



CLINICAL GUIDELINE

Developmental Care: Reducing Environmental Stimuli

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

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

Noise

Although the human cochlea and peripheral sensory end organs are developed by 24 weeks gestation, neurologically, the preterm infant is not well developed to handle extrauterine stimuli. Research has shown children from NICU were more at risk of sensorineural hearing loss (SNHL)^{5,7}.

Infants in the neonatal intensive care unit (NICU) are subjected to stress, including noise, unwanted sound. The acoustic environment in the NICU is often containing high sound level of short duration and at irregular intervals. Sustained ambient noise is detrimental to the health of preterm and sick infants, staff and parents.

The negative impact of unwanted sound on the health of infants can include

- apnoea
- hypoxaemia
- alternation in oxygen saturation
- increased oxygen consumption
- elevated heart and respiratory rates

In the long term, elevated sound levels can potentially result in hearing loss and delays in language development.

For staff, high noise levels are associated with an increased rate of errors and accidents.^{3,7}

The current recommended ambient (background) noise levels in an intensive care unit should not exceed 45-50dB. In an average home, the quiet background sound level equates to about 40dB, whereas two or three people having a normal conversation in an office would produce a sound level of 60dB.

There are many sources of sound, generally categorised into 3 groups; sound generated from staff or equipment and building generated sound.

- Human activities: social conversation, handover, careless handling of equipment, falling objects.
- Equipment: ventilators, monitors' alarm, portable trolleys, IV pumps, incubators, radios, pagers
- Building: PA announcements, air conditioning, doors closing, fridge compressor, phone ringtones, running water in sink

Strategies and Measures to Reduce Noise

- Decrease the voice volume of conversation at bedside.
- Restricted use of radio in clinical area.
- Implement “quiet time” period in each nursery aiming between 1400hrs-1600hrs. Utilise the quiet time for skin-to-skin kangaroo care. General housekeeping activities to be avoided in this time period.
- Respond quickly to silence alarms and set alarms volumes of monitoring devices to lowest tone. As a guide:
 - Bedside monitoring device, set at level 90.
 - Pulse oximeter, set at level 1.
 - Ventilator (Drager), set at level 1.
- Open and close doors of incubators carefully and quietly.
- Turn suction off at the wall after use.
- Prevent water build up in CPAP and humidity circuits.
- Avoid talking over the top of the incubator, leaning on/against incubator or tapping fingers on incubators.
- Avoid placing hard items on incubators as it is magnified inside e.g. Bottles, charts.
- Use of ear muffs on infants

Lighting

Essential minimum lighting is to remain switched on at all times to maintain a safe level for accurate clinical observation. Utilise down-lights and overhead lights when extra lighting is required. Consider eye pads if extra lighting is required for extended periods of time if not able to use an incubator cover.

Other Noxious Stimuli

- Discourage the use of strong fragrances.
- Minimise painful procedures and provide appropriate pain relief measures including comfort measures.

References

1. Chang A, Kok Y, Coventry L, Sin M, Vines P, Sharp M. Noise Levels In The Newly Designed Neonatal Intensive Care Unit At King Edward Memorial Hospital. 2017.
2. EM W, A L. The effects of noise on preterm infants in the NICU. British Medical Journal [Internet]. 2011 [cited 27 June 2017];96(4):F305–F309. Available from: <http://fn.bmj.com.kelibresources.health.wa.gov.au/content/96/4/F305.long>
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4. Noise: A Hazard for the Fetus and Newborn. PEDIATRICS. 1997;100(4):724-727.
5. Lahav A, Skoe E. An acoustic gap between the NICU and womb: a potential risk for compromised neuroplasticity of the auditory system in preterm infants. Frontiers in Neuroscience. 2014;8.

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