# 41 The OSCE Method with Simulated Patients

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> SBT [simulation based training] is an instructional technique designed to accelerate expertise by allowing for skill development, practice, and feedback in settings replicating real world clinical environments.
>
> Weaver et al. 2010

*Abstract*: The OSCE (Objective Structured Clinical Examination) is an oral examination procedure that is now widely used internationally and is aimed at practical skills in an approximated doctor-patient reality in which the patients are simulated by actors (simulated patients) (§ 41.1). During the Covid-19 pandemic, it became necessary to replace the di-

rect contact between simulated patients and students with a telemedical presentation (§ 41.1.1 and 41.2.2). The use of simulated patients in practice, teaching and examination scenarios offers a number of advantages over original patients, but also has limitations (§ 41.2.1). A key advantage is the systematic feedback from simulated patients to learners, thus the regular clarification of the patient's perspective, which happens less frequently or only sporadically in student contact with original patients (§ 41.2.3). Simulations with feedback in OSCE scenarios require special standardisation (§ 41.2.4). Simulated patients represent a heterogeneous group that includes amateurs, professional actors, other people with theatre experience, members of the medical professions and students (§ 41.2.5). In addition to the acquisition of specific patient roles, their training requires preparation for various exercise, teaching and examination formats, the teaching of skills for stepping out of a role again and ultimately long-term support in portraying seriously ill patients or highly stressful clinical scenarios (§ 41.2.6). In addition, target group-specific simulations must be considered against the background of the real people behind the role (§ 41.2.7). Evaluations of doctor-patient simulations require specific measures of simulation quality as well as empirical studies of the achieved medical learning performance (§ 41.3). The medical simulation world (simulated patients, simulation dolls, virtual reality, digital game-based learning ...) in medical education and training will come closer to the real medical world but will not be able to replace it (§ 41.4).

## 41.1 OSCE exams and practical relevance

The OSCE (Objective Structured Clinical Examination) is an oral examination procedure that is now widely used internationally in the training of doctors, nursing and healthcare professions and is particularly aimed at practical skills in everyday medical practice. Students are required to demonstrate specific medical skills in an approximated doctor-patient reality in which the patients are simulated by actors (acting patients, simulated patients, abbreviated to SP). The actors follow a previously trained script that contains content requirements for the portrayal of a specific patient with his or her clinical picture and associated symptoms. The skills to be demonstrated by the students may include demonstrating a physical examination, prescribing medication, report-

ing findings, taking a medical history and more. The OSCE situation thus requires applied knowledge, not theoretical knowledge, which must be demonstrated in a paper-pencil examination situation, for example (Harden 1988, Wallace et al. 2002).

The OSCE realisation can take different formats: e.g. a multi-station course in which 20 students rotate through 20 stations in a given time interval (e.g. 5 minutes each), at each of which they have to demonstrate a specific clinical skill and, in total, a range of clinical competences 'on the patient' (some call it 'academic circuit training'). However, it can also be a single station where students have to fulfil a complex, time-consuming task, e.g. taking a medical history. All scenarios to be completed require a certain degree of practical relevance and demand clinical skills close to the profession. The simulated patients involved in these different scenarios and OSCE formats have to portray patients to varying extents and proportions.

In addition to the live scenarios of the OSCE design, it may be necessary to avoid direct simulated patient-student contact in the face-to-face examination, e.g. during the Covid-19 pandemic, and to look for media alternatives. In this sense, Seifert et al. (2021) conducted a tele-OSCE (with Zoom software) in oral and maxillofacial surgery during the Covid-19 pandemic. Herbstreit et al. (2021) investigated the feasibility and acceptance of an anamnesis OSCE station adapted to a telemedical setting via Zoom. Bußenius & Harendza (2023) presented the simulation-based prototype of an OSCE design for conducting medical interviews without the presence of examiners, who then subjected the video-recorded interviews to a later evaluation.

## 41.2. Simulated patients

Simulated patients are people (trained laypersons, professional actors, etc.) who are trained to portray a patient role for teaching purposes. They portray symptoms of a disease, significant personality traits and behavioral patterns of patients, their biographies and their current life situation (Dudley 2018, Ortwein et al. 2006, Peters 2018). Simulated patients are used in various teaching and examination formats in medical training, but also in educational and training settings in numerous medical specialist areas (Hardoff, Schonmann 2001, Hoffmann et al.

2007, St. Pierre, Breuer 2018). There they serve as a supplement, not as a substitute for real patients - with advantages and disadvantages (Koerfer et al. 2008, 63ff., Wallace et al. 2002, 345).

