Case Study

Multiprofessional Simulations in Teams for Better Management of Obstetric Emergencies

Stavanger University Hospital

Stavanger, Norway

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This case study describes how simulation training is integrated with the staff training, how the training is organized and some reflections after 18 months. The document was developed in collaboration with and approved by Stavanger University Hospital.

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VIDEO INSIDE

STAVANGER UNIVERSITY HOSPITAL IN SHORT

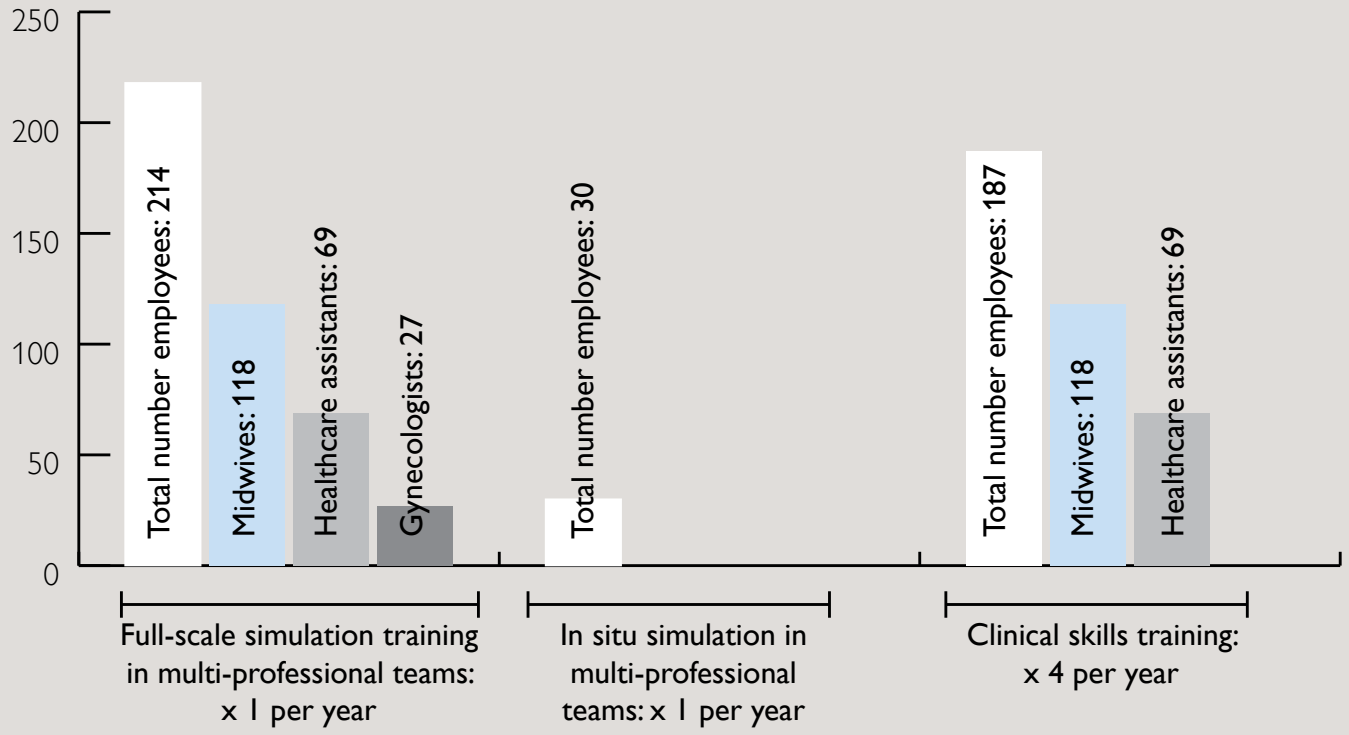
Stavanger University Hospital is Norway's fourth largest in terms of activity. The hospital employs 6500 staff, serves a population of 333,000 and has the following main responsibilities: Patient care, research, healthcare education and patient education.[1]

The maternity unit

With close to 200 employees and 5000 deliveries a year, the hospital's maternity unit ranges among Norway's three busiest. Women in need of epidural anesthesia or close monitoring for any reason deliver at the section's maternity ward, while normal births without expected complications take place at the 'Delivery Loft'.[1]

To enhance the handling of obstetric emergencies and hence improve patient safety, the maternity unit integrated full-scale, multi-professional, team-based simulation training in 2010.

