Tabiscope
Mobile Device Camera Connector

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Group #7

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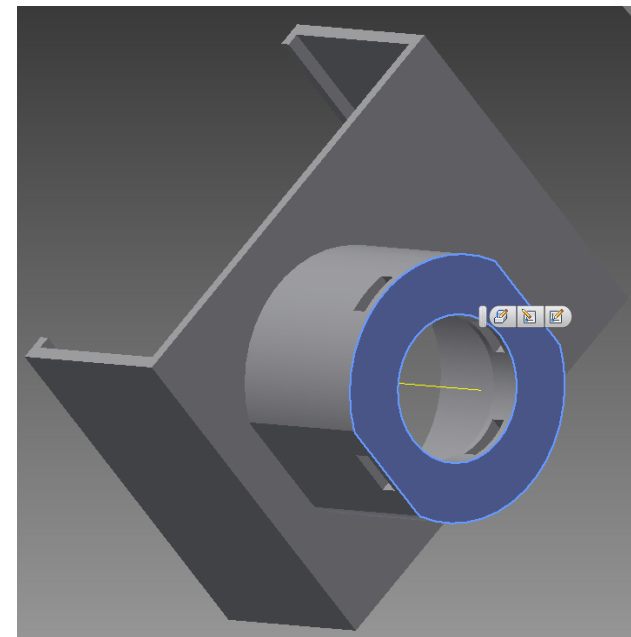
Mentors: Kevin Olds and Dr. Amit Kochhar

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Project Overview

- **Project Goal:** Create an Android application as well as a mechanical adapter in order to use an Android tablet to record video and images from an endoscope

Papers

- Levitan, Richard M., Ted S. Goldman, Donald A. Bryan, Frances Shofer, and Andrew Herlich. "Training with Video Imaging Improves the Initial Intubation Success Rates of Paramedic Trainees in an Operating Room Setting." *Annals of Emergency Medicine* 37.1 (2001): 46-50. Print.

- Ayoub, C. M., G. E. Kanazi, A. Al Alami, C. Ramesh, and M. F. El-Khatib. "Tracheal Intubation Following Training with the GlideScope Compared to Direct Laryngoscopy." *Journal of the Association of Anaesthesists of Great Britain and Ireland* 65.7 (2010): 674-78. *Wiley Online*. Web. 1 Apr. 2014.

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Motivation

- What are the practical usages of our project?
  - These papers provide examples of how are project can be used in medically related fields
  - It can be used by doctors, residents, medical students and even EMTs

Levitan et al. Introduction

- Determining whether using videos of laryngoscopy helps improve intubation success rates in EMTs

  - Compares video training against the traditional training

   - http://www.stcc.edu/wd/descriptions/images/emt_LOGO.jpg

Levitan et al. Methods

- 113 students spanning four year in the traditional group
- 36 students in the video group
- Each student received the traditional training of classroom instruction
- They also got the opportunity to practice their technique on mannequins and observe OR intubations
- The video group got the additional training of watching a 26 minute video
  - Watched the video three times
  - 15 real procedures recorded

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Levitan et al. Charts/Tables

Group	No. of Attempts	No. of Trainees	Successful Intubation (%)
Traditional			
	1	5	20
	2	3	33
	3	8	46
	4	6	42
	5	16	51
	6	21	40
	7	2	43
	8	18	53
	9	2	44
	10	21	54
	11	1	55
	12	7	42
	13	1	54
	14	1	71
	15	1	60
Video			
	1	8	88
	2	8	88
	3	12	86
	4	4	94
	5	2	100
	6	1	83
	10	1	80

