

Case study

Improving Medical Training with Simulation



SIMULHUG - Geneva University Hospital

Geneva, Switzerland

By: Ellen Thomseth, Laerdal Medical

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

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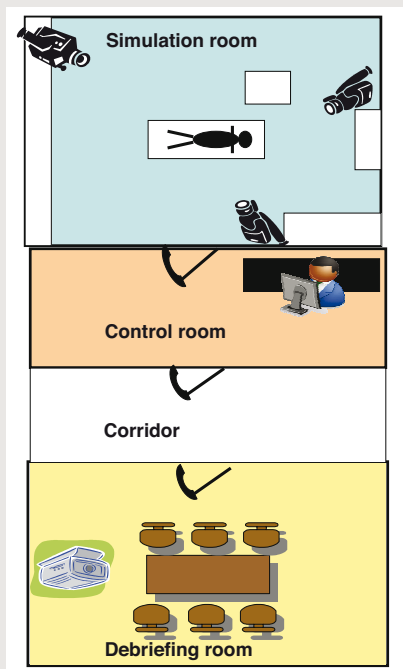
SIMULHUG IN SHORT

Programme de simulation des Hôpitaux et de l'Université de Geneve (SIMULHUG) was established in 2007. The simulation program is located in a clinical environment at the Geneva University Hospital, where the facilities occupy 90 sq meters. Here, the participants in the simulation program are exposed to critical medical situations where they must take action. Through experience, reflective practice and feedback, the participants learn how to improve their performance, on an individual level and as members of a team. Approximately 250 physicians, nurses, and students were trained in the first full year (2008). Participants came from the anesthesia, pediatric, and neonatology departments. Next in line are emergency and intensive care units, the trauma team, ambulance personnel, and ward nurses. SIMULHUG provides some training sessions for external clientele in addition to the internal, core participants from the hospital and the university. The training activity is expected to increase in coming years and the simulation program aspires to act as a regional resource center for medical simulation training in Switzerland.

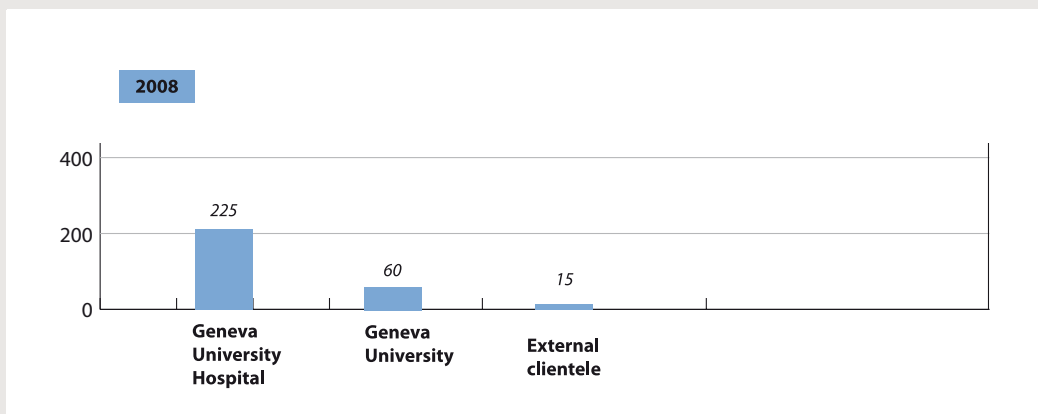
Profile

The simulation program provides Crisis Resource Management and Competency Management training.

Floor plan



Activity



WHY SIMULATION WAS IMPLEMENTED

The main incentive to establish the simulation program was the conviction that simulation training improves individual medical skills and the performance of interdisciplinary teams; which in turn increases quality of care and patient safety.¹

A mandatory part of medical education: Switzerland is developing a new, national curriculum for postgraduate training in anesthesia. Simulation training will be an essential part of the curriculum reform, and is expected made mandatory for anesthetists.

ORGANIZATIONAL MODEL

SIMULHUG is an integral part of the Geneva University Hospital and answers to the Department of Anesthesiology. The simulation program is headed by a consultant anesthesiologist. The director's time is divided between the University of Geneva, the University Hospital, and the simulation program, where the director also acts as instructor and facilitator. Five part-time instructors facilitate training on a regular basis.

Staff competency levels

All instructors have a medical background and hold either a three-day or a one-week formal instructor course. Novice instructors may conduct simulation training under supervision, pending a formal qualification.

