OPERATING ROOM NOISE: MORE THAN MEETS THE EAR

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Description of Program:
The noise level guidelines for hospitals provided by JCAHO, WHO, OHSA and NIOSH may not realistically represent the conditions of the operating room (OR) of today. Currently, average noise levels in the OR far exceed guidelines and represent a potential safety hazard to patients and OR staff.¹

The OR can be a noisy environment due to multiple contributing factors (e.g. movement of equipment, surgical instruments/machines/lasers, beepers/phones, overhead pages, conversations, and music). Some factors can be controlled, while others are essential to patient care. Hazards to patient safety and care due to miscommunication amongst OR personnel have been demonstrated in both simulated and actual OR suites.² Research demonstrates that prolonged exposure to excessive noise levels in the workplace leads to occupational stress, decreased hearing acuity, miscommunication, and errors.³ However, current guidelines are conflicting, inconclusive, and outdated. The aims of this study were: 1) to determine if members of the OR team reported difficulty in hearing and communicating during surgical cases and, 2) to see if current noise level guidelines are correlated with actual effective communication during a surgical procedure.

After IRB approval, OR staff members, including anesthesia providers (n=17), surgeons (n=23), and nurses/techs (n=13), completed an anonymous survey to assess perceptions of OR noise levels. The anesthesia providers also measured noise levels at critical times during a variety of surgical procedures using an audiometer at their ear level.

Most anesthesiologists (88%) and nurses (92%) who responded to the survey, but only 35% of surgeons, reported having difficulty hearing in an OR; 53.5% of anesthesiologists, 46.2% of nurses, and 4.3% of surgeons indicated that the OR noise level is too loud in general. Decibel readings collected from the OR suites suggest that the OR noise levels exceeded health regulatory guidelines (Table 1).

In addition to answering our primary goals, our survey also yielded a number of critical learning points. First, it revealed that OR personnel have dramatically different perceptions of the causes of noise in the OR (Table 2). Secondly, the comfort level of individuals to request noise reduction in the OR varied greatly according to their role. For example, surgical and anesthesia residents, compared to the other OR staff, reported a lower comfort level in requesting noise reduction (Table 3). Finally, open ended comments provided by survey respondents demonstrated strong opinions about OR noise levels (Table 4). Yet this is an issue that is not openly addressed in many institutions.
WHO, OHSA, NIOSH, and JCAHO report conflicting noise pollution guidelines. These guidelines refer to hospital wards and not specifically the OR suite.\textsuperscript{4} The OR staff in this study, reported auditory difficulty which could lead to occupational stress and patient safety hazards. Noise pollution guidelines in the OR should be re-evaluated by health and safety organizations taking into account modern OR suites, communication through facemasks, instrumentation, and other contributing factors.

It is paramount that noise pollution in the OR, which is a growing risk factor to patient safety and as an occupational health hazard be addressed and taken seriously. Based on our results, our peri-operative administration is taking this risk into account and has begun to educate and implement changes to reduce the noise pollution in the operating room. Finally, all hospitals and surgical suites should strive to eliminate controllable noise that interferes with communication and patient care. These changes could be made at little or no cost to the institution (e.g. eliminating controllable noises such as music and loud conversations and OR personnel education). Conversely, without these changes, an institution could be put at risk of a patient safety lawsuit and/or an occupational hazard lawsuit as demonstrated in the 2009 lawsuit at St. John Health System.\textsuperscript{5}

Illustrations:
Table 1:

Table 1: Average Operating Room Noise Levels

<table>
<thead>
<tr>
<th>Event</th>
<th>Decibel Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient emergence from anesthesia</td>
<td>66.00</td>
</tr>
<tr>
<td>Count of instruments and supplies</td>
<td>62.00</td>
</tr>
<tr>
<td>While instruments were used</td>
<td>64.00</td>
</tr>
<tr>
<td>During Procedure</td>
<td>60.00</td>
</tr>
<tr>
<td>Time Out</td>
<td>66.00</td>
</tr>
<tr>
<td>Induction of Anesthesia</td>
<td>64.00</td>
</tr>
<tr>
<td>Patient Arrival into OR</td>
<td>62.00</td>
</tr>
<tr>
<td>Empty OR</td>
<td>58.00</td>
</tr>
</tbody>
</table>

Average OR noise levels were at their highest during critical portions of the surgical case and are indicated in red (i.e. the induction of anesthesia, time out, and emergence from anesthesia). A 5 decibel increase is equivalent to a 44% increase in volume.
Table 2: What was the cause of problems hearing in the OR?

Staff (Nurses/Techs):

Anesthesia:

Surgery:
Survey responses to the question, “Are you comfortable asking an OR team member to decrease the noise level?

Table 4:
Sample responses from survey open ended comments:

- We need to create a culture of awareness of noise level during change of personnel and emergence from anesthesia.
- It is usually too noisy upon induction due to loud conversations. I don’t feel music is an issue – surgeons typically like it.
- I don’t feel enough emphasis is placed on providing a soothing atmosphere during the induction of/emergence from anesthesia.
- The operating suite is supposed to be an environment of patient-centeredness and patient safety, this is not the reality. There is such a disrespect for the anesthesia provider during induction and emergence with conversations that are loud and unrelated to the patient even while the patient is awake. Is it too much to ask that the patient and anesthesia provider have quietness during these critical times?
- People are very uncooperative about noise level reduction. They think it is a joke and dismiss efforts to be quiet.
- The OR staff and even surgeons are annoyed by attendings or residents who ask to decrease music volume. So, I try to avoid asking to decrease volume, and instead just turn up the monitor volume.
- If music is taken out of the operating room, I will quit!
References:
2. J Am Acad Audiol. 2008 (9):686-95
4. www.osha.gov
5. "St. John Health System Settles EEOC Disability Discrimination Lawsuit" 
   http://www.eeoc.gov/eeoc/newsroom/release/11-18-09.cfm