Australian Health Workforce Advisory Committee

Health workforce planning and models of care in emergency departments

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Terms of reference of the Australian Health Workforce Advisory Committee

The Australian Health Ministers' Advisory Council (AHMAC) established AHWAC to assist with the development of a more strategic focus to national nurse, midwifery and allied health workforce planning in Australia and advise on national health workforce matters, including workforce supply, distribution and future requirements.

AHWAC reports to AHMAC, and through AHMAC to the Australian Health Ministers' Conference. AHWAC is one of a number of AHMAC workforce committees, including the:

- Australian Health Workforce Officials' Committee; and
- Australian Medical Workforce Advisory Committee.

AHWAC provides advice to AHMAC on a range of nurse, midwifery and allied health workforce matters, including:

- workforce supply and demand in Australia;
- the composition, balance and distribution of the health workforce in Australia; and
- the establishment and development of data collections concerned with the health workforce.

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Part A: Emergency care context

Chapter 1 Introduction and Key Findings

This report has been prepared by the working party commissioned by the Australian Health Workforce Advisory Committee (AHWAC) to conduct a project on *Emergency care – models of care health workforce planning*.

The terms of reference for the working party were to report on:

- the current supply, distribution and skill mix of the emergency care workforce
- the adequacy of the current emergency care workforce
- the projected future requirements for the emergency care workforce
- the best way to ensure an optimal supply, distribution and skill mix to meet future requirements over the next ten years, from 2004-2014.

The working party was asked to take a 'models of care' approach to workforce planning that considered all the workforces within the emergency department and their interrelationships.

This report provides an overview of both the current emergency workforce/s as well as developments in emergency care models of care.

Challenges with "models of care" planning at the national level.
There are a number of challenges with "models of care" planning at the national level. These were evident with this project and another AHWAC project, the Perioperative Workforce in Australia project. Both projects were required to adopt a models of care approach to national health workforce planning.

The traditional approach to health workforce planning examines the workforce (usually one occupational group or discipline) and projects supply and demand assuming the current work arrangements (overall skill-mix and the way work is done) remain constant. The models of care approach differs, in that it examines the workforce in terms of the way care and associated services are provided and by whom for a particular patient population, rather than using a uni-disciplinary approach. In doing so, it aims to identify the best practice model of care to meet the needs of a particular population. The skill-mix and competencies required to meet service needs are then determined and these are used to determine workforce supply (Australian Health Ministers' Advisory Council, 2002).

Whilst models of care planning may be achievable and relatively straight forward at the local or service level, there are concerns about its application to national health workforce planning. These concerns are summarised by the Australian Health Ministers Advisory Council (2002) as being:

- Introducing considerably more complexity into an already complex planning area;

- Planning for a model of care which may or may not be able to be implemented, dependant on issues including ability to achieve change, funding, professional politics, supply of suitable workforce and substitutability;
- Difficulty in achieving consensus on a model of care in Australia's Federal system - both between the Commonwealth, States and Territories, and within States and Territories;
- Geographic and population differences making one model of care unlikely, so that there may need to be several models of care;
- Consumer acceptance of a model based on assessed need, compared with consumer demand.

Added to the above issues, this project found that:

- There is insufficient data available related to all occupational groups providing their services in emergency departments (particularly for allied health and the unregulated health workforces),
- The definition of "model of care" is interpreted differently by different people, including Working Party members;
- The use and development of a projection tool (or model) for multi-disciplinary workforces and workforces in transition (in terms of scopes of practice) is complex and has not been developed for national use in Australia to date;
- There is no "one size" fits all model that can be applied nationally to this workforce (models of care depend on service type, service sector, service setting and regulations and other differences;
- "Best practice" generally has not been evidenced in relation to different models of care: there is little or no research available in Australia determining "best practice" in terms of patient outcomes, efficiencies and efficacy as it relates to alternate models of care.
- It is difficult to identify all the models of care available in all emergency departments.

This report and its findings

For these reasons, the terms of reference for this project were unable to be met using a models of care approach. However, this report provides an overview of a number of important factors related to emergency department models of care, which are detailed below.

The working party canvassed the current understanding of the models of care approach to health workforce planning in Australia and the implications for emergency care. It also reviewed the data available at a national level and the planning methodologies already used for emergency department workforces. This material makes up Part A of this report. It became apparent that the consideration of all the workforces involved in emergency care requires good quality data sets across numerous disciplines. At this stage, health workforce data for allied health and support staff is not as developed as that for the medical and nursing professions — and this has implications for the quality of a data modelling exercise.

Part B of this report summarises the literature about innovative projects and models currently being trialled in emergency departments both in Australia and overseas. It also includes comments on the workforce implications of these new models.

One of the most significant developments in emergency departments in Australia, the United

States and the United Kingdom is the application of business process redesign. There are several similar processes known by various names — these include emergency department collaboratives, business process re-engineering, learning networks and lean thinking. Flow management theories and techniques from industry have been adapted to manage patient flows through emergency departments with the goal of improving patient satisfaction and patient outcomes. Business process redesign has been shown to be useful for relieving some of the pressures upon emergency departments. It is a significant development for emergency departments and has workforce implications.

Models of service provision in emergency departments are in a phase of rapid development, with numerous models in trial in various sites across the country. However there are not yet any comparative evaluations to inform the selection of the most efficient and cost effective models. There is also evidence to suggest that the best model of care will be unique to each emergency department. It will be determined by local factors such as patient demographics, physical layout, availability and level of staffing, and the role delineation of the hospital. The same development work and trials in emergency departments have demonstrated that there is scope to improve emergency department performance and outcomes for consumers through business process redesign in Australia.

Principles for business redesign in emergency departments

The review found that the application of business process redesign to work flows in Australian and overseas emergency departments can improve patient outcomes and staff satisfaction. The approach recognises that each emergency department has unique features including its size, patient demographics, layout, staffing profile and other local issues. Any innovations applied need to be designed in response to the specific characteristics and local issues presenting at each emergency department.

A set of seven overarching principles should underpin and guide decision making on innovative work practices and new models of care in an emergency department.

The seven overarching principles are that:

1. Emergency department redesign through business process redesign is most effective when it is a localised process as it is interdependent with many factors that may be unique to an emergency department. These include demographics, physical layout, patient acuity and profile, and local staff retention and recruitment issues.

2. The goal of business process redesign is to promote the best health outcomes and high patient satisfaction through accessible and timely quality treatment in the most suitable location.

3. In-depth understanding of the patient journey through the emergency department from beginning to end is the basis for all design decisions.

4. Design of the emergency department processes should be driven by a fully integrated, multidisciplinary approach to determine the best practices for the patient outcome goals.

5. Consumers are involved in decision making for health service and emergency department planning.

6. The emergency department is one component of the broader hospital system. The whole hospital needs to be actively involved in improving the patient journey, contributing to timely patient treatment in the most suitable location of the hospital, and promoting optimal health outcomes.

7. Promoting smooth transition back to care and support in the community is an important part of the patient journey that needs to be considered in workplace redesign in both the emergency department and the hospital.

Principles for workforce planning and design

Emergency workforce analysis and workforce design should be driven by patient need in each emergency department. Workforce planning, staff development and work practice design should be focused on making the patient journey through the emergency department as efficient, safe and non-traumatic as possible.

The workforce implications of the new emergency department environment have not yet received as much attention as other strategies for improving the management of patients and patient flow. The working party has therefore developed a broad set of principles for emergency department workforce planning based on the recent innovations in business process redesign. These principles are highlighted below.

Emergency department staff are pivotal in driving the design processes in their own department. The workforce is the major resource of the department and work practices may be one of the chief areas of attention for redesign.

Six workforce principles and suggested implementation strategies have been developed to guide business process redesign in emergency departments. These workforce principles are listed here, with suggested strategies provided in chapter 6.4

1. Maximise interdisciplinary team work and promote collaboration between disciplines.

2. Provide leadership and invest time and resources in the strategic management of the emergency department.

3. Support staff to develop and acquire the advanced skills and experience required for some alternative models of care in the emergency department.

4. Make best use of the capacity and expertise of staff in allocating tasks and roles and recognise experience, knowledge, skills, competencies and qualifications.

5. Use new technologies, where proven, to improve efficiency and ensure there is adequate support for implementation.

6. Ensure adequate investment of resources with support from other departments and senior management to sustain improved outcomes.

Chapter 2 Emergency departments in Australia

Key points

- An emergency department is a dedicated area in a hospital that is organised and administered to provide a high standard of emergency care to those in the community.
- In 2003, there were 129 public sector emergency departments located in major referral, urban district or major regional / rural base facilities.
- There were 23 private hospitals with formal emergency departments, and a total 50 private facilities providing 481,000 occasions of service described as emergency care (whether of not they had a formal accident and emergency unit).
- Demand for emergency care is increasing. The total growth in the national occasions of service in the period 1996-97 to 2002-03 was 14% or 2.3% per year.
- The growth in emergency attendance is attributed to the ageing of the population, increasing rates of chronic disease, the availability of new technologies, new procedures and additional resources that have encouraged demand growth, and reduced access to primary community care.
- Emergency department patients aged over 65 years have higher rates of admission than those aged between 5 and 64 years.
- Increases in access block — or the percentage of patients admitted, transferred or dying in the emergency department where their total emergency department time exceeds 8 hours — is correlated to major decreases in bed numbers, community residential care facilities and changes in workforce and community attitudes.
- The core business of emergency departments has changed significantly over the last 20 years due to factors such as changing demographics and changes in health care provision in hospitals and the community.

2.1 What is an emergency department?

An emergency department is a dedicated area in a hospital that is organised and administered to provide a high standard of emergency care to people in the community who perceive the need for, or are in need of, acute or urgent care including hospital admission (Australasian College for Emergency Medicine 2004).

Staffing of emergency departments must include registered nurses on duty, on-site access to medical officers and on-call access to a senior doctor at all times. There will also be on-call access to specialist medical services and/or arrangements for the transfer of patients to receive those services when needed. Emergency departments require access to the services of allied health staff and 24 hour access to pathology, radiology and operating theatre services.

Patients using an emergency department's services may initially deal with reception and then be triaged or assessed for their level of urgency. Once inside the department they receive an initial assessment followed by stabilisation and management of their condition. They may then be discharged home or to another service, or admitted to a hospital ward for further treatment possibly via the operating theatre.

There are different definitions and classifications of emergency departments for different purposes. The only nationally consistent definitions are the role delineations of the Australasian College for Emergency Medicine (ACEM), which categorise emergency departments by their role and level of function. These categories are major referral, urban district and major regional / rural base emergency departments. Two further categories — the rural emergency service and primary care / remote rural emergency service relate to hospital-based services that are too small or under-equipped to be considered emergency departments.

2.2 How many emergency departments are there in Australia?

Using the three ACEM emergency department role delineations, Table 1 shows the number of public emergency departments in Australia. It does not include rural emergency services and primary care / remote rural emergency services.

The figures may appear to be different from figures in individual jurisdictions due to the varying classification systems used in each jurisdiction.

Table 1: Public hospital emergency departments, by state/territory, 2003

Role delineation	NSW	Vic [(a)]	Qld	SA	WA	Tas	NT	ACT	Aust
Major referral	12	6	5	3	4	1	1	1	30
Urban district	22	13	7	3	5	0	1	1	54
Major regional / rural	13	16	10	7	3	2	0	0	45
Total	**47**	**35**	**22**	**13**	**12**	**3**	**2**	**2**	**129**

Source: AMWAC emergency medicine workforce review 2003
(a) Data provided in 2006, excludes specialist obstetric and ophthalmology services

Private hospital emergency departments have been operating in Australia since 1988. Table 2 shows the numbers of private emergency departments approved per state.

In addition, the Australian Bureau of Statistics (2004) recorded a total of 50 private hospitals in 2002-03 that treated emergency patients, whether or not they had a formal accident and emergency unit. 481,000 occasions of service were provided to patients in these 50 hospitals.

