



Et samarbeid mellom



Evidence based safety training

Kjetil Torgeirsen, Manager External training programs
SAFER

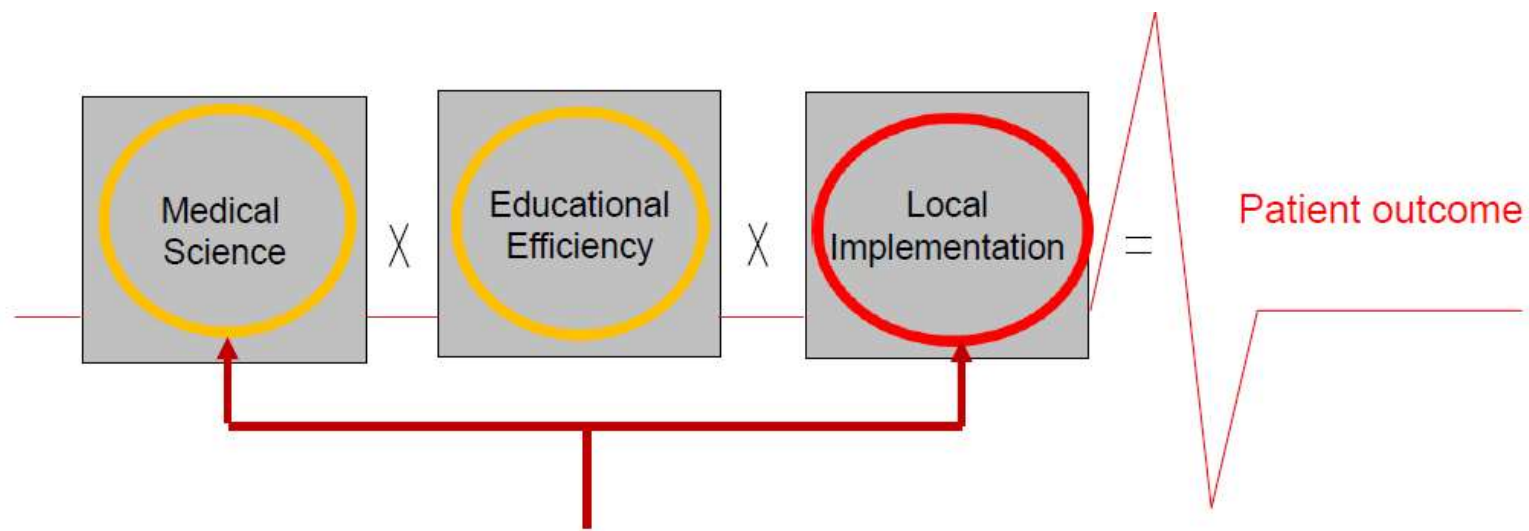
SAFER simulation center, Stavanger, Norway

- ▶ Established as a foundation in 2006
- ▶ A collaboration between the University of Stavanger, Stavanger University Hospital and Laerdal Medical AS
- ▶ 17000 participant days annually.
- ▶ International contributor to simulation networks and faculty development projects for teaching institutions, hospitals and other industries.
- ▶ Simulation based training programs for oil and gas industry since 2006, now the national industry standard in Norway.

Look to healthcare!

- ▶ Healthcare has easy access to research competence and produce a lot of high quality research.
- ▶ Strong incentives for efficient use of resources:
 - ▶ Limited resources (budgets and personnel)
 - ▶ Patient safety issues (large numbers of medical errors and adverse events)

The Utstein Formula for Survival



A big gap between theoretical knowledge and clinical practice.

What is efficient training?

- ▶ The Kirkpatrick Model is probably the best known validated model for analyzing and evaluating the results of training and educational programs:



Simulation based training

► What is simulation?

