

COMMISSIONED ARTICLES

Undergraduate Medical Education in Scotland, 1955 and 2005

*Professor James H McKillop**Head of Undergraduate Medical School**University of Glasgow*

Correspondence to:

Wolfson Medical School Building

University of Glasgow

Glasgow

G12 8QQ

Introduction

The last 50 years have been a time of very substantial changes to undergraduate medical education in Scotland and elsewhere, and, in particular, the last 10-15 years have seen a very welcome resurgence of interest in undergraduate medical education, with a questioning of its objectives and increasing value given to expertise in educational development and delivery. The purpose of this very short article is to explore the changes which have happened in undergraduate medical education in Scotland since 1955 and to highlight some current points of debate or continuing development.

A comprehensive account is not possible in the space available, so I will concentrate on four main areas:

Changing perceptions of the purpose of undergraduate medical education.

Changes in the number of medical schools in Scotland, in medical student numbers and in student demographics.

Funding of medical education within the NHS.

Collaboration between the Scottish schools.

The purpose of undergraduate medical education

In 1955, only two years after the Junior House Officer Year became a compulsory condition for full General Medical Council (GMC) registration, medical courses had to produce graduates against a background where many of them would proceed to full, perhaps single handed, independent practice as a general practitioner one year later. Medical curricula in 1955 were characterised by a strict division into pre-clinical and clinical phases. Thus the 1955 Glasgow course, which was 6 years long, had a pre-clinical phase of 2 years and 2 terms in which a variety of sciences underpinning medicine were studied.¹ Chemistry, physics, zoology and botany were all included in the early part of the course, as well as the "preclinical" biomedical sciences but the psychological and social sciences were completely absent. There was no patient contact in this initial period. Clinical experience, and study of the pathological sciences began in the Third Term of Year 3. The remaining three years of the course consisted of a series of clinical attachments and lecture courses. There was no specified clinical time in General Practice or other community settings,

though the Faculty of Medicine minutes for 1955-56 refer to a recently introduced series of lectures in General Practice which had been poorly attended.² All of the assessments were in single disciplines.

The period since 1955 has, of course, seen an explosion of knowledge in the biomedical and other sciences relevant to medicine, linked to even more complex and effective diagnostic and therapeutic opportunities and increasing medical specialisation. How to reflect this in undergraduate courses has been a major dilemma. Medical schools reacted to this by sequential additions to the curricula, at the same time, for the Scottish schools, as a reduction in course length from 6 to 5 years. Not surprisingly, this produced an increasingly packed curriculum. The GMC identified this overload in a number of reports and urged the medical schools to reduce the factual burden and to produce graduates who were generic clinicians rather than mini specialists in multiple disciplines.

The key document in resolving this was "Tomorrow's Doctors", published by the GMC in 1993.³ This report has produced a fundamental shift in undergraduate medical education in the UK and beyond. Tomorrow's Doctors 1993 reflected on the problems of "gross overcrowding of most undergraduate curricula", the fact that all doctors would undergo a period of postgraduate training, a shift in the balance of healthcare from hospitals to the community, the increasing role of members of other caring professions and the challenges of increasing specialisation. It also addressed the increasing public concerns that doctors were very knowledgeable but often lacked the practical professional and personal skills necessary for good medical practice.

The main recommendations in Tomorrow's Doctors 1993 were:

- A curricular style which would encourage "student centred learning"
- Integration of the curriculum with "interdisciplinary synthesis"
- A more rigorous definition of the core curriculum with reduction in factual burden
- Acquisition of and understanding of relevant scientific and clinical knowledge

- Development of proficiency in basic clinical skills
- Acquisition of and demonstration of attitudes necessary to achieve high standards of clinical practice
- Assessment systems which adequately test the achievement of the educational goals
- The introduction of Special Study Modules – also known as Student Selected Components (SSCs) – to allow students to explore non core material in which they were interested.

