Teaching practical procedures in general practice

A primer for supervisors of medical students and registrars

John Fraser, *FRACGP, FAFPHM, FACRRM, MPH&TM, DipRACOG, is Director, New England Area Rural Training Unit, New England Area Health Service, Conjoint Associate Professor, Discipline of General Practice, University of Newcastle, and Senior Medical Educator, New England Area Training Services, Moree, New South Wales.*

BACKGROUND Practical procedures are central to many general practitioners' job satisfaction and their ability to provide comprehensive care. Despite this, students lack opportunities to learn skills and fewer GPs perform them.

OBJECTIVE This article develops a framework for teaching practical skills and their assessment in general practice.

DISCUSSION True competence means more than performing a task in isolation; knowledge, skills and attitudes are needed to perform in the workplace. Teaching should be closely related to assessment in general practice. A four stage method of instruction can facilitate learning of task skills. This should be followed by a series of case discussions, scenarios or simulations to teach and assess the learners' ability to manage tasks in the work environment. Linking teaching, assessment and feedback is integral to improving learning opportunities in general practice.

Practical skills are needed in general practice to provide comprehensive care to patients.[1] General practitioners find this work rewarding, particularly in rural areas where procedural medicine is an important part of job satisfaction.[2,3] A sustainable Australian general practice workforce requires practical skills to be taught to registrars and medical students aspiring to become GPs. General practitioner supervisors act as important role models and mentors to this group; part of their role is to plan teaching to facilitate skills acquisition and opportunities for ongoing practice of these skills under supervision.

Rural GPs perform procedures with safety in small Australian communities.[4,5] A major initiative in training has been to require all registrars to experience rural general practice motivating some to train specifically for procedural practice. At the same time, the work environment of rural general practice is changing; fewer GPs are involved in procedural medicine.[2] Part of the challenge for supervisors is to promote the professional

rewards of procedural medicine to registrars. Appropriate initial training is central to developing psychomotor skills,[6] however, confidence to continue to practise skills are also related to caseload and the attitudes of peers and patients.[5]

Several developments have decreased the amount of practical skills teaching in general practice including medicolegal issues, concerns about higher complication rates with novice practitioners,[7] limited time, and the fact that some important procedures occur rarely, limiting teaching opportunities. Undergraduates and junior medical officers complain about a lack of opportunities to learn skills during their prevocational training.[8] This has placed a greater reliance on GP supervisors to teach registrars during their postgraduate training.[9] The philosophy of 'see one, do one, teach one' as the most effective means of skills training is changing. Work based training linking skills training to assessment of competence is needed.[10] This article develops a framework for

teaching and assessing procedural skills and their assessment in general practice.

Competence compared to confidence

True competence means more than performing a task in isolation; knowledge, skills and attitude are needed to undertake procedures in the workplace.[10] Medical procedures involve a series of complex psychomotor steps,[11] but it is communication errors that cause many adverse outcomes in health care.[12] General practitioners and those in training need to consider: teamwork, what resources are available locally, and how to select suitable cases.[3,6]

It is often asserted that if a GP has high confidence in performing a procedure, they are competent and able to teach that skill.[9] These assumptions need exploring as confidence and competence are different and correlate poorly (neither one ensures competence to teach).[10,13] Confidence relates to attitude, while competence is assessed by observing

Table 1. Components of competence

Task skills

Being able to demonstrate the steps involved in adult endotracheal intubation and perform these

Transfer skills

Being able to demonstrate how to modify these skills when intubating infants and children, eg. considering differing anatomy, larnygoscopes and endotracheal tube selection

Task management skills

Being able to demonstrate contingencies, when the planned outcome does not occur, eg. what to do if endotracheal intubation is unsuccessful

Job/role environment skills

Being able to manage the work environment to ensure equipment and trained personnel are available to undertake the skill, eg. ensuring that a difficult airway tray, suction, and an assistant trained to apply cricoid pressure are available

Table 2. Methods of teaching task skills – attributes[11,15–18]

	Manikin	Real patient	Manikin with role playing actor	Medical students	Animals/ cadavers
Realism (fidelity)	Low	High	High	Low	Low
Verbal interaction	Low	High	High	Low	Low
Perform procedure	High	Low	High	Noninvasive only	Anatomy different
Safety	High (a)	Low (b)	High (a, c)	Low (d)	High (a)
Ethical concerns	Low	High	Low	High	Very high (e)
Costs	High	Low	High	Low	High

(a) disable all hazardous equipment, consider infection control
(b) increased risks with novice learners
(c) instructor needs to consider potential for actor to be harmed
(d) only noninvasive procedures. Issues if abnormalities are found in lesson
(e) now unacceptable unless training can not be offered any other way