Staffing

Director
1 technician

Formally trained instructors: 4 MDs
1 nurse anaesthetist

Facilities

SIMULHUG is equipped with 1 simulation room, 1 control room, and 1 separate room for briefs and debrief sessions.

Curriculum

The Geneva University Hospital controls the curriculum. The scenarios are developed to comply with selected learning objectives and educational needs of the participants.

FINANCIAL MODEL

SIMULHUG is owned and primarily funded by the Geneva University Hospital (fig 1). The Faculty of Medicine at University of Geneva acts as funding partner through Unit for Development and Research in Medical Education (UDREM). The budget covers daily management and investments. The director's salary is partly covered by the university, while the remaining staff is paid by the hospital. Research activity is funded partly by grants, partly by the hospital. External clientele generate some additional funding, in that external

simulation training is delivered at a higher price than cost price. It is an ambition to increase the number of external clientele.

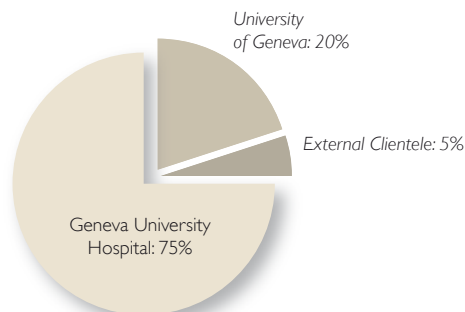


Figure 1. Funding.

BENEFITS OF MODEL

- **Location:** Core clientele (hospital employees) have easy access to the training facilities. In-situ training is more feasible when the simulation equipment is located close to its core users.
- **Meeting Educational Needs:** By allocating time to clinical practice, the training staff manages to maintain a clear understanding of the core participants' educational needs. The medical students will likewise benefit from the director's teaching position with the University of Geneva.
- **External Clientele:** Simulation courses for external clientele generate some additional funding.

CHALLENGES WITH MODEL

- **Facilities:** One available simulation room limits productive capacity.
- **Growth:** The initiative for the simulation program originated from the Anesthesiology Department. Further development is however a two-way process, and will depend on priorities set both by the Anesthesiology Department and the Hospital board/faculty.

DEMOGRAPHICS OF CLIENTELE

Professionals

Physicians
Anesthesiologists
Internists
Senior residents

Nurses
Anesthesia
Emergency care
Intensive care
Pediatric
Ward nurses

Postgraduates

Nursing students
Anesthesia
Anesthesia postgraduate
program
Ward nurses

Undergraduates

Medical students: 6th year

External Clientele

Pharmaceutical industry

EDUCATIONAL ACTIVITIES

The Circle of Learning (fig 2) reflects the continuing process of attaining, maintaining, and enhancing clinical competence. SIMULHUG facilitates knowledge acquisition, skills proficiency, and full-scale simulation.

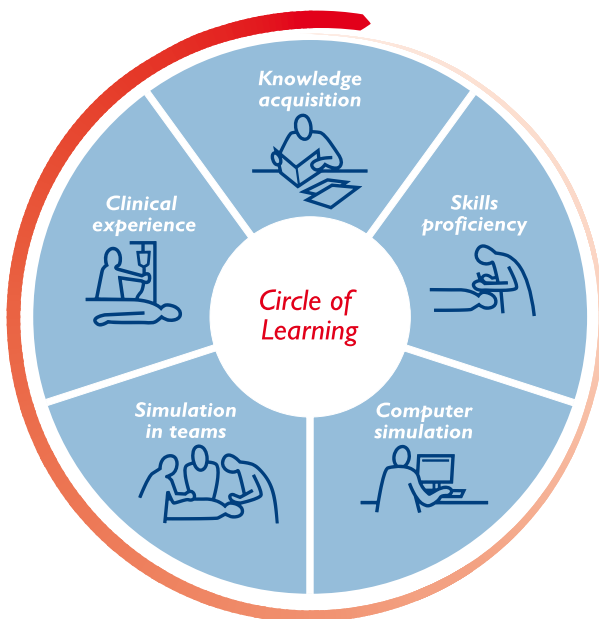


Figure 2. The Circle of Learning reflects the continuing process of attaining, enhancing, and maintaining clinical competencies.

TRAINING SOLUTION

The training equipment currently includes:

1 SimMan
1 SimBaby
1 SimNewB
4 Resusci Anne
Laerdal skill trainers and manikins

METHODOLOGY**Simulation Training in Teams**

Preparation: Participants prepare for the simulation training by attending subject related lectures and by studying relevant literature.