Table 2: Private hospital emergency departments, by state/territory, 2003

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Australia
Private emergency departments	3	6	8	3	1	2	-	-	23

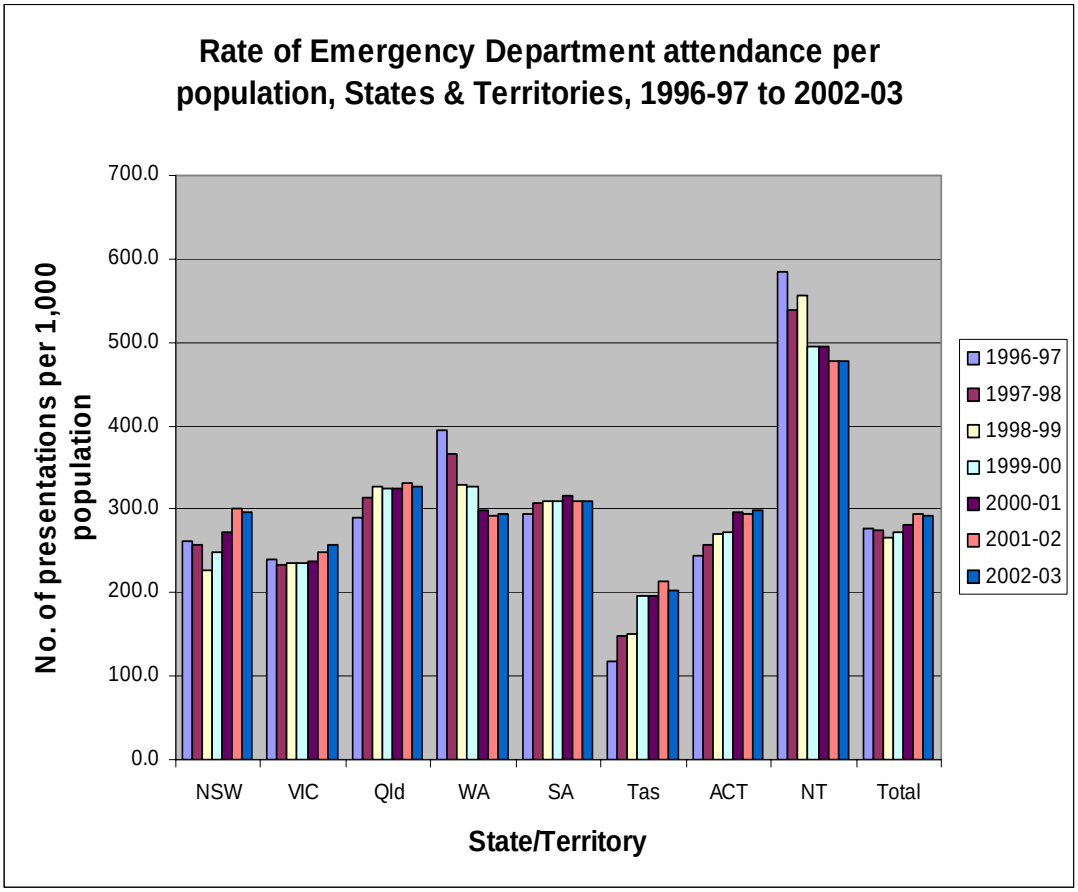
Source: AMWAC emergency medicine workforce review, 2003

2.3 Caseloads

Demand for emergency services is increasing. Australian hospital statistics[1] from the Australian Institute of Health and Welfare (AIHW) show growth in presentations in New South Wales, Victoria, Queensland, South Australia, Tasmania and the Australian Capital Territory. Figure 1 shows the changes in the rate of presentation per 1,000 population in each state and territory and nationally from 1996-97 to 2002-03.

[1] These data are from the National Public Hospital Establishments Database which has a number of differences in the scope compared with the Emergency Department Waiting Times Data Collection. These differences lead to increased number of occasions of service being captured in the National Public Hospital Establishments Database. These discrepancies may be due to differing definitions or different interpretations of definitions or differences in the quality of data provided for different purposes. Some private hospitals are omitted from the National Hospital Morbidity database. For more detail on the collections refer to the 'Australian Hospital Statistics' publications from the AIHW.

Fig 1: Rate of accident and emergency occasions of service per 1,000 population, by state and territory, 1996-97 to 2002-03.



Source: AIHW Australian Hospital Statistics 1996-97 to 2002-03

Note: Reporting arrangements have varied significantly across years and across jurisdictions. 2002-03 data for NSW are preliminary. In WA the number of hospitals which contribute data has changed between years and is significantly higher than the number of recognised emergency departments. See Appendix B for data.

The total national occasions of service in emergency departments was 5,082,434 in 1996-97 and 5,795,857 in 2002-03[2]. While the data are subject to variations in reporting arrangements between years, the total growth in the period 1996-97 to 2002-03 is 14% or 2.3% per year. Australia's population grew 10.3% or 1.7% per year between 1996 and 2002 (ABS Census data).

This growth in attendance, which is outstripping population growth, has been attributed to the ageing of the population, increasing rates of chronic disease (partly due to people living longer), and the availability of new technologies, new procedures and additional resources that have encouraged demand for services (Auditor General of NSW 2004).

[2] National Public Hospitals Establishments Database

Data on the growth in occasions of service does not however give a full picture of the increased workload in emergency departments. Growth in numbers is occurring in the context of a changing patient demographic mix. The structural ageing of Australia's population means that people over 65 years of age are an increasing proportion of Australia's population. Emergency department patients aged over 65 years have higher rates of admission than those aged between 5 and 64 years and are thus likely to require more time and resources during their emergency department visit. In addition, more care of the elderly now occurs in the community and this can increase the reliance on the emergency department when a person's condition deteriorates. A small growth in the size of the aged population therefore impacts the workload of emergency departments more significantly[3].

Developments in the way health care is delivered over the past twenty years have encouraged shorter hospital stays, more after care at home, and increased attention to the efficient scheduling of elective surgery. The effect of these efficiency improvements is that hospital bed occupancy levels are high. This impacts the ability to admit emergency patients promptly to in-patient beds. The term 'access block' has arisen to describe the situation where a patient in an emergency department requires inpatient care but is unable to gain access to an appropriate hospital bed within a reasonable time-frame. It may be measured as 'the percentage of all patients admitted, transferred or dying in the emergency department where their total emergency department time exceeds eight hours' (Cameron and Campbell, 2003). The causes of access block correlate with major decreases in bed numbers, community residential care facilities and changes in workforce and community attitudes. In an historical control observational study in Royal Adelaide Hospital, modest decreases in hospital occupancy resulted in highly significant reductions in emergency department waiting times (Dunn 2003).

Access block is a major problem for emergency departments as it is related to longer in-patient stays and poorer patient outcomes. It also interferes with efficient hospital functioning. Cameron and Campbell (2003) show how the issue is a systemic one and addressing it requires effort across the whole healthcare system, the whole of the hospital as well as organisational changes within the emergency department.

General practitioners or GPs are one of the main providers of primary care in the community and several significant trends in GP availability impact community access to primary care. AIHW medical labour force data shows that GPs, like many other doctors, have reduced their average working hours in the last few years. Many GPs refer patients to locum services for after-hours services. There is also a reduction in procedural work done by GPs due to, for example, the cost of equipment and the additional time required, indemnity and skills maintenance issues. Patients may choose to attend emergency departments due to their accessibility and convenience, particularly for out of hours care and for particular patients, such as the elderly and the very young. Changes to the availability of bulk billing can also add a cost disincentive to using GP services when an emergency room with comprehensive and free diagnostic and treatment services may be available at the hospital.

[3] The same phenomenon has not been observed for Australian hospital in-patients. The total proportion of hospital beds used by patients aged over 65 years has not changed despite increased admission rates because of concomitant reductions in length of stay (Gray 2004). However, the emergency department deals with patient throughput and the flow data demonstrates the effect of the increased numbers of older patients.

The core business of emergency departments is to provide acute emergency services, however the role of emergency departments are playing have changed over the last 20 years due to a number of factors including changed patient demographics and health care provision in both the community and the hospital. Numerous overseas countries are reporting similar pressures in their emergency departments for similar reasons.

The issues of access block, ambulance bypass and unacceptable length of patient waits require systemic action — they cannot be solved solely through changes within emergency departments. However the focus of this project was on the workforce planning issues and other workforce implications for emergency departments. These implications have not yet received as much attention as other strategies for improving the management of patients and patient flow. However the changing core business of emergency departments suggests a need to continually evaluate the appropriateness of work practices and skill sets.

Chapter 3 Models of care

Key points

- Changes in models of care in emergency departments have been introduced to improve patient focus and care and increase the effectiveness of how the workforce is deployed.

- Workforce shortages are a major driver of change.

- A models of care approach includes:

  - analysing the functions and tasks each staff member performs to deliver the preferred patient outcomes
  - mapping the service stream or patient flow
  - describing the skills and competencies associated with these functions
  - identifying the health discipline or occupation best able to perform these skills
  - identifying existing workforce competencies
  - identifying service gaps
  - defining, testing and evaluating profiles of the workforce supply and mix
  - planning for the future, including projected trends in service requirements and supply issues.

- Workforce models of care will vary from place to place depending on the size and location of the emergency department and local demographics and demand.

3.1 The models of care approach to health workforce planning

Changing existing models of care has the potential to improve outcomes for patients. Often the objective of implementing the change is to deploy the workforce in a more consumer focused and cost effective way. This is closely linked with the idea that changing the way staff work and / or the tasks associated with certain roles may improve the effectiveness or quality of care.

Workforce shortages are another key driver for change. Here the objective for introducing change is to ameliorate workforce shortages by using the available workforce in an optimum way to provide best patient care and maximise job satisfaction for staff. Better job retention and improving the attractiveness of health care careers are also goals.

This paper found that a single 'best workforce model of care' cannot solve all the challenges of contemporary emergency departments. Increasing demand, and increasing difficulties with output due in part to access block, are multifactorial issues that can only be solved using a range of strategies. Therefore, better use of the workforce and improved job satisfaction are only one dimension of a broader solution.

A 'models of care' approach to health workforce planning includes an analysis of the functions and tasks each staff member performs to deliver the preferred patient outcomes. This first requires the service stream or patient flow processes to be mapped. Although this detail can be based on observations or arrived at by consensus, an approach that also refers to evidence based clinical practice guidelines is ideal. The roles and functions of staff will vary across different locations and hospitals depending on the morbidity profile and needs of patients.

The 'models of care' approach also requires that the skills and competencies associated with these functions are described, and the health disciplines or occupations that are best able to perform these skills are identified. This needs to include an assessment of the competencies of the existing workforce, an identification of service gaps, an assessment of the best person to undertake the role, and delegation opportunities. Once these potential profiles of the workforce supply and mix have been defined, tested and evaluated, future planning can be done based on expected trends in service requirements, such as population growth, and supply issues impacting each of the workforces. Service plans using these profiles may also be developed at the more local level.

3.2 A proposed models of care approach for emergency care workforce planning

The possible steps in producing workforce plans have been outlined in a paper by the National Health Workforce Secretariat called 'Models of care – a possible approach to health workforce planning (2005).

The following list combines the steps from various approaches into a conceptual plan for approaching emergency care workforce planning under a 'models of care' approach.

1. What are the desired consumer outcomes and service requirements in emergency care and is there general agreement among service providers about these factors?

2. What are the existing clinical models of care and multidisciplinary workforce supply and mix and how do these vary by location (state, territory, urban and rural) and patient profile?

3. Is there any evidence that changes to the workforce mix could deliver better outcomes for consumers or service efficiencies?

4. Are there more realistic, sustainable or effective ways of organising staff that will improve on existing models of clinical care?

5. How will these preferred future clinical models of care and workforce supply and mix vary by location to ensure equity of access for consumers?

6. What changes in service delivery are desirable and expected in the next 5-10 years?

7. What changes in consumer demand are expected in the next 5-10 years?

8. With these changes in mind, what are the preferred clinical model/s of care and workforce supply and mix for the future ie the next 5-10 years?

Some of the key issues facing the working party were:

- How to best define current models of care operating in Australian emergency departments?

- How to best improve current models of emergency care to promote patient outcomes and satisfaction and provide a more sustainable service?

- Is it possible to identify the ideal workforce mix required given the diversity of existing and emerging approaches to emergency care?

- Are the many new approaches sufficiently developed to base workforce plans on them?

- If clinical models of care and related workforce needs are not yet concretely defined, what is the most effective way to invest our health workforce planning effort including promoting the right skills development?

3.3 Existing models of care in Australia

A literature review prepared for the Victorian Department of Human Services (Bearing Point 2004) described four core stages in the flow of patients through an emergency department.

These four stages are:

- Arrival
- Receiving initial assessment of clinical priority in accordance with the Australasian triage scale
- Receiving detailed assessment and treatment eg history taken, clinically assessed, tests conducted and results interpreted, diagnosis made, treatment plan developed and started
- Departure eg departure plan completed and necessary contacts and appointments made, and discharged, admitted or transferred to another hospital.

This model is described in a more sophisticated way with multiple patient pathways in the 2004 Victorian Auditor General's report on managing emergency demand in public hospitals, or in the Queensland model in Appendix C.

All of these models are describing patient flows. To deal with the workforce implications, we need a description of the workforces that currently, or could potentially, perform the tasks and functions along the continuum of care. The literature does not provide examples of studies that link workforce and patient flow, although there are some brief references to the 'US model' or the 'traditional triage model' — this is where registered nurses assess the clinical urgency of all patients before they are seen for assessment and diagnosis by medical staff.

Figure 2 provides a basic model of the workforce against patient flow. The importance of communication with the patient, family and/or carers cannot be underestimated across all stages of patient flow. Effective communication ensures the safety, quality and efficiency of emergency department care.

The limitation of presenting the staff mix against the patient flow is that is doesn't reflect how management, teaching, quality assurance and research functions fit into staffing models of care.