Simulation Activity (2010)



Website: http://www.helse-stavanger.no

Simulation training facilitated during work hours is highly resource demanding. Despite hesitation among some, the Maternity Department at Stavanger University Hospital, Norway started such training for all their employees. The simulations were soon embraced and are now practically regarded a requirement. This case study provides insights into why simulation training was implemented, how the training is organized, and some reflections so far.

WHY SIMULATION TRAINING?

Patient safety: Regular, multi-professional training sessions for all staff members is increasingly regarded a condition to improve patient safety. With former experience as a midwife in rural Norway, Signe Egenberg is fully aware that a proficient staff makes all the difference when it comes to handling unexpected emergencies, especially as the more specialized assistance is located far away.

While larger hospitals have extensive resources at their disposal, rural delivery rooms are at the very opposite end of this scale, and, perhaps because of it, exhibit even more awareness around potential emergency situations. According to Egenberg it was rather obvious that "we needed a plan in case of complications. What do we do if…?"

Drilling of skills: The acknowledgement resulted in an organized, systematic drilling of the staffs' clinical-, communication- and cooperation skills, which, in addition to enhancing their overall competence, also contributed to increasing staff members' professional confidence.

Team training: The greater supply of resources found in hospitals has its advantages, but is not the sole key to patient safety. Early detection of complications and timely and accurate care actions are equally important here when it comes to ensuring the safety of mother and child during deliveries. Hence, the need for team training and enhancement of clinical skills is at least as relevant for hospitals as it is for rural maternity wards.

Stavanger University Hospital: The Maternity Department has systematically focused on quality improvement since the 1990s. Multi-professional simulations in teams fits nicely into the hospital's tradition of improving quality of care and patient safety.

New national quality requirements: While Stavanger University Hospital was seeking to enhance individual and team competencies at the maternity unit, the central government was preparing new, national quality requirements for maternity care in Norway (2010), of which competencies was an essential part. The maternity unit therefore got a head start implementing the new national guidelines before these even came into effect.

The department had some prior experience with in situ-simulation,* but was now ready to extend this training and also start making use of the full scale training facilities that were available to them at SAFER** - a simulation center of which the hospital is one of three owning partners.

* Simulation training taking place in the workplace, e.g. at the maternity ward.
** SAFER simulation center: http://www.safer.net/

HOW THE PROCESS EVOLVED

Wanted more training: The maternity ward had already been using various training manikins and birth simulators, when some of the midwives wanted to extend this activity and enable the staff to train at more regular intervals. With this in mind, Signe Egenberg, midwife, and later practice development midwife, organized, along with a colleague, a three-day training drill (2006), allowing all participants to practice various clinical skills at manned training stations. The major part of the staff took part in the training and the feedback was very positive.

Since then, these training days have been integrated with the staff's work plans and now comprise lectures on relevant topics, clinical skills training and simulation training.

Simulation training: In 2009 it was decided to include full-scale simulation training in multi-professional teams. These sessions are now facilitated annually over a three day period and include all staff, except for short term temporaries.

Preparation: To prepare for its facilitation, five midwives completed an operator course * while another five completed the Train-the-Trainer course, ** a three-day formal instructor course where debriefing is one of the major subjects.

* For learning how to operate the simulators.
** For more information: http://www.eusim.org/

TRAINING BUDGET

There is no separate budget for the training days, but the periods are integrated with the work plans for all the unit's midwives and care assistants. Nor is there a budget for purchasing training equipment, why the unit borrows skills trainers and simulators partly from the hospital's educational department and partly from the manufacturer.