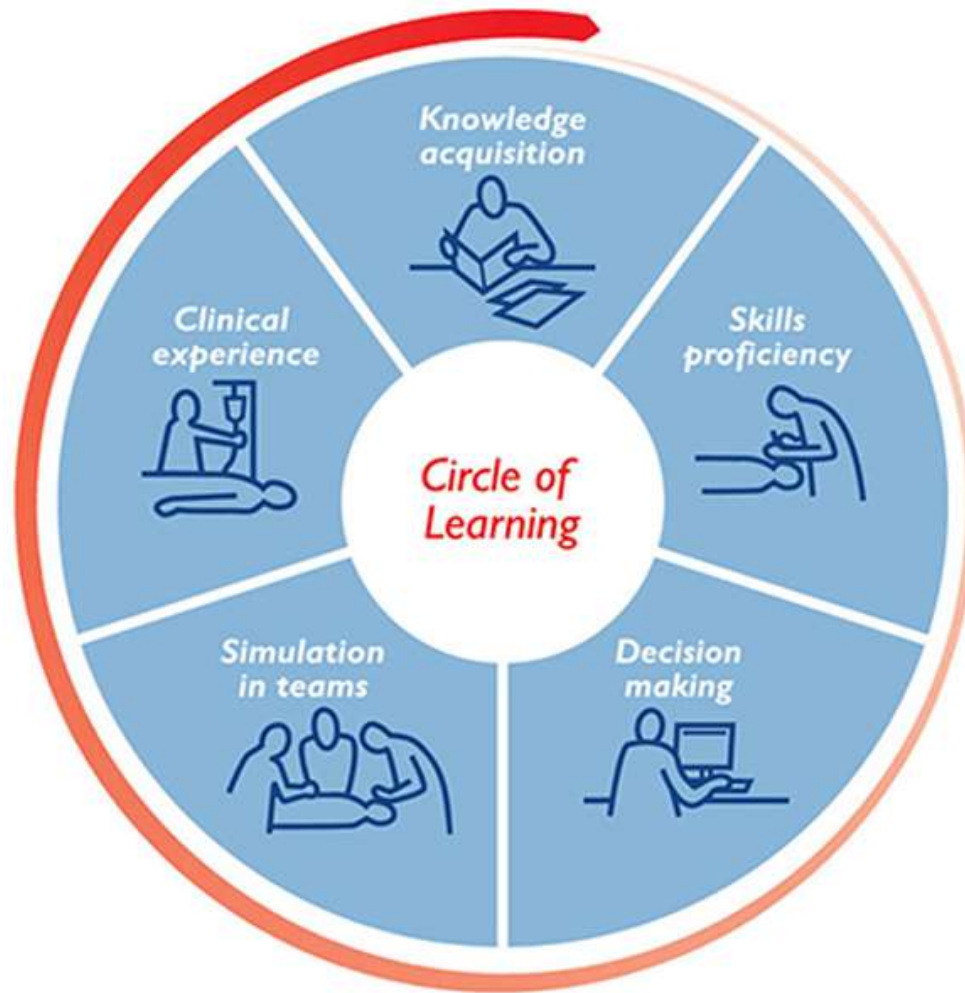
A technique that creates a situation or environment to allow persons to experience a representation of a real event for the purpose of practice, learning, evaluation, testing, or to gain understanding of systems or human actions

(Healthcare simulation dictionary)



Pedagogical theories in simulation

- ▶ Dawson's theories of experience based learning
- ▶ Kolb's experimental learning cycle
- ▶ Blooms taxonomy
- ▶ Sweller's cognitive load theory



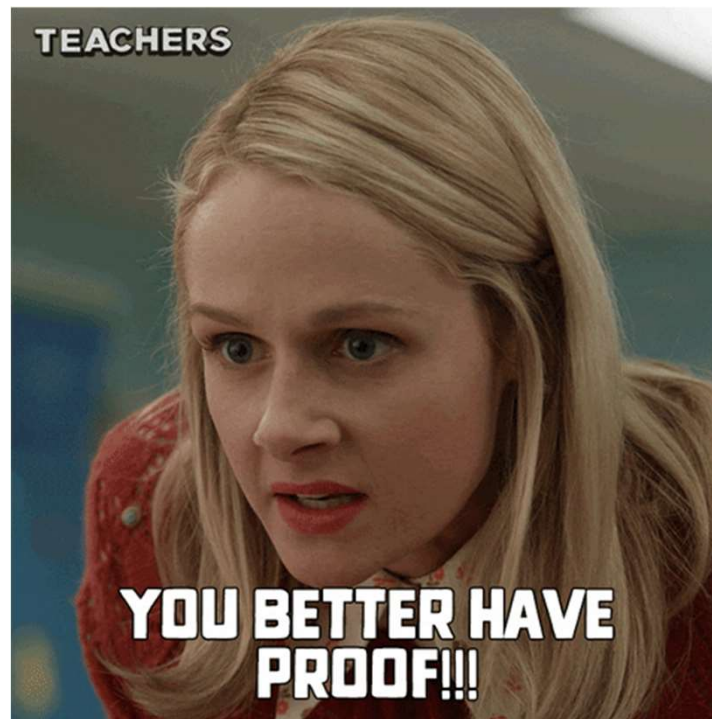
Why simulation based training

- ▶ Proven to be effective in changing clinical behavior
- ▶ Generates experience which can be replicated in a real life situation.
- ▶ Increases self efficacy.
- ▶ Learning experiences should be designed to reduce working memory 'load' in order to promote schema acquisition – Done right, this is what simulation do.
- ▶ Proven to reduce mortality and adverse events
- ▶ Involves several pedagogical modalities.

Why simulation based training

- ▶ Efficient way of identifying and closing knowledge gaps
- ▶ Efficient way of observing and learning from others
- ▶ Covers medical, behavioral and safety topics.
- ▶ Contextualized skills, and decision-making related to skills and protocols.

What about the evidence?



A scoping review

Kjetil Torgeirsen – SAFER, Univesity of Stavanger and Stavanger University Hospital

Can simulation based training for emergency medical teams improve patient safety?



Background and aim

- ▶ Research question: Can simulation based training for emergency medical teams improve outcomes and patient safety?
 - ▶ Patient safety measured by Kirkpatrick Level 4:
 1. Improved patient outcome/reduced mortality rates.
 2. Reduction in reported adverse events.

