Clinical skills centre teaching

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Introduction

Teaching in a clinical skills facility is a necessity for the 21st century. It provides the ideal setting for both developing healthcare practitioners while also protecting patients.

The last decade has seen enormous advances in our knowledge of why and how adverse events occur in clinical practice. The influential report from the Institute of Medicine *To err is human* in the USA (Kohn et al 2000) followed by *An organisation with a memory* (DOH 2000) has highlighted the cost of adverse events in terms of finances and harm to patients.

We have also seen a series of high profile cases of professional misconduct which have resulted in increased scrutiny of both competence and professional conduct (DOH 2007).

These reports have highlighted the need to detect those requiring remediation early as well as provide assurances to patients, the consumers of healthcare.

Within this context clinical skills facilities have proliferated providing unique opportunities for teaching practitioners safe standards of clinical practice. This chapter considers the following questions.

- Why is there a need for clinical skills facilities?
- What are the familiar terms?
- What should we teach in a clinical skills environment?
- How should we teach in clinical skills?
- What are the practical approaches to clinical skills teaching?
- What are the current trends in the use of simulation for skills education?
- What are the limitations/challenges of clinical skills facilities?

Why is there a need for clinical skills facilities?

The following explores six of the many reasons for the need for clinical skills facilities.

Regulatory requirements

The growth of Clinical Skills Centres throughout the world over the last 10 years responds to the need to provide standard evidence of competence to practice at all levels undergraduate, postgraduate and as part of continuing professional development (DOH 2007). In addition there is a need to set these regulatory requirements in the context of the 'circumstances, aspirations and expectations of the patient.'

Patient expectations

Patients no longer accept the need for practitioners to practice on them. There is now an expectation that healthcare practitioners will have been prepared to an agreed standard of competence prior to their participation in the reality of healthcare practice (Sedlack & Kolars 2004, Santen et al 2004).

Effective team work

Effective healthcare in the 21st century now relies on multiprofessional teams with contributions from many health professionals. Patients are therefore reliant on robust chains of communication for their quality of care (Sherpbier et al 1997).

Changes in healthcare provision

A number of clinical skills facilities have been developed as a result of changes in healthcare provision (du Boulay & Medway 1999). Most developed countries now follow a system of short inpatient admissions. This increases the service workload with teaching becoming less of a priority. In addition patients are often too sick for teaching or learning clinical skills. This has affected both the quantity and quality of students' clinical experience for both nurses and doctors (Jolly & MacDonald 1989).

Changes in skills profiles

There is increasing evidence of the need for advanced care practitioners with an additional skills profile. There is, as a result, a need to ensure that whoever

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delivers a clinical skill to a patient delivers it to an agreed standard within their professional code of conduct.

The delivery of clinical skills involves cognitive, psychomotor and affective components.

Learning

Traditionally students have learnt their health care practice using an apprenticeship approach. This was very effective when there was plenty of time for opportunistic learning, when hours of work were not so limited and when healthcare practice had few therapeutic options. In the 21st century it is essential that students are able to build their learning in a more structured and systematic way. Over the past 30 years we have begun to understand how clinical expertise develops and how we can support learners in the workplace to make judgments and practice their skills as safely as possible. There is evidence that rehearsing skills (cognitive, psychomotor and affective) in preparation for practice reduces the evidence of adverse events (Shapiro et al 2004, Leonard et al 2004). There is also increasing evidence that behaviours observed in a simulated clinical setting can predict how professionals will behave in the reality of practice (Weller et al 2003). This 'knowing how' can only be gained through professional clinical experience which clinical skills centre teaching can enhance through preparation, deliberate practice and reflection.

There has also been an increasing realisation that the workplace may act as a barrier for learning with students more anxious about practising on patients and making mistakes. In addition, for novice practitioners the reality of the workplace may be overwhelming with too much 'noise' to identify key learning opportunities.

What are the familiar terms?

What is a clinical skill?

> "A clinical skill can be defined very broadly as: 'Any action by a health care practitioner involved in direct patient care which impacts on clinical outcome in a measurable way'"
>
> *Philip Cachia, Postgraduate Dean Scottish Clinical Skills Strategy 2007*

Clinical skills include:

Procedural skills	Communication skills
History taking skills	Patient management
Physical examination skills	Investigative skills
Decision making skills	Time management skills
Health and safety	Documentation skills
Administrative skills	Critical appraisal skills
Learning skills	Leadership skills
Diagnostic skills	

What is a technical and non-technical skill?

