

## MEDICAL EDUCATION AT THE UNIVERSITY OF SYDNEY - THE LAST 40 YEARS

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### Abstract

Medical education in Sydney was initiated in 1883. Designed for undergraduates and based on the highly regarded Scottish system of medical education, it was scientifically rigorous, progressing from basic science to clinical work. Those fundamental principles of the curriculum did not change substantially in 90 years. Changes introduced in the 1970s (reducing six years to five) and 1980s (returning to six years) were designed to enhance and integrate the scientific and clinical content, but the basic structure remained similar. New subject areas were progressively included, but teaching methods were basically didactic, with few exceptions. Clinical contact was delayed. Departmental budgets were based on contact hours, leading to competition for curriculum time. The consequence was an overloaded curriculum, punctuated by largely written examinations; students had only a limited sense of a progression in knowledge, understanding and skills. One medal-winning student characterised the program as "doing the Higher School Certificate six times". Radical change was instituted during the 1990s, with the development of a four-year, graduate-entry program that is integrated and problem-based. The role of the Australasian and New Zealand Association for Medical Education is discussed.

### The first curricula

The Medical School at the University of Sydney was founded in 1883 when the 26-year old Professor TP Anderson Stuart arrived as Dean. He instituted a curriculum based on the rigorous Scottish model of the time, considered then to be "state-of-the-art".<sup>1</sup> Students first enrolled in a year of Arts, studying the basic sciences and clinical subjects for three years. The Arts requirement was abandoned early 1889 and the program extended to five years. In 1922 it was lengthened a little and in 1926 it was extended to a full six years. The underpinning philosophy did not change, although the curriculum was shortened during World War II. A small number of early subjects were later removed (eg. latin, materia medica, botany), but new scientific disciplines were progressively included, eg. physiology and biochemistry were separated in 1948 and neuroscience was introduced in the 1960s, combining neurophysiology and neuroanatomy.<sup>2</sup> The growth in knowledge was relatively slower in the 1950s than now. Eg. a classmate of ours in first year at that time comfortably used his father's zoology notes; the lectures (and even the drawings carefully done on the blackboard) had not changed in any substantial way.

Up until about 40 years ago, few academic staff were salaried. Major departments had a tenured professor as head, but lecturers – often medical practitioners – worked part-time. Departments that offered practical work usually had a full-time demonstrator, but the classes tended to be repetitive, traditional and uninspiring. By no means all staff undertook research. Clinical teaching was idiosyncratic as it depended on unpaid tutors and needless to say they exhibited a wide range of abilities in teaching; their levels of enthusiasm (and competence) varied considerably. Medical education was just starting to become a recognised area of study. Forty years ago, Australian medical schools were still accredited by the General Medical Council of Great Britain, nothing like as rigorous or supportive a process as that later developed by the Australian Medical Council.

### Curriculum change in the 1970s and 1980s

A major systematic reform started from 1969 with the planning of a five-year curriculum, which was introduced in

1974. The reasons for the reduction to five years remain somewhat obscure. Staff in both medical schools in Sydney apparently thought they needed to make the change because the other was doing it. At that time, two interfaculty workshops for the medical faculty of Sydney and NSW on evaluation and curriculum development were convened and conducted by Bill McCarthy, which were influential. These workshops led subsequently to the development of the Australasian and New Zealand Association for Medical Education (ANZAME).

Bill McCarthy was Subdean for Medical Education at the University of Sydney from 1975 to 1989. In that role, he was a member of the Dean's advisory committee on curriculum and was active in the progressive implementation of the five-year curriculum, although he was not the originator of the idea for the reform. Bill had gained a Masters degree in medical education at the University of Illinois with medical educational pioneers George Miller and Thomas King. In 1973 he prepared a crucial faculty paper encouraging evaluation of teaching by students. This issue was vigorously debated and some staff felt it was inappropriate for students to comment on experienced teachers. In 1975 a faculty committee of students and teachers successfully developed an effective process which was subsequently endorsed and has been consistently implemented since that time. Indeed, enhanced and better resourced, it remains a centrepiece of the current curriculum. A Staff-Student Liaison Committee was established for ongoing face-to-face discussion of these issues.