Course budget: A budget for competence development pertaining to the unit's nurses, midwives and care assistants, altogether ca. 240 employees (2010) amounts to EUR 25,500 (2011).

ORGANIZATIONAL MODEL

Who does what:

- The practice development midwife is the main responsible for planning and organizing the training days.
- Staff members from the maternity- and pediatric wards contribute with lectures on relevant, selected topics.
- Instructor and operator functions are mostly performed by midwives. The majority of them have completed relevant training for these tasks.

Where: Lectures, skills training and in situ-simulations take place at the hospital, while the full-scale simulation training is conducted at SAFER simulation center.

Theory and clinical skills: Every three months all midwives and care assistants are withdrawn from their ordinary work plans to attend lectures and perform clinical skills training. This arrangement provides every staff member with four such training days per year.

Lectures are held at the maternity ward's meeting rooms and the skills training takes place in three of the hospital's group activity rooms where stations with the different types of skills trainers are assembled for the training.

In situ-simulations: One hour a month, the maternity- and neonatal wards collaborate on facilitating in situ simulations in multi-professional teams. This training takes place on different wards around the hospital.

Full-scale simulations: Once a year, full-scale simulation training in multi-professional teams is facilitated for all healthcare providers employed at the unit.

Training staff (2011)

1 organizer
7 facilitators
3 instructors
8 operators
3 lecturers each of the three days
(8 standardized patients)

Learning modes, where and how often
At the hospital
• Theory (lectures) x 4 per year (all)
• Clinical skills training x 4 per year (all)
• In situ-simulations in cross professional teams. Limited to ca. 30 new employees x 1 per year
At SAFER simulation center
• Full-scale simulation training in cross professional teams x 1 per year (all)

CURRICULUM

Learning objectives: A cross-professional steering committee comprising midwives, obstetricians and healthcare assistants selects appropriate learning objectives and develops patient cases for upcoming simulation days. The committee

Cutting the umbilical cord.

collaborates closely with the neonatal unit and with SAFER simulation center to ensure the curriculum is relevant and caters to all staff.

METHODOLOGY

The full range of learning modalities comprises lectures, clinical skills training, simulation training, and debriefing.

1. LECTURES

Training days facilitated at the hospital every 12 weeks start with lectures held by various professionals. The duration is 20-60 minutes.

Relevant lecture topics

- Pregnancy complications
- Normal delivery
- Monitoring during delivery
- Birth complications
- Maternity- and neonatal care
- Ill neonates
- Psychiatry
- Intoxication/violence
- Ethics
- HSE, including hygienics and fire protection
- CPR for adults and neonates
- IT, documentation
- Cooperation with primary healthcare
- Pre-hospital maternal care etc.

2. CLINICAL SKILLS TRAINING

Teams: After the lectures, all participants are divided into groups of around 15 persons; hence training is facilitated more efficiently. Midwives, nurses and healthcare assistants train together in teams.

How: The multi-professional teams go from station to station, each equipped with different kinds of skills trainers and simulators and manned by 1-2 instructors who provide guidance when needed. The most common skills trained here are CPR for neonates and CPR for pregnant women.

Duration: 45 minutes.

Certification: All midwives and doctors from the maternity ward must to be STAN-certified.*
Midwives from the maternity unit provide the necessary training and certification.

* STAN (ST-ANalysis): Method combining FHR assessment and analysis of the ST-segment.

Most frequently trained skills

- CPR for neonates
- CPR for pregnant women
- CPR for adults

3. SIMULATION TRAINING

Simulation training is facilitated in the hospital (in situ) on a monthly basis and once a year at SAFER learning center.

a) In situ simulations in multi-professional teams

Simulations in the workplace (in situ) take place either on the maternity ward, in the operating room, in the post-natal ward or in the patient hotel (where healthy mothers are transferred after delivery). A neonate manikin is used and the sessions are facilitated on a monthly basis by one of the pediatricians and the practice development midwife.

Team members: The professions training together are midwives, pediatricians and healthcare assistants. When selecting topics for the scenarios, the facilitators apply real patient cases from everyday practice that were found especially challenging.

