

SUPPLEMENTAL MATERIAL 2

Simulation session details

Table 3 in the “Reporting guidelines for health care simulation research” was used as a framework for providing details about the simulation sessions in the following paragraphs.[1]

Participant orientation:

As the sessions were in-situ whoever was on-call the day of the session participated. All members of the stroke-team work on rotations that are longer than one week thus a different person from each profession usually attended each of the 12-14 simulation sessions during one cluster. Participants were oriented two days before the session through an e-mail containing learning objectives, the revised treatment protocol, information about simulation training and the facilitators contact information. In addition, the different members of the quality improvement (QI) team were responsible for orienting participants within their own profession in-person one day before the session. Depending on the profession and the needs of the participant, the orientation contained a brief review of learning objectives (approx.10 minutes). If the participant felt unsure about the procedure (i.e. unexperienced participants) the members usually offered to “walk participants through” the new protocol as part of the brief.

Simulation environment:

The sessions were performed in the same environment (emergency room, Computed Tomography [CT] scanner) and with the same equipment available as for real stroke patients. Credentials belonging to a mock patient with an existing electronic medical journal were used so that imaging and blood samples could be ordered in the same way as for real patients.

Intravenous needles were taped to the skin of the simulated patient and CT-scans were “mock” scans with the same duration as real scans but without radiation.

Simulation scenario:

An acute stroke scenario was used simulating the in-hospital stroke care pathway from door to needle. We scripted straightforward scenarios as we wanted the protocol and team non-technical skills rather than medically challenging cases to be the focus of the sessions. The patient was usually a 40-year-old male or female (depending on the simulated patient) with no previous medical history, no prior medication, an acute onset of right sided hemiparesis and subjective speech difficulties. Upon examination the simulated patient acted weaker on the right side and complained of difficulties finding certain words. The patient was instructed to report symptom onset approximately 5 minutes before calling the emergency medical services from a predefined location (an office building) outside the hospital. The scenario started when the patient called emergency medical services triggering an ambulance dispatch. Whenever the session would have interfered with treatment of real patients the session was cancelled. If only a single participant was needed elsewhere the session could usually go on without that participant. In most cases one of the facilitators then played the part of the missing participant.

We reviewed elements from several non-technical skills and teamwork assessment instruments in order to construct learning objectives. Most of the elements included in the learning objectives are from the Anaesthetic Non-Technical Skills and Mayo High Performance Teamwork Scale frameworks. [2] From these instruments we included the elements we believed were most likely to improve team efficiency and address the specific neurology leaderships skills that were evident from the local survey. The key learning objectives for all participants were: 1) Adherence to the revised treatment protocol 2) Non-

technical skills: Members demonstrate a clear understanding of their roles, supporting colleagues when needed (e.g. in carrying the patient from the stretcher to CT-scanner), repeat back instructions or clarifications and provide concise handover reports. For neurologists' additional non-technical skills learning objectives were: 1) Visual and audible team leadership (i.e. wearing one of the "Team-leader" vests readily available in the emergency room). 2) Facilitating situational awareness and task management: Performing a short team "brief" (Gathering the team before patient arrival, sharing information and distributing tasks) and a "team timeout" before decision making (sharing updated patient information and a decision regarding thrombolysis).

Simulated patients:

We collaborated with the local stroke patient organization for patient participation in scenarios. Thus, 3 different patients having suffered a previous stroke were simulated patients. The Association of Standardized Patient Educators Standards of Best Practice were used as practical guidelines for securing a safe work environment and training standardized patients[3]. The simulated patients participated in the debrief with the rest of the team and their primary objective was to share how they experienced the session from a patient perspective.

Instructional design, feedback and debriefing:

The sessions lasted approximately 60 minutes, 30 minutes for the scenario and 30 minutes for debriefing. The scenario was run only once per session. The sessions were run by 2-3 facilitators (2 neurologists and one radiologist) who had attended a "train-the-trainer" course in which principles of medical simulation training, amongst others, were conveyed. One of the facilitators followed the simulated patient from prehospital pickup. Facilitated reflective

debriefing was conducted immediately after the scenario. The debrief session focused on learning objectives in addition to evaluation of the treatment protocol with suggestions whenever participants, including the simulated patients, had ideas for improvement. Additional feedback was offered to neurology registrars after the plenary session upon the neurology registrars request. The instructional design thus included individualized learning in addition to group practice, feedback and facilitated reflective debriefing; all of which are considered best practice for simulation-based education [4].

References

1. Cheng A, Kessler D, Mackinnon R, *et al.* Reporting guidelines for health care simulation research: extensions to the CONSORT and STROBE statements. *Advances in Simulation*. 2016;1(1):25.
2. Sevdalis N, Hull L, Birnbach DJ. Improving patient safety in the operating theatre and perioperative care: obstacles, interventions, and priorities for accelerating progress. *British journal of anaesthesia*. 2012;109 Suppl 1:i3-i16.
3. Lewis KL, Bohnert CA, Gammon WL, *et al.* The Association of Standardized Patient Educators (ASPE) Standards of Best Practice (SOBP). *Advances in Simulation*. 2017;2(1):10.
4. Cook DA, Hamstra SJ, Brydges R, *et al.* Comparative effectiveness of instructional design features in simulation-based education: systematic review and meta-analysis. *Medical teacher*. 2013;35(1):e867-98.