

Operating Room (OR) Noise is a health and safety risk: real time noise level measurements during critical times of surgery and multidisciplinary staff's noise perception in Vanderbilt Adult OR

Glendyle Levinskas RN, BSN, CNOR; Elizabeth Card, MSN, APRN, FNP-BC, CCRP; Cynthia Kildgore MSHA, RN; Oscar Guillamondegui, MD; Steve Hyman, MD; Matthew Fosnot MS, APN, CRNA; Buffy Krauser Lupear, DNP, APRN, CRNA; Diane Johnson, MSN, RN; Jennefer Payne, MSN, RN; Chris Vincent, CSTFA

BACKGROUND

- Research indicates noise negatively affects individuals and patient safety
- Operating room (OR) can be one of the noisiest clinical areas due to complex multi-information sharing among a multidisciplinary team simultaneously working with various rich technology devices and equipment to perform surgery on a patient
- Research shows trauma OR averages 85 decibel (dB) almost 13 fold (40/3) higher than Environmental Protection Agency (EPA) 45dB safe range.
- Orthopedic & Neurosurgery noise > other specialties' noise
- Current practice & issue: observed increased noise level, staff unaware of noise producing behaviors and unsafe effect of noise, mixed of concerned and unconcerned staff, noise is unregulated, unmonitored and no policy to address issue

PURPOSE

1. To investigate noise effects and effective noise reduction strategies to individual & patient safety
2. To assess OR noise levels and multidisciplinary staff's noise perception

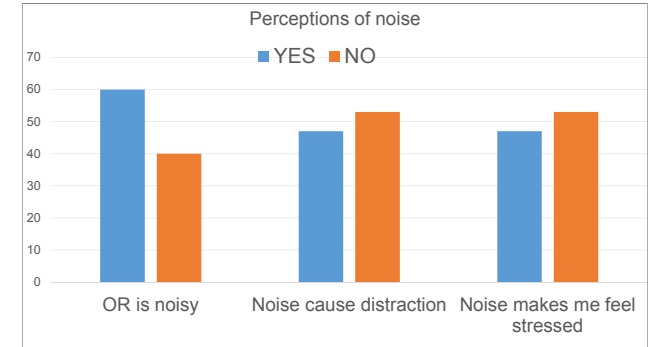
METHODS

- Completed Evidence-based Practice fellowship in 2017
- Communicated and discussed noise concern to OR leadership for approval
- Reviewed & synthesized literatures on OR noise and interventions
- Based on summarized study results initiated "Noise Reduction during critical times of surgery" protocol and obtained Institutional Review Board (IRB) approval
- Proposed IRB approved OR noise reduction protocol, a practice initiatives to perioperative multidisciplinary quality & practice committee for support & collaboration
- Involved National Institute of Occupational Safety Health (NIOSH) Senior Engineer for expertise support on sound level meter (SLM) Iphone App for noise measurement
- NIOSH SLM calibrated by Vanderbilt Hearing & Speech department
- Measured OR noise level in multispecialty surgeries using NIOSH SLM, 4 feet perimeter from OR table
- Assessed staffs OR noise perception using IRB approved REDCap survey
- Proposed noise interventions to leadership: multidisciplinary involvement and noise education

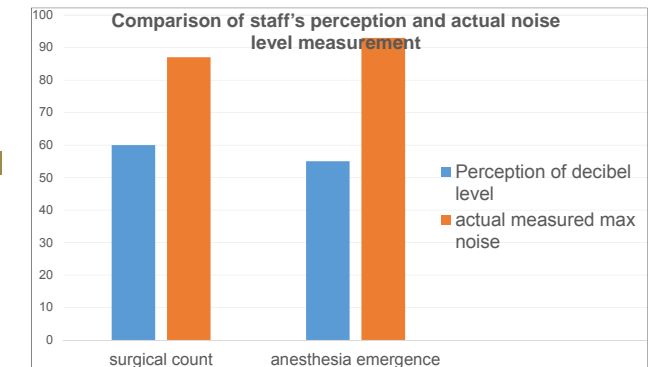
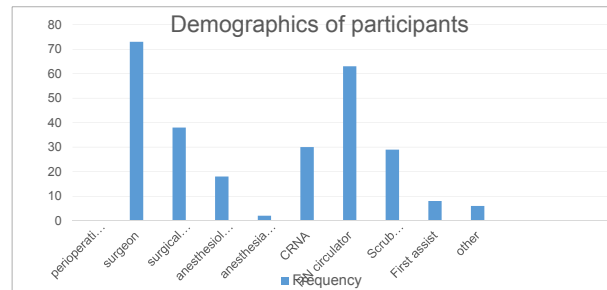
RESULTS OF NOISE LEVEL MEASUREMENTS



RESULTS OF STAFF'S NOISE PERCEPTION



RESULTS OF STAFF'S NOISE PERCEPTION

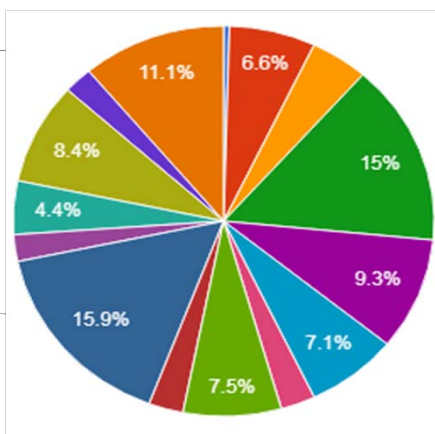


FIGURES ON NOISE EFFECTS AND REDUCTION



Counts/frequency by surgical specialty

- burn (1, 0.4%)
- cardio-thoracic (15, 6.6%)
- EENT (10, 4.4%)
- general (34, 15.0%)
- GGUR (21, 9.3%)
- GYN (16, 7.1%)
- Head & Neck (6, 2.7%)
- neuro (17, 7.5%)
- oral/maxillary/facial (6, 2.7%)
- orthopedic (36, 15.9%)
- plastic (5, 2.2%)
- transplant (10, 4.4%)
- trauma (19, 8.4%)
- vascular/endovascular (5, 2.2%)
- other (25, 11.1%)



CONCLUSIONS

- Literatures indicates **NOISE**:
 - a. Affects physical & psychological health of people
 - b. Can lead to adverse event on patient's safety & compromise patient care
 - c. Reduction during critical times of surgery improves patient safety
- Research shows multidisciplinary approach decreases noise
- Several perioperative professional organizations advocate controlled & regulate OR noise for patient safety
- Vanderbilt OR measured noise levels above EPA recommendations of 45dB(A)
- Multidisciplinary staff perceived OR
 - a. to be noisy
 - b. almost half considered noise to be stressful and a distraction
- Slated future multidisciplinary noise reduction education pending upon leadership approval
- Plans to repeat OR noise level measurements and survey staff's noise perception after noise education

IMPLICATION

- Data based assessment of problem provides strong evidence, critical in soliciting intervention to a multidisciplinary team organization
- Evidence-based practice increases quality of patient care
- Nurse driven practice improvement initiatives empowers staff to find answers to clinical questions

REFERENCES

May request a copy of references: glendyle@icloud.com