

Sound Level Targets UHL Neonatal Guideline

1. Introduction and Who Guideline applies to

This Guideline is aimed at all health care professionals involved in the care of infants with in the Neonatal Service.

Related UHL documents

Document	ID number or Appendix number
Audit assessing sound levels on the NICU at LRI	Available on Sharepoint

Aims

- To provide guidance on the best way to reduce sound levels on the neonatal unit and meet target sound levels.
- To optimise growth and development of all neonates by reducing sounds levels on the NICU.
- To work towards meeting AAP sound level recommendations.

Background

Advancements in neonatal intensive care now allow survival of infants born as early as 22 weeks' gestational age. Infants at these gestational ages have immature central nervous systems, putting them at high risk of adverse outcomes due to excessive noise. This can have detrimental effect on sleep patterns, growth, and neurodevelopment. ⁽¹⁾

High sound levels on the neonatal unit are often due to the constant use of essential lifesaving equipment, such as respiratory support. However, there are a variety of ways in which the multidisciplinary team can work together to reduce unnecessary sound levels, improving patient care and optimising growth and development. The aim is to provide guidance on the best way to reduce sound levels on NICU and meet target sound levels.

In 1997, the AAP guidelines recommended sound levels of <45db on neonatal units ⁽²⁾. With the 'SoundEar' equipment in place, we can use the more recent AAP 2007 standards. The noise metrics that can be measured include the equivalent continuous sound level (L_{eq}), the maximum noise level (L_{max}) and the noise level exceeded for 10% of the measurement period (L_{10}). The AAP target sound levels for NNU are as follows: $L_{eq} < 45\text{dB}$, $L_{10} : 50\text{ db}$ and $L_{max} : 65\text{db}$ ⁽³⁾.

Recommendations for reducing noise pollution

- Regular monitoring of sound levels on the NNU and to review the need for improvements and change (includes utilising a 'Sound Ear' for monitoring sound levels)
- All babies requiring an incubator, to be nursed in a double-walled incubator.
- All monitored babies to have incubator covers except during family time and medical treatment. The use of incubator covers should still allow for clinical observation of the infants at all times.
- Quiet time to be implemented for two hours every day, with minimal handling.
- Education to staff about the importance in reducing sound levels and how change in behaviours can help achieve this.
- Visual aids to be used in the clinical area to prompt staff in reducing sound levels.
- Lower light level correlates with lower sound levels
- Sound absorbing ceiling/flooring and soft-close bins
- When purchasing new equipment, sound control to be considered ⁽²⁾
- Use of silicone earplugs ⁽⁴⁾

Further recommendations to reduce sound exposure in day-to day practice:

- Turn equipment off when not in use – Such as CPAP flow, suction
- Remove suction tubing from incubator if left on (and neopuff tubing as allowed by the medical situation)
- Remove water from ventilator tubes
- Do not inadvertently tap on incubator – blood bottles, parents, bowls, scissors etc.
- Close incubator doors/port holes quietly
- Do not talk loudly over incubators but rather away from incubator where possible. However, it is still important to encourage parents to speak softly to their baby.
- Educate parents in noise reduction for their infant e.g. closing incubator port holes softly.
- Deal with alarms promptly
- Answer phone promptly when possible
- Turn down phone tone if possible
- Reduce ultrasound scanner audio when possible

