

Learning in practice

New perspectives—approaches to medical education at four new UK medical schools

Amanda Howe, Peter Campion, Judy Searle, Helen Smith

With the expansion in UK medical student numbers, four new medical schools have been established. The authors, all senior faculty members at these new schools at the time of writing, discuss how much the schools have in common in their approaches to medical education

To create more UK doctors, the government has funded an increase in medical student numbers of 57% (from 3749 to 5894)¹ between 1998 and 2005. This has been done by increasing student places at existing medical schools; creating shortened programmes open to science graduates; “twinning” arrangements, which host an existing curriculum at a new site; and four entirely new schools (table 1). Through reflection on our experiences and the literature evidence, we examine to what extent these new schools have a common vision and approach to undergraduate medical education, and we discuss the rationale for and likely outcomes of these new ventures.

Key perspectives

A key aspect of a medical school's ideology is its approach to the curriculum. The UK accrediting and registering body for medicine, the General Medical Council, has for the past decade called for reforms in medical education² and recommended courses that integrate teaching of basic sciences (anatomy, biochemistry) with clinical and social sciences, make use of community as well as hospital healthcare settings, increase overall patient contact, and provide greater student choice. New courses are likely to encourage learning methods that directly link new knowledge to patient care,³ modernise approaches to basic science (in particular anatomy⁴), increase emphasis on appropriate consultation skills⁵ and attitudinal learn-

ing,⁶ and promote a more humane and supportive learning environment.⁷

New schools also have the opportunity to take innovative approaches to selecting candidates for medical education and to the assessments that underpin the direction of student learning. How do the four new medical schools deal with these issues?

Student selection and admissions policies

The new medical schools are funded for UK and European Union applicants, and their approaches have been influenced by the “widening access” debate.^{8 9} They have reconsidered what constitutes necessary prior academic attainment, and they attempt to attract good candidates regardless of age and sociodemographic and school background. Interestingly, although all the new schools offer a full five year undergraduate entry course with no reduction for those who already hold a first degree, between 20% and 60% of their first cohorts have not come directly from secondary school.

All the schools claim to use selection procedures for applicants in which academic criteria are only one hurdle in the process, standardised interviews are the norm, and part of the selection rests on non-academic criteria. All have local access links and programmes to encourage applicants from non-traditional backgrounds (for example, 15% of the intake at the University of East Anglia are from access schemes

School of Medicine Health Policy and Practice, University of East Anglia, Norwich NR4 7TJ
Amanda Howe
professor of primary care

Hull York Medical School, University of York
Communications Office, Heslington, York YO10 5DD
Peter Campion
professor of primary care medicine

Peninsula Medical School, Plymouth PL6 8BX
Judy Searle
associate dean

Brighton and Sussex Medical School, Brighton BN1 9PH
Helen Smith
professor of primary care

Correspondence to:
A Howe
amanda.howe@uea.ac.uk

BMJ 2004;329:327–32

Table 1 Demographics of the four new UK medical schools

Characteristic	Medical schools			
	Brighton and Sussex	Hull York	Peninsula	University of East Anglia
University location (county)	Brighton (Sussex)	Hull and York (north and east Yorkshire)	Exeter and Plymouth (Devon and Cornwall)	Norwich (Norfolk)
Duration of course (years)	5	5	5	5
Intercalated degree (timing)	Yes (after year 3)	Yes (after years 2 or 4)	Yes (after year 4)	Yes (years 3 or 4)
Date of first intake	2003	2003	2002	2002
No of students in first intake	135	130	127 (increased to 167 in 2003)	110 (increase to 130 in 2004)
% of non-traditional students* in first intake	28	20	33	56

*Not directly from school.

Table 2 Admissions requirements and selection methods of the four new UK medical schools

Characteristic	Medical schools			
	Brighton and Sussex	Hull York	Peninsula	University of East Anglia
Academic criteria:				
Traditional school leavers	A level grades A, B, B (biology and chemistry to AS level, one to A2). Minimum of 320 points from 18 units	A level grades A, B, B (biology and chemistry to AS level, one to A2, but chemistry normally required to A2) (under review)	Normally 340 points, at least one science and one non-science subject	A level grades A, A, B (biology essential)
Not directly from school	Access to medicine course (distinction)	Access to medicine course (distinction) or AS level biology or chemistry <i>plus</i> degree at grade 2:1 or professional qualification	GAMSAT score	Various (distinction grade from access courses, first degree at grade 2:1)
Assessment of attributes suited to medicine	UCAS personal statement plus semi-structured interview	UCAS form plus standardised interview rated for caring, independent learning, motivation, and understanding	Standardised interview and teamwork activity (both with quantitative and qualitative scoring)	Both UCAS and standard interview examine personal achievement, teamwork, caring, decision making, and motivation
Fitness to practise assessment	Independent occupational health assessment	Independent occupational health assessment	Independent occupational health assessment	Independent occupational health assessment
Criminal Records Bureau clearance	Required	Required	Enhanced disclosure	Enhanced disclosure

