



Simulation-based Education as a Cultural Change Vehicle in Healthcare Quality & Patient Safety





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- Israeli Air Force > 20 years
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The Chaim Sheba Medical Center

- Largest in Israel
- Almost 2000 beds (1000 Acute + 900 Chronic)
- >6,000 Employees
- 85,000 Admissions
- 1M Patients
- 150,000 ER visits
- 35,000 Operations
- 10,000 Deliveries
- 850 MDs / 2000 RNs
- \$350M Budget





Aviation and Medicine

- Similarities
 - High-risk and high-tech industries
 - Low tolerance to errors
 - Intolerance to not learning from errors
 - Diverse skills required
- Differences
 - Admission and screening culture
 - Training and certification culture
 - Reporting and debriefing culture

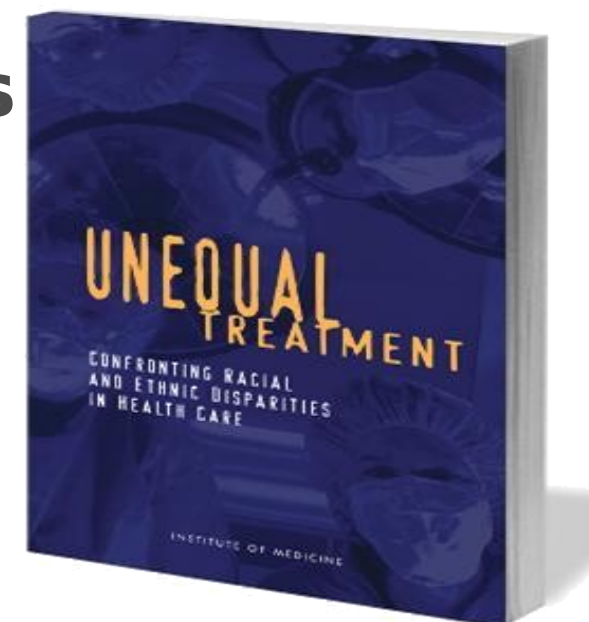
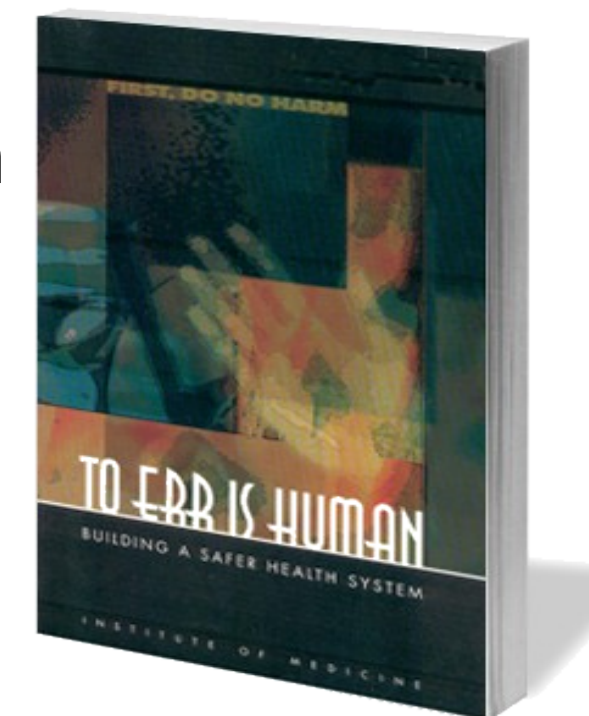
Assessment & Safety Culture