Fig 2: Current emergency department workforce model of care

Phase	Workforce involvement and tasks
1. Arrival	▪ Ambulance staff - transport ▪ Reception staff - clerical admission at this point or after triage ▪ Transport staff - patient transfers
2. Receiving initial assessment of clinical priority in accordance with the Australasian triage scale	▪ Registered nurse – triage - usually following experience in the area and after training in consistent application of triage assessment.
3. Receiving detailed assessment and treatment eg history taken, clinically assessed, tests conducted and results interpreted, diagnosis made, treatment plan developed and started	Most complex phase, that involves some or all of the following: ▪ Registered nurse - initial assessment ▪ Junior doctor - assessment and ordering of tests ▪ Consultant / senior doctor - review of care ▪ Clerical staff - admission paperwork, processing of requests for diagnostics and coordination of patient transport ▪ Registered nurse – observations, treatment or performance of some diagnostic tests ▪ Enrolled nurse - observation or patient care ▪ Transport staff – transfer of patient between emergency department and diagnostic tests or within department ▪ Allied health - treatment or consultation following referral by doctor ▪ Specialist medical practitioner - consultation on referral ▪ Doctor - junior doctor under supervision or senior doctor / consultant - interpretation of results, diagnosis and treatment. ▪ Nurse/doctor/allied health worker advise patient and family/carers of what has happened and the plan for care
4.Departure eg departure plan completed and necessary contacts and appointments made and discharged, admitted or transferred to another hospital.	▪ Nurse, doctor and/or allied health discuss treatment plans, admission or discharge with patient and/or family/carers ▪ Doctor - completes medical notes and discharge documentation, liaise with community care provider as necessary. ▪ Nurse / allied health worker/clerical staff - organise in-patient transfer to ward or theatre, home or residential facility, liaise with community care provider as necessary. ▪ Transport staff – transfer patient ▪ Cleaning staff prepare bed / cubicle for next patient

Source: Adapted from Bearing Point (2004). Literature Review: Emergency Department and Radiology Workforce Department Flow and Workforce. Prepared for the Department of Human Services, Victoria.

3.4 Site and geographic variations

Workforce models of care will vary from place to place and the size and location of the emergency department will have a considerable impact on this. Metropolitan tertiary referral emergency departments manage and provide comprehensive initial care for all emergencies — including trauma — with a wide range of subspecialties, including neurosurgery and cardiothoracic surgery, on site. They have experienced nursing and medical staff on site 24 hours a day, although consultant coverage is likely to be 24 hours on call rather than on site. In some states, emergency departments form part of a critical care network.

Emergency departments in outer metropolitan hospitals vary from basic emergency departments, with designated nursing staff and on call medical staff, to those that provide a full range of services. Major trauma is generally transferred to tertiary referral hospitals.

Base / regional hospitals in rural areas play a role which falls between tertiary referral hospitals and other metropolitan hospitals. Base hospitals typically provide high level emergency services with trained nurses and medical officers on site.

Other rural hospitals provide basic emergency care for resuscitation and limited stabilisation from nursing staff with a medical officer on call. They do not have the capacity to provide definitive care in major trauma. Often the doctor providing emergency care is a local GP.

In smaller rural communities, emergency services are provided from the local hospital by a local GP. In remote areas the service will be provided by the local GP, the local hospital or the Royal Flying Doctor Service. The majority of specialists (53.5%) are located in major referral hospitals (AMWAC, 2003).

Chapter 4 - The emergency care workforce

Key points

- The role of an emergency physician is to assess, stabilise and manage patients who are or could be suffering an acute or urgent illness or injury. They are the senior medical grade in emergency departments.
- Between 1995 and 2001 there was an annual increase in emergency physicians of 13.9%, but a reduction of 9.1% in their total hours worked.
- There are ongoing vacancies in emergency physician positions due to a growth in demand and a drop in their participation rate.
- A range of other medical staff provide emergency care services including emergency medicine and other specialty trainees, career medical officers, locum practitioners, GPs and junior medical officers.
- In 2003, approximately 25% of doctors working in emergency departments were overseas trained doctors.
- Emergency nurses assess patients, prioritise patient care, and provide ongoing nursing management for the diverse patient population presenting to an emergency department.
- There were an estimated 7,532 clinical nurses (7,050 registered nurses) employed in the area of casualty /accident / emergency in 2001, 2,223 more than in 1995. There are however ongoing and significant nursing shortages in emergency care.
- The need for better integrated patient care has encouraged the incorporation of allied health practitioners such as physiotherapists, occupational therapists, social workers, aged care coordinators, pharmacists and nutritionists into emergency care.
- Workforce planning for allied health professionals suffers from a lack of agreed definitions for some of the professions as well as a considerable lack of data.
- Clerical staff, clinical support staff, transport staff and cleaners are essential roles in emergency departments, but there is no national data for these occupations in emergency departments.
- The employment of nurse practitioners is one strategy for improving the efficiency of emergency departments.

4.1 Medical roles and functions

Emergency physicians

The role of an emergency physician is to assess, stabilise and manage patients who are or who could be suffering an acute or urgent illness or injury. These patients may be from all age groups and have diverse medical, surgical and behavioural disorders. Patients with less urgent conditions also present for emergency services.

Emergency physicians are the senior medical grade in emergency departments. They are responsible for investigating, diagnosing and initiating a treatment plan for the acutely ill and injured as well as others who present unscheduled to emergency departments. They may also provide a general medical consultant service to the wards and be involved in pre-hospital care, retrieval medicine, public health, disaster medicine, hyperbaric medicine, clinical toxicology and other special interest areas.

Apart from direct patient care, emergency physicians also:

- supervise and train junior staff and other health professionals
- coordinate patient flow
- liaise with other practitioners and agencies both within the hospital and in the broader community — such as ambulance and retrieval services, community groups, general practitioners (GPs) and other health professionals
- research and teach, including undergraduate teaching
- educate health care professionals and the community more broadly
- become involved in policy formulation, critical incident monitoring and investigation, other quality activities and administration.

An emergency physician has been defined as a Fellow of the Australasian College for Emergency Medicine (ACEM) or a person with an equivalent qualification who conducts emergency consultations, practises emergency medicine, provides medico legal consultations on emergency medicine, or is in a full time or part time academic position relating to emergency medicine. Emergency physicians may work in salaried positions or in private practice.

Staffing models in Australian emergency departments have changed from consultant led care to consultant based care. In consultant based care, consultants are rostered on the floor in protected clinical time during which they are not available for meetings or other administrative work. They are the floor leader and are expected to oversee the function of the department. They typically see the sickest patients and are available for junior staff to discuss the care and management of patients in their care.

The supply of emergency physicians

AIHW medical labour force survey data from 1995 to 2001 showed a 13.9% annual compound increase in the number of emergency medicine specialists[4] — this is the AIHW category that covers emergency physicians. The number of emergency medicine specialists per population has also grown from 1.1 per 100,000 population in 1995 to 2.3 per 100,000 population in 2001 (AIHW 2002).

In 2002, the average age of emergency medicine specialists was 41.1 years — 9.0 years younger than the average age of all medicine specialists. Females made up 20.7% of the emergency medicine workforce, slightly above the 19.8% of females in the total specialist medicine workforce.

Emergency medicine specialists reported working shorter average weekly hours than other specialists. They worked 44.1 hours per week in 2002 — the average for all specialists was 47.1 hours per week — and emergency medicine specialists worked 9.1% less hours in 2002 than in 1995.

In 2005, 108 new trainees are expected to enter first year accredited training positions. This is the same as in 2004, but 22 below the AMWAC target set in 2003. The AMWAC report on the Australian specialist emergency medical workforce (AMWAC 2003) recommended that advanced trainee intakes should increase to 130 per year as soon as infrastructure could accommodate this number, preferably from 2004 onwards. In 2004 there were a total of 471 emergency medicine trainees in Australia. This is a reduction of 131 training positions or 21.8 % on the 602 training positions in 1997.

In 2004, there were 612 active fellows of the ACEM. The number of new fellows is probably the most concrete measure of growth in the profession. A total of 219 new fellows became eligible to enter the workforce in the four years to 2003. The number graduating each year ranged from 36 to 82 per year over the same period.

Although there was a 13.9% compound annual increase in the number of fellows entering the workforce, the drop in the participation rate and the growth in demand has meant there are ongoing vacancies in specialist emergency medicine positions. A report by the Auditor General of NSW in 2004 noted that shortages of staff in NSW emergency departments, including specialist emergency doctors, were affecting the ability of the health system to increase capacity.

Workforce planning for emergency physicians

The methodology used in the report on the Australian specialist emergency medicine (AMWAC 2003) to project future requirements involved setting benchmark emergency physician staffing levels by category of emergency department. To estimate the total number of emergency physicians required, the benchmark staffing level for each category of emergency department

[4] *Emergency medicine specialists* is the AIHW data category that captures emergency physicians

was multiplied by the number of emergency departments within each category. The ACEM role delineation for emergency departments was used to categorise emergency departments. State and territory health departments were asked to provide information on future plans for expansion and development of new emergency departments during the ten year projection period to see if any change in the number of emergency departments was anticipated. The Australian Private Hospitals Association (APHA) surveyed private hospitals to determine planning intentions for private hospital emergency departments.

There is no accepted formula or simple measure to work out the number of medical staff needed in an emergency department. In Victoria, each hospital makes decisions on medical staffing based on their patient numbers, case mix and acuity (Auditor General Victoria 2004).

In common with other states, Victoria has increased the number of medical staff who have specialist qualifications in emergency medicine, and the hospitals examined in the Auditor General's report had good coverage from senior medical staff with specialist emergency medicine qualifications.

Other medical staff

Many other medical practitioners work in emergency departments. Emergency medicine advanced trainees account for over 471 positions nationally (MTRP 2004) and a range of other specialty trainees — such as surgical, physician, anaesthetic and intensive care trainees — can undertake training terms in an emergency department.

Career medical officers, locum practitioners and junior medical officers in their early postgraduate years also provide services in emergency departments.

GPs support emergency departments, particularly in rural areas, where in 2003, 60% of rural and remote doctors identified themselves as regularly practising emergency care. The proportion of GPs who regularly practise emergency care increases with increasing remoteness. The highest proportions of GPs regularly practising emergency care are those working in hospitals and as "fly in/fly out" GPs (Australian Rural and Remote Workforce Agencies Group, 2003).

In 2003, AMWAC surveyed the hospital medical workforce in Australia and achieved a response rate of 83.3% of Australian hospitals (AMWAC 2004). The make-up of the Australian trained emergency department medical workforce according to this survey was:

- 31.8% or 166.8 full time equivalent (FTE) doctors were staff specialists
- 48.8% or 255.8 FTE were trainee doctors
- 19.3% or 101.3 FTE were other.

The total FTE Australian trained medical workforce identified by the survey was therefore 523.9. At the same time, there were 179.3 FTE overseas trained doctors working in emergency departments — 25.5% of emergency department doctors. Overseas trained doctors are therefore a significant consideration in health workforce planning for emergency departments.

4.2 Nursing roles and functions

Emergency nurses

Emergency nurses assess patients, prioritise patient care and provide ongoing nursing management for the diverse patient population presenting to an emergency department. Nursing practice in the emergency department may range from life saving interventions and caring for and communicating with people in crisis to providing health promotion and injury prevention information. Emergency nurses need to be familiar with a wide range of illnesses and injuries covering the full range of body systems and life cycle including paediatric, geriatric and obstetric.

It is common practice that registered nurses have at least one year's nursing experience post registration before working in emergency departments. In addition, some hospitals hold short orientation and continuing professional development courses to help new staff to acquire the basic level of skill required to work in the emergency department.

A graduate certificate or diploma of emergency nursing of at least 12 months duration is often recommended but is not mandatory. About 37% of nurses working in emergency departments in 2001 had emergency nursing postgraduate qualifications, up from 25% in 1995 (AIHW unpublished). Courses are offered at various universities and professional organisations and may be affiliated with a number of hospitals.

The supply of emergency nurses

In 2001, there were an estimated 7,532 clinical nurses employed in the area of casualty / accident / emergency in 2001, 2,223 more than in 1995 (AIHW unpublished). Of the 7,532 in 2001, 7,050 or 93.6% were registered nurses. The number of full-time equivalent (FTE) clinical nurses working in emergency was 6,283.2 in 2001 compared with 4,763.7 in 1995. This is an increase of 1519.5 FTE nurses or 31.9%. Over the same time, headcount increased by 41.9%. The increase in headcount for the total employed registered and enrolled workforce — including non-clinicians — over this period was 3.4%.

The rate of FTE emergency nurses to every 100,000 population has increased from 26.4 per 100,000 in 1995 to 32.4 per 100,000 in 2001. The emergency care nursing workforce has been growing in both headcount and full-time equivalent between 1995 and 2001. This growth is much greater than that of the total employed nursing workforce over the same period. The growth in FTE has occurred despite a small reduction in the average weekly working hours of emergency nurses — in line with the general trend in the total nursing workforce — and an increase in the proportion of emergency nurses who work part time to just over half the emergency workforce in 2001.