These themes were developed further in the second version of *Tomorrow's Doctors* published in 2003.⁴

The first edition of *Tomorrow's Doctors* produced substantial activity by all medical schools as they moved to address the recommendations. A variety of approaches were adopted and, as a result, there is much greater variation in the styles of undergraduate medical courses in 2005 than there was in 1955. All schools, however, are working to fulfil the outcomes set out by *Tomorrow's Doctors*. There is substantial experience in primary care and the psychosocial sciences are integral. All of the Scottish medical schools have developed more integrated curricula, usually based on organ systems rather than extensive and stand alone courses in specific disciplines. Each school has introduced curricular features, which will equip graduates with the skills to become "life long learners". All have introduced patient contact from an early phase of the curriculum and begin to develop clinical and professional skills from early in Year 1. Definition of content and control of assessment no longer lies with individual departments; rather it is a more communal process. The style of assessments has changed to allow more objective assessment of knowledge and competencies. There is increasing use of "standard setting" (also known as "criterion referencing") to define pass marks. In this approach a minimum standard is set for competence and all students attaining it passed rather than passing a fixed proportion of candidates or having a constant pass mark for all assessments ("norm referencing"). Much of the initial work in developing objective clinical assessments was done by Prof Ronald Harden and his team in Dundee, notably in devising the Objective Structured Clinical Examination or OSCE.⁵

The changes resulting from *Tomorrow's Doctors* have produced much greater clarity and objectivity in defining curricular aims and outcomes but a series of questions remains which are the topic of debate and require further work, including:

- What knowledge and competencies should the core curriculum contain? Reduction in factual content is required, but students must still have the core knowledge required for safe practice. Has the right balance been struck between what is taught to medical undergraduates and what is acquired as a postgraduate? Has the right balance been achieved between the "hard" scientific or skills outcomes and "softer" ones relating to personal attributes?
- How can professionalism be taught and assessed?

Many schools are developing portfolios to evaluate this crucial component. Work is needed to ensure such portfolios link with those which will be used after graduation. NHS Education for Scotland and the Medical schools are beginning to discuss this. All medical schools have set up Fitness to Practice procedures for students whose behaviour causes concern about their suitability for clinical practice. The GMC has recently sought views on whether medical students should have some form of registration with them.

- Working in a multidisciplinary team is central to all clinical practice. How can this be taught to medical students and can it be assessed? Similarly, what is the role of interprofessional learning – should it be strongly represented in the undergraduate curriculum or is it a predominately postgraduate activity?

- How can standards be assured? Fifty years ago the GMC was a relatively distant body for medical schools, with occasional short inspection visits to schools. Now there is regular interaction between the schools and the GMC. All Schools submit an annual report to the GMC, specifying changes to their courses or assessments. In 2003, the GMC introduced their Quality Assurance of Basic Medical Education programme,⁶ initially in a pilot form. This differs from the previous inspection process in being much more detailed and more interactive with schools and entails a series of visits by a GMC team to the school over an academic year. A recent GMC consultation asked if there should be some form of national assessment at the end of the undergraduate course.

- What is the correct balance between the core and student selected components (SSCs)? The second edition of *Tomorrow's Doctors* indicates that SSCs should occupy 25-33% of a standard five year curriculum.

- How can the undergraduate/postgraduate interface be optimised? The introduction of Foundation Programmes, with a curriculum and defined outcomes, is a welcome step. The Postgraduate Medical Education and Training Board (PMETB) has recently been set up to supervise postgraduate medical education⁷. The undergraduate schools must work with the GMC, PMETB and the Postgraduate Deans to ensure that the undergraduate curricula and postgraduate training fit well together.

Medical Student numbers

The number of medical students studying at the Scottish medical schools has increased substantially since 1955 (Table 1). There has also been a substantial change in the gender balance – in 1955 the male/female ratio at Glasgow and St

Table 1 - Medical School intake in Scotland

Medical School	Intake in 1955-56(1, 2)	Intake Targets 2005-6 3
Aberdeen	Not available	175
Dundee	0	154
Edinburgh	178	218
Glasgow	166	241
St Andrews	85	112

Andrews (the two institutions for which I have been able to obtain figures) was 75.2%/24.8%^{8, 9}, while in 1963 an UCCA survey showed that 29% of entrants to UK medical schools were female.¹⁰ In recent years UK medical schools have typically had a 60% or greater female intake.¹¹

