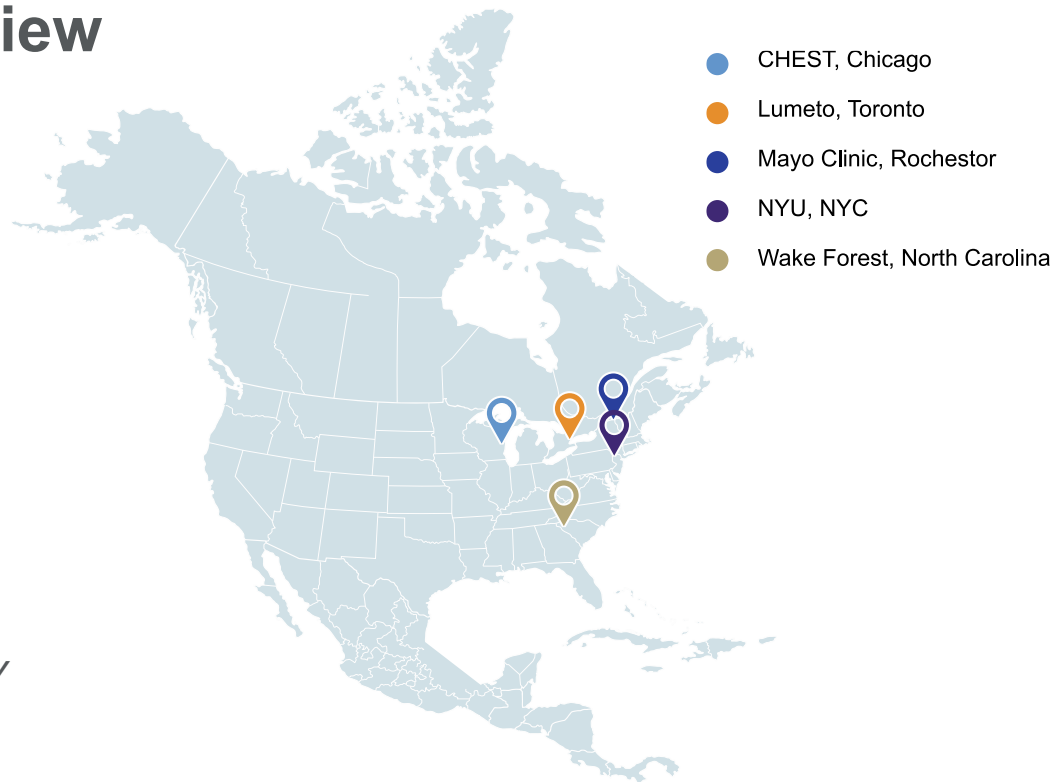


VR Research Pilot Overview

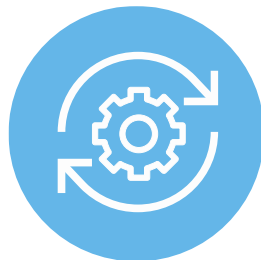
- IRB Approved study
- 3 Pilot institutions
- 39 VR Learners with varying levels of specialization
 - Physicians
 - Fellows-in-training
 - Respiratory Therapists
 - Residents
 - Nurse
 - Medical Student
 - Physician Assistant
- Mix of remote and on-premises sessions
- Medical research paper published by EOY



What The Pilot Program Measured



Usability of the
technology and
teaching modality



Efficacy of the pilot in
accomplishing learning
objectives



Learner Satisfaction
with the learning
modality

Pilot Format Overview

Session Structure

- VR onboarding
- 2-3 learners + instructor in each session
- Two rounds of scenarios, changing learner roles
- Debrief, and faculty grading checklist

Scenario Topic

- Intoxicated patient with difficult airway
- Video Laryngoscope

Teaching/training Tools

- CHEST APPROACH checklists

Avg session time (start of simulation to end of debrief)
- 25 mins

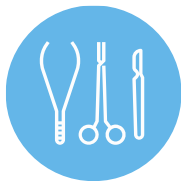


Pilot Learning Objectives



DESCRIBE

risk factors, physical exam findings, and clinical situations associated with a difficult airway.



