

# Simulation-Based Interpersonal Communication Skills Training for Neurosurgical Residents

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**ABSTRACT:** **Background:** Communication skills are an important component of the neurosurgery residency training program. We developed a simulation-based training module for neurosurgery residents in which medical, communication and ethical dilemmas are presented by role-playing actors. **Objectives:** To assess the first national simulation-based communication skills training for neurosurgical residents. **Methods:** Eight scenarios covering different aspects of neurosurgery were developed by our team: 1) obtaining informed consent for an elective surgery, 2) discharge of a patient following elective surgery, 3) dealing with an unsatisfied patient, 4) delivering news of intraoperative complications, 5) delivering news of a brain tumor to parents of a 5 year old boy, 6) delivering news of brain death to a family member, 7) obtaining informed consent for urgent surgery from the grandfather of a 7 year old boy with an epidural hematoma, and 8) dealing with a case of child abuse. Fifteen neurosurgery residents from all major medical centers in Israel participated in the training. The session was recorded on video and was followed by videotaped debriefing by a senior neurosurgeon and communication expert and by feedback questionnaires. **Results:** All trainees participated in two scenarios and observed another two. Participants largely agreed that the actors simulating patients represented real patients and family members and that the videotaped debriefing contributed to the teaching of professional skills. **Conclusions:** Simulation-based communication skill training is effective, and together with thorough debriefing is an excellent learning and practical method for imparting communication skills to neurosurgery residents. Such simulation-based training will ultimately be part of the national residency program.

IMAJ 2013; 15: 557–560

**KEY WORDS:** simulation, education, neurosurgery

Communication and professionalism are fundamental to the patient-physician relationship. Effective communication improves patient satisfaction and health outcomes [1], whereas poor communication and unprofessional behavior are linked to patient complaints and malpractice claims [2]. In the

United States the Accreditation Council for Graduate Medical Education requires that residency training programs assess six core competencies, which include professionalism, interpersonal skills and communication skills. As part of their training, residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals. Residents must also demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles [3].

A widely used methodology for training and evaluation of communication skills is the use of role-playing actors as standardized patients. Using this training and assessment methodology, trainees face medical, communication and ethical dilemmas presented by actors in controlled and validated scenarios. Encounters can be used for testing and evaluation, or videotaped for debriefing and training. This simulation modality is widely used by medical and nursing schools [4], as well as by medical boards worldwide, including the U.S. National Board of Medical Examiners that introduced mandatory simulation-based clinical skills examinations as part of its requirements for medical license in the USA. This simulation modality was also adopted by the American College of Surgeons as part of the training and evaluation tools used in the Advanced Trauma Life Support (ATLS) course [5]; it was also used for training communication skills in many medical professions such as oncology [6], psychiatry [7], neurology [8] and pediatrics [9]. This training modality was also used in the training of surgeons and obstetricians on obtaining informed consent from patients for surgical intervention.

In the field of neurosurgery, simulation-based training is used for technical skills training [10]; the development of virtual reality simulators is in progress [11,12]. However, an updated medical literature review did not yield any description of simulation-based interpersonal communication skills training for residents in this field. In view of the daily challenges and demands raised by patients and family members in the preoperative and postoperative periods as well as in the intensive care environment, these skills are crucial. The aim of this manuscript is to describe a national simulation-based communication skills training for neurosurgical residents.

## MATERIALS AND METHODS

The communication skills training was initiated and performed as a national project by the Israel Neurosurgical Society in cooperation with MSR – the Israel Center for Medical Simulation [13].

### SCENARIOS DEVELOPMENT

Eight scenarios representing relevant clinical communication and ethical dilemmas covering different aspects of neurosurgery were developed by content experts (senior neurosurgeons), assisted by experts in simulation-based medical education and in communication skills. Scenarios included the following situations: obtaining informed consent for an elective surgery, discharging a patient following elective surgery, dealing with an unsatisfied patient, delivering news on intraoperative complications to a family member, delivering the news of a brain tumor to parents of a 5 year old boy, delivering the news of brain death to a family member, obtaining informed consent for urgent surgery from the grandfather of a 7 year old boy with epidural hematoma, and dealing with a case of child abuse. (For a fuller description of the scenarios see Appendix 1). Scenario development was followed by training the actors by the content and simulation experts.

### TRAINING

Fifteen residents from the six neurosurgical departments in the country agreed to participate in the one day training program. The simulated setting was of a fully equipped clinic with video and audio recording devices. During the training, scenarios were run in parallel so that each participant was in the “hot seat” for two scenarios and watched his/her colleague performing through a one-sided mirror in four other scenarios. Following each training session, feedback on the performance was given by a content expert (a neurosurgeon) and a communication expert. Feedback was performed in groups of seven to eight participants and was assisted by videotapes of the training. In addition, each participant received personal feedback on his/her communication skills at the end of each scenario from the simulated patient (the actor).

