# Rediscovering university teaching hospitals for Australia

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## ABSTRACT

- Partnership between research and health services has a long history in other countries, but has been relatively recent in Australia, with several models arising in the 1960s and 1970s as research-based specialties developed.
- Since the implementation of Medibank, which became Medicare, Australian Health Care Agreements have been primarily crafted on the basis of transactional numbers, ignoring the need for links with teaching and research and the need to implement new developments.
- Education and research have been seen as the responsibility of the federal government, and hospitals are progressively less recognised or funded for these functions by the states.
- Australia's teaching hospitals are in danger of falling seriously behind those in other countries and losing their capacity to monitor quality, to innovate and to branch into new strategies in partnership with primary care services.
- We should look at initiatives in other countries such as the United Kingdom and Canada, which are making big strides in tackling similar issues. University hospitals hold the key, if appropriately linked with other services.
- The current Australian Health Care Agreements are on hold. A new agency is needed to support clinical and service-related research, with a new structure and track for federal government funding, and providing oversight of research and development, of clinical governance and quality of outcomes in health care, linked with new strategies for prevention and treatment.
- A component of the foreshadowed additional federal government funding for health should be sequestered to set up such an agency.


MJA 2008; 189: 332–335

The practice of medicine has changed immensely over the past 50 years. Discoveries in biomedical science and new technology for both diagnosis and treatment have burgeoned, and new preventive possibilities continue to emerge. The new frontier is translating research into clinical services. Over the past 30 years, our public hospital system has been locked into a system that lacks the necessary capacity to adapt, tied as it is to processes of transactional funding. Innovative actions by managers have led to shortening of hospital stays and more day surgery. However, the interface with community-based care has been poorly developed in terms of sharing necessary information about patients, developing linked programs for care, collecting information on health outcomes and adapting to necessary changes in education of health professionals. In reality, health care is increasingly provided outside hospitals.

Those responsible for managing tightly budgeted public hospitals and those providing clinical services under inevitable time pressures need to pause and consider whether we have the essentials in place to handle emerging challenges. The appointment of a *National Health and Hospitals Reform Commission* and the suspension of 5-year *Australian Health Care Agreements* (AHCAs) offer a "once in a generation" opportunity to get sensible plans in place for the next 20 years.

Relevant research and development is critical for providing the basis for ongoing evolution. Australia has outstanding medical research and first-class clinicians, but the two need to be brought together effectively with appropriate support. Major teaching hospitals and their associated universities have much to offer if they accept a commitment to extend their roles in partnership with primary health care.

Many assume advances in health care just happen, but on the world scene, major university hospitals have provided most of them. These hospitals have a great history, with important messages that are still relevant today.

## Evolution of the university hospital

Medical education in Europe was undergoing major change when Australia's first medical schools were established on the British model in Melbourne and Sydney. Between 1820 and 1850, Paris was the unquestioned leader in clinical methods and medical training.[1] After 1855, however, an explosion of knowledge about human biology and disease led by Virchow, Cohnheim and Koch in Germany, about physiology by Bernard in France, and about microorganisms as the cause of disease by Pasteur (largely ignored by the Parisian clinicians) changed the scene at the time Australia's medical education was being established.[1]

Prompted by Pasteur's research, Lister in Edinburgh developed antiseptic surgery from 1867,[2] and Billroth in Vienna effectively founded modern antiseptic surgery. These developments were slow to be adopted in surgical practice in both London and Australia, where visiting honorary staff reigned, committed to existing practices. Edinburgh had both university and practitioner schools; Lister belonged to the former.

In the United States, Johns Hopkins University developed its graduate school of medicine on a model akin to that of the Berlin medical school, opening a hospital in 1889 with research in laboratory-based teaching and clinical settings. The Harvard medical school was then reshaped, as were the then Columbia-Presbyterian Medical Center in New York and Yale School of Medicine. The University of Chicago, founded by John D Rockefeller, drew heavily on the Hopkins model.[3]

The key to the hospital model was leadership of all units by academic clinicians with questioning minds, contributing to knowledge and committed to services of the highest standard. From this was to develop rigour in testing the quality of services linked with traditional peer review, now spoken of as "good clinical governance".