### 41.2.1 Simulated patients in training, teaching and examination scenarios: Advantages and disadvantages

#### Plannability, availability and reliability

Simulated patients are generally more readily available than real patients, especially when clinical pictures need to be demonstrated at the right time in specific courses. There is no need to search for patients who have the clinical picture in question and also agree to take part in a course. This can make it easier and more reliable to plan and organize the course. On the other hand, the use of simulated patients can involve a great deal of training, organization and costs, especially for teaching and examination events with large student cohorts.

#### Standardization and repetition

Actors can present the patient to be portrayed with their specific clinical picture more repetitively for different groups of students than the original patients themselves. Actor-patients must have the ability to 'reset': to 'play dumb' and 'start again' for each new student or OSCE examination candidate. Standardized acting patients must therefore ensure the reliability, repeatability and comparability of their patient presentation. In a broader sense, this also applies to the simulation of chronic diseases with longitudinal, multiple patient contact by students over a period of months (Bokken et al. 2009, Linssen et al. 2007). The simulation of longitudinal, complex multimodal interventions (Albus et al. 2012) is still waiting to be realized.

#### Diversity and simulation scenarios

Depending on their training, experience and length of service as a simulated patient, acting patients can portray several patient roles with different clinical pictures or, as a collective of actors, a wide range of illnesses and patients.

The areas of application for simulated patients can be just as diverse: There are now numerous simulation scenarios in doctor-patient communication (taking medical histories, diagnoses, giving bad news, informative discussions, etc.; Lane, Rollnick 2007), medical emergency problems (Urban et al. 2018), anesthesia (Müller, Timmermann 2018), intensive care medicine (Breuer et al. 2018), surgery (Lehmann, Gröne 2018), obstetrics (Kainer et al. 2018) and many other areas. The range of simulations is being increasingly expanded.

In these and other areas, simulated patients have been used nationally and internationally for many years, for the first time as early as 1963 in neurology at the University of Southern California: Dr. Barrows trained the actress Rose McWilliams, who simulated a paraplegic patient with multiple sclerosis (Barrows, Abrahamson 1964, Fröhmel et al. 2007, Gottlieb 2002). Starting in 1999, in Germany, the Clinic and Polyclinic for Psychosomatics at Cologne University Hospital has been one of the first institutions to use simulated patients in OSCE examinations (Koerfer et al. 2000).

### Realism

A major advantage of the simulation is certainly its proximity to reality: in analogy to a real doctor-patient situation, the students interact with a patient-comparable person and do not, for example, practice on a doll or document theoretical knowledge about a patient's symptoms in a paper-pencil situation. In addition, contextual features can be varied in order to increase the extent to which the simulation matches the simulated real-life situation (simulation fidelity; Stein et al. 2018). For example, a hospital with original facilities is available to students at the Münster University Hospital, which enables a high-fidelity simulation (Strassmann 2007).

### Limits of simulatability

Despite the desired closeness to reality and the variety of simulation options, these also have clear limits. The entire spectrum of the patient's world, including the associated medical examinations, can only be partially simulated with simulated patients.

It is unlikely that a simulated patient would make themselves available for various physical examinations that are particularly unpleasant, e.g. colonoscopy, prostate examination or similar (but see Groß 2010).

Certain combinations of simulated patients with models or simulators (presentation of pathological findings by strapping on a suitably prepared breast palpation model, blood sampling through an injection pad worn by the SP, etc.) can extend the limits of what is feasible, but not by much. Training then begins on medical simulation pumps and in virtual reality. Like all simulations, these also have to face the problem of 'simulation fidelity', i.e. how closely the simulation matches the simulated reality, and often require long phases of development with numerous readjustments in order to achieve the closest possible approximation to reality (Schebesta et al. 2012).

Simulations can be more or less realistic and playful (but ultimately 'just play'), enabling students to apply their knowledge in a practical and clinical setting. In some scenarios, students may not be able to distinguish between simulated and real patients and show the same degree of empathy (Sanson-Fisher, Poole 1980). However, the recognition rate may be different for clinical residents (Norman et al. 1982). In the studies by Rethans et al. (1987, 1991), simulated patients complaining of urinary tract complaints, headaches, diarrhea, diabetes or shoulder pain were not recognizable in general practice. In most scenarios, however, the simulation status is already evident from the information provided in advance. Ultimately, the simulation of reality remains a simulation, it is not congruent with it. Simulating fear in the eyes of a patient rarely comes close to reality. Although students often develop increasing feelings of reality during certain simulations, e.g. those of doctor-patient conversations in OSCE situations, and can largely forget the simulation (Ritter 2011, 33f.), there ultimately remains an 'uncovered residue' to the real original patient.