Non-technical skills are sometimes referred to as human factor skills or generic skills (Table 12.1). This implies that these skills can be transferable across clinical settings and to non-clinical settings. It is necessary to be clear, in relation to terminology, when teaching in the clinical skills environment as different approaches are needed to facilitate the development of these skills. There is also evidence that human factors or nontechnical skills are often the first sign of a potential adverse event and therefore are required to specifically develop and rehearse these skills in the clinical skills environment (Salas 2005). In learning a technical skill in surgery teaching cognitive skills enhanced the learning of technical skills (Kohls-Gatzoulis et al 2004).

Table 12.1 Examples of technical and non-technical skills

Technical skills	Non-technical skills
History taking	Situational awareness
Physical examination	Task management
Communication skills with patient	Team communication
Procedural skills	Situational awareness
Information management	Decision making

What is simulation?

Simulation is a powerful learning tool which is often used to support teaching in clinical skills centres:

> A person, device or set of conditions that tries to present patient problems authentically. The learner is required to respond to the problem as he or she would under natural circumstances
>
> McGaghie 1999

Simulation is therefore dependent not only on the situation created but on the involvement of the learner. In healthcare education it should be considered as a

There has in the past been an arbitrary division between clinical and surgical skills but the above term is probably more realistic and is all encompassing. The description of a skill is also dependent on which level it is being delivered:

Level 1 – Task or skill component
Level 2 – Skill as part of a patient care scenario (Kneebone et al 2002)
Level 3 – Skill being delivered in different healthcare setting or context.

tool to recreate clinical reality without compromising patient care. In creating a simulation all domains of learning (cognitive, psychomotor and affective) need to be considered in the reconstruction.

Advantages of simulation include:
- Setting standards
- Creating sequenced structured learning events
- Safe environment to learn from mistakes
- Allows immersion in tasks
- Supports deliberate practice
- Enables tasks to be structured and chunked in stages

Adapted from Glavin & Maran 2003

Salas (2005) identified guidelines to effective simulation based training. These include:
- Understanding the learner
- Creating scenarios based on learning outcomes
- Focus the simulation on cognitive and psychological fidelity
- Create synergy between clinician and educational experts
- Guide practice to seek improvement
- Embedding measurement of performance in the simulation for both technical and non-technical skills
- Ensure feedback is facilitated
- Evaluate the programme.

What is a clinical skills centre?

Clinical skills facilities provide specialist expertise for all those who deliver healthcare services to patients and communities (Dent 2001, Dacre et al 1996). The success of a clinical skills facility relies on three key factors: geography of the facility, leadership and management, financial infrastructure.

A clinical skills centre can be defined in terms of:
- facilities
- specialist equipment
- specialist tutors.

Facilities

Facilities should be flexible to enable different simulations to be undertaken by different sizes of groups of learners for different levels of simulation. Most clinical skills can be best taught and learnt in a small group setting and so multipurpose small group teaching rooms which can also double up as a two or three bay ward or consulting room provides an appropriate space. Often having a corridor which links a series of rooms or a central seminar room with a circuit of smaller rooms off can provide the most flexible accommodation. If there is the possibility of having audiovisual links between rooms in a clinical skills facility then learners can share their experiences and learn from and about their own and peers professional practice.

In addition, facilities such as a dedicated ward, theatre and laboratory area can provide contextual simulations for learners (Fig. 12.1).

There have also been several attempts to try and identify levels of skills facilities from a skills room, to a unit, to a centre to a tertiary facility rather along the lines of how healthcare facilities are described. This arbitrary system can be limiting and can act as a barrier as a facility develops and expands. What is clear is the need for a dedicated facility to be working in collaboration with the healthcare system to ensure teaching and learning reflects the needs of both current and future healthcare practitioners.

A hub and satellite model is a useful concept for ensuring standards across regions and healthcare settings. IT support can enable standards of skills practice to be delivered at any level regionally, nationally or internationally.