Topics: Communication, collaboration, and alerting are all frequently used learning objectives. Each session lasts approximately one hour.

How: Around 5 minutes is used to allocate various roles, present the selected learning objectives and have the participants familiarize themselves with the simulation equipment.

Duration: Ca. one hour.

Activity level: The unit's current capacity allows only a small group of new participants each month.

Relevant neonate scenarios

- Asphyxia
- Respiratory arrest
- Cardiac arrest

Corresponding learning objectives

- Identify and carry out accurate care actions, such as assisted ventilation, alerting, CPR
- Allocate roles
- Master communication, collaboration, alerting

b) Full-scale simulations in multi-professional teams

All employees participate in the annual multi-professional simulation training at the SAFER learning center in downtown Stavanger. It takes three full working days to run everyone through the program, where all midwives, gynecologists, care assistants and nurses from the maternity unit train together in teams. A pediatrician participates on all three days, if possible.

Briefing and random teams: The participants are briefed about the scheduled program that incidentally corresponds to relevant theory and local procedures. Afterwards, the large group is divided into multi-professional teams comprising midwives, doctors and healthcare assistants. The teams are put randomly together to reflect a normal workday, where everyone must depend on one another. They rotate through 3-4 simulation rooms, each with a different scenario, until all teams have completed the full program for the day.

How: Prior to each simulation the participants familiarize themselves with the simulator and other equipment located in the simulation room. 5-10 minutes later, after the learning objectives are announced and the various roles are defined, the scenario can start. Each group will in turn perform briefing, simulation and finally a debriefing session together. The instructor is present in the simulation room to guide the participants when needed.

Participants without active roles in one scenario will be assigned roles in a later one. Meantime they observe their colleagues' performance and actively participate in the subsequent debriefing.

Duration: Each scenario lasts 5-10 minutes.

Frequency of training: Once a year all maternity staff (midwives, gynecologists and healthcare assistants) are allocated one full day of team-based multi-professional simulation training.

Mandatory training: Once a year all maternity staff (midwives, gynecologists and healthcare assistants) are allocated one full day of team-based multi-professional simulation training.

Relevant scenarios

- Post-partum hemorrhage
- Shoulder dystocia
- Vacuum delivery
- Forceps delivery
- Pre-chock
- Neonatal resuscitation
- Breech presentation
- Eclampsia
- Breast-feeding difficulties

The standardized patient (midwife) has the the MamaNatalie Birthing Simulator strapped on and allows two colleagues to assess the fetal heart during second stage of labor. At the same time the team practice their communication skills. To view full video: http://bit.ly/yJknfO or scan QR code to the right.

Corresponding learning objectives

- Prevent post-partum hemorrhage
- Identify and initiate appropriate care actions to prevent asphyxial baby and shoulder dystocia
- Master communication & leadership
- Master multi-professional collaboration
- Master breast-feeding instruction (workshop)

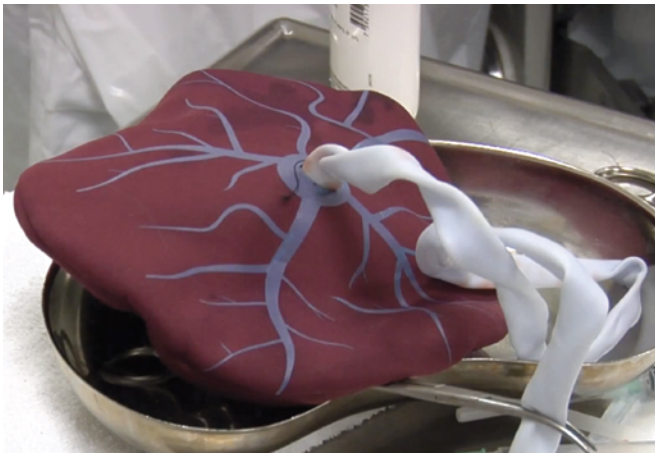
4. DEBRIEFING

Instructor-led: Each simulation scenario is followed by a debriefing session facilitated by midwives. Most of them have performed relevant training and those who haven't so far will do so in the near future. All instructors have however vast experience guiding students in clinical practice and take easily on this new role.

