

Review Article

Extending rural and remote medicine with a new type of health worker: Physician assistants

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Abstract

The purpose of this paper was to demonstrate that the medical workforce shortage is an international phenomenon and to review one of the strategies developed in the USA in the late 1960s: the physician assistant model of health service provision. The authors consider whether this model could provide one strategy to help address the medical workforce shortage in Australia. A systematic review of the literature about medical workforce shortages, strategies used to address the medical workforce shortage, and the physician assistant role was undertaken. Literature used for the review covered the period 1967–2006. Physician assistants provide safe, high-quality and cost-effective primary care services under the direction of a doctor and respond to workforce shortages in rural and remote areas, family practice medicine and hospital settings. This model of health care provision has been adopted in several other developed countries, including England, Scotland, the Netherlands and Canada. The physician assistant concept might provide Australia with a novel strategy for addressing its medical workforce shortage, particularly in rural and remote settings.

KEY WORDS: *Indigenous health service, international medical graduate, medical migration, medical workforce shortage, physician assistant, rural and remote health service.*

Introduction

The shortage of doctors in Australia is well documented.¹ Between 2000 and 2004, the supply of medical

practitioners rose in metropolitan areas and fell in the non-metropolitan regions in spite of the fact the absolute number of doctors grew by 14%. The available supply of primary care or GP decreased in all regions except Inner Region, where there was little change.² Since the new century, several strategies have been used in an attempt to overcome this shortage. One has been to increase the number of university places for medical students, and the other to import medical graduates from overseas. Already Australia leads the world in the number of doctors imported per capita.³

Another strategy might be to seek flexibility in the workforce by amplifying and extending the role of the Australian doctor with the physician assistant. This medical workforce model was introduced in the USA in the mid-1960s in response to medical workforce shortages similar to that currently in Australia.

Australia has introduced nurse practitioners into its health workforce within the last decade. In some comparisons made of the role of nurse practitioners and physician assistants in the USA, little difference between them can be seen, particularly when both work within the delegated practice model under medical officers.^{4–7} However, within the Australian context, nurse practitioners are seen to practice autonomously,^{8,9} not necessarily in a delegated practice model.

The physician assistant concept should not be seen as competing with the nurse practitioner model, rather a provider that works directly under medical officer supervision. The physician assistant is an addition for providing health care and will attract a broader range of people than already attracted to the nursing profession. In many ways, it is seen as career ascension for those with a diverse background of health care skills, such as paramedics.

This paper, written after a systemic literature review, spans 40 years of research on the physician assistant in the USA and elsewhere. The premise is that the medical workforce shortage is an international phenomenon and the physician assistant provides opportunities to think creatively about medical workforce shortage. Brief

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Accepted for publication 22 July 2007.

TABLE 1: *Medical workforce figures*

Region	Doctor-to-population ratios (2003)
Sub-Saharan Africa	Range of 1:5 000–1:30 000
Other developing nations	1:1 400
Developed nations	1:300
Australia	1:353

suggestions of how this model might be applicable to the Australian context are provided.

Medical workforce shortage

The medical workforce shortage is a global problem. There are severe doctor and other health worker shortages in the developing world, particularly in sub-Saharan Africa. In the developing world, the doctor-to-population ratios range from 1:5000 to 1:30 000 in sub-Saharan Africa, and 1:1400 in other parts, while in some parts of the developed world, the ratio is 1:300.¹⁰ In 2003, Australia's doctor-to-population ratio was 1:353¹¹ (Table 1). The World Health Organisation estimates the health workforce shortage is 4.5 million and growing.¹²

While countries of the developing world have great shortages, even North America has problems. The USA is facing a shortage of 200 000 physicians by 2010,¹³ while Canada has its own problems: for example, it is experiencing the need for an extra 400 orthopaedic surgeons since 2004.¹⁴ In Britain, both GP and hospital doctors are needed.^{15,16} Currently, in the USA there are shortages within some specialties and maldistribution of the medical workforce, with shortages in some geographical areas,¹⁷ the physician workforce is ageing, with 29% of the active workforce over 55 years old,¹⁸ and younger doctors are not prepared to work the long hours that older doctors worked throughout their careers.¹⁹

The Australian Medical Workforce Advisory Council found key shortages in particular medical specialties and maldistribution of doctors across the country, with coverage decreasing as remoteness increases.²⁰ The Queensland Rural Medical Support Agency identified shortages of GP across the state,²¹ and Lennox demonstrated that Queensland Health has a major shortage of Australian-trained doctors across the state but particularly in rural and remote regions.²²