AS=first year of A levels. A2=second (and final) year of A levels. GAMSAT=graduate Australian medical schools admissions test. UCAS=Universities and Colleges Admissions Service.

whereby students from non-traditional backgrounds can do a foundation year of science preparation). The academic performance of applicants who are not coming directly from school is assessed in a variety of ways, with the Peninsula Medical School trialling the GAMSAT (graduate Australian medical schools admissions test)¹⁰ as a screening tool. Table 2 gives further details of the selection procedures.

Curriculum design

Integration

All the new schools integrate student learning by focusing on patients throughout the course. Their curriculums show no traditional divide between clinical and non-clinical phases, nor between basic and applied science. They structure learning around desired outcomes¹¹ and systematically rehearse clinical and technical skills through simulated and supervised “near life” situations. They aim to reduce apprenticeship “tag along with me” learning, which risks wide variation in student opportunities.

All the schools provide a structured learning approach within a “spiral” curriculum (where what the student has already seen and done is explicit, and can be built on)¹²; this is especially valuable when learning is based on more than one campus (such as with Peninsula Medical School and Hull York Medical School) and at dispersed clinical sites. However, there are considerable differences of local detail, with each school having particular innovations in curriculum design (see table 3). These innovations may be

moderated as the GMC assesses each school during its development.

Student selected modules

For students to acquire critical appraisal and research skills, the four schools have adopted repeated use throughout the course of what the GMC called student selected modules. These occupy about 30% of course time and draw on the social sciences and humanities as well as professional fields such as law and health economics. In these modules, students encounter methods and assessment modalities similar to those used in postgraduate education—such as peer presentations. All courses include a summatively assessed research project for senior students.

The options of non-clinical topics (such as humanities at University of East Anglia, Brighton and Sussex Medical School, and Hull York Medical School and community studies at Peninsula Medical School) show how these schools aim to broaden students’ minds and train them for flexible application of new knowledge and perspectives to medical practice. Process goals are also embraced: Hull York Medical School uses a “market” model for students to choose their modules, to demonstrate economic principles, in line with its theme of “managing resources for quality and efficiency”—thus showing students the constraints of reliance on a “provider” market.

Fitness for purpose

Without historical constraints, the schools have designed their curriculums with the aim of creating junior doctors fit for the purpose of working as part of multidisciplinary teams that include the patients. Early patient contact, systematic consultation skills linked to clinical practice, and group learning settings are used to emphasise the responsibilities of the students towards others. Student progress is assessed on attitudinal as well as intellectual progress, thus ensuring that fitness to practise is a formative curricular goal, rather than a retrospective judgment, and enabling early diagnosis and intervention in areas of weakness (see table 4). The development of mechanisms to identify and act on concerns about fitness to practise is likely to provide other institutions with some valuable lessons.



