Hospital Admission Risk Program (HARP)
Background Paper

Emergency Demand Coordination Group
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Preface

This Background Paper provides practical information to assist people with an interest in the Victorian Hospital Admission Risk Program (HARP) to better understand emergency demand focused preventive initiatives. It has been developed by a Working Party of the HARP Reference Group as the first component in an iterative process to build an evidence base around emergency demand focused preventive initiatives. The Paper includes high level analysis of datasets used within the Victorian public hospital system and draws together the literature reviews and consolidated reports that were available.

The objectives of this Background Paper are to:

- Outline the context of HARP, its objectives and how it is targeted.
- Present data from the Victorian Admitted Episode Dataset (VAED) and Victorian Emergency Minimum Dataset (VEMD), which identify the high volume conditions that consume relatively high proportions of acute public hospital resources.
- Provide a broad description and overview of the literature reviews and summary reports that have been undertaken of models of care and interventions, which are relevant to preventive initiatives.
- Describe the gaps in the summarised literature and identify the opportunities for further work that could be considered by the Reference Group.
- Consider the practice change implications for implementing preventive initiatives.

It was beyond the scope of this paper to undertake a detailed critical review of the literature, source original research or to correlate those high volume conditions amenable to preventive initiatives with models of care that are effective.

Whilst there is some evidence regarding preventive strategies that are likely to be efficacious, there is a great deal more to be learnt about how to best manage patients with identified risks for hospitalisation. Thus future work will be undertaken to document the effectiveness of projects undertaken within HARP along with emerging evidence from the health field. In particular, HARP projects will significantly advance our knowledge as the HARP evaluation describes the effectiveness of new projects in the Victorian context. Additionally the HARP Reference Group will oversee the development of an evidence base to better inform HARP initiatives.

This Background Paper has been produced to assist in designing projects for the 2002 - 2003 HARP funding round. Whilst acknowledging the limitations of the data analysis and the emerging nature of evidence around preventive models, the Background Paper will be of assistance in formulating proposals for consideration under this funding round.

We would appreciate any comments, suggestion for further work or other feedback you may have on the contents of the Background Paper. These can be forwarded to the HARP Project Officer, Ian Coverdale at ian.coverdale@dhs.vic.gov.au and will be considered as we further develop the evidence around preventive initiatives.

Acknowledgements

This Background Paper has been produced by a Working Party of the HARP Reference Group, which involved:

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- Ms Carole Staley *Everitt Anderson Corporation*

We thank both the HARP Reference Group and the HARP Departmental Steering Committee for their suggestions and contributions to the Paper. The members of these groups are listed in Appendix A.

We have verified the information in this Background Paper to the best of our ability. We would appreciate you informing us of any errors or omissions, by email to ian.coverdale @dhs.vic.gov.au

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Glossary of Terms

Case management	a collaboration process which assesses, plans implements, coordinates, monitors and evaluates options and services to meet an individual's health needs through communication and available resources to promote quality cost effective outcomes.
Clinical pathway	a tool which defines the sequencing and timing of interventions and day to day activities of medical, nursing and allied health team members to maximize the quality of care and better utilise resources.
Clinical practice guideline	a guideline reflecting current best practice regarding the clinical management of a condition aimed at reducing inappropriate variation in clinical practice and promoting the adoption of evidence-based practice.
Coordination	implies two or more parties working towards a common goal[1].
Collaboration	working jointly.
Cooperation	implies two or more parties with different goals helping each other . Even though their goals are different, working together gives both a greater chance of success than they would have alone[1].
Demand management	is organization of services to ensure the most cost efficient, appropriate and equitable health system possible considering social, cultural and economic features of the population[2].
Disease management	is an approach to managing chronic illness that focuses on systematised evidence-based practice and better coordinated care.
Effective Discharge Strategy	an initiative to improve the discharge planning processes across Victorian hospitals[2].
Emergency admission	is a patient requiring an unplanned admission to hospital due to unexpected illness or injury that necessitates urgent care[2].
Emergency department	is a hospital department that specialises in providing emergency care for those who are in need of urgent care (for example ambulance cases) and those who choose to seek treatment in an emergency department[2].
Evidence-based	based on valid empirical information[3].
Fall	unintentionally coming to rest on the ground, floor or other lower level; excludes coming to rest against furniture, wall or other structure[4].
Health promotion	Health promotion is the process of enabling people to increase control over, and improve, their health and the factors that influence their health. Health promotion activities address the individual's lifestyle and the particular physical, social, economic and political environments in which the person lives[5].

Home and Community Care	a program jointly funded by the Commonwealth and State/Territory governments, which aims to provide basic maintenance and support services for frail older people, people with disabilities and their carers. Services are provided to assist carers in their caring role, thereby preventing inappropriate admission or premature admission to long-term residential aged care and thus enhancing the consumer's quality of life. Local government organizations provide a vast majority of services funded through HACC (excluding community nursing), for example, home help, meals on wheels, home maintenance and adult day care[2].
Integration	refers to the linking by various means of the services of two or more service providers to allow treatment of an individual's or family's needs in a more coordinated and comprehensive manner[1].
Post acute care	a time limited short term intervention designed to assist patients to recuperate following an acute hospital admission and to facilitate their independence or transition to continuing care where required[2].
Primary prevention	aims to avoid a disease or disability from occurring, by identifying and reducing risk of exposure or behaviours, for example health promotion screening to reduce the incidence of disease within the population [5,6].
Secondary prevention	aims to screen for signs of disease in early stages and provide advice or treatment to cure it or prevent it from progressing to reduce the burden of disease in individuals (also referred to as preventive medicine)[5,6].
Tertiary prevention	is aimed at reducing the progress or complications of established disease and is an important aspect of therapeutic and rehabilitation medicine. It consists of the measures intended to reduce impairments and disabilities, minimize suffering caused by departures from good health, and promote patients' adjustment to incurable conditions and reduce the need for the patient to attend or be treated in an acute hospital. Tertiary prevention is often difficult to separate from treatment since the treatment of chronic disease has, as one of its central aims, the prevention of recurrences[6,7].
Victorian Admitted Episode Dataset	all Victorian public and private acute hospitals, including acute facilities in rehabilitation and extended care institutions and day procedure centres, are required to report the relevant minimum data set of admitted patient activity. These data are compiled into the VAED[2].
Victorian Emergency Minimum Dataset	central collection of patient level emergency data. The dataset has the potential to facilitate the improvement of both the treatment and the prevention of illness and injury[2].

Abbreviations

ACSC	Ambulatory Care Sensitive Conditions
ARCHI	Australian Resource Centre for Hospital Innovations
CCT	Coordinated Care Trial
CDSMP	Chronic Disease Self Management Program
CGA	Comprehensive geriatric assessment
CHF	Chronic heart failure
CPG	Clinical practice guideline
COPD	Chronic obstructive pulmonary disease
DHS	Department of Human Services
DOSA	Day of surgery admission
DRG	Diagnostic related group
ED	Emergency department
EDCG	Emergency Demand Coordination Group
GEM	Geriatric evaluation and management
GP	General practitioner
HACC	Home and Community Care program
HARP	Hospital Admission Risk Program
HDM	Hospital Demand Management strategy
HIV/AIDS	Human immunodeficiency virus/auto-immune deficiency syndrome
ICD – 10	International Classification of Diseases – Version 10
LOS	Length of stay
MDC	Major diagnostic category
NDHP	National Demonstration Hospitals Program
NZHTA	New Zealand Health Technology Assessment group
PAC	Post acute care
PCP	Primary Care Partnership strategy
PHARM	Pharmaceutical Health and Rational use of Medicines Committee
VAED	Victorian Admitted Episode Dataset
VEMD	Victorian Emergency Minimum Dataset

Executive Summary

Demand for public hospital services is growing consistently at 3%-4% per annum, both in Victoria and other States. For the twelve major metropolitan hospitals across Melbourne with emergency departments (EDs) emergency admissions are growing at 7%-8% per annum. This emergency demand pressure has driven the growth in ambulance bypass and longer waits in EDs.

The combination of demand growth and capacity constraints is resulting in an imbalance between supply and demand within the healthcare system. A new approach, the Hospital Demand Management (HDM) strategy, is being implemented that is creating additional capacity to meet the demand pressures. The Victorian Government has committed $582 million over four years to this Strategy. The importance of prevention within the HDM strategy has been highlighted with an allocation of $150 million over four years for the Hospital Admissions Risk Program (HARP). HARP aims to avoid unnecessary use of EDs and inpatient services in the hospitals participating in the HDM Strategy. The primary objective of HARP is to implement models of care that better manage emergency presentations and emergency admissions to public hospitals through alternatives that involve the hospital and the community. HARP will foster initiatives that are based on the continuum of health care emphasising that a person's health is better managed across their lifespan rather than in episodic intervals as acute exacerbations of illness occur.

HARP will target preventive initiatives that are most likely to be effective and deliver tangible and measurable outcomes. These initiatives will focus on people who have a manifest health need, often where their disease or condition is chronic or complex. Priority will be given to high volume and/or frequent users of the acute public hospital system.

Analysis of Victorian hospital datasets (i.e. the Victorian Admitted Episode Dataset and the Victorian Emergency Minimum Dataset) revealed that it is possible to identify the high volume conditions that present to EDs along with the high volume conditions that are admitted as emergency patients. Of the 680,337 emergency presentations to Victorian EDs in 2000/2001, there were 83,542 re-presentations from 15,440 patients who presented on at least four occasions.

Common reasons for presenting to ED included: chest pain, unstable angina and myocardial infarction; abdominal pain, acute appendicitis, gastroenteritis, nausea and vomiting; viral infections; respiratory tract infections; follow-up examinations; open wound of wrist and hand; fractures; urinary tract infection; chronic obstructive pulmonary disease, congestive heart failure and asthma.

Analysis of admitted episode data demonstrated growth in emergency separations of 9% between 1999-2000 and 2001-2002 with projections for the current year at 625,086. High volume emergency separations (i.e. greater than 7,000 per year) included the following conditions: chest pain, injuries, respiratory infection/inflammation, abdominal pain/mesenteric adenitis, oesophageal, gastric and major digestive disorders age > 9 years, poisoning and toxic effects of drugs, bronchitis and asthma, chronic obstructive airway disease, heart failure and shock, non-major arrhythmia and conduction disorder, unstable angina and non-surgical neck and back condition.

Trends in emergency growth demonstrated disproportionately high use of both EDs and hospitals by people aged greater than or equal to 65 years of age. Considering population trends, the emergency workload associated with this sub-set of the population will continue to increase.

From this analysis it is clear that many conditions managed in Victorian public hospitals as intermittent episodes or exacerbations of underlying conditions, would be amenable to management as ambulatory sensitive conditions with a more comprehensive approach to care in the community.

In addition to the data analysis of high volume conditions, this paper provides a broad description and summary of literature reviews that have been undertaken of models of care and interventions, which are relevant to preventive initiatives. All of these initiatives involve some element of improvement in care coordination and process redesign, both within and between the different sectors of the health care system. In some instances, the preventive initiatives are targeted at specific conditions or cohorts of patients, whilst others focus upon re-engineering the system to streamline processes that will affect the majority of patients.

Initiatives identified as being effective in preventing emergency presentations, admissions and readmissions include various disease management models of care, falls prevention, implementation of clinical practice guidelines and pathways, health promotion in EDs, general practitioners based in EDs and discharge planning. The key is to ensure that these initiatives are implemented broadly across the health care system and where possible expanded to more patients groups, for example, developing disease management programs for patients groups other than those with COPD, CHF, asthma and diabetes.

Many initiatives, whilst not supported by rigorous evidence, are also valuable to consider for preventing emergency demand. The absence of rigorous evidence may simply indicate a gap in research and/or published literature rather than unequivocally indicating these initiatives will not contribute to reducing demand for acute hospital services.

Finally, there are many initiatives that have been mentioned that lend themselves to expansion to other patient groups and health services, require further research or exploration of the literature to reveal available evidence. These initiatives include: disease management models and clinical practice guidelines/clinical pathways, falls prevention, quality use of medicines and telephone triage.

Paramount to the success of HARP initiatives is the ability for health services to embrace the need for change within the health care system. Practice change will be achieved through the commitment of organizations and individual clinicians, participation and collaboration within and between the various sectors of the health care system and innovation in the development of new models of care.

1 Background

Demand for public hospital services is growing consistently at 3%-4% per annum, both in Victoria and other States. For the twelve metropolitan hospitals across Melbourne with emergency departments (EDs) emergency admissions are growing at 7%-8% per annum. This emergency demand pressure has driven the growth in ambulance bypass and longer waits in EDs.

There are a number of factors that are contributing to demand growth, including the ageing population, new treatment options through advances in medical technology, a reduction in the availability of general practitioners for home visits and after hours care, and societal changes that have led to a reduction in the capacity of the informal carer network in the community.

The other side of the equation is the capacity of hospitals to respond to demand. Concurrent with the demand growth there have been constraints on Victorian hospital capacity predominantly associated with:

- Beds – Victoria has a lower per capita number of residential aged care beds compared with other states; and
- Nurses – workforce issues has meant that there has been a shortage of nurses to staff services.

1.1 The Hospital Demand Management Strategy

The combination of demand growth and capacity constraints is resulting in an imbalance between supply and demand within the healthcare system. A new approach, the Hospital Demand Management (HDM) strategy, is being implemented that is creating additional capacity to meet the demand pressures. The Victorian Government has committed $582 million over four years to this Strategy. Key aspects of it include:

- Creating extra capacity through funding growth;
- Relieving pressure on acute hospital beds and EDs through diverting people to alternative options where clinically appropriate;
- Working with clinicians to achieve better patient management practices through negotiation of a tailored response for each hospital;
- Improving working conditions that will attract and retain nurses; and
- Implementing a prevention strategy to reduce the demand pressures on hospitals (known as the Hospital Admission Risk Program or HARP).

The HDM Strategy focuses on the service system as a whole rather than on fragmented interventions or single organizations. It promotes appropriate pathways for people using health services and encourages models of care that respond to current demands for health services. Collaboration between health providers is emphasised within this strategy.

1.2 What is HARP?

The importance of prevention within the HDM strategy has been highlighted with an allocation of $150 million over four years. HARP aims to avoid unnecessary use of EDs and inpatient services in the hospitals participating in the HDM Strategy. The primary objective of HARP is to implement models of care that better manage emergency presentations and emergency admissions to public hospitals through alternatives that involve the hospital and the community. This will:

Improve people's health outcomes. It is anticipated that enhancements to people's health status and their wellbeing will be achieved through:

- Supporting people's independence and capacity to live within the community;
- Increasing capacity within the health system to respond to the health needs of people;
- Developing responsiveness in services and proactive management of people's health needs;
- Clearer clinical pathways delivering better continuity of care; and
- Creating cohesion between public hospitals, the subacute and primary care sectors.

And in addition,

Reduce preventable use of EDs and inpatient services in the hospitals participating in the HDM strategy. It is anticipated that the preventive initiatives funded will have a noticeable impact on the acute health system and will be reflected in one or more of the following outcome measures:

- A reduction in the rate of growth in presentations to EDs for relevant conditions;
- A reduction in the rate of growth in admissions and readmissions to inpatient services for relevant conditions; and
- A decrease in length of stay for those people with relevant conditions who are admitted to hospital.

The specific aims of HARP are to:

- Identify target conditions and/or cohorts of patients with high volume ED presentations and admissions that have potential to be proactively managed in the community;
- Undertake focused literature reviews for high volume conditions to document best practice principles and establish an evidence basis for hospital specific prevention plans;
- Develop specific prevention plans around hospitals participating in the HDM Strategy;
- Engage clinicians in driving major clinical practice change for target conditions;
- Contribute to establishing a collaborative and cooperative preventive approach between all sectors of the public health care system;
- Oversee implementation of hospital specific plans;
- Establish condition specific network(s) to share information with all participating sites; and
- Coordinate evaluation of funded projects.

1.3 How will HARP be targeted?

HARP will target preventive initiatives that are most likely to be effective and deliver tangible and demonstrated outcomes. These initiatives will focus on people who have a manifest health need, often where their disease or conditions is chronic or complex. Priority will be given to high volume and/or frequent users of the acute public hospital system.

Initiatives funded will reduce emergency demand pressures on hospitals by:

- Targeting conditions where the evidence shows patients with such conditions are associated with frequent use of public hospital services;
- Promoting models of care that focus on groups of patients who frequently access hospitals, and which are based on best practice; and
- Enhancing access to and systematic use of primary health services, including general practitioners, where these services' involvement in a patient's care will avoid unnecessary emergency presentations and/or reduce hospital admissions and readmissions.

Importantly, HARP will foster initiatives that are based on the continuum of health care emphasising that a person's health is better managed across their lifespan rather than in episodic intervals as acute exacerbations of illness occur.

Although acute public hospitals are key providers in the treatment and management of disease within the Victorian community, they do not stand-alone and their effectiveness is significantly contributed to by the primary care, sub acute and specialist community services. HARP will emphasise enhancing the continuum of care through clearer clinical pathways and greater cohesion between services. Co-operation between agencies in different sectors and collaboration in developing and implementing new models of care will be an important feature of HARP.

1.4 How will HARP be managed?

HARP is a collaborative strategy between hospitals, general practitioners, community providers, key clinical groups, consumers, research bodies and the Department of Human Services.

Reflecting this, a HARP Reference Group has been established. This group is chaired by Professor John Funder and brings together a range of stakeholders with an interest and relevant expertise in the area including clinicians, primary health providers, general practitioners, health service administrators, consumers and carers, researchers and the metropolitan ambulance service to provide strategic direction and monitor implementation of HARP.

The Reference Group will consider and provide advice on:

- Target population groups or conditions with most potential for preventing hospitalisations;
- Trends in morbidity and care options;
- Best practice for management of patients;
- Models of care that have demonstrated efficacy; and
- Evaluation of initiatives funded.

Additionally the Secretary of the Department, Ms Patricia Faulkner, has established a HARP Departmental Steering Committee that is chaired by the Executive Director of Metropolitan and Aged Care Services, Mr Shane Solomon. This Committee brings together representatives from relevant parts of DHS and will oversee the implementation and ongoing evaluation of HARP and ensure that a whole of Department approach is achieved. The Reference Group reports and provides advice to the Steering Committee. Professor Funder as the Chair of the Reference Group is a member of the Departmental Steering Committee.

2 High Volume Conditions/Cohorts of People

2.2 Data Sources

The hospital data used in this section is from the Victorian Emergency Minimum Dataset (VEMD) and the Victorian Admitted Episode Dataset (VAED). In both cases caution should be exercised in interpretation of the data as these datasets are principally used for administrative and financial purposes. Additionally, changes in coding practice over time may have affected trends for some diagnoses.

The data presented is for the hospitals participating in the HDM Strategy, which appear in Appendix B. Generally, the data has been compared for the years 1999-2000, 2000-2001 and 2001-2002. The current years' data (2001-2002) has been derived by doubling the actual data for the first half of the year (July-December 2001). This may affect the data for diagnoses with seasonal patterns.

2.2 Population Trends

The Victorian population is projected to grow by 14.8% over the period 1998-2020. Growth will not be uniform across the age range however. The highest rate of growth will be in the 65 years and over age group with projected growth of 65.3% during this period. Within the same time span the population which is under 15 years of age is projected to decline by 11%. For the remaining age cohort, those 15 to 64 years of age will grow by approximately 10.8% These trends are outlined in Table 2.1.

Table 2.1. Population trends 1998-2020 (,000)

Age Groups	1998	2000	2002	2004	2005	2010	2015	2020
Under 15 yrs	626	621	619	616	612	583	567	557
15 to 64 yrs	3,437	3,507	3,565	3,619	3,646	3,758	3,795	3,809
65 yrs and over	588	606	625	647	658	731	850	972
Total	4,651	4,734	4,810	4,882	4,916	5,072	5,212	5,338

Source: Department of Infrastructure; 1996 census data.

2.3 Presentations to Emergency Departments

Emergency departments have been experiencing growth in presentations to the extent that over the two years to 2001-2002 there will be overall growth of 7%. Within the total growth the most significant increase has been for those 65 years and older with an increase of 15.2%. Growth in emergency presentations for patients under 15 years is more modest at around 2%. Table 2.2 shows trends in presentations to EDs by age group over three years.

Table 2.2. Trends in emergency presentations 1999-2002

Age Groups	1999-2000	2000-2001	2001-2002*	Variance
Under 15 yrs	172,106	177,162	175,709	+2.1%
15 to 64 yrs	365,790	374,146	389,845	+6.6%
65 yrs and over	121,667	129,029	140,221	+15.2%
Total	659,563	680,337	705,776	+7.0%

** Projected from July to Dec 2001 data*

Table 2.3 summarises the volumes of emergency patients, emergency presentations and emergency presentations that resulted in admission for 2000-2001 by age group.