### QUESTIONNAIRES

At the end of the training day the participants were asked to fill in a feedback questionnaire. The questionnaire included six items and participants were asked to comment on each using a 1–4 Likert scale [Table 1].

## RESULTS

Fifteen of the 22 neurosurgery residents from the 6 neurosurgical departments in Israel participated in the training and completed the feedback questionnaire at the end of the training.

**Table 1.** Feedback questionnaire (n=15)

		1	2	3	4
1	The simulated patients represented real patients and family members			1	14
2	The cases used for training were relevant and challenging			8	7
3	Encounters with simulated patients can be used as an important tool to improve communication skills			5	10
4	The videotaped debriefing contributed to the teaching of professional skills			1	14
5	The training day was logistically well organized			1	14
6	In the future I would like to participate in simulation-based training		1	3	11

Participants were asked to comment on each of the sentences using a 1–4 Likert scale (1 = do not agree, 2 = partly agree, 3 = agree, 4 = agree to a great extent)

As indicated in Table 1, most participants agreed to a great extent (score 4 on a Likert scale of 1–4) that the simulated patients represented real patients and family members (14 of 15), that the videotaped debriefing contributed to the teaching of professional skills (14 of 15), and that the training day was logistically well organized (14 of 15). All participants agreed or agreed to a great extent (score 3 or 4 on a Likert scale of 1–4) that the cases used for training were relevant and challenging, and that the encounters with standardized patients can be used as an important tool to improve communication skills. Only one participant stated that he partly agrees to participate in simulation-based training in the future.

## DISCUSSION

Changes in the clinical environment, such as the increased complexity of patients admitted to teaching hospitals, emphasis on patient safety, shorter work week for residents, and an emphasis on operating room efficiency, resulted in a reduction of teaching time for technical tasks by surgical residents [14]. As opportunities for learning through work with patients have diminished, basic surgical skills are learned and practiced on models and simulators, with the aim of better preparing trainees for the operating room experience. Although the effectiveness of simulation training has not been validated in large-scale studies it was shown to be effective primarily for lower-level learners of both laparoscopic and open procedures [15].

In the present study, simulation-based training was used as a tool for teaching communication skills to neurosurgery residents. The motivation of the Israel Neurosurgical Society for this training came from the recognition that communication and professionalism are a fundamental but sometimes neglected component of residents' education. As indicated by the feedback questionnaires, our residents perceived training as realistic and important for their training. This feedback is important to sup-

port the content validity of training, although the influence of simulation-based training on residents' actual communication skills was not assessed. Interestingly, although training in communication skills in medicine is used worldwide, the number of studies assessing its influence on the performance of medical personnel is limited. The techniques used include post-training self-assessment [16,17], patient assessment of the medical personnel [18], or post-training simulation-based assessment using validated assessment tools [19].

Although the training described in this manuscript focuses on communication with patients and their families, communication in the operating room environment may play an important role as well. Interpersonal communication was found to be a causal factor in 43% of errors made in surgery, and it was reported that 27% of claims against a health care organization resulted from cognitive and diagnostic errors in the operating room [20]. According to these findings, to achieve and maintain high surgical performance, attention must be paid to non-technical skills such as team-work, leadership, situation awareness, decision making, task management, and communication [21]. These skills are taught in crew resource management courses in aviation [22], anesthesia [23], surgery [24] and trauma management [25] but have not yet been adopted for neurosurgery. Although the implementation of such training modalities needs significant financial and logistic investments, costs can be covered by institutions, boards or malpractice insurance companies interested in quality of medical care, patient safety, and reduction in malpractice insurance claims. In this context we quote Derek Bok, the former president of Harvard University, who said: "If you think education is expensive, try ignorance."

Although the present article describes a project limited to a small number of residents, the content validity of training supports the use of simulation-based training in communication skills in neurosurgery. Furthermore, simulation-based training can be adapted to other aspects of neurosurgery such as surgical skills, neuro-intensive care, and operating room-related communication skills. We encourage other programs worldwide to adopt this learning tool and to evaluate its impact on residents' performance and quality of care.

**Acknowledgments**

We thank Galit Gruber for her excellent assistance with the project, developing the scenarios, training the standardized patients and managing the flow of the simulation

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## Appendix A. The scenarios

### Scenario 1: Obtaining informed consent for an elective spine surgery

- Medical aspects – a 65 year old patient with severe cervical myelopathy is scheduled to undergo elective surgery
- Communication aspects – the neurosurgeon must obtain consent for surgery from the patient. In step 1 of the scenario the patient declares that he does not want any information about possible complications. In step 2 the patient raises many questions regarding the timing of surgery, possible complications, and the outcome following surgery.