A revolution in American medical education followed a review by Flexner in 1910. He achieved closure of up to 120 "apprenticeship-based" schools of low quality. His "model", based on Johns Hopkins University School of Medicine, was one of medical education in an environment tested and enriched by research.[4] Between 1913 and 1928, working for the Rockefeller Foundation, Flexner facilitated the allocation of huge sums of money, both in the US and overseas, to support clinical professors with research

laboratories.[5] Since that time, America's university hospitals have been the international powerhouse of research and innovation, with burgeoning funding from the National Institutes of Health since 1946, and partnerships with industry.

## Australia's medical schools and teaching hospitals

Medical education in Australia commenced at the University of Melbourne in 1862. Clinical teaching depended on honorary clinical staff ("honoraries") of the Melbourne Hospital, who had trained in London, Edinburgh and Dublin.[6]

The University of Sydney's medical faculty was established in 1858. It became a medical school in 1883, led by Stewart Anderson, an able young Edinburgh graduate with research experience in the German medical school at Strasburg.[7] Academic teachers from Britain included a young British physiologist, Charles James Martin, who later developed both outstanding teaching and experimental research in Melbourne from 1896. He returned to London in 1904, but his name is remembered in the prestigious C J Martin Fellowships of the National Health and Medical Research Council (NHMRC).

In 1913, the University of Melbourne adopted a proposal for clinical chairs and hospital-based research appointments based on the Flexner model, but it was not implemented.[8] In 1927, the Rockefeller Foundation invited a delegation from Melbourne to visit university hospitals in the US and Canada, envisaging support from the Victorian government to rebuild the Melbourne Hospital close to a new medical school. A change of government in Victoria led to abandonment of the hospital move and ended the Foundation's interest.

In Sydney the next year, a remarkable philanthropist, George Henry Bosch, funded two new full-time salaried clinical chair positions. The University of Sydney medical school then sought and gained a generous grant from the Rockefeller Foundation to rebuild its medical school close to the Royal Prince Alfred Hospital as they awaited arrival of the clinical professors.[7]

## Clinical professors appointed in Australia

When Lambie (medical chair) and Dew (surgical chair) reached Sydney, the Flexner model proved unacceptable to the staff of the Royal Prince Alfred Hospital. Lambie put the view that *"the University Medical School should be the centre or focal point of all medicine" and that "the Professor of Medicine should have overall control as was the case in the major German Universities before World War I"*.[7] However, the professors' hospital appointments permitted responsibility for patients only within their professorial units, and they were specifically excluded from the hospital hierarchy. A similar pattern later followed in new schools in Adelaide and Brisbane.

A clinical chair in obstetrics was established for Marshall Allen in Melbourne in 1929, after publication of his groundbreaking research report on maternal and neonatal deaths in Victoria. Like the other professors, he was not given control of obstetrics at his hospital.

An overview of important developments in academic departments in teaching hospitals after World War II is shown in Box 1.

## Changes to our system since 1975

The introduction of Medibank in 1975 provided free hospital services across the nation, with funding shared by the federal and state governments. Medibank was re-established as Medicare in 1984. Control of burgeoning hospital costs became paramount for governments, with ever-growing demand for services. Shared responsibilities between the federal and state governments were set out in AHCAs, defining the responsibilities of states for hospital services linked with an agreed formula for federal contributions over a 5-year period. Negotiations became increasingly preoccupied with "transactional" numbers and politically sensitive issues like waiting lists. Diagnosis-related groups (DRGs) came to determine hospital budgets. Research and education were seen as the responsibility of the federal government. "Cost shifting" between federal and state governments became an art form. Support for research and university functions in hospitals dwindled as funding for universities was also progressively squeezed.

**1 Academic departments in teaching hospitals after World War II**

By the 1960s, pressure for specialties supported by research became critical in fields such as endocrinology, haematology, interventional cardiology and open-heart surgery, gastroenterology, nephrology, organ transplantation and others.

Clinical professors in medicine (Lovell) and surgery (Ewing) were appointed in Melbourne in 1956 on the British (and Sydney) model, with discrete academic units in the Royal Melbourne Hospital (Lovell) and Alfred Hospital (Ewing). However, these and similar appointments in other Australian medical schools came to provide much needed research support for new specialties and contributed greatly to specialist training.

Genuine partnership between hospitals and universities in development of services became important as research-based specialties evolved in the 1960s and 1970s.