Table 2.3. Emergency activity 2000-2001

Age Groups	Patients	Presentations	Admissions
Under 15 yrs	132,610	177,162	27,444
15 to 64 yrs	278,584	374,146	66,049
65 yrs and over	88,178	129,029	59,562
Total	499,372	680,337	153,055

From this table, the average numbers of ED presentations per patient were 1.3 for patients under 15years, 1.3 for patients 15 to 64 years and 1.5 for patients 65 years and over. Overall, the average number of presentations per patient was 1.4.

The overall admission rate per presentation was 22.5%. The proportion of emergency presentations that resulted in admission were 15.5% for patients under 15 years of age, 17.7% for patients aged 15 to 64 years and 46.2% for patients aged 65 years and over. Patients aged 65 years and over had a markedly higher rate of admission than other groups.

2.3.1 High volume presentations to emergency departments

Table 2.4 shows annual trends in high volume presentations to EDs from 1999-2000 to projected totals for 2001-2002.

Table 2.4. ICD top 50 table

ICD – 10	Description	1999-00	2000-01	2001-02	Variance
R074	CHEST PAIN UNSPECIFIED	18,021	20,684	22,768	26.3%
R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	19,948	21,865	22,173	11.2%
B349	VIRAL INFECTION UNSPECIFIED	16,002	17,850	19,846	24.0%
Z099	F/U EXAM AFTER UNSPEC RX FOR OTH COND	15,209	14,530	14,681	-3.5%
A09	DIARRH & GASTROENTERITIS PRES INFECTIOUS	12,248	12,677	11,885	-3.0%
S619	OPEN WOUND OF WRIST & HAND PART NOS	10,811	11,158	11,840	9.5%
J069	ACUTE URTI UNSPECIFIED	9,058	10,263	10,526	16.2%
S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	9,274	9,453	9,751	5.1%
R69	UNKNOWN & UNSPEC CAUSES OF MORBIDITY	9,258	9,394	9,510	2.7%
N390	URINARY TRACT INFECTION SITE NOT SPEC	8,234	8,960	9,373	13.8%
J459	ASTHMA UNSPECIFIED	9,179	9,143	8,855	-3.5%
S0180	UNSPEC OPEN WOUND OF OTHER PARTS OF HEAD	8,743	8,334	8,836	1.1%
R55	SYNCOPE AND COLLAPSE	6,929	7,399	8,037	16.0%
J450	PREDOMINANTLY ALLERGIC ASTHMA	7,863	8,481	7,412	-5.7%
J181	LOBAR PNEUMONIA UNSPECIFIED	6,168	6,261	7,398	19.9%
I200	UNSTABLE ANGINA	9,113	8,284	7,393	-18.9%
L989	DISORDER SKIN & SUBCUTANEOUS TISSUE NOS	4,328	5,389	6,925	60.0%
L039	CELLULITIS UNSPECIFIED	6,268	6,682	6,655	6.2%
S9340	SPRAIN AND STRAIN OF ANKLE NOS SITE	5,907	5,911	6,073	2.8%
R11	NAUSEA AND VOMITING	5,411	5,555	5,809	7.4%
S019	OPEN WOUND OF HEAD PART UNSPECIFIED	5,017	5,460	5,404	7.7%
M7919	MYALGIA SITE UNSPECIFIED	4,387	4,787	5,200	18.5%
H669	OTITIS MEDIA UNSPECIFIED	5,140	5,208	5,185	0.9%
K529	NONINFECT GASTROENTERITIS & COLITIS NOS	4,538	5,174	5,117	12.8%
K590	CONSTIPATION	4,768	5,267	5,034	5.6%
J039	ACUTE TONSILLITIS UNSPECIFIED	3,763	3,946	4,808	27.8%
J449	COPD UNSPECIFIED	4,489	4,295	4,696	4.6%
G439	MIGRAINE UNSPECIFIED	4,270	3,922	4,611	8.0%
J050	ACUTE OBSTRUCTIVE LARYNGITIS [CROUP]	6,683	4,764	4,450	-33.4%
R060	DYSPNOEA 3,217 3,707 4,372 35.9% R509 FEVER UNSPECIFIED	4,075	4,186	4,370	7.2%
M5499	UNSPECIFIED DORSALGIA SITE UNSPECIFIED	3,427	3,565	4,263	24.4%
R51	HEADACHE 4,132 3,787 4,124 -0.2% N23 UNSPECIFIED RENAL COLIC	4,623	4,690	4,083	-11.7%
I500	CONGESTIVE HEART FAILURE	3,681	3,676	4,037	9.7%
J22	UNSPEC ACUTE LOWER RESPIRATORY INFECTION	3,470	3,332	3,918	12.9%
T659	TOXIC EFFECT OF UNSPECIFIED SUBSTANCE	3,887	4,058	3,886	0.0%
J219	ACUTE BRONCHIOLITIS UNSPECIFIED	3,552	3,659	3,777	6.3%
F419	ANXIETY DISORDER UNSPECIFIED	3,305	3,227	3,682	11.4%
I64	STROKE NOT SPEC HAEMORRHAGE OR INFARCT	3,530	3,417	3,592	1.8%
T159	FOREIGN BODY ON EXTERNAL EYE PART NOS	3,420	3,530	3,473	1.5%
K359	ACUTE APPENDICITIS UNSPECIFIED	3,499	3,364	3,424	-2.1%
S529	FRACTURE OF FOREARM PART UNSPECIFIED	3,486	3,529	3,411	-2.2%
I48	ATRIAL FIBRILLATION AND FLUTTER	2,992	3,174	3,287	9.9%
R101	PAIN LOCALIZED TO UPPER ABDOMEN	3,090	2,962	3,282	6.2%
R568	OTHER AND UNSPECIFIED CONVULSIONS	2,749	2,995	3,248	18.2%
I219	ACUTE MYOCARDIAL INFARCTION UNSPECIFIED	2,940	3,007	3,195	8.7%
S7208	FRACTURE OF OTHER PARTS OF NECK OF FEMUR	2,586	2,724	3,117	20.5%
T07	UNSPECIFIED MULTIPLE INJURIES	2,661	2,972	3,081	15.8%
R42	DIZZINESS AND GIDDINESS	2,604	2,804	3,061	17.5%
	Total for all presentations	659,563	680,337	705,776	7.0%

When interpreting this data consideration should be given to the fact that many patients will not have a definitive diagnosis prior to departing the ED. This list of 50 ICD – 10 codes accounts for approximately 323,461 ED presentations (ie 46%).

High volume ED presentations include: chest pain, unstable angina, and myocardial infarction; abdominal pain and acute appendicitis, gastroenteritis, nausea and vomiting; viral infections; respiratory tract infections; follow-up examination after therapy for orthopaedic condition; open wound of wrist and hand; fractures; unknown and unspecified causes of morbidity; urinary tract infection, chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF) and asthma.

From this table, growth of greater than 20% is projected for disorders of the skin and sub-cutaneous tissue not otherwise specified, dyspnoea, acute tonsillitis, chest pain unspecified, unspecified dorsalgia, and fracture of other parts of the neck of femur.

Information provided from the Metropolitan Ambulance Service identified that there were approximately 223,000 emergency cases in the calendar year 2001 of which 74% resulted in a patient transport to hospital. Major emergency case types in the metropolitan area included: chest pain/cardiac arrest/heart problems (13.4%); breathing problems (9.8%); Falls (9.2%); unconscious or fainting (7.7%); doctor request (7.3%); sick person – no priority symptoms (6.9%); traffic accident (6.4%); psychiatric patient (4.0%); overdose (3.9%); convulsions (3.9%); abdominal pain (3.8%); and haemorrhage (3.5%). Significant growth areas for ambulance demand included falls; doctor requests; psychiatric patients; chest pain and sick persons with no priority symptoms.

2.3.2 Re-presentations to Emergency Departments

For the purposes of this analysis, re-presentations to EDs were defined as patients presenting to the same ED four or more times over the year. Table 2.5 summarises the numbers of emergency patients, presentations and admissions from ED by age group for 2000-2001 across target hospitals.

Table 2.5. Emergency re-presentations 2000-2001

Age Groups	Patients	Presentations	Admissions
Under 15 yrs	3,468	17,236	960
15 to 64 yrs	8,084	45,953	3,101
65 yrs and over	3,888	20,353	4,565
Total	**15,440**	**83,542**	**8,626**

There were 15,440 patients who attended the same ED on four or more occasions in 2000-2001. These patients had a total of 83,542 presentations, which accounted for 12.3% of all ED presentations. The age range for re-presenting patients ranged from less than one year up to 100 years, with an average age of 37 years. The average number of presentations per patient was 5.4 ranging from 5.0 in patients aged less than 15 years up to a maximum of 5.7 in patients aged 15 to 64 years. The numbers of re-presentations per patient ranged from a minimum of four (per definition) up to a maximum of 91. The admission rate per patient ranged from 0.3 for patients aged less than 15 years up to 1.2 for patients aged 65 years and over. Overall, the average admission rate per patient was 0.6.

Table 2.6 summarises the volume of patients who had four or more presentations to the ED by age.

Table 2.6. Volume of patients re-presenting to EDs 2000-2001

	Number of Patients by Age Group			
Number of Presentations	0-14 years	15-64 years	≥ 65 years	Total
4	1,946	3,971	1,969	7,886
5	759	1,651	888	3,298
6	356	885	426	1,667
7	162	491	252	905
8	112	313	114	539
9	52	184	77	313
10	29	142	55	226
>10	52	447	107	606
Total	3,468	8,084	3,888	15,440

As the number of presentations increases the volume of patients representing decreases across all age groups. Those patients with four, five or six presentations account for 85% of the total.

Figure 2.1 summarises the number of patients who had four or more presentations to the same ED during 2000-20001.

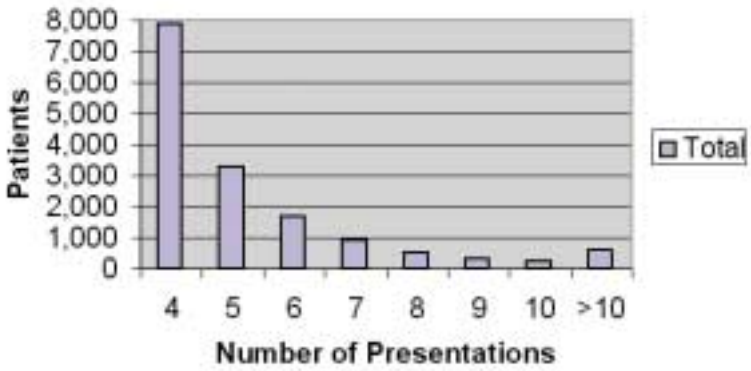


Figure 2.1. Re-presentations to ED 2000-2001

There were 15,440 patients who had a total of four (i.e. 51%) or more ED presentations in 2000-2001. Of these patients 7,886 had four presentations, 226 (i.e. 1.4%) patients had 10 presentations and 606 (i.e. 3.9%) patients had greater than 10 presentations. The age distribution of patients with four or more presentations is shown in Figure 2.2.

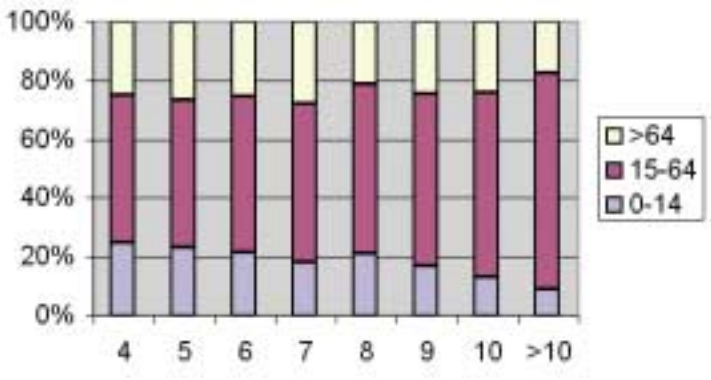


Figure 2.2. Proportion of re-presentations by age 2000-2001

Of these patients, 23% (3,463) were aged less than 15 years, 52% (8,084) were aged 15 to 64 years and the remaining 25% (3,888) were aged 65 years or over. As the number of presentations increased there was an increase in the proportion of patients aged between 15 and 64 years, thus patients > 65 years account for 18% of patients who presented to EDs and 25% of re-presentations.

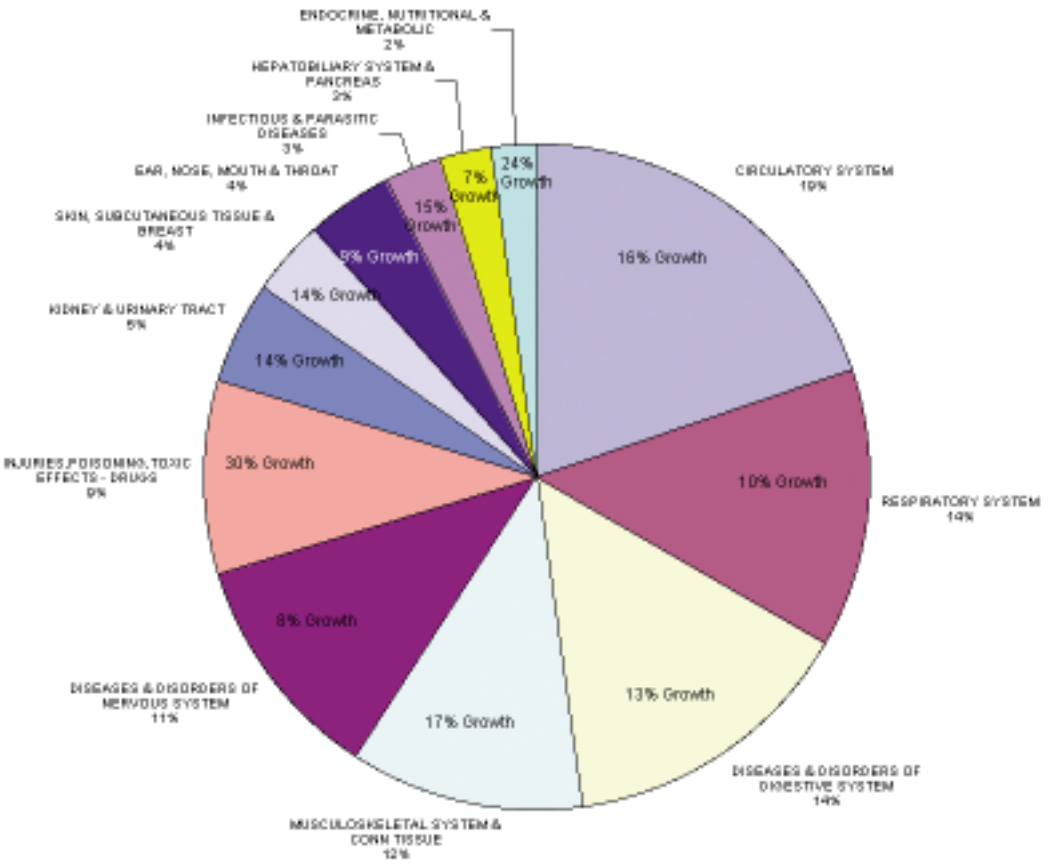
2.4 Admissions to Hospital

The following analysis uses data from the VAED and adopts abbreviated 3-digit DRG codes group related diagnoses.

2.4.1 High volume emergency separations by Major Diagnostic Category

In 2001-2002 there will be an estimated 579,516 separations from the HARP target hospitals. Of these, 257,691 are projected to be emergency separations.

Figure 2.3 shows the 12 highest volume Major Diagnostic Categories (MDCs) for emergency separations along with projected growth over the two years 1999-2000 to 2001-2002. These high volume MDCs account for 91% (i.e. 222,281) of all projected emergency separations for 2001-2002.



NB. includes same day and multi-day separations, % growth = projected growth 1999-00 – 2001-02, (%) = proportion of total

Figure 2.3. High volume MDCs for emergency separations

From this projected data for 2001-2002, conditions of the circulatory system (49,624 separations = 18%), respiratory system (34,578 separations = 12%), digestive system (36,173 separations = 13%), musculoskeletal system (29,325 separations = 11%), nervous system (27,911= 10%), and injuries, poisoning, or toxic effects of drugs (23,832 = 9%) collectively account for 72% of all emergency separations. Each of these MDCs have demonstrated significant growth over the last 2 years ranging from 11% for diseases and disorders of the nervous system up to 32% for injuries, poisoning or toxic effects of drugs.

Marked growth in emergency separations has also occurred in the following lower volume MDCs over this time-frame:

- Mental Diseases and Disorders (up 60% from 2,428 to 3,930 separations);
- Factors Influencing Heath Status (up 65% from 1,426 to 2,347 separations);
- Alcohol/Drug Use and Induced Mental Disorder (up 23% from 1,910 to 2,359 separations); and
- Disease and Disorders of the Eye (up 48% from 1,000 to 1,482 separations).

2.4.2 Trends in high volume separations – all ages

Trends in high volume separations for elective and emergency separations across target hospitals are shown in Table 2.7.

Table 2.7. High volume separations – all ages 1999-2002

Diagnosis	Multi-day Separations			Same Day Separations			Total			Variance in total seps	% Emerg 2001-02
	1999-00	2000-01	2001-02	1999-00	2000-01	2001-02	1999-00	2000-01	2001-02		
CHEST PAIN	4570	4967	5602	3900	5103	5928	8470	10070	11530	36%	98%
INJURIES	2430	2736	3720	3066	4373	5820	5496	7109	9540	74%	98%
RESPIRATRY INFECTN/INFLAMMTN	8166	7218	8412	851	939	1040	9017	8157	9452	5%	96%
ABDOMNL PAIN/MESENTRC ADENITIS	3725	3885	4190	3563	4288	4800	7288	8173	8990	23%	97%
RED BLOOD CELL DISDERS	1697	1428	1598	6014	6512	7314	7711	7940	8912	16%	17%
OESPH, GASTR & MJR DIG DIS A>9	4251	4511	4582	3118	3734	4046	7369	8245	8628	17%	93%
POISONING/TOXIC EFFECT DRUGS	4218	4255	4524	2660	2781	3026	6878	7036	7550	10%	99%
BRONCHITIS & ASTHMA	5629	5507	5540	1433	1542	1678	7062	7049	7218	2%	97%
CHRNIC OBSTRUCTIVE AIRWAY DIS	5265	5097	6212	803	859	884	6068	5956	7096	17%	96%
HEART FAILURE & SHOCK	4356	4154	5126	919	920	1004	5275	5074	6130	16%	97%
NON-MJR ARYTHMIA&CONDUCTN DSRD	2796	2728	3186	1631	1841	218	4427	4569	5370	21%	83%
STROKE	431	4043	4612	679	716	714	4996	4759	5326	7%	93%
UNSTABLE ANGINA	4977	4363	4040	1048	1147	1228	6025	5510	5268	-13%	98%
NON-SURG NECK & BACK CONDITION	1896	2099	2368	2472	2654	2834	4368	4753	5202	19%	74%
INJ FOREARM,WRIST,HAND,FOOT	2297	2181	2298	1973	2176	2518	4270	4357	4816	13%	87%
KIDNY & URINARY TRACT INFECTS	3113	3137	3464	1183	1189	1298	4296	4326	4762	11%	94%
SEIZURE	2725	2741	2896	1532	1679	1862	4257	4420	4758	12%	91%
OTH KIDNEY & URINARY TRACT DX	1841	2005	1770	1915	2330	2950	3756	4335	4720	26%	30%
CIRC DISRD-AMI+IC IN PR	3376	3076	3044	1707	1642	1584	5083	4718	4628	-9%	32%
CELLULITIS	3856	3794	3850	449	514	634	4305	4308	4484	4%	90%
SYNCOPE & COLLAPSE	1661	1861	2266	1394	1737	1804	3055	3598	4070	33%	98%
INJ SHOULD, ARM,ELBOW,KNEE,LEG	1864	1916	2166	1292	1572	1872	3156	3488	4038	28%	95%
OTHER WRIST, HAND PROCEDURES	1673	1425	1500	2214	2011	2404	3887	3436	3904	0%	35%
CIRC DISRD+AMI-INVAS INVEST PR	3223	3043	3200	440	493	628	3663	3536	3828	5%	98%
OTH FACTOR INFLU HEALTH STATUS	516	699	736	3377	3488	3012	3893	4187	3748	-4%	20%
OTITIS MEDIA & URI	2090	2066	2434	874	1014	1278	2964	3080	3712	25%	93%
CHOLECYSTECTOMY-CLOSED CDE	4011	3410	3552	16	20	46	4027	3430	3598	-11%	24%
HEADACHE	1540	1415	1542	1537	1704	1948	3077	3119	3490	13%	93%
DIABETES	2002	2481	2658	303	567	716	2305	3048	3374	46%	86%
APPENDICECTOMY	3241	2982	3192	4	9	10	3245	2991	3202	-1%	96%
Total for all separations	262,078	249,745	265,112	311,332	329,771	359,974	573,410	579,516	625,086	9%	43%

**Annualised from July to Dec 2001 data*

Data from this table projects 1% growth in multi-day separations, 16% growth in same-day separations with overall growth of 9% over this time. Growth greater than 20% is projected in the following high volume diagnostic categories: Injuries; Diabetes; Chest Pain; Syncope and Collapse; Injury of the Shoulder, Arm, Elbow, Knee or Leg; Abdominal Pain; Other Kidney and Urinary Tract Diagnosis; Otitis Media and Upper Respiratory Infection; and Non-Major Arrhythmia and Conduction Disorder.