The Premise

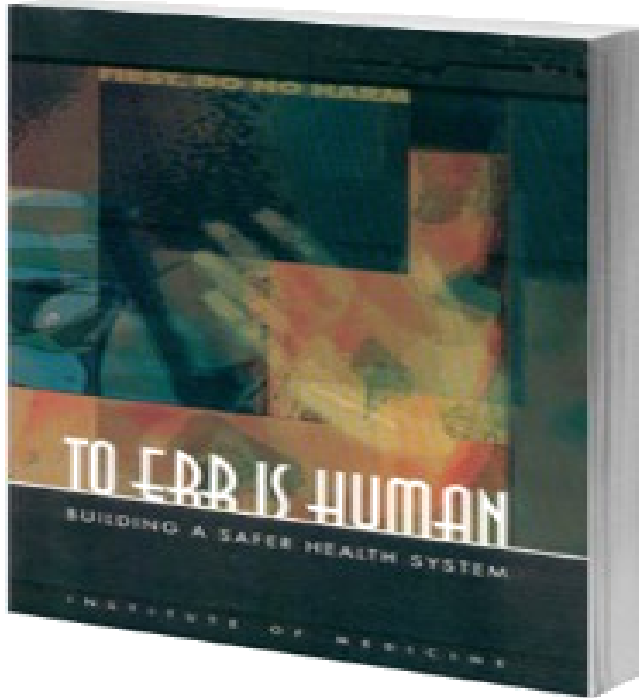
- Current Patient Safety & Quality Care Reality is suboptimal
- The Underlying assumption / hypothesis is:
 - **Medical Education** and **Medical Assessment** has a share in this reality
 - A change in **Medical Education** and in its **Assessment Paradigm** could improve this reality
- Simulation-based Education has the power to serve as a cultural change vehicle leading towards:
 - More **Effective / Safe / Patient Centered** Medical **Practices**
 - Improved **Readiness / Preparedness** of Health Professionals
 - Improved **Accountability** of the **Health Profession** at large





The Epidemic

1999 ~ **100,000** annual deaths from medical errors - IOM



~



1 x 747 Crashing daily

Medical errors are the **5th** cause of death



The Epidemic

2013 > 400,000 annual deaths from medical errors - NASA

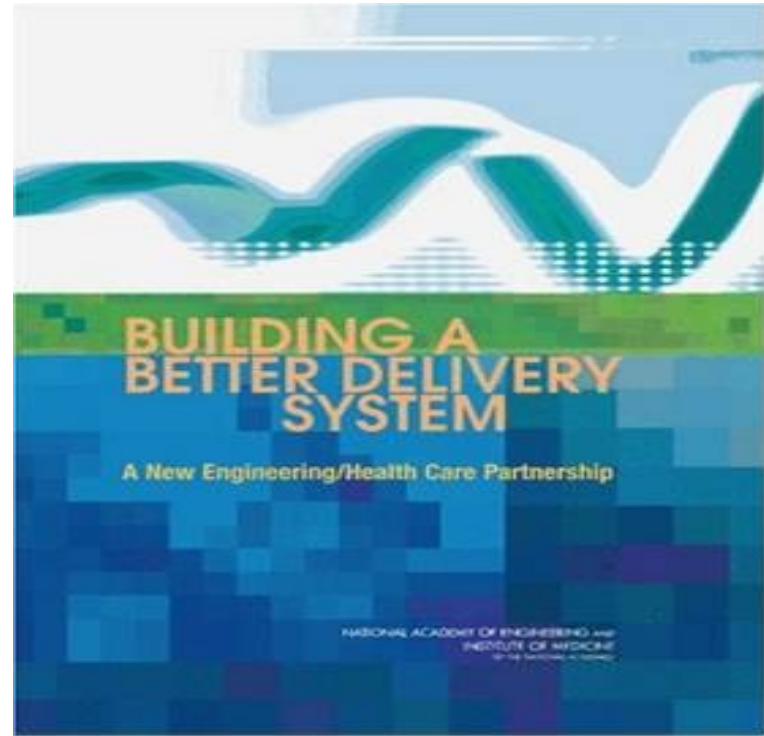


4 x 747 Crashing daily

Medical errors are the **3rd** cause of death



It's About Our Systems



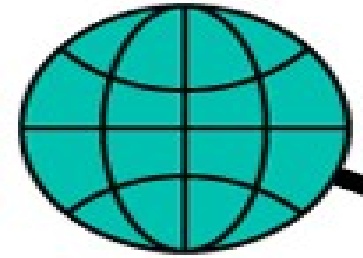
Simulation-based Education = Cultural change vehicle leading towards:

- More **Effective & Safe** healthcare systems
- Improved **Readiness/Preparedness** of professionals
- Improved **Accountability** of the profession

The (educational) Swiss Cheese Model



Triggers



Inadequate
Screening &
Selection Process

Sub-optimal
Training &
Formative
Assessment

Competency
Assessment &
Licensing
Paradigm

Recertification /
Maintenance of
Competency
(MOC & MOL)

