

CHANGE/INNOVATION

A New Socially Responsible Medical School for Regional Australia

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ABSTRACT **Background:** Northern Australia is a geographically large region that has too few medical graduates and is a long way from Australia's metropolitan medical schools. This paper describes the establishment of a new medical school to serve these needs.

Methods: The paper describes the steps in development and presents an overview of the innovative educational approach, based on best available educational evidence, that aims to produce a medical workforce that understand the health care needs of the region and want to practice there.

Conclusion: The result is an innovative, highly integrated programme with different aspirations and a different student profile from other Australian medical schools.

KEYWORDS Medical education (undergraduate), social accountability, curriculum design, assessment.

Background

Australia is a relatively wealthy nation with a high standard health care system that produces long life expectancy, low perinatal mortality, and reasonable control of many infectious and lifestyle diseases. Health care is easily accessible to most through a taxpayer-sponsored, combined public/private health care system, served by more doctors per head of population than most other nations. The cost is also reasonable, as Australia's expenditure on health consumes less of her GDP than is the case in many other developed nations.

Yet these data hide many imbalances in the nation's health report card. Not all Australians share the health riches. Two groups that do not are those living

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in rural and remote communities and Australia's indigenous peoples. Australia is a vast, sparsely populated land, with most of the people and infrastructure concentrated in the southern and eastern regions, with the exception of a small south-western metropolitan region. This is also where most hospitals and health professionals are located, leaving the rest of the population relying on too few doctors and small district hospitals (Australian Medical Workforce Advisory Committee, 1996). Rural economies are in decline, agricultural and mining accident rates are high, and the health status of rural people is lower than that of urban Australians (Trickett *et al.*, 1997). A special problem is the health of indigenous peoples, who have a life expectancy about 20 years lower than other Australians and much higher rates of diabetes, heart disease, social and economic disadvantage, and violent death (Australian Bureau of Statistics, 1997).

The imbalance in infrastructure distribution has also been reflected in medical education. Until recently, all except one of the 10 medical schools were in State capitals and relatively few entering medical students came from outside the capital cities (Craig, 1994). The exception was Newcastle, still within the south-eastern conurbation, but in a large regional city and with an interest in regional workforce issues in that State. However, whereas the impact of its innovative problem-based learning programme Australian medical education was profound, its impact on career choice was more limited, although measurable (Rolfe *et al.*, 1995).

By the mid-1990s it was clear that Australia needed an expansion of medical education, particularly in rural and regional areas. All medical schools were offered incentives to recruit more rural background students and to increase the orientation of curricula to rural health care issues. Perhaps the most notable initiative was the establishment in 1999 of a new medical school at James Cook University, to recruit, train and support northern Australian students to understand the health care needs of people living in northern Australia.

Now in its third year of operation, this medical school has several major differences from the more established schools, particularly in terms of its greater community orientation, its responsiveness to regional health workforce needs and its innovative educational design. This paper describes briefly the process by which the new school was established and explains how it differs from the more established medical schools in Australia.

Establishing a new medical school

The new medical school was the result of a 30-year campaign by a strengthening coalition of supporters. The early leaders were the local regional university (James Cook University, established in 1961), the medical profession and local government. National support came from a report that recommended

three new schools as a means of addressing workforce shortages (Karmel, 1973), although national priorities allowed for the establishment of only two of these, at Newcastle and Flinders Universities. However, support continued to grow. James Cook University expanded, developing strengths in biomedical sciences and establishing nursing and other health professional programmes. The development of health services and pressure from the medical profession resulted in the establishment of the North Queensland Clinical School (Mudge, 1993), a branch of the University of Queensland School of Medicine that provided the final half of medical education in health care facilities throughout northern Queensland. However, this was a relatively small clinical school that did not recruit local students or follow a curriculum linked to local health care needs, so local groups united informally to press State and Federal Governments to create a new school that would better address regional concerns. Strong support came from rural and Indigenous health organizations. By 1998 the support was so strong and so broad that the Federal Government announced that it would fund its share of the new school. A similar commitment came soon after from the State Government, partly driven by its need to enhance health care services for the region, including the development of a new tertiary teaching hospital adjacent to the University and re-development of other major hospitals in northern Queensland.