David Madison, the Dean of the Medical Faculty at that time was an enthusiastic educator and, with Bill McCarthy as convenor, initiated a workshop on curriculum change which facilitated the curriculum developments. Several educational papers were published, including a comparison of the Australian and American systems<sup>3</sup> and surgical clerkships.<sup>4</sup> Other papers on the examination process<sup>5,6</sup> and the techniques of teaching<sup>7,8,9</sup> followed.

Curriculum planning provided a major opportunity to review the Sydney program, remove redundancy and introduce some clear improvements. In 1974, faculty summarised six key aims of the new curriculum: horizontal integration between preclinical disciplines; the introduction of behavioural sciences;

the development of integrated clinical sciences; the introduction of general practice; the inclusion of specific teaching in history-taking and physical examination; and the development of a strategy for progressive assessment.

Some of the difficulties in developing a new curriculum arose because, at the time, Sydney was by a considerable margin the largest medical school in Australia, with the most daunting student-staff ratios. Statistics from the Australian Universities' Council in 1975 recorded figures for Sydney Medical School of 1804 students enrolled, 159 equivalent full-time staff and a student-staff ratio of 11.3. These figures compared unfavourably with the next biggest, Melbourne, with 1625 students, 216 staff and a ratio of 7.5. It was noted at the time that a continuing problem for Sydney had been that the great majority of clinical teachers were generally unpaid, unlike their counterparts in some other states.

Other major educational initiatives occurred after the arrival of Michael Blunt in 1973 to the Chair of Anatomy who had a long commitment to enhancing the teaching of anatomy. Dissection was no longer mandatory but available as an option. Students studied in discussion groups with a tutor, using prosected specimens to meet defined objectives. The method was very popular with students and many staff; it was demonstrated to be educationally superior, with better long-term retention of knowledge.<sup>10</sup> The program was also time-efficient and cost-effective.

Despite some effective initiatives, strains soon developed in the new curriculum, reflected in faculty minutes. Without agreed goals (which had not been developed), there was no effective way to manage the curriculum. Despite the faculty's commitment to integration, individual departments vied to include yet more material because their funding depended on contact time and the numbers of students. The students were vocal in their complaints of overload, overlaps and redundancy. Material was not integrated, the levels of detail were often inappropriate for undergraduates and some of the information was largely irrelevant. Thus in 1980 discussions were held about extending the curriculum again to six years. A report recommended extension, but it was not implemented at that time.

In 1983, for the first time, clinical students completed a questionnaire that sought their views on the whole medical course. Half of the students in each of the last two years (four and five) completed the questionnaire. They generally felt that most of their subjects were providing appropriate preparation for practice. Nevertheless, 79% supported lengthening the program. Also in 1983, the Australian Medical Council was established in December, to start the process of accreditation from 1985. It was to become the major force for curriculum review and development across all Australian and New Zealand medical schools, but Sydney was not listed for its first accreditation visit until 1993.

After a faculty retreat, it was agreed that a small, effective "curriculum committee with teeth" should be established to develop a six-year curriculum. A "core plus options" approach was suggested, with integration to be a key element. The paramount need for faculty development in teaching was recognised. The report was adopted in 1984 and the new curriculum was to be developed and overseen by interdepartmental committees. Some time afterwards, objectives were agreed, but inevitably too late to drive curriculum design. Nevertheless, initiatives included logbooks and journals, a wider use of multiple-choice questions and clinico-pathological discussions.

During 1988, as the new program was being implemented, it was recognised that one of the difficulties in the curriculum lay in the lack of "vertical integration" between basic and clinical learning. A lively workshop was held, with M Field, J Harris and A Sefton elected as sub-deans. Their final report recommended mechanisms to encourage discussion across all six years of the curriculum within "vertical streams" – topic areas that extended throughout all years of the curriculum. While many themes were designed to link related basic and clinical sciences (eg. heart and circulation, nutrition, neuroscience), other issues (eg. growth and development, ageing) were included. After much discussion and activity, it became apparent that existing departmental structures made it impossible to implement such a "vertical" curriculum. Undoubtedly, the most valuable legacy of those discussions was a greater awareness of shared interests between basic science and clinical teachers. Not only did those meetings provide an invaluable basis for the collaborative development of the next curriculum, a number of cross-disciplinary research projects were born and new friendships were generated.

