High Fidelity: Superior Training

Timothy C. Brand, MD, FACS
LTC(P), MC, USA
Urology Residency Director
Associate Professor of Surgery, USUHS
Madigan Army Medical Center

No Disclosures – These views are my own and not that of the DoD.
High Fidelity: Superior Training

- Learner performance metrics
- Immersive learning environment
- Patient specific simulation
- Data supports
- Worth the cost
High Fidelity: Superior Training

Enhanced collection of learner performance metrics

NOVICE

EXPERIENCED
High Fidelity: Superior Training

Learner Performance Metrics
High Fidelity: Superior Training

Immersive Learning Environment

“The Human Factor”

Lap Repair of Cava – Synthetic
R. Sweet, et. al

Live Tissue Training – Porcine Lap Nephrectomy
High Fidelity: Superior Training

Patient Specific Simulation

Temporal Bone Drilling – tailor to patient specific CT
High Fidelity: Superior Training

Answers the second half of the learning curve
Beyond deconstructed tasks – procedure based

![Graph showing the relationship between Desired Outcome and Number of Cases.](image)
High Fidelity: Superior Training

The Data

Virtual reality training for surgical trainees in laparoscopic surgery
Myura Nagendran, Kirinchi Selvan, Gurusamy, Rajesh Aggarwal, Marilena Loizidou, Brian R Davidson

Intervention Review

Virtual reality training for surgical trainees in laparoscopic surgery
Myura Nagendran, Kirinchi Selvan, Gurusamy, Rajesh Aggarwal, Marilena Loizidou, Brian R Davidson

Database Title

The Cochrane Library

Published Online: 27 AUG 2013

Authors' conclusions

Virtual reality training appears to decrease the operating time and improve the operative performance of surgical trainees with limited laparoscopic experience when compared with no training or with box-trainer training. However, the impact of this decreased operating time

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>VR training</th>
<th>Box trainer</th>
<th>Std. Mean Difference</th>
<th>Weight</th>
<th>Std. Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N Mean(SD)</td>
<td>N Mean(SD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hamilton 2002</td>
<td>10 48.3 (4.4)</td>
<td>9 40.6 (5.7)</td>
<td>1.46 [0.42, 2.50]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>0</td>
<td>0</td>
<td>0.0 [0.0, 0.0]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Validity and Acceptability of a High-Fidelity Physical Simulation Model for Training of Laparoscopic Pyeloplasty
Poniatowski Lauren H., Wolf J. Stuart Jr., Nakada Stephen Y., Reihsen Troy E., Sainfort François, and Sweet Robert M.

Journal of Endourology. April 2014, Vol. 28, No. 4: 393-398

An evaluation of high fidelity simulation using a human patient simulator in a new Diploma in Military Medical Care

Journal of Military and Veterans' Health

High-Fidelity Simulation for Continuing Education in Nurse Anesthesia

M. Roseann Cannon-Dahl, CRNA, DNP
Susan M. Rugari, RN, PhD, CNS
Terri S. Jones, CRNA, DNP

AANA Journal • June 2012 • Vol. 80, No. 3
High Fidelity: Superior Training

The Standard For Endoscopy
High Fidelity: Superior Training

Worth the Cost

Surgical Skill and Complication Rates after Bariatric Surgery

John D. Birkmeyer, M.D., Jonathan F. Finks, M.D., Amanda O'Reilly, R.N., M.S., Mary Oerline, M.S., Arthur M. Carlin, M.D., Andre R. Nunn, M.D., Justin Dimick, M.D., M.P.H., Mousumi Banerjee, Ph.D., and Nancy J.O. Birkmeyer, Ph.D., for the Michigan Bariatric Surgery Collaborative
Higher Fidelity: Superior Training

Are we willing to risk negative training transfer to “cut corners”?
High Fidelity with Proven Training Effectiveness
Combat Medic Training

R. Sweet, R. Rush et al.
High Fidelity: Superior Training

Summary

• Learner performance metrics
• Immersive learning environment
• Patient specific simulation
• Data supports
• Worth the cost
High Fidelity: Superior Training

Rebuttal
High Fidelity, Low Cost Solutions

Pepper Cystoscopy Model
Ureteroscopy

- Porcine ex vivo kidney and ureter
- Previously placed stones
High Fidelity: Superior Training

Enhanced collection of learner performance metrics

Feasibility of collection of technical errors on a day-in and day-out basis?
Thank You

- Rob Sweet, MD for cava video and medic video
- Brad Schwartz, MD for high fidelity, low cost slides
- Tom Lendvay, MD and Tim Kowalewski, PhD for kinematic collaboration
- COL Rob Rush, MD for invitation