Although the emergency nursing workforce is predominantly female, it has a higher proportion of males than the total nursing workforce. The proportion of males has also grown between 1995 and 2001. Males work slightly longer average weekly hours and are slightly younger than females in the emergency care workforce.

Although increasing in age, emergency nurses remain one of the younger nursing groups compared with other areas of clinical nursing. In 2001 the average age was 37.8 years. It has increased each survey year since 1995 when the average age was 35.8 years.

Workforce planning for specialist areas of nursing is difficult because, unlike medical specialties, nurse registration data does not capture information about specialist nurses if they are not required to have a separate authorisation to practice. The nurse labour force surveys published by the AIHW are therefore the main source of data. Although the AIHW collection contains good data about the headcount and FTE numbers working in accident and emergency, it cannot provide any information on inflows to and outflows from the specialty. Some state payroll systems have the ability to track inflows and outflows into specialty areas of practice, but cannot determine when a nurse is leaving the specialty entirely versus changing health setting. Changes in the 'front-end' of nursing supply — that is, entries to undergraduate nursing education programs — have a flow on effect to the numbers moving into specialty areas, but the magnitude of the flow on is hard to predict.

Vacancy rates provide some indication of supply but they are crude measures of true shortages. The definition of a vacancy can vary and the number can be underestimated if employers stop advertising positions that are difficult to fill. However there is some data on vacancies. The national skills shortages lists produced by the Commonwealth Department of Employment and Workplace Relations have emergency nurses listed as being in shortage in all states and territories.

In 2004, the Victorian Auditor General found that nurse shortage issues varied among the hospitals studied in their performance audit of 13 metropolitan emergency departments in Victoria. After the initial impact of the implementation of the Victorian nurse staffing ratios, one hospital reported that they had a waiting list of staff wishing to work there while other hospitals were still having difficulty permanently filling positions.

The NSW Auditor General noted that nursing shortages in general were having an impact on response times in emergency departments. Nursing shortages also exist in medical and surgical wards — this reduces the capacity to open additional beds and affects the ability to admit patients from the emergency department.

Workforce planning for emergency nurses

Few jurisdictions use a standardised system for calculating the number of nursing staff needed on each shift in an emergency department. In Victoria in 2000 an enterprise bargaining agreement established agreed ratios for nurse staffing and specified that emergency departments should have a staffing ratio of one nurse to three cubicles. The implementation of these ratios had an immediate and significant impact on hospitals. It caused bed and emergency department cubicle closures as hospitals found they had insufficient staff to open the required number of beds/cubicles under the new arrangements.

The Victorian Auditor General found that a system that determines required nurse staffing levels based on a simple ratio of staff per cubicle does not adequately address the staffing needs of hospitals with high numbers of waiting room patients. For example, a single triage nurse would be unable to effectively observe large numbers of waiting patients and triage new arrivals.

4.3 Allied health roles and functions

The need for better integrated patient care, especially for frequent users of emergency departments, has encouraged the incorporation of physiotherapy, occupational therapy, social work, aged care coordinators, pharmacy and nutrition services into emergency care. Care coordination teams may include nurses, social workers and mental health workers. There is some evidence that services are most likely to improve discharge planning and re-presentation rates if they have rapid access to allied health professionals.

Workforce planning and supply in allied health

Workforce planning for the allied health professions suffers from a lack of agreed definitions for some of the professions as well as a considerable lack of data. Many emergency departments do not have dedicated allied health staff, but call upon staff who work elsewhere in the hospitals to provide services in the emergency department. Therefore, quantifying the FTE staff working in emergency departments would be difficult even if there were better national data available.

The ABS census of population and housing gives headcount numbers of people employed by professional field. The latest census data is for 2001. It provides broad numbers employed by health occupation and by age (national only), sex, geographic region and hours worked. Trends between census dates can also be observed. Department of Education Science and Training data provides university commencements and completions by university course, giving a broad indication of future supply across each profession. The national skills shortage list, prepared by the Department of Employment and Workplace Relations, shows that at March 2004 there were a number of allied health professions in shortage across many, but not all, states.

Information about the employment of allied health professionals in emergency departments is usually related to reports of specific initiatives. Some of the National Institute for Clinical Studies emergency department collaboratives employed physiotherapists to triage and treat minor injuries with good results.

The Victorian Auditor General found that all the hospitals they examined used care coordinators or discharge planning staff to act as dedicated problem solvers. These staff were generally allied health professionals such as physiotherapists, occupational therapists or social workers. Their roles included assessing patient needs, addressing needs that cannot be met by existing supports, arranging short-term support services to assist patients to recover at home, arranging referrals to other community services to provide longer-term assistance, and liaison with other hospital staff to assist with early planning for discharge needs of inpatients.

4.4 Support staff

Clerical staff, clinical support staff, transport staff and cleaners are essential roles in emergency departments, but there is no national data source on these occupations within emergency departments and few studies comment on their roles in emergency departments.

A project by the South Western Sydney Area Health Service (Morris et al 2001) trialled four new roles to improve work practices in emergency departments and recommended the roll out of these practices to all NSW emergency departments. Two of the roles related to support services. Having a centralised communications clerk — who was trained and equipped to receive and direct all incoming calls and track patient information — saved 34 clinical hours per week. An equipment officer who managed the selection, ordering and maintenance of equipment and consumables plus physical restocking was estimated to have saved 288 clinical hours per week.

The Victorian Auditor General found a variety of approaches to determining the duties and workload of support staff in Victorian hospitals. Some hospitals had worked to implement multi-skilled, flexible roles for their clerical and support staff. As a result, they felt that their use of these staff was efficient day to day, and when they needed to implement changes to procedures in the emergency department they had the flexibility to do so. Other hospitals had narrower role definitions for support staff — for example, one hospital had three different categories of clerical staff within the emergency department. Staff at these hospitals felt that, although the demands on the emergency department and models of care had changed dramatically in the last decade, their support workforce was still based on traditional roles. All emergency departments experienced delays transporting patients to imaging rooms due to the unavailability of hospital transport staff.

4.5 Opportunities for new roles

Nurse practitioners

Nurse practitioners have had a presence in some countries since the 1960s. In recent years a number of Australian jurisdictions have undertaken work related to the role of nurse practitioners and some have increasing numbers of authorised nurse practitioners.

The nurse practitioner standards project (Gardner et al 2004), sponsored by the Australian Nursing Council and the New Zealand Nursing Council, defined a nurse practitioner as:

> ‘A registered nurse educated to function autonomously and collaboratively in an advanced and extended clinical role. The nurse practitioner role includes assessment and management of clients using nursing knowledge and skills and may include but is not limited to the direct referral of patients to other health care professionals, prescribing medications and ordering diagnostic investigations. The NP role is grounded in the

nursing profession's values, knowledge, theories and practice and provides innovative and flexible health care delivery that complements other health care providers. The scope of practice of the nurse practitioner is determined by the context in which the nurse practitioner is authorised to practise'.

The employment of nurse practitioners is seen as one strategy for improving the efficiency of emergency departments. They are able to attend to and assess selected patients, initiate laboratory and diagnostic tests, prescribe medications, and refer and admit patients. They work in collaboration with their health care colleagues to identify the most appropriate care for patients.

Many jurisdictions have or are in the process of developing the nurse practitioner role in emergency departments. NSW Health publishes lists of authorised nurse practitioners and, as at July 2005, there were 8 emergency department nurse practitioners out of a total of 63 nurse practitioners.

Queensland is progressing well with their nurse practitioner demonstration sites, one of which is in the emergency departments of Redcliffe, Caboolture and Kilcoy. These nurses are currently seeing a wide variety of non-complex trauma and general health condition cases using clinical guidelines.

The Western Australian government passed legislation in April 2003 to provide the structural framework for the practice of nurse practitioners. Organisations can apply for approval to have a nurse practitioner practice in a designated area under the guidance of approved clinical protocols. Reducing waits in emergency departments is an example given of where they might work.

In Victoria, the Department of Human Services has funded a number of hospitals to develop a model of nurse practitioners in emergency nursing. The Alfred, Austin, Northern, Royal Children's, Sunshine, Box Hill and Dandenong hospitals and the Monash medical centre have implemented the role. The final reports from these projects show that nurse practitioners in emergency departments provide safe and effective care and can improve access to services for patients. Following the success of this project, the Department of Human Services has recently funded a further five nurse practitioner projects in regional Victorian emergency departments.

There are currently two nurse practitioners working in emergency departments in South Australia and the scope for their roles is developing.

Emergency care practitioners

The national health service (NHS) modernisation agency in the UK have developed the emergency care practitioner role to support 'first contact needs' of patients. The role can be filled by staff from a variety of professional backgrounds and a multidisciplinary approach has been encouraged. The emergency care practitioners or ECPs have been used to respond to 999 calls with ambulances to reduce unnecessary transports, support GPs in out of hours

services by carrying out home visits, and increase the workforce capacity in urgent care centres. In 2004, there were 376 ECPs across 17 NHS sites.

PART B: Developments in Australian and overseas emergency departments

Chapter 5 A review of models and projects

Key points

- A range of organisational models are being tried in Australian and overseas emergency departments. They include co-locating a short stay observation ward in an emergency department, 'fast tracking' patients with specific conditions, transit lounges for patients awaiting transfer, and primary care units for GP type services.
- There is a lack of comparative assessments to evaluate which projects offer the greatest overall benefits in managing patient flows and under what conditions.
- Evaluation reports are available on the impact of trials of new models, but not many report on their workforce implications.
- Two key issues facing organisations implementing innovative models are the shortage of staff with advanced skills or experience and difficulties in adapting the skills of existing staff to suit new roles.
- Effective changes in the delivery of emergency care have involved:
  - nurse practitioner initiatives
  - multidisciplinary aged care services emergency teams
  - emergency medical units
  - rapid emergency assessment teams.
- Business process redesign uses a localised and team approach to designing, evaluating and implementing improvements by the staff of an emergency department.

  Common elements include:

  - a goal of improved patient outcomes and satisfaction
  - a systematic view of the emergency department
  - reliance on an evaluation method
  - workplace / work practice redesign through multiple changes or a series of small changes
  - localised development of improvements by the local staff working as a team.

5.1 Australian reviews of models of emergency care

There are several different organisational models of emergency care being tried in Australia and considerable literature about their local effectiveness and perceived benefits.

These models include:

- Co-locating a short stay observation ward with an emergency department
- 'Fast tracking' the assessment and treatment of patients with specific conditions
- Transit lounges for patients awaiting transfer
- Primary care units for patients requiring GP type services.

However there is a lack of comparative assessments to evaluate which projects offer the greatest overall benefits in managing patient flows and under what conditions. This makes it hard to make informed management, organisational change and resource allocation decisions (Auditor General of Victoria 2004).

In 2004, a review of emergency department literature was prepared for the Victorian Department of Human Services (Bearing Point 2004). It aimed to identify work practices and recent innovations, examine staffing and service profiles, and find trends in emergency department workflow and practices.

The review found innovation occurring in three main areas:

- Improved infrastructure, largely relating to information technology and some changes to work practices
- Non-traditional roles
- Organisational and service model change.

Most of the main findings of the review have workforce implications. They are as follows:

1. Performance improvement may be achieved through IT projects that improve communication and reduce, or improve the efficiency of, the administrative workload. Particular projects have focused on the use of portable devices to reduce the time required for doctors' clinical notes and electronic whiteboards to improve visibility of patient demand.

2. Reduction in emergency department waiting time and overall length of stay appears to result from role changes and the reallocation of tasks. For example, using physicians assistants for minor suturing and completing medical records, creating specialist nursing roles to conduct triage, suture, read x-rays and prescribe drugs within a limited range, and using paramedics to deliver services such as intubation.

3. The capacity to roster staff in accordance with their individual demand peaks will deliver greater capacity to deal with emergency department workload peaks. Individual hospitals may already work in this way but it appears that this is not widely practiced.

4. Performance improvement strategies appear to be hospital specific and based on the activities in single hospitals. There is very little literature that describes system-wide change strategies.

5. Emergency department demand is increased when patients use the emergency department 'inappropriately' — for example, instead of going to a GP. Strategies to deal with this demand profile have included:

- Establishing primary care capability within or next to the emergency department staffed by specialist nurses
- Training emergency department nurses to deal with minor trauma through suturing, ordering and reading x-rays, and prescribing drugs within clinical protocols
- Using paramedics to pre-screen emergency cases at the site of the emergency — this appears to reduce emergency department demand and improve the targeting of services.

6. Broad acceptance or uptake of an expanded role for nurses and para-professionals suffers from a failure to adopt national standards for the accreditation of these roles. Perceptions of differences in the quality and reliability of accreditation programs lead to a lack of transferability of specialist nurses between health areas in Australia and overseas. The national nursing and nurse education taskforce will be developing national standards for nurse practitioners and this should make their transferability more practicable.

7. Specialist programs for nurses have been created to improve the ability to retain nurses and reduce the low-grade medical work falling to doctors. However there is some evidence that this upgrading of skills is at the expense of some of the more traditional caring roles of nurses.