Students in a practical skills session

Table 3 Curriculum features of the four new UK medical schools

Characteristic	Medical schools			
	Brighton and Sussex	Hull York	Peninsula	University of East Anglia
"Anatomy"	Integration of dissection, living anatomy, and imaging. Anatomy teaching continues throughout course	Some prosection, multimedia, and clinical	Non-cadaver teaching of human structure	Prosection, student options in dissection in anatomy SSMS
Problem based learning format	Weekly disease focused clinical symposia	Groups of 8. Two tutorials and usually 2 cases ("virtual patients") a week: tutors are not "content experts." Comprehensive paper study support guides	Three tutorials per case over 2 weeks: tutors are not "content experts." Paper case. Minimal study guides (McMaster modified)	Two meetings a week in groups of 10, plus a structured feedback session to check objectives covered
Information technology in curriculum management	Managed learning environment "studentcentral" can be accessed at all sites	"Blackboard" accessible at all sites, with timetables, course documents, resources, discussion groups, lecture slides, etc.	"Blackboard" accessible at all sites	"Blackboard" accessible at all sites
Early patient contact: clinical settings	25% clinical teaching in years 1 and 2	Overall half of clinical experience in the community; half day in year 1, whole day in year 2, more later	Community placements in years 1 and 2. Pathways of care model for clinical placements years 3 and 4	Consistent clinical contact throughout course. Large group structured clinical teaching in primary care
Special study modules	SSMs in all years Individual research project in year four	Student selected components operating in "free market" environment	Varied choice of community, science and clinical SSMS. Strong research component in years 3-5	Systematic cross disciplinary focus of SSMS in conjunction with research methods
Other features	e-learning course on professional studies during regional attachments in year 5	Pioneering use of "reusable learning objects" through international collaboration for virtual learning (IVIMEDS)	Strong science emphasis in years 3 and 4	Use of professional development objectives in tutoring and assessment
Consultation skills	Consultation skills relevant to the clinical topic being taught throughout in integrated fashion	Integrated teaching of consultation and clinical methods from start. Simulated patients represent "virtual patients" of PBL	Currently incorporated in clinical skills linked to case each week	Specific teaching in each module, using PBL cases to script some simulations as at Hull York Medical School
Interdisciplinary learning	Clinical symposia integrating science and clinical practice from year 1	Not implemented in 2003-4, but planned	Planned shared learning opportunities in year 5—pilot research projects	"Buddy scheme" in year 1 across the health schools—focus on care pathway

SSMS=special study modules. PBL=problem based learning.

Learning methods and assessment

New approaches to life sciences

The basic life sciences are radically altered both in amount and approach, with dissection and laboratory work being replaced in three of the four schools by prosection (pre-dissected material displayed for students to study, examine, and touch) and use of sophisticated models and computerised imaging. The schools are most diverse in this regard, expressing their individuality and preferred philosophies through such issues as anatomy teaching, with Peninsula Medical School not using cadavers at all whereas Brighton and Sussex Medical School includes dissection throughout the course.

Patient focus is retained in theoretical learning through the use of a range of approaches to problem based learning¹³—"virtual patients whose problems unfold over time" (Hull York Medical School); a life cycle model tracking the stages of life through both normal and abnormal function (Peninsula Medical School); interdisciplinary clinical symposia (Brighton and Sussex Medical School); all within a

systematically planned curriculum based on common clinical presentations (University of East Anglia) (see table 3).

Information technology for better communication and integration

All four schools use electronic curriculum programmes ("Blackboard" or "studentcentral") to underpin and coordinate their courses. These allow rapid access to information and quick turnaround of evaluation and messaging, and allow all tutors, assessors, and students at any site to look at the curricular context of their own particular contribution. These managed learning environments form a strong backbone to self directed and e-learning.

Clinical emphasis

All the schools have adopted early contact with patients, supported by large numbers of clinical (NHS) staff as tutors in both campus based teaching and clinical placements. Although the overall time commitment to clinical placements is probably no greater than in other medical schools, they seem to be organised differently. The principle is to base learning on the patient perspective, rather than by specialty. In Hull York Medical School clinical placements, from year 1 to year 4, are fully matched to the specific systems being taught. Peninsula Medical School plans to run placements in years 3 and 4 as "pathways of care" which cross over medical specialties, and University of East Anglia uses large group teaching in general practice that matches patient contact with the "case of the week" rather than opportunistic learning. Introducing new approaches to student learning into a heavily burdened health service is a challenge for the new schools, and the feasibility of such innovations will be judged over time.



Students engaged in small group learning

Table 4 Methods of assessing fitness to practise in the four new UK medical schools

Method of assessment	Medical schools			
	Brighton and Sussex	Hull York	Peninsula	University of East Anglia
Formative	By personal and academic tutors and in core support tutorials	Short tests after each block, longer papers each term. Weekly ratings by clinical placement supervisors and clinical skills tutors. (Do not contribute to summative results)	Multiple opportunities and methods. Case specific as well as preparatory for summative assessment	By tutors and self completed test questions with model answers (MCQs, sample papers)
Summative	Modular assessment with OSCEs, knowledge tests, and wide range of course work assessments. Synoptic assessment in years 3 and 5	By 3 integrated thematic groups, at end of each year, using MCQs, EMQs, SAQs, and OSCPEs	Four vertically integrated assessment modules throughout course. Multiple instruments (progress test, ISCE, judgments, etc)	Advanced notice extended notes, OSCE, critical appraisal, presentations
Fitness to practise	Varied assessment including personal portfolio, clinical reports, and OSCEs	Record of achievement and personal portfolio, structured formative discussion with personal adviser	Module for personal and professional development, portfolio analysis, multiple judgments by assessors	Summative: portfolio report, composite tutor feedback. Formative: structured discussion with personal adviser
Panels	Fitness to practise subcommittee, distinction and prizes committee	Fitness to practise committee, with health and conduct subcommittees convened as required; academic progress committee	Fitness to practise panels: professional behaviour committee, occupational health assessment committee	Fitness to practise panel sits in parallel with each exam board

MCQs=multiple choice questions. EMQs=extended matching questions. SAQs=standardised assessment questions. OSCEs=objective, structured, clinical examinations. OSCPEs=objective, structured, clinical, and practical examinations.