Table 3. Stages in teaching task skills[15]

- The instructor demonstrates the skill silently (at normal speed) while the learner observes
- The instructor repeats the skills in a number of steps with their own dialogue (questions are clarified at this stage)
- The instructor repeats the skills, with the learner providing the dialogue
- The learner performs the skills with their own commentary

behaviours. Direct observation is a useful tool for giving specific feedback to modify and improve performance in general practice.[14] Teaching practical skills requires an evaluation of successful attainment of objectives to ensure that competence has been achieved.[10,15]

Components of teaching procedural skills and assessing competence

Work based training and assessment identifies four dimensions of competence.[10] These four dimensions are required to perform skills at work. The components of competence (as they relate, for example, to endotracheal intubation) are listed in Table 1.

Different training is required to teach a GP the knowledge, skills and attitude to achieve these components of competence. The first step is to learn the task skills, from which higher levels of competence will develop.

Teaching task skills

Learners need to be challenged and motivated to learn.[10,15] Clear instructions about the objectives for the lesson or the assessment process need to be given early. The learner needs a clear understanding about what they are expected to do. This includes instructions about the indications, contraindication and complications of the procedure.[15]

Teachers need to consider the learning environment to ensure that learning can occur in a safe and efficient manner. Considerations will include: group size, availability of equipment, and safety (both for patients and learners).[10,15] Hazardous equipment (such as defibrillators) should be deactivated to prevent inappropriate and unsafe use during training. Learning on patients can involve risks (eg. the risk of dental damage is high in learning endotracheal intubation).[7] Patients can also suffer adverse and unexpected complications during assessment sessions.[16]

In terms of endotracheal intubation training, patients undergoing surgery or manikins are used most frequently.[11] The recently deceased, cadavers and animals have been considered and used previously; revised ethical guidelines now prevent these practices.[11] Some noninvasive skills training can be performed on volunteers or other medical students. Ethical issues are now being raised concerning privacy, potential for harm, and the learner's obligations should they detect unexpected abnormalities in a peer.[17] Invasive procedures are less appropriate in this context, thereby limiting their application.

The relative advantages and disadvantages of methods of delivering task skills training are described in Table 2. Task skills include a combination of verbal and motor skills. Patient role plays allow verbal task skills to be performed, such as gaining consent or explaining a proce-

Table 4. Methods for teaching and assessment of competence[10,15]

What is being taught and assessed	Assessment tool
Knowledge	Multiple choice quiz with feedback
Task skills verbal and motor	Objective structured clinical examination (or skills station) with feedback
Knowledge, attitudes	Case discussions with feedback
Knowledge, task skills (verbal), attitudes	Role plays with feedback
Knowledge, task skills (motor and verbal), attitudes	Scenarios with feedback
Knowledge, task skills (motor and verbal) attitudes, team work, system errors including equipment failures	High fidelity simulation with feedback

dure. Models allow motor tasks to be performed repeatedly without harm to patients. Some authors have combined a role playing actor with a model to increase fidelity in task skill training.[18]

A four stage method of instruction is recommended to teach task skills.[15] The steps in instruction are listed in Table 3. This method allows the learner to observe what is required while it is demonstrated explicitly by the teacher at full speed. If the teacher spoke initially, learners would be distracted as they would look at the teacher rather than observing the skill. Repetition allows the skills to be demonstrated three times and steps involved heard twice, before the skill is performed by the learner. The teacher is able to assess whether the learning objectives have been met, giving feedback to modify behaviour if required. During feedback, teachers need to explore how the learner felt they performed the new task. Often learners will tend to under rate their own performance. Following this, the teacher can review the performance giving positives ahead of negatives. At all times, teachers need to be mindful of performance anxiety involved in learning new tasks. This will be exacerbated if peers observe each other during performance and feedback sessions.[14]

From the teacher's perspective, the type of procedure needs to be considered. Sometimes it will be inappropriate to repeat the procedure four times (eg. Pap smear training on patients). Modification of the lesson plan is required in these situations. With the assistance of the Family Planning Association, our unit has utilised pseudopatients (trained nurses) who give structured feedback to novice learners on their Pap smear technique. All GP registrars attending a session in 2002 (n=12) agreed that this form of task training was useful to their general practice training. Alternatively, other educators have used a role playing actor with a model to teach verbal and motor task skills contemporoneously.[18]

Teaching and assessing other components of competence

Case discussion, scenarios and simulation

A fifth important stage in task skills training is for the supervisor to provide the learner with opportunities to perform the skill at work. Transfer skills, task management and job environment skills require extensions of basic knowledge, skills, attitudes and ability to apply them at work. An important aspect of acquiring these components of competence will be to reflect on performance.[14]

Supervisors can offer a number of learning opportunities to extend skills in general practice. These can include case discussions and scenarios. Simulations are a form of high fidelity scenario.[11,12] Table 4 outlines various teaching and assessment tools to assess competence. Evidence collected for assessments needs to be valid, reliable, flexible and fair.[10]

Case discussions are useful to explore knowledge and some attitudes. Scenarios involving role plays also assess motor skills. Learning objectives for these sessions need to be planned and explicit. An example (referring to entubation) is:

A 50 year man presents after a motor vehicle accident with head injuries and stridor. His pulse is 150 and respiratory rate is 40. What is your initial approach to this patient in a small rural casualty?