Clinical skills facility can enable the recreation of a clinical setting in a protected environment. This contextual fidelity is crucial in supporting transfer to the real world and in creating a suspension of disbelief to enhance learning (Ker et al 2006).

Specialist equipment

Specialist equipment in the clinical skills centre should reflect the reality of practice in relation to medical equipment and consumables. Environmental cues are crucial for simulation events and as the practitioner becomes more experienced in the real practice environment then some of these cues become essential to engage the learner in the event. There is no point in rehearsing a skill for current practice in a simulated healthcare setting with resources that are not available in real practice. The caveat to this is that there is sometimes a need to set standards of skills practice in a clinical skills facility with the plan of improving future practice. It is important in these circumstances to ensure learners have advanced warning of their role as change agents and are not sent out with false expectations.

Simulators

A variety of low fidelity and medium fidelity simulators should be provided where appropriate for each of the clinical skills sessions (Table 12.2).

In addition there is an increase in the use of technology to provide realistic simulations especially of high complex technical skills such as laparoscopic techniques. There is increasing evidence that these virtual reality simulators can enhance cognitive skills (Sedlack & Kolars 2004).

Fig. 12.1 Facilities

	Essential	Required
Dedicated multipurpose tutorial rooms		
Seminar room		
Had decontamination facilities		
Dedicated healthcare settings		
Outpatient consulting rooms		
Ward area		
Operating theatre		
Emergency room and resuscitation area		
Roadside motor vehicle		
Domestic setting		
Video debriefing facility		
Self revision area		
Workshop		
Storage area		
Wet lab		
Simulated patient waiting area		

Table 12.2

Simulator type	Examples
Simulators	
Part task trainers	Venepuncture arms
	Arterial arms
	Male and female pelvic models
	Skin and tissue jigs for injection and suture practise
Computer based systems	Emergency medicine (Microsim™ – Laerdal)
Virtual reality and haptic systems	
Precision placement	Venepuncture trainer Cath Sim
	IV cannulation
Integrated simulators	
Instructor driven simulators	SimMan
Simulated patients	
Simulated environments	Simulated wards, operating theatre, GP surgeries, outpatient rooms

After Maran & Glavin 2003

> Clinical skills and simulation can be used for many different purposes a number of which are given below
>
> Ker & Bradley 2007

Simulated patients

A clinical skills centre will benefit enormously from simulated and real patients who contribute to preparing students with training to develop their:

- Communication skills
- History and physical examination
- Non-invasive procedural skills
- Consultation skills.

There are a number of different types of tutors in clinical skills:

Specialist tutors

Specialist tutors are required for all aspects of any teaching and learning programme using simulation whether it is role play or the incorporation of a mid fidelity simulator or involving a simulated patient or actor in the learning event.

- Clinical skills educators with expertise in the use of simulation
- Clinicians with expertise in communication skills
- Clinicians with an interest in teaching.

The tutors should work in teams with an identified lead tutor for each session.

Tutors have to develop experience in how much of the simulation they need to prepare the learners for and how much they should participate in the event either to provide support or assistance. They also need to be trained to be familiar with the use of simulation in whatever form as part of the simulation learning event.

Tutors need to be supported by administrative, academic support and technical staff, the latter of whom have expertise in maintaining part task trainers and simulators. This type of team can ensure that the facility is used to its maximum capacity. In relation to the use of animal material for surgical rehearsal of specialist technical skills, support staff are essential.

It is very useful though not mandatory to have tutors who have both educational and clinical expertise. Most skills faculty should be advised to retain their clinical expertise with a health service commitment as they have a role even in a simulated setting, as a professional role model. It is also helpful in transferring skills from a simulated environment to the reality of the workplace if students can relate to their tutors in different settings.

What should we teach in a clinical skills environment?

Teaching is now a specific part of the profile of any professional practitioner. Teaching in a clinical skills setting can provide both evidence for a portfolio but can develop teaching expertise in the use of simulation to prepare learners for practice.

Rehearsal

The use of simulation in the clinical skills environment enables novice practitioners or expert practitioners learning new skills to rehearse these in their component parts and then to practice them together without compromising patient care with the support of a facilitator using a structured programme.

