

Case study

Integrating more Simulation into Everyday Training



SAFER - Stavanger Acute Medicine Foundation
for Education and Research

Stavanger, Norway

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This case study is one, in a series of eight, describing various aspects of European simulation centers. The document was developed in collaboration with and approved by SAFER.

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SAFER IN SHORT

Background

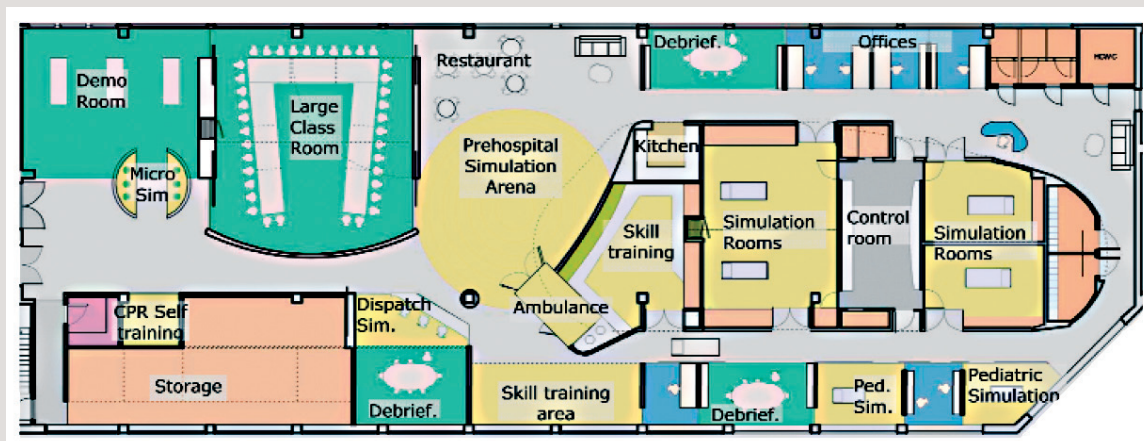
Stavanger Acute Medicine Foundation for Education and Research (SAFER) was established by Stavanger University Hospital, University of Stavanger, and Laerdal Medical in 2006.

The simulation center is located in central Stavanger, where the modern and spacious facilities occupy 900 sq meters. The largest groups trained in the first full year were ambulance personnel and nurses and physicians from the intensive care, anesthesia, emergency, cardiology, medical, and pediatric hospital units. The following year these groups were surpassed by an increasing number of participating nursing students. Simulation training is also provided for external clientele, from both public organizations and corporate industries. SAFER actively participates in national and international simulation networks and acts as a model center for others who plan to establish similar learning centers. Efforts are made to stimulate research within learning, patient safety, and clinical practice.

