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

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**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 uninterested 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 staff’s OR noise perception using IRB approved REDCap survey
- Proposed noise interventions to leadership: multidisciplinary involvement and noise education

**RESULTS OF NOISE LEVEL MEASUREMENTS**
- Max noise level 87dB(A)
- Peak noise level 106dB(A)

**RESULTS OF STAFF’S NOISE PERCEPTION**
- Perceptions of noise:
  - OR is noisy
  - Noise cause distraction
  - Noise makes me feel stressed

**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@cloud.com