The apprenticeship model of clinical medical education: time for structural change

Kate Rassie

ABSTRACT
The apprenticeship model, which forms the backbone of the current medical education system, has a strong historical precedent (and indeed multiple strengths). It is, however, important to acknowledge that its application to modern medicine is far from perfect, particularly with the breadth and complexity of current hospital systems. Demands on clinician resources, the sheer volume of knowledge our trainees must amass, short attachments and rigorous assessment schedules are all major challenges to a relatively simplistic educational system. Identifying and addressing these vulnerabilities is essential to enhancing the educational experiences of both undergraduate medical students and junior doctors.

Clinical medical education in New Zealand is based, essentially, on an apprenticeship framework. This model (which is applied to our undergraduate medical courses, the prevocational intern programme and vocational training schemes) undoubtedly has strengths: with the medical workforce as the ultimate destination, early immersion in the clinical environment enables the acquisition of practical and applied knowledge. The apprenticeship model sees the trainee become familiar early on with common medical problems and presentations; and facilitates their progress from observation through to participation, supervised execution and then independence. Progressive responsibility is conferred, but ongoing close clinical supervision safeguards patient safety and aims to further refine and develop the skill of the apprentice.¹

The apprenticeship model also allows the student to become familiar with the culture, processes and expectations of the medical workforce. It enables them to become comfortable interacting with patients, and to model their own clinical behaviour on that of respected seniors. Professor Tim Wilkinson, in his 2013 reflections on medical education systems, deftly summarises the intent of modern, clinically-based, apprentice systems: “the major challenge of medical education is to integrate formal knowledge with clinical experience and to develop habits of inquiry and innovation. The gold standard of good medical education is where students learn the underlying theory and science of a problem at the same time as they encounter that problem in real life”.²

For undergraduate medical students, patient contact is relatively structured and goals are often assessment-driven. The education provider is the responsible university, and there is no expectation of service delivery. After graduation, resident medical officers (RMOs) actively care for patients as part of a wider clinical team. Employed by district health boards (DHBs), they have professional, moral and social responsibilities to patient care. They learn through clinical practice, receiving feedback from the wider professional body. Both educational phases, however, involve gradual acquisition of knowledge and skill, graded delegation of responsibility; and comprehensive oversight, supervision and feedback.

Despite being standard—and seemingly unquestioned—within medical education, some elements of our current apprenticeship-based education system are less than ideal. In my recent years (as an undergraduate medical student, then

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as a house officer, and now as a registrar and physician trainee) the flaws of our prevailing model have become increasingly apparent. While it is both desirable and realistic to assume that the apprenticeship model is here to stay, several areas of the current system are in need of modification and improvement. In my recent position as a clinical medical education fellow at the University of Auckland, current undergraduate medical students frequently expressed similar sentiments. Watling et al demonstrate the drawbacks of the apprenticeship model in their 2013 and 2014 pieces, drawing interesting comparisons between medical educational culture and other educational cultures, namely those of performance music and competitive sport. Their group used a constructivist grounded theory approach with formal interviews and focus groups, interviewing students and educators within all fields. When contrasted in this way, several features of the medical apprentice system emerged as significant potential vulnerabilities.

Teaching education to clinicians

One of the most striking drawbacks of the current apprenticeship model is that very few clinicians have any specific education in teaching itself. Virtually all doctors find themselves within teaching roles at some stage, and all of us aim to fulfill the obligations sworn in the Hippocratic Oath: “to impart precept, oral instruction, and all other instruction … to indentured pupils who have taken the physician’s oath”. However, very few clinicians have actually had formal instruction in the theory and execution of effective teaching.

As Watling et al point out, within medicine, a teacher’s credibility is seen to depend more on their personal clinical skills than their teaching ability. This is a stark contrast to music, where teachers’ instructional skills are perceived as paramount, and their own performance proficiency is seen as a more secondary concern. Despite this perception, however, both medical and musical students acknowledged that teaching ability was of profound importance; and—as such—the ideal situation was to have a teacher who was both an apt clinician and an effective teacher.