Strategies used to overcome the medical workforce shortage

The strategies used to address the medical workforce shortage in developed countries include finding doctors

in other parts of the world, increasing the numbers of medical graduates, and delegating some medical work to other health professionals. Substituting nurses for doctors is commonly used, and the development of new categories of workers has been tried in various countries.^{23,24} A major strategy used in Britain, as it redesigned the National Health Service, was the redesign of the roles of health professionals.^{25–28}

Australia is using two key strategies: increasing the number of medical graduates and importing doctors from overseas. Queensland has used another strategy: increasing medical salaries, which have attracted medical staff to Queensland at the expense of the other states.^{29,30} This is not a strategy that will increase the number of medical staff across Australia, rather it leads to internal migration and rising costs as the states compete with each other for medical staff.

A total of eight new Australian medical schools have been established or are planned for this decade, with an expected increase of medical graduates from 1300 in 2005 to 1900 in 2010.³¹ In Queensland, three new medical schools (including a private one) have been developed, one in Townsville, and two on the Gold Coast. The two existing ones are expanding their intake of new medical students. This should almost double the number of graduates in Queensland by 2010, when 540 are expected.³² However, with the length of time that medical education takes, from medical graduate to specialist, it will be the last few years of the next decade before these graduates begin to filter through to more senior ranks of doctors. Increasing the number of medical graduates is a long-term strategy to overcome the medical workforce shortage.

Importing medical graduates from overseas countries has an immediate impact on increasing the number of doctors in the health system in Australia. In 1998, 21% of the Australian medical workforce were international medical graduates (IMG)³³ and, in 2005, 'about 10 000 or 20 per cent of Australia's medical workforce is overseas trained' and another 700 plus expected by 2007.³¹ This proportion is higher in remote areas, with 'more than 30% of the general practice workforce' being IMG.³¹ Almost half of the 900 Resident Medical Officer positions in Queensland Health in 2003 were filled by overseas trained doctors.²²

There is a key problem with this strategy. It contributes to a maldistribution of medical staff between those countries with adequate health resources and those with limited resources and major health problems. Up to 40% of the IMG in Australia have come from lower-income countries,³ those with the least ability to replace the medical workforce from other parts of the world.

According to the Commonwealth Department of Health and Ageing, the Australian Government

'supports the Commonwealth Code of Practice for the International Recruitment of Health Workers',³¹ and only developed countries are targeted for international medical recruitment. Given the number of doctors from less developed countries in Queensland hospitals, targeted recruitment is not the only strategy used to attract doctors.

Australia is one of only seven nations within the Organization for Economic Cooperation and Development to import more than 10% of its medical workforce.³ The other nations who do this include the USA, Canada, Britain, New Zealand, Switzerland and Norway. Other ways of addressing the medical workforce shortage without robbing underserved countries of their vital medical workforce are needed. One of the strategies to consider is developing a cadre of health care professionals similar to the physician assistant model of the USA.

Physician assistants

Physician assistants are health care professionals trained within the medical model of care and licensed to practise medicine under medical supervision.³⁴ They undertake a range of medical tasks, including physical examination, diagnosing and treating illnesses, ordering and interpreting medical tests, assisting in surgery, writing prescriptions and providing preventive health care services.³⁴ All these tasks are undertaken within a framework of delegated practice, with the physician assistant either co-located with a doctor or supervised at a distance by a medical officer.^{4,5,35}

In the USA, physician assistants work in a broad range of settings and fields of medicine. The role of physician assistants includes procedural/technical activities, direct patient care, administration, research and medical education. Besides directly caring for patients, they also undertake patient education and health promotion.³⁶

Those working in primary care fields cover family practice, paediatrics and women's health. The places where they work include private practices with family medicine doctors (equivalent to GP), or in a rural/remote practice associated with a supervising doctor who may be some distance away. Other settings include prison services, walk-in clinics in poorly resourced areas, hospital outpatients and occupational health positions.^{4,37-40}

They also work in hospital and specialist settings. These include trauma centres,⁴¹ renal dialysis services,⁴² paediatrics,⁴³ medical and surgical wards,^{44,45} and specialty units such as gastroenterology,⁴⁶ urology,⁴⁷ dermatology⁴⁸ and cardiac services.⁴⁹