Another long-running issue was that of student selection. In the 1950s, any applicant could enrol in any faculty providing he or she had achieved a minimum of five Leaving Certificate B passes. Subsequently, entry requirements were tightened, until medicine at the University of Sydney was the most difficult university program in NSW to enter. There was substantial evidence that many lacked any specific motivation. They enrolled because they "got the marks" or as a result of pressures from families and schools. Failures and discontinuations were common. The faculty compensated to some extent by opening up places for internal transfers and for a small cohort of graduates and others with health professional qualifications.

### **Genesis of the Graduate Medical Program (now the Sydney Medical Program)**

By the early 1990s, an increasing sense of frustration developed. All the educational effort so far had not resulted in significant change in the curriculum, which remained overloaded and traditional in approach. There was by then an increasing literature on medical education; many academic and clinical staff were reading about alternative ways of educating medical students. Some had experienced other systems while on sabbatical leave or had visited Newcastle (NSW) Medical School. Nevertheless, each department or unit approached their educational tasks from an independent perspective, leading to duplication and gaps. Worse, the educational approaches were inconsistent or even conflicting.

Professor John Young, as the new Dean from 1989, was strongly aware of these issues and tensions, although his predominant interests had previously centred in research. During a visit to Harvard in 1991, he arranged for Ann Sefton to attend an intensive week-long educational leadership course there. By chance, Stephen Leeder, who was undertaking a sabbatical, was one of the faculty for the week. They both agreed that there was no real reason why Sydney could not make a similar change, despite the lack of Harvard's immense financial resources. In following years, the Dean arranged for a number of other key academic staff members to attend the Harvard program.

In October 1991, the faculty determined to explore the possibility of moving to a four-year, graduate entry program. Committees were formed to write reports which were presented to a meeting of faculty for final decisions in one

year's time. Committees were established with nominated chairs; members of faculty and students were encouraged to join one or more of them. Goals were to be developed and made explicit (Chair: Stephen Leeder), a curriculum would be outlined (Ann Sefton); modern assessment methods would be designed (Bill McCarthy); new strategies for admission were prepared (Ian Fraser) and a blueprint for the development of clinical schools was prepared (John Stewart). In the event, the total contributions to the planning committees came from 98 members of staff and 17 students, some contributing to more than one committee. It was a time of intense but creative activity; new alliances and friendships developed and those who contributed gained a greater understanding of different viewpoints. The previous work on vertical streams had provided a very useful foundation by initiating and supporting communication between individuals and departments. The charismatic Professor Dan Federman, Dean of Education at Harvard Medical School visited during the year and provided strong support.

At the biggest faculty meeting ever held, a vote was taken. The final decision was made on the basis of the detailed report, with one caveat: the Dean had to be assured that resources were sufficient. The result was 166 in favour of a four-year goal and theme-based graduate entry program, a focus on problem-based learning, new assessment strategies and early clinical contact. Six voted against the motion; some (not all) of those later participated willingly and creatively in developing the program. Michael Field and Ann Sefton were appointed as Associate Deans (curriculum).

Unfortunately, soon afterwards, planning activities had to be put on hold for well over six months as we prepared the documentation for the essential accreditation by the Australian Medical Council of the existing program. Although notice had been given of a radical change, Sydney was still required to complete the full formal accreditation of a program that would only be accepting a few more intakes. After that experience (which was shared with Flinders Medical School whose program was accredited in the previous year), more realistic arrangements have been put in place when medical schools give notice of a change in curriculum.

A most valuable source of support came from the realisation during the planning year that two other Australian medical schools were thinking of a similar move - Flinders and Queensland. A consortium of the three universities was formed; it provided mutual support and significantly eased the burden of development by sharing the responsibility for leading on specific issues<sup>11,12</sup>. Many Sydney staff also attended a range of consortium meetings, as well as educational conferences and courses locally and internationally. A number visited other problem-based learning (PBL) schools, including MacMaster (the "home" of PBL), Newcastle NSW (which generously provided strong support particularly in admissions and in introducing Sydney staff to PBL), Harvard and Maastricht, amongst others.