Defences

Institution

Organization

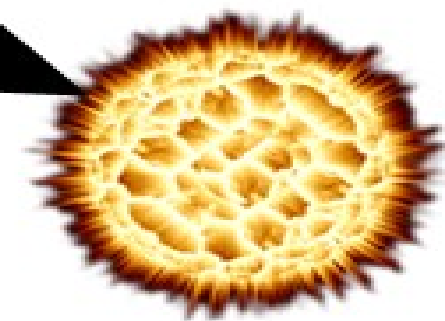
Profession

Team

Individual

Technical

Accident



Modified from Reason, 1991 © James Reason

Continuum of Education & Practice

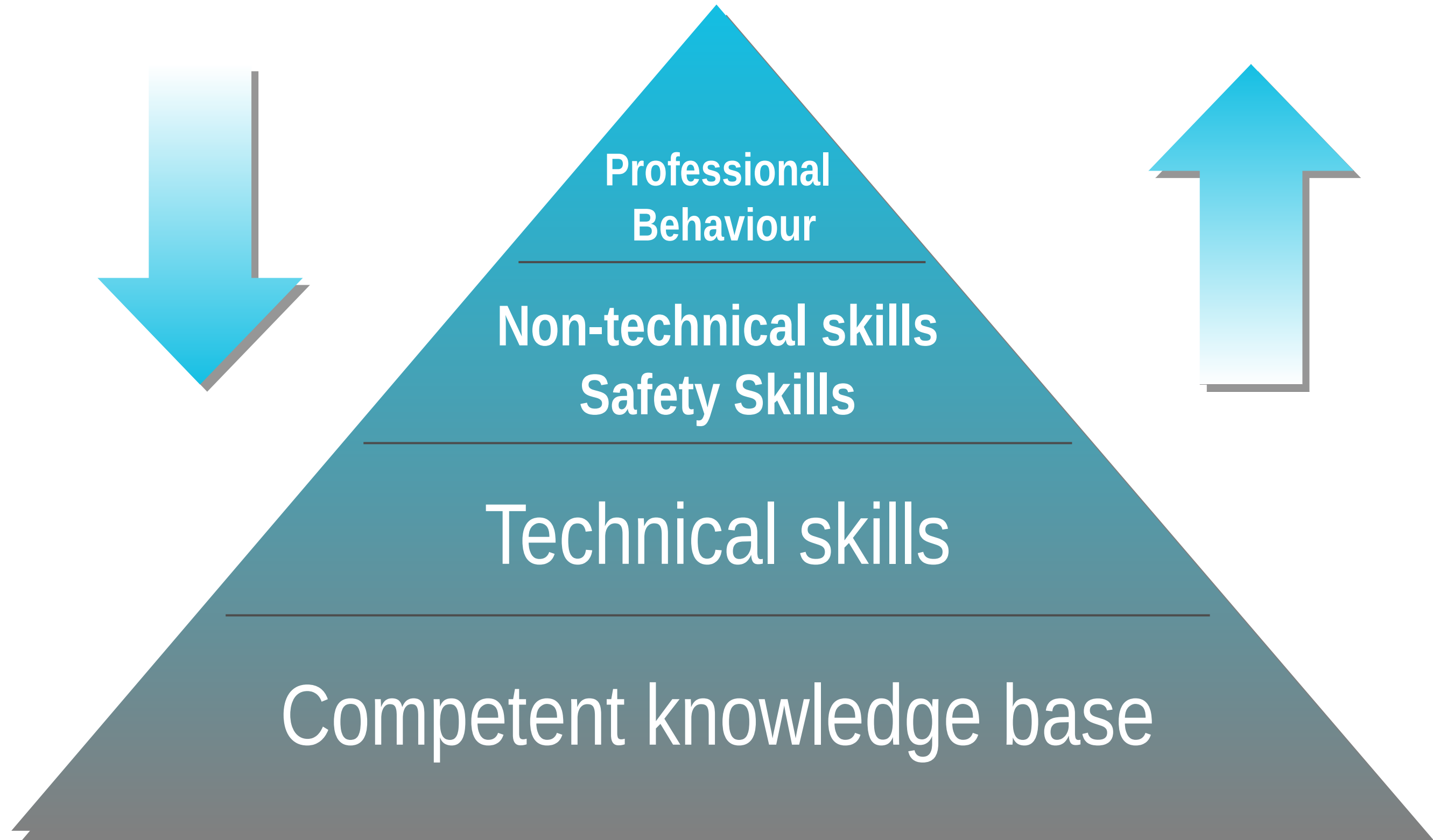


?Why Simulation

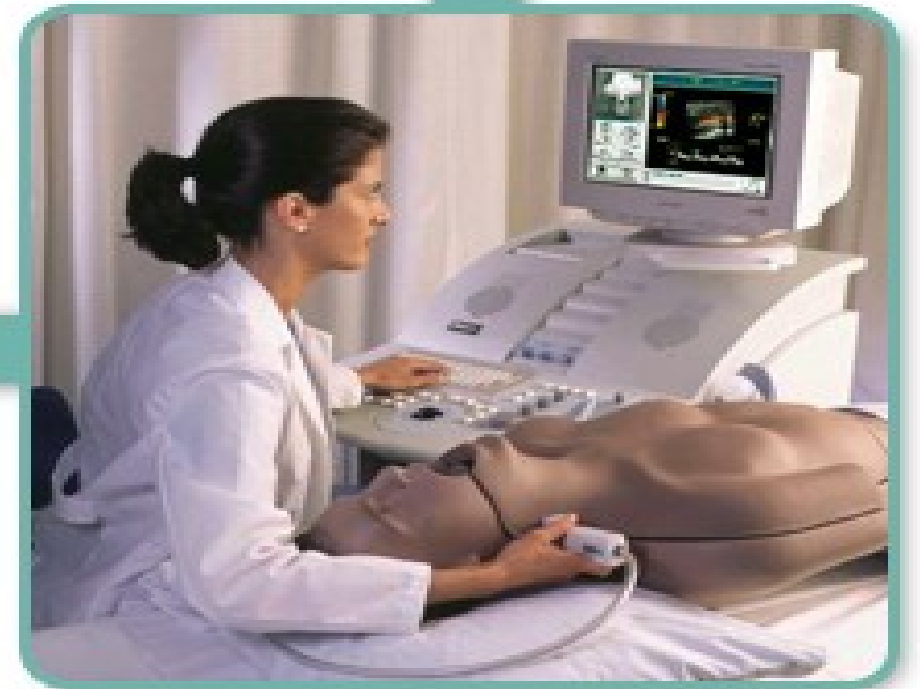
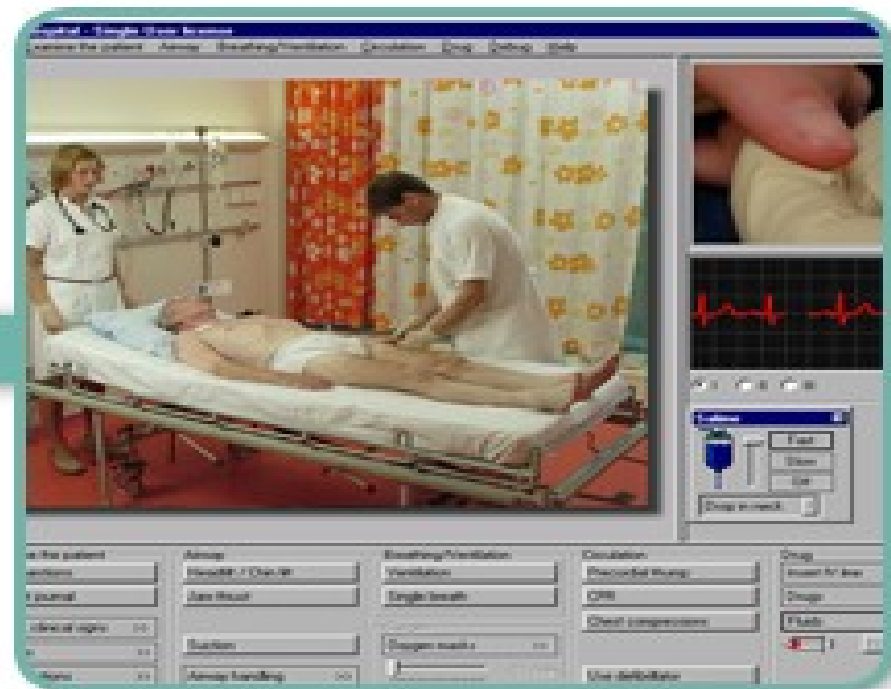
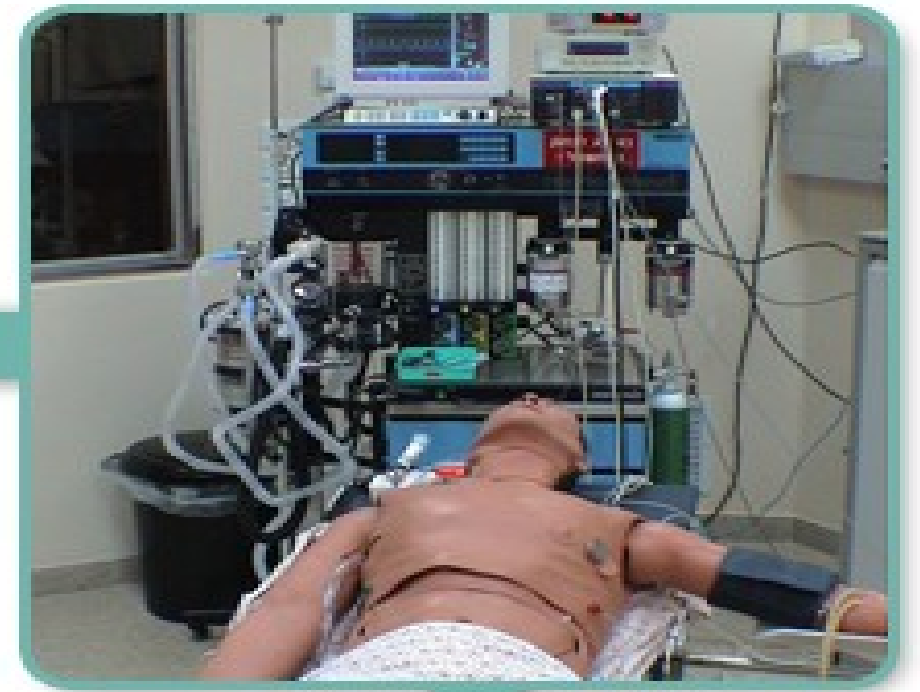
- Safe environment - mistake forgiving
 - **Error driven education**
- Proactive and controlled training
 - **Nightmare driven education / Receptiveness**
 - **Just in Time / Transitions = Increased Motivation**
- Trainee/ Team / System Centered Education
 - **Experiential / Emotional learning - IPE**
- Feedback and debriefing-based education
 - **Reflective/Narrative learners / Process-based education**
 - **The message: Apply in & as Life Long Learners**
- Reproducible, standardized, objective (CSA)
 - **Assessment driven education**



