# High Risk/High Stress Simulations + Emotional Intelligence = Patient Satisfaction:

## A Longitudinal Training Program with Otolaryngology Residents and Faculty

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## Introduction

Emotions can run strong in high risk/high stress situations and disrupt communications and affect quality and patient satisfaction. For example, too much anger or not empathy can short circuit the communication[1], leadership[2], and teamwork[3] exchanges that are frequently cited as the root cause of medical errors[4] and performance deficits[5]. Our hypothesis was if we can practice the skills of emotional intelligence (reframed as non-technical skills) under fire in high risk/high stress simulations then attunement of these skills would be reflected in increased patient satisfaction scores[6].

Since most practitioners perform satisfactory or better under normal or expected conditions we wanted to help residents and faculty prepare for situations that were not expected to happen but do happen. Also, to minimize the natural defensiveness in asking residents and faculty to identify and describe their emotional responses to unexpected events, we reframed emotional intelligence skills as non-technical skills and used both terms interchangeably.

## Methods

In this seven year study, there were three major methods: (1) repeated assessment of residents' and faculty's emotional intelligence, (2) participation in high risk/high stress simulations (3) and active involvement of senior faculty and department leadership.

In the first couple years of the training program, because of time and cost restraints and as most of us were relatively new to simulations, we borrowed and recreated simulations from professionally produced videos that showed breakdowns in performance under pressure. Examples of some of those professionally produced videos were: *First, Do No Harm: A Case Study of System Failures* and *Johns Hopkins' Study of Medical Errors: The Josie King Story.* We showed part of the video, then had a brief simulation and debrief with our group. Next, we compared our group's reactions to the comments in the professional video. Our goal was to encourage reflection of emotional reactions to high pressure moments. To facilitate discussions during the debriefing we encouraged residents to share their initial reactions to the unexpected event portrayed in the simulation as to what they would have liked to have said but did not. This airing of a range of blunt and sometimes amusing emotional reactions fostered an atmosphere where participants could feel more comfortable in acknowledging their own frustrations and the challenge of identifying more attuned reactions.

As our confidence grew with simulations, we created and produced our own high risk/high stress video simulations. One was titled: *Responding to an Airway Emergency in the Operating Room: Technical and Non-Technical Skills*. We recruited two anesthesiologists, two OR nurses and two members of our leadership team (DG and TT). Those two members were our surgeon/actors and the other member of our leadership team (RW) was the producer/director. The surgeon/actors were encouraged to be gruff, the anesthesiologist snide, and the nurses uncooperative as the technical and non-technical problems increased. This snarling and frustrating atmosphere portrayed in the video created a number of opportunities where the video could be stopped, an encounter simulated and debriefed. Each year of the training, the faculty, residents, or a guest presenter created one or more high risk/high stress simulations that were debriefed and emotional reactions highlighted.

## Outcomes

To assess the training program, we gathered 4 levels of outcome data and used a training evaluation method, the Kirkpatrick method which has been described as the gold standard for evaluating training. Did participants enjoy the program (level 1)? Could they apply the training to their practice (level 2)? Did it change their behavior (level 3)? Did it affect patient satisfaction (level 4)? Our multilevel outcome approach attempted to address one of the major challenges of medical education research: determining "how the designs and conduct of medical education program affect the clinical outcomes produced by doctors." 7(p1067)

## Results

On level 1, 97% of participants (103 of 106) agreed or strongly agreed they enjoyed the program. On level 2, 98% (104 of 106) strongly agree or agreed they "used or could have used the information in their practice recently." On the third outcome level, **Table 1** demonstrated participants improvement in mean emotional intelligence scores from 102.19 (baseline/pertaining) to 107.29 (post training). This increase was sustained in successive years, and these results supported with linear growth curve analysis. At level 4, an increase in participants' emotional intelligence scores and active involvement in high risk/high stress simulations corresponded with increase in patient satisfaction scores. **Figure 1** shows the department's percentile rank of patient satisfaction for 3 years before EI training (89% in 2002, 90 % in 2003 and 85% in 2004) and for 6 of the 7 years after EI training (96% in 2005, 97% in 2006, 99% in 2007, 95% in 2008, data not available in in 2009, 92 % in 2010, and 97% in 2011).