5.2 Staffing issues for new models of care

There are evaluation reports on the impact of trials of new organisational or service models, but not many report in detail or in a systematic way on the workforce implications of the new model. However there are some recurring themes emerging. Two key issues faced are the shortage of staff with advanced skills or experience, and difficulties in adapting the skills of existing staff to suit new roles.

The Victorian audit report (Auditor General Victoria 2004) concluded that the roles of the emergency department workforce had not kept pace with changing models of clinical care. One particular change noted was the increased need for complex care planning for after discharge care. The lack of progress in adapting clerical and clinical support roles in response to changing models of care was noted, more so than the medical and nursing workforces that have increased numbers of staff with specialist qualifications.

The report was generally positive about the implementation of fast track models in Victoria, but found that most hospitals had occasional difficulties in staffing programs with appropriately

trained medical staff. This meant that some fast-track programs either did not run on certain days or operated with interruptions due to the use of non-dedicated doctors. This was especially the case where the primary fast-track doctor splits their duties between the main treatment area and fast track. This creates 'stop-start' operations, making it difficult for the triage nurse to know whether fast track is operating or not. The report therefore suggested that maximum effectiveness would be achievable when using dedicated medical and nursing staff.

The use of care coordination staff in the emergency department to prevent hospital admissions was found to be a promising initiative that is enhancing patient care and reducing pressure for hospital beds. Coordinated care programs worked best when the staff could be a dedicated resource to the care coordination team within the emergency department. However, it is not possible to provide dedicated resources in the full range of disciplines that may be needed in the emergency department. The availability of staff for the team limited the numbers of patients who could be seen by care coordination staff, and selective application to patients was being practiced based on potential to prevent admission.

The Victorian report further noted that — as emergency departments increasingly implement new models of care where ambulatory patients are directed to waiting areas and streamed through fast-track — staffing models need to consider more than simple cubicle to staff numbers and take into account patient acuity and models of care.

The National Health Service (NHS) in the UK has promoted emergency department collaboratives and role redesign as part of a national goal to reduce patient waiting times to less than four hours. 'See and Treat' is also being widely taken up — patients with minor injuries and illnesses not likely to require admission are treated by the first multidisciplinary person to see them, rather than being triaged and waiting for more urgent patients to be seen first.

The English National Audit Office in a report presented in October 2004 evaluated the improvements in emergency care. Significant improvements were found, largely achieved through improved working practices and local investment in emergency departments. With respect to staffing, the traditional reliance on junior doctors has been found to be unhelpful in implementing 'See and Treat' as doctors in their first foundation years of practice are part of a supervised training program that depends on input from senior medical and nursing staff. Attraction and retention of suitably qualified clinical staff was an ongoing challenge in the UK emergency departments. One of the three most important changes in the delivery of emergency care was found to be nurse practitioners, but problems with the recruitment and retention of experienced nurses were also noted.

New South Wales has implemented a range of new organisational models to improve emergency care. Multidisciplinary aged care services emergency teams were implemented from August 2002 in 36 hospitals. Almost all teams reported recruitment difficulties delaying project start up and retarding progress during implementation in some hospitals. The same issue was reported with the implementation of clinical initiatives nurses who operate as adjuncts to the triage nurse and focus on the patients and families who are waiting. An evaluation of short stay, emergency medical and medical assessment and planning units in Victoria found that these units were successful in reducing length of stay for target groups (CEHSEU 2004).

Two other models in NSW — emergency medical units and rapid emergency assessment teams —were found to be successful (Auditor General of NSW 2004). Emergency medical units house patients who need short-term observation and treatment, usually between 24 - 48 hours, but do not necessarily need to be admitted to a ward. Rapid emergency assessment teams fast track the treatment of patients with semi-urgent illness or injury by teams of senior medical staff.

The NSW Health Emergency Care Taskforce has developed the "ideal emergency department journey" which provides a framework for a number of new models of emergency care. These include "triage and treat", "fast-track", "3-2-1- process" for complex and high acuity patients, short stay units and integrated care as well as highlighting hospital-based alternatives to emergency care such as advice lines and community and post acute care services (NSW Health Department, 2006).

5.3 Business process redesign

A significant new trend in emergency care is the use of business process redesign. This is not a particular model of care but a localised and team approach to designing, evaluating and implementing improvements by the staff of an emergency department. The techniques were originally developed for manufacturing engineering and adapted to suit patient care in the hospital setting. The goal of business process redesign in health care is to improve patient outcomes and the patient's experience of the emergency department.

The common elements of this approach are:

- A goal of improved patient outcomes and satisfaction
- A systemic view of the emergency department
- Reliance on an evaluative method
- Workplace / work practice redesign through multiple changes or a series of small changes
- Localised development of improvements by the local staff working as a team.

In Australia, the National Institute of Clinical Studies (NICS) has used what it refers to as a collaborative methodology to improve evidence based care through the rapid sharing and spreading of ideas by a multidisciplinary team. The collaborative projects use the plan-do-study-act cycle or PDSA to sequentially test ideas and identify changes that are improvements (NICS 2004). NICS attributes this terminology and model to the US Institute for Healthcare Improvement and Langley et al 1996.

The US Institute for Health Care Improvement aims to translate relevant industry knowledge and methods for use in the improvement of the complex health care system, acknowledging that biomedical science alone cannot be applied to the complex patient flow and systems management issues in contemporary health organisations (Nolan 2004). The Institute website has a wealth of articles about projects that use these methods in patient care.

Since 2002, there has been extensive investment in collaborative projects in emergency departments in the UK and other initiatives to help hospitals meet the commitments made in the

NHS plan for emergency services. Their collaboratives use a similar approach to the Australian NICS collaboratives. They emphasise a localised approach, the correct diagnosis of issues, robust data collection to support evidence based performance management, and the broad involvement of the clinical staff at the site. Local role redesign to suit local needs and the creation of fast-track services for patients with less urgent or minor conditions are common outcomes. Statistical process control is the quantitative technique commonly promoted within the NHS to evaluate potential changes.

Collaborative projects conducted in the United States by the urgent matters learning network (UMLN 2004) approached the sustainability issue by building in a hospital-wide approach from the beginning. Emergency department overcrowding was seen as a hospital wide issue, not just an emergency department issue. In any hospital, the team overseeing the project had to have active CEO support and executive membership.

Lean thinking is a term used in manufacturing that is now being applied to emergency department management — particularly at Flinders Medical Centre in South Australia where it is being used to improve the flow of patients and reduce waiting times for treatment. The term was first coined by Toyota where it was applied to the production system. Lean management or lean thinking aims to eliminate waste in materials, labour and time. It does this by looking at the whole customer experience of the system, rather than the separate activities or functions of the organisation. All processes are examined and redesigned where necessary to optimise the patient flow, rather than to optimise the running of each of the separate departments.

Some of the features of business process redesign and the factors that are critical to its success are:

- Redesign is preceded by the analysis of demographics, environmental factors, workplace culture, size and type of institution and patient profile. Internal business processes are analysed from the perspective of the patient experience and the patient journey through the system. The necessary controls (legislation, standards, strategy, policy, guidelines etc) and enablers (clinical and non-clinical staff, information services, facilities, equipment etc) are considered through each phase of the system.

- The current situation is mapped as baseline data collected at the outset.

- Issues or areas needing attention are put in priority order — taking into account risks to patient safety, most commonly occurring problems or resource inefficiencies.

- Well managed trials are undertaken of any changes that will potentially address the priority areas.

- Qualitative and quantitative techniques are used to evaluate the trialled changes before deciding whether to implement them on an ongoing basis. The impact of the changes on the system as a whole must also be considered before they are implemented.

5.4 Australian results - The NICS Emergency Department Collaborative.

The National Institute of Clinical Studies (NICS) released an evaluation report of the emergency department collaborative conducted in Australia in 2002 (NICS 2004). They found many areas of clinical and organisational improvement and also reported on some of the workforce implications.

There were 47 Australian emergency departments involved in the collaborative. A common goal of hospital projects was to reduce the time between presentation and administration of either analgesia, nebulisation, thrombolytic medication, antibiotics or referral to specialist units. The collaborative projects shared the same features as business process redesign projects.

The projects frequently departed from the traditional triage model of care with many examples of triage for a specific patient group being done more effectively by medical staff, senior nurses or physiotherapists. However there was no single trend of one discipline taking on the tasks of another.

A diverse range of strategies were employed in different places, but registered nurses featured frequently in the case studies chosen for inclusion in the NICS evaluation. This is possibly because registered nurses are the largest professional group employed in emergency departments.

Staffing models of care differed among hospitals, even when they were working towards the same clinical goal. For example, three different models for medical staff practices were used in projects in South Australia that aimed to reduce time to thrombolysis. The existing medical staffing structure at the facility appears to have helped determine the staffing model chosen. Each model was associated with reduction in time to thrombolysis, although to varying degrees.

It is apparent from the participating hospitals that there was no single 'best' alternative model of care. All hospitals developed their own strategy for working towards their goal. This may be essential given differences in size, staff and many other local circumstances. A key issue is whether emergency department staff have the time skills, especially management time, and incentive to start working in an innovative and cross-disciplinary way. Issues of culture change and departures from historic ways of working through a focus on cross disciplinary team building and communication were particularly prominent in the NICS work. They also noted the need for continued positive interest from key people within the hospital and emergency department management structure to sustain project outcomes.

5.5 Some key themes

There is experimentation occurring in Australian and overseas emergency departments with different organisational models, non-traditional roles for staff, and different work practices. These have generally been responses to local needs or part of a special project in the hospital. A comparative evaluation of the many approaches has not been done, but there are some consistent themes emerging about workforce issues.

These themes are that:

- Patient outcomes and satisfaction can be improved by focusing on how work practices impact on the patient journey.
- Emergency department issues can be addressed through a systemic approach across the whole hospital and beyond.
- New models of care are being implemented in Australian emergency departments, but there is no clear evidence that any particular model is superior to another.
- There is considerable acceptance that business process redesign and management of patient flows should be part of hospital and emergency department management.
- A multi-disciplinary and team based ‘grass roots’ approach designed and implemented by emergency department staff in response to the local circumstances can be very effective under the right circumstances and given the right support.
- A lack of experienced staff and delays in adapting skill sets to new roles may be obstacles to the rapid implementation of new models.

Chapter 6 Workforce planning principles

Key points

- The review found that the application of business process redesign to work flows in Australian and overseas emergency departments can improve patient outcomes and staff satisfaction.

- A set of seven overarching principles should underpin and guide decision making on innovative work practices and new models of care in an emergency department. These principles include taking account of local factors, having an in-depth understanding of the patient journey, involving consumers in decision making, seeing the emergency department as a component of the broader hospital system, and promoting a smooth transition for patients back to the community.

- Emergency workforce analysis and workforce design should be driven by patient need in each emergency department. Workforce planning, staff development and work practice design should be focused on making the patient journey through the emergency department as efficient, safe and non-traumatic as possible.

- Projecting future workforce requirements before further development in the redesign work currently happening in Australian emergency departments could result in a projected workforce profile that is misaligned with new models of care and actual needs.

- Six workforce principles and suggested implementation strategies have been developed to guide business process redesign in emergency departments. These workforce principles include maximising interdisciplinary team work, providing leadership, supporting staff to develop and acquire skills and experience, allocating tasks and roles to make the best use of staff expertise, using new technologies and investing resources to sustain improved outcomes.

6.1 The development of the principles

These principles have been developed by the emergency care model of care working party of the Australian Health Workforce Advisory Committee following a review of developments in Australian and overseas emergency departments. They are based on the experience of working party members and their insights into successful innovations in emergency departments.

The review found that the application of business process redesign to work flows in Australian and overseas emergency departments can improve patient outcomes and staff satisfaction. The approach recognises that each emergency department has unique features including its size, patient demographics, layout, staffing profile and other local issues. Any innovations applied need to be designed in response to the specific characteristics and local issues presenting at each emergency department.

During the review, there were a number of common workforce themes that emerged in the context of business process redesign. The working party has synthesised these and developed some overarching principles that are considered common to all emergency department settings. It is intended that these principles underpin and guide health administrators, policy makers, managers and clinicians who are considering innovative work practices and new models of care in an emergency department setting. They are principles that guide management at the operational level but also have relevance at the policy level.

The working party felt strongly that emergency department workforce analysis and workforce design should be driven by patient need in each emergency department. Workforce planning, staff development and work practice design should be focused on making the patient journey through the emergency department as efficient, safe and non-traumatic as possible. Consumers should be actively involved in helping to identify and inform continuous improvement activities that impact on their health outcomes and the care that they receive.

For effective planning and change management, it is essential to fully understand the emergency department work environment. This includes its core business, goals, workflow and processes for delivering care within the emergency department and facilitating client movement beyond the department to other areas of the medical facility or the community — that is, the entire patient journey. This journey should be analysed from end-to-end, from the time the patient first makes contact with the health system in the emergency department until they exit the hospital. A comprehensive understanding of this journey provides the basis to measure and benchmark changes that may result from new models of care and changes in workflow. The focus will be on that part of the journey spent in the emergency department, while recognising that this department is also part of a complex health system with multiple interactions and reactions possible from any changes made.