Duration: 25-30 minutes.

Focus the positive: To ensure a good atmosphere and avoid the feeling of defeat, the instructors focus first and foremost on what went well during the scenario. The debriefing hence starts out by discussing some of the positive aspects about the participants' performance, and only later will the instructor suggest how some of the challenges could perhaps have been handled differently. The conversation is managed to a certain extent to ensure active participation from all participants.

Addressing errors: When addressing judgment errors the instructor focuses people's roles, rather than using their names. This way much pressure is taken off each individual. For example: "midwife 2 should perhaps rather have"… instead of "Jim, you should perhaps rather have"...etc.).



A postnatal examination of the placenta is performed to ensure the entire placenta is expelled.

TRAINING SOLUTION AND USAGE

Equipment currently in use: SimMan, MamaNatalie, NeoNatalie, PROMPT, Baby Anne, Resusci Baby Basic, Little Ann and Neonatal Resuscitation Baby.

How the current birthing simulators are used today

MamaNatalie

- Hemorrhage
- CPR for neonates
- Pre chock in neonates
- Communication training *

*Hybrid simulation allows for real human interaction as one person plays the patient's role.

PROMPT

- Shoulder dystocia
- Breech delivery
- Vacuum delivery
- Forceps delivery
- Cephalic presentation with impending asphyxia and potential need of vacuum delivery
- Communication training

Expected use when SimMom is fully integrated with the training program

MamaNatalie

- Hemorrhage
- Shoulder dystocia
- Impending asphyxia combined with neonatal resuscitation
- Protracted course

PROMPT

- Shoulder dystocia
- Operative vaginal delivery
- Breech presentation
- Cephalic presentation with focus on supporting the head.

SimMom is expected to replace PROMPT during full-scale simulation scenarios.

SimMom

- As current use of PROMPT
- Umbilical cord prolapse
- Assess progress of delivery
- Neonatal collaps (circulation and/or respiration failure)

REFLECTIONS AFTER ONE YEAR

Signe Egenberg
Practice Development Midwife
Stavanger University Hospital, Norway

Identified benefits

"The training is realistic and colleagues are putting it to use right away when handling real emergency situations – especially their improved clinical skills, the teamwork, the staying calm. Roles are clearer now, and colleagues feel more confident."

"People who usually handle emergency situations get to train together. Knowing that the others think the same about a situation is reassuring."

"Multi-professional simulation is crucial for safe handling of real emergency situations."

"Using the same terminology enhances communication – it's calmer in the delivery room now."

"Protocols are improved."

"Training at the SAFER center ensures that the participants complete the whole program. With in situ simulation there is a greater danger of interruption. Drawing on SAFER's expertise and all the other resources there is also a great benefit."

"In situ simulations allow us to see how the unit handles emergency situations. The learning effect is huge, as the simulations take place in our everyday working environment."*

*Recognized benefits of in situ simulation:

- People who normally work together train together
- Facilitates multi-professional team training
- Using everyday tools and equipment prepares better for real emergencies
- Cost effective (no travel, no need for special training facilities)

Identified challenges

- Large groups ("six minutes per person")
- A tight schedule
- Multi-professional equals diverse learning needs
- Heavy workloads on the wards leaves facilitators with little time for preparation
- Midwives who rotate between the delivery and maternity wards risk less exposure to emergencies they are exposed to during training

Identified success factors

- Good planning ahead of time
- Support from management
- Having a separate committee develop learning objectives ensures broad competency and promotes ownership
- Input and good advice from colleagues with relevant experience

Evaluation of start-up phase: To find out whether the participants perceived team based multi-professional simulation training as effective, Egenberg conducted two surveys from the start-up phase in spring 2010. The first survey was completed immediately after training and the second 6 months later. Below is an extract from the two (so far not published) surveys.