### Varying levels of difficulty for different target groups

For different target groups (e.g. medical students in the first, fifth or eighth semester in courses with different content, PJ students, assistant doctors...), different levels of difficulty of the patient problems and presentation can be selected (different complex clinical pictures, patient personalities, medical settings...).

### Difficult and rare clinical situations

Simulated patients can be used to present and train difficult clinical situations that would not be feasible or ethically justifiable with original patients for teaching and training purposes, e.g. the delivery of infaust diagnoses (see KoMPASS - structured communication training for oncology physicians - www.kompass-o.org; Fabro et al. 2014). In addition, situations can be simulated that rarely occur in everyday clinical practice and are therefore difficult to teach and learn but are highly dangerous and can be prepared in simulated 'dry runs'.

### Load capacity

Since the drama patients ultimately 'play' all medical problems, patient personalities, illnesses and difficult medical settings and are not themselves actually affected patients with suffering, they can be subjected to much greater stress through student practice and examination behavior than original patients. In addition, they can be expected to cope with a significantly higher time and content load than original patients in terms of the duration and areas of application.

Nevertheless, simulated patients are also burdened by their simulation activity, for example by inadequate examination techniques of the OSCE examinees, by their own emotional reactions to the seriously ill roles they are playing and by difficulties in leaving them after the assignment (Schrauth et al. 2005, 2006). However, with good role training and reliable debriefing after the role assignment, this does not have to affect the actors' private quality of life (Lauber et al. 2010; Dieckmann 2018). In addition to the pure patient portrayal in the simulation world, the circumstances and the before and after in the real world should also be taken into account.

However, relationships between the simulated and real worlds can also signal reverse stress conditions. In the essay ‚Der Empathietest‘ (The Empathy Test), Leslie Jamison (2015; Mayer 2015) as the notoriously clammy author, plays a traumatized patient in a simulated consultation, which represents an exam for the participating medical students to assess their empathy skills, among other things. Jamison's presentation of the patient reliably triggers a genuine effort at empathy from the budding 'understanding' doctors. In a parallel plot, however, which represents her real life, she experiences how difficult it can be to

gain empathy through real pain and how the hoped-for empathy fails to materialize as an unreliable interpersonal currency on the part of the social environment. The simulation world and the real world can clash.

#### Error tolerance and trial and error

Since real patients are not involved, it is avoided that they are emotionally burdened by seminar or lecture hall situations and by any suboptimal behavior of the students. The students can learn with less anxiety in the knowledge that they are not burdening a patient through their own possibly clumsy behavior, but rather prepared simulated patients. This gives students the opportunity to try things out, which can increase their willingness to experiment.

### 41.2.2 Simulated patients in telemedical presentations

It may be necessary to avoid direct contact between simulated patients and students, e.g. during the Covid-19 pandemic, and to look for media alternatives. With this in mind, Langewitz et al. (2021) used the WebEncounter program during the Covid-19 pandemic to implement web-based 1:1 encounters between simulated patients and students for medical conversation with immediate subsequent feedback from the SPs in a protected dialogue. Harendza et al. (2020) established a training course for PJ students who, in the role of physicians, conducted four telemedical history-taking interviews with simulated patients (SP), from whom they also received subsequent feedback. Dahmen et al. (2021) investigated the conversion of a simulated conventional face-to-face consultation to a simulated teleconsultation (2nd semester human medicine students with lay actors) in the context of the COVID-19 pandemic. Although both consultation hour formats achieved high satisfaction scores, the face-to-face consultation hour achieved higher scores in terms of the students' subjective motivation and their assessment of the ‘realistic consultation hour simulation‘.

### 41.2.3 Simulated patients: Feedback to learners

Unlike original patients, simulated patients systematically give their student or doctor counterparts individual, verbal feedback, the effect of

which has proven to be efficient (Howley, Martindale 2004). It is to be distinguished from other types of feedback in medical training and conveys a special perspective (Archer 2010): it is intended to give the counterpart an insight into the patient's perspective, into the experience of the 'patient' in the course of the previous interaction and also to stimulate reflection on deficits and competencies and, if necessary, to clarify starting points for necessary modifications to student or doctor behavior. Learning processes should be developed on the basis of feedback (Thrien 2018). SP feedback should be descriptive, non-judgmental and constructive. In principle, it can be given from three perspectives (Kurtz et al. 2005):

1. From the patient's perspective, but emotionally neutralized: this is probably the most common form of SP feedback. If the patient was anxious, angry or shy in the previous interaction, this affect is neutralized in the subsequent feedback, but it is still formulated from the patient's perspective. The acting situation is abandoned, the feedback situation is different.