A different approach?

The opportunity to develop a new medical school comes infrequently and we took this opportunity to develop a different model from the more established medical schools in Australia and New Zealand. These differences are in the degree of our community orientation, workforce orientation and innovation in educational design.

Community-orientation

The high level of community support means that the School has access to many organizations and individuals wanting to contribute to student selection, curriculum development and delivery and programme evaluation. This is important as medical education can no longer rely as heavily on large teaching hospitals for access to patients, due to the changes in health care delivery listed in Box 1.

The increasing cost of modern health care, largely due to the advances in technology and the complexity of management, pose major problems for health care funders. In response, more health care is moving from hospitals to the community; examples include the management of patients with chronic mental health problems and those who require renal dialysis. Inpatient beds are either

- Increased emphasis on primary care
- Increased emphasis on preventive approaches
- Hospitals more oriented to high-technology investigation and management
- Increased complexity of inpatient cases
- Increased use of same-day facilities for procedures and investigations
- Increased cost of health care, particularly in hospitals
- Increasing age of the Australian community
- Increasing recognition of needs of particular populations

Box 1. Health care system influences on medical programme development

being converted to same-day service units or reserved for those who cannot return to the community. Population demographics are also changing as the population ages and the special needs of particular populations are recognized. The impact of these changes on most new medical programmes in an orientation is to a more community-oriented health care system (Habbick & Leeder, 1996).

Our response has been to utilize for student learning health care facilities throughout the region, rather than just larger hospitals, and significant attention is paid to illness prevention, health economics and the needs of particular communities. The strong community orientation is reflected in the mission statement of the School to improve the health of rural and remote, indigenous and tropical populations. As a measure of how seriously this issue is embraced, the School has in addition to the normal national accreditation processes an external evaluation committee that advises on how well we meet the expectations of our local community. Few medical schools have such a strong external voice in their internal evaluation mechanisms.

Workforce orientation

Research evidence provides moderate support for the contention that local recruitment and local training achieves high local retention of graduates (Kamien & Buttfield, 1990; Rosenblatt *et al.*, 1992; Magnus & Tollan, 1993). Long term follow up indicates that up to 80% of local students will work for substantial periods of time in the local area, although the graduate profile will still be dispersed across geographic and specialty boundaries and many other factors can influence ultimate career and locality choice. Hence the school promotes medicine as a career to local (i.e. northern Australian) school students and has devised a selection system that addresses educational disadvantage of rural and remote school students by adjusting entry scores

according to the degree of rurality of applicants (Hays & Bower, 2001). Funding is partly conditional on achieving selection targets for rural background students (25%) and indigenous students (five per year); both targets have been achieved or exceeded in the first three entry cohorts. With only half of its cohorts recruited, JCU has passed all but Newcastle in terms of the numbers of indigenous medical students enrolled and it has the highest proportion of rural background students of the 11 medical schools. About 60% are from northern Australia, many of whom stated that they would not have studied medicine had they not been able to study medicine close to home, usually due to financial pressures and family dislocation. Hence the new school appears, as intended, to have attracted academically eligible applicants who are likely to stay in the region long term. This interest is fostered through a rural student club (already one of the largest in Australia), the longest rural clinical placement scheme (at least 20 and up to 100 weeks during the programme) and financial support through scholarships. Wherever possible faculty recruitment seeks to appoint in all disciplines those with substantial experience in rural professional practice and specialist academic staff are encouraged to provide outreach services to under-served areas.

Educational design

We chose to develop our own hybrid curriculum model that included elements of both problem-based and traditional learning approaches in an innovative and cost-effective manner. The educational design principles adopted are summarized in Box 2.