Teachers would expect a systematic approach to management with learners using an ABCDE (airway [with cervical spine stabilisation], breathing, circulation, disability, exposure) approach.[15] Specific objectives to be taught and assessed may include the management of difficult airways. Teachers need knowledge and skills to adjust the case discussion or scenario as the learner performs different interventions. By this process, the teacher provides a learning opportunity to extend task management, transfer and job management skills. Feedback and debriefing to reflect on performance is essential. As the fidelity of the scenario or role play increases, feedback becomes increasingly important as learners may remain locked in role, unless they are given the opportunity to debrief.

Conclusion

Competence requires a learner to perform and apply tasks at work. Linking teaching, assessment and feedback is integral to improving learning opportunities in general practice.

Conflict of interest: none declared.

SUMMARY OF IMPORTANT POINTS

- Linking teaching, assessment and feedback is integral to improving learning opportunities in general practice.
- Confidence and competence correlate poorly in general practice.
- True competence means more than performing a task in isolation, knowledge, skills and attitudes are needed to perform skills at work.
- A four stage method of instruction can facilitate learning of task skills.
- Case discussions, scenarios and role plays can be used to extend task skills at work.

References

1. Royal Australian College of General Practitioners. Training program curriculum. 2nd edn. Melbourne: The Royal Australian College of General Practitioners, 1999.
2. Dunbabin J. Procedural medicine in rural and remote NSW. Newcastle: NSW Rural Doctors Network, 2002.
3. Watts R. The GP proceduralist. Aust Fam Physician 1993; 22:1475,1478.
4. Woollard L, Hays R. Rural obstetrics in NSW. Aust N Z J Obstet Gynaecol 1993; 33:240–242.
5. Watts R, Marley J, Beilby J, Mackinnon R, Doughty S. Training, skills and approach to high risk obstetrics in rural GP obstetricians. Aust N Z J Obstet Gynaecol 1997; 37:424–426.
6. Jackson W, Diamond M. Procedural medicine: Is your number up? Australian Family Physician 1993; 22: 1633–1639.
7. Chen J, Susetio L, Chao C. Oral complications associated with endotracheal general anaesthesia. Ma Tsui Hsueh Tsa Chi Anaesthesiologica Sinica 1990; 28:163–168.
8. Spike N, Veitch C. Competency of medical students in general practice procedural skills. Aust Fam Physician 1991; 20:586–591.
9. Sturmberg J. Learning relevant procedural skills: Are supervisors providing opportunities? Aust Fam Physician 1997; 26:1163–1165.
10. Australian National Training Authority. BSZ98: Assessment and workplace training package. Australian National Training Authority. Available at: http://www.anta.gov.au/trainingPackage.asp?qsID=36 last updated 12/9/2002.
11. Owen H, Plummer J. Improving learning of a clinical skill: The first year's experience of teaching endotracheal intubation in a clinical simulation facility. Med Educ 2002; 36:635–642.
12. Howard S, Gaba D, Fish K, Yang G, Sarnquist F. Anesthesia crisis resource management training: teaching anesthesiologists to handle critical incidents. Aviat Space Environ Med 1992; 63:763–769.
13. Morgan P, Cleave-Hogg D. Comparison between medical students' experience, confidence and competence. Med Educ 2002; 36:534–539.
14. Holmwood C. Direct Observation. A primer for supervisors of doctors in training. Aust Fam Physician 1998; 27:48–51.
15. Mackway-Jones K, Walker M, eds. The pocket guide to teaching for medical instructors. London: BMJ Books, 1999.
16. Sayer M, Bowman D, Evans D, Weissier A, Wood D. Use of patients in professional medical examinations: current UK practice and the ethicolegal implications for medical education. BMJ 2002; 324:404–407.
17. Braunack-Mayer A. Should medical students act as surrogate patients for each other? Med Educ 2001; 35:681–686.
18. Kneebone R, Kidd J, Nestel D, Asvall S, Paraskera P Darzi A. An innovative model for teaching and learning clinical procedures. Med Educ 2002; 36:628–634.

AFP

Correspondence

Email: jdfraser@doh.health.nsw.gov.au