2. From the patient's perspective with the emotions associated with the role: this would throw the learner and the SP back into the emotions or dilemmas of the previous interaction and offer little learning gain. However, it can be highly useful to explicitly ask the SP during his feedback (given from the above mentioned 1st perspective) to go back to specific points of the previous interaction, to slip back into the emotional role, so that the learner can try out alternatives to his previously shown behavior at these points instead of just discussing alternatives with words.

3. From the SP perspective, but outside the role: this would no longer be direct patient feedback, but rather explanatory comments from the SP about the patient presented in the SP role. In addition to the above-mentioned 1st perspective, this can make the simulated patient's characteristics and reactions more comprehensible to the learner.

The formal and content-related structure of the feedback is trained beforehand (Schlegel 2011) and often follows the sandwich or cookie-lemon-cookie method: critical aspects (lemon) that are reported back are surrounded by positive aspects (cookies) that are formulated at the

beginning and end of the feedback. The initial naming of positives is intended to make it easier for the feedback recipient to get started with the feedback. The problematic aspects that may then need to be mentioned and require modification (observed behaviors of the learner as feedback recipient in their effect on the SP as feedback provider) are somewhat softened again in the concluding summary, which essentially emphasizes positive aspects (an example can be found in Box 41.1; for further examples of SP feedback, see § 13.6.3).

Box 41.1 Feedback from a simulated patient (SP) to a study participant after taking a medical history in an OSCE situation

"I felt comfortable in the interview ... taken seriously. I was able to describe my complaints to you ... You listened to me, even when I didn't really know how to describe my pain to you in more detail ... When you asked about my family background ... I was surprised at first that someone was interested ... But I was relieved to realize that someone understood the situation I was in ... and understood my stress.
What sometimes irritated me was your eye contact. Now and then you suddenly looked away while I was talking to you ... that irritated me, I didn't know what that meant.
I found the end of the conversation very helpful. The fact that I can come back again has given me hope that a way can be found to combat my pain after all. I would come back to you again."

In the Pendleton model, the learner as the feedback recipient first describes which parts of his demonstrated behavior he would rate as positive. The SP as the feedback giver then names the parts in which he agrees with the self-assessment of the learner/feedback recipient and adds to these if he has noticed others. Only then does the SP name the areas of the learner's behavior as a feedback recipient that were problematic in the SP's experience and formulates concrete starting points that he would consider to be in need of change.

In general, the SP feedback is formulated close to the experience, but in the best case it also contains behaviour-based, operationalized statements that make the SP patient experience apparent in terms of concrete, operationally tangible (and therefore in principle changeable) actions of the other person (Ende 1983, Dayer-Berenson et al. 2012),

e.g: "When you interrupted me again, I was disappointed and only answered the bare minimum to your questions."- "When you asked me this question, I felt relieved and was able to tell you about my eating disorder." - "When you remained silent at this point, I became insecure and didn't tell you about my problem."

Reciprocal feedback from the student or doctor to the SP - "Oh, I understood you quite differently. I had the impression that you were uncomfortable with the topic, so I let it go" - could clarify the mutual misinterpretations and the resulting communicative blockages. Making such communicative interfaces transparent increases the chance of learning how to optimize them in the future.

The usually largely unidirectional feedback in the use of SP could thus be expanded to include systematic bidirectional feedback that attempts to clarify what is mutually meant but possibly misunderstood and not adequately expressed. This would make both the observable external world of doctor and patient or student and simulated patient (their words, intonation, facial expressions, gestures, actions, etc.) and their non-observable inner psychological world (experience accompanying the conversation, thoughts, feelings, etc.) more transparent for both sides in retrospect, thus increasing the mutual gain in understanding the interaction (Hörmann 1978; Obliers et al. 1993). This coincides with Archer's analysis of various feedback components and his plea for two-way feedback (2010). In OSCE examination situations, a third form of feedback is usually added, that of the examiner, who has to evaluate the medical performance of the students to a greater extent. The examiner often builds on the feedback from the simulated patient (patient perspective) and adds further specialist medical aspects that go beyond this (sometimes using systematic observation and assessment procedures, such as the ‘Kölner Evaluationsbogen Kommunikation KEK‘ (Cologne Evaluation Sheet for Communication) to assess communicative competence in communication-oriented OSCE procedures; § 13.6.3).