The common conceptual framework for teaching and assessment was made possible because the whole programme was designed at the same time and the learning objectives are regarded as the basis of the assessment blueprint. This involved a core group of curriculum designers, including a combination of clinicians and educationalists, meeting every week for 2 years to develop the complete curriculum framework. A range of relevant content experts drawn from the broader health professions (not just medicine) and university staff assisted this core group as required. The detailed curriculum for the first half of the programme was completed by the end of 1999 and for the second half of the programme by the end of 2002. The curriculum is organized conceptually into four domains: Applied Basic and Clinical Science; Critical Reasoning Clinical and Communication Skills; Community and Population Health; and Ethics, Personal and Professional Development. These guide both curriculum content and assessment topic selection, although are not applied rigidly as they are recognized as overlapping conceptually.

The level of integration is high, with a multiple, overlapping spiral design that leads through increasingly sophisticated levels of understanding of basic and clinical sciences. Where possible clinical scenarios written by multi-

- A common conceptual framework for curriculum development and assessment
- Integration across basic and clinical sciences through using clinical cases to demonstrate the need for the basic sciences
- Strong focus on rural/remote, indigenous and tropical health
- Strong community orientation
- Relatively little didactic teaching with reliance on small group learning and independent learning
- Early involvement of students in direct patient care
- Extensive intra-net development of resources to support the curriculum and assessment programmes
- Dispersed clinical learning
- Strong emphasis on formative assessment
- 'Best-practice' integrated summative assessment methods

Box 2. Educational design principles

professional teams (including basic scientists and clinicians) are used to illustrate the importance and relevance to practice of new material. Each week of the programme has a theme that is supported by written clinical cases that require understanding across subjects and the week is 'rounded off' with a 90-min 'Integrating Session', usually a highly interactive session with panels comprising patients and health professionals. Rural, indigenous and tropical health contexts are often used as integration binders as they provide a different perspective on how curriculum material can be viewed and assist the programme to promote its three 'flagship' health issues.

Each of four subjects has 5 h of curriculum time each week, comprising a 1-h lecture, 3 h of small group, mostly practical learning, and a 1-h 'synthesizing session', usually a large group tutorial that is often conducted by the students. Most weeks include visits to community health facilities and/or family practices to demonstrate the relevance of the on-campus programme. Students are allocated to groups of eight and are allocated a tutor and have 24 h access to a 'home room' equipped with a PC and a range of written and electronic resource materials.

The curriculum is supported by a web-accessible intranet resource that includes learning objectives, all pre-reading, summaries of all scheduled sessions, selected additional readings, contact details of staff members who can provide additional assistance and formative assessment materials. This is particularly important as the later years of the programme will be delivered in many sites, including four medium-sized regional teaching hospitals separated by several hundred kilometers and many smaller rural communities in between.

The assessment programme has been carefully designed to provide as much formative assessment as possible. Participation in the formative assessment programme is mandatory, although a particular level of performance is not; students with difficulties are offered additional assistance. There are weekly, self-marking, web-based tests of knowledge and students are offered 'practice exams' that are entirely formative, in addition to the annual summative assessment. New question banks are being written for extended-matching (EMQ) and single-best response (SBR) multiple choice questions (Case & Swanson, 1993), 'key-feature' short answer questions (Bordage & Page, 1987) and multiple station tests; all of these methods have demonstrated reliability and the link to the curriculum framework ensures reasonable validity. All assessments attempt, where possible, to assess the integrated curriculum in an integrated manner.

Conclusion

The first new medical school in Australia for 25 years will produce graduates that meet national requirements for internship in an Australian or New Zealand hospital, but has adopted evidence-based selection policies and curriculum strategies that address a more socially-accountable regional mission. The Australian Medical Council accredited the programme in November 1999 and the first students will graduate at the end of 2005. If international experience of regional schools is any guide, by 20 years from now JCU graduates will be practising in all specialties in all States of Australia, but the majority will stay close to where they grew up and were trained. A longitudinal cohort study is in place to determine if School will be a long-term answer to many of its current medical workforce problems.

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