An analysis of current emergency workforce data provides a snapshot of the current status of workforce supply and a future reference point. However the working party felt that projecting future workforce requirements before further development in the redesign work currently

happening in our emergency departments could result in a projected workforce profile that was misaligned with new models of care and actual needs.

6.2 The National Health Workforce Strategic Framework Vision

The National Health Workforce Strategic Framework was released by the Australian Health Ministers in April 2004 (Australian Health Ministers' Conference, 2004). It aims to guide national health workforce policy and planning and Australia's investment in its health workforce throughout the next decade. It identifies the three main challenges for future workforce planning as:

- The demographic changes of an ageing population and slower growth in new workforce entrants
- The increasing development of new technologies
- Empowered consumers seeking information about treatments as well as information about the performance of facilities and individual practitioners.

The framework contains a vision statement that sets the direction in which workforce effort should be focused. It is that:

> 'Australia will have a sustainable health workforce that is knowledgeable, skilled and adaptable. The workforce will be distributed to achieve equitable health outcomes, suitably trained and competent. The workforce will be valued and able to work within a supportive environment and culture. It will provide safe, quality, preventative, curative and supportive care, that is population and health consumer focused and capable of meeting health needs of the Australian community.'
>
> National Health Strategic Framework, April 2004

This vision applies equally to emergency department workforce planning. In addition, in the context of business process redesign in emergency departments, the vision of the working party is that:

> 'Improved health outcomes and patient satisfaction will be achieved by empowering and equipping the multidisciplinary emergency department team to analyse, evaluate and redesign their own workplace and work practices from the perspective of the patient journey. This will be actively supported by the processes and practices of the whole health facility. Positive patient outcomes will result through the coordination and timely treatment of patients in the best location by the most appropriately skilled workforce, and the facilitation of continuity of care and support for the entire patient journey including transition back to the community.'

6.3 Overarching principles for business process redesign in emergency departments

The seven overarching principles are that:

1. Emergency department redesign through business process redesign is most effective when it is a localised process as it is interdependent with many factors that may be unique to an emergency department. These include demographics, physical layout, patient acuity and profile, and local staff retention and recruitment issues.

2. The goal of business process redesign is to promote the best health outcomes and high patient satisfaction through accessible and timely quality treatment in the most suitable location.

3. In-depth understanding of the patient journey through the emergency department from beginning to end is the basis for all design decisions.

4. Design of the emergency department processes should be driven by a fully integrated, multidisciplinary approach to determine the best practices for the patient outcome goals.

5. Consumers are involved in decision making for health service and emergency department planning.

6. The emergency department is one component of the broader hospital system. The whole hospital needs to be actively involved in improving the patient journey, contributing to timely patient treatment in the most suitable location of the hospital, and promoting optimal health outcomes.

7. Promoting smooth transition back to care and support in the community is an important part of the patient journey that needs to be considered in workplace redesign in both the emergency department and the hospital.

6.4 Workforce principles

Emergency department staff are pivotal in driving the design processes in their own department. The workforce is the major resource of the department and work practices may be one of the chief areas of attention for redesign.

The following principles are designed to guide business process redesign in relation to workforce issues. Each principle includes suggested strategies for implementation.

1. Maximise interdisciplinary team work and promote collaboration between disciplines.

Strategies

a) Involve each of the emergency department's disciplines and occupational groups in the change management processes, the identification and prioritisation of issues and the planning, trialling, evaluation and implementation of potential solutions.

b) Create opportunities, supported by appropriate education and information, for the different disciplines and occupational groups to openly gain an understanding of the skills and capabilities of each other through interdisciplinary activities.

2. Provide leadership and invest time and resources in the strategic management of the emergency department.

Strategies

a) Develop good leadership practices to effectively manage business process redesign.

b) Make sure emergency department managers work as a collaborative management team.

c) Allocate time and resources to managers to achieve agreed outcomes.

d) Develop and communicate a common vision for the goals and direction of the department.

e) Foster a positive culture of ownership by staff by involving them in all stages of decision making, allocating time and providing support.

f) Develop effective communication strategies that keep all stakeholders advised of any developments, ensure transparency and accountability, and encourage a culture of openness and inclusion.

3. **Support staff to develop and acquire the advanced skills and experience required for some alternative models of care in the emergency department.**

Strategies

a) Provide constructive performance feedback and career development opportunities.

b) Develop future leaders and managers by ensuring access to appropriate education and mentoring, and encourage and support experienced staff to take on a broad range of responsibilities with confidence and autonomy.

c) Take proactive measures to promote retention and identify and address workload issues.

d) Balance the training function of teaching hospitals with the service requirements of the department through appropriate clinical support and supervision coaching and mentoring of undergraduates, new graduates and less experienced staff by those who are more experienced.

e) Provide in-house skills or knowledge development along with retention strategies for experienced practitioners to support those willing and/or capable of fulfilling new and more autonomous roles.

4. **Make best use of the capacity and expertise of staff in allocating tasks and roles and recognise experience, knowledge, skills, competencies and qualifications.**

Strategies

a) Ensure practice is commensurate with the skills, knowledge level, scope of practice and legislative frameworks.

b) Identify core skills and competencies required to provide emergency department services and examine who is capable of performing them.

c) Carefully analyse workflows and activity assignments and, where appropriate, consider the re-assignment of activities that will result in more efficient, timely service delivery and better employment of staff resources.

   To do this in a comprehensive way, it will be necessary to:

   - consider the regulatory frameworks, codes of conduct and competency standards within which staff work
   - examine the clinical evidence base for the safety and efficacy of redesigned care activities
   - provide the education and support for multidisciplinary team members and other staff who are involved in the re-assignment of activities
   - consult with all relevant stakeholders to develop protocols for the new models of care which might involve newly created autonomous roles.

5. **Use new technologies, where proven, to improve efficiency and ensure there is adequate support for implementation.**

Strategies

a) Consider the use of hand held technologies for patient side recording.

b) Use videoconferencing and electronic based training packages for skills and knowledge development.

c) Consider use of technology and electronic means for patient information and diagnostic test results transfer.

6. **Ensure adequate investment of resources with support from other departments and senior management to sustain improved outcomes.**

Strategies

a) Support people change initiatives with systems and infrastructure support. Ensure adequate resources are invested in the time, skills, development needs and systems support necessary for the emergency department to undertake and sustain redesign processes.

b) Sustain improvements by building operational aspects into hospital systems such as the IT system, quality improvement processes and hospital wide planning, including bed management and patient discharge.

References

Auditor General of NSW, 2004, Transporting and Treating Emergency Patients - NSW Department of Health, Ambulance Service of NSW, Sydney.

Auditor General Victoria, 2004, Managing Emergency Demand in Public Hospitals, presented to President Legislative Council, 26 May 2004.

Australian Bureau of Statistics, 2004, Private Hospitals 2002-03, Canberra, cat no 4390.0

Australasian College for Emergency Medicine, Policy Document: Standard Terminology http://www.acem.org.au/open/documents/policy.htm [accessed Nov 2004]

Australasian College for Emergency Medicine, Statement on Emergency Department Role Delineation http://www.acem.org.au/open/documents/policy.htm [accessed Nov 2004]

Australian Health Ministers' Advisory Council (2002). Tomorrow's Doctors. Review of the Australian Medical Workforce Advisory Committee (AMWAC). Canberra.

Australian Health Ministers' Conference (2004). National Health Workforce Strategic Framework. Sydney. http://www.healthworkforce.health.nsw.gov.au

Australian Institute of Health and Welfare, 2001, Nurse Labour Force Survey, unpublished data

Australian Institute of Health and Welfare, 2004, Australian Hospital Statistics 2002-03, AIHW, cat. no. HSE 32, Canberra (AIHW Health Services Series, no. 22)

Australian Institute of Health and Welfare, 2002, Medical Labour Force 2002, AIHW, cat. no. HWL 30, Canberra (AIHW Health Services Series, no. 30)

Australian Medical Workforce Advisory Committee, 2004, The Public Hospital Medical Workforce in Australia, Sydney cat no. 2004.4

Australian Medical Workforce Advisory Committee, 2003, The Specialist Emergency Medicine Workforce in Australia – An Update, Sydney cat no. 2003.6

Australian Rural and Remote Workforce Agencies Group, 2003. Reality Bites: Rural and Remote GP Workforce Information. A preliminary analysis of the Australian Rural and Remote Workforce Agencies Group minimum data set. October 2003.
http://www.arrwag.com.au/client_images/ACF1B3E.pdf

Bearing Point, 2004, Literature Review: Emergency Department and Radiology Workflow and Workforce, Department of Human Services, Melbourne (unpublished).

Cameron, P.A. & Campbell, D.A 2003, access block: problems and progress, Medical Journal of Australia, vol178, 99-100.

Clinical Epidemiology & Health Service Evaluation Unit (CEHSEU), The Royal Melbourne Hospital, 2004, Models of Care to Optimise Acute Length of Stay: Short Stay / Observation Units (SOU); Medical Assessment and Planning Unit (MAPU); Emergency Medical Unit (EMU).

Department of Employment and Workplace Relations, National and State Skill Shortage Lists, March 2004.

Emergency Services Collaborative – Making See and Treat work for Patients and Staff, www.modern.nhs.uk/emergency

Gardner, G., J Carryer, SV Dunn, and Gardner, A. 2004, Report to the Australian Nursing and Midwifery Council. Nurse Practitioner Standards Project.

Gray, L.C. Yeo, M.A, Duckett, S.J 2004, 'Trends in the use of hospital beds by older people in Australia: 1993 – 2002', Medical Journal of Australia, 181 (9), p478-481.

The Improvement Guide, 1996, by Gerald J. Langley, Kevin M. Nolan, Clifford L. Norman, and Lloyd P. Provost.Jossey-Bass Publishers Inc, California, USA.

Medical Centre School of Public Health and Health Services, www.urgentmatters.org accessed 4 Feb 2005.

Medical Training Review Panel, 2004, Eighth Report, Canberra

Morris, J. Ieraci, S. Bauman, A. Mohsin, M. 2001, Emergency Department Workpractice Review Project: Introduction of workpractice model and development of clinical documentation system specifications, South Western Sydney Area Health Service, May 2001.

National Health Service Modernisation Agency, (2003) Workforce Matters: A guide to role redesign in emergency care. http://www.modern.nhs.uk/scripts/default.asp?site_id=35&id=8237

National Health Service Modernisation Agency, 2004, Top 10 Tops for reducing Waiting Times for Emergency Care within Acute Trusts, www.modern.nhs.uk/emergency useful documents menu accessed 4 Feb 2005.

National Health Workforce Secretariat. Models of Care – a possible approach to health workforce planning. Draft paper, 2005.

National Institute for Clinical Studies, 2004, National Emergency Department Collaborative Report. NICS Melbourne

NSW Health Department, 2006. Models of Emergency Care. www.health.nsw.gov.au

Nolan, T.W, 2004, Improvement Methods Expert Host, Institute for Health Care Improvement, http://www.ihi.org/IHI/Topics/Improvement/ImprovementMethods/Changes/ accessed 4 Feb 2005

Roberts, J. 2004, Hospital's Assembly-line cure-all, The Australian, Thurs April 29, p5.

Urgent Matters Learning Network, 2004, Bursting at the Seams – Improving Patient Flow to Help America's Emergency Departments, The George Washington University.

Appendices

Appendix A Emergency department performance and patient profile

The Australian Institute of Health and Welfare (AIHW) publishes annual data on a range of public hospital performance indicators. Emergency department waiting times are regarded as indicators of the responsiveness of the acute care sector. The indicator is the proportion of patients presenting to public hospital emergency departments who waited longer for care than was clinically appropriate, by triage category.

The Australasian Triage Scale (ATS) is used for rating clinical urgency in hospital-based emergency services throughout Australia and New Zealand. It is primarily a tool for ensuring that patients are seen in a timely manner, based on clinical urgency. It also provides an opportunity to analyse a number of performance parameters in the emergency department such as casemix, operational efficiency, utilisation review, outcome effectiveness and cost.

The ATS categories are:

- triage category 1: patients needing resuscitation — seen immediately
- triage category 2: emergency — patients seen within 10 minutes
- triage category 3: urgent — patients seen within 30 minutes
- triage category 4: semi-urgent — patients seen within 60 minutes
- triage category 5: non-urgent — patients seen within 120 minutes.

For each category there is an ACEM recommended performance indicator threshold for the proportion of patients that should be seen within the relevant waiting time.

National data on waiting times and the proportion of patients seen within the desired time provides a basis for performance measurement. However comparability between jurisdictions is not precise as there are differences in the way times are calculated and the coverage of emergency departments included in each jurisdiction's data varies. It is estimated that 71% of emergency department visits made in Australia in 2002-03 are included in the 2002-03 emergency department waiting times data collection.