The following eight conditions each accounted for more than 30,000 acute bed days: Stroke, Respiratory Infection/Inflammation, Dementia and Chronic Disturbance of Cerebral Function, Other Factors Influencing Health Status, COPD and Heart Failure and Shock.

2.4.3 Trends in high volume separations < 15 years

Trends in high volume elective and emergency separations for patients aged less than 15 years across hospitals are shown in Table 2.8.

Table 2.8. High volume separations < 15 years 1999-2002

Diagnosis	Multi-day Separations			Same Day Separations			Total			Variance in total seps	% Emerg 2001-02
	1999-00	2000-01	2001-02	1999-00	2000-01	2001-02	1999-00	2000-01	2001-02		
BRONCHITIS & ASTHMA	3076	3087	2810	56	639	520	3642	372	3330	-9%	97%
GASTROENTERITIS A<10	2183	2168	2208	349	38	43	2532	2554	2644	4%	97%
INJ FOREARM,WRIST,HAND,FOOT	132	1213	1210	815	83	888	2142	2049	2098	-2%	84%
WHOOPING COUGH &ACUTE BRONCHIO	1652	147	1770	9	133	15	1749	1609	192	10%	96%
RESPIRATRY INFECTN/INFLAMMTN	1608	134	1774	99	10	126	170	1453	1900	11%	95%
OTITIS MEDIA & URI	1202	1168	1388	369	438	502	1571	160	1890	20%	92%
VIRAL ILLNESS	1083	1299	1240	299	322	424	1382	1621	1664	20%	97%
SEIZURE	723	709	758	313	312	348	103	1021	110	7%	79%
NEO,ADMWT >2499G-SIGNIF OR PR	600	545	594	308	340	364	908	885	958	6%	65%
OESPHS & MISC DIG SYS DIS A<10	699	691	70	214	199	248	913	890	954	4%	71%
ABDOMNL PAIN/MESENTRC ADENITIS	598	633	680	19	231	268	795	864	948	19%	96%
APPENDICECTOMY	925	792	920	2	2	4	927	794	924	0%	94%
INJURIES	315	30	338	280	435	550	595	741	888	49%	94%
TESTES PROCEDURES	260	212	268	584	601	584	844	813	852	1%	30%
LARYNGOTRACHEITIS&EPIGLOTTITIS	1041	536	462	603	425	346	1644	961	808	-51%	99%
KIDNY & URINARY TRACT INFECTS	694	66	614	105	100	118	799	76	732	-8%	91%
INJ SHOULD, ARM,ELBOW,KNEE,LEG	467	481	486	179	200	222	64	681	708	10%	94%
POISONING/TOXIC EFFECT DRUGS	452	398	36	299	278	316	751	676	682	-9%	99%
MISCELANS METABOLIC DISORDERS	328	300	324	255	293	33	583	593	660	13%	46%
RETICLENDOTHLL & IMMUNITY DSRD	380	362	350	266	273	278	646	635	628	-3%	52%
OTHER MUSCULOSKELETL DISORDERS	184	134	14	332	391	472	51	525	618	20%	22%
OTH EAR, NOSE, MOUTH& THRT DX	329	257	284	412	324	320	741	581	604	-18%	40%
ACUTE LEUKAEMIA	368	383	378	122	154	202	490	537	580	18%	25%
FEVER OF UNKNOWN ORIGIN	29	290	380	11	164	188	412	454	568	38%	95%
MINOR SKIN DISORDERS	118	240	26	368	330	294	48	570	560	15%	44%
RED BLOOD CELL DISDERS	89	83	9	488	478	450	577	561	54	-5%	16%
OTHER HEAD INJURY	353	324	330	199	210	198	552	534	528	-4%	98%
DNTAL & ORAL DIS-EXTRCT&RESTRTNS	249	215	222	323	311	30	572	52	528	-8%	61%
CELLULITIS	525	502	46	48	58	62	573	560	528	-8%	91%
FEBRILE CONVULSIONS	361	265	37	141	105	144	502	370	520	4%	98%
Total for all separations < 15 years	39,001	36,234	37,730	26,020	25,960	27,040	65,021	62,194	64,770	0%	56%

**Annualised from July to Dec 2001 data*

Over this two year time-frame, projected figures for 2001-2002 estimate a 3.3% reduction in multi-day activity balanced by a 3.9% increase in same-day with a minor reduction (< 1%) in overall separations for patients aged less than 15 years when compared with 1999-2000.

For patients less than 15 years, conditions with over 1,500 separations per annum include: Bronchitis and Asthma; Gastroenteritis; Injury of the Forearm; Wrist, Hand or Foot; Whooping Cough and Acute Bronchiolitis; Respiratory Infection/Inflammation; Otitis Media and Upper Respiratory Infection; Viral Illness; and Seizure.

From these projections, growth of at least 20% in separations occurs in Injuries, Fever of Unknown Origin, Viral Illness, Otitis Media and Upper Respiratory Infection; and Other Musculoskeletal Disorders.

2.4.4 Trends in high volume separations ≥ 65 years

Table 2.9 summarises trends in high volume separations for elective and emergency patients 65 years of age and over.

Table 2.9. High volume separations ≥ 65 years 1999-2002

Diagnosis	Multi-day Separations			Same Day Separations			Total			Variance in total seps	% Emerg 2001-02
	1999-00	2000-01	2001-02	1999-00	2000-01	2001-02	1999-00	2000-01	2001-02		
HEART FAILURE & SHOCK	3708	3598	4524	803	817	882	4511	4415	540	20%	97%
CHRNIC OBSTRUCTIVE AIRWAY DIS	3754	3663	4722	60	657	664	4360	4320	538	24%	97%
RESPIRATRY INFECTN/INFLAMMTN	4114	3792	4412	429	504	508	4543	429	4920	8%	97%
CHEST PAIN	1508	1723	2040	1355	1800	2022	2863	3523	4062	42%	98%
STROKE	3178	3017	3590	403	427	420	3581	3444	4010	12%	96%
UNSTABLE ANGINA	3257	2820	2658	689	779	798	394	3599	345	-12%	98%
NON-MJR ARYTHMIA&CONDUCTN DSRD	1783	1809	2050	891	1039	127	2674	2848	332	24%	83%
RED BLOOD CELL DISDERS	1069	955	1134	1385	1550	1964	2454	2505	3098	26%	35%
OESPH, GASTR & MJR DIG DIS A>9	159	1788	1870	958	1089	1208	2554	2877	3078	21%	94%
CIRC DISRD+AMI-INVAS INVEST PR	2138	210	2368	301	321	404	2439	2427	2772	14%	98%
SYNCOPE & COLLAPSE	1106	1264	1604	82	1088	1114	1932	2352	2718	41%	99%
INJURIES	678	809	1218	637	90	1148	1315	1715	236	80%	99%
OTH KIDNEY & URINARY TRACT DX	910	905	838	898	1119	141	1808	2024	2254	25%	36%
CIRC DISRD-AMI+IC IN PR	1493	1382	1420	700	709	722	2193	2091	2142	-2%	34%
KIDNY & URINARY TRACT INFECTS	1252	1371	1592	483	461	530	1735	1832	2122	22%	96%
OTHER HIP & FEMUR PROC	167	1695	1932	3	2	0	1679	1697	1932	15%	93%
HIP REVISION OR REPLACEMENT	1711	1660	1760	3	1	0	1714	1661	1760	3%	53%
NON-SURG NECK & BACK CONDITION	683	721	830	823	860	928	150	1581	1758	17%	69%
ABDOMNL PAIN/MESENTRC ADENITIS	693	75	828	723	794	898	141	1550	172	22%	96%
OTH GASTROSCOPY+MJR DIGEST DIS	950	992	992	751	665	674	1701	1657	166	-2%	56%
CORONARY ATHEROSCLEROSIS	651	641	660	549	665	760	1200	130	1420	18%	91%
PERIPHERAL VASCULAR DISORDERS	870	772	748	56	532	644	143	1304	1392	-3%	39%
TIA & PRECEREBRAL OCCLUSION	797	881	102	302	322	31	1099	1203	1342	22%	93%
CELLULITIS	044	1099	1130	133	12	120	1177	1225	1250	6%	90%
DIABETES	574	87	948	115	241	272	689	1117	1220	77%	85%
OTHER RESPIRATORY SYSTEM DX	708	71	850	278	369	368	98	1085	1218	24%	91%
OTHER RESPIRATRY SYSTEM OR PR	480	438	512	630	629	688	1110	1067	1200	8%	23%
INJ SHOULD, ARM,ELBOW,KNEE,LEG	617	657	744	335	399	42	952	105	1170	23%	97%
BONE DIS & SPCFC ARTHROPATHIES	537	51	680	457	494	480	994	1010	1160	17%	64%
KDNY & URINRY TRCT SIGNS&SYMPS	531	500	528	40	498	592	937	998	1120	20%	83%
Total for all separations ≥ 65 years	94,909	93,693	103,082	101,715	114,452	128,248	196,624	208,145	231,330	18%	43%

**Annualised from July to Dec 2001 data*

Considering the trends in population growth, along with patterns of health care use by age, the growth in demand for hospital services will continue to be weighted towards patients over the age of 65 years. Projected data from this table indicates that marked growth (i.e. > 20%) for this group is occurring in many conditions including Injuries, Diabetes, Chest Pain, Other Factors Influencing Health Status, Syncope and Collapse, Transient Ischaemic Attack and Precerebral Occlusion, Kidney and Urinary Tract Disorders, Other Respiratory System Disorders, Non Major Arrhythmia and Conduction Disorders, COPD, Kidney and Urinary Tract Infections, Abdominal Pain/Mesenteric Adenitis and Heart Failure and Shock.

2.4.5 Trends in presentations and separations by hospital

Trends in emergency presentations and emergency separations by hospital are shown in Table 2.10

Table 2.10. Trends in emergency separations and presentations 1999-2002

Hospital	1999-2000		2000-2001		2001-2002		Variance	
	Separations	Presentations	Separations	Presentations	Separations	Presentations	Separations	Presentations
Alfred	16,715	36,305	18,254	37,475	23,334	35,956	40%	-1.0%
Angliss	7,318	29,161	8,533	31,814	9,593	34,028	31%	16.7%
ARMC Austin	15,447	33,956	15,634	35,606	17,310	36,444	12%	7.3%
Ballarat Base	7,251	28,997	7,383	30,317	7,514	30,922	4%	6.6%
Bendigo	7,629	31,004	7,617	30,700	7,044	32,505	-8%	4.8%
Box Hill	15,051	33,477	15,742	35,063	17,238	35,552	15%	6.2%
Dandenong	17,344	39,051	18,213	38,504	17,695	40,813	2%	4.5%
Frankston	18,150	34,489	20,324	37,558	22,192	39,370	22%	14.2%
Geelong	11,076	37,021	15,182	36,230	16,070	38,331	45%	3.5%
Shepparton	6,981	23,733	6,926	25,735	7,129	25,576	2%	7.8%
Maroondah	7,330	28,686	9,311	29,143	11,069	30,083	51%	4.9%
MMC Clayton	24,676	49,075	24,809	48,879	25,980	50,072	5%	2.0%
Latrobe Regional	4,694	26,740	5,084	26,605	5,483	26,191	17%	-2.1%
Northern	11,496	40,489	12,554	42,198	13,701	43,094	19%	6.4%
RCH	11,405	52,318	10,949	53,433	11,073	55,012	-3%	5.1%
RMH	20,013	44,127	22,022	43,972	22,697	45,855	13%	3.9%
St Vincents	11,511	27,397	13,880	30,465	15,187	30,733	32%	12.2%
Sunshine	4,178	25,104	4,272	26,974	10,646	42,961	155%	71.1%
Western	19,145	36,853	19,965	39,682	16,310	31,573	-15%	-14.3%
Total	237,410	657,983	256,654	680,353	277,267	705,071	17%	7.2%

**Annualised from July to Dec 2001 data*

From this table, growth in multi-day separations and emergency presentations is variable across hospitals. Overall it is estimated that growth in emergency separations of around 17% will be accompanied by growth in emergency presentations of around 7.2% over this 2 year time-frame. A summary of high volume ED presentations and multi-day separations by hospital is included in Appendix B.

2.4.6 High volume separations across hospitals

Table 2.11 identifies the number of hospitals (of those listed in Table 2.10) in which these high volume conditions appear within the "top 10" based on volume of separations.

Table 2.11. High volume conditions common across 19 hospitals 1999-2002

DRG	Description	Frequency in Top 10
E62	RESPIRATRY INFECTN/INFLAMMTN	19
E65	CHRNIC OBSTRUCTIVE AIRWAY DIS	17
F62	HEART FAILURE & SHOCK	16
F74	CHEST PAIN	13
G67	OESPH, GASTR & MJR DIG DIS A>9	11
E69	BRONCHITIS & ASTHMA	11
X62	POISONING/TOXIC EFFECT DRUGS	10
F72	UNSTABLE ANGINA	10

These conditions are used to explore the relative homogeneity of patients who were readmitted during 2000-2001 in the following section.

2.5 Readmissions to Hospital

Figure 2.4 summarises the numbers of patients who had two or more admissions to the same hospital during 2000- 2001. This data excludes maternity, geriatric respite, mental health, newborn, interim care and statistical readmissions.

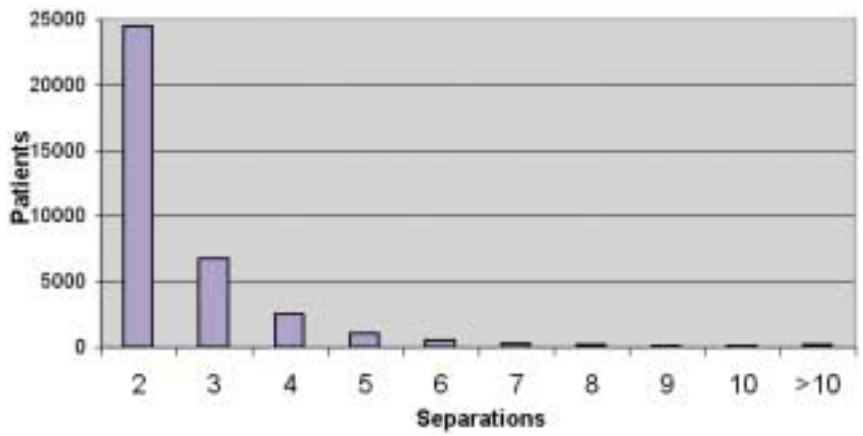


Figure 2.4. Volume of readmissions 2000-2001

The number of patients who were readmitted for two or more multi-day episodes of care during 2000-2001 ranged from 24,457 with two separations down to one patient with 29 separations. A total of 213 patients had more than ten multi-day episodes.

Figure 2.5 summarises the proportion of readmitted patients by age group.

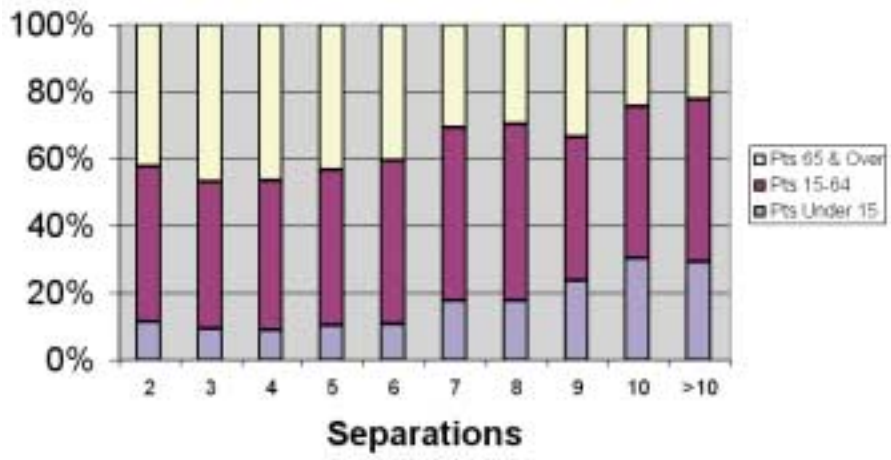


Figure 2.5. Proportion of readmitted patients by age group 2000-2001

Patients aged less than 15 years accounted for 10.9% of re-presenting patients, while 45.7% of re-presentations were aged 15 to 65 years and the remaining 43.4% of re-presentations were aged greater than 65 years. Thus patients aged over 65 years account for 35.9% of separations and 43.4% of re-presentations.

2.5.1 Complexity of patients with three or more separations

There were a total of 18,330 patients who had as many as three or more emergency separations in 2000-01. Table 2.12 summarises the number of patient episodes allocated multiple ICD-10 Codes for these patients.

Table 2.12. Number of ICD-10 codes for emergency patients with ≥ 3 separations

Number of ICD-10 Codes	Episodes	Percentage	Patients
1	2415	10.1%	1601
2	3500	14.6%	2393
3	3430	14.3%	2496
4	3027	12.7%	2336
5	2687	11.2%	2156
6	2231	9.3%	1844
7	1746	7.3%	1460
8	1347	5.6%	1158
9	926	3.9%	828
10	689	2.9%	641
>10	1930	8.1%	1417
Total Episodes	**23928**	**100.0%**	**18330**

There were 23,928 patient episodes for these patients who were admitted on at least three occasions. Of these episodes 2,415 (10.1%) were allocated a single ICD-10 Code. Thus the vast majority of these patient episodes were allocated two or more ICD-10 codes with the average number of ICD-10 codes per episode being 5.1 ICD-10 codes.

The following analyses examine the frequency with patients are readmitted with COPD, CHF, chest pain/angina, bronchitis/asthma and poisoning and toxic effects of drugs. The data is limited to multi-day emergency separations only.

2.5.2 Chronic obstructive pulmonary disease

There were a total of 2,41patients who had at least one multi-day emergency separation with a primary diagnosis of COPD and who also had at least one further admission. Table 2.13 summarises the frequency with which these patients who had a primary diagnosis of COPD on at least one admission, were readmitted to the same hospital for COPD during 2000-2001.

Table 2.13. COPD re-presentations 2000-2001

Multi-Day Seps	Number of COPD Primary Diagnoses per Patient								
	At least 1	1	2	3	4	5	6	7	8
2	856	567	289						
3	398	196	128	74					
4	216	101	47	39	29				
5	109	37	23	20	15	14			
6	63	15	17	6	9	9	7		
7	38	9	7	7	5	4	3	3	
8	16	5	3	1	1	0	1	2	3
>8	28	7	6	3	2	1	1	2	6
Total	**1724**	**937**	**520**	**150**	**61**	**28**	**12**	**7**	**9**

From this table there were 856 patients who had two separations, at least one of which was for COPD. The majority of these patients (567) were assigned a primary diagnosis of COPD for only one of their two admissions. The remaining 289 patients (i.e. 34%) were assigned to COPD for both of their admissions.

A total of 16 patients had eight separations during 2000-2001 with at least one being for COPD. Of these patients five had a primary diagnosis of COPD assigned to one separation, three patients had COPD assigned to two separations and a further three patients had COPD assigned to all eight separations. Two patients had COPD assigned for seven of their eight presentations and individual patients had COPD assigned for three, four and six of their eight separations.

The maximum number of separations per patient for this sub-group was 12.

2.5.3 Heart failure and shock

Table 2.14 summarises the frequency with which the 2,645 multi-day emergency patients who had a primary diagnosis of CHF on at least one admission, were readmitted to the same hospital for CHF during 2000-2001.