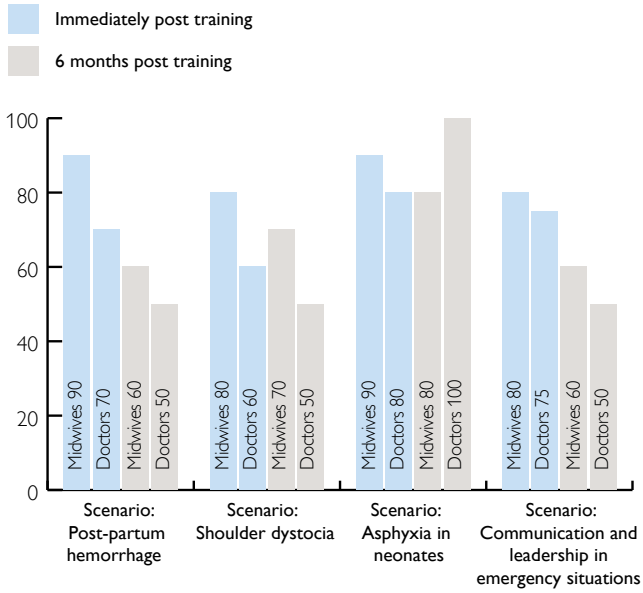


Figure 1. Percentage of midwives and doctors rating the simulations on post-partum hemorrhage, shoulder dystocia, asphyxia in neonates, and communication/leadership as 'very useful.'

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?

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."

Right conditions:

- 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
- Learning on the simulator occurs in a controlled environment
- Individualized learning with reproducible, standardized educational experiences is provided
- Learning outcomes are clearly defined
- Ensuring the simulator is a valid learning tool

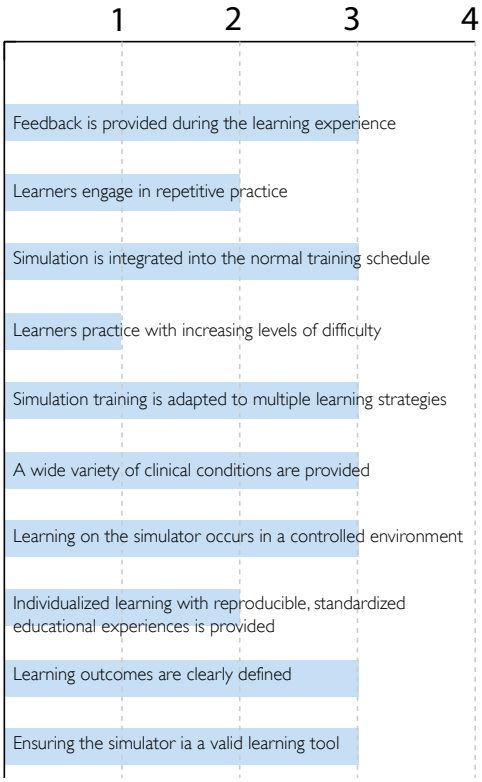


Figure 2. The rows indicate to what degree the maternity unit delivers on each of the 'right conditions' as assessed by the practice development midwife on a 4-point Likert scale.

Egenberg further considers *Individualized learning* and *Feedback is provided during the learning experience* (along with multi-professional team training) as the most important features.

FUTURE PLANS AND PROJECTS

- Doctors and more midwives have completed instructor training
- In situ simulations are also facilitated in the ER
- In situ simulations reflect more emergency situations than today's neonatal resuscitation
- AVS (audio visual systems) is applied for debriefing

Though competence development has been a focus for many years, it's only lately that the maternity unit has provided a comprehensive plan for practical training in emergency obstetric care. Once more experience is gained Egenberg expects that changes will be made.

REFERENCES

1. Stavanger University Hospital – Homepage: www.helse-stavanger.no
2. S. Barry Issenberg, William C. McGaghie, Emil R. Petrusa, David Lee Gordon, Ross J. Scalese. 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, 2005

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