In 2002-03 there were 4,156,790 patients seen in the 195[5] hospitals that reported data to the emergency department waiting times data collection.

[5] This is a much larger number of institutions compared to the national number of emergency departments. It is largely due to the inclusion of data from numerous rural, remote and primary care emergency services that are not categorised as emergency departments using the role delineations for emergency departments. Western Australia contributes data from a large number of these emergency services.

Table A1: Emergency department waiting times[(a)] by triage category, by states and territories, 2002-03

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total[(c)]
Total no. of hospitals	218	144	179	94	80	25	3	5	748
No. of reporting hospitals	51	19	21	80	13	4	2	5	195
Estimated proportion of visits (%)(b)	73	57	64	96	75	84	100	100	71
No. of patients seen	1,469,232	714,220	782,555	548,006	354,849	97,506	96,151	94,271	4,156,790

Source: AIHW Australian Hospital Statistics 2002-03

(a) Care needs to be taken in interpreting this data. Nationally agreed definitions exist but there may be differences in how data is collected. Data may vary across jurisdictions as a result of differences in clinical practices.
(b) The ratio of number of occasions of service for hospitals reporting to the emergency department waiting times collection divided by the accident and emergency occasions of service reported to the national public hospitals establishments database as part of the non-admitted patient data collection.
(c) Includes data for hospitals not included in the specified hospital peer groups and contracted private hospitals.

The proportion of patients seen on time per triage category was 66% in 2002-03. However, the proportion of patients seen on time from triage category 1 – who require resuscitation – was 99% nationally.

Table A2: Proportion of patients seen on time (%) by triage category, by states and territories, 2002-03

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
1 – Resuscitation	100	100	99	94	99	91	100	100	99
2 – Emergency	77	84	73	73	65	55	82	60	75
3 – Urgent	57	76	55	64	47	61	74	64	61
4 – Semi-urgent	62	65	55	68	49	59	67	58	61
5 – Non-urgent	86	85	80	87	84	90	79	88	85
Total	**65**	**73**	**60**	**73**	**53**	**64**	**74**	**65**	**66**

Source: AIHW Australian Hospital Statistics 2002-03

In 2002-03, 29% of patients were subsequently admitted. The requirement for admission increases with increasing acuity as measured by the triage scale. 86% of triage category 1 required admission compared with 6% of triage category 5.

Table A3: Estimated proportion of patients who were subsequently admitted, 2002-03

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
1 – Resuscitation	89	87	83	87	n.a.	83	74	61	86
2 – Emergency	71	74	66	61	n.a.	57	47	63	69
3 – Urgent	50	53	37	44	n.a.	41	34	41	46
4 – Semi-urgent	21	27	13	16	n.a.	15	17	16	19
5 – Non-urgent	7	8	4	5	n.a.	4	4	8	6
Total	**31**	**38**	**24**	**22**	**n.a.**	**27**	**17**	**24**	**29**

Source: AIHW Australian Hospital Statistics 2002-03

(a) Care needs to be taken in interpreting this data. Nationally agreed definitions exist but there may be differences in how data is collected. Data may vary across jurisdictions as a result of differences in clinical practices.
n.a. Not available.

The majority of emergency department patients (75%) are assessed as triage categories 3 or 4. The highest acuity patients in triage categories 1 and 2 make up only 8% of patients.

Table A4: Proportion of patients in each triage category (%), 2002-03

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
1 – Resuscitation	1	1	1	1	1	1	1	1	1
2 – Emergency	7	9	7	6	9	7	4	5	7
3 – Urgent	31	32	33	21	30	29	20	26	30
4 – Semi-urgent	41	48	48	44	52	49	37	51	45
5 – Non-urgent	12	11	12	28	8	14	38	17	14
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: AIHW Australian Hospital Statistics 2002-03

Appendix B **Summary of Patient Occasions of Service**

Table B1: Rate of patient occasions of service, public acute hospitals, accident and emergency by 1,000 population, states and territories, 1996-97 to 2002-03

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
1996-97	260.8	239.6	290.5	395.7	293.8	118.3	243.7	583.9	275.9
1997-98	256.4	232.4	314.1	365.7	307.3	148.2	256.3	537.8	275.8
1998-99	226.0	235.0	326.2	328.4	309.5	150.7	269.5	555.9	265.5
1999-00	249.3	235.8	323.9	326.2	309.6	195.2	272.6	495.3	273.6
2000-01	272.4	238.6	324.6	298.4	317.0	196.3	297.0	494.0	280.5
2001-02	301.6	249.3	332.5	292.3	308.7	212.9	293.7	476.8	293.6
2002-03	297.1	257.2	326.0	294.2	309.7	203.6	298.0	477.6	292.9

Source: AIHW Australian Hospital Statistics, 1996-97 to 2002-03; ABS Demographic Statistics 3101.1 series, December quarters 1996 to 2002.

Table B2: Non-admitted patient occasions of service, public acute hospitals, accident and emergency by states and territories, 1996-97 to 2002-03

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
1996-97	1,627,291	1,097,554	979,254	705,134	433,711	56,102	75,188	108,200	5,082,434
1997-98	1,617,047	1,075,473	1,077,455	662,255	455,659	69,907	79,189	101,759	5,138,744
1998-99	1,442,842	1,102,011	1,137,045	606,726	461,240	70,984	83,207	106,400	5,010,455
1999-00	1,608,664	1,117,961	1,146,519	611,305	463,044	91,732	84,825	96,240	5,220,290
2000-01	1,771,345	1,144,487	1,167,772	566,107	475,609	92,301	92,775	96,966	5,407,362
2001-02	2,003,438	1,210,195	1,220,435	560,847	468,896	100,772	94,763	95,320	5,754,666
2002-03	1,982,190	1,260,848	1,222,777	570,975	472,041	96,604	96,151	94,271	5,795,857

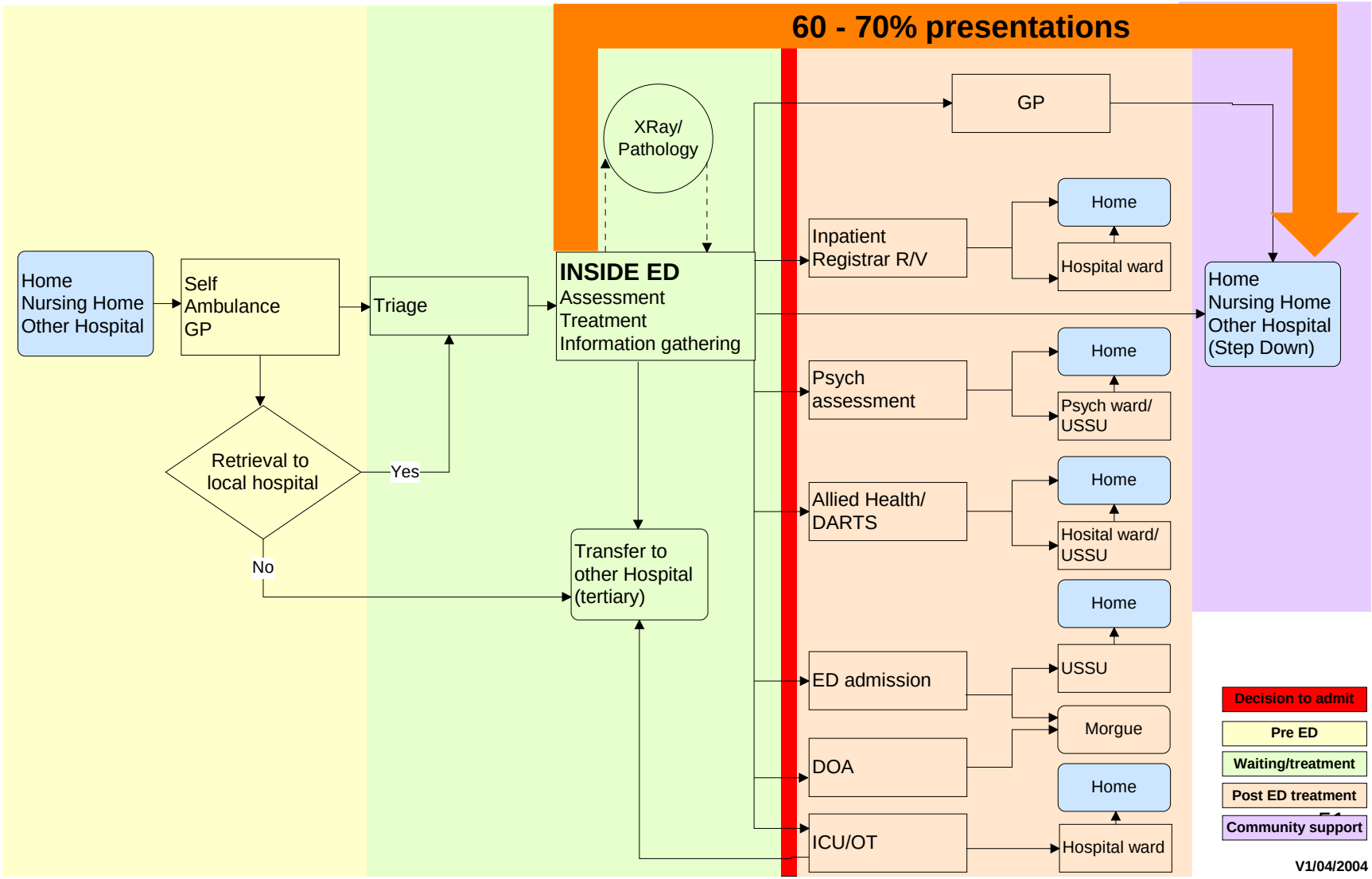
Source: AIHW Australian Hospital Statistics, 1996-97 to 2002-03

Note: Reporting arrangements have varied significantly across years and across jurisdictions. Data for NSW in 2002-03 is preliminary. In WA the number of hospitals from which data is collected has changed between years.

Appendix C Toowoomba Health Service District Emergency Department Model

Toowoomba Health Service District
Emergency Department – Model of patient journey through a public hospital

Queensland Government
Queensland Health



Appendix D **Summary of medical workforce in emergency care data**

Information is available on emergency medicine specialists and trainees, and on the proportion of rural and remote GPs who do emergency work.

Key trends – emergency physicians

Emergency physicians or emergency medicine specialists are growing in number despite student numbers that can be erratic in size from year to year. AIHW data from 1995 to 2001 shows a 13.9% annual compound increase in the number of emergency medicine specialists. The number of specialists per population is also increasing, with 13.0% average per annum growth in the number of specialists per population between 1995 and 2001.

Compared with other specialists, emergency medicine specialists are young. With an average age of 41.0 years in 2001, they are 8.7 years younger than the average age of all specialists. Therefore there is not the concern, as with some specialties, that an age related retirement wave will impact the supply of specialists in the near future. However, the specialty is a relatively new one and less is known about the longevity of emergency medicine specialists and whether factors such as the demands of the job will promote attrition at an earlier age than for other specialties.

Emergency medicine specialists work shorter average weekly hours than other specialists. In line with other health professions, their hours have reduced in recent years and males work longer average weekly hours than females.

The profession is currently around 80% male which means that the shorter working hours of the female specialists has less impact on overall output. The proportion of female new fellows each year tends to be higher, ranging from 25.0% in 2002 to 39.0% in 2003. A gradual shift in the sex ratio over time is therefore expected.

Trainees

New trainees are expected to number 108 in 2005 – this is 13 more than the number that was expected for 2004, but 22 below the AMWAC recommendation that intakes should increase to 130 per year as soon as the necessary training infrastructure was in place.

Relative to state population, Victoria has acquired a greater share of the total number of new fellows between 2001 and 2003 whereas New South Wales has attracted less than its population share.

The general practitioner component of emergency care

Many rural and remote regions are too sparsely populated to support emergency medicine specialists. In these areas, general practitioners (GPs) may perform emergency procedures and provide emergency care.

GPs support emergency departments, particularly in rural areas, where in 2003, 60% of rural and remote doctors identified themselves as regularly practising emergency care. The proportion of GPs who regularly practise emergency care increases with increasing remoteness. The

highest proportions of GPs regularly practising emergency care are those working in hospitals and as “fly in/fly out” GPs (Australian Rural and Remote Workforce Agencies Group, 2003).

Some key data

1. There were 612 non-retired Fellows of the College of Emergency Medicine in 2004.

2. The increase in specialist numbers has been much more marked in some of the smaller states — South Australia (36.5% compound annual growth), Australian Capital Territory (17.4% compound annual growth) and Tasmania (17.1% compound annual growth).

3. The number of emergency medicine specialists per population has grown from 1.1 per 100,000 population in 1995 to 2.3 per 100,000 population in 2001. This represents an average increase of 13% per annum.

4. Emergency medicine specialists are much more concentrated in the 35 to 44 years age band than specialists in general, with 62% of emergency physicians in that age band in 2001 compared with 33.2% of all specialists.

