SHIFT TEST - Neonatal Lung Function Assessment

Guideline Responsibilities and Authorisation

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Target Audience	Registered Nurses, Nurse Practitioners, Clinical Nurse Specialists, Registrars, Senior Medical Officers
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Guideline Review History

Version	Updated by	Date Updated	Summary of Changes
1	J Pope, M Rainbow	Oct 2020	New guideline

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1 Overview

1.1 Purpose

To provide guidance on when and how to perform SHIFT test on qualifying infants to determine oxygen requirement at rest.

1.2 Scope

Waikato District Health Board DHB staff working in Neonatal Intensive Care Unit (NICU).

1.3 Patient / client group

Preterm babies born <29 weeks and now 35+0 to 36+6 weeks corrected gestational age.

1.4 Definitions

ANZNN	Australia New Zealand Neonatal Network
CNS	Clinical nurse specialist
CO2	Carbon dioxide
CPAP	Continuous positive airway pressure
FiO2	Fraction inspired oxygen
NICU	Newborn Intensive Care Unit
NNP	Neonatal Nurse Practitioner
O2	oxygen
SpO2	Oxygen saturation

2 Clinical Management

2.1 Competency required

- Registered nurse able to care for babies on CPAP, ventilator, high flow blended oxygen or low flow oxygen
- NNP/CNS
- Medical resident

2.2 Equipment

- Oxygen saturation monitor
- Time-keeping device
- Head box with oxygen analyser and medical gas blender, for babies who are in room air or on nasal flow <2L/minute

2.3 Guideline

- Template for assessment form can be found here:

  https://anznn.net/Portals/0/DataDictionaries/ANZNN_Shift_Test_protocol_template.docx

  Talk to parents about test and give them the parent information leaflet

2.3.1 How to use Head Box for Shift Test

For use only when baby is on <2L/min blended nasal flow or low flow oxygen

- Prepare baby as instructions for Shift Test i.e. calm & settled, 30 minutes post feed.
- Take prongs off baby
- Ensure head box on steady surface to prevent leaks,
- Position baby so there is some space around neck; can adjust neck outlet on head box
- Oxygen analyser should be in the vicinity of the face
- Provide blended oxygen at a flow of at least 6L/minute to create adequate air movement within the head box which ensures continuous flushing of CO_2 from the head box
- Percentage of oxygen in head box needs to be adjusted to maintain oxygen saturations

Approximate blender setting oxygen percentages @6L/min

30% @ 6L/min =27% O_2 (FiO2 = 0.27)

40% @ 6L/min = 36% O_2 (FiO2 = 0.36)

50% @ 6L/min = 43% O_2 (FiO2 = 0.43)

2.3.2 When SHIFT test is completed and baby has remained in <0.3 FiO2 for 15 minutes, AND

was initially in <2l/min blended flow or in low flow oxygen, proceed to perform the Modified Walsh Reduction to Air Trial as per SHIFT test record sheet.

2.4 Potential complications

Remote possibility that baby might destabilise while in head box, this would be mitigated by the close observation that the Shift Test requires.

In the event of prolonged desaturation <90% for 5 minutes or <80% for 15 seconds, or apnoea for >20 seconds the assessment is abandoned, and baby managed appropriately to recover.

2.5 After care

- Return baby to respiratory support prior to doing Shift test.
- Document SHIFT test outcomes on ANZNN data sheet and in clinical notes

3 Patient information

https://anznn.net/Portals/0/DataDictionaries/ANZNN_Parent_Information_Sheet_Lung_Function_Assessment.pdf

4 Audit

4.1 Indicators

- All qualifying infants have SHIFT test performed at appropriate time

4.2 Tools

- ANZNN data collection forms
- Clinical task sheet

5 Evidence base

5.1 Summary of Evidence, Review and Recommendations*

- https://anznn.net/Portals/0/DataDictionaries/ANZNN_Parent_Information_Sheet_Lung_Function_Assessment.pdf
- https://anznn.net/Portals/0/DataDictionaries/ANZNN_Shift_Test_protocol_template.docx

5.2 Bibliography

- E MacLachlan1, S Pal2, R Ross-Russell2, Abstract in Archives volume 101 issue supplement 1)

Appendix A - Head box set up for SHIFT test

Head box set up for SHIFT test (neonatal lung function assessment)

For use when infant in <2L/min nasal flow or on low flow oxygen

Gather equipment (kept in store room)

Head box

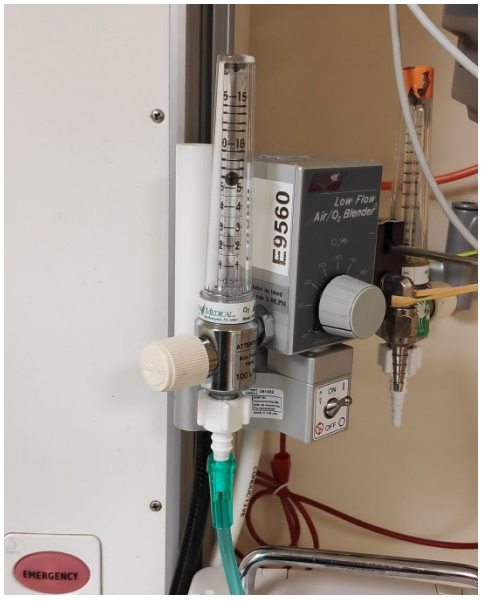
Neopuff O2 tubing

Oxygen analyser

Blended flow

Saturation monitor (already on infant)

Time keeping device (e.g. clock on monitor/on wall in nursery)



Set flow metre to 6L/min through blender

This allows adequate flushing of CO2 from head box

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Remove nasal cannula from infant's nose

Place head box over infant's head on steady, flat surface

Adjust neck outlet, allowing only small amount of space around neck

Ensure side port holes are closed

Insert oxygen tubing at back of head box away from infant's face

Place Oxygen analyser close to infant's face, either inserted in top of head box or on bed beside infant's head inside head box

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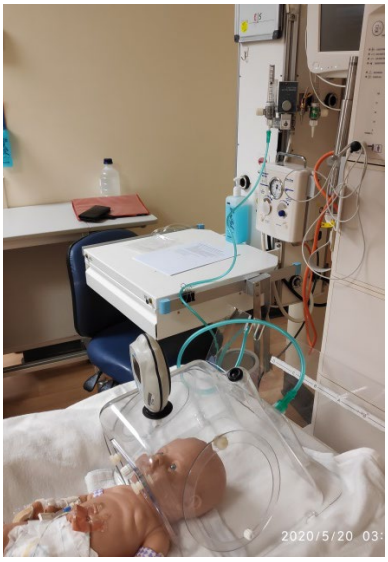

Adjust FiO2 to maintain SpO2 90-94%

Wait for infant to settle

Keep FiO2 constant throughout 15 minute recording period