### Scenario 2: Discharge of a patient following elective surgery

- Medical aspects – a 62 year old patient is discharged home 5 days following removal of a parasagittal meningioma. The patient has minimal motor deficiency
- Communication aspects – the neurosurgeon must give the worried patient instructions on his rehabilitation and medical treatment and encourage the patient to go home with the understanding that he is still under the responsibility of the surgical team.

### Scenario 3: Unsatisfied patient

- Medical aspects – a 28 year old patient was admitted to the hospital after a few days of severe low back pain radiating to the right leg and accompanied by loss of sacral and genital sensation
- Communication aspects – the neurosurgical department is very busy and the load on the medical and nursing team is heavy. While the neurosurgeon is admitting the patient to the department, the patient asks many questions about his medical condition and complains about the service in the department.

### Scenario 4: Delivering news of intraoperative complications to a family member

- Medical aspects – a 53 year old woman has surgery to remove a meningioma by a fellow. The operation was complicated by massive bleeding and resuscitation. The patient is now stable but still anesthetized and ventilated in the post-anesthesia care unit
- Communication aspects – the neurosurgeon must give this information to the patients' husband, a lawyer, who asks many questions regarding the events without waiting for the answers.

### Scenario 5: Delivering news of a brain tumor to the parents of a 5 year old boy

- Medical aspects – a 5 year old boy was sent to the emergency room

following a computed tomography of his brain demonstrating a tumor and obstructive hydrocephalus. The CT scan was performed after complaints of headache lasting 2 months and two events of vomiting a week earlier

- Communication aspects – the neurosurgeon is the first medical staff member to give the parents the diagnosis. The mother cries and blames herself for the delay in the diagnosis; the father is passive and interested more in technical details such as who is the best surgeon in the world for this operation.

### Scenario 6: Delivering the news of brain death to a family member

- Medical aspects – a 38 year old patient was admitted with massive subarchnoid hemorrhage to the neurosurgical intensive care unit 3 days before. The patient underwent coiling of an aneurysm but his condition deteriorated and he is now brain dead
- Communication aspects – the neurosurgeon must explain the situation to the patient's wife. The wife does not understand the concept of brain death and organ donation (although her husband had declared in the past that he would be willing to donate an organ) and wants to talk to a rabbi although she is not religious.

### Scenario 7: Delivering news of an epidural hematoma to the grandfather of a 7 year old boy

- Medical aspects – a 7 year old boy was admitted to the emergency room unconscious after falling off his bicycle. The child needs urgent surgery for epidural hematoma evacuation
- Communication aspects – the neurosurgeon must talk to the child's grandfather who was taking care of him while the parents are abroad. The grandfather keeps blaming himself for the event and does not fully understand the urgency of surgery.

### Scenario 8: Child abuse

- Medical aspects – a 10 month old baby was brought to the emergency room by his mother because he fell in the bath and lost consciousness for a few seconds. Physical examination reveals many hematomas all over the baby's body, and brain imaging shows small subdural and subarchnoid hematoma and signs of small fractures
- Communication aspects – the mother is living with a boyfriend after separation from the boy's father a few months previously. She is abused by her boyfriend but until today does not suspect that the child is abused.

## Capsule

### Severe hypoglycemia and cardiovascular disease: systematic review and meta-analysis with bias analysis

Goto et al. provide a systematic and quantitative summary of the association between severe hypoglycemia and risk of cardiovascular disease in people with type 2 diabetes and examine the sensitivity of the association to possible uncontrolled confounding by unmeasured comorbid severe illness using a bias analysis. Of 3443 citations screened, 6 eligible studies with 903,510 participants were identified. In the conventional random effects meta-analysis, severe hypoglycemia was strongly associated with a higher risk of cardiovascular disease (relative risk 2.05, 95% confidence interval 1.74–2.42,  $P < 0.001$ ). The excess fraction of cardiovascular disease incidence that was attributable to severe hypoglycemia (the population attributable fraction) was 1.56% (95%CI 1.32–1.81%,  $P < 0.001$ ). Although moderate

heterogeneity across the studies was suggested ( $I^2=73.1%$ ,  $P = 0.002$  for heterogeneity), most subgroups showed similar results in stratified analyses. The bias analysis indicated that comorbid severe illness alone may not explain the association between hypoglycemia and cardiovascular disease; to explain this association, comorbid severe illness would have had to be extremely strongly associated with both severe hypoglycemia and cardiovascular disease. These findings suggest that severe hypoglycemia is associated with a higher risk of cardiovascular disease; they also support the notion that avoiding severe hypoglycemia may be important to prevent cardiovascular disease in people with type 2 diabetes.

BMJ 2013; 347: f4533

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