograms per mL (2mL ampoules). Either preparation can be used for neonates.
- 3.5 **Note:** Use of the Narcan 400micrograms per ml ampoule will be necessary to provide the recommended dose for average sized infants without injecting excessive fluid volume. Use of the Narcan Neonatal ampoule is only of value when tiny doses of Narcan are being administered, such as a smaller initial dose of 20 micrograms per kg bodyweight, repeated as necessary⁴.
- 3.6 The duration of action of naloxone is short, particularly after intravenous administration (about 30 minutes), and subsequent observation of the infant should be instituted as outlined in 2.4 and 2.5.

Due for review: Five years from date issued, by the NSW Pregnancy & Newborn Services Network

This Circular should be read in conjunction with:

- Circular 2002/30: *Framework for Area Health Services to develop policy and procedures relating to clinical care and resuscitation of the newly born infant.*

Robyn Kruk
Director-General

References

- ¹ NHMRC. *Perinatal morbidity*. AGPS Canberra 1995. Available at <http://www.health.gov.au/nhmrc/>
 - ² International Guidelines for Neonatal Resuscitation: An excerpt from the guidelines 2000 for cardiopulmonary resuscitation and emergency cardiovascular care: International Consensus on Science. *Pediatrics* 106(3) e29, 2000. Available at <http://www.pediatrics.org>
 - ³ McGuire W, Fowle PW, Naloxone for narcotic-exposed newborn infants. (Cochrane Review) In: *The Cochrane Library*, 2002 In press. Oxford: Update Software
 - ⁴ MIMS Full Prescribing Information for Narcan, Narcan Neonatal. *MIMS Annual 2000*. Boots Healthcare Australia Pty Ltd. Available at <http://www.mims.hcn.net.au> 23 July 2001
 - ⁵ American Academy of Pediatrics Committee on Drugs: Naloxone dosage and route of administration for infants and children: addendum to emergency drug doses for infants and children. *Pediatrics* 86(3): 1990. 484-5
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