PICO

- ▶ P – Emergency medical team, medical emergency teams, HEMS, Rapid response teams, patient care team, air ambulance, emergency helicopter, ambulance, emergency
- ▶ I – Simulation based training
- ▶ C – Not relevant
- ▶ O – Improved patient safety defined as: reduced mortality and reduced risk of errors

Results

- ▶ Of 164 studies – 18 met the inclusion criteria's.
- ▶ 12 of the single studies found impact on Kirkpatrick level 4 - patient outcome or mortality (K4).
 - ▶ Results ranging from 18-49% mortality reduction!
 - ▶ Populations n – range from 78 – 180 000
- ▶ 1 single study found no K4 impact.
 - ▶ Intervention – 1 day simulation based training.
- ▶ 5 literature reviews was included.

Discussion

- ▶ Strength of the evidence varies!
- ▶ Only one RCT (Walker et al. 2017)
 - ▶ n=51086
 - ▶ 40% mortality reduction
- ▶ Msemo et al. 2013 – multicentre controlled trial
 - ▶ n=78500
 - ▶ 47% mortality reduction
- ▶ Studies conducted in low resource systems

Discussion

▶ Comparable studies conducted in high resource systems:

▶ Riely et al. 2011

▶ Prospective cohort study, cluster randomized

▶ n=1140

▶ 37% reduced mortality

▶ Theilen et al 2012

▶ n= 17096

▶ 42% reduction in unplanned ICU admissions

Conclusion

- ▶ The review found that simulation based training may have a huge impact on K4 level, improving patient outcome.
- ▶ Integrated training programs with repeated training seems to be a key element vs. single session interventions.
- ▶ Similar results from low and high resource systems strengthen the total impression and the validity of the findings from low resource systems and reveals the potential of high quality systematic simulation based training.
- ▶ Lack of impact in some studies seems to correlate with poorly designed simulation intervention.

Simulation based training, quality indicators

- ▶ Description of scenario and learning objectives
- ▶ Instructional design; duration and frequency/repetitions
- ▶ Feedback/debriefing; structure/method, duration, facilitator characteristics
- ▶ Time used for intervention, repetitions, education of facilitators etc.

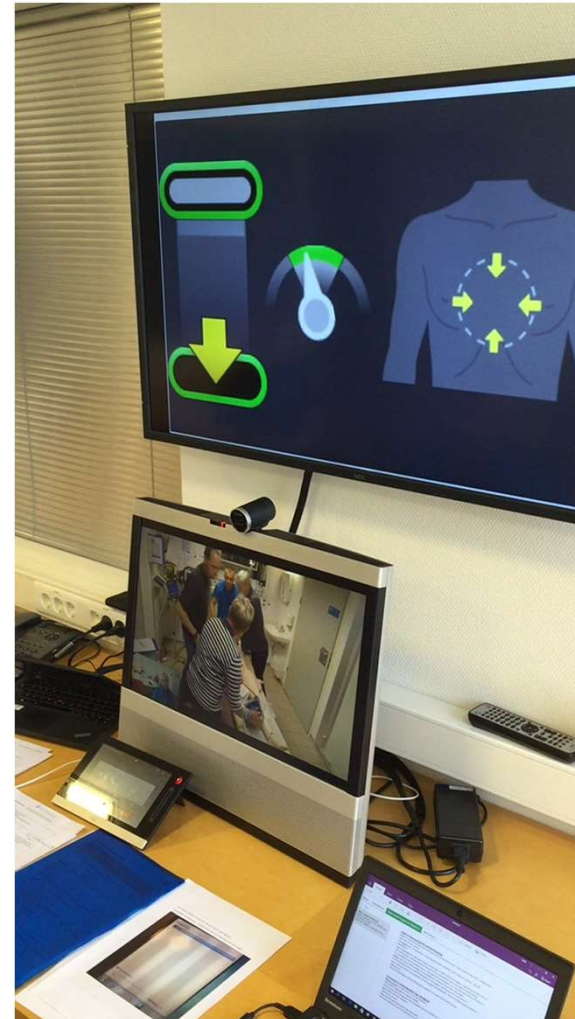
Ref. Cheng et al. 2016 Reporting guidelines for health care simulation research: extensions to the CONSORT and STROBE statements

Next level of evidence, return of investment

- ▶ Cohen ER et al. Cost savings (\$700 000) from reduced catheter related bloodstream infection after simulation based education for residents in a medical intensive care unit. *Sim Healthcare* 2010
- ▶ Zendejas B, Wang AT et al. Cost: the missing outcome in simulation based medical education research: a systematic review. *Surgery* 2013;153:160-76
- ▶ Theilen U et al. Regular in situ simulation training of paediatric Medical Emergency Team leads to sustained improvements in hospital response to deteriorating patients, improved outcomes in intensive care and financial savings (£ 801 600). *Resuscitation* 2017

Next level of simulation based training – on site

From the pilot testing of telesimulation for Equinor offshore medics in the North Sea





equinor



We have the recipe and the proof is in the pudding.

Thank you for your attention

Contact:

Kjetil Torgeirsen

kjetil.torgeirsen@safer.net

Phone: +47 975 10 097