Example: Learning to do venepuncture as technical skill building up to consenting and preparing a patient and then carrying out procedure on a simulator and then to practice during a ward simulation exercise.

Reinforcement

Reinforcement of clinical skills can be achieved through providing e-learning support in clinical skills, which enables learners in their own time to participate in an interactive patient scenario, thus linking both technical and non-technical skills and providing feedback.

Example: Provision of an e-learning package which revises basic science knowledge health and safety and professional and ethical considerations associated with venepuncture.

Renewal

Clinical skills provide opportunities for experts in practice to revisit their skills proficiencies and relearn skills which can fade when seldom used.

Example: Identification of complications in clinical practice in relation to venepuncture practice such as needle stick injury and lack of use of protective equipment workshop to revisit and video practice.

Re-design

In developing new ways of working the skills facilities provide the opportunity to safely try out new roles and develop new systems for their integration into clinical practice.

Example: Development of venepuncture training as part of package for GP receptionists using standard approaches.

Risk reduction

There is now a knowledge platform in relation to how and why adverse events in healthcare practice occur. Clinical skills and simulation provide an opportunity to ensure there is no unwarranted variation in the way skills education is delivered to different healthcare practitioners.

Regulation

Clinical skills facilities and simulation are increasingly being used for assessment as they provide objective evidence of ability. Regulation is of increasing importance in all health professional practice as explicit evidence of competence is required.

Example: Standards of competence can be clearly defined through assessment checklists for a simulation setting and global assessment measure for the workplace.

Research

Clinical skills and the use of simulation are relatively new in the development of capable and proficient healthcare practitioners and there is an opportunity to identify the most effective and efficient methods through research.

Example: There is no point having three ways of learning venepuncture. Interprofessional skills learning through team exercises can impact on patient safety.

In the clinical skills environment how the teaching and learning are carried out is dependent on the learning outcomes or objectives for the session as part of the overall curricular programme or as part of an agreed structured programme of learning.

There are a number of educational theories that underpin learning from a simulation event. Commonly used in clinical skills facilities are behaviorism, cognitive constructivism and reflective learning.

Learning cardiopulmonary resuscitation skills – behaviourism

Behaviourism is based on a stimulus response type of learning and is very useful for skills and drills simulations such as that of CPR training whether for Basic or Advanced Life Support. This is the best approach for emergency skills which need to be over rehearsed and automatic.

Learning patient consultation skills – cognitive constructivism

Cognitive constructivism is a useful approach to developing expertise in consultation skills. This builds on prior knowledge and experience and enables the simulation event, with the facilitation of the tutor to be linked into existing experience either in the cognitive psychomotor or affective domain and for this new learning event. This is useful in the early years of the novice practitioner as it enables links between other components of the curriculum and the clinical skills simulation. E-learning is a useful approach to ensuring standards of practice and knowledge shared and can provide reinforcement and preparation opportunities.

Learning from a ward simulation exercise – reflection

Developing a ward simulation exercise using simulation can utilise reflective learning to enhance transfer of skills from the simulated environment to the workplace. This involves structuring the simulation event to include a short simulation exercise with a structured period of debriefing and feedback. This can include requiring the learner to document their assessment of their performance.

How should we teach clinical skills?

Gaba (2004) identified 11 dimensions which needed to be considered for developing a successful simulation event. Ker and Bradley (2007) simplified these dimensions into three key elements:

- Purpose element
- Process element
- Participants' element.

It is essential to ensure the purpose of the learning event, using simulation is explicit to those participating.

Process is more challenging in clinical skills as it relates to how realistic to clinical practice the simulation event needs to be. The reality factor is crucial to the process and needs to be judged in relation to both the purpose and the participants. Often a focus on realism creates distracters to the purpose of the learning especially for novice practitioners. This needs to be clarified at the beginning of the simulation. Role play can be a very powerful simulation medium for both cognitive and affective domain developments. The participant element highlights how simulation is increasingly being used to good effect in the education and training of non-technical skills for different levels of the healthcare organisations.

Three 'P' elements of simulation:
Purpose – Refinement, rehearsal, research, regulation
Process – Reality fidelity
Participants – individuals, teams, organisation

What are the practical approaches to clinical skills centre teaching?