In addition, the entire verbal feedback, which is based on the memory-based recollection of the previous interaction sequence, can be supplemented by video feedback, which can make it easier to clarify interaction details afterwards, especially in the case of longer interactions.

### 41.2.4 Simulated patients: Standardization in OSCE scenarios

In OSCE examinations, the standardization of SPs is much more important than in training and practice situations. What is required is not just a simulation, but a standardized simulation. In order to achieve the greatest possible test fairness and examination reliability, the SPs must repeatedly play their roles for the various test takers according to the script and as far as possible in the same way, thus presenting them in a standardized manner. Existing studies on the consistency and repeatability of SP performance show good values over periods of 3 to 12 months with good prior training in the scenarios investigated (Badger et al. 1995, Vu et al. 1987, Vu, Barrows 1994).

The OSCE examination participants are also given standardized specifications that are binding for everyone for the task they have to perform in the simulation with the SP, e.g. to face the SPs in the role of a GP. In an OSCE multi-station course, in the course of which each student has to complete various stations with different clinical tasks, the requirement structure is naturally more heterogeneous, although the tasks at each station are standardized for examinees and SPs.

The development of role scripts for simulated patients and model scenarios for OSCE formats in various medical fields is now a market that fills numerous websites worldwide. There is now also an extensive range of literature and various websites on OSCE exam preparation for students with a wide variety of sample stations, e.g. in surgery, emergency medicine, internal medicine, etc. (Hanretty 2004, Jünger, Nikendei 2005, 2012, Kadmon et al. 2011, Shelmerdine et al. 2012, www.osceskills.com). Considerations on quality assurance in case development and case presentation are now also available in a dedicated form (Bachman et al. 2018).

### 41.2.5 Who becomes a simulated patient?

Standardized simulated patients can be embodied by different groups of people (amateurs, professional actors, etc.). They can be recruited in different ways: Notices, internet advertising, word-of-mouth, recruitment at drama schools, etc. Depending on the size of the institution and the frequency of use of SPs, the number of SPs employed may well exceed 100. Tailored software can be useful for managing such a large

number of SPs, such as CAE-Learningspace, a software that is used specifically for the management of SPs and the planning, implementation and evaluation of OSCEs at the Berner Bildungszentrum Pflege. An SP coordinator is often appointed as the contact person for the SPs, who takes care of the needs of the simulated patients and manages all deployment data.

Professional actors, theater educators, and other individuals with theater experience are typically characterized by lay medical knowledge but, beyond that, by specialized acting expertise. This enables them to play a role professionally and to express thoughts and emotional nuances toward other persons in a practiced and understandable way (Kruse, Klemme 2015). Occasionally, too much 'stage expression' is initially observed, but this can usually be reduced to fit the student target groups in learning and examination situations. Professional actors are particularly repetition-trained: they are used to performing roles repeatedly and can therefore reliably develop the respective patient role 'from scratch' for each student. This standardization increases the reliability of, for example, OSCE examinations. Compared to non-professional actors, the training for the roles to be played can be shorter.

Other groups of people may have proven to be good candidates for standardized simulated patients, e.g. members of their own profession, in this case the medical profession, and depending on the location and problem, also students, doctors and lecturers. They can contribute their experience from their own training or professional practice with sick people to the simulation but should not consciously or unconsciously incorporate their own approach to the simulated problem. For example, medical students in higher semesters who have already led tutorials with simulated patients for students in lower semesters have proven to be suitable simulated patients (Obliers et al. 2002). From their own course practice, they know the nuances of simulation-based teaching for certain student groups and can make use of this when they themselves act in the role of simulated patients. Thanks to their in-depth knowledge of their target group, they can provide very precise feedback, e.g. after simulating a doctor-patient discussion.

In addition, a certainly very small, largely undiscovered subgroup has proven to be a very good candidate for standardized simulated patients: Professional actors who are studying medicine in their secondary education (medical students and actors in personal union). They have mastered the acting know-how and are also familiar with the world of doctor-patient interactions, especially in student teaching-learning sit-

uations. This can have a positive effect on the quality of the simulation of the patient presentation as well as on the accuracy of the operational feedback. The feedback-oriented monitoring of the learner during their own patient presentation is a resource-demanding multi-tasking for simulated patients, at least at the beginning of their 'career' (Woodward, Gliva-McConvey 1995), which only gains in playful elasticity as their career progresses. The work of simulated patients requires the bundling of medical, acting and didactic knowledge (Pleines Dantas Seixas et al. 2021). The simulated patients addressed here, who are medical students and actors in one, have a lower multi-tasking load: during their patient presentation, they usually already have greater automated attention resources available for the perception of student behavioral details in the simulated doctor-patient interaction due to their own student and medical knowledge. Accordingly, they can provide feedback afterwards that can more precisely pinpoint their own SP patient experience to concrete operationally tangible behaviors of the counterpart. This increases the learning opportunity for the students involved.