Table 2.14. Heart failure re-presentations 2000-2001

Multi-Day Seps	Number of CHF Primary Diagnoses per Patient								
	At least 1	1	2	3	4	5	6	7	8
2	865	743	122						
3	474	344	109	21					
4	244	164	48	27	5				
5	127	80	24	17	4	2			
6	76	43	16	8	6	2	1		
7	25	17	3	3	2	0	0	0	
8	26	8	6	5	4	2	1	0	0
>8	20	3	6	3	3	2	0	1	2
Total	1857	1402	334	84	24	8	2	1	2

A total of 865 patients had two admissions with at least one being for CHF. One hundred and twenty two of these patients (14%) were assigned a primary diagnosis of CHF for both separations while the remaining 743 patients were assigned CHF for only one of their two episodes.

There were 26 patients who had eight separations that included at least one episode for CHF. None of these patients were assigned a primary diagnosis of CHF for all of their episodes, and eight of these patients were assigned a diagnosis of CHF only once. The maximum number of emergency multi-day separations for these CHF patients was 9.

2.5.4 Chest pain and unstable angina

Table 2.15 shows re-presentation data for patients with multiple admissions for Chest Pain and Unstable Angina during 2000-2001. In 2000-2001 there were 2,813 patients who were admitted on more than one occasion who had a primary diagnosis of chest pain/unstable angina at least once.

Table 2.15. Chest pain/unstable angina re-presentations 2000-2001

Multi-Day Seps	Number of Chest Pain Primary Diagnoses per Patient								
	At least 1	1	2	3	4	5	6	7	8
2	1558	1342	216						
3	629	501	104	24					
4	315	235	56	29	2				
5	148	106	32	6	4	0			
6	73	51	15	5	2	0	0		
7	39	24	7	6	2	0	0	0	
8	32	21	4	5	0	0	2	0	0
>8	19	5	2	4	2	3	0	0	3
Total	2813	2285	436	79	12	3	2	0	3

There were 1,558 patients who had 2 separations with at least one being for Chest Pain/Unstable Angina. Of these patients 1,342 (86%) were assigned a primary diagnosis of Chest Pain/Unstable Angina for only one of their episodes, with the remaining 216 patients assigned to this diagnostic category on both occasions.

Of the 32 of these patients who had eight admissions, the majority (21) were classified with a primary diagnosis of Chest Pain/Unstable Angina for only one of their episodes. None of these patients were assigned a diagnosis of Chest Pain/Unstable Angina for all eight episodes. The maximum number of separations for this group of patients was 15.

2.5.5 Bronchitis and asthma

There were 1,034 representing patients had at least one multi-day emergency separation with bronchitis/asthma. Patients with multiple admissions that included at least one for Bronchitis/Asthma are shown in Table 2.16.

Table 2.16. Bronchitis/asthma re-presentations 2000-2001

Multi-Day Seps	Number of Bronchitis/Asthma Diagnoses per Patiient								
	At least 1	1	2	3	4	5	6	7	8
2	668	381	287						
3	189	96	43	50					
4	78	41	11	13	13				
5	52	20	7	7	9	9			
6	20	13	3	0	3	5	0		
7	5	3	0	0	2	0	0	0	
8	10	5	2	0	0	1	0	1	1
>8	12	5	0	1	1	0	1	1	3
Total	1034	564	353	71	28	15	1	2	4

From this table there were 668 patients who had two admissions, with at least one being for Bronchitis/Asthma. Of these patients, 381 (57%) were assigned a primary diagnosis of Bronchitis/Asthma for one of their two admissions, while the remaining 287 patients were assigned this diagnosis for both admissions.

A total of ten of these patients had eight separations during 2000-20001. Five of these ten patients were assigned a primary diagnosis of Bronchitis/Asthma for only one of their eight admissions, while one patient was assigned this diagnosis for each of their eight admissions. The maximum number of emergency multi-day separations for this group was 17.

2.5.6 Poisoning/toxic effect of drugs

There were 1,057 patients admitted on at least one emergency multi-day occasion for poisoning/toxic effect of drugs. Table 2.17 summarises the frequency with which patients who were admitted for Poisoning or Toxic Effect of Drugs on at least one admission, were readmitted to the same hospital during 2000-2001.

Table 2.17. Poisoning/toxic effect of drugs re-presentations 2000-2001

Multi-Day Seps	Number of Poisoning/Toxic Effect of Diagnoses per Patiient								
	At least 1	1	2	3	4	5	6	7	8
2	575	469	106						
3	231	164	41	26					
4	105	76	18	6	5				
5	55	34	10	8	2	1			
6	35	19	8	3	2	2	1		
7	26	16	6	3	0	0	1	0	
8	15	5	7	1	0	0	1	1	0
>8	15	4	4	2	2	0	0	0	3
Total	1057	787	200	49	11	3	3	1	3

From this data there were 575 patients admitted twice during 2000-2001 with at least one admission for Poisoning or Toxic Effect of Drugs. Most of these patients (469) were assigned to this diagnostic category on only one of their two admissions. The vast majority of these patients with eight episodes (i.e. 12 of 15 patients) were assigned this diagnosis for one or two of their eight admissions only. The maximum number of separations for this group was 12.

This data indicates that patients, who were readmitted to hospital with at least one episode for these high volume conditions, were frequently admitted for other conditions during the time frame of this analysis. It is not possible to determine the proportion of these readmissions that occurred for conditions related to the index condition. However, it is likely that many of these readmitted patients have multiple conditions that result in relatively frequent admission to hospital.

2.6 Other Cohorts of Patients

The analyses in this chapter have focused on age, diagnosis, utilisation of EDs (i.e. presentations and re-presentations) and emergency utilisation of hospital services. It is clearly recognised that there are other useful ways to group patients in order to understand the diverse drivers of emergency demand eg. social circumstances, support at home, ethnicity, language spoken, polypharmacy, medication compliance and medication side effects etc. Analyses of these cohorts were beyond the scope of the data available within the VEMD and VAED. However, further consideration should be given to future work that provides a broader understanding of patient cohorts amenable to HARP initiatives.

2.7 Ambulatory Care Sensitive Conditions

Ambulatory care involves providing treatment and care for patients in community settings rather than admitting people to acute hospitals for treatment. Generally ambulatory services rely on patients being more active in managing their conditions. The sharing of responsibility between patients and health services often also allows greater involvement of general practitioners.

Ambulatory Care Sensitive Conditions (ACSC) are those conditions for which hospitalisation is thought to be avoidable with the application of preventative care and early disease management, usually delivered in the ambulatory setting. The Public Health Branch of the Department of Human Services has produced a series of reports from the Ambulatory Care Sensitive Conditions (ACSC) Study that identify potential opportunities for interventions in ACSC's that will reduce demand on hospital services. These reports identify rates of hospital admissions for conditions that are thought to be avoidable through prevention and early disease management in the primary care service system. Admission rates are analysed down to Primary Care Partnership catchments and include rates of admission for conditions such as asthma, diabetes, cardiovascular diseases and COPD. These reports can be found at http://www.dhs.vic.gov.au/phd/0104072. It is also noted that a subsequent volume will be available later this year.

From the analysis of VAED and VEMD data undertaken in this section of the Background Paper, it is clear that many high volume conditions managed in Victorian acute hospitals have the potential to be managed as ACSCs.

3 Summary of Literature

The Victorian health care system is under considerable pressure demonstrated by increasing emergency presentations and admissions. This trend is not unique to Victoria and is being experienced in the United Kingdom, the United States, Canada, New Zealand and throughout Australia[8,9]. Many countries are grappling with how to better manage their health system aiming to provide appropriate health care services to meet the growing demand. This is occurring within an environment adopting evidence-based practice, focusing upon patient outcomes whilst providing cost effective care.

There is considerable innovation in health care occurring throughout the world and a stockpile of evidence is accumulating to guide the transition to evidence-based practice. However, whilst there is innovation occurring within the health care system best practice is not uniform and there is variation among hospitals and across geographic areas. A culture of sharing information, experience and learning is not widespread, so there is significant opportunity to improve patient management through more cooperation and dissemination of knowledge and expertise[9].

Many of the papers identified as relevant for this background paper describe models of care relating to management and policy interventions where much of the evidence provided has not been evaluated using randomised or comparative study designs, thus the body of evidence is not particularly robust and there are numerous gaps. The evidence available provides a starting point for fostering innovation in developing models of care.

In Victoria, through the Patient Management Task Force, two extensive literature reviews were commissioned (and completed in 2001) to identify interventions which were likely to be both clinically and cost effective and which had the potential to free up resources from the acute health care sector[8,10]. Whilst these reviews did not identify any practices or models of care that are unknown within the Victorian health care system, it was obvious that many effective strategies were not being used universally or consistently across the system[8]. This document has been guided by these two documents and further expanded by trawling literature and studies on high volume conditions that are amenable to preventive strategies. However, it is acknowledged that the paper does not contain a detailed or comprehensive review of all available data.

A summary of preventive initiatives identified as appropriate for HARP are listed in Table 3.1, including an indication of the supporting evidence available (as reported in the literature). It should be noted that a number of preventive initiatives have been excluded from this list as they are supported by alternative funding streams, for example, preadmission clinics and day of surgery admissions (DOSA). Also, some interventions, whilst supported by alternative funding streams, warrant further integration into the continuum of care using alternative approaches and therefore, may be considered suitable for HARP, for example, discharge planning.

Table 3.1. Preventive initiatives

Intervention	Supporting Evidence*
Disease Management - Hospital – Home support trials[11-15]	Some
Disease Management - Shared care for chronic diseases[11,16,17]	Some
Disease Management - Self-management education[11,18]	Good
Chronic disease self-management programs[19]	Good
Quality use of medicines[20,21]	N/A
Falls prevention[22,23]	Good
GP/Hospital Interface[16]	Some
Telephone triage[6,24-26]	Ambiguous
GPs in emergency departments[6,8,27]	Good
Resources in EDs (Supplementary staff, senior clinical staff, access to specialist/diagnostic services)[8,27]	Some
"Fast track" systems in EDs[8]	Some
ED Guidelines/protocols[27]	Good
Health promotion in EDs[5]	Good
Rapid response services[8,27]	Some
Special geriatric units for the acute medically ill[8,27]	Some
Comprehensive geriatric assessment[11]	Good
Care coordination/case management[8,28]	Some
Clinical practice guidelines/clinical pathways[29-31]	Some
Discharge planning[8]	Good

**Evidence levels reflect those that are reported in the reviewed literature. N/A indicates further exploration of the literature is required to evaluate evidence.*

A summary of the literature and studies identified as relevant to emergency demand and informing the HARP process is provided in Table 3.2.

Table 3.2 Summary of literature and studies relevant to emergency demand and informing the HARP process is provided in Table 3.2.

Topic	Author/Date	Location	Comments
Overview	Patient Management Task Force, DHS; 2001	Melbourne, Australia	A series of documents summarising the literature reviews commissioned and consultations undertaken by the Patient Management Task Force (DHS) when exploring the issues surrounding increasing demand for acute hospital services[9,32-35].
Overview	Anderson, J, Bernath, V, Davies, J et al.; 2001	Melbourne, Australia	Extensive literature review commissioned by the Patient Management Task Force re integrated bed and patient management[8]
Overview	Dwyer, J, Jackson, T; 2001	Melbourne, Australia	Extensive literature review commissioned by the Patient Management Task Force re integrated bed and patient management[10]
Overview	The Centre for Health Economics Research and Evaluation (CHERE); 2001.	Australia	A government report providing information that will assist decision-making regarding the provision of public health services in Victoria (yet to be released). In particular, an important objective is to identify strategies that, when implemented, will improve public health and reduce demand on acute health care services in the future[6].
Overview	Australian Resource Centre for Hospital Innovations (ARCHI), Website	Australia	ARCHI promotes the dissemination of information and resources related to innovative health care delivery both in hospitals and across the community. Originally established and funded by the Commonwealth Department of Health & Aged Care as a clearing house for the National Demonstration Hospitals Program (NDHP), ARCHI includes a searchable database covering many topics related to integrated bed and patient management. (www.archi.net.au)
Disease management	Institute for Public Health and Health Services Research, MMC; 2000	Melbourne, Australia	Literature Review of evidence to support models of disease management for various chronic conditions[11].
Disease management – congestive heart failure	McAlister FA, Lawson FM, Teo KK, et al.; 2001	Canada	A systematic review conducted to determine whether disease management programs improve outcomes for patients with heart failure[14].
Disease management – diabetes care	Renders, CM, Valk, GD, Griffin, S et al.; 2001	Dutch	A Cochrane Collaboration systematic review and meta-analysis re interventions to improve the management of diabetes mellitus in primary care, outpatient and community settings[17].
Disease management – asthma care	Fay, J, Jones, A, Ram, F; 2002.	United Kingdom	A Cochrane Collaboration systematic review to determine the effectiveness of organised asthma care via primary care based asthma clinics[18].
Falls prevention	Gillespie, LD, Gillespie, WJ, Robertson, MC, et al.; 2002	New Zealand	A Cochrane Collaboration systematic review assessing the effects of interventions designed to reduce the incidence of falls in elderly people (living in the community, or in institutional or hospital care)[4].
GP integration	Powell Davies, G, Betbeder-Matibet, L, Nicholls, A et al.; 1996	Sydney Australia	An overview of the literature relating to integration between general practice and the broader health system in Australia[1]. (Centre for General Practice Integration Studies www.commed.unsw.edu.au/cgpis)
GP/hospital integration	Reynolds, F; 2001	Australia	A literature review providing an overview of programs to assist with GP/hospital integration (yet to be released)[16]
ED attendance	New Zealand Health Technology Assessment; 1998	New Zealand	A critical appraisal of literature regarding emergency department attendance[3]
ED attendance	Harris, M, Daffurn, K, Saunders, C, Westwood, B, et al.; 2001	Sydney Australia	This study (retrospective chart review) was undertaken to patients who present most frequently to Liverpool Hospital ED. Mental health clients were the most frequent attendees, a review of medical literature was conducted to identify appropriate evidence-based strategies to adequately support and reduce the likelihood of clients presenting to the ED on multiple occasions[36].

Table 3.2 Summary of literature and studies relevant to emergency demand (continued)

Topic	Author/Date	Location	Comments
Telephone triage	Price, A, McKay, B; 2000	Australia	A literature review of the potential application of telephone health advice lines using call centre technology in managing demand for healthcare services in Australia[37].
Health promotion in EDs	Bensberg, M; 2000	Melbourne, Australia	A report describing the development of the Health Promoting Emergency Departments Program, including an extensive literature review[5].
Inpatient initiatives	New Zealand Health Technology Assessment; 1998	New Zealand	A critical appraisal of literature exploring issues surrounding the increasing acute medical admissions to public hospitals in New Zealand and interventions to reduce acute medical admission rates[27].
Inpatient initiatives – process redesign	Nosworthy, J, Campbell, D, Byrnes, G et al.; 2001.	Melbourne, Australia	A descriptive/cohort study examining and describing the features of medical inpatients, including factors effecting LOS such as psychological determinants, and the work undertaken by specialist and general medical units to identify opportunities for improving performance within the acute sector[38]. (www.dhs.vic.gov.au/ahs/edcg)
Case management	Zwarenstein, M, Stephenson, B, Johnston, L; 2002	South Africa	A Cochrane Collaboration systematic review regarding case management and the effects on professional practice and health care outcomes[28].
Discharge planning	Health Services Research Unit, Department of Epidemiology and Preventative Medicine, Faculty of Medicine, Monash University; 2000	Melbourne, Australia	A government report based upon an extensive literature search, this report details the components of effective discharge and potential performance indicators[39]
Sub-acute interface	Quality and Care Continuity Branch, Acute Health Division, DHS; 2001	Melbourne, Australia	A government report exploring the boundaries and relationships between the acute and sub-acute service systems including identification of efficient and effective service models and practices and strategies to improve management of current and future service demand.

4 Preventive Initiatives

This section provides both a definition and an overview of the various preventive initiatives and models of care with the aim of standardising the terminology used and highlighting the level of supportive evidence.

4.1 Patient Management in the Community

The primary care health sector provides a diverse range of services, which people generally use as a first point of contact when they are sick, injured or having difficulty coping with life's circumstances[40]. The core agencies within the primary care sector include:

- Community health;
- Primary care services funded and delivered by local government;
- Home and Community Care (HACC); including district nursing;
- General practice;
- Psychiatric disability support;
- Psychogeriatric assessment and treatment teams;
- Aged care assessment;
- Women's health;
- Aboriginal community controlled health services;
- Sexual assault;
- Dental health;
- Community drug treatment services;
- Local ethno-specific health services[41].

These agencies aim to improve people's health and well being and maintain them within the community thus reducing preventable use of hospital, medical and residential services through the early identification of people's needs and by coordinating care for people with complex or chronic conditions[41].

Primary care services are a critical part of an effective health care system and are the most frequently utilised health services. Each year approximately 85% of Victorians access at least one of these services. Referral from primary care services impacts directly on hospital demand, as does the capacity of the primary care sector to provide timely and appropriate responses to consumer needs.

The interface between primary care and acute care services requires particular attention. Several studies have identified that poor coordination of services across this interface contributes significantly to adverse events, preventable readmissions and poor consumer outcomes. The evidence base for effective interventions across this interface is relatively poorly developed and often anecdotal. Consequently, the development and evaluation of innovative models need to occur.

However, the evidence that does exist (such as that outlined in the care coodination/case management section of this paper) indicates that well coordinated access to a range of services across the acute/primary care interface, is critical to the effective care management of consumers. This applies particularly to those who are frail aged, those with chronic and complex conditions and those from lower socio economic groups who have the poorest health status and who are over represented in service utilisation data including utilisation of public acute hospitals. Key issues in provision of care to these groups are general practice coordinated care; effective referral systems and practice; access to allied health services and access to step-down rehabilitation and palliative care services.

As with all sectors of the health care system, the primary care sector is experiencing growth in demand for services. Recently within Victoria, the Primary Care Partnership (PCP) Strategy was introduced. Primary Care Partnerships are voluntary alliances of primary care providers usually covering two or three local government areas, which aim to improve the health and well being of their catchment's population by better coordination of planning and service delivery response to identified needs, including increasing health promotion, illness prevention and disease management[41].

Primary Care Partnerships provide a structure to build upon collaboration undertaken to date by local government, providers, consumers, carers and other key stakeholders[41]. The Partnerships are working towards developing and implementing local service models. The development of strategic links between PCPs and the acute hospital system is integral to providing a comprehensive health system that is responsive to the community's needs. The Primary Care Partnerships have similar goals and are well placed to work with acute hospitals in developing initiatives amenable to HARP.

Primary Care Partnerships and acute hospitals should take account of the range of other complementary activities that are currently being developed by Commonwealth and State Governments, for example, Coordinated Care Trials (CCT). Many of these initiatives aim to achieve improved service response for consumers with chronic and complex care needs, and ultimately improved health outcomes.[42] Currently, the Victorian Healthcare Association is undertaking a project to identify and document business cases for collaboration between community health services and acute services in key treatment areas. This project will be completed in March 2002 and will identify:

- Models where services can be provided by community health to address HARP priorities;
- The potential role of PCPs in facilitating improved service coordination between sectors and the leadership role for community health in this; and
- Models where the Primary Health and Population Advisory Committees established by hospitals have been effective in facilitating collaboration.

4.1.1 Coordinated Care Trials

The Australian Coordinated Care Trials sought to determine whether coordinating care for people with chronic illness and complex care needs could improve their health outcomes within existing budgets and within a context of pooling of funds by both Commonwealth and State/Territory governments[43]. The learnings from these trials are relevant to informing the development of models of care aimed at reducing demand pressures.

The Southern Health Care Network Coordinated Care Trial (SHCN CCT) model consisted of the development, of a client care plan that was subsequently implemented, monitored and reviewed. The care coordination function was undertaken either by a GP alone or in association with a service coordinator/case manager. The intention was to better marshal services and to better meet client needs while, at the same time, reducing unnecessary service use (including hospital admissions) or replacing it with lower cost options[44]. Key components of the model included defining the eligible population, fund pooling arrangements and the basis of access to services[43].

The evaluation of the SHCN CCT concluded the primary hypothesis of the Trial was not supported i.e. did not result in improved individual client health and well being within existing resources[44]. However, many of the objectives of coordinated care were achieved including implementation of care plans with GPs in the role of care coordinators, enhanced access to services and a positive impact upon well being due to improved liaison and coordination of services[43].