Brief: A 30-minute lecture on medical simulation and debriefing is provided in the brief/debrief room. Afterwards, the group is divided into smaller groups of 4-5 participants. These groups will then take turns performing the selected case scenarios. Familiarization with the simulation equipment takes place in the theater prior to the simulation training. Topics for the selected scenarios are not revealed to physicians prior to training, while nurses are provided with this information. Each group is encouraged to refrain from sharing their experiences with the rest of the group, until all groups have completed one scenario each. The groups are exposed to different scenarios, but they all last about 15 minutes. One group at the time will struggle with medical challenges in the theater, while the other participants observe the ongoing performance via a screen in the brief/debriefing room.

Validity: SIMULHUG emphasizes validity to a high degree.

Interactive Approach: When a team gets stuck and is unable to think of alternative ways to approach a problem (so called fixed error), the instructor will either stop the scenario or intervene and constructively suggest some solutions. Otherwise, the simulation experience may generate frustration instead of providing a good learning experience.

Scenarios: All scenarios are self-made and pre-programmed in the scenario editor. More than 35 different scenarios have been programmed so far.

Most frequently used scenarios

- Acute, critical illness
- Anesthesia crises
- Cardiac arrest
- Chest pain
- Coma
- Difficult airway / Intubation
- Hemorrhaging chock
- Impaired respiration
- Myocardial infarction
- Respiratory arrest
- Trauma cases
- Pulmonary disease

Debriefing

Emphasis: High.

The facilitator addresses the group as a whole for about 45 minutes. The participants are encouraged to share their simulation experiences regarding perceived degree of realism, level of stress and frustration, and the relief when scenario cases were resolved. By posing questions to the group, the facilitator manages to generate self-reflection on the courses of action that were taken or lack of action, respectively.

Example (SBAR):

S - SITUATION! (what is happening now?)

B - BACKGROUND (the circumstances leading up to this situation)

A - ASSESSMENT (what do I think the problem is?)

R - RECOMMENDATION (what should we do to correct the problem)

SBAR provides a mechanism to frame a conversation so that information is conveyed among people in a consistent and reliable way.

Applied Tools

- Video clips recorded during ongoing simulation
- Notes taken by instructor during ongoing simulation
- Collaboration (technician/instructor)

SIMULHUG is motivated by the concept that improved performance and reduction of errors in medical emergencies is largely related to team performance, leadership, communication, and management. The simulation program applies primarily team training and full-scale simulation to enhance these skills. The debrief sessions are lengthy, personalized, and instructor-led. ACLS, airway management, and central venous access are compulsory skills for residents in anesthesia, however skills training for other healthcare personnel has so far not been made mandatory. The scenarios are designed to train all of the above, and to demonstrate clinical competence.

Focus

- Team performance
- Individual performance

WHAT MAKES GOOD SIMULATION PROGRAMS

Issenberg et al² reviewed and synthesized existing evidence in educational science that addressed the following question: What are the features and uses of high-fidelity medical simulations that lead to most effective learning?

Issenberg argued 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

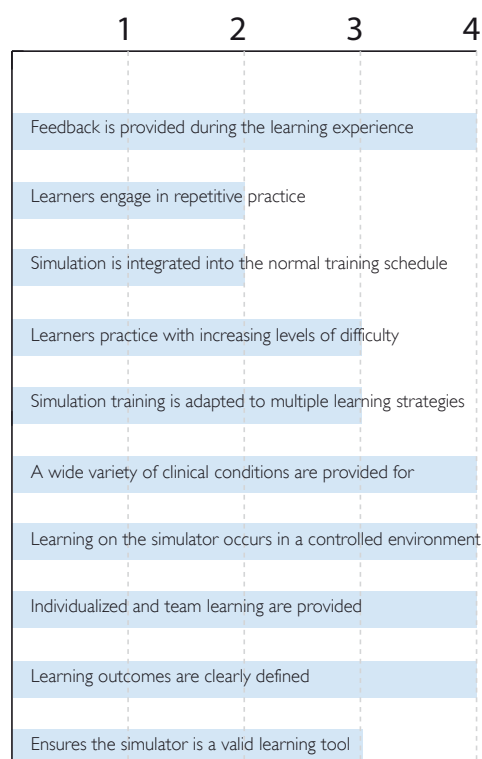


Figure 3. The bars indicate to which degree SIMULHUG delivers on each of the listed right conditions - as assessed by the simulation center on a 4 - point Likert scale (4 = highest).

RESEARCH ACTIVITY

SIMULHUG conducts research projects related to Learning Transfer and Crises Situations.

PUBLICATIONS:

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2. S. Barry Issenberg et al. (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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Case Study

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