

'Below ten thousand': An effective behavioural noise reduction strategy?

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Noise in the operating theatre environment has remained a persistent and unresolved problem¹. The problem currently lacks an effective solution². In order to partially resolve this issue, the authors created a behavioural noise reduction tool called 'Below ten thousand'.

This study identifies a potential solution to the problem of behavioural noise in the operating theatre, and indicates further research must be undertaken to identify the full scale of benefits this technique can deliver to the team environment in the operating theatre.

Introduction

'Below ten thousand' started as a simple conversation in Recovery between two clinical nurses. The conversation centred on the amount of noise in the operating theatre at the time of induction of anaesthesia, and the researchers wondered if there was a tool in existence which could help gain co-operation in the effort to reduce noise at this specific time. A literature review was undertaken, and no evidence of such a tool was found.

Whilst undertaking the literature review, several references were found which alluded to the concept of the 'sterile cockpit', though there was no evidence of attempts to apply it formally within the operating theatre environment having been undertaken³.

'Below ten thousand' is an integral concept embedded within the aeronautical sterile cockpit policy and crew resource management. It relates to the time an aircraft is below the altitude of ten thousand feet. This range of altitudes

represents the time when minimising distractions is imperative to safely navigate the cognitive-rich and complex task set inherent in taking off or landing an aircraft⁴.

In this 'trial of concept' study, surveys were conducted to determine if the proposed tool was effective in the similarly complex environment of operating theatres. The survey indicated that the 'Below ten thousand' strategy resulted in a satisfactory outcome 80 per cent of the time it was used.

Noise in a gathering of people is a social necessity. It stems mainly from conversation when people form a group, and can include laughter and other abrupt and loud attention-directing vocalisations. Conversation has a social function, and it affords community, co-operation, social standing and is also used to control, to exclude, to frighten off, or to attract assistance⁵. In the operating theatre, conversation in the specific form of strategic clinical communication can assist in the provision of safe patient care. It allows members of a team to collaborate in order to provide surgical assistance to a patient in need.

In the modern setting, with increased informality and divisions of labour, groups of persons may be inactive in a theatre whilst another group still has a task sequence to perform.

During these moments of inactivity, it is a social certainty that the non-active members of the team will begin conversation.

Whilst this is a very human activity to engage in, the resultant increase in ambient noise makes it difficult for the active group to communicate strategically between themselves, the extended team and the patient, and makes it difficult and effortful for them to cognitively make themselves aware of important external sounds such as the pitch and tone of the pulse oximeter, or subtle and nuanced noises such as the sound of air leaking from a semi-inflated endotracheal tube cuff⁶. At these times, anaesthetists and nurses have had few tools to work with⁷.

Current solutions generally tend to be informal, escalating, and eventually explosive and divisive in relation to the construct of 'team'. In particular, anecdotal evidence leads us to believe that senior consultants who have the authority in the room may navigate this situation somewhat effectively, though they invoke positional power in order to attain it, and their efforts can, on occasions, be abrasive and destructive to the team's sense of cohesion. However, some consultants and trainees struggle to gain the level of distraction-free operating conditions they require. They undertake the requisite task sequences with sub-optimal working conditions, and inadvertently compromise their own ability to perform to their self-subscribed level of satisfaction⁸. It was proposed that the technique afforded by 'Below ten thousand' will increase safety in the latter circumstances, and promote better 'team affirming' outcomes under the former.

'Below ten thousand' is used as a trigger statement, and is simply verbalised to notify to the room

in general that a 'sterile cockpit' environment is required. The statement is not confrontational and importantly does not cause alarm in a patient who is awake. Further, it creates a readymade cognitive link between an idea and an action that is well established in another high reliability, high safety industry and therefore the term is fruitful and affirming for those who choose to investigate further.

Methods

A voluntary survey was made available to those who wished to use the 'Below ten thousand' behavioural noise reduction strategy. The electronic survey was made available via the www.belowtenthousand.com website. It included four questions, and took an average of one minute and twenty seconds to complete.

The survey was preceded by one in-service education session, which occurred during scheduled education time for nurses and technicians in day-stay surgery theatres. The offer of participating in the survey was also informally made available to main theatre staff, and education was delivered through three formal in-service sessions and through ad hoc education and guerilla marketing techniques.

No formal policy was in place, and no ethics approval was sought, since no change in patient treatment occurred. Data was collected through reflective reporting.

Results

Who used 'Below ten thousand', and when?

A total of ten people responded to the trial of concept survey. Seventy per cent of respondents – six nurses and one anaesthetist – used 'Below ten thousand' at induction of anaesthesia. The remainder (30 per

cent) were scrub nurses – one of whom called it during scrub count and others during particularly noisy surgical procedures.

Why did they use it?

Of the respondents, 60 per cent cited that they were frustrated and had difficulty communicating, while 40 per cent cited reasons for calling 'Below ten thousand' as having difficulty concentrating and needing everyone to 'stop, look and listen'. One person (10 per cent) reported being distracted by things unrelated to the task at hand.

What was the result of using 'Below ten thousand'?

Of all the respondents, 80 per cent indicated that they felt heard in their efforts to secure a quieter work environment. Respondents also stated that they felt more focused, supported and validated by the respectful response to their articulated need. One person specifically stated in their response that they felt 'safer', which was an interesting observation, as we had neglected to include it as an option in the range of anticipated answers. Importantly, none felt ignored.

