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## Excessive noise in the operating room: Can it be improved?

### Cover Page Footnote

Acknowledgment: This project would not have been possible without the help of Marisa Lubian, Nicole McDonald, Ann Hazen, Kelly Sanders, Neetha Dsouza and Kate Pamaran

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# Excessive noise in the operating room: Can it be improved?

## Abstract

**Introduction:** Excessive noise in the operating room has been a topic of interest since the early 70s. It has been recognised that excessive noise can affect cognitive behavior and impair memory function which can be a health and safety issue. Though different approaches have been explored there remains a deficit in research into the application of noise modification programs within the operating room to combat the issue of noise pollution. This project aimed to identify if a discussion about appropriate noise levels and the use of a safe phrase at 'time out' would reduce noise levels in the operating room.

**Method:** Several different approaches were used throughout this study, including a questionnaire to collect data before and after the project and two observational tools, one used to collect baseline data and the second used throughout the four-week trial period.

**Results:** The evidence gained from this project showed an overall improvement with noise during the surgical process reduced by 26 per cent. This was done by discussing appropriate noise levels at 'time out' and allowing staff to speak up using the non-judgmental safe words 'below ten thousand'.

**Conclusion:** This study aimed to see whether discussing appropriate noise levels at 'time out' could help reduce current noise levels within the operating room as, seen in other studies, reducing noise can be a challenge. Though small, the overall results of this study had a positive impact on reducing noise levels. It is, however, recommended that continued reinforcement and education about the issues surrounding noise are required.

**Key words:** noise, operating room, time out

## Identified problem

This project was designed to identify a suitable approach to address the question of excessive noise in the operating room. The documented evidence suggests that noise in the operating room continues to be an issue with widespread implications.<sup>1-3</sup> However, limited attention has been allocated to the prevention or limitation of this issue.

## Proposed solution

After reviewing the current literature, it could be seen that limited resources have been applied to address this problem. However,

some recommendations have been made.<sup>4</sup> The proposed approach for this project was to use an adaptation of the health service organisation's current surgical safety checklist, as initiated by the World Health Organization in 2009. The adaptation of this checklist involved adding a discussion at 'time out' about appropriate noise levels during the patient's surgical journey and using a non-judgmental safe phrase if it was felt that the volume of noise was becoming a distraction at any time, especially during time critical moments.<sup>5</sup>

## Project plan and implementation

Ethics approval was required and granted (ID:40698). Data collection for this project took the form of a questionnaire consisting of open and closed questions distributed throughout the department before and after the trial period. Two observational tools were designed to collect information about the practice within randomly selected operating rooms. The observations were undertaken by perioperative nurses who volunteered to help collect data.

The observation tools gathered a variety of information which included:

- surgical specialty
- number of staff present (surgical flow)
- noise at critical moments, including pre- and post-anesthesia, throughout the surgical procedure and during perioperative counts
- types of distraction
- use of safe phrase and success (second observational tool).

Prior to the start of the four-week trial, baseline information was collected which was followed by a departmental presentation. This presentation justified the project, including information from the baseline data, and described what would be involved during the trial. Also, concerns or issues surrounding the project were addressed, which included using an appropriate safe word or phrase as this has been found beneficial in reducing distraction at critical moments.<sup>6</sup> A reference sheet addressing the 'time out' discussion was made available in each operating room. The sheet helped to initiate a conversation about appropriate noise levels and identify a safe word or phrase for each 'time out'.

## Project results and improvement strategies

The information gained from this quality project was both subjective and objective. The data analysis tools consisted of both descriptive and narrative analysis as these approaches are considered to complement each other and allow for flexibility within an open-ended enquiry.

The project results showed that before the trial commenced the noise levels in the operating room during surgery were high to moderate, on average. During the trial period noise levels improved too acceptable to moderate. Non-procedural communication was identified consistently as the contributing factor to excessive noise levels.

### Survey results

The pre-trial survey identified that discussion about appropriate noise levels was rarely undertaken. During the post-trial survey, respondents agreed that it was an issue that should be addressed as inappropriate noise levels can be distracting at time critical moments. Using a non-judgmental safe word or phrase to draw attention to inappropriate noise levels was well received as some staff felt quite intimidated about speaking up.<sup>7</sup> The safe phrase used in this trial was 'below ten thousand' but it was felt to be too long and would need to be re-evaluated. Some of the general comments included:

- noise levels increased during teaching
- some specialties are significantly quieter than others
- the vocal tone of some staff can be higher than others.

## Observation results

The results from the observational tool detected an overall reduction in noise levels of 26 per cent compared with the pre-trial data. As the operating rooms were randomly selected, not all specialties within the department were covered; however, it was generally observed that a discussion about appropriate noise levels was had at each 'time out'. On further observation, it was found that some surgical specialties were non-compliant throughout the trial period and this was reflected in the results. As with the departmental surveys, the main contributing factor to excessive noise levels remained non-procedural communication. However, it could be seen that a further contributing factor to excessive noise was surgical flow and the number of staff involved in some surgical procedures.

Since the project was conducted, a further survey was sent out to see whether noise in the operating room continues to be an issue. The feedback revealed that noise levels remain moderate but no further improvement has been seen since the trial. It was found that 60 per cent of the respondents still felt that discussing noise at 'time out' and using a safe word or phrase would be highly beneficial.

## Implications to practice and future recommendations

For the continuation of appropriate noise levels to be addressed several strategies must be considered and implemented, as appropriate.

- Positive reinforcement of discussing appropriate noise levels at 'time out' and encouraging all team members to speak up if it is felt that the level of noise is becoming a distraction.

- Regular education and training programs to discuss the noise levels in the operating room and the long-term health and safety issues excessive noise can cause.
- Restriction of staff movement and the number of staff in an operating room at any one time.
- A requirement that communication devices be put on silent and any music played during surgical procedures is appropriate and at an acceptable volume.
- Keeping non-procedural communication to a minimum.

These small adjustments to our practice can provide a safe environment for the welfare of our patients, colleagues and ourselves.

## Acknowledgment

This project would not have been possible without the help of Marisa Lubian, Nicole McDonald, Ann Hazen, Kelly Sanders, Neetha Dsouza and Kate Pamaran.

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