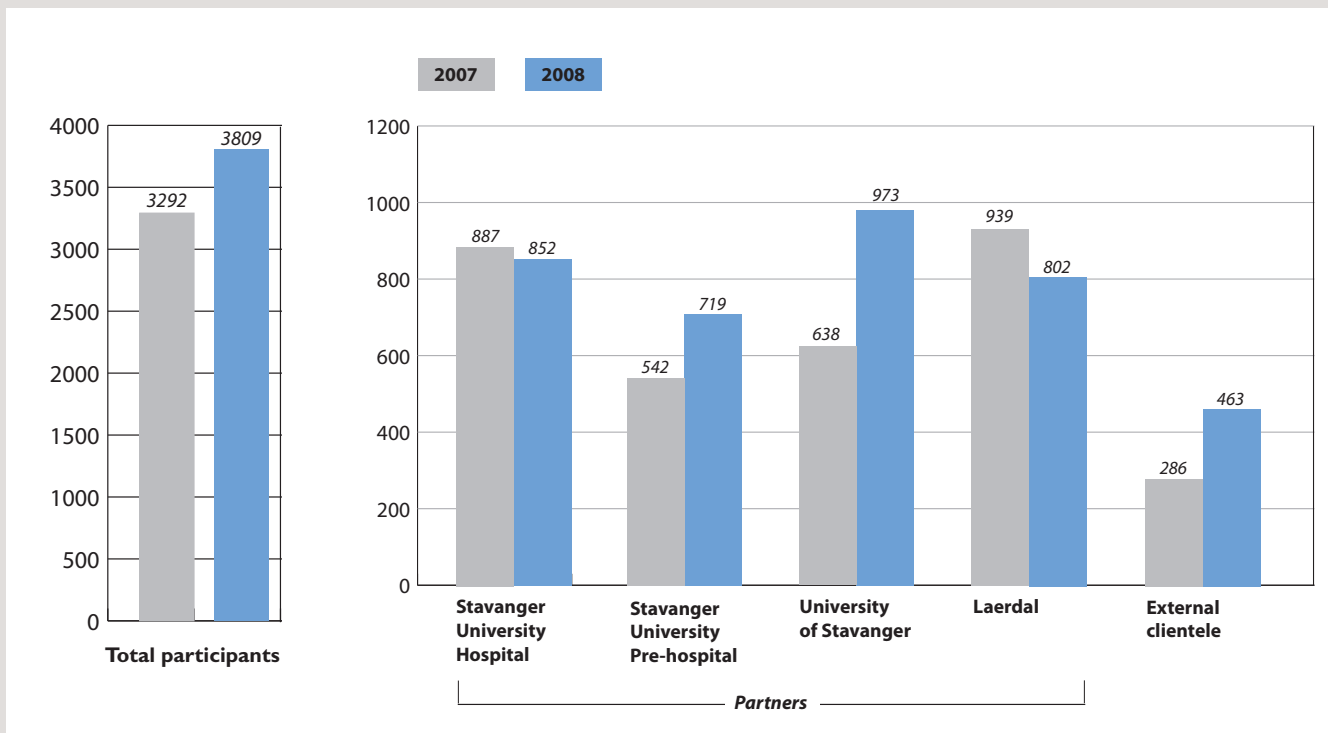
Profile

Simulation training is provided for all sectors in the chain of survival.

Floor plan



Activity



WHY SIMULATION WAS IMPLEMENTED

The main incentive to implement medical simulation training has been to strengthen acute medicine and patient safety, by contributing to improved medical training and enhanced competence development for healthcare personnel.¹

ORGANIZATIONAL MODEL

SAFER is a self-contained foundation and the three partners are equally represented on the board of directors. The simulation program is headed by a full-time medically trained manager (ICU nurse). 3 part-time coordinators (1 university- and 2 hospital employed) quality assure and schedule the planned simulation activity. The coordinators offer advice and support to instructors in charge of the ongoing simulation training. This arrangement ensures that the training is conducted according to established standards, and has proved especially useful in relation to inexperienced instructors. 4 (part-time) instructors facilitate training at the SAFER center on a regular basis. Another 2 (also part-time) instructors will be engaged to handle the increasing activity for external, offshore clientele. Hospital personnel and university students remain the core users of the simulation center. An affiliated group of >100 instructors (hospital- and university employees) conduct training for this group of clientele. Training for hospital personnel may also take place off the center's premises, eg at the hospital emergency unit (in situ training). SAFER has a special focus on course activities and general follow up for this group of instructors.

Staff competency levels

All instructors have a medical background and hold formal 3-day simulation-training courses developed in collaboration by the Barts, TuPASS, and DIMS simulation centers. Debriefing is highly emphasized and hence an essential part of this instructor course. Levels 2 and 3 of the Train-The-Trainer course are underway.

For additional information: <http://www.EUsim.org/>

Staffing

General manager
Medical director

In-house Instructors: 2 MDs
4 Intensive care nurses
2 Paramedics

Associated

Instructors: >100 hospital employees/university faculty members

Facilities: SAFER is equipped with 7 simulation rooms, 2 control rooms, 3 debriefing rooms, labs, and 1 large class room that may be divided into 2 smaller rooms. Scenarios can be run independently in all simulation rooms in addition to the open area surrounding the ambulance located inside the simulation center. Debriefing takes place in either the simulation rooms or in the rooms allocated to debriefing.