Australian ventures on the Flexner model[4] in terms of academic leadership began to emerge:

- at the Austin Hospital in Melbourne from 1966, as it became a new clinical school, and became the driver of clinical research in Melbourne;
- at Flinders University in 1974, with a fully integrated university hospital, Flinders Medical Centre, developing much national research leadership;
- in Sydney from 1976, when Westmead Hospital was developed with strong research involvement; and
- at the University of Newcastle from 1975, with its medical school and John Hunter Hospital having clinical academic oversight of services and a strong community interface. ◆

## Medical research in Australia

The NHMRC has led development of Australian medical research over many years, funding research in universities, research institutes and hospitals. It developed the immensely important Postgraduate Research Scholarship and Research Fellowship programs. Following the Wills review of 1999[9] and the Grant report of 2004,[10] which confirmed the high international standing of Australian medical research, the NHMRC enjoyed trebling of research funding over a period of some years.

*Access Economics* demonstrated huge economic returns to the community from advances in medical science,[11] but Grant raised important questions as to whether the NHMRC was sufficiently supporting evidence-based medicine and generating real innovation in health policy and services as seen in Canada, the Nether-

lands, the US and elsewhere. Grant gave examples from several countries of major improvements and cost savings in health services proceeding from rigorous applied (clinical) research.[11]

Changes have since led to restructuring of the NHMRC with new leadership, establishment of Clinical Research Centres of Excellence, new Fellowships in Clinical Research and support for the evidence-based medicine program. Funding for research infrastructure had been secured for universities in 1990, and was also introduced for medical research institutes from 2005, but is not provided for hospitals which struggle even to fund necessary administrative support for their Human Research Ethics Committees. The AHCAs referred to neither research and development, nor bridging the gap between hospitals and community-based care as service. This situation needs to change. An ageing population as well as Indigenous health and mental health now offer major challenges. Are we satisfied that, as a nation, we have the means to handle future needs in health care?

## What can we learn from Britain and elsewhere as we look at change?

From 2004, the United Kingdom government committed major support for development of research within the National Health Service (NHS). Reforms, led by Professor Sally Davies as Director General of Research and Development for the NHS, were reported in 2006, finding that the NHS "needs a stronger culture to support research".[12] A National Institute for Health Research, including the Medical Research Council, was established with strategies that bring research to interface effectively with clinical services at many levels across their system.

A 2008 review of the NHS, led by Lord Darzi, a practicing academic surgeon, has moved reorganisation even further in this direction.[13] Major new funding is supporting development of large university health centres, bringing research, service delivery and education together to create the equal of any of the great university health centres in America.

## Where does Australia stand at this time of change?

Transactional funding, based on DRG-adjusted figures, currently drives our system. Teaching hospitals are increasingly funded and managed as large community hospitals, with little recognition of their special functions. Repeated instances of failure in hospital performance reflect poor clinical governance. There is objective international evidence that teaching hospitals provide better quality health care than non-teaching institutions.[14] They recruit and retain the best staff, and inevitably influence hospitals linked to them for undergraduate teaching, intern and registrar rotations.

In Melbourne, the Bio21 Cluster strategically links the University of Melbourne with Victoria's teaching hospitals and neighbouring research institutes. These institutions share expertise and infrastructure in new joint programs, getting outside research funding as and where they can. A Monash cluster is evolving similarly. An example of such collaboration is an online facility for sharing data between Victorian hospitals, now named BioGrid Australia, currently applied to cancer tissue samples but with planned expansion into data on epilepsy and diabetes. Sharing of genetic information is awaiting development. Multicentre trials in intensive care, anaesthesia and cancer therapy in Victoria and elsewhere struggle to fund research nurses to enter data without confining research to drug trials for international pharmaceutical companies. Such multicentre trials should be widespread, seeking to test and improve our own services.

The Bio21 Cluster sponsors a Victorian forum of hospital research directors, experienced part-time research leaders who liaise with their hospital chief executive officers (CEOs), research ethics committees, hospital and university researchers, and associated research institutes. Most member hospitals now publish research reports. These moves seek to rediscover university hospitals in an Australian context. Hospital CEOs are constrained to contain expenditure within budgets, which are set with "caps" on funding of "weighted patient separations". Fresh funding is needed for administrative support of research, advice on data handling and for research nurses collecting clinical data in support of busy clinicians.