Discussion

The possibility that behavioural noise reduction is an achievable outcome in the predominantly noisy environment of the operating theatre is a positive finding. The fact that it has been achieved on a handful of occasions by invoking a purely voluntary behavioural change in a diverse team is encouraging given that no formal support had been given to the attempts to implement the safety strategy as a more formal operational tool.

Clinician-led culture change

In the event that formal approval to the proposed safety strategy was

delayed, the decision to proceed as a clinician-led culture change was carefully considered. The lack of formal approval and structured policy meant that the researchers had to appeal to good will and dynamic education strategies in order to effect change. The 'clinician-led' nature of the culture change initially eroded confidence in some who verbalised to us that they would like to use it but remained unsure as to whether they could.

Currency was enhanced through the delivery of a presentation on the topic at the 2014 ACORN national conference in Melbourne, Australia, and the publicity surrounding it and the positive feedback the researchers received assisted them in accelerating interest in the idea.

The logic used to advance the 'Below ten thousand' noise and distraction abatement, situational awareness and high performance team trigger as an informal culture change vehicle was that the current methodology, that is, the use of vernacular colloquialisms, was similarly without policy, and we reasoned that replacing one phrase or word for a less emotive and more effective one could scarcely be actively discouraged.

Opportunities to improve noise related safety behaviours

The opportunity to improve noise-related distracting behaviours was extended to include, though not be limited to, surgical count, intubation, time-out and extubation.

The concept has also been adopted and adapted to context in the Intensive Care Unit and is being considered for use in the Emergency Department.

Situational awareness

An unforeseen though sentinel benefit of calling a distracted and

noisy team to attention using a non-emotive phrase has a derivative benefit of creating situational awareness in the team. The later realisation of this aspect led us to further develop the concept to include a verbal flag to question-marked thinking.

We theorise that, once uncertainty appears as a question mark in a clinician's thinking, for example when generalised bleeding for no apparent reason occurs during a laparoscopic operation, by flagging the problem, the clinician can evoke a series of responses. For example, this may trigger helpful interventions from the anaesthetist, and it may encourage the scout nurse to make sure the required setup is available and ready to open should the need arise.

Thus the situation may be happily brought under control through collaborative efforts or, when the surgeon decides to abort attempts to continue the procedure via laparoscopic means, the setup is ready and can be opened without undue haste.

Focus on the task at hand

Minimising distractions increases the ability to focus on the task at hand⁹. Anecdotal reports from several anaesthetists conveyed appreciation for a perceived increase in the safety environment due to their ability to communicate more effectively with their team, focus more effectively on what they were doing, and think more clearly about how they were to achieve a successful outcome.

Leadership

'Below ten thousand' as a methodology affords opportunity to expressly participate in leadership behaviours in establishing a safe clinical environment for the patient to be treated in. Leadership is critical in team environments,

though informality erodes the ability of leaders to evoke behavioural compliance at times when 'routine' normalises what are essentially 'sentinel task sets'.

'Below ten thousand' offers a generic and non-confrontational way of enabling and empowering clinical leaders to intervene at those times as necessity occurs. It also provides a mechanism by which managers can invoke performance measures should individuals continually fail to comply with efforts by another team member to establish a safe care environment in order to undertake their specified task.

High performance teams

'Below ten thousand', by virtue of its use, invites the operating theatre team to consider how it performs as a team, and how each member engages and operates within the construct of 'team'. Once team virtues begin to be explored, further opportunities may arise which allow the team to improve its functioning, both at critical times and non-critical times.

Limitations

The primary limitation of this study is clearly the small sample size of active participants. However, the authors will attest that the small number simply alters the degree to which the results have empirical exactness, not the extent to which they are valid.

A larger, formally supported study is needed to fully determine the degree to which 'Below ten thousand', as a behavioural noise reduction tool, will consolidate the findings apparent in this scoping research project.

Being able to more reliably mark out behavioural parameters will markedly improve the confidence with which the appeal to noise reduction is made, and also the certainty of a successful outcome.

Conclusions

'Below ten thousand' has risen from humble beginnings to find a niche within the team environment of the operating theatre. As a noise and distraction abatement, situational awareness and high performance team methodology, it offers increased patient safety and staff engagement.

It has now become part of our department's 'agreed behaviours'. It has spread to other institutions across Australia and has found application in diverse clinical settings. Organisations that have adopted the 'Below ten thousand' methodology include:

- University Hospital Geelong, Victoria, operating theatres and Intensive Care Unit
- Liverpool Hospital, New South Wales (via the outstanding efforts of Suzanne Rogan, CNE, is using 'Below ten thousand' with a contextually altered trigger word to suit their own institutional preferences)

- Liverpool Hospital's Emergency Department, Cardiac Cath Lab and Interventional Radiology have also adopted the methodology.

'Below ten thousand' has been implemented in public and private hospitals throughout Australia and has also received interest from clinicians in the United States and the United Kingdom.

'Below ten thousand' has been labelled a very patient-centric and compassionate nontechnical model of care which has potentially solved the previously unsolved worldwide clinical dilemma of finding an effective solution to the problem of noise and distraction in the operating theatre.

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