Professionalism- Hierarchy



Simulation Modalities





Simulation Driving Forces and Trends

- **Patient Safety Movement**
- **Accountability of Medical Education**
 - **Competency-based education**
- **Ethics - Patient (& animal) Rights movements**
 - **“First Do No Harm” = Patient Centered Concept**
- **Liability and Mal-Practice** (teaching vs. practice)
- **Increased Emphasis on Screening, Licensure, Certification**
- **Multiple Sim-centers** worldwide – multiple models
 - Single Profession, Single Modality, Institutional (e.g. - Mayo Clinic), National (MSR)



MSR – The Israeli Vision

National **resource** for comprehensive inter-disciplinary, multimodality medical simulation center dedicated to:

- Patient safety and quality care
- Hands-on** training
- Readiness to clinical practice
- Performance assessment**

Cultural Change Vehicle



MSR - Virtual Medical Environment – 13 Years of Activity

- All simulation modalities
 - SPs, High-tech simulators, Task trainers
- Clinical environments
 - Home, Field, ER, OR, Clinic
- Debriefing technologies
 - A/V & Debriefing software
- Multidisciplinary staff > 40
- > 190,000 Trainees / Examinees(>50% teams)
- > 2000 trained Instructors & > 2500 trained Raters
- **MSR on Wheels**





Guidelines and Principles

- **National collaboration**
 - Involve **Regulators** (IMA, MOH, IDF, HMO) – **Certification**
- **Link with Risk Management and Patient Safety / “real world”**
- **Not for profit - fee for service** – ~ **operationally balanced**
- **Focus on debriefing**
 - “Train the Trainer / Rater” - Bottom-up & top-down approach
- **Focus on assessment - Expertise in testing and evaluation**
 - Strategic partnership with NITE (“Israel’s ETS”)



National Programs (Sample)

