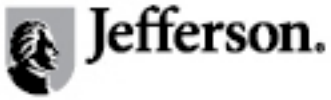

1-2020

Sound Dampening Headband for Infants

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Title: Sound Dampening Headband for Infants

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Background: Noise in the Intensive Care Nursery (ICN) has been linked to sleep disruption, vital sign destabilization, abnormal development, and stress response induction in infants. Specifically, a sound level ≥60 decibels (dB) was linked to sleep disruption in infants, and the American Academy of Pediatrics (AAP) set a maximum recommended sound level of 45dB in ICNs. The present work was conducted to confirm that the Jefferson ICN exceeds the 60dB and 45dB levels, like most hospitals do, and to conduct preliminary testing on materials for a wearable intervention to reduce infants' exposure to noise.

Methods: A group of 30 neonatologists, nurses, audiologists, music therapists, sound experts, and administrative staff were interviewed about noise in the ICN and the viability of potential solutions. A 24-hour sound recording was recorded in the Jefferson ICN using a REED-SD-4023 meter. The same meter was used to the sound dampening ability of several materials at 990Hz.

Results: The 24-hour sound recording showed that the ICN spent 100% of the time above the AAP recommended level of 45dB, and 44% of the time above 60 dB, the level that disrupts sleep. The maximum sound level was 93dB, and the minimum was 49dB. In our preliminary

testing of materials, both Sorbothane and mass-loaded vinyl were far superior to the seven other tested materials.

Conclusions: Excessive noise in the Jefferson ICN is clearly a problem. Experts showed immense interest in our work to reduce their patients exposure to noise. Additionally, the team was able to identify a sound dampening material to focus on in creating a wearable noise-reducing apparatus for infants. The project was limited by lack of formal user surveys. Future studies can focus on a higher fidelity way of measuring the ability of the wearable apparatus to dampen noise at the level of the ear.