The evaluation identified a number of attributes that are central to the development and implementation of effective care coordination between health services, including:

- Strong leadership, with a clearly articulated vision;
- A management structure that allows the key participants to contribute to the decision making process;
- Skilled staff who understand the coordinated care model and for a Trial, the principles of evidenced based research;
- A primary focus on enhanced care and client outcomes, rather than cost i.e. if the model is valid the improved care will result in a better financial outcome;
- An adequate time frame for the Trial to be able to test the research principles, preferably at least a 5 years; and
- An adequate planning timeframe, preferably of at least 12 to 18 months[43].

4.1.2 Disease management

Integrated disease management focuses on systematised evidence-based practice and better coordinated care for those with chronic illness. It is believed to result in better outcomes and a better quality of life for people with chronic illness and has the potential to reduce the burden of disease and achieve reductions in hospitalisations.

Participants in disease management programs typically suffer from disorders that are chronic and costly, yet controllable; the foremost characteristics of diseases targeted by disease management programs include the following:

- Exhibit chronic or recurring symptoms;
- Incur conspicuously expensive costs;
- Involve large patient populations;
- Occur in frequent but avoidable acute episodes of care; and
- Provide opportunity to control costs, patient compliance, and outcomes[45].

The most typical conditions addressed by disease management programs include asthma, diabetes, COPD and CHF. Building on the pre-existing infrastructure used to manage these conditions, disease management programs may be expanded to include a wider array of conditions. Examples of conditions that may be suited to disease management programs include:

- Alzheimer's disease
- Arthritis
- Back pain
- Coronary artery disease
- Depression/anxiety
- End stage renal disease
- Headache/migraine
- Haemophilia
- HIV/AIDS
- Hypertension
- Multiple sclerosis
- Organ transplant
- Osteoporosis
- Senior care[45]

A review conducted on behalf of the Aged, Community and Mental Health sector of DHS identified a number of multi-component, multidisciplinary interventions and models of care, which have resulted in improvements in the processes and outcomes of chronic disease management[11].

The majority of trials were designed and implemented by specialist hospital staff using one of the following models:

1 Non-medical health professionals, usually specialist nursing staff, to implement individual care plans, as well as to support, co-ordinate, monitor, and liaise with the primary health sector.

2 Specialists working with GPs in shared care arrangements, with specialists providing recommendations for care, support for GPs and limited consultations with patients[11].

The key success factors identified as important to effective disease management programs included:

- Use of explicit plans and protocols;
- Reorganisation of practice systems and provider roles;
- Systematic attention to the information and behavioural needs of patients;
- Ready access to necessary expertise;
- Improved self-management support;
- Extended periods of follow-up;
- Control over implementation of individual care plans; and
- Supportive information systems[11].

4.1.2.1 Hospital-home support trials

Hospital-home support programs focus on supporting the hospitalised elderly and/or chronically ill at the time of hospital discharge and on return to home, with the aim of keeping patients at home and decreasing hospital readmission and nursing home admission. These programs combine structured discharge planning and individual care plans with home visits which may assist the person at risk of failing to manage at home, but readmissions may not be preventable where decline in function or disease progression or relapse are unavoidable or where a new diagnosis develops[11].

The evidence suggests this model of care can prevent significant numbers of hospital readmissions, often with reduced length of stay, and can also reduce the use of institutional care and increase the time elderly patients spend at home. These benefits occurred in groups at high risk of readmission, as well as in general populations of frail elderly without increasing the use of community support services. This model can result in significant cost savings to the health care system[11].

4.1.2.1.1 Chronic obstructive pulmonary disease

A Cochrane Review regarding home support for COPD patients concluded patients with moderate COPD may have some mortality and health related quality of life gains from a nursing outreach program, but there are no data about reductions in hospital utilisation. Patients with severe COPD do not appear to have any benefit from such programs and one large study found no reduction in hospital admissions in such patients. Additionally, outreach care programs appear to be resource intensive and therefore may not be of great economic benefit[12].

A trial conducted under the National Demonstrations Hospitals Program (NDHP) identified the additional establishment and running costs of a dedicated hospital-based outreach team was a weakness in previously conducted trials of home-based support for COPD patients. Consequently, they conducted a trial of an integrated model of care using existing community services[13.]

The intervention group, patients managed at home with outreach services, experienced an improvement in their quality of life. However, there was no reduction in the hospital utilisation, i.e. there was no change in length of stay. Additionally, the control group, those managed in hospital, was less likely to require re-admission within 28 days, although the numbers were too small to approach statistical significance. Due to the high incidence of pre-existing complications, co-morbidities or home situation in this clinical group, the study was only able to recruit 15% of eligible patients presenting for admission to the two institutions. There was also significant anxiety by the hospital medical staff regarding the management of potentially unstable patients at home[13]. The authors concluded the global management of acute COPD patients at home using this model was inappropriate[13].

4.1.2.1.2 Congestive heart failure

McAlister et al conducted a systematic review to determine whether disease management programs improve outcomes for patients with heart failure[14]. Their findings indicated programs involving multidisciplinary teams, an emphasis on patient education and self-management and enhanced access to specialized clinics or home visits were cost saving and reduced the risk of hospitalisation in patients with heart failure[14]. However, the data on mortality and quality of life were not yet conclusive[14].

Jerant, Azari, and Nesbitt note that home nurse visits to CHF patients who have been discharged from hospital following an acute exacerbation can reduce re-admissions; however, these authors expressed concerns regarding the high cost of this type of intervention[15]. They conducted a randomised controlled trial to evaluate three hospital discharge models, utilising distance technologies, for reducing CHF related readmissions. The three models were:

1 Home telecare delivered via 2-way video-conference device with an integrated electronic stethoscope;

2 Nurse telephone calls; and

3 Usual outpatient care[15].

Jerant and colleagues found home nursing care using either telephone or video-based home telecare resulted in a statistically non-significant but a clinically promising trend toward lower readmission rates and emergency presentations for CHF patients. The video-based home telecare was found to be no more effective than telephone follow-up, perhaps because CHF home care may not be reliant on a "visual" approach[15]. These findings, whilst based on a small sample size, suggest the need to weigh up the advantages of providing CHF home follow up by either home visits or telephone (which may be a less costly intervention than home visits).

4.1.2.2 Shared care for chronic diseases

Shared care programs are based upon the collaboration between GPs and specialist physicians working together to enhance best practice management of people with chronic conditions and preventing acute exacerbations. Examples of people who would fit within the shared care "prevention" category are people with diabetes, cardiovascular disease, asthma, COPD, mental health issues and drug and alcohol issues[16].

- The key success factors of shared care programs include:
- Patient cooperation or shared care cards
- Initial and continuing GP education
- Written treatment and management protocols
- Efficient patient record and recall system
- Protected GP time to perform necessary duties
- Effective communication
- Appointment of a liaison officer[16].

4.1.2.2.1 Diabetic care in general practice

Diabetes mellitus is a major and growing health problem that is increasingly managed in primary care. Achieving good glycaemic control is important in reducing the occurrence of retinopathy, nephropathy and neuropathy. Attention to cardiovascular risk factors, which lead to heart disease and stroke, is also an important aspect of diabetes management. Even so, empirical data suggest that care for diabetic patients in primary care, outpatient and community settings could be improved[17].

A systematic review conducted by the Cochrane Collaboration of patients with diabetes in primary care, outpatient and community settings concluded there is a large number of multi-faceted models of care being tested for diabetes management[17]. The models of care reviewed incorporated interventions including professional and organisational interventions such as postgraduate education, reminders, audit and feedback processes, peer review, patient tracking systems, revision of professional roles and telecommunication systems. The authors concluded that multi-faceted professional interventions can enhance the performance of health professionals in managing patients with diabetes and organisational interventions that improve regular prompted recall and review of patients can improve diabetes management[17]. Also, the addition of patient orientated interventions can lead to improved patient health outcomes, for example, nurse led patient education and reinforcement of the treatment regime[17]. However, many models evaluated in this review used a combination of interventions making it difficult to differentiate which interventions were most effective. Additionally, many of the studies reviewed failed to evaluate patient outcomes and the cost effectiveness of interventions[17].

Another review conducted by the Cochrane Collaboration compared general practice, hospital outpatient management or a combination of the two and surveillance of people with diabetes. The review cautiously suggested that prompted general practice care of people with uncomplicated diabetes can be as good or better than hospital outpatient care, at least in the short term[11].

The concept of shared diabetes care is further supported by a trial evaluating a shared care program between a “diabetes service” and GPs in Amsterdam, which demonstrated significantly improved metabolic control in the majority of intervention patients. GPs in this trial reported increased enthusiasm for diabetic care[11].

4.1.2.3 Mental illness care

Mental health problems are common in the primary health area, with a documented prevalence of at least 25%. Most of these patients are not in contact with secondary services; hence GPs are in a unique position to intervene. It has been recognised, however, that as much as half of the mental health morbidity in primary care is undetected by GPs. When mental health conditions are detected by GPs, they are treated in primary care settings and only a minority are referred to specialist services[11].

Data analysis conducted by the DHS (2000-2001) revealed that an average of 45 cases per day with a primary diagnosis of mental health or self harm present to the EDs of the 13 major public hospitals in Melbourne. This accounted for 3.4% of all ED presentations in 2000-2001. More than 40% of all mental health related presentations have a primary diagnosis of unspecified anxiety (16.3%) or depressive disorder (13.3%), or a mental health disorder due to acute alcohol intoxication (11.3%)[46].

Various service models have been implemented to meet mental health needs, including the provision of mental health services in the primary care setting. The development of community mental health teams is well developed, although varies across juridictions47. However, the effectiveness of these models has been poorly evaluated, and there have been calls for careful evaluations of such models in order to confirm their suspected value on both clinical and cost-effectiveness grounds, as well as their effects on GPs[11].

4.1.2.4 Self management education

Patient education empowers the consumer to take control of their health, and educates them on how to use the healthcare system wisely[37]. The evidence about whether patient education reduces the need for people to attend hospital is mixed and appears to be dependent on the clinical area and the type of intervention. A literature review conducted by the Centre for Health Economics Research and Evaluation found evidence on the effects of patient education in the areas of asthma (for both children and adults), diabetes, COPD, CHF and surgical patients[6]. In a number of instances patient education programs aimed to provide more appropriate care in the appropriate setting as well as inform patients about possible self-management techniques and general information about the disease so that patients felt more confident about their own self-care and health care choices. However, no direct research was found that links the cost of chronic diseases and effectiveness of patient education[6].

4.1.2.4.1 Asthma

Asthma is a common chronic condition affecting both adults and children and is the most common chronic disease of childhood. The quality of asthma care is variable with evidence of poor quality treatment in both hospitals and general practice. Improvements in treatment and organization of asthma care could potentially have major impacts on hospitalisation, emergency visits and absenteeism from work and school[11].

Training programs in asthma self-management that involve a written action plan, self monitoring and regular medical review have been shown to be effective in reducing hospitalisations and ED visits, unscheduled doctor visits due to asthma, days lost from work due to asthma, and episodes of nocturnal asthma. Further research is required to define the duration of benefit offered by such programs, whether maintenance programs are required to maintain the benefit and what form such maintenance programs should take[11].

A systematic review conducted by the Cochrane Collaboration reports the proliferation of primary care based asthma clinics throughout the United Kingdom[18]. These clinics are generally nurse led, doctor supported and focus upon supporting self-management through regular review and education regarding medication and treatment regimes. Whilst self-management and regular review have demonstrated favourable outcomes for asthma patients, there are concerns that these results are not generalisable to all patients, as participants of self-management programs may be an interested minority[18].

The systematic review aimed to determine the effectiveness of organised asthma care via primary care based asthma clinics, however only one trial met the criteria for inclusion in the review. In this Australian based trial, the intervention involved an asthma clinic session conducted by asthma educators (registered nurses) covering topics such as asthma education and management, written asthma management plans, spirometry and instructions on use of peak flow meters and inhalers, and an asthma diary card. All sessions ended with a consultation by a general practitioner. The evidence from this trial indicated there is benefit for primary care based asthma clinics in terms of asthma control manifested by less nocturnal waking. Further trials were recommended to contribute to the evidence base regarding the effectiveness of primary care based asthma clinics[18].

4.1.2.4.2 Chronic Disease Self Management Programs

Alternatives to self management programs that concentrate upon improving people's ability to adhere to their treatment regime are "Expert Patient Programs" or Chronic Disease Self Management Programs (CDSMP). CDSMP are user-led and move beyond the medical view, often using a patient's perception as a starting point. They look at how the illness impacts upon daily life and the ways in which people can take greater control over their condition on a day-to-day basis[48].

User led self management programs have been developed and evaluated in the areas of rheumatology, asthma, diabetes, HIV/AIDS and other chronic illnesses[48]. There is a growing body of evidence to show self-management approaches can provide important benefits including improved skills for self-management and better disease outcomes[48]. The five core self-management skills in the CDSMP are: problem solving; decision-making; resource utilisation; formation of a patient-professional partnership and taking action[48]. These five skills in combination provide the individual with the confidence and belief that they can take control over their life despite their disease[48].

Lorig et al's evaluation of a community-based, peer-led program over a two year period found reduced health distress, fewer outpatient visits and a reduction in length of in hospital stays for participants. Participants did not show deterioration in their health state that would otherwise be expected over the timeframe and despite worsening physical disability, participants maintained all other aspects of their health status[19]. Lorig et al concluded that CDSMP are low cost and can improve elements of health status while reducing health care costs in populations with diverse chronic diseases.

4.1.3 Quality use of medicines

Drug related hospital admissions are a significant and expensive public health problem in Australia, and approximately half are considered possibly or probably preventable[20]. Roughead et al (1998) conducted a systematic review to establish the extent of drug related hospital admissions. Drug related hospital admissions were defined as those patients who had a medical condition:

- that required drug therapy (a drug indication), but the patient was not receiving a drug for that indication;
- for which the wrong drug was being taken;
- for which too little of the correct drug was being taken;
- for which too much of the correct drug was being taken;
- resulting from an adverse drug reaction;
- resulting from a drug-drug, drug-food, drug-laboratory interaction;
- that was the result of not receiving the prescribed drug; or
- that was the result of taking a drug for which there was no valid medical indication[20].

The authors of this review identified the risk factors for drug related hospital admissions as being increasing age - with over 50% of incidents involving patients over the age of 65 years, and an increasing number of medications (i.e. patients who had drug related admissions were taking an average of four to five medications)[20]. The medications commonly implicated in drug related admissions were cytotoxics, non-steroidal anti-inflammatory drugs or aspirin, cardiovascular and antihypertensive agents, anticoagulants, central nervous system depressants and corticosteroids[20]. The common diagnoses associated with these incidents were: gastrointestinal bleeds, cytotoxic-induced immunosuppression, heart failure, asthma, falls, angina, diabetes, haemorrhage, arrhythmias and seizures. The average length of stay for adult patients admitted with drug related causes ranged from seven to ten days.

Roughead et al (1998) noted studies included in their systematic review provided a reliable estimate of the prevalence of drug related hospital admissions, with the incidence being approximately 2.4% of all Australian public hospital admissions. Therefore, the incidence of drug-related hospital admissions has a significant impact upon hospitals, whilst compromising the health and well being of patients[20]. Additionally, this data reflects only drug related hospital admissions and does not take into account drug related morbidity in the community i.e. those people who experience a drug related incident but do not require hospitalisation. Furthermore, the studies reviewed by Roughead et al (1998) suggest that many drug related hospital admissions were preventable.

Roughead et al's (1998) study provides insight into the incidence of drug related hospital admissions. However, studies reviewed did not explore factors contributing to such incidents or the proportion that may be preventable for specific conditions. Therefore, further studies were recommended to explore causal factors and the potential for prevention of such incidents[20].

The Pharmaceutical Health and Rational use of Medicines Committee (PHARM) conducted a series of consultations with consumers to identify the problems and possible solutions for those managing multiple medications 21. PHARM identified that consumers rarely set out deliberately to misuse their medications, but rather compromise the quality use of medication by making reasoned decisions in the absence of adequate knowledge[21]. There are a number of factors affecting consumers' decisions regarding their medication management including:

- Their own attitudes or lack of understanding;
- Difficulties accessing important information regarding their medications;
- Inadequate communication between consumers and doctors, and consumers and pharmacists;
- Difficulties managing complex regimes of multiple medicines and obtaining help to overcome or compensate for those difficulties; and
- Systemic issues that can contribute to poor quality use of medicines including:
    - Lack of appreciation of consumer perspectives on medicine use;
    - Poor communication and co-ordination between the different sections of the health system and between different health professionals;
    - The existence of different brands of the same medicine;
    - Inadequate labelling;
    - An over-reliance on medicines when other forms of therapy may be more appropriate[21].

Through these consultations a number of strategies were identified that may minimise the issues experienced by consumers when managing medication regimes, with many being appropriate for HARP initiatives including:

- The introduction of a full medicine record held voluntarily by the consumer in the form of a printout, a smart card or an electronic record to assist in emergency situations and promote better continuity of care between GPs, specialists and hospitals;
- Encouraging regular medicine reviews that provide an opportunity for more thorough discussion between consumers, carers, and service providers about medicines and their management;
- Better access to information regarding medications eg. telephone medicine information service, encouraging consumers to make better use of pharmacists' knowledge and education strategies to encourage consumers to ask questions and equip them with the right questions to ask of health professionals re medications[21].

Identification of the existence of evidence regarding how amenable these strategies were for preventing emergency presentations and hospital admissions was not possible within the timeframe of writing this Background Paper and is an area that requires further exploration, particularly the role of pharmacists within EDs and the community.

4.1.4 Falls prevention

Falls in older people are a major public health concern in terms of morbidity and the cost to health and social services[22]. There is a large body of evidence related to the incidence of falls and interventions to minimize falls. The proportion of people sustaining at least one fall over a one-year period varies from 28-35% in the ≥ 65-year age group to 32-42% in the ≥ 75-year age group[4]. A person who has experienced one fall has a two-thirds chance of falling in the subsequent year, and over half of residents in institutional care experience at least one fall per year; about half of those who fall do so repeatedly[22].

In those who fall, approximately 65% of women and 44% of men fall inside their home and about 25% of men and 11% of women fall in their garden. In the home, most falls occur in the most frequently used rooms-bedrooms, kitchen and dining room. People aged <75 years are more likely to fall outdoors than those aged 75 years and over, and indoor falls are associated with compromised health status in more active people. Most falls in the community occur during the day with only 20% occurring during the night. Colder days and the winter season increase the rate of falls in women and the incidence of fractures[22].

Over 400 potential risk factors for falling have been identified; these can be grouped into five categories:

- Environmental (eg loose carpets, bathtubs without rails, poor lighting, unsafe stairs, ill-fitting shoes);
- Medication (eg antidepressants, sedatives and hypnotics);
- Medical conditions and changes associated with ageing (eg poor vision, cognitive impairment);
- Nutritional (eg calcium and vitamin D deficiency); and
- Lack of exercise[22].

Approximately 40-60% of falls lead to injuries, with 30-50% being minor injuries, 5-6% major injuries excluding fractures and 5% being fractures. Up to 1% of falls in older people are said to result in a hip fracture which has a significant morbidity, mortality and cost to health services[22].

Most falls result from a dynamic interaction between intrinsic and extrinsic factors. Therefore, interventions involving a multidisciplinary approach incorporating medical, functional and environmental assessment are most likely to be effective. At present it is unclear as to who is most likely to benefit from intervention or indeed which intervention strategy is most beneficial and cost effective[23].

A significant number of studies have been undertaken to evaluate intervention strategies to reduce the risk of falling, with many achieving a reduction in the number of falls for the participants, including a reduction in the number of hospitalisations and bed days occupied. Successful interventions and outcomes include:

- Modifying and reducing risk factors through review of medications, balance and gait training and improvement in functional skills demonstrated a reduction in the number of hospitalisations and bed days occupied;
- Structured medical and occupational therapy assessment with referral to existing services produced significant and sustained reduction in number of falls and recurrent falls whilst also preserving level of function;
- A psychotropic withdrawal program and a home based exercise program resulted in reduction of falls, however, demonstrated individuals require ongoing support to remain off psychotropic medications;
- Exercise to improve gait, balance and strength leads to reduction in the risk of recurrent falls; and
- Occupational therapy home assessment and help with modifications resulted in a significant reduction in the number of falls[23].

Areas identified as requiring further exploration as to their impact upon reducing the incidence of falls include:

- Population based screening
- Role of interventions to prevent falls in the institutional setting
- Preventive strategies for those with dementia
- Prevention and treatment of osteoporosis
- Evaluation of hip protectors[23].

4.1.5 The GP/hospital interface

In Australia, approximately 86% of the population sees a GP at least once per year, making GPs the most frequent point of first contact with the health care system[1]. General practice offers patients continuity of care both with the same practitioner and in linking care between different services, often acting in a gatekeeper role eg referring on to other services if appropriate[1]. GPs are often seen as the care coordinator of patients' healthcare. However, they experience difficulties with integration with other areas of the health system, such as acute hospitals, due to issues of communication and fee-for-service payment, which has not, until recently, rewarded GP involvement in case conferences, hospital visits, telephone consultations and communication with other workers[1].