- **Medical Preparedness programs**
 - Military/Civilian; Pre-hospital/In-hospital; In-Situ
- **Patient Centered Ethical Programs**
 - Transparency / **Apology** (error disclosure, informed consent)
 - **Communication Skills** focusing on:
 - Conveying Difficult News
 - “End of Life Discussion”
 - Cultural Humility
 - Domestic Abuse
 - **Interns - transition into hospitals - 4 d “nightmare course”**
 - **Physician / Patient / Computer Skills**





National Simulation-Based High-Stakes Assessment In Collaboration with NITE



- **Anesthesiology board exams** (since 2003)
 - > 70 examinees annually
 - In collaboration with the Israel Board of Anesthesia
- **Emergency Medicine board exams** (since 2012)
 - >20 examinees annually
 - In collaboration with the Israel Board of Emergency Medicine
- **Paramedics certification exams** (since 2004)
 - >100 examinees annually
 - In collaboration with the Israel EMS (Magen David Adom)
- **Advanced nursing licensing exams** (since 2008)
 - >1000 examinees annually (15 different clinical domains)
 - In collaboration with the Israel MOH Nursing Authority
- **MOR - Screening of medical school candidates** (since 2005)
 - > 1000 examinees annually on Humanistic Qualities (Empathy, Integrity, Maturity...)



National (Cultural) Impact

- High penetration rate
 - **Vertical** - MDs: Admission / Med School / Interns / Residents / Seniors / CEOs
 - **Horizontal** - RNs / Dieticians / Pharma / SW / OT/ Medical Clowns
 - **Health care institutions** - HMOs / Hospitals / Prof. Schools
- Multiple sectors experience High-Stakes SBT
 - ALL: Interns / Graduating paramedics / Military docs / Advanced nurses / > 80% MS candidates
 - Exposure / Involvement of > 50% of registered paramedics / Anesthesiologists / medical schools' faculty (as Raters!)
- **Significant increase in SBME implementation**
 - Multiple peripheral sim-initiatives (in collaboration with MSR)



Evidence of Safety Improvement

- **Improved Outcomes** - Improved Survival rates following Institution wide Simulation-based Mock Codes
 - Michigan - Survival rates increased to approximately 50%
 - CHOP – Better neurological outcomes also
- Improved **Patient Experience**
 - Women’s Hospital Sheba -communication skills of staff
 - Tutors -communication skills of students and tutors
- Improved **Adherence to Guidelines**
 - Conscious sedation
 - Asthma
- Improved **Trainee Experience**
 - Interns – better sense of readiness and true ability



Simulation-based Safety Training: Patient Centered Paradigm Shift

Traditional approach

- Safety - Personal Value
- Secret / Close Guild
- Reactive System
- Assessment of Knowledge
- Duration-based education
- Apprentice-based learning

21st Century Cultural Shift

- Safety - System Value
- Transparency - Debriefing
- Proactive Approach
- Performance/Readiness Ass.
- Proficiency-based education
- Simulation-based Training



International Activities / Impact

- **Comprehensive Institutional Consulting**

- Consultant to [Albert Einstein](#) Sao-Paulo (Brazil), [NYP-Columbia University](#) (US)
- International training courses - [Italy](#)...
- **TTT/TTR** (on/off-site) - Faculty development to McGill, Toronto - Michener, Sick-Kids, Kazakhstan, Spain, Hong Kong, Singapore, China and more...

- **Sister center initiatives**

- Partnership with [Mayo Clinic](#) (ICU curriculum)
- Partnership with [Case Western](#) (Surgical curriculum)

- **Developing World**

- Ethiopia, Brith Mila (HIV), [Ghana](#), Kenya...

- **Briefings @ US congress & HHS & HLS**

- Multiple visits by International [Military](#) Medical Corp
- [Homeland Security](#) & CDC & [GNYHA](#) & [GNJHA](#)



Lessons / Challenges

- **Transition from “Wow” to “Mature” Phase**
- **Educational Challenges**
 - Apply debriefing / self reflection in real practice
- **Performance Assessment Measures of Skills**
 - Apply Readiness Concepts – Competency-based progress
 - Measuring the “un-measurable”/“the important”
- **Regional / National / (& global) collaboration** - Crucial for success
- **Recognition by Regulators: Accreditation / Licensure / Certification**
- **Delivery Model / Cost Effective**
 - Fee for Service / Financial Stability
 - **Philanthropic Funding** for physical expansion, new generation simulators, additional trained staff



The (Patient Centered) Safety Message

Humility

“To Err is Human”