McCann et al conducted a large survey of senior medical officers (SMOs) within the Auckland region, focusing on the role of ‘doctor as teacher’. His group acknowledged the lack of preparedness of senior clinicians in New Zealand for their teaching and supervisor roles: “the role of SMOs as teachers and supervisors is vitally important to the continued practice of medicine and to the training of the future medical workforce ... In all of the categories surveyed (ie, teaching, supervision and feedback) there was a statistically significant difference between the SMOs’ self-rated competence and the perceived competence required to perform the job (p<0.0001). In other words, SMOs feel inadequately prepared to fulfill their role as teachers”. His group suggested this was a potential source of significant job dissatisfaction for senior clinicians, notwithstanding its impact on the quality of the educational experience provided to students and junior doctors.

While there are professional development opportunities for senior clinicians which focus specifically on the skills of supervision and teaching, these sessions are often brief and relatively infrequent. Tertiary institutions have increasingly recognised the need to bolster health education teaching—the Centre for Medical and Health Sciences Education at the University of Auckland, for example, focuses specifically on the area. The centre offers both formal postgraduate qualifications in medical education and more practical “teach the teacher support” for those in primarily-clinical roles. McCann et al, however, note that educational fixtures of this type are often most attended by clinicians who have formal university affiliation, which is actually a minority of those providing day-to-day supervision.

Lack of continuity

Another unique aspect of the medical apprenticeship model is its inherent lack of continuity. It is, of course, vital that students and junior doctors gain exposure to (and proficiency across) a number of subspecialties, but this inevitably results in a string of short clinical attachments under different supervisors. There is very little long-term
continuity of supervision, which makes it difficult to establish trusting teacher-learner relationships.

Interestingly, many of the musical students surveyed by Watling’s group felt that the continuity of their relationship with their teachers was central to meaningful and effective feedback: “the longitudinal relationship with the music teacher facilitated the perception of feedback as not only accurate and well-informed, but also firmly well-intentioned. Within such trusting relationships, feedback could be more direct, more critical and at times harsher, while remaining influential”.

Medical students, whose supervisor relationships were necessarily much shorter-term, described receiving feedback that was more superficial and felt easier to discard. This feedback was “less likely to be perceived as credible and thus less likely to be accepted and acted upon.”

This issue has been acknowledged among medical educationalists: the University of Auckland, for example, has moved in recent years to a ‘cohorting’ system, which attempts to retain undergraduate medical students within the same institution for an entire year of the medical programme. This, it is hoped, helps to mitigate the detrimental impact of constant transitioning and may allow students to develop longer-lasting and more meaningful relationships with key senior clinicians. However, the system is more effective in small institutions than in larger ones, where continuity is often still minimal. Expanding medical student numbers also present an ongoing logistical challenge.

For junior doctors, educational continuity remains an issue after graduation. Recent industrial action, for example, was a major threat to educational quality and stability. The changes to working conditions mandated in the new Multi Employer Collective Agreement (MECA) settlement present a further challenge to the apprenticeship model, and are likely to further fragment educational exposures. International comparisons are apt here: after work time restrictions laid down in the European Working Time Directive were rolled out in the UK, limiting rostered hours, multiple workplace surveys assessed the impact on junior doctor education. A literature review for the General Medical Council in Britain in August 2012 concluded that “doctors’ perceptions of the educational impact of restrictions are largely negative.”

The negative sentiment was shared by junior doctors and consultants, with issues including missed clinical and surgical experience, reduced exposure to managing emergencies, missed teaching sessions, less ability to follow a patient from admission to discharge, and more general cultural issues such as an absence of teamwork and feelings of less support. The majority of those surveyed felt the more fragmented hours had adversely impacted on the delivery of training.

Dual roles: supervisor and assessor

The dual role of many clinical supervisors as both tutor and assessor is another uniquely medical idiosyncrasy. In most medical student attachments, and in the supervised intern years post-qualification, the senior clinician providing daily tutelage and feedback to the trainee is the precise same individual who will ultimately decide on their definitive assessment grade. This arrangement may dissuade students from openness and curiosity, creating a sense of ‘distance’ and ‘formality’. The assessment grade becomes the focus, unintentionally detracting from the quality of the educational experience.