Curriculum: Each partner develops and controls the curriculum for their clientele. This way the university ensures that students are exposed to scenarios relevant to their different educational levels, and the hospital develops scenarios that reflect the defined learning objectives for their staff.

FINANCIAL MODEL

The SAFER foundation is supported and funded by three equal partners: The Stavanger University Hospital, University of Stavanger, and Laerdal Medical. The budget covers daily management, including manager salary, and investments. Salary for remaining staff is covered by the university and the hospital, respectively. Research activity is funded by grants from the Laerdal Foundation along with financial support from the University in Stavanger. The Laerdal Foundation contributed substantially during the start-up phase of the learning center (2006-08). Starting 2009, these grants are being replaced by alternative sources of income, such as external training, which is delivered at a somewhat higher price than cost price. It is a strategic goal to increase number of external clientele considerably over the next couple of years.

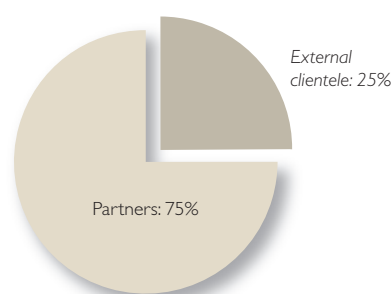


Figure 1 Funding

BENEFITS OF MODEL

- **Collaboration:** SAFER acts a common meeting place for the partners. The ongoing exchange of ideas, experience, and competence taking place here enhances student-professional relationships, which in turn benefits collaboration when these groups later meet in clinical settings during clinical practice.
- **Facilities:** The 7 simulation rooms allow for flexibility and efficiency in that several scenarios may be run simultaneously and thus larger numbers can be trained. Large groups may have the plenum session together and be divided into smaller groups for the simulation/debrief sessions.
- **Meeting Educational Needs:** Because hospital staff train hospital employees and university staff train their students, all instructors exhibit a clear understanding of the core (internal) clientele's educational needs.
- **External clientele:** Simulation courses for external clientele generate additional funding.
- **Location:** Training conducted away from the workplace prevents disruption and promotes focus.

CHALLENGES WITH MODEL

- **Staff Competency:** Competency levels vary, because some of the affiliated instructors do not conduct simulation training often enough to gain sufficient practice.
- **Location:** Because hospital personnel must leave their workplace to train, simulation training may at times be given a lower priority.

DEMOGRAPHICS OF CLIENTELE

Professionals

Physicians Anaesthesiologists General practitioners Internists Offshore physicians Pediatricians Trauma teams	EMS Ambulance personnel Paramedics Other Instructor training (Train-The-Trainer courses)
Nurses Anaesthesia Casualty clinic/Emergency Ward nurses Emergency care Intensive care Offshore nurses Operating room (OR) Pediatric	

Postgraduates

Physicians General practitioners	Nurses Anaesthesia Casualty clinic Intensive care Operating room
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Undergraduates

Medical students: 4th year Nurses

External Clientele

Oil industry
 General practitioners

EDUCATIONAL ACTIVITIES

The Circle of Learning (fig 2) reflects the continuing process of attaining, maintaining, and enhancing clinical competence. SAFER facilitates knowledge acquisition, skills proficiency, computer simulation, and full-scale simulation in teams. The clientele that benefit most from working with computer simulation (Laerdal MicroSim) are medical students, specialized nurses, and computer savvy participants in general.

Underway

- eLearning will supplement lectures and textbooks for knowledge acquisition.
- Students will obtain theoretical CRM knowledge prior to performing team training, so that CRM training can start sooner and thus be implemented into an earlier stage of the Circle of Learning.
- **Preparation:** SAFER plans to conduct prequalification courses in order to make the simulation training more effective. The curriculum will be tailored to the participants' varying competency levels and to the intended learning objectives for each course.