Teaching a technical skills task

Gagne (1985) listed three phases in designing the teaching of technical skills:

1. Cognitive phase – consciously develop a routine with cues from facilitator.

2. Associative phase – deliberate practice to integrate component parts. Rest periods interspersed with practice have been shown to be most effective.
3. Autonomous phase – skill automatic to enable cognitive activity.

Students should be increasingly involved in identifying how they would like to run the session as it is their learning time. Tutoring the same group each week enables the tutor to identify those who volunteer and those who are more reticent and require practice.

A useful approach to structuring a technical skills learning session with a group of novices is the STEPS technique which keeps the whole group involved as you give everyone different components of the STEPS to do.

S – Set the foundation of prior learning, the importance of the skill and the context in which it will be learned and applied
T – Tutor demonstration in real time without commentary
E – Explanation with repeat demonstration
P – Practice under supervision with feedback from peer and tutor
S – Subsequent deliberate practise encouraged.

Teaching a non-technical skills task

A useful approach to structuring a non-technical session with novices includes the SIS-FR method which involves structured immersion and interventions:

S – Set the context and identify roles and outcomes
I – Immerse in roles and practice for agreed time frame
S – Intervention to summarise progress
F – Feedback from self, peers and tutor
R – Refine practice building on feedback by re-immersion.

Debrief and feedback from a clinical skills and simulation event

At the completion of any simulation event there are four stages to the feedback process:

• Preparation
• Disengagement
• Constructive feedback
• Contemplation.

Each stage is crucial to promote both learning from the simulation event and in facilitating transfer of learning to the workplace.

Disengagement is a crucial stage after a learner has immersed themselves in a simulation event. This disengagement stage enables the learner to disassociate themselves from the role they were taking from themselves as a learner. However, feedback should be an intrinsic part of the simulation event itself, embedded in the teaching and learning experience. This enables the learner to compare themselves to a standard and identify their own strengths and weaknesses. Video debrief can assist in the development of these skills where students are given time after a simulation event to review their performance with the use of a structured feedback sheet. Different models of constructive feedback can be effective (see Ch. 47) (Table 12.3).

This part of the programme is vital to the success of the sessions and to students identifying the links between knowledge pathways. It is also important for the tutor to debrief their role in the clinical skills teaching session. This can be achieved through reflective questioning.

Question: Can I improve my teaching in any way?. Peer observation of teaching and feedback can be a helpful way of developing your role.
Question: How can this benefit my clinical role?. Teaching and clinical skills outside of clinical skills teaching can be of benefit to the clinical team. It can also provide evidence for appraisal/revalidation.

Dreyfus' model of skills acquisition

In considering any clinical skills teaching session it is also important to recognise the development of expertise. This will have an impact on any simulated event. Expertise may be considered as the end point in a stepwise development of cognitive, psychomotor and

Table 12.3
Effective feedback

Features of effective feedback
• Well timed as close to the simulation session as possible
• Based on direct observation of the learner, i.e. descriptive
• Phrased in nonjudgemental language
• Specific not generalised
• Focused on actions – be constructive
• Not focused on too many different aspects at the same time
• Given adequate time
• Be in an appropriate setting

Barriers to effective feedback
• Lack of planning
• Defensive learner
• Too generalised
• Inconsistent from multiple sources
• Lack of respect /credibility
• Anxiety
• Personalisation of comments

Table 12.4
Levels of expertise

Level 1	Novice	• Rigid adherence to taught rules or plans • Little situational perception • No discretionary judgment
Level 2	Advanced beginner	• Guidelines for action based on attributes and aspects of situation (recognise global characteristics after experience) • Situational perception limited • All attributes and aspects treated separately and given equal importance
Level 3	Competent	• Coping with crowdedness • Sees actions in terms of longer term goals • Conscious deliberate planning • Standard routine performance
Level 4	Proficient	• Sees situations holistically • Sees importance in situation • Perceives deviations from normal • Decision making less laboured • Uses guidance but recognises variation
Level 5	Expert	• Intuitive grasp of situations based on tacit understanding • Analytical approach used only in novel situations • Vision of what is possible

affective skills. The Dreyfus brothers (2005) described five levels of development of expertise (Table 12.4).

What are the current trends in clinical skills teaching?