CLASSIFY

types of equipment and describe their potential use and limitations.



DEMONSTRATE

a systematic approach to patient evaluation, plan development with appropriate equipment, and drug utilization.



DEMONSTRATE

effective management of the patient with a difficult airway.



EMPLOY

video laryngoscopes in difficult airways.



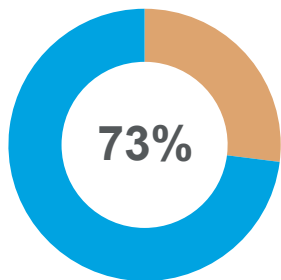
CREW RESOURCE

effectively utilize an airway management team, maximizing success and patient safety.

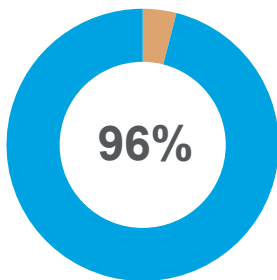
Usability Findings

Key Insights

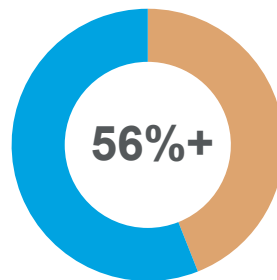
- Overwhelming majority of users were able to onboard in VR comfortably and successfully complete an intubation
- No differences in learner understanding and completion rates across:
 - Different experience levels
 - Ages
 - Previous experiences with VR



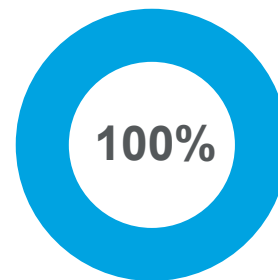
Found it easy to role play an intubation scenario in VR



Were able to move around in VR with ease



Had no previous VR experience



Learners with no intubation experience successfully completed an intubation in VR

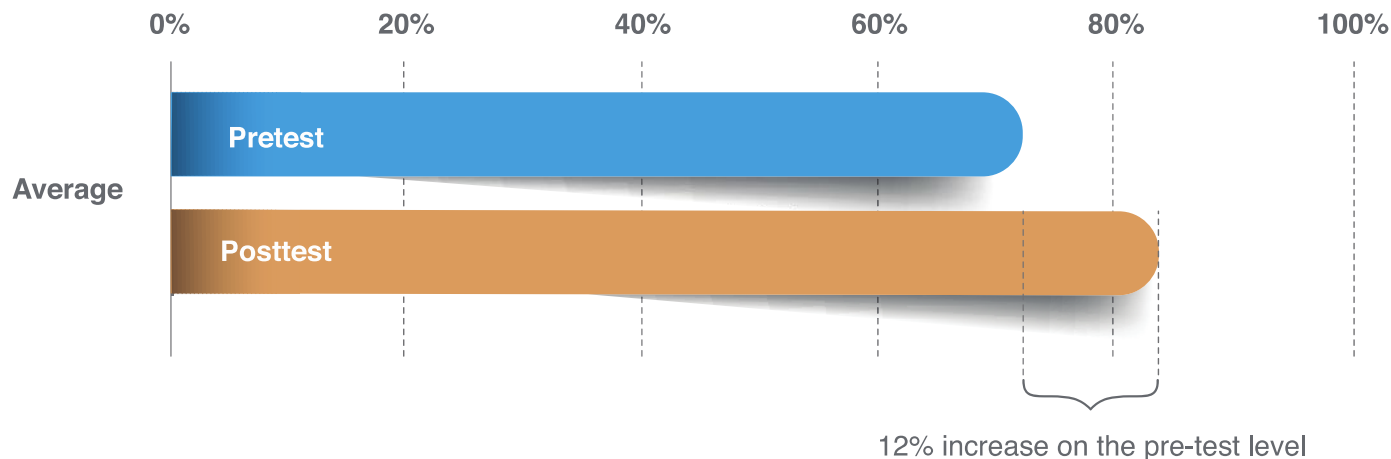
Pre and Post Test Questions

- Consisted of 11 pretest and 12 posttest questions
- All multiple questions
- Pretest questions asked prior to VR Training
- Posttest questions were asked after VR training and debriefing