Key features of the new program include graduate entry on the basis of academic performance in: a first degree; aggregate performance in a Graduate Australian Medical Schools Admission Test (GAMSAT) developed by the Australian Council for Educational Research<sup>13</sup> to include reasoning in the sciences, and in the social sciences, as well as a writing task. On the basis of their results, applicants are invited to a structured interview which is currently undergoing modification.

At the heart of the curriculum are the goals which define four themes that extend throughout the program: basic and

clinical science; patient and doctor; community and doctor; and personal and professional development. The themes form the basis for the organisation of the program and the integrated assessment. Problem-based learning extends throughout, designed to stimulate discussion, critical thinking and problem-solving in all of the themes in each weekly problem. Clinical contact starts from the first week; students spend a day each week in their clinical school, learning the skills of communication, examination and procedures, as well as observing and interacting less formally with patients and clinical staff. A Medical Education Unit, now the Office of Teaching and Learning in Medicine, was established on campus to manage the program with Jill Gordon as Associate Dean and Head. Its expert tasks include: ongoing systematic development; managing assessment; extensive program evaluation; and supporting and leading the development of scholarship and research in teaching and learning. The office also continues to train PBL and clinical tutors as well as interviewers for the admissions process and offers seminars on educational issues. Staff publish regularly in the literature of medical education. Last year, a Masters in Medical Education degree (partly online) was developed and it is proving popular. Notably, the Department of Surgery established its own educational unit, led by Bill McCarthy between 1994 and 1996. From that unit have come studies on formative assessment<sup>14</sup> and competency based education<sup>15</sup> amongst others.

Perhaps the most innovative aspect of the program has been the development of a unique learning management system supported by information technology (IT), under the leadership of Simon Carlile and Stewart Barnett.<sup>16</sup> Providing a framework and supporting many aspects of the students' learning, the system is used to provide the triggers for the problem-based learning discussions (an image and a short statement). It allows the timed release of data on the patient including images and clinical information. Staff prepare resources relevant to each problem and the librarians have been invaluable in ensuring access to high quality materials on-line; they also help to develop the students' bibliographic searching and critical appraisal skills for evidence-based medicine. Students can access recommended websites, communicate with staff and each other. The function most used provides access for the students to online questions for formative self-testing; they use it at all hours of the day and night. In the future, a project is under way to transfer written examinations to online delivery. Evaluation of all aspects of the program, a key feature, is also carried out online. With the development of distant rural clinical schools, distant teachers and students have access to the same resources as their city-based colleagues. Further, the ongoing development of sophisticated teleconferencing facilities encourages interaction between disparate sites. The expertise in educational IT developed during the development of the program has enabled a very successful unit, the Centre for Innovation in Health Professional Education, to be established. It currently successfully bids for educational contracts from various sources, including some of the postgraduate medical colleges and government organisations.

Continuing a theme initiated by Bill McCarthy, evaluation of the program and of the students' learning experiences is vital to the continuing and future quality of the program. Newer methods make this process simpler and more effective, but the underlying philosophy has not changed. All aspects are open to review: tutorials, quality of materials and resources (including library and IT), effectiveness of tutors and teachers, perceived relevance and clinical experiences.

One measure of the impact of a program is evidence of its adoption by other institutions. In Sydney, the first two years of the medical program have been adopted and adapted by the Faculty of Dentistry. That faculty uses a similar method of selection from among graduates and shares almost all of the problems studied by the medical students in the first two years, but in separate tutorial groups. Both programs have been attractive to international students from a range of countries, including the US, Canada, and Singapore. Perhaps the most obvious evidence of success, however, comes from the fact that the Sydney medical program has been adopted and adapted for use internationally – in places as diverse as Johannesburg (South Africa), Derby (UK), Riyadh (Saudi Arabia) and locally by the Australian National and Bond Universities. Other initiatives, including a partnership in Vietnam, are future possibilities.