However, due to their generally younger age, the possibilities of using the latter two groups as simulated patients are limited to correspondingly age-appropriate patient roles with corresponding clinical pictures. In addition, some faculties do not permit their use in principle: in their role as simulated patients, they would already be familiar with the simulated scenarios that they might later have to undergo themselves as medical students in an OSCE examination.

The overall group of simulated patients is not homogeneous. The only thing they have in common is the simulation of patients. The heterogeneity of this group raises the question of whether such a group can be trained at all to behave in a similarly standardized way in their patient simulation (Wallace et al. 2002).

### 41.2.6 Training of simulated patients

The training of a simulated patient usually includes a script that needs to be practised and which contains content specifications for the presentation of a patient, his or her clinical picture and the associated symptoms, significant personality traits and behaviors as well as excerpts from his or her biography and references to his or her current life situation. The training scripts can be freely generated with a view to the training and teaching content of specific specialist areas. They can also

be based on real patient cases, which may even include videotaped interactions and conversations with the original patients, provided they have given their permission and release for research and teaching purposes. This opens up special possibilities for fine-tuning the simulation with the original patients.

When adopting a specific patient script, age-appropriate matches between the real age of the simulated patients and the age of the simulated patients with possibly age-typical disease developments must be taken into account - it must fit with a certain range of variation. This must already be considered during the casting. Depending on the institution, a pool of actors with a wider age range is usually set up, which can present patients of different ages with age-typical illnesses.

In several training sessions, the simulated patients are then trained by a professional trainer to take on the respective patient role. This may differ to a certain extent for amateur and professional actors due to their different prior knowledge and experience. This does not apply to the training for providing structured feedback. As a rule, both amateur and professional actors are largely novices in this respect.

In addition to the varying degrees of prior knowledge and experience about the acting presentation, the prior knowledge of the SPs with regard to the clinical pictures to be portrayed must be taken into account and improved during training or fundamentally built up first. Depending on the clinical picture to be portrayed, the simulated patient must acquire a certain amount of medical background knowledge. For example, an actor who portrays an insulin-dependent diabetes patient must be able to provide information about the insulin preparation used, the therapy regimen practiced to date, the number of units to be injected, hypoglycemic symptoms, etc., when asked by his or her student or doctor counterpart in the simulation situation.

The ability to play seriously ill patients (e.g. palliative patients) or difficult, highly stressful clinical scenarios (simulated patient as a patient who is given a fatal diagnosis, or as a mother who is informed of the death of her infant after an operation, etc.) can rarely be assessed at the first casting, but may become apparent during training or only more clearly in the course of the simulation activity over several semesters. Sometimes it can be observed that the actors 'grow' in their roles, so that after several semesters of experience with themselves in the simulation activity, they also want to take on more difficult roles. Subsequently, the development can also reverse again when actors who have portrayed seriously ill patients and difficult clinical situations over sev-

eral semesters are relieved again and want to play patients with milder complaints in the future.

Finally, the training also includes imparting the skills to be able to step out of the roles again after a presentation (consciously guided rituals, farewell exercises, final reflections, collegial exchange between the SPs after an OSCE event).

In addition to practicing the content of one or more patient roles, which may vary in difficulty, the simulated patients are prepared for the various exercise, teaching and examination formats in which they will later be deployed. This also includes information about the respective duration of the patient role to be played, the frequency of presentation repetition on a given day and about the target groups that the simulation patients will encounter in the respective scenarios and for which they may have to provide different doses of feedback.

Refreshing the learned role (back-ups) is necessary after a certain period of time, both to fine-tune the role against the background of the experiences made with the respective target groups, to adjust the role presentation to new teaching and examination formats and to support the SPs with their personal experiences in the presentation of possibly seriously ill people, palliative patients, borderline patients, heroin addicts, etc.

Studies on the impact of SP activity on one's own patient behavior in real life show a greater critical questioning of one's own patient role, a changed perception of one's own health and a more self-confident appearance in interactions with doctors (Lorkowski 2011, Rubin, Philp 1998, Wallach et al. 2001).

### 41.2.7 Target group-specific simulations and the people behind the role

All simulated patients have to adapt their actions to specific target groups and develop target group-specific know-how depending on the area of application: Medical students in a biopsychosocial first-semester tutorial, in a doctor-patient communication course in the fifth semester, in a block internship in the eighth semester, junior doctors in specialist training, etc. approach simulated patients with different knowledge, attitudes and patient experiences.