Suspension of the AHCA process and the establishment of the National Health and Hospitals Reform Commission offer a rare chance to make the necessary changes to meet the challenges of the next 20 years. We must think broadly, and be aware of what is happening elsewhere in the world where similar problems are being tackled. Australia has outstanding resources in research and in its clinical workforce; a small investment in bringing them closer together could yield great benefits. A "hub and spoke" model linking major university hospitals with community hospi-

### 2 Proposed solutions to the problems facing health care in Australia

- Recognition and support should be given to reinvigorating the partnership between major teaching hospitals and universities, in clinical services and related research as well as in education, involving all health services.
- Teaching hospitals must interface effectively with primary care and preventive health. Medical schools with their departments of public health and general practice must support this development, and must work with general practice networks.
- New initiatives using broadband information technology facilities need to become part of this mix, with common patient identifiers and records. They can provide the means to link data across the health care system, support family practice with information, and track health outcomes.
- Existing links between major teaching hospitals, community hospitals and regional hospitals for both medical education and postgraduate training need to be formalised in a "hub and spoke" model so that education, research and development involve a wide network. Better links with general practice are essential for aged care, diabetes care, mental health and overall patient services.
- A portion of new federal government funding foreshadowed for health care should be sequestered and managed through a new agency for health development and quality associated with both the Department of Health and Ageing and the National Health and Medical Research Council. This agency should oversee and fund programs for research and for prevention, in partnership with the state governments and hospitals, with special focus on innovation and assessment of the quality and outcomes of all health services, both public and private, and provide support to university hospitals and other agencies to meet the real costs of service-related research.
- The next Australian Health Care Agreements must commit state governments to collaborate with the new agency in developing Australia's health system.
- These are key issues for consideration by the National Health and Hospitals Reform Commission, due to report later this year. ◆

tals, already associated in education and postgraduation training, and with general practice networks, has much to offer. We need modest additional funding through a new dedicated channel to support change in both hospital care and community-based care.

Proposed solutions to the problems facing health care in Australia are offered in Box 2.

## Competing interests

None identified.

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## References

1 Bonner TN. Becoming a physician. Medical Education in Britain, France, Germany and the United States. Oxford: Oxford University Press, 1995.
2 Lobban RD. Edinburgh and the medical revolution. Cambridge introduction to world history. Cambridge: Cambridge University Press, 1980.
3 French JC. History of the university founded by Johns Hopkins. Baltimore: Johns Hopkins Press, 1946: 102-142.
4 Flexner A. Medical education in the United States and Canada: a report to the Carnegie Foundation for the Advancement of Teaching. New York: Carnegie Foundation for the Advancement of Teaching, 1910.
5 Kerr C. Introduction. In: Flexner A. Universities: American, English, German (foundations of higher education). New Brunswick, NJ: Transaction Publishers, 1994: xvi.
6 Gregory A. The ever open door. A history of the Royal Melbourne Hospital. Melbourne: Hyland House Publishing, 1998: 53-57.
7 Young JA, Sefton AJ, Webb N, editors. Centenary book of the University of Sydney Faculty of Medicine. Sydney: University of Sydney Press, 1984: 171-175, 369.
8 Russell KF. The Melbourne Medical School 1862–1962. Melbourne: Melbourne University Press, 1977: 117.
9 Wills PJ. Health and Medical Research Strategic Review. The virtuous cycle: working together for health and medical research. Canberra: Australian Government Department of Health and Aged Care, 1999.
10 Grant J (Chairman). Sustaining the virtuous cycle for a healthy, competitive Australia. Investment Review of Health and Medical Research. Canberra: Australian Government Department of Health and Ageing, 2004.
11 Access Economics. Exceptional returns: the value of investing in health R&D in Australia. Prepared for the Australian Society for Medical Research. Canberra: Access Economics, 2003.
12 Cooksey D. A review of UK health research funding. London: HM Stationery Office, 2006.
13 Lord Darzi of Denham. High quality care for all: NHS next stage review final report. London: Department of Health, 2008. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_085825 (accessed Aug 2008).
14 Imperial College, London. Faculty of Medicine. Dr Foster Unit at Imperial College. http://www1.imperial.ac.uk/medicine/about/divisions/ephpc/pcsm/research/drfosters/ (accessed Aug 2008).

*(Received 23 Jul 2008, accepted 4 Aug 2008)* ❑