*The number of trainees within each subgroup is listed in the middle column.
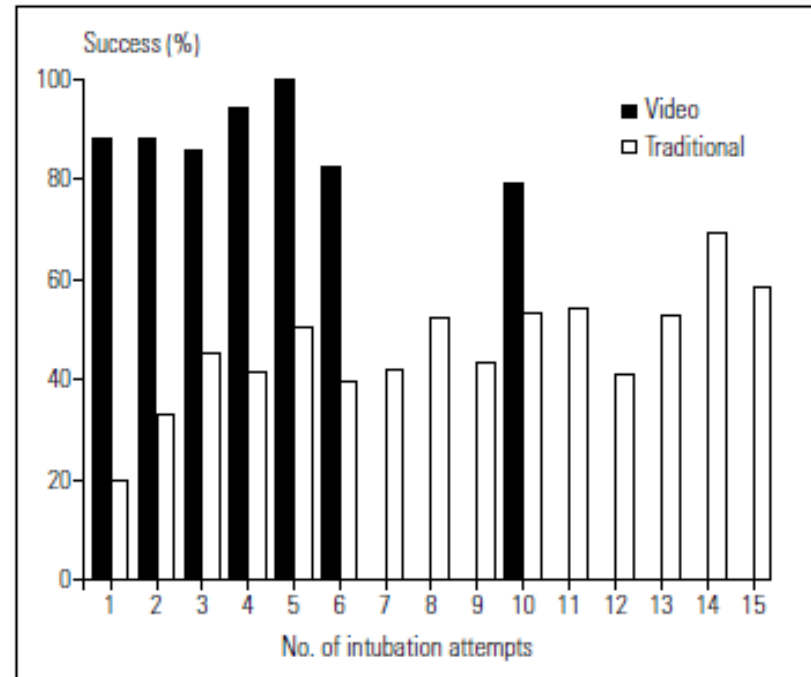
Graph and table from Levitan et. al. Training With Video Imaging Improves the Initial Intubation Success Rates of Paramedic Trainees in an Operating Room Setting

Levitan et al. Conclusions

- Traditional group had success rate of 46.7% with a 95% confidence interval

- Experimental, video, group had a mean success rate of 88.1% with a 95% confidence interval

- Similar increase in success rate was same even when accounting for number of intubations

- Success determined by supervising anesthesiologist

Levitan et al. Importance

- Evidence indicates that supplementing classroom training and mannequin practice with video training is beneficial
- There were significant improvements between the two groups even when accounting for number of intubation attempts

Levitan et al. Shortcomings/Improvements

- Study done in Nineties, would be better to conduct study again

- Authors themselves say there could have been bias in selecting patients for each group

- Did not control for faculty who trained students in each group

Ayoub et al. Introduction

- Determining whether using videos of laryngoscopy helps improve intubation and laryngoscopy success rates
  - Compares video training against the traditional training using Macintosh scopes

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Ayoub et al. Methods

- 42 students with no experience prior to start of study
- Students divided into 21 in control group and 21 in experimental group
- All of the students attended lectures on the evaluation and diagnosis of airways.
- Then one group observed a senior anesthesiologist using a rigid scope on a mannequin
- The second group observed the anesthesiologist using a GlideScope video
- Each student then had a senior anesthesiologist score his/her performance on three patients

Ayoub et al. Charts/Tables

	GlideScope	Macintosh	p value
Success rate of 1st intubation	47.6 (28.3–67.6)	14.3 (5–34.7)	0.043
Success rate of 2nd intubation	69.9 (40.9–79.3)	14.3 (5–34.7)	0.004
Success rate of 3rd intubation	80.9 (60–92.3)	33.3 (17.2–54.6)	0.004

	GlideScope	Macintosh	p value
Time of 1st intubation; s	59.3 (4.4)	70.7 (7.5)	0.006
Time of 2nd intubation; s	56.6 (7.1)*	73.7 (7.3)	0.003
Time of 3rd intubation; s	50.1 (4.0)†‡	67.6 (2.0)	< 0.001

*p = 0.012 vs time of 1st intubation in GlideScope group.
†p < 0.0001 vs time of 1st intubation in GlideScope group.
‡p = 0.013 vs time of 2nd intubation in GlideScope group.

These two tables were obtained from Ayoub et. al. Tracheal Intubation following training with the GlideScope compared to direct laryngoscopy

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Ayoub et al. Conclusions

- Data indicates that both groups experience an increase in success rate each round

- In each round, except the first one, there is a significant difference in success rates

  - GlideScope group had a higher success rate

- Decrease in procedure time for both groups

  - GlideScope group had significantly lower times compared to the Macintosh group

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Ayoub et al. Importance

- Evidence indicates that the training with the GlideScope is better than the traditional training methods

- Each group got the opportunity to conduct the same number of trials, so this is not a confounding factor

- Study controlled for age, weight, sex ratio and other factors

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Ayoub et al. Shortcomings/Improvements

- Few number of students, so researchers should conduct more studies

- Study only conducted with patients who were deemed easy patients by senior anesthesiologists

- Future studies should conduct study with students getting more tested opportunities

Overall Conclusions

- Researchers should conduct more studies to determine longevity of training

- These two studies prove promising for the use of video laryngoscopes in training

- Success rates seem to increase while trainees also show the ability to perform the procedures in shorter time spans

Relevance

- The success of video training means that medical schools and other training facilities will require the traditional imaging towers

- Current towers are quite expensive, on the order of $4300

- Our solution will eliminate the need for these towers

- Additionally, the portability will help with training

Questions?