The superiority of the formally more 'highly trained' individuals in terms of empathy, commitment, patient sensitivity etc. is not prejudiced

at all. The variance within each training cohort is high. It is not uncommon to observe that a highly empathetic and committed first-semester medical student scores better in the skills mentioned than some eighth-semester students or junior doctors. In the course of their medical studies, however, the same person can develop a latent cynicism (Schüffel 1984, 5) and massive 'institutional disillusionment' during further specialist training, resulting in a 'disillusioned' approach to patients, which can also be observed in contact with the simulated patients.

The professional biography leaves behind sediments of experience that can have an impact on the current patient contact, be it of a beneficial or destructive nature. Simulated patients therefore encounter medical staff with very different professional biographies and personality-specific backgrounds, which they do not know but whose effects they feel. This is likely to be of different relevance in an OSCE station with comparatively simple simulation and doctor actions (e.g. simulation of a patient whose blood pressure is measured) than in an OSCE station with relatively complex simulation and doctor actions (e.g. simulation of a patient in whom a reasonably extensive medical history is taken in a sensitive dialog and a relatively extensive patient biography has to be presented accordingly).

The reverse perspective must also be considered: In the OSCE situation, the medical staff encounter actors who not only simulate a patient but do so in their own individual way. This becomes particularly clear to the examiners present when they observe several actors simulating the same patient - the differences can be considerable. Whether one understands this as an 'actor's different interpretation of the same role', as the individual real personality of the respective actor 'shining through' or as a combined effect of both, the differences in simulation behavior are evident.

Ultimately, in a simulation scenario, people not only interact with each other in the role of student/doctor or simulated patient, but above all as real people with biographical backgrounds and overall personalities that have an impact on the current reciprocal interaction in the role scenario.

This may even be interesting for training situations in education and further training as a wealth of variation but may have serious consequences for OSCE examination situations with regard to relevant quality criteria. If, for example, the participants in an OSCE examination for taking a medical history each face one of a series of SPs who present

the same patient script in significantly different ways, or different SPs with different patient scripts, this raises problems for quality criteria such as actor standardization, implementation objectivity and reliability of the examination. On the other hand, the idealization of completely standardized 'textbook case' simulations would erase all idiosyncrasies of real patients.

## 41.3 Evaluation of doctor-patient interactions in simulation scenarios

Evaluations of courses with simulations of doctor-patient interactions require methodological survey procedures that can capture the typical nature of such simulations in learners. Various methods have been developed to record the effect of simulation fidelity, i.e. the correspondence between a simulated situation and the situation to be simulated, on the subjective experience of learners (experienced simulation depth): semi-standardized interviews (Dieckmann 2005), questionnaires (Shapiro et al. 2004), simple global scales (Ritter 2011) and video-based external ratings (Hotchkiss et al. 2002). External ratings of simulation depth do not necessarily correlate with the learners' self-assessments of the simulation depth experienced. In an OSCE scenario (anamnesis survey), the assessment of the situation authenticity (simulation depth) of examiners and simulated patients correlated with each other, but not with the experienced situation depth of the participating students (Ritter 2011). The possible confounding of the depth of simulation experienced by the students with the influences of the censorial observation under which the students are placed as examinees in the OSCE situation must be considered. Under the observation of a third person (examiner), their behavior and the depth of simulation they experience may be different than in an unobserved practice situation (§ 13.6.1).

Ritter (2011) developed and validated a simple global scale, the K-VAS (Cologne Visual Analog Scale), to measure the depth of simulation. The subjective simulation depth experienced by medical students using this scale proved to be strongly scenario-dependent (4 scenarios with varying degrees of realism) and increased in the scenarios with higher simulation fidelity. Similarly, there were more moments in the simulation scenarios in which the OSCE students felt like they were in a real doctor-patient discussion. The time required for OSCE students to fa-

miliarize themselves with the doctor's situation was shorter in scenarios with high simulation fidelity. In addition, the different simulated patients had a significantly different influence on the simulation fidelity experienced by the students. The actor- and case-based variance was considerable.

A scale- and free-text-based procedure for recording the relevance and acceptance of a communication-oriented OSCE procedure with simulated patients as assessed by the students can be found in § 13.6.3.