The establishment of the Divisions of General Practice has facilitated greater involvement of GPs in cooperative activities and projects to improve integration[1,16]. Additionally, the introduction of new benefit items to the Medical Benefits Schedule, the Enhanced Primary Care Package, for care and discharge planning, case conferencing etc have provided an avenue for GPs to be reimbursed for these coordinating activities.

There are many potential advantages to improving the GP/acute hospital interface, including:

- Increased continuity of care
    - Collaborative clinical care with tertiary colleagues
    - GPs more informed about patients medical history
    - Facilitated post discharge care
    - Prevention of professional isolation
- Increased communication
    - Enhanced patient involvement in their health care
    - Improved patient confidence in their GP
- Efficient use of resources
    - Reduction in the duplication of services
    - Reduction in prolonged inpatient stays
    - Reduced financial costs of patient
    - Reduced unnecessary admissions
- Opportunities for education for both GPs and hospital based staff[1].

Initiatives that have been implemented to promote greater integration of GPs with hospital services include:

- Building working partnerships
    - Memorandums of understanding (written documentation of agreed roles)
    - Joint education/up skilling programs
    - GP participation in ward rounds
    - GP Division representation on key hospital committees
    - GP liaison positions[1,16,49]
- Prevention of acute care
    - Shared care of people with chronic illnesses (see Disease Management section)
    - Case management as a component of preventive care has been shown to be useful in increasing compliance with treatment regimes.[1,16]
- Shifting care
    - After hours care, GP involvement in EDs eg: establishment of co-located primary care clinics
    - GP involvement in ambulatory care programs eg: hospital in the home, early discharge programs

- Managing transitions of care
  - Discharge planning and communication
  - GP/hospital communication including: referral processes; discharge planning; discharge communication; and guidelines and protocols[1].

These initiatives have been reported in two literature reviews regarding GP/hospital integration conducted in 1996 and 2001 and whilst there appears to be numerous studies, reviews and evaluations of programs that have relevance to the GP/hospital interface there is not a substantial body of evidence either for or against many of these initiatives[1,16]. However, anecdotally, these initiatives are reported to have benefits for all stakeholders in the system including consumers, carers, GPs and hospitals. Therefore, it is prudent to promote these initiatives with the aim of contributing to a body of evidence that will indicate the efficacy of such initiatives.

4.2 Patient Management in the Emergency Department

The ED provides access to the acute hospital for emergency treatment and admissions. As emergency demand increases, there is considerable attention given to EDs regarding their appropriate use, internal processes and interaction between primary care providers and the inpatient areas[3,8].

Whilst there is much debate regarding the "appropriate" use of EDs, this is a contentious issue reflecting inconsistent assumptions and methodological difficulties with studies conducted to evaluate the extent of "inappropriate" presentations[8]. Additionally, the notion of "inappropriate" will vary depending upon whose perspective is being considered. It is generally accepted that appropriate ED use is related to the urgent need for medical attention. However urgency is open to interpretation as what is considered urgent by a medical practitioner and a patient may be quite disparate, particularly, in the presence of acute pain and limited medical knowledge[3]. Therefore, it is important to have systems in place such as triage that channel patients to the appropriate location, for the appropriate treatment in a timely fashion[3].

When considering strategies to prevent and manage emergency demand it is important to consider patient management processes and models of care that improve access to treatment and care through avoiding unnecessary presentations, for example, by offering more attractive care alternatives[32]. These alternatives need to provide satisfactory service to patients, whilst enabling patients to appropriately manage their own minor health problems thus reducing demand over the long term[3]. The implementation of single interventions are unlikely to be successful whereas those that involve multiple strategies that include the patient, physician and system changes are more likely to be successful[3].

There are a range of ED initiatives that may assist with better managing demand and smoothing the flow of patients through the ED including:

- Risk-screening tools commencing within ED to identify those patients who will require coordinated management;
- Specialised staff within the ED such as pharmacists, gerontology and psychiatric nurses;
- Separate areas within the ED to manage specific patient groups eg: short stay observation units (SOUs), psychiatric, elderly or paediatric patients;
- GP clinics next, or near to EDs;
- Surgical and medical ward rounds within EDs to reduce the time spent by patients waiting for review; and
- Optimal staffing levels within EDs with careful rostering of consultant staff (including extended consultant hours)[32].

A range of initiatives relevant to EDs will be described in more detail in the following subsections.

4.2.1 Telephone triage

Triage is a formal process of immediate assessment, predominantly by a nurse, of all patients who present seeking emergency care. Triage assessment findings are then used to prioritise or classify patients on the basis of illness or injury severity and need for medical and nursing care. The decisions made by a triage nurse are a pivotal factor in the initiation of emergency care. Therefore the accuracy of triage decisions is a major influence on the health outcomes of patients[50]. Triage has been suggested to be able to identify a group of non-urgent patients who can be referred elsewhere for care, however, studies have shown conflicting results with only some concluding triage can successfully reduce ED attendance[3]. Additionally, ethical concerns remain about sending away patients who have presented to an ED for medical care[3].

The provision of healthcare information or an assessment of a presenting problem via the telephone is increasingly being used in the provision of healthcare both in Australia and internationally, in a variety of ways:

- Telephone consultations (doctor-patient communication), eg in the home reducing the need for transportation[6,37];
- Telemedicine/telehealth (doctor-doctor communication), eg transmission of medical images for evaluation by specialists over long distances or sharing of medical information between research clinicians who are geographically disparate[6,37];
- Health service advice and helplines, eg Lifeline[6];
- Ambulance priority dispatch systems[6], eg Metropolitan Ambulance Service has developed a proposal to refine its existing call taking protocols to identify patients who may be suitable for referral to another service (eg locum doctor, or nursing service). After initial triaging, further structured questioning would be used to identify a suitable service for referral, potentially avoiding an ambulance dispatch and transport to an ED; and
- Telephone triage systems, which may be supported by telephone based decision support systems[6,37].

It has been reported the provision of telephone advice by EDs is common practice in Australia, occurring on an ad hoc basis by staff with relatively little training in the provision of telephone advice[37]. Price (2000) reports findings of a study conducted by Fatovitch and Jacob (1998) citing phone calls for the provision of advice contribute to an additional 28% of business for EDs[37]. These authors concluded there is a strong argument for the implementation of formal telephone triage systems, particularly if used in combination with "decision support systems" and staff training[37].

Decision support systems enable healthcare workers to assist a patient in identifying the most appropriate care required. These systems can be structured in a variety of ways with regard to logic and clinical approach. The goal of decision support systems is to produce minimum variability in the consistency and quality of outcome for the patient, particularly when high volumes of calls are being taken[37].

The potential benefits of the implementation of telephone triage include:

- Increased access to after hours medical care by facilitating appropriate use;
- Reduced pressure on public hospital EDs when used in combination with the establishment of co-located GP clinics i.e. reduces the need for "double attendance" by diverting the patient to the GP clinic before presenting to the ED;
- Increased access to GPs in rural Australia, by assisting people in their decision whether to attend a GP or hospital located some distance away;
- More appropriate use of medical services; and
- Improved self-management of health through the provision of timely information and appropriate use of medical services[37].

The interest in telemedicine including telephone triage is gathering momentum with the belief that this type of technology may prevent inappropriate emergency presentations or transfers between hospitals. However, literature reviews conducted to date have found no conclusive evidence of telemedicine's ability to reduce hospitalisations[3,6]. Additionally, many of the strategies for improving health services or access to services usually involve other significant changes apart from the use of telephones. For example, telephone health advice lines or triage often also involve a change in the type of staff contacted (at least initially), and may be assisted by computerised decision support systems. For these reasons, the effects and costs of the telephone component in such complex interventions may be difficult to isolate[6].

The lack of evidence supporting this initiative may reflect its newness and evidence may be forthcoming as programs become more established. A number of programs have been recently establish and may offer practical information regarding this model of care:

- Greater Murray Accessline (intake assessment and assistance with case management for mental health issues) – New South Wales[37];
- Healthfirst – Australian Capital Territory (www.healthfirst.net.au);
- Healthline - New Zealand[51,52];
- NHS Direct – United Kingdom[53,54];
- WA Health Direct - Western Australia[37];
- Westvic Triage model – Stawell and Ararat;
- Telephone Triage – Western Hospital, Melbourne.

Preliminary findings and discussion regarding these programs is beginning to appear in journals and reports[24-26,55]. All of these programs have reported high levels of use, particularly by younger people and those seeking advice regarding childhood

illness[24-26]. A significant impact of these services is the redirection of telephone enquiries away from emergency departments, thus alleviating EDs of the burden of these calls[24,26]. However, a reduction in the numbers of emergency presentations has yet to be experienced[24,55]. NHS Direct reports a possible reduction in the workload for GPs out of hours, through fostering self-management of illnesses by patients[24]. All of these services are reporting high levels of consumer satisfaction and that they are as safe as other routes to accessing health care[24-26].

Overall, there appears to be a benefit in directing patients to more appropriate forms of care and adding value by reassuring patients and saving them unnecessary anxiety. However, early findings are yet to demonstrate a decrease in demand for emergency services and predominant use of telephone triage by younger patients raises concerns regarding accessibility to the service by older people and by those of ethnic background, who may find it less easy to use the telephone 24-26,55.

4.2.2 GPs in emergency departments

In the Australian context, anecdotal evidence suggests that the ability or willingness of primary care community-based providers to respond to emergency needs after-hours has diminished, leading to an increased demand on ambulance services and hospital EDs. In general practice, factors such as remuneration for emergency response after-hours and the provision of provider numbers, both in the Commonwealth policy sphere, are relevant. After-hours services have increasing difficulties in recruiting and adequately remunerating doctors and there are many reported difficulties in accessing quality after-hours services in a timely manner. GPs are increasingly reluctant to respond out-of-hours due to personal safety, remuneration and fatigue concerns. Twenty-four hour GP clinics have virtually gone from the metropolitan area and bulk-billing for out-of-hours services appears to have declined in recent times[9].

As public hospital ED departments increasingly become the only providers of out-of-hours care (as well as access to interpreting services) that is free at the point of delivery, there is a growing tension between the objective of providing hospital emergency care for those who need hospital-based services and the obligation to provide services to all who seek them[9].

The New Zealand Health Technology Assessment group (NZHTA) (1998) suggested it may be of value to expand the scope of services provided by EDs to meet the demand for non-urgent care by including primary care workers, eg GPs in the staffing structure or developing primary care centres within EDs[3]. In Victoria, some metropolitan health services have made arrangements with GP groups to set up general practice clinics near the hospital ED. This enables many triage Category 4 & 5 patients to have the option of faster and more appropriate care in a general practice setting[32].

Whilst this strategy may not strictly reduce the demand for care in EDs, there is some evidence of reduced hospital resource use i.e. lower use of diagnostic investigations and fewer referrals to secondary services than patients who saw hospital ED staff[6].

4.2.3 Appropriate resources within EDs

Achieving the right balance of resources within EDs is reported to have a positive effect upon preventing admissions and reducing length of stay (LOS) within the ED. Some people remain in EDs because either appropriate senior and specialised staff are not on hand, or the services required to allow the patient to be discharged are not accessible. Areas for consideration include:

- Supplementary ED staffing[9];
- Role of senior clinical staff eg more appropriate admission decisions may be made if EDs are staffed and supported by experienced medical staff[10];
- Access to specialist and diagnostic services, including geriatric, psychiatric, alcohol and drug services and multidisciplinary care[9]; and
- Faster response times for diagnostic services eg: laboratory and radiology[9].

4.2.4 "Fast track"

The term "fast track" has been interpreted to describe different models of care as follows:

1. Diverting less acutely ill patients to a specialist treatment area, Rapid Assessment and Treatment Units, either within or adjacent to the ED to be treated quickly and thus spend less time in the ED. The aim of this model of care is to increase throughput and is reliant upon specific triage criteria. However, "fast track" does not have a large impact upon inpatient bed management and there is little rigorous evidence to evaluate the impact of such models[8].

2. Processes designed to hasten specific treatments or improve efficiency of inpatient admission and discharge. These processes may focus on specific conditions eg reducing "door to needle" time for patients requiring thrombolysis after myocardial infarction by moving them directly to a coronary care unit, or those that take a more system wide approach[8].

Fast track initiatives rely upon a number of factors including:

- Logistics and location of ancillary services eg laboratory and radiology;
- The use of clinical practice guidelines (CPGs) and clinical pathways; and
- The use of more senior staff in assessment and early treatment planning[8].

4.2.4.1 Guidelines/protocols

"Fast track" models of care can be supported by the use of CPGs and clinical pathways, which are explored in a later section related to inpatient care. However, guidelines and pathways are also of value within the ED setting and should be considered for common presentations eg asthma, chest pain, deep venous thrombosis, and for streamlining care within observation units. For further information on clinical guidelines in ED see www.dhs.vic.gov.au/pdpd/edcg.

4.2.5 Care coordination/case management

People who present frequently to EDs often fall into a high-risk group with regard to morbidity and mortality and generally have complex medical, psychological and/or social problems including:

- Social isolation
- Deteriorating health
- Violence
- Alcohol and drug related problems
- Mental illness[36,56,57].

The classification of a "frequent user" or "multiple presenter" varies throughout the literature and ranges from someone who attends the ED four or more times in twelve months to more than six times in 12 months[36,56]. Even so, there is general agreement that this group of patients represent a small proportion of the total number of patients attending the ED, however, they are indeed challenging and often a source of frustration for staff[36,57]. Staff may see them as non-urgent, mischievous or a burden but from the patient's perspective perceived pain or other symptoms are a source of anxiety compelling them to seek urgent assistance[36,56,57]. Frequent users may run a risk of fragmented care or over treatment because they are seen by many different doctors[56].

A study conducted at the Liverpool Hospital ED, Sydney, that focused on frequent users concluded the majority had mental health issues and given the complexity of their situations an integrated model of care was called for in their management. Such a model would include the following components and a similar model may well be suitable for the majority of frequent users:

- Implement a comprehensive program addressing the physical, social and psychological needs of clients;
- Develop clinical pathways, risk assessment tools and mental health triage guidelines for EDs;
- Address the gap in services to target the needs of those with mental health problems, particularly those at risk;
- Provide accessible and acceptable service to the community;
- Educate staff in understanding mental illness;
- Create positions for dedicated psychiatric staff in EDs (such as psychiatric clinical nurse consultant);
- Collaborate with community-based clinical teams to ensure both community and hospital based services are available to a catchment population;
- Develop good communication between all stakeholders, including ambulance paramedics as there is a significant overlap between "frequent users" of ambulance services and EDs;
- Develop quality management to provide a continuous evaluative process[36]; and
- Implement a multidisciplinary approach involving community providers[57].

Care coordination is an important response to the increasing number of patients with complex needs presenting to EDs, particularly older patients and those with psychiatric and substance abuse problems. Staff employed in care coordination

roles in the ED include gerontology nurses, psychiatric nurses, social workers and other allied health staff[9].

4.2.6 Health promotion in EDs

Emergency departments are an environment that provide opportunities for health promotion initiatives with respect to chronic disease and acute illness (such as asthma, cardiovascular disease, mental health, stroke, diabetes, accident and injury prevention) as well as risk factor reduction (for example smoking and high blood pressure). Strategies such as the following may form part of a comprehensive ED approach to reduce hospital demand:

For patients:
- Health information, education and empowerment
- Screening procedures and referral pathways
- Early intervention services and discharge planning
- Involvement in planning preventive initiatives

For staff:
- Clinical guidelines and education
- Prevention protocol and multi disciplinary committee
- Involvement in planning preventive initiatives.

These strategies include interventions that support individual's behaviours and also the organisational systems (i.e. reorganising practice systems and supportive information systems) that effect health. The InformED Program (Emergency Departments Promoting Health) has been trialing similar interventions through integrating health promotion projects and systems into the usual clinical and curative work of seven EDs at: Angliss Health Service; Box Hill Hospital; Dandenong Hospital; Frankston Hospital; Maroondah Hospital; Northern Hospital; Western Hospital[58].

Projects that are being implemented include:

- Promoting patients' health
  - Follow up of patients with high blood pressure
  - Asthma care
  - Chest pain pathways
  - Positive mental health
  - Written health information for ED patients
- Promoting communities' health
  - Falls prevention
  - Designing a health enhancing ED
- Promoting staff and organisational health
  - Shift work survivor
  - Reducing violence in the ED.

The InformED Program also extends its health promotion activities "upstream" as such, some projects operate beyond the ED to form partnerships with primary care and community providers, such as GPs and divisions of general practice, community health centres, local governments, and other specialist agencies[59].

4.2.7 Rapid response services

Services that provide rapid-response home-based care for those at risk of admission are an effective alternative to hospital care and promote linkages with services that may divert the need for hospitalisation. One such example is the integration of the Post Acute Care program (PAC) within EDs. Typically, rapid response services accept referrals from ED staff and GPs and aim to respond within hours with a range of home-based nursing, allied health and home help services designed to support, for a limited time, patients at risk of emergency admission[10,32].

The findings of an evaluation of a Quick Response Program in Canada, which was developed to prevent unnecessary hospital admissions of frail elderly and handicapped adults by promptly coordinating services in their own homes, concluded this was an appropriate, effective alternative level of care for non-acute individuals, as compared to hospital care. The keys to success

for this program included integration within the health service and a single point of entry. Whilst it was reported that the home care alternative was a cheaper option, the impact on health care expenditure is dependent upon whether the program is provided in addition to current service levels or in combination with a reduction in bed capacity[60].

4.3 Patient Management in Inpatient Facilities

When considering initiatives to reduce inpatient admissions, the focus tends to be upon alternatives that are likely to reduce the need for admission (i.e. strategies to maintain people at home, minimise exacerbations of chronic illnesses) or effective management and referral within the ED obviating the need for admission. Once a patient has been admitted to the inpatient area, the focus changes to how to improve health outcomes, minimize the requirement to remain in hospital, and prevent readmissions once discharged.

4.3.1 Management of the elderly

Many elderly patients present complex medical, social and psychiatric challenges. They may suffer with "geriatric syndromes" such as depression, cognitive impairment, poor mobility, falls, incontinence, and experience functional decline during hospitalisations. This may contribute to longer lengths of stay, increased risk of complications, iatrogenic events, impairment of physical performance and additional need for sub-acute and/or residential care.

The factors that contribute to the functional decline of the elderly whilst they are in hospital are identifiable and can be avoided by modifying the acute hospital environment, for example, de-emphasizing bed rest, removing the hazard of high bed rails, and actively facilitating mobility and socialization. Interdisciplinary care and the implementation of shared objectives are vital to promoting appropriate geriatric care in acute hospitals to limit functional decline and promote earlier transfers to home or rehabilitation. Table 4.1 summarises modifications to inpatient environments that minimise functional decline in the elderly.

Table 4.1. Recommendations for elderly "friendly" health services

Ambulation	Low bed without rails
	Carpeting
	Encouragement and assistance
	Minimization of "tethers" eg: IVs, catheters etc
Reality orientation	Clocks
	Calenders
	Dressing and undressing
	Communal dining
Increased sensory stimulation	Proper lighting and decorating
	Attention to glasses and hearing aids
	Newspapers and books
	Available recreation
Functional change	Primary care concept
	Team management
	Interdisciplinary rounds
	Sharing of objectives
	Family participation
	Early discharge planning

*Source: Morton C, Creditor M. Hazards of hospitalization of the elderly. Annals of Internal Medicine 1993;**118:**219-223*[61].

Unfortunately, the care of the elderly is often fragmented with the present model of medical care being very acute and episodic giving little attention to management of chronic illness. Acute and long term care are seen as discrete health delivery systems by health providers; whereas to the individual, an inpatient admission is just one of many care elements in

their health care continuum. Older people with acute/chronic needs are at high risk of multiple hospital admissions[8]. Consequently, the care of the elderly warrants special attention. The key themes identified from the literature include:

- Risk screening instruments to identify those elders likely to make repeated ED presentations, in order to reduce hospital utilisation and cost and improve quality of life for the group[8];
- Specialist units in EDs to care for the needs of the elderly[8];
- Special units for frail aged medically ill patients for inpatient care helping people to develop or maintain functional independence[8];
- Care planning and coordination across time and place of service to facilitate communication between service providers and caregivers and improve continuity of care[8];
- Integration of information systems to create a record that contains clinical information and functional diagnoses, and is shared across all levels of care provider[8]; and
- Day-based settings for the assessment and care of the elderly, as part of a comprehensive home-based service[10].