Mentorship

Many of the issues discussed here (a lack of supervisor continuity and the supervisor/assessor dichotomy) may be difficult to change at a structural level. As such, many have suggested that the succession of clinical supervisors should ideally be supplemented by a longitudinal, more objective relationship with a separate medical ‘mentor’. Fraser provides interesting perspective on the subject, with reference to the historical evolution of medical education and emphasis on the concept of mentorship. His 2004 piece points out that the original medical apprenticeship model was a simple dyad, with a supervisor and his apprentice working together over years. In this context, the supervisor could comfortably assume a mentorship role too. Over time, however, medical training “has moved further away from the traditional apprentice model by focusing very intensely on the acquisition...”
of knowledge ... the satisfaction of the training requirements is largely time-based, although a succession of supervisors affirm that the trainee has performed to an at least adequate standard".9

The dynamic of an effective modern mentoring relationship, then, should be very different to the serial supervisor relationships: it should be parallel to, and uncoupled from, performance expectations or fear of assessment. “Mentorship ... is characterised by an intense and global nature, extending over a long time. It covers both professional and personal issues and is aimed at the mentored person's development, with the mentor having the best interests of the mentored person at heart”.9

In some fields, this sort of relationship is culturally sanctioned (or indeed mandatory). For example, most clinical psychologists and psychiatrists are encouraged to work under lifelong ‘supervision’ (a relationship that, despite its name, is actually much more akin to mentorship). A relationship of this description is accepted as essential—for the professional development and clinical competency of the clinician, but also for their personal and pastoral health: “supervision is proposed as a core competency area in psychology for which a number of elements reflecting specific knowledge, skills and values must be addressed to ensure adequate training and professional development of the trainee ... professional development is a lifelong, cumulative process requiring attention to diversity in all its forms, as well as legal and ethical issues, personal and professional factors, and self- and peer-assessment”.10

In most areas of medicine, however, there is no such expectation, nor any set mentoring framework. As such, mentors are often acquired relatively ‘organically’: “informal mentoring relationships ... develop during training, as the trainee identifies a senior whose practice he/she wishes to emulate”.9 Because of this relatively opportunistic route, then; not every trainee is lucky enough to develop such a connection.

Service load

A final key limitation to the apprenticeship model (and again, one fairly unique to medicine) is the ongoing and inevitable tension between service provision and education. When time is in short supply, service delivery and patient care necessarily take absolute priority over teaching. This conflict can be difficult to navigate even when resources are plentiful, but the reality of clinical medicine in New Zealand’s public hospitals is very different, and clinicians often work (and attempt to teach) in environments which may be thinly-staffed and time-pressured. Recent increases to medical student and RMO numbers have attempted to fill workforce gaps, but have not been matched by proportional increases in SMO positions, further eroding the viability of an effective apprenticeship model.

Jaye et al11 conducted a 2009 observational study of the teaching environment for medical students on surgical ward rounds in Dunedin. They combined direct observation of rounds with medical student interviews, and noted that “high patient volume and throughput can result in decreased learning activities ... If students feel they are in the way or a nuisance, opportunities to practice clinical skills and professionalism will not be taken up”. McCann et al6 show that these concerns are shared at SMO level: “results showed that a number of SMOs reported a ‘lack of time’ or ‘clinical workload’ as the greatest impediment or barrier to teaching RMOs in the workplace”. McCann and colleagues suggest that “possible strategies to overcome these impediments would be appropriate job sizing for consultants, protected teaching time built into contracts, protected time to attend training courses and seminars, as well as specific in-house courses to assist with management and supervision of RMOs. These strategies would be in keeping with trends in international institutions.”6 His group also points out that many SMOs surveyed felt their role as teachers and supervisors was often overlooked, and that a more general cultural shift towards increased interest and recognition of the importance of teaching is required.
Potential solutions

While it is the universally accepted model for the education of medical students and junior doctors, an apprenticeship-style training programme has several key vulnerabilities when applied to medicine. Many doctor-teachers have minimal or no formal educational training, and are often valued primarily on the basis of clinical acumen and experience (which is not always positively correlated with teaching ability). In addition, consistent attachment transitions result in a lack of supervisor continuity, and the dual role of many supervisors as both teacher and assessor can be detrimental to educational experience. Finally, the constant tension between service delivery and time to teach is a major issue, and is perceived as problematic by both teachers and learners.