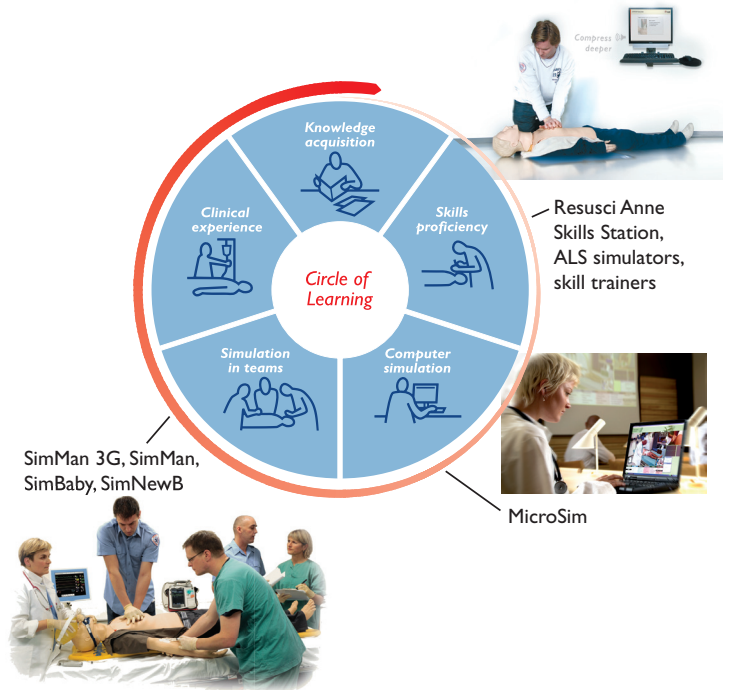


Figure 2 The Circle of Learning and chosen products

CHOSEN SOLUTION

SAFER is equipped with the following simulation products from Laerdal:

- 1 SimMan 3G
- 5 SimMan
- 2 SimBaby
- 1 SimNewB
- 8 AVS
- 8 PCs with MicroSimTM
- 1 Resusci Anne Skills Station
- 2 ALS simulators
- Laerdal skill trainers and manikins

The fact that SimMan 3G, SimMan, SimBaby, and SimNewB provide lifelike clinical feedback makes the scenarios seem much more realistic, according to SAFER. Features like the voice option, respiration, and pulses are especially appreciated.

METHODOLOGY

Simulation Training in Teams

Preparation: Form and degree of preparation is currently instructor dependent, as is the applied methodology in general. Because the partners each own their curriculum, there is a disparity in terms of how the simulation training is carried out and how, whether, or to what extent the participants should prepare, the scenarios selection, the emphasis put on debriefing, and so forth.

When eg the Stavanger University runs simulation training for their nursing students, this partner will provide their own instructors, select the relevant scenarios, and finally determine how the actual training and debriefing is conducted.

Brief: All instructors provide a 30-minute brief comprising an introduction to how medical simulations are carried out, a description of simulator features, and equipment functionality.

Validity: SAFER emphasizes validity to a high degree.

The sense of realism is enhanced by using props and outfits that suit the selected scenarios, and eg by generating sounds that resemble noise from oilrigs (to impede auscultation). Desired degree of realism depends on the focused learning objectives and the learners' level of abstraction. Novice individuals seem to require a higher degree of realism than do the more experienced learners. Although the participants value a realistic atmosphere, it is more so the relevance of the simulation training that generates actual learning outcomes.

Interactive Approach: When participants need help moving forward - or would perhaps benefit from greater challenges than the ones they first were presented with - the instructor will simplify or complicate the scenario according to perceived needs.

Trend: Increasing emphasis is put on knowledge acquisition prior to the simulation training.

Scenarios: All scenarios are self-made.

Most frequently used scenarios:

- Acute, critical illness
- Cardiac arrest
- Chest pain
- Coma
- Difficult airway / Intubation
- Ethical aspects related to patient death
- Hemorrhaging chock
- Impaired respiration
- Myocardial infarction
- Pulmonary disease
- Respiratory arrest
- Trauma cases

Debriefing

Emphasis: High.

Facilitators use the dialogue form to encourage participants to share their perceptions and experiences with the rest of the group, and in turn reflect on their own performance. Instructor and operator have a short conversation before the debriefing session starts.