The number of medical schools in Scotland has also changed since 1955, though Scotland has not seen the rapid expansion which has occurred in England in the last 5 years or so. Prior to 1966, medical students who received their pre-clinical education in St Andrews moved to Dundee for their clinical course. This arrangement ended in 1966 when Queen's College, Dundee, originally a College of St Andrews, became Dundee University and established its own medical school. St Andrews entered into a partnership with the University of Manchester, which had become aware of the very great potential for undergraduate clinical education in their region. Following approval by the Royal Commission for Medical Education and the University Grants Commission, the link was forged in 1967 and has continued successfully to the present. (I am grateful to Dr David Sinclair for providing information on the history of the link).

A Review of Basic Medical Education in Scotland was published in 2004, authored by Sir Kenneth Calman and Mr Michael Paulson-Ellis.¹² This report examined whether additional medical student places were needed in Scotland to ensure an adequate medical workforce, in the light of expected demographic changes, changes in healthcare delivery and changes in doctors' work patterns and hours. The Scottish Executive responded to this in June 2005¹³, by deciding that, as a first step, 100 of the students who currently transfer from St Andrews to Manchester should be reallocated for their clinical training to the other four Scottish medical schools and the time course of the introduction of the new arrangements is currently under discussion.

Another major topic highlighted in the Calman Report is "Widening Participation" – i.e. having a student body which is more representative of our population as a whole. All Universities have programmes to increase the recruitment of students who come from backgrounds with a traditionally low participation rate in Higher Education. Medical schools, with tightly controlled student numbers and a surplus of academically highly qualified applicants, face particular difficulties in meeting this challenge and are responding in various ways such as Access Courses or programmes in relevant secondary schools to help bright pupils attain the academic entry requirements. The Scottish schools have all joined a recently formed consortium of 23 UK medical schools which is developing cognitive and aptitude testing instruments which may be useful, in conjunction with academic achievement, in student selection. A number of English medical schools have set up shortened (typically 4 year) programmes for graduate entrants, but no such courses yet exist in Scotland.

Funding Undergraduate Medical Education in the NHS

The NHS provides a substantial and essential input to undergraduate medical education, both in terms of staff time and other resources. For more than 30 years this cost to the NHS has recognised through the provision of Additional Costs of Teaching (ACT) monies, which was paid directly by the Health Department to the "Teaching Boards".

In recent years concerns have been voiced about the transparency of use of ACT funding, the different rates of ACT operating in the various Scottish medical schools, the division of funding between "Teaching" and "Non-Teaching" Boards and between hospital and community settings. Following a report of a subgroup of the Standing Committee on Resource Allocation¹⁴ the Health Department decided that ACT monies would be channelled through NHS Education Scotland, who would pay funds directly to Teaching and Non-Teaching Boards based on activity. This process is currently being developed further. Parity of funding is likely to take some 5 years to achieve. NHS Education Scotland and the medical schools are currently working on methods for ensuring greater transparency of use of ACT funds and on measuring the quality of teaching delivered. In a parallel move, medical schools are developing or refining Memoranda of Understanding and Service Level Agreements with their partner Health Boards as required in a recent Health Department Letter, issued following the introduction of the new consultant contracts¹⁵. The loss of "knock for knock" arrangements between medical schools and health boards and their replacement with these more formal mechanisms is deprecated by some, but I believe they are a necessary development to ensure that the provision of clinical teaching, and the appropriate use of funds to support it, are insulated against the pressures of NHS service delivery.