## Discussion

High risk/high stress simulations were the sine qua non of our training program. The challenging nature of the simulations allowed participants during the debriefs to take risks beyond their usual comfort zone and to possibly say something stupid without feeling stupid. Faculty shared tacit knowledge of their reactions in a crisis and participants learned there were a range of valuable non-technical skills that are essential in a crisis. Our expectations and experiences suggested that most health care providers respond satisfactory or better to normal everyday patient and team situations. In order to improve performance beyond the ordinary patient encounters providers must practice their reactions in high risk/high stress simulations.

In future training sessions, we plan to incorporate the principles of deliberate practice with feedback[8]. Each resident and faculty member will have specific reactions that they will be alerted to reflect on and practice visualizing. The repetitive practice of reflecting and visualizing helps generate a new emotional response habit[9]. For example, in high risk/high stress situations providers may learn to be alert to how quickly tunnel vision emerges and limits emotional awareness and team communication.

## Conclusions

The use of high risk/high stress simulations combined with an emphasis on assessment and enhancement of emotional intelligence or non-technical skills powered by committed senior faulty and leadership positively affect patient satisfaction. "Increasing non-technical or EI skills may be part of a rising tide that contributes not only to patient satisfaction but also to improvement in interprofessional cooperation, in turn strengthening sign-outs, handoffs, patient centered care, and conflict reduction in high risk/high stress situations."6(p725)

## References

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## Table 1:

Within-Person Changes in EQ Before and After Emotional Intelligence Training

| Tests of Fixed Effects | b (s.e.)* | *P* value | 95% C.I. |
|---|---|---|---|
| **Average Emotional Intelligence Score Prior to Training**** | 104.74 (1.30) | <.001 | 102.19, 107.29 |
| **Change in Emotional Intelligence Pre-Training to First Year After** | 6.71 (1.67) | <.001 | 2.78, 11.02 |
| **Linear Change in Emotional Intelligence in Years After Training++** | 0.39 (0.6S) | .553 | -0.89, 1.66 |
| **Tests of Random Effects** | Variance | P-Value+++ | |
| **Variance Among Participants in Average Emotional Intelligence Prior to Training** | 49.04 | <.001 | |
| **Variance Among Participants in Change in Emotional Intelligence Pre-Training to First Year After** | 68.63 | <.001 | |
| **Residual (Error) Variance Among EQ Measurements** | 29.91 | | |

*All coefficients (b) are expressed in EQ units. Because these coefficients are unstandardized, standard errors are also provided. Coefficients were calculated using a hierarchical linear model in which repeated measures are nested within people. All coefficients are adjusted for the year in which the participated entered the EQ program and status as faculty or resident. Adjustments for gender and age were also considered but were left out given the limited number of participants; there were no statistically significant differences by either characteristic. The complete model (including covariates) was estimated using HLM 6.06 software, and employed restricted maximum likelihood estimation.

**This coefficient represents the average EQ score among participants prior to participation in this program.

+This coefficient represents the difference (in EQ units) between a participant's baseline EQ score and their score at the first follow-up wave post-intervention. An interaction between faculty status and this change was considered in this model, but was not statistically significant (b = -1.68, s.e. = 3.23. $p$ = .606, 95% CI= -8.01, 4.65)

++This coefficient represents the average change (in EQ units) from one year to the next in a participants' EQ scores in the years following intervention. A non-significant change suggests that EQ scores are stable after intervention.

+++P-values presented with random effects (variance components) are associated with chi-square tests to determine whether a variance component is significantly greater than zero. Statistically significant variance components suggests that there are differences between participants in the EQ program.

## Figure 1:

Department's Patient Satisfaction Scores 2002-2011