Assessment

Under the close scrutiny of panels of visitors from the GMC's Education Committee, each school has developed rigorous procedures to assess students' knowledge, skills, attitudes, and fitness to practise. Formative assessment is generally used to enable students to appreciate their progress, while summative tests ensure that only those who are performing adequately can progress to the next stage of the course or to their preregistration year. Peninsula Medical School has adopted a progress test (run four times a year) for its major summative assessment of applied medical knowledge.¹⁴ The objective structured clinical (and practical) examination (OSCE or OSCPE) is commonly used to assess clinical skills; projects and presentations are used to assess other academic ability; and portfolios of evidence from students and tutors reveal attitudes and behaviour. Peer and tutor feedback and reflection on experiential learning help students to compile a summatively assessed "portfolio report." The time needed to perform and validate such detailed, multi-faceted assessments may prove challenging as student numbers increase over the first five years, and more so if further expansion occurs.

The wider academic context

There is considerable tension between teaching and research roles in most universities,¹⁵ and this is particularly acute for the new schools—where staff numbers are still building up, there are major educational and organisational challenges in setting up the new courses, and the research units have no institutional track record. Peninsula Medical School has developed research institutions rather than traditional clinical academic departments as the main "home" for its staff, sending a strong message about the value of education in a research-rich environment. Hull York Medical School is placing staff active in research in existing departments of the universities of Hull and York, so providing the infrastructure for research and critical mass for research groups. Time and the research assessment exercise, which compares research performance across UK universities, will tell how successful these arrangements are.

The innovations in the new schools may themselves be under-researched.¹⁶ Evidence is lacking for many of the changes made: for example, the outcomes of new admissions policies cannot be evaluated until the changes have been made. No substantive funding has been offered for research into the comparative outcomes of the new courses across Britain as a whole. A longitudinal cohort study to compare outcomes would be of great value, and, given the taxpayers' investment in the expansion of medical school places, this does not seem an unreasonable proposal. A comparative survey is currently in progress for the Department of Health, which includes representation from the new schools, and this may reveal further research needs.

Conclusion

The four new medical schools examined briefly here, though differing in detail, seem to be using similar approaches to key areas of medical education and have capitalised on the opportunity of development from a "clean slate." They have used evidence and current policy to modernise the selection process, the curriculum, and learning activities in accordance with the expectations of the GMC and the public and the new opportunities provided by modern information technology. Emphasis is placed on changing the "culture" of medical learning—to one that has high academic as well as vocational expectations, where the role models experienced are spread across the whole of the NHS, and where students as learners and patients as teachers are accorded higher value than in the past.

There are areas where one might predict problems. "Worst case" scenarios include a high dropout or failure rate among students from non-traditional backgrounds facing the uncertainties of unconventional curriculums; an inability of the NHS to deliver the expanded clinical placement capacity needed to underpin the expansion in medical training; inadequate academic staffing to ensure a high quality of educational development and delivery¹⁷; conflicting tensions between research and teaching in universities; and a failure to establish a credible research base. There is, however, no evidence to suggest that these scenarios are more likely to come to pass than the more positive ones envisaged in this article.

Summary points

The four new UK medical schools are implementing key reforms in medical education; they show considerable similarities in their approaches to curricular design and learning methods

Key features are integrated curriculums with patient contact throughout the course

Academic training of research methods through student options is central

Altered selection criteria is leading to a different student mix, even in non-graduate entry programmes

These four new medical schools aspire to be the pioneers of 21st century medical education, driven by the enthusiasm of local champions and the need to expand the national workforce. Their shared vision suggests a common set of educational principles, firmly grounded in best current practice but seeking to discover new routes to the goal of quality teaching and learning. The benefits should come to all—when we need the help of one of the next generation of doctors.

Since this article was written, JS has become dean at Griffith Medical School, Griffith University, Australia.

Contributors and sources: All authors contributed equally to identifying key educational issues and providing specific data from their school. AH coordinated the first drafts, with much

help from all in further revisions. The sources of data are largely from the experience of the authors as senior faculty at these schools comparing their approaches to other institutions, and referencing this to the literature.