Quality of care, acceptance by patients and cost-effectiveness

A number of comparisons have been made between the work of physician assistants and that of doctors to ensure that quality of care is not reduced, that patients accept them, and that costs of care are improved without compromising safety. According to the studies undertaken over 30 years in a range of clinical settings, the quality of care has not been eroded when physician assistants have been providing the care.^{4,5,41,46,49-53} Patient acceptance has been well demonstrated,^{50,54-56} and there have been cost-savings in employing physician assistants in medical practices.^{38,46,57,58}

Flexibility in responding to workforce needs

Physician assistants are currently used as part of the medical workforce in the USA, Canada, the Netherlands, Taiwan and Britain.⁵⁹ A major advantage of physician assistants as health professionals is their flexibility in response to particular workforce needs. They are a practice-focused group who, with broad based, yet relatively short training times, are able to adapt to a broad range of clinical settings and clinical specialties. Nor do they seek to practise independently of doctors, which makes them attractive to the medical profession.⁴

US health workforce history documents that physician assistants continue to move to areas of need such as rural and non-metropolitan areas.^{55,60,61} The initial response was to the rural medical workforce shortages,^{36,62-71} followed by a response to primary care shortages.^{64,69,72-74} By the early 1980s, there had been a significant shift of physician assistants into institutions, particularly public ones, in response to several factors: a reduction in the number of foreign medical graduates available due to more stringent entrance requirements; the ability of physician assistants to adapt to a different clinical setting quickly; and the recognition that physician assistants were more economical than medical staff.⁶⁴

Hospitals found that they could substitute about 50-75% of a doctor's work with one physician assistant, with their broad based training enabling them to quickly function in a number of different clinical settings.⁶⁴ Physician assistants work in medical, surgical and paediatric settings, including emergency care.⁵⁹ In one geriatric institution, the Beth Abraham Hospital in New York, 'foreign medical graduate house officers were replaced by 10 physician assistants in 1979. There was a marked decrease in patient mortality on physician assistant-staffed wards when compared with the results before 1979'.⁶⁴

One of the advantages of having physician assistants working in house officer positions was the continuity of service they offered. They were not rotated as junior medical staff were, and 'they get trained for a very specific role and stay with it'.³⁶

Educational preparation

Physician assistant education programs in the USA are on average 2 years in length,⁷⁵ with up to 12 months of that time spent in a clinical workplace. Most programs select students who have time and experience in patient care, ensuring that these students already have many of the communication and time management skills necessary for the role. Most programs screen applicants for basic science and behavioural science knowledge. This can add up to two years for students without this background. Even with this additional two years, physician assistant programs are much shorter than medical education programs.

Scope within the Australian medical workforce scene

The physician assistant model will not solve all the medical workforce issues in Australia. However, the introduction of this model might provide one strategy that could assist in overcoming shortages in specific areas. There are several areas of practice in which physician assistants have been shown to be effective, that are applicable to the Australian context.

There could be a role for physician assistants in public hospitals providing basic medical care to patients in emergency, medical and surgical settings, under the supervision of medical staff. A second role in the public sector could develop within high-volume medical investigation units, for example endoscopy units and cardiac investigation units, increasing throughput and freeing medical staff for more complex procedures and patient management.

With amendment to the Medicare funding arrangements, physician assistants could take a role in general practice settings, working within a practice alongside GP. There is potential employment by medical and surgical specialists, if changes in the current funding arrangements were made.

Physician assistants could take a role in the provision of Indigenous health services in one of several ways: as primary care workers and as role models. One of the characteristics of the physician assistant profession in the USA is that at least 17% of the physician assistant students are from minority groups.⁷⁶ There is 'greater diversity' and 'increasing visibility of underrepresented minorities' among physician assistants than is seen in

the medical workforce.⁶⁵ Indigenous health workers would be one of the groups of current health care providers in Australia who could become part of the physician assistant workforce.⁷⁷

It is difficult to predict the number of physician assistants that Australia could support, and this would depend on the areas of practice developed for physician assistants in this country. If we followed the USA model in application, there could be a need for 3500 physician assistants in this country when numbers of physician assistant positions and populations are compared.^{35,65}

Conclusion

The medical workforce shortage in Australia is part of a worldwide phenomenon. Increasing medical graduates and importing IMG will not solve this problem alone. Other strategies require innovation and change. The introduction of a medical assistant role, similar to the American physician assistant model, offers one strategy that could allow flexible medical delegation while expanding the role of the doctor in Australia.

Conflicting interests

No funding was provided for this study. There are no conflicting interests for either author.

Author contributions

Contribution of the Teresa O'Connor, 75%; Roderick Hooker, 25%.

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