Neumann et al. (2011) developed the factor-analytically based SES-Sim (Student Evaluation Scale for Courses with Simulations of Doctor-Patient Interaction), consisting of 18 questionnaire items, to record central elements of the simulation and the quality of the course embedding it. The five factors represent learning success, acting patients, premises, lecturers and students and all correlate significantly with a measurement of general satisfaction with the course (see Table 41.1).

| | overall rating |
|---|---|
| learning success | -,49*** |
| actors/actresses | -,29*** |
| premises | -,24** |
| lecturers | -,38*** |
| students | -,31*** |

Table 41.1: Correlations of the SES-Sim scales with the overall evaluation of the teaching event (in: Neumann et al. 2008, 3), *** p < .001, ** p < .01

The overall assessment of the course is most strongly linked to the students' own assessment of their learning success: Students rate the course more positively the more they feel they have learned something there. However, the assessments of the performance of all groups of people involved (lecturers, drama students and students themselves) as well as the premises are also significantly related to the overall assessment of the course.

The authors clearly point out the limitations of the questionnaire they developed, as with all methods of student evaluation of courses: student evaluations can be highly dependent on the general popularity of the subject. Less popular subjects are generally rated worse than

popular subjects, and subjects that are more remote from patients are rated worse than clinical subjects, regardless of the didactic quality of the courses. An assessment of course quality therefore requires further criteria, e.g. a survey of learning success (van der Bussche et al. 2006).

Okuda et al. (2009) investigated the learning success of simulation-based courses and, following a literature review of 113 studies, came to the following conclusion: there are proven improvements in medical practice in some of the areas of work investigated (e.g. laparoscopic surgery following simulator training), in numerous studies on teaching and the acquisition of medical knowledge, communicative skills and procedural skills, as well as on the assessment of learning achievements in the preclinical and clinical stages of study. An example of the assessment of communicative competence (using the Cologne Evaluation of Medical Communication (C-EMC), see § 17) in an OSCE on medical interviewing in the context of taking a medical history with simulated patients can be found in § 13.6.

Just over a decade later, McInnerby et al. (2022) summarized the performance effects of simulation training for medical students in a systematic review of simulation-based medical education studies from 2010 to 2020. General medical and surgical SBME measures in the preclinical phase were analyzed. The learning success was assessed using written evaluations, checklists and OSCE evaluations. All studies reported positive effects of SBME on knowledge development.

## 41.4 Simulations in medicine – essential?

In a risky area of reality such as medicine, in which incorrect medical and nursing actions can have disastrous and possibly fatal consequences, realistic practice in advance is essential. Medical simulations are now an integral part of the education and training of doctors, nursing staff and personnel in disaster control, emergency services and similar organizations. The pace of development and diversification of patient simulation has accelerated enormously in the 21st century (St. Pierre 2018). An increasing number of institutions worldwide now carry out patient simulations on a regular basis. They are embedded in comprehensive reforms of medical training, pedagogical concept developments in the clinical teacher-student relationship and numerous technical developments in the world of medical simulation.

Against the background of a growing culture of patient safety (Hughes 2008, Singer et al. 2007), simulations with high simulation fidelity, be it using virtual reality, digital game-based learning, simulation dolls, simulated patients or combinations of all, can be used as patient-friendly 'dry exercises' can be extremely helpful (Bowyer et al. 2006, Niederlag et al. 2014). The world of medical simulation now encompasses a highly sophisticated spectrum, from simple reproductions of isolated body parts to highly complex and cost-intensive whole-body simulation mannequins with numerous sensors, simulations of variable physical parameters (heart and lung sounds, bleeding, fever, etc.) and technical finesse (e.g. cold-sweaty latex skin, pre-sets for common medical conditions that can be controlled via WLAN, medication effects that can be recharged via plug-in, etc.). In addition to this area of 'non human simulation', there are digital game-based learning programs (e.g. the Internet-mediated Cologne PatDoc Talk for taking anamnesis, cf. § 13), highly developed virtual reality programs and, as a non-technical variant of the simulation world, simulated patients made of ‚flesh and blood' for different medical disciplines and different complex doctor-patient interactions in use ('human simulation') (Bradley 2006, Schnabel 2018, St. Pierre, Breuer 2018). Despite all the substantial limitations, the medical simulation world in education and further training will come even closer to the complex real medical world in its further development, although it cannot replace it.

## 41.5 Further information

Examples of the assessment of communicative competence (using the Cologne Evaluation of Medical Communication (C-EMC), see § 17) in an OSCE on medical interviewing in the context of taking a medical history with simulated patients can be found in § 13. For further literature and examples on simulation in medicine and the OSCE method, please refer to the books by Shelmerdine et al. (2012) and St. Pierre M, Breuer G (eds.) (2018).

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