



GUIDELINE

Pneumonia

Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this [disclaimer](#)

Aim

This guideline describes clinical features and management of infants with pneumonia.

Risk

Non-adherence to the guideline may increase morbidity and mortality in infants with pneumonia.

Background

Pneumonia is an important cause of neonatal infection and accounts for significant morbidity and mortality as neonates with pneumonia can deteriorate rapidly. In the newborn, pneumonia is indistinguishable from other forms of respiratory distress.

The diagnosis of neonatal pneumonia is based upon a combination of clinical, radiographic, and microbiologic findings. The main indicator is the chest x-ray which may show areas of collapse and consolidation.

Neonatal Pneumonia can be categorised as [vertical transmission](#), [nosocomial infection](#) or [aspiration pneumonia](#).

Vertical transmission

- Trans-placental as part of a generalised congenital infection
 - [Herpes virus group](#) ([CMV](#), varicella, simplex etc)
 - [Syphilis](#)
- Transmission from genital tract at birth (increased risk with chorioamnionitis and prolonged rupture of membranes) see [sepsis calculator](#)
 - Group B Streptococcus disease ([GBS - see Sepsis Guideline](#))

- Haemophilus
- Gram negative bacteria
- Chlamydia

Nosocomial infection

- Ventilation associated pneumonia (VAP) see [Ventilated Neonate: Nursing Care](#) for VAP prevention and management.
 - Multiple organisms
- Airborne virus. See [Neonatal Viral Infections](#) guideline.
 - Common respiratory virus infections, RSV, influenza A&B, para influenza, COVID19

Aspiration Pneumonia

Inhalation of milk or other agents, associated with respiratory symptoms. The anatomy of the pharynx and larynx is largely responsible for protecting the airway from inhalation. This is aided by 'defensive reflexes.' Material in the pharynx initiates swallowing and reflex breath holding. If the airway is still threatened, additional reflexes are provoked with the aim of protecting the airway. These include more prolonged apnoea, choking, laryngospasm and coughing. These mechanisms are less effective in the neonatal period than in older children and adults.

The epidemiology is dependent on the cause of the aspiration:

1. **In-coordination of sucking/swallowing/breathing** caused by:
 - Prematurity
 - Secondary to structural malformations or neurological disorders/defects e.g. HIE, cleft palate, laryngeal cleft, trachea-oesophageal fistula. Pierre-Robin syndrome
 - Congenital malformations associated with poor sucking e.g. Prader-Willi
 - Sedation (opiates) or tachypnoeic as swallowing and breathing is more difficult.
2. **Syndromes** attributed to Gastro Oesophageal Reflux (GOR)
 - In infants on IPPV – RUL collapse
 - Apnoeic episodes
3. Massive regurgitation and inhalation of a feed

Clinical Presentation

Aspiration pneumonia can be seen in:

- Term infants who during a breast/bottle feed in the first 48-72 hours of life chokes, splutters and may be transiently apnoeic and blue. Many of these are at the extreme end of normal spectrum in response to feeding.

- Silent aspiration in an ill or convalescent infant, provoking an apnoea

Investigations

- Chest X-ray may show changes especially in the RUL and RLL. Alternative diagnoses especially infection should be considered.
- If the infant is unwell, investigate as per general respiratory management.
- A barium swallow may be indicated to examine feeding coordination, investigate for trachea-oesophageal fistula (H-type) and to whether aspiration is present.

Management of pneumonia

- Severely ill patients may require ventilatory, volume, and/or vasopressor support to maintain adequate oxygenation and perfusion. See [Ventilated Neonate: Care of](#)
- Blood culture is mandatory before commencing antibiotics. See [Sepsis](#) guideline.
- Review all microbiological information available on baby and mother to assist in antimicrobial choice. Antimicrobial choice see [Sepsis](#) guideline.
- If recurrent, consider the possibility of underlying anatomical problems (trachea-oesophageal fistula, incompetent airway protective reflexes), cystic fibrosis and immune compromise.
- Treatment is dependent on the extent of pulmonary compromise and the reason for aspiration, and risk of sepsis.

Related CAHS internal policies, procedures and guidelines


Neonatology Guidelines

- [Cytomegalovirus \(CMV\): Neonatal Pathway](#)
- [Neonatal Viral Infections](#)
- [Sepsis Calculator – Assessment of Early Onset Sepsis in Infants ≥ 35 Weeks Gestation](#)
- [Sepsis: Neonatal](#)
- [Ventilated Neonate: Nursing Care](#)

References and related external legislation, policies, and guidelines

1. Foglia E, Meier MD, Elward A. Ventilator-associated pneumonia in neonatal and pediatric intensive care unit patients. *Clin Microbiol Rev* 2007;20(3):409-25, table of contents. doi: 10.1128/CMR.00041-06
2. Goerens A, Lehnick D, Büttcher M, et al. Neonatal Ventilator Associated Pneumonia: A Quality Improvement Initiative Focusing on Antimicrobial Stewardship. *Frontiers in Pediatrics* 2018;6 doi: 10.3389/fped.2018.00262
3. Hooven TA, Polin RA. Pneumonia. *Semin Fetal Neonatal Med* 2017;22(4):206-13. doi: 10.1016/j.siny.2017.03.002
4. Speer ME. Neonatal pneumonia - UpToDate: UpToDate; 2020 [Available from: <https://www.uptodate.com/contents/neonatal-pneumonia>]

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