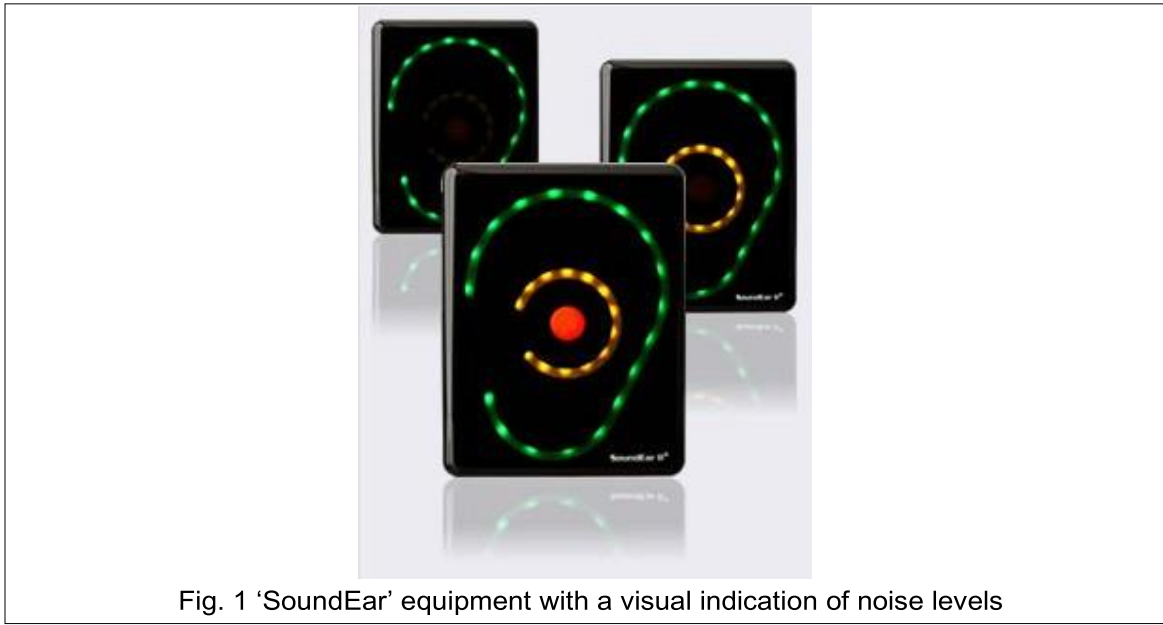


Fig. 1 'SoundEar' equipment with a visual indication of noise levels

3. Education and Training

None

4. Auditable standards

$L_{eq} < 45\text{dB}$, $L_{10} : 50\text{ db}$ and $L_{max} : 65\text{db}$

(45dB is equivalent to a bird call. A normal conversation at one metre is around 60dB and chamber music 75dB)

5. Supporting References

1. Mayhew, Kelli J. MScN, RN; Lawrence: Elevated Sound Levels in the Neonatal Intensive Care Unit, What Is Causing the Problem?
2. *Advances in Neonatal Care* [22\(6\):p E207-E216, December 2022.](#)
3. Committee on Environmental Health. 'Noise: A hazard for the fetus and Newborn' *Pediatrics*, 1997 100(4): 724-727
4. Witt CL. Addressing noise in the NICU. *Forward. Adv Neonatal Care*, 2008 8 (5) *Adv Neonatal Care*. 2008;8(5 Suppl):S2. doi:10.1097/01.ANC.0000337264.62846.14.
5. Abdulraoof Almadhoob, Arne Ohlsson. 'Sound reduction management in the neonatal intensive care unit for preterm or very low birth weight infants'
6. *Cochrane Database Syst Rev*. 2020; 2020(1): CD010333.

6. Key Words

.Noise, SoundEar,

The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.
 As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

CONTACT AND REVIEW DETAILS			
Authors: Sam Fossey – Deputy Sister, Sumit Mittal - Consultant Guideline Lead: Sumit Mittal - Consultant		Executive Lead Chief Nurse	
Details of Changes made during review:			
Date	Issue Number	Reviewed By	Description Of Changes (If Any)
September 2013	1	Sam Fossey , Sumit Mittal	Original document
August 2014	2	Neonatal Guidelines group Neonatal Governance group	minor editorial changes – REM (ratified)
Sept 2017	3	Neonatal Governance meeting	Guidelines reviewed and updated by authors. Plan for re-audit. Ratification by circulation
May 2020	4	Guidelines reviewed and updated by authors	Audit in process
Oct 2023	5	Guidelines reviewed and updated by authors. Neonatal Guidelines group Neonatal Governance group	Added reference to the extremely premature neonates of 22 weeks gestation. Added low level lighting and silicone earplugs in recommendations for reducing noise levels