

Alberta Doctors' Digest

Failing forward

Medical residency is a time of new friendships and experiences but also challenges that we only got glimpses of in medical school. With these new opportunities come stress, worry and a fear of disappointment when things go awry. Even a core skill such as an endotracheal intubation presents a huge barrier to learning throughout a physician's career. These high-acuity but low-occurrence procedures don't happen very often, and traditional learning models have relied excessively on chance occurrences to learn these core skills. This reliance on chance occurrences is compounded by an abundance of eager learners vying for the same experiences, which often results in a lack of suitable and safe learning opportunities for young physicians.

As a PGY-5 emergency medicine resident, Dr. Omar Damji is often drawn into chance occurrences resulting in high-stakes, high-pressure intubations that sometimes do not end as successfully as he would like. According to Dr. Damji, local experience suggests that even senior learners specializing in acute care often do not have high success rates on first attempt intubations. And they are not alone. Dr. Damji recalls a high-pressure situation that resulted in an unsuccessful intubation early in his residency training. Although the patient had no long-term adverse impacts, the experience created a space for self-reflection and a desire to do better.

Through intimate self-reflection, Dr. Damji realized that failure can be transformed into innovation. While traditional intubation learning strategies consist of plastic mannequins and cadaver models, by nature these tools are unable to replicate the intensity and pressure of an acute care setting. Dr. Damji started quietly working on an ambitious solution that he calls VITAL XR (<https://vitalxr.ca>). Currently in the prototyping phase, he describes it as “a multi-modal practice tool bridging software and hardware to create an immersive and advanced simulation training environment to practice and learn intubation.”



By placing the user in a customizable virtual emergency room with a mixture of real and simulated equipment, staff and even background noise, direct feedback in a safe environment becomes possible. (Photo credit: Haley Martin)

Immediate feedback is at the core of VITAL XR, with practical and anatomically accurate hands-on models that mirror some of the challenges experienced with real-life intubations. The direct feedback system isn't solely focused on reporting a user's failure rates. Feedback also means incorporating a highly immersive mechanism to provide tactile, visual and auditory stimuli that are missing from current cadaver/mannequin training techniques.

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A large and highly integrated technological solution would seem scary to some, but Dr. Damji exudes excitement and energy when he talks about his project. "I know people will think that this project is too big, or it's too ambitious, but I hope to elucidate that no idea is too big to conquer and as long as you love what you do, it will get done," says Dr. Damji.

Like other Alberta physicians who have ventured into the realm, Dr. Damji started with no formal training in industrial design or computer science. His only true pre-requisites so far are his love for technology, passion for academic rigor and the drive to support his colleagues as partners in learning. "This interest in love of technology provided fuel for me to learn not only the basics behind each of these realms but specifics as they related to medical innovation," says Dr. Damji.

His concurrent medical residency over the last five years has not been a barrier to technological innovation and, if anything, has been invigorating. Dr. Damji's strongest assets are the same skills common in everyday use. This includes bridging diverse viewpoints, investing in relationships, and sparking creative solutions to inspire others to perform at their best. Although failure can be a disappointment, it is certainly not the end if we let these core skills guide the way.

Those interested in connecting or learning more about this project are welcome to contact Dr. Omar Damji at odamji@ucalgary.ca or check out some of his early videos at <https://vitalxr.ca>.

Editor's note: The views, perspectives and opinions in this article are solely the author's and do not necessarily represent those of the AMA.

Banner image credit: Haley Martin