4.3.1.1 Comprehensive geriatric assessment

Comprehensive geriatric assessment (CGA) is a process that defines an elderly person's medical, psychosocial, functional and environmental resources and problems, and links these with an overall plan for treatment and follow-up. It utilises the planning and coordinating skills of a spectrum of health professionals, including geriatricians, other specialist physicians, nurses, social workers, pharmacists and allied health staff, who devise individual care plans for patients. When CGA is coupled with case management, the term geriatric evaluation and management (GEM) is used[11].

Models of CGA:

- Outpatient assessment service;
- Home assessment service;
- Integrated case management and care planning by a community geriatric evaluation unit and GPs.

The accumulated evidence suggests significant benefit from non-institutional-at-home programs in terms of improved survival and at home living location for elderly patients, but not for hospital admission or for physical and cognitive function. In addition, control over implementation of recommendations arising from comprehensive geriatric assessment, and extended ambulatory follow-up appear to be key elements in increasing program effectiveness[11].

Morton and Creditor (1993) report functional decline of the elderly during hospitalisation begins immediately and improves little by discharge despite cure or repair of the condition for which they were admitted[61]. Ideally, CGA of elderly hospitalised patients should identify risk factors that would predict potential functional decline and enable minimisation strategies to be implemented. Unfortunately, the processes and time frames of arranging inpatient CGA are not consistent with this need and often decline has occurred prior to intervention by an assessment team.

4.3.2 Care coordination

As acute care is the most expensive care sector it is imperative to coordinate inpatient and outpatient care to ensure the duration and frequency of admission is appropriate. Nosworthy et al. (2001) reported that failure of internal processes such as delays in the completion of medical, subacute and aged care or allied health consultations or waiting the outcome from specific tests impact upon length of stay[38]. A study exploring "high user" patients, those who have six or more combined emergency presentations and inpatient admissions per year, concluded that relatively few patients account for a high proportion of health care costs and recommended case management and development of disease specific models of care including increased use of home care options and extending the ED role to becoming a link in providing referral to home health and case management[8].

4.3.2.1 Case management

Case management is a mechanism that provides comprehensive management of complex patients through the entire episode of illness from community to hospital and back to the community. Case management can:

- Conform to a number of different models eg.
    - Brokerage – usually community based,
    - Integrated case management,
    - Patient empowerment, and
    - Liaison services etc;
- Use different types of health professionals in the role of case manager such as nurses and other professions eg. GPs, social workers;
- Be initiated at different times i.e. at admission, during the inpatient stay, at discharge or in the community; or
- Occur in different settings eg. in hospitals, in sub-acute care facilities and in the community[28].

In the course of treatment for an illness, many patients will require intervention from several healthcare disciplines and various treatment and diagnostic services. In order to ensure that the correct interventions are applied, in the correct order, and that complications, delays and duplications are avoided, a large number of decisions need to be co-ordinated[28]. Case management can assist to streamline this process. To optimise use of this model, the literature indicates that case management needs to be targeted to those who will gain the most benefit, for example, those with multiple co-morbidities, complex mental health conditions and substance abuse issues[8].

Anderson et al. (2001) reported that the value of case management alone in reducing inpatient admissions is not clearly demonstrated, although it may improve patient well being. The only RCT of case management showed that when combined with discharge planning, case management was effective in reducing length of stay and increasing patient and staff satisfaction. Of question is the rigour of these studies in terms of providing conclusive evidence that the improvements purely relate to case management and/or clinical pathways. Case management and clinical pathways have assisted in organising health services in order to treat the patient at the right time in the right setting by reducing fragmentation, reducing duplication and improving coordination across health care providers. Clinical information systems are needed to identify these groups, support case management activities, allow sharing of information (with patient consent) and facilitate the extension of case management activities outside of the acute setting[8].

Effective case management is dependent upon defining clear roles, responsibilities and accountabilities for members of the multi-disciplinary team and being able to work across organisational boundaries[8].

4.3.2.2 Clinical practice guidelines/clinical pathways

Clinical practice guidelines are intended to facilitate reduction in inappropriate variation in clinical practice and the adoption of evidence-based practice. The intent is to improve the overall standard of care by addressing important decisions along a pathway of care and to identify and rank the level of evidence for a best practice decision at that point. Then by joining up the points, as it were, a best practice guideline can be identified, codified and published.

Likewise, a clinical pathway is a tool that sets locally agreed clinical standards, based on the best available evidence, for managing specific groups of patients. Unlike a CPG, a pathway forms part or all of the patient's record and allows the care given by members of the multi-disciplinary team, together with the progress and outcome to be documented[8].

The provision of timely and appropriate care is the impetus for introducing CPGs and clinical pathways, which all attempt to improve patient care outcomes by prescribing the ideal management for specific patient groups. Clinical Practice Guidelines also have the potential to provide education regarding the most current strategies for diagnosis and management[29]. Even so, a number of studies report the inconsistency of physician adherence to implementing CPGs and pathways[29,62]. Dean et al. (2000) suggested that adherence to guidelines will vary dependent upon a number of factors including: the nature of the guideline; the specific clinical problem; the patient group targeted; and the mode of implementation[31]. For complex medical patients, guidelines may have a limited use due to the existence of multiple, frequently interacting medical problems. Dean et al. (2000) also acknowledge that a degree of non-adherence, or rather overriding, to CPGs is appropriate and reflects the individuality of patient needs[31].

Clinical Practice Guidelines and pathways can help to optimise length of hospital stay and efficient use of resources. Anderson et al. (2001) reported on their effectiveness citing a study that showed a 0% readmission rate over a period of two years when a cohort of CHF patients were managed via a combination of case manager and care pathway[8].

The critical success factors of CPGs and clinical pathways include:

- A strong evidence base;
- Clinical leadership and commitment to developing and implementing pathways;
- Multidisciplinary involvement (spelling out roles and responsibilities of all involved with patients with particular conditions);
- An in-house design and implementation team to address local issues;
- Implementation within a cycle of continuous improvement including variance analysis, evaluation and refinement;
- Information technology support; and
- Ongoing staff education.

To date, a large number of clinical pathways have been developed by Victorian metropolitan health services. However, except in a small number of hospitals, these are not used in a systematic way. Likewise, there are well developed CPGs in the areas of asthma, COPD and CHF, however these are not used universally and the concept of CPGs could be expanded to other target patient groups. It is a concern that despite the existence of evidence-based clinical pathways and CPGs, their uptake is limited and health services need to commit to this initiative. The Patient Management Task Force observed that significant duplication could be avoided through greater sharing of information, knowledge and experience about pathways that have already been developed. To focus effort, a collaborative project on pathways could begin with a small number of high volume conditions (examples include COPD, fractured neck of femur and chest pain)[34].

4.3.3 Discharge planning

A common theme in CPGs and pathways is planning for discharge, which is vital for maintaining access to beds in acute hospitals. Discharge planning is a component of hospital care that has been given significant attention over the years. Regardless, of the extent to which discharge planning has been explored and reviewed, there is a sense that it is something with which hospitals continue to struggle and invariably do not do well. Inadequate discharge planning can often be attributed to the need to focus on dealing with the acute illness in the first instance and deferring discharge planning to "another time", as a lower priority. In a busy hospital, "another time" may not eventuate as staff are busy dealing with other acutely ill patients, who are given a higher priority. This issue is compounded by shorter lengths of stay and higher patient turnover leaving less time to interact with patients to identify their discharge planning needs[63].

The following key phases and activities may be conceptualised for effective discharge:

- An assessment phase – provision of timely and informative risk screening;
- A planning phase – commencement of the preparation of the discharge plan;
- An implementation phase – timely notification of community health providers;
- An implementation phase – provision of timely and informative discharge summary; and
- An evaluation phase – follow-up of the discharge plan[39].

By examining these phases, discharge planning can be effective in reducing length of stay and readmissions. The risk screening process identifies those patients who have complex needs and may benefit from interventions, including case management, to improve their health outcomes. Nosworthy et al. (2001) identify factors such as impaired cognition, living alone, higher levels of dependency for care and the requirement for additional home and carer supports as most likely to increase length of stay in medical patients[38]. The commencement of early discharge planning and provision of information to community service providers enables them to rally their resources and support their efforts to maintain the patient at home.

Reynolds (2002) summarises the evidence supporting effective discharge planning and identifies there is insufficient evidence of a wide range of measurable clinical, economic and organisational benefits for good discharge planning. However, she concludes that there remain sufficient and substantive reports of the perceived benefits to all stakeholders in the system and that it is important to continue activity around improved discharge planning until there is a better understanding of confounding factors and adequate ways to measure all possible outcomes.

Reynolds (2002) summarises the evidence supporting discharge planning as follows:

- The high likelihood that effective discharge planning can reduce hospital length of stay and readmissions;
- Some evidence that it will improve continuity of care and decrease morbidity;
- Clear evidence that it will increase patient satisfaction; and
- Some evidence that it will improve secondary prevention[16].

A Cochrane systematic review found some evidence that discharge planning reduced average length of stay, but not for all hospitals. There was no clear result regarding the effect of discharge planning on readmission rates. While three trials reported reduced readmissions or days in hospital due to readmission in the short term (one to four weeks), this difference disappeared at longer term follow up (6 weeks to 9 months). Although differences were detected in health status, there is some evidence to suggest that patients receiving discharge planning experience increased levels of satisfaction with their care[8].

The Patient Management Task Force identified scope for more hospitals to follow the lead set by others, by planning patient discharge earlier (before or at the time of the patient's admission) and by regularly examining the internal causes of delayed discharges and working to resolve the obstacles identified. Hospitals can further develop the role of the discharge coordinators to address any internal causes of delayed discharge and to secure the maximum degree of cooperation among health and community providers in meeting the needs of discharged patients. Many hospitals provide suitably qualified and staffed discharge lounges for patients ready to leave hospital, to enable the patients to vacate beds promptly and to admit new patients. They may also provide alternative services (such as home support) to allow patients to return home promptly, as well as step-down care beds for use when the provision of services from other care providers is delayed and occupation of an acute ward bed is no longer appropriate[32].

4.3.4 The sub-acute/acute interface

Sub-acute care is defined as the specialised health care delivered to patients, primarily older people with functional impairment and complex medical problems, who need time rather than intensity and who require a range and mix of clinical and professional skills rather than the focused management of a single speciality. For some patients, sub-acute care is provided when acute care is no longer needed; for others, it will be the appropriate care from admission. Sub-acute care may be delivered on an inpatient or outpatient basis, within the community and at home[64]. The sub-acute service system overlaps in part and provides a link with both the acute system and the community care system. The increasing demand for health care within the Victorian health care system is also having an impact upon access to sub-acute beds. Sub-acute care needs to be coordinated with acute and community care through appropriate discharge and referral practices[64].

As a proportion of acute patients require further management or intervention in a sub-acute facility, access to this level of care needs to be timely for both the patient and to ensure the health system functions efficiently. This not only makes the best use of acute hospital resources, but ensures that those with complex needs have access to appropriate services, including rehabilitation or the involvement of a geriatrician and a multidisciplinary allied health team in their ongoing care[64].

The DHS undertook a project addressing the sub-acute/acute interface, to investigate the boundaries and relationships between acute and sub-acute service systems, identify efficient and effective service models and practices and recommend strategies to improve management of current and future service demand[64].

The key findings of the consultation and analysis include:

1. There is a lack of focus and coordination in referral to and provision of sub-acute services, which affects throughput and efficiency.
2. There are communication blocks between and within acute and sub-acute services, which affect patients' progress through the continuum of care.
3. There are significant numbers of patients awaiting transfer to residential care in both acute and sub-acute beds, which affect both patient management and service delivery.
4. There is a lack of equitable access to home-based care and community services, which affects the ability of sub-acute services to discharge appropriately[64].

The recommendations from this project were primarily related to changes in service practice and increased flexibility in service provision. The project identifies a number of factors relating to process redesign, including single point of entry, goal oriented care, improved communication within and between organizations and better integration with acute and community services. Many of these initiatives are likely to have an impact upon length of stay and readmissions within both acute and sub-acute facilities, which are fundamental to the aims of HARP.

4.4 Summary

The preventive interventions described throughout this section all involve some element of improvement in care coordination and process redesign, both within and between the different sectors of the health care system. In some instances, the preventive initiatives are targeted at specific conditions or cohorts of patients, whilst others focus upon re-engineering the system to streamline processes that will affect the majority of patients. Table 4.2 and Table 4.3 summarise the preventive interventions in relationship to those targeted at high volume conditions and those focusing upon process redesign and provide an indication of the supporting evidence (as identified in the reviewed literature).

Table 4.2. Preventive interventions targeted at high volume conditions

Interventions targeted at high volume conditions	Conditions/Cohorts of People	Supporting Evidence*	Comments
Disease Management - Hospital – Home support trials[11-15]	COPD, CHF	Some	The most typical conditions addressed by disease management programs include asthma, diabetes, COPD and CHF. Building on the pre-existing infrastructure used to manage these conditions, disease management programs may be expanded to include a wider array of conditions eg. Alzheimer's disease, arthritis, back pain, coronary artery disease, depression/anxiety, end stage renal disease, headache/migraine, haemophilia, HIV/AIDS, hypertension, multiple sclerosis, organ transplant, osteoporosis, senior care[45]. The home-support model of care is of benefit to patients with moderate COPD and those with CHF, however, this model is resource intensive and consideration needs to be given to cost benefits.[12,13]
Disease Management - Shared care for chronic diseases[11,16,17]	Diabetes, cardiovascular, asthma, COPD, mental health issues, drug and alcohol issues	Some	
Disease Management - Self-management education[11,18]	Asthma, COPD, CHF	Good	
Chronic disease self-management programs[19]	Arthritis, asthma, diabetes, HIV/AIDS, other chronic illnesses	Good	
Falls prevention[22,23]	Injuries, elderly	Good	A significant number of studies have been undertaken to evaluate intervention strategies to reduce the risk of falling, with many achieving a reduction in the number of falls for the participants, including a reduction in the number of hospitalisations and bed days occupied[23].
ED Guidelines/protocols[27]	Asthma, chest pain, deep vein thrombosis	Good	CPGs/clinical pathways support the notion of "Fast Track" through the ED as they can hasten specific treatments and improve efficiency. There is the potential to expand the use of CPGs/clinical pathways to other patient groups[8].
Health promotion in EDs[5]	Asthma, cardiovascular disease, mental health, stroke, diabetes, accident & injury	Good	EDs have developed niche roles in health promotion, successfully implementing detection and early intervention programs for: smoking cessation; domestic violence; child abuse; some women's cancers; injury prevention; and alcohol abuse[5].
Special geriatric units for the acute medically ill[8,27]	Elderly	Some	The factors that contribute to functional decline of the elderly whilst they are in hospital are identifiable and can be avoided by modifying the acute hospital environment, for example, de-emphasizing bed rest, removing the hazard of high bed rails, and actively facilitating mobility and socialization[61].
Comprehensive geriatric assessment[11]	Elderly	Good	Improved survival and maintaining a person at home are significant benefits of CGA conducted in the home environment. However, the processes and time frames of arranging inpatient CGA are not consistent with the need to avert functional decline in the hospitalised elderly[61].
Clinical practice guidelines/clinical pathways[29-31]	High volume conditions, all ages	Some	The provision of timely and appropriate care is the impetus for introducing CPGs/clinical pathways, which all attempt to improve patient care outcomes by prescribing the ideal management for specific patient groups. A large number of inpatient CPGs/clinical pathways have been developed by metropolitan health services, however, except in a small number of hospitals, these are not used in a systematic way and the concept could be expanded to other target patient groups[34].

** Evidence levels reflect those that are reported in the reviewed literature. N/A indicates further exploration of the literature is required to evaluate evidence.*

Table 4.3. Process redesign initiatives

Interventions focusing upon care coordination/process redesign	Conditions/Cohorts of People	Supporting Evidence*	Comments
Quality use of medicines[20,21]	Patients with complex medication regimes/on specific medications (see Section 4.1.3, page 48)	N/A	A variety of medications are associated with drug related admissions[20]. Whilst a number of strategies have been proposed to minimise these incidents further exploration of the literature is required to identify evidence[21].
GP/hospital interface[16]	All patients	Some	There is not a substantial body of evidence either for or against many initiatives related to the GP/hospital interface however there are reported benefits. It is important to promote these initiatives with the aim of contributing to the body of evidence[16].
Telephone triage[6,24-26]	All patients	Ambiguous	Preliminary findings and discussion regarding telephone triage are reporting high levels of use and a significant impact from redirecting calls away from EDs but without a reduction in the numbers of emergency presentations as yet[24-26].
GPs in emergency departments[6,8,27]	Triage category 4 & 5 patients	Good	This strategy expands the scope of EDs, however, may not strictly reduce the demand for care in EDs. However, there is some evidence of reduced hospital resource use i.e. lower use of diagnostic investigations and fewer referrals to secondary services than patients who saw hospital ED staff[3,6,32].
Resources in EDs (Supplementary staff, senior clinical staff, access to specialist/diagnostic services)[8,27]	All patients, specialist services for elderly, mental health etc	Some	Achieving the right balance of resources within EDs is reported to have a positive effect upon preventing admissions and reducing LOS within the ED[9,10].
"Fast track" systems in EDs[8]	Triage category 4 & 5 patients	Some	This term relates to Rapid Assessment and Treatment Units, which may be GP clinics located within EDs, and the use of CPGs/clinical pathways – see comments re these initiatives[8].
Rapid response services[8,27]	People at risk of admission due to lack of community supports eg. frail aged	Some	Rapid response services accept referrals from ED staff and GPs with the aim of responding immediately to avert the need for emergency admission. These services represent a model for effective linkage between EDs/GPs and community based services eg. PAC[10,32].
Care coordination/case management[8,28]	Complex medical conditions, "frequent users", mental health, drug & alcohol related problems, elderly	Some	Care coordination/case management is focused upon reducing the fragmentation of care and thus has the potential to streamline processes for those with complex needs and is relevant to all sectors of the health care system[8,9,28,36,56].
Discharge planning[8]	All patients, particularly those at risk of readmission	Good	Planning for discharge is vital for maintaining access to health services. There are many reported benefits of effective discharge planning, however, there is scope for further refining discharge planning process[16,32].
Sub-acute/acute interface	All patients, particularly the elderly	N/A	There are a number of factors relating to process redesign including single point of entry, goal oriented care, improved communication within and between organizations, and better integration with acute and community services. Many of these initiatives are likely to have an impact upon LOS and readmissions within both acute and sub-acute facilities[64].

** Evidence levels reflect those that are reported in the reviewed literature. N/A indicates further exploration of the literature is required to evaluate evidence.*

From these tables it can be seen there is evidence supporting a number of initiatives as being effective in preventing emergency presentations, admissions and readmissions. The key is to ensure that these initiatives are implemented broadly across the health care system and where possible expanded to more patients groups, for example, developing disease management programs for patients groups other than those with COPD, CHF, asthma and diabetes.

Many initiatives, whilst not supported by rigorous evidence, are also valuable to consider in preventing emergency demand. The absence of rigorous evidence may simply indicate a gap in research and/or published literature rather than unequivocally indicating these initiatives will not contribute to reducing demand for acute hospital services.

Finally, there are many initiatives that have been mentioned that lend themselves to expansion to other patient groups and health services, require further research or exploration of the literature to reveal available evidence. These initiatives are displayed in Table 4.4.

Table 4.4. Opportunities for expansion, innovation and further research

Interventions	Comments
Disease management models expanded to other patient groups	Alzheimer's disease, arthritis, back pain, coronary artery disease, depression/anxiety, end stage renal disease, headache/migraine, haemophilia, HIV/AIDS, hypertension, multiple sclerosis, organ transplant, osteoporosis, senior care
Falls prevention	Areas identified as requiring further exploration as to their impact upon reducing the incidence of falls includes: • Population based screening • Role of interventions to prevent falls in the institutional setting • Preventive strategies for those with dementia • Prevention and treatment of osteoporosis • Evaluation of hip protectors[23]
ED guidelines/protocols expanded to other patient groups	
Clinical practice guidelines/clinical pathways expanded to other groups	
Enhancing the role of the ambulance service in triage to the most appropriate service	
Quality use of medicines	Further exploration of literature required to identify evidence
Telephone Triage	Requires rigorous evaluation to measure impact upon emergency presentations and patient outcomes

5 Practice Change

The increasing demands on the health care system and the ongoing pressure to be more effective and efficient leads many services to review their processes and systems in search of improvement. Degeling et al. (1998) undertook a study to evaluate the impact of the trend towards increasing clinician involvement in management to engender a more financially driven and output orientated approach to service delivery, and how health care staff had adopted this perspective[65]. Their study revealed the response varied between professional groups and it was difficult for the professional sub-cultures to adapt to this imposed change. Essentially, the economic imperative is often in conflict with the patient centred view of both medical and nursing staff. The review of work processes that engenders a multidisciplinary approach is fraught with difficulties due the medical (individualist) and nursing (collective) concept of clinical work. In order to implement change these two hurdles need to be overcome. Degeling et al. (1998) recommend there are a number of new perspectives that all health care professionals need to adopt:

- An acceptance of the interconnections between the clinical and resource dimensions of care;
- A commitment to implement structures and methods which bring clinical work within the ambit of work process control;
- An acceptance of a model of clinical unit management which emphasises the benefits of systems for monitoring performance with respect to resource usage, efficiency, effectiveness, appropriateness and quality;
- A perspective which seeks to balance clinical autonomy with accountability to management and which argues for displacing existing personalised and organisationally opaque accountability systems with structures and methods which engender greater transparency[65].