5. According to AIHW data, the emergency medicine specialty workforce was 82.5% male and 18.9% female in 2001. ACEM data for 2004 shows that 77.1% are male and 22.9% are female.

6. Emergency physicians worked an average of 44.1 hours per week in 2001, a decline of 9.1% in total since 1995.

7. Male physicians worked an average of 4.3 hours more per week than females in 2001, but female physicians over 55 years worked longer average hours than their male counterparts (noting there are small numbers of female physicians over 55 years).

8. Emergency physicians continue to have slightly shorter average weekly working hours (44.1 hours per week) than general medicine (47.6 hours per week), paediatric (48.5 hours per week) and all specialists (48.1 hours per week).

9. The number of emergency medicine specialists grew the most in major cities, with 15.3% compound annual growth, and in outer regional areas where compound annual growth was 14.4%.

10. The national number of trainee emergency medicine specialists has been in the high 400s for the four years from 2001 to 2004.

11. The proportion of females among emergency medicine trainees has ranged from 28.0% in 1998 to 39.9% in both 2003 and 2004. This is higher than the proportion of females among all qualified emergency medicine fellows –18.9% in 2001.

12. The number of new fellows is probably the most concrete measure of growth in the profession. It has ranged from 36 to 82 per year in the four years to 2003.

13. The proportion of females amongst new fellows has ranged from 25.0% in 2002 to 39.0% in 2003.

14. The proportion of new fellows per state/territory is not in line with state population share. New South Wales had 24.0% of the new fellows over the three years 2001 to 2003, compared with a 33.6% share of national population. Over the same three year period, Victoria had 34.1% of new fellows but has only 24.74% of the national population.

15. The number of training departments has been increasing since 1997 until a decline of 3 between 2002 and 2004 – the current number is 85.

AMWAC review of the specialist emergency medicine workforce

AMWAC reviewed the specialist emergency medicine workforce in 2003 and found that it was undersupplied. This was based on the number of vacancies, a comparison of the current workforce size with the 1997 AMWAC estimated requirements, opinions from state and territory health departments, and specialists' perceptions on the adequacy of the workforce.

The original 1997 AMWAC review found that the workforce was under supplied, but it was expected that this shortage would be filled as a large cohort of trainees who entered the training program in the early 1990s were anticipated to enter the workforce. Since the publication of the 1997 report, the emergency medicine trainee intake fell below the anticipated number and the large cohort of trainees anticipated to enter the workforce did not materialise. As a consequence, the recommendation of the 1997 report to reduce trainee intakes was reversed in the 2003 report.

A number of features of the emergency medicine workforce have made it difficult to estimate future numbers. These include the flexibility of the training program and the lack of long term trend information. It is a relatively new specialty and the workforce is relatively young so retirement patterns are not well understood.

The number of public and private emergency departments and their role delineation was considered the primary determinant of the future workforce size. Estimated required emergency physician staffing levels by role delineation were applied to the existing number of emergency departments. This produced a requirement for emergency medicine specialists in 2012 ranging from 1,067 to 1,464 physicians.

Based on the projected estimates of workforce supply and requirements, AMWAC recommended that trainee intake levels be increased to ensure future workforce supply meets requirements. The recommendation was to have 130 new trainees entering the emergency medicine advanced training program nationally each year from 2004 onwards. It was recognised that this might not be feasible in the short term because of the lead time needed to put in place the necessary training infrastructure.

Emergency medicine specialist training arrangements

The Australasian College for Emergency Medicine (ACEM) currently has two pathways operating, a new program and an old program. Under the new program — which applies to all trainees who registered with the ACEM on or after 1 January 1999 — training consists of two years of basic training, one year of provisional training and four years of advanced training. Basic training comprises the intern year and a second postgraduate year. The provisional year must include a six month term in emergency medicine.

Advanced training must include 30 months training in emergency medicine and 18 months in other disciplines. It must also include paediatric experience. A primary examination in basic sciences must be successfully completed in the provisional year. Progression to advanced training requires structured references from supervising specialists and participation in the trainee selection process. At the present time there is no quota associated with this process.

Under the old program — which will continue to apply to trainees registered before 1 January 1999 — the minimum time requirement is for two years of basic training and five years of advanced training. During advanced training a minimum of two years full time training in approved hospital emergency departments is required, as well as a minimum of 12 months in training placements other than in emergency medicine — including a rotation in paediatric medicine. The remaining 12 months may be spent in either emergency medicine or other disciplines. A period of up to 12 months may also be spent in research.

The progressive change over of trainees from the old pathway to the new could account for some of the decrease in vocational trainee numbers from 2000. There was also a ‘bulge’ in trainee registrations during the 1990’s and a subsequent decrease.

Appendix E **Summary of nursing labour force in emergency care data**

Data on registered and enrolled nurses employed in emergency care in a clinical capacity is drawn from the AIHW nursing labour force surveys of 1995, 1997, 1999 and 2001.

The clinical emergency care nursing workforce has been growing in both headcount and full-time equivalent between 1995 and 2001. Its growth is much greater than that of the total employed nursing workforce over the same period. The growth in FTE has occurred despite a small reduction in the average weekly working hours of emergency nurses — in line with the general trend in the total nursing workforce — and an increase in the proportion of emergency nurses who work part time, to just over half the emergency workforce in 2001.

Although the emergency nursing workforce is predominantly female, the field has a higher proportion of males compared with the total nursing workforce. The proportion of males has also grown between 1995 and 2001. The males work slightly longer average weekly hours and are slightly younger than the female emergency care workforce.

Emergency nurses work slightly higher average weekly hours than the total nursing workforce. Although increasing in age, they remain one of the younger nursing groups compared with other areas of clinical nursing.

The rate of FTE emergency nurses per 100,000 population has also increased between 1995 and 2001 and is higher in remote and very remote areas, than in city and regional areas.

The emergency nursing workforce is predominantly registered rather than enrolled, and the majority are employed in the public sector, in a major city and in a hospital.

Around a third of the emergency nursing workforce has post basic qualifications in the area and this has increased since 1995.

The nursing labour force survey does not provide any data on nursing retention or length of time worked in emergency.

Skills shortages

The Department of Employment and Workplace Relations assesses skill shortages by a number of means including contacting employers, industry, employer and employee organisations and education and training providers. A skill shortage is said to exist when employers are unable to fill, or have considerable difficulty in filling, vacancies for an occupation at current levels of remuneration and conditions of employment and in reasonably accessible locations.

Registered and enrolled nurses – including accident and emergency registered nurses – are in shortage in all states and territories. Enrolled nurse shortages are not broken down by area of employment.

Some key data

1. There were 7,532 clinical nurses employed in the area of casualty / accident / emergency in 2001, an increase of 2,223 since 1995 when there were 5,309.

2. Of the 7,532 nurses in 2001, 7,050 or 93.6% were registered nurses and 482 or 6.4% were enrolled nurses.

3. Emergency nurses represent 3.7% of the total clinical nursing workforce and are the tenth largest of the AIHW's 23 types or areas of nursing.

4. The emergency nursing workforce is predominantly female (86.6% in 2001) but the female proportion has reduced slightly since 1995.

5. There is a higher proportion of men in the emergency nursing workforce than in the total clinical nursing workforce —13.4% male in emergency in 2001 compared with 8.4% male in the total workforce.

6. The majority of emergency nurses are employed in the public sector (88.0%), in a major city (63.2%) and in a hospital.

7. The proportion of nurses working part-time in emergency increased from 46.6% in 1995 to 56.0% in 2001.

8. The number of full-time equivalent (FTE) clinical nurses working in emergency was 6,283.2 in 2001 compared with 4,763.7 in 1995. This is an increase of 1519.5 FTE or 31.9%. Over the same time, headcount increased by 41.9%. The increase in headcount for the total employed registered and enrolled workforce (including non-clinicians) over this period was 3.4%.

9. The rate of FTE emergency nurses to every 100,000 population has increased from 26.4 per 100,000 in 1995 to 32.4 per 100,000 in 2001.

10. In 2001 the rate of FTE emergency nurses per 100,000 population was highest in very remote areas at 43.6 FTE per 100,000 population and lowest in major cities with 27.6 FTE per 100,000 population.

11. In 2001, 54.3% of the emergency nursing workforce was aged between 30 and 44 years. The group aged between 40 and 44 years grew considerably between 1995 (800) and 2001 (1,364).

12. The average age of all emergency nurses has been increasing. In 2001 the average age was 37.8 years. It has increased each year since 1995 when the average age was 35.8 years.

13. The average age of all employed clinical nurses was 41.8 years in 2001. Emergency nurses are the third youngest of the AIHW's 23 clinical nursing types.

14. The average hours worked by registered nurses in emergency care was 31.7 hours per week in 2001, a reduction from 34.0 hours per week in 1995. Most of the reduction occurred between 1997 and 1999.

15. Males worked longer than females with average weekly hours of 36.6 compared with females at 31.0. Males worked longer than females in every five year age band except for registered nurses aged under 25 years. Both sexes have reduced their average working hours since 1995, but the reduction was greater for females than for males.

16. Compared with the 22 other nursing areas, emergency nurses worked the ninth highest hours per week. Average hours per week for all clinical registered and enrolled nurses were 30.1 hours per week in 2001.

17. 37.0% of all nurses working in emergency had post basic qualifications in emergency or trauma nursing in 2001. This had increased from 24.9% in1995.

Appendix F Summary of allied health data

Nationally consistent allied health data tends to be available only at a broad level, such as total numbers of people employed by profession, student completions by state etc. There is no national data source that provides sufficient detail about place of work to identify those employed in emergency care.

The ABS population census provides numbers of people employed by health occupation and by age (national only), sex, geographic region and hours worked. Trends between census dates can be observed.

The AIHW publish further detail on the ABS data in their health workforce publications for some professional groups. This includes data on sex, age, country of birth, indigenous status and whether working in the field.

DEST data provides university commencement and completion numbers by university course and by state, giving a broad indication of future supply across whole professions. Those reported on are physiotherapy, occupational therapy, pharmacy, radiology and rehabilitation therapy.

Skills shortages

The national skills shortage list, prepared by the Department of Employment and Workplace Relations, shows that at March 2004 there were a number of allied health professions in shortage.

Table D1: National and state skill shortage lists Australia - 2004

Skill shortages list – Professionals March 2004								
	Australia	NSW	VIC	QLD	SA	WA	TAS	NT[1]
HEALTH SPECIALISTS								
Pharmacist (hospital/retail)*	N	S	S*	S	S	R		D
Occupational therapist*	N	S*	S*	S	D	D*	S	R
Physiotherapist*	N	S*	S*	S	S	S*	S	S
Speech pathologist*	N	M	S*	S	R		S	D
Diagnostic radiographer*	N	S*		S			S	S
Nuclear medicine technologist	N	D		S		S	S	
Sonographer	N	S		S	S	S	S	S

Notes: 1. Not all occupations assessed in all states

* = shortages may be restricted to specialist skills. Occupations marked with an asterisk have qualifying comments below.

N = National shortage M = Shortage in metropolitan areas S = State-wide shortage

R = Shortage in regional areas D = Recruitment difficulties

Pharmacist: VIC: shortages of pharmacists particularly in rural areas and hospitals. SA: shortage of pharmacists is particularly evident in the retail sector.

Occupational therapist: NSW: shortages especially for occupational therapists in senior roles and for specialists in mental health. VIC: shortages in occupational therapists is particularly acute in aged care, paediatrics, disability/rehabilitation services and rural practice. Senior positions and those in regional and outer metropolitan regions are also particularly difficult to fill. QLD: shortages are for experienced occupational therapists in specialisations such as mental health services and aged care. WA: recruitment difficulties are evident in aged care facilities.

Physiotherapist: NSW: shortages are especially in the public sector. VIC: shortages of physiotherapists are particularly evident in aged care, women's health, working with children with disabilities, cardio-thoracic and rural areas. QLD: shortage is most apparent for physiotherapists experienced in specialisations such as gerontology and for locum work. SA: shortages are particularly evident in the aged care and public hospital sector. WA: shortage is greatest for paediatric physiotherapists and for physiotherapists in rural areas.

Speech pathologist: VIC: Shortages of speech pathologists are particularly evident in paediatrics, education, disability services, for locum positions and regional and outer metropolitan areas.

The rural allied health workforce

Services for Australian Rural and Remote Allied Health (SARRAH) have produced a number of profiles on the rural allied health workforce. These profiles are based on ABS census of population and housing 2001 data and cover the following professions — audiology, dietetics, hospital pharmacy, medical imaging, occupational therapy, orthoptics, orthotics / prosthetics, physiotherapy, podiatry, psychology, social work and speech pathology.

The following tables are available:

- number of allied health professionals by state and territory: major city and 'other' regions
- number of allied health professionals by ASGC-remoteness
- number of allied health professionals per 10,000 population by ASGC remoteness
- age distribution (%) of allied health professions – major city and 'other' regions
- distribution of allied health professionals by sex – major city and 'other' regions.