Efficacy Pre-Post Test Overview

Pre vs. Posttest Overall

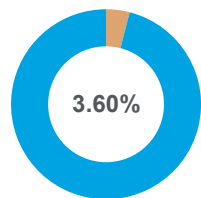


In a single session of average 25 mins, there was a 16% relative increase in procedural knowledge of difficult airway management across all learners

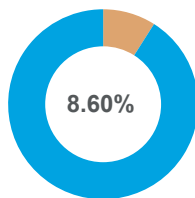
Efficacy Findings – Pre & Post Test

In a single session of average 25 mins

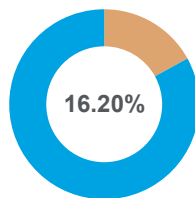
Increase in Difficulty Airway Management know-how across different types of learners



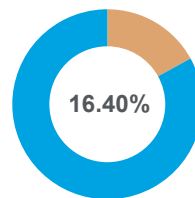
16-25 years
experience



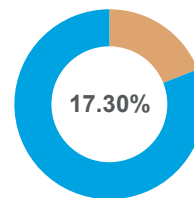
Some Intubation
Experience



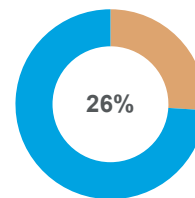
Average
learner



< 5 years
experience



Only lecture-based
Intubation experience



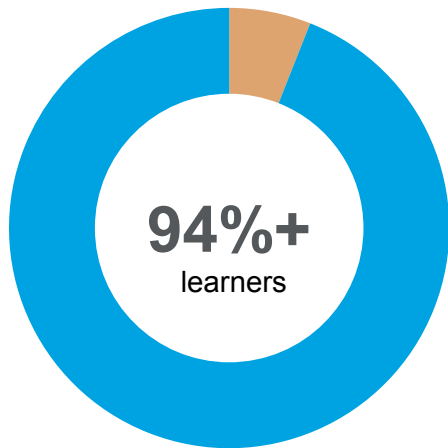
Residents

Key Insights

- Potential to introduce VR-based Airway Management training in earlier years of clinical experience
- Experienced clinicians saw moderate improvements

Efficacy Findings – Self Assessment

Based on two Difficult Airway Management in VR sessions that included moderator-led debrief in VR:



- Describe risk factors, physical exam findings, and clinical situations associated with a difficult airway
- Demonstrate a systematic approach to patient evaluation, plan development with appropriate equipment, and drug utilization prior to intubation
- Demonstrate effective management of a patient with a difficult airway
- Use crew resource management principles to effectively utilize an airway management team, maximizing success and patient safety during intubation

Learner Satisfaction findings

What formats of activities/sessions would be beneficial to your learning experience?

ANSWER CHOICES	RESPONSES
Virtual Reality (VR)	87.10%
Simulation (hands on)	93.55%
Online/self-directed	35.55%
Case studies and discussions	41.94%
Self-assessment modules	19.35%
Flipped classroom (self-directed pre-work followed by live interactive session)	41.94%
Total Respondents: 31	

Key Insights

- Difficult Airway Management in VR ranked second only to hands-on physical simulation
- VR as a format for Difficult Airway Management training ranked higher than all didactic and screen-based learning modalities

What Barriers Still Exist

- Fidelity to physical environment and tools – need for haptic feedback
- Language processing and facial expressions for improved patient realism
- Standardization vs specific needs of individual programs
- Adoption of technology (headsets and software)
- Perception of VR being in early adoption phase

- Since the pilot, significant improvements made on the InvolvXR platform
- Continuous improvement and progress by CHEST and Lumeto to enable better immersive learning

Thank you