Funding: None.

Competing interests: None declared.

- 1 Higher Education Funding Council for England. *Increasing medical student numbers in England (Report 01/31)*. Bristol: HEFCE, 2001.
 - 2 General Medical Council. *Tomorrow's doctors*. London: GMC, 2003.
 - 3 Usherwood T, Joesbury H, Hannay D. Student directed problem based learning in general practice and public health. *Med Educ* 1991;25:421-9.
 - 4 Hafferty FW. *Into the valley: death and the socialization of medical students*. London: Yale University Press, 1991.
 - 5 Silverman J, Kurtz S, Draper J. *Skills for communicating with patients*. Abingdon: Radcliffe Medical Press, 1998.
 - 6 Asch E, Saltzberg D, Kaiser S. Reinforcement of selfdirected learning and the development of professional attitudes through peer and self assessment. *Acad Med* 1998;73:575.
 - 7 Sinclair S. *Making doctors: an institutional apprenticeship*. Oxford: Berg, 1997.
 - 8 Universities UK. *Social class and participation: good practice in widening access to higher education*. London: UUK, 2002.
 - 9 Holmes D. Eight years experience of widening access to medical education. *Med Educ* 2002;36:979-84.
 - 10 Australian Council for Educational Research. *Graduate Australian medical schools admissions test UK: information booklet 2002-2003*. Cheltenham: Universities and Colleges Admissions Service, 2002.
 - 11 Harden RM, Crosby JR, Davis MH, Friedman M. Outcome-based education 5—from competency to meta-competency: a model for the specification of learning outcomes. AMEE Guide 14. *Med Teach* 1999;21:546-52.
 - 12 Harden RM, Stamper N. What is a spiral curriculum? *Med Teach* 1999;21:141-3.
 - 13 David T, Patel N, Burdett K, Rangachari P. *Problem based learning in medicine*. London: Royal Society of Medicine, 1999.
 - 14 Van der Vleuten CPM, Verwijnen GM, Wijnen WHFW. Fifteen years of experience with progress testing in a problem-based learning curriculum. *Med Teach* 1996;18:103-9.
 - 15 Department for Education and Skills. *The future of higher education*. London: Stationery Office, 2003. (www.dfes.gov.uk/hegateway/strategy/hestrategy/pdfs/DFES-HigherEducation.pdf, accessed 5 Jul 2004).
 - 16 Prideaux D, Bligh J. Research in medical education: asking the right questions. *Med Educ* 2002;36:1114-5.
 - 17 Smith T, Sime P. *A survey of clinical academic staffing levels in UK medical and dental Schools: a report to the Council for Heads of Medical Schools*. London: Council for Heads of Medical Schools, 2001.
- (Accepted 17 February 2004)

Commentary: Promises and delivery—a research imperative for new approaches to medical education

David Prideaux

Howe et al describe the approaches to medical education in the four new medical schools in the United Kingdom.¹ The new programmes embrace wider selection procedures, spiral curriculums, fitness to practise, integrated clinical experiences, and comprehensive assessment processes. The reforms are part of wider changes throughout British medical education, and Britain is not alone in this endeavour. In Australia there have been similar changes in existing and new medical schools.² Indeed, the past 20 years have seen worldwide reforms if measures such as adopting problem based learning and creating medical education units are to be taken as key indicators.

Several external factors have been driving the reforms, and their importance was apparent in my study of four international medical schools that were changing their education programmes or creating new ones (unpublished data). In both Britain and Australia the external forces have come through funding from governments with clear agendas to change both the quality and quantity of future entrants to the medical workforce.

External support does not come without obligations. External sponsors want to know if the programmes they support have the desired impacts on the healthcare system. Providing the answer to this type of question is not easy, as some writers on medical education reforms in North America have shown.³ Determining which attributes of graduates from innovative medical schools are important and how long they are retained as careers progress are complex problems. But therein lies an opportunity for staff in the new or changed medical schools.

Funding for workforce reforms frequently targets teaching initiatives without investing in research. Howe et al outline some of the difficulties of conducting medical education research at the same time as establishing new education programmes and the implications of this for the scholarship of medical education where programmes are located in otherwise research-rich environments.

There is at least one profitable direction for research in new or changed medical schools. Impact or outcome research may provide external sponsors with

Department of Medical Education
Flinders University,
GPO Box 2100,
Adelaide, South
Australia 5001
David Prideaux
head
david.prideaux@
flinders.edu.au