Solutions for these issues are not straightforward. However, strong clinical mentorship and a culture which emphasises and values mentor relationships (as relationships distinct from instruction and assessment) is vital. Strong objective mentors help to ‘unload’ the clinical attachment supervisor, who—in many cases—is expected to be instructor, assessor, supervisor and pastoral carer all in one. Mentoring helps to circumvent the issues with discontinuity of supervision, and allows feedback to be given within a more trusting framework. While some junior doctors ‘naturally’ find such an individual, this is not guaranteed, and structured networking and mentorship programmes may be invaluable in the establishment of such connections. We may even begin to create a cultural ‘expectation’ of such a relationship, following precedents set by the fields of clinical colleagues in psychology and psychiatry.

As medical student numbers expand, an increased focus on alternatives to apprenticeship is also important. Simulation-based medical education (SBME), for example, is gaining increased credibility as a learning tool; and many medical educational institutions now integrate intensive clinical simulation sessions into the curriculum alongside more traditional ward-based apprentice training and didactic teaching. These are run in high-fidelity environments, and may incorporate interactive mannequins or trained medical actors. They can be multi-disciplinary (the WardSim programme at the University of Auckland, for example, trains medical students alongside colleagues from the nursing and pharmacy). Such initiatives are a valuable adjunct to traditional, apprenticeship-style teaching: “Simulation-based medical education is one of many educational approaches that is used most powerfully and effectively to achieve learning objectives in concert with other educational methods. It complements clinical education but cannot substitute for training grounded in patient care in real clinical settings.”12

In addition, a cultural shift toward increased recognition of the doctor-as-teacher role is well overdue. A systems solution is required, and would need buy-in from the service delivery sector as well as traditional educational and academic institutions. Doctors at all stages of training should be given at least basic training in the art of teaching, supervision and feedback delivery. For the most established and senior members of our medical communities, more comprehensive formal training in teaching and supervision should be mandatory. This may require express changes to guidelines and requirements for clinical educational supervisors within university teaching networks, the prevocational supervision programme and vocational colleges.

Workshops and training days are one aspect of this, but additional measures could include incentivising teaching, providing appropriate leave entitlements and remuneration, and creating clearly ring-fenced teaching roles within hospital environments. (‘Non-clinical hours’ within DHB contracts for senior medical officers are currently nebulously defined, and may be used for administration, research or private sector work well ahead of teaching. More explicit, and appropriately remunerated, protected teaching time is required.)

Educational opportunities should not be offered exclusively to SMOs, but to junior doctors too: fostering strong future teachers is also critical to the future of medical education, and medical students often learn best from junior members of the medical
workforce, whom they may find it easier to relate to.

More structured opportunities for supervision are also important. The New Zealand Curriculum Framework for prevocational medical training has recently moved to a new ePortfolio system, which provides a defined list of clinical competencies and requires maintenance of a sustained supervisory relationship. Importantly, this curriculum accommodates community-based attachments, allowing RMOs to be directly supervised in general practice settings and extending the apprenticeship model beyond hospital-based medicine.

**Conclusion**

Medical apprenticeship follows a time-honoured tradition, dating back to the Hippocratic Oath era. However, its application to modern medicine is imperfect: thinly-resourced health systems create conflicts between service delivery and dedicated teaching time, short clinical attachments threaten quality longitudinal relationships between teacher and learner, and the value of mentorship is often overlooked. There is a need for structural change, which places increased emphasis on ‘teaching the teacher’, which formally recognises the importance of dedicated teaching and incentivises it accordingly, and which provides structured opportunities for clinical mentor relationships. Addressing key vulnerabilities in the prevailing apprentice model, and adjusting this model to keep pace with the changing face of healthcare delivery, is essential for the future of medical education.

**Competing interests:**

Nil.

**Author information:**

Kate Rassie, Clinical Medical Education Fellow, University of Auckland, Auckland.

**Corresponding author:**

Dr Kate Rassie, Medical Programme Directorate, Faculty of Medical and Health Sciences, University of Auckland (Grafton Campus), Private Bag 92019, Auckland 1142. kate.louise.duggan@gmail.com

**URL:**


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