During the debrief session the instructor encourages the participants to:

- phrase their own process of learning (ie self learning process)
- identify areas in need of improvement
- pose questions that encourage each individual to participate in the debrief

Examples of details logged by operator:

- touching of the patient (simulator)
- measures taken
- point of time noted measures were taken
- appropriate/good levels of communication
- inadequate/poor levels of communication

Applied Tools:

- notes taken during ongoing simulation
- video clips recorded during simulation (AVS)
- SimMan software log (AVS)
- collaboration operator/instructor

Because SAFER provides simulation training to a wide range of healthcare personnel, the educational context will vary, and reflect the different needs and priorities of each group. The simulation center's objective setting is to provide improved medical training that in turn enhances competency levels for healthcare personnel. To accommodate the diverse group of participants, the learning center offers skills training, decision-making training, and full-scale simulation training - individually and in teams. Communication, interaction, and leadership are all highly focused aspects of the full-scale simulation training. The debrief sessions are lengthy, personalized, and instructor-led.

Focus:

- Team performance during full-scale simulation (CRM)
- Individual performance (Competency Management)
- Protocol training

WHAT MAKES GOOD SIMULATION PROGRAMS

Issenberg et al ² reviewed and synthesized existing evidence in educational science that addressed the question - what are the features and uses of high-fidelity medical simulations that lead to most effective learning? Articles that demonstrated effective learning were purposely selected and reviewed and several important features and aspects of medical simulations were identified. The authors concluded that the weight of the best available evidence suggests that high-fidelity medical simulations facilitate learning when training is conducted under the 'right conditions.'

The right conditions include:

- Feedback is provided during the learning experience
- Learners engage in repetitive practice
- Simulation is integrated into the normal training schedule
- Learners practice with increasing levels of difficulty
- Simulation training is adapted to multiple learning strategies
- A wide variety of clinical conditions are provided for
- Learning on the simulator occurs in a controlled environment
- Individualized and team learning are provided
- Learning outcomes are clearly defined
- Ensures the simulator is a valid learning tool

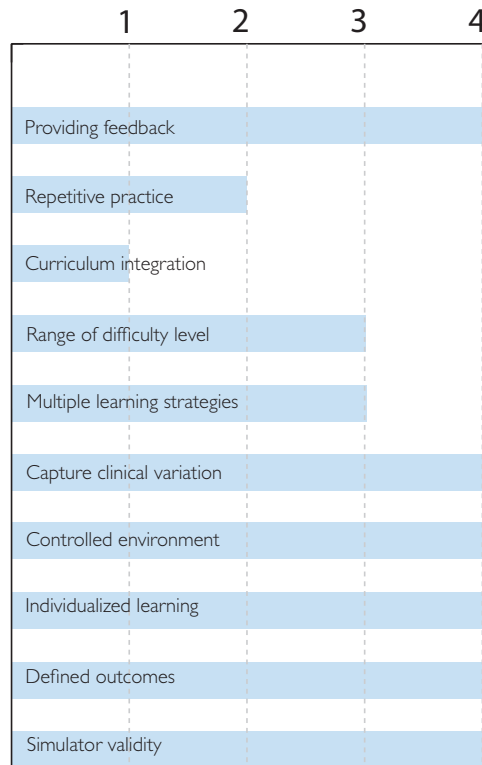


Figure 3 The rows indicate to what degree SAFER delivers simulation training on each of the listed right conditions - as assessed by SAFER on a 4-point Likert scale (4 = highest). The right conditions are not individually graded.

RESEARCH ACTIVITY

Topics for ongoing projects:

- Risk management and patient safety in acute medicine
- Simulation as a pedagogical method in nursing education
- Pedagogically effective methods for efficient teaching of healthcare personnel

PUBLICATIONS:

Solli, Stephen et al: Pre-hospital advanced airway management by anaesthesiologists: Is there still room for improvement? 2008

REFERENCES:

1. SAFER website: <http://safernet/>
2. S. Barry Issenberg, William C. McGaghie, Emil R. Petrusa, David Lee Gordon, Ross J. Scalese (2005) Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic review, *Medical Teacher*, Vol.27, No.1, pp. 10-28

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