There are a number of current trends in the use of clinical skills facilities which are shaping clinical education and will impact on the future of healthcare delivery. There has been an exponential growth in the development of skills facilities and in the publications about the use of simulation in these purpose-built facilities. However, there needs to be more robust research around the added value. Scotland has taken a lead in developing a national strategy for clinical skills linked to healthcare needs with principles of equality of access both professionally and geographically (NHS 2007). Six trends are described here.

Focus on non-technical skills

There have been several studies to identify behaviours which assess non-technical skills in a complex healthcare environment (Fletcher et al 2003). Studies analysing the enhancement of teamwork in complex environments through team training using simulation have produced varying evidence as to its level of impact on patient safety but this may be due to the fact that as yet we do not have the tools to measure the eight skill dimensions of teamwork (Stout & Salas 1997).

Dimensions of teamwork:
Adaptability
Situational awareness
Performance monitoring and feedback
Leadership and team management
Interpersonal relations
Coordination
Communication
Decision making

Assessment

There has been a focus on ensuring that assessment of clinical practice is valid and reliable and can discriminate between the competent and incompetent practitioner. This is normally carried out through direct observation of some component of practice using the OSCE or OSLER. There is a move towards sampling standards of professional practice in the workplace using a variety of tools but there is still reliance, especially at undergraduate level, on the use of simulation in clinical skills facilities to assess competency (Bouriscourt et al 2007). In relation to assessing

With our increased knowledge of how adverse events occur in healthcare practice, clinical skills and simulation provide an opportunity to practice the components of clinical practice in a structured way ensuring that practitioners have practised both technical and non-technical skills prior to the reality of healthcare delivery. The clinical skills sessions are set in a simulated environment with the objective of preparing students for working and learning in real clinical environments.

The vital role played by teams in both controlled and uncontrolled healthcare environments has highlighted the need for team training in healthcare.

doctors in difficulty a ward simulation exercise (Hyslop et al 2007) has also been shown to provide evidence of performance by using contextual simulation.

Remediation

In relation to providing remediation clinical skills facilities can provide structured opportunities to observe and debrief learners. This process enables the tutor to identify the degree of insight of the learners which can expedite the remediation programme. Clinical skills facilities are increasingly being utilised for this type of programme.

Re-learning

There are a number of practitioners who through the reality of their practice come to take dangerous short cuts as a routine part of their practice. There is increasing evidence that the use of simulation can support re-learning or unlearning of habitual practices.

Predicting performance

With the increasing emphasis on the need to provide explicit evidence of competence for the purposes of revalidation and re-licensure more research is being focused on identifying predictors of performance especially in relation to the effects of stress and fatigue with the use of simulation (Howard et al 2003).

Standards

It is essential given the changing skills profile of different healthcare professionals that standards of skills practice are identified so that patients with complex conditions are given the same safe standards of skills irrespective of the healthcare professional delivering them.

What are the limitations?

There are a number of caveats related to the use of clinical skills facilities for teaching. Clinical skills facilities do not replace clinical practice – they enhance the learner's state of preparedness for practice. They provide a safe environment for deliberate practice. A major challenge remains the ability to predict performance or competence in the workplace from that in a simulated context. Learning in the clinical skills environment also needs to be integrated into the curricular programme. There is also a concern that such an environment may induce abnormal risk taking behaviours as it is not perceived as real by learners. There is also the dissonance of the conflict that arises particularly for novice learners when they observe different practice in their workplace role models from the ideal standard taught in the skills and simulation setting. There are also

considerable costs associated with the use of clinical skills facilities in relation to consumables as well as the personnel and physical facilities.

Summary

Clinical skills facilities provide excellent opportunities for all healthcare practitioners to prepare themselves for the realities of practice in a complex high reliability organisation like a health service. It is therefore essential that teachers as well as students develop their expertise in the use of these facilities and the specialised environment that simulation offers to ensure that learning is both accurate and maximised before being transferred to the workplace. There are many approaches to learning in clinical skills facilities using underpinning educational theories which enhance what can be learnt in terms of technical and non-technical skills. There is emerging evidence of the importance of clinical skills facilities in ensuring the risk of adverse events to patients are minimised through rehearsal, redesign, renewal, research, reinforcement and regulation.

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