Additional measures of success cannot be ignored. The program has attracted and graduated more Indigenous students in eight years than in the previous 104 years, although numbers are still too small. Faculty data indicate that a significant number of students in the previous program withdrew or failed, with only around 85% at best graduating within minimum time plus two years after enrolment. Currently, very few of the graduate entry students fail or discontinue. They are strongly positive in their responses to the national course experience questionnaire and graduate surveys, as well as to local evaluations. Students in the previous program were resoundingly negative in their responses to the same questionnaires. In terms of output measures, in a recent study of intern performance, Sydney graduates have performed above graduates from the other two NSW medical schools on six of eight items, and no differently on two.<sup>17</sup>

### **Australasian and New Zealand Association for Medical Education (ANZAME)**

Australia is now generally recognised as a leader in medical education. One of the major drivers has been the Australasian and New Zealand Association for Medical Education (ANZAME). As noted earlier, Bill McCarthy initiated the idea in the early 1970s, with a number of colleagues largely from the Universities of Sydney and NSW, following the two successful workshops referred to earlier. It was established when World Health Organisation was looking to establish a Regional Training Centre for Asia and the Western Pacific in Sydney, although that centre was ultimately located at the University of NSW.

Bill was the foundation President of ANZAME and held that office for six years. Other early committee members included Gerry Milton and Fred Katz (the latter from UNSW). It all started from a discussion in 1972 in Canberra (at which I was also present). There was hot debate about what to call the planned organisation. The title was chosen to ensure that not only New Zealand, but also Western Pacific nations could be included. It formally started in 1973, again at a meeting in Canberra. From humble beginnings, initiated by small cast of enthusiasts, it has become a widely respected organisation which now attracts not only hundreds of local participants to its conferences, but also highly respected medical educators from around the world as speakers. The annual meetings, which have been held continuously since, are invariably interactive, of high quality, but uniquely friendly and lively. Students have always been welcomed and many make outstanding contributions.

One of the undoubted strengths of the organisation has been the inclusion of all the health professions. Overseas,

educational organisations are often specific to medicine, or to nursing or the therapies. The broad umbrella of ANZAME provides real opportunities for interaction and broad inter-professional discussion. At least in part, that inclusiveness was probably due to both of the McCarthys – Bill as a medical and Mavis as a nursing educator. Both served on Council and together, for many years, they edited and produced the ANZAME Bulletins, which provide an interesting record of the growth and development of thinking about medical, nursing, health science, medical science and even veterinary education.

The formats of the conferences provide opportunities for real interaction and discussion. Examples of issues that arose in the 1980s included learning for understanding, early patient contact, continuous curriculum development, as well as a more specific inclusion of social and preventive medicine. Educational expertise was encouraged for all teachers.

Ken Cox from University of NSW provided a comment from the early days of ANZAME:

*"I think my most powerful memory of that time was not any specific incident, but of Bill's tenacity in the face of overt and covert opposition and the blocking of change. Without Bill, educational development in medicine would have been very much later, and slower. The activities he nourished gave education a legitimacy in daily practice, instead of the insincere lip service of the time."*

### **Other educational aspects**

In their teaching, Bill and his colleagues have drawn attention to the need to communicate effectively and empathically and to explain clearly the nature of the illness or disability. Indeed, they have studied a number of issues in effective communication in their clinical work<sup>18,19</sup>. Bill and Mavis also wrote a paper for *Nursing Times* with the intriguing title of "Egotistical specialists and nursing students", but it has proved difficult to locate. The Melanoma Unit has been a striking example too, of educating the broader public about sun exposure and sunscreens. Walking past primary school playgrounds in different parts of Sydney, it is very easy to see that the "no hat, no play" message is effective.

### **Conclusion**

Medical education at the University of Sydney has come a very long distance, from a traditional, discipline-based, passive and didactic curriculum to problem-based, interactive and integrated learning. The new programs are based on increasing evidence of effective educational practice: active and interactive learning; early clinical contact; and explicit training in skills, critical appraisal, effective communication, all supported by new assessment strategies. Medical education is now taken seriously by all Australian medical schools, although not necessarily with the level of support now provided in Sydney. Bill McCarthy has made a significant educational contribution to that development. He has also been influential within Australia and our region more generally through ANZAME.

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