Cooperation between the Undergraduate Medical Schools

In 1955 there was little collaboration between the four Scottish medical schools in the provision of undergraduate medical education, other than to provide external examiners for one another. Shortly after the publication of *Tomorrow's Doctors* in 1993, a group was formed from the four clinical schools to discuss how to respond to the report. After a series of meetings over 12-18 months, the group dissolved, but individuals within the schools maintained contact and in 1998 The Scottish Deans' Medical Curriculum Group (SDMCG) was established with membership from all five schools. This group met for the first time in February 1999, under the Chairmanship of John Simpson from Aberdeen. (I am grateful to Prof Simpson for providing information on the setting up of the group). The SDMCG has continued to meet regularly since then. It has produced two major reports on curricular outcomes and assessment^{16, 17}. The outcomes contained in these reports (known as "The Scottish Doctor") are agreed by all five schools as appropriate objectives for an undergraduate medical course and suggest possible methods of assessing them. The Scottish Doctor publications are widely cited and used internationally as source documents for designing curricular content and

assessment. SDMCG is presently working on areas of common concerns to all of the schools including standard setting of assessments, student portfolios, training students to provide acute care and the interaction between the UK schools and Foundation Programmes. It is hoped that a shared post (funded by the Medical and Dental Defence Union of Scotland) will be appointed in 2006, to support further development of ethics and medico-legal aspects of the five curricula.

The Calman Report¹² also recommended the setting up of a Board for Academic Medicine in Scotland with membership from all five medical schools. This Board has now been established, under the Chairmanship of Sir David Carter, and met for the first time in December 2005. It is likely that this Board, on which the NHS and the Funding Council are also represented, will be a very important and powerful force for the co-ordinated activity of the Scottish medical schools in a whole range of activities, including undergraduate medical education.

Conclusions

The core activity of a medical school is undergraduate medical education. Other activities, such as research, clinical duties and professional leadership are also important, but they are secondary to the task of educating the doctors of the future. Scotland has a long tradition of delivering internationally respected. Initiatives such as those described in this short paper will support the maintenance of that proud record.

Acknowledgements

I am grateful to Dr Hamish McKenzie (Aberdeen), Professor Martin Pippard (Dundee), Ms Lesley Richmond (Glasgow University Archives), Professor John Simpson (Aberdeen), Dr David Sinclair (St Andrews) and Dr Donald Thomson (Edinburgh) for providing information used in this article.

Sources

¹Personal communications from Drs Hamish Mackenzie, Donald Thomson and David Sinclair

²Glasgow University Archives

³Scottish Funding Council website – <http://www.sfc.ac.uk/library>

References

1. University of Glasgow Calendar 1955–56, 346–359, Jackson, Son and Co. Ltd. Glasgow
2. Faculty of Medicine Minutes, 11th October 1955
3. General Medical Council. Tomorrow's Doctors: Recommendations on Undergraduate Medical Education. London. December 1993
4. General Medical Council. Tomorrow's Doctors: Recommendations on Undergraduate Medical Education. London. February 2003
5. A Handbook for Medical Teachers, 3rd edition, Newble, D and Cannon R. Kluwer Academic Publishers, London, p 136
6. <http://www.gmc-uk.org/gambe/index.htm>
7. <http://pmetb.org.uk>
8. Personal communication, Dr David Sinclair
9. Glasgow University Faculty of Medicine Minutes, 11th October 1955
10. The Universities Central Council on Admissions (1964) First Report. 1961–63. London UCCA
11. The demography of medical schools: a discussion paper. British Medical Association, London 2004.
12. Review of Basic Medical Education in Scotland. Scottish Executive. Edinburgh. 2004
13. Review of Basic Medical Education in Scotland. The response of the Scottish Executive. Scottish Executive. Edinburgh. 2005
14. Research on Additional Costs of Teaching in NHS Scotland. Final Report SCRA (2003) 8, Standing Committee of Resource Allocation in NHS Scotland, 2003.
15. Treatment of Teaching, Training and Research under the New Consultant Contract and Development of Memoranda of Understanding between Universities and NHS Boards, Scottish Executive Health Department HDL (2004) 25, 2004.
16. Learning Outcomes for the Medical Undergraduate in Scotland: A Foundation for competent and reflective practitioners. Scottish Deans' Medical Curriculum Group, 2000.
17. The Scottish Doctor. Undergraduate Learning Outcomes and their Assessment: A foundation for competent and reflective practitioners. Scottish Deans' Medical Curriculum Group, 2002 (available at <http://scottishdoctor.org/>)