Clearly, bringing about change of the health care system is hinged upon unifying the people within the system by a common aim[66]. The aim should be specific and ambitious, indicating that the current status quo is inadequate. The aim should be reiterated to remind people and maintain focus to achieve the goal. Defining the aim of system change is the first step towards improvement described in the plan-do-study-act cycle, an inductive learning process that promotes continuous learning within an organization[66]. Once having defined the aim, the next task is to define measurements that will demonstrate achievement against the aim and allow evaluation of progress and identification of further modifications if necessary. The next step is to develop and implement an innovative strategy to achieve the aim, followed by evaluation. This is reflective learning and the basis for evidence based change[66].

The key to developing innovative strategies is based upon three principles: attention, escape and movement. People need to be encouraged to pay attention in a different way, escape current mental patterns, and maintain movement in their thoughts to develop innovative strategies i.e. think beyond "this is the way we have always done things" and rules that currently define processes, and move towards "what if?" and "how could we make that happen?"[67]

Studies referred to throughout this document, which achieved successful outcomes repeatedly, mentioned the importance of the commitment of care delivery organizations and individual clinicians to achieve practice change. Careful planning and the use of formal quality improvement and coordination across care delivery sectors were evident[8]. Additionally, taking a systems view of the health system and a more collaborative approach has the potential to promote wide spread implementation of innovations[34].

The key factors that are likely to assist with the successful implementation of innovative initiatives/models of care are:

- Long term perspective and a systems view;
- Commitment of the organization(s) and individual clinicians;
    - Strong leadership at all levels of management
    - Enlistment of clinician support;
- Coordination and integration between and within organizations in the health care sector. Integration will be assisted by;
    - Systems that provide representation and increase opportunities for collaboration and dissemination (eg Primary Care Partnerships, Divisions of General Practice)
    - Information systems that serve to record patient medical histories and collect data for research (eg medical records, databases)
    - Communication systems that provide the actual links between and within organizations (eg referrals, reports, liaison officers, email, fax)
    - Education to clarify roles, develop and maintain skills and disseminate best practice guidelines[1];

- Emphasis on participation of all key stakeholders, including patients and their carers in: identifying the problem, finding solutions, planning directions, implementing the change and evaluating the results[5];
- Change driven through education, by expanding and challenging people's ideas, beliefs and behaviours so they approach old problems with new directions[5];
- Working with groups rather than individuals[5];
- Effective communication;
- Careful planning;
- Linking with quality improvement systems; and
- Resource allocation[5]

Preventive initiatives will contribute to developing a momentum for sustainable change if they are:

- Evidence-based;
- Appropriately evaluated to enable assessment of the impact both on patient outcomes and the public health system;
- Based on a methodology that effectively reduces demand growth; and
- Designed to improve the quality of patient management through enhanced communication and coordination of activities within and between organizations.

Appendix A – Contributors

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Dr Brett Knight	Physician, Ballarat Health Services
Mr Allan Lilly	Chief Nursing Officer, Caulfield Medical Centre
Dr John McEncroe	Chair, General Practice Divisions Victoria
Ms Libby Owen	Manager Hospital to Home, Bundoora Extended Care Centre
Assoc Prof John Rasa	Chief General Manager, Acute Health Services, Eastern Health
Professor Bruce Singh	Cato Professor & Head Department of Psychiatry, University of Melbourne
Mr Shane Solomon	Executive Director, Metro Health & Aged Care Services DHS
Dr Craig White	Executive Director Clinical Services, Austin & Repatriation Medical Centre

Departmental Steering Committee

Dr Michael Ackland	Manager, Health Outcomes Section, Public Health Branch
Dr Chris Brook	Executive Director, Rural and Regional Health & Aged Care Services
Mr Ian Coverdale	HARP Project Officer, Emergency Demand Coordination Group
Ms Sue Daly	Project Manager, Emergency Demand Coordination Group
Professor John Funder	Chairperson, HARP Reference Group
Ms Sarah Goding	Manager, Emergency Demand Coordination Group
Mr Brian Joyce	Director Primary and Community Health
Mr Geoff Lavender	Director Rural and Regional Health Services
Ms Gabrielle Levine	Regional Director, Western Metropolitan Region
Ms Jan Snell	Regional Director, Barwon South West
Mr Shane Solomon	Chair and Executive Director, Metro Health & Aged Care Services

Appendix B - Hospital Presentations and Separations

Angliss Hospital – Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	Z099	F/U EXAM AFTER UNSPEC RX FOR OTH COND	1709
2	L989	DISORDER SKIN & SUBCUTANEOUS TISSUE NOS	1623
3	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	985
4	A09	DIARRH & GASTROENTERITIS PRES INFECTIOUS	951
5	B349	VIRAL INFECTION UNSPECIFIED	942
6	S619	OPEN WOUND OF WRIST & HAND PART NOS	751
7	J069	ACUTE URTI UNSPECIFIED	692
8	R074	CHEST PAIN UNSPECIFIED	689
9	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	617
10	J459	ASTHMA UNSPECIFIED	527
11	S0180	UNSPEC OPEN WOUND OF OTHER PARTS OF HEAD	481
12	J181	LOBAR PNEUMONIA UNSPECIFIED	413
13	H669	OTITIS MEDIA UNSPECIFIED	403
14	L039	CELLULITIS UNSPECIFIED	399
15	N390	URINARY TRACT INFECTION SITE NOT SPEC	368
16	Z478	OTHER SPEC ORTHOPAEDIC FOLLOW-UP CARE	362
17	S9340	SPRAIN AND STRAIN OF ANKLE NOS SITE	359
18	R69	UNKNOWN & UNSPEC CAUSES OF MORBIDITY	334
19	S019	OPEN WOUND OF HEAD PART UNSPECIFIED	308
20	M7919	MYALGIA SITE UNSPECIFIED	296

Angliss Hospital – High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	G67	OESOPHAGITIS,GE,MISC DIG SYS	470	821	1.7
2	E62	RESPIRATORY INFECT/INFLAMMATIONS	401	1,976	4.9
3	F74	CHEST PAIN	357	514	1.4
4	G66	ABDOMINAL PAIN/MESENTERIC ADENITIS	332	492	1.5
5	J64	CELLULITIS	298	1,512	5.1
6	X60	INJURIES	255	440	1.7
7	E69	BRONCHITIS AND ASTHMA	253	437	1.7
8	G07	APPENDICECTOMY	194	696	3.6
9	E65	CHR OBSTRUCT AIRWAY DISEASE	190	1,111	5.8
10	X62	POISON/TOX EFF-DRUGS,OTH SUBS	189	320	1.7
11	I68	NSURG NECK,BACK W PAIN MAN PR/MYELOGRAM	186	545	2.9
12	L63	KIDNEY & URINARY TRACT INFECTIONS	160	607	3.8
13	T63	VIRAL ILLNESS	160	222	1.4
14	D63	OTITIS MEDIA AND URI	156	210	1.3
15	F62	HEART FAILURE & SHOCK NO CATASTROPHIC CC	142	983	6.9
16	O40	ABORTION W D&C,ASP CURETTAGE/HYSTEROTOMY	138	143	1.0
17	L64	URINARY STONES AND OBSTRUCTION	133	172	1.3
18	F72	UNSTABLE ANGINA	131	338	2.6
19	G68	GASTROENTERITIS	130	177	1.4
20	B77	HEADACHE	129	138	1.1

Austin and Repatriation Medical Centre - Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	R074	CHEST PAIN UNSPECIFIED	1183
2	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	1087
3	R55	SYNCOPE AND COLLAPSE	657
4	I200	UNSTABLE ANGINA	652
5	S619	OPEN WOUND OF WRIST & HAND PART NOS	554
6	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	550
7	N390	URINARY TRACT INFECTION SITE NOT SPEC	524
8	A09	DIARRH & GASTROENTERITIS PRES INFECTIOUS	503
9	B349	VIRAL INFECTION UNSPECIFIED	482
10	J459	ASTHMA UNSPECIFIED	457
11	J449	COPD UNSPECIFIED	434
12	I500	CONGESTIVE HEART FAILURE	433
13	S019	OPEN WOUND OF HEAD PART UNSPECIFIED	396
14	M7919	MYALGIA SITE UNSPECIFIED	349
15	L039	CELLULITIS UNSPECIFIED	326
16	I48	ATRIAL FIBRILLATION AND FLUTTER	315
17	J181	LOBAR PNEUMONIA UNSPECIFIED	304
18	S9340	SPRAIN AND STRAIN OF ANKLE NOS SITE	300
19	J22	UNSPEC ACUTE LOWER RESPIRATORY INFECTION	293
20	I219	ACUTE MYOCARDIAL INFARCTION UNSPECIFIED	286

Austin and Repatriation Medical Centre - High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	F74	CHEST PAIN	731	862	1.2
2	E62	RESPIRATORY INFECT/INFLAMMATIONS	517	3,715	7.2
3	E65	CHR OBSTRUCT AIRWAY DISEASE	494	3,428	6.9
4	G67	OESOPHAGITIS,GE,MISC DIG SYS	480	1,062	2.2
5	G66	ABDOMINAL PAIN/MESENTERIC ADENITIS	471	786	1.7
6	X62	POISON/TOX EFF-DRUGS,OTH SUBS	463	873	1.9
7	F62	HEART FAILURE & SHOCK	460	2,392	5.2
8	F72	UNSTABLE ANGINA	364	1,031	2.8
9	B70	STROKE	347	3,577	10.3
10	X60	INJURIES	335	728	2.2
11	E69	BRONCHITIS AND ASTHMA	320	701	2.2
12	F73	SYNCOPE & COLLAPSE	319	1,038	3.3
13	B76	SEIZURE AGE>2	318	1,333	4.2
14	F71	NON-MAJ ARRHYTHMIA+CONDUCT DIS	307	763	2.5
15	L63	KIDNEY & URINARY TRACT INFECTIONS	244	1,672	6.9
16	I68	NSURG NECK,BACK W PAIN MAN PR/MYELOGRAM	228	785	3.4
17	F66	CORONARY ATHEROSCLEROSIS	202	288	1.4
18	I75	INJ TO SHOULDER,ARM,LEG,ETC	200	588	2.9
19	F60	CIRC DIS W AMI	195	1,026	5.3
20	J64	CELLULITIS	194	1,065	5.5

Ballarat Base Hospital - Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	Z099	F/U EXAM AFTER UNSPEC RX FOR OTH COND	1895
2	R69	UNKNOWN & UNSPEC CAUSES OF MORBIDITY	1449
3	B349	VIRAL INFECTION UNSPECIFIED	822
4	S619	OPEN WOUND OF WRIST & HAND PART NOS	684
5	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	634
6	R074	CHEST PAIN UNSPECIFIED	608
7	K529	NONINFECT GASTROENTERITIS & COLITIS NOS	545
8	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	521
9	S9340	SPRAIN AND STRAIN OF ANKLE NOS SITE	516
10	M7919	MYALGIA SITE UNSPECIFIED	478
11	M7999	SOFT TISSUE DISORDER NOS SITE UNSPEC	420
12	T159	FOREIGN BODY ON EXTERNAL EYE PART NOS	399
13	J069	ACUTE URTI UNSPECIFIED	381
14	I200	UNSTABLE ANGINA	361
15	N390	URINARY TRACT INFECTION SITE NOT SPEC	354
16	J459	ASTHMA UNSPECIFIED	352
17	S0180	UNSPEC OPEN WOUND OF OTHER PARTS OF HEAD	337
18	S609	SUPERFICIAL INJURY OF WRIST & HAND NOS	333
19	S0090	SUPERFICIAL INJURY HEAD NOS PART NOS	320
20	R100	ACUTE ABDOMEN	317

Ballarat Base Hospital - High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	F72	UNSTABLE ANGINA	313	1,247	4.0
2	E69	BRONCHITIS AND ASTHMA	264	694	2.6
3	E62	RESPIRATORY INFECT/INFLAMMATIONS	208	1,150	5.5
4	X62	POISON/TOX EFF-DRUGS,OTH SUBS	195	359	1.8
5	F60	CIRC DIS W AMI NO INV CARD INV PROC	177	917	5.2
6	G67	OESOPHAGITIS,GE,MISC DIG SYS	170	619	3.6
7	F74	CHEST PAIN	170	313	1.8
8	E65	CHR OBSTRUCT AIRWAY DISEASE	164	1,176	7.2
9	U40	MENTAL HEALTH TREATMENT, SAMEDAY, W ECT	150	150	1.0
10	B70	STROKE	141	1,413	10.0
11	G66	ABDOMINAL PAIN/MESENTERIC ADENITIS	137	354	2.6
12	F62	HEART FAILURE & SHOCK	120	864	7.2
13	F71	NON-MAJ ARRHYTHMIA+CONDUCT DIS	117	505	4.3
14	J64	CELLULITIS	115	604	5.3
15	G07	APPENDICECTOMY	101	352	3.5
16	I74	INJURY- FOREARM,WRIST,HAND,FOOT	99	185	1.9
17	X60	INJURIES	99	287	2.9
18	F73	SYNCOPE & COLLAPSE	98	332	3.4
19	L63	KIDNEY & URINARY TRACT INFECTIONS	96	468	4.9
20	O40	ABORTION W D&C,ASP CURETTAGE/HYSTEROTOMY	94	107	1.1

Bendigo Hospital – Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	1246
2	Z099	F/U EXAM AFTER UNSPEC RX FOR OTH COND	1044
3	R074	CHEST PAIN UNSPECIFIED	1011
4	M7999	SOFT TISSUE DISORDER NOS SITE UNSPEC	781
5	B349	VIRAL INFECTION UNSPECIFIED	726
6	L989	DISORDER SKIN & SUBCUTANEOUS TISSUE NOS	723
7	S619	OPEN WOUND OF WRIST & HAND PART NOS	678
8	J459	ASTHMA UNSPECIFIED	494
9	S9340	SPRAIN AND STRAIN OF ANKLE NOS SITE	458
10	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	445
11	S0180	UNSPEC OPEN WOUND OF OTHER PARTS OF HEAD	404
12	A09	DIARRH & GASTROENTERITIS PRES INFECTIOUS	395
13	R11	NAUSEA AND VOMITING	377
14	T159	FOREIGN BODY ON EXTERNAL EYE PART NOS	369
15	N390	URINARY TRACT INFECTION SITE NOT SPEC	368
16	Z480	ATTENTION TO SURG DRESSINGS & SUTURES	360
17	I200	UNSTABLE ANGINA	355
18	H578	OTHER SPECIFIED DISORDERS EYE & ADNEXA	322
19	R69	UNKNOWN & UNSPEC CAUSES OF MORBIDITY	304
20	Z478	OTHER SPEC ORTHOPAEDIC FOLLOW-UP CARE	300

Bendigo Hospital – High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	F72	UNSTABLE ANGINA	268	1,022	3.8
2	E62	RESPIRATORY INFECT/INFLAMMATIONS	246	1,537	6.2
3	F62	HEART FAILURE & SHOCK	199	1,703	8.6
4	E69	BRONCHITIS AND ASTHMA	193	495	2.6
5	E65	CHR OBSTRUCT AIRWAY DISEASE	184	1,431	7.8
6	G07	APPENDICECTOMY	175	634	3.6
7	F60	CIRC DIS W AMI NO INV CARD INV PROC	167	970	5.8
8	B70	STROKE	155	1,529	9.9
9	I08	OTH HIP & FEMUR PROCS	150	1,838	12.3
10	I74	INJURY- FOREARM,WRIST,HAND,FOOT	147	236	1.6
11	G67	OESOPHAGITIS,GE,MISC DIG SYS	141	643	4.6
12	F71	NON-MAJ ARRHYTHMIA+CONDUCT DIS	138	550	4.0
13	G66	ABDOMINAL PAIN/MESENTERIC ADENITIS	134	389	2.9
14	J64	CELLULITIS	130	794	6.1
15	G68	GASTROENTERITIS	130	262	2.0
16	X62	POISON/TOX EFF-DRUGS,OTH SUBS	128	258	2.0
17	I13	HUMERUS,TIBIA ETC PROCS	116	601	5.2
18	D63	OTITIS MEDIA AND URI	116	244	2.1
19	O40	ABORTION W D&C,ASP CURETTAGE/HYSTEROTOMY	110	132	1.2
20	F74	CHEST PAIN	106	296	2.8

Box Hill Hospital – Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	1471
2	R074	CHEST PAIN UNSPECIFIED	1237
3	B349	VIRAL INFECTION UNSPECIFIED	753
4	R55	SYNCOPE AND COLLAPSE	636
5	S619	OPEN WOUND OF WRIST & HAND PART NOS	635
6	A09	DIARRH & GASTROENTERITIS PRES INFECTIOUS	623
7	J459	ASTHMA UNSPECIFIED	613
8	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	568
9	I200	UNSTABLE ANGINA	511
10	S0180	UNSPEC OPEN WOUND OF OTHER PARTS OF HEAD	498
11	N390	URINARY TRACT INFECTION SITE NOT SPEC	443
12	M7919	MYALGIA SITE UNSPECIFIED	405
13	R69	UNKNOWN & UNSPEC CAUSES OF MORBIDITY	386
14	L039	CELLULITIS UNSPECIFIED	379
15	J450	PREDOMINANTLY ALLERGIC ASTHMA	379
16	Z099	F/U EXAM AFTER UNSPEC RX FOR OTH COND	364
17	S9340	SPRAIN AND STRAIN OF ANKLE NOS SITE	332
18	S019	OPEN WOUND OF HEAD PART UNSPECIFIED	288
19	J449	COPD UNSPECIFIED	285
20	J181	LOBAR PNEUMONIA UNSPECIFIED	282

Box Hill Hospital – High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	F74	CHEST PAIN	688	977	1.4
2	E62	RESPIRATORY INFECT/INFLAMMATIONS	552	3,617	6.6
3	E69	BRONCHITIS AND ASTHMA	475	1,145	2.4
4	G66	ABDOMINAL PAIN/MESENTERIC ADENITIS	465	781	1.7
5	G67	OESOPHAGITIS,GE,MISC DIG SYS	446	1,280	2.9
6	X62	POISON/TOX EFF-DRUGS,OTH SUBS	385	593	1.5
7	F72	UNSTABLE ANGINA	374	1,190	3.2
8	B70	STROKE	366	3,632	9.9
9	F62	HEART FAILURE & SHOCK	355	2,302	6.5
10	E65	CHR OBSTRUCT AIRWAY DISEASE	342	2,515	7.4
11	X60	INJURIES	273	496	1.8
12	F73	SYNCOPE & COLLAPSE	270	767	2.8
13	F71	NON-MAJ ARRHYTHMIA+CONDUCT DIS	269	927	3.4
14	F60	CIRC DIS W AMI	236	1,279	5.4
15	I74	INJURY- FOREARM,WRIST,HAND,FOOT	226	267	1.2
16	F42	CIRC DIS NO AMI W CARD INV	224	879	3.9
17	I75	INJ TO SHOULDER,ARM,LEG,ETC	224	668	3.0
18	I68	NSURG NECK,BACK W PAIN MAN PR/MYELOGRAM	221	943	4.3
19	L63	KIDNEY & URINARY TRACT INFECTIONS	217	1,126	5.2
20	J64	CELLULITIS	213	1,079	5.1

Dandenong Hospital – Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	R074	CHEST PAIN UNSPECIFIED	1199
2	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	1183
3	L989	DISORDER SKIN & SUBCUTANEOUS TISSUE NOS	1179
4	A09	DIARRH & GASTROENTERITIS PRES INFECTIOUS	1026
5	B349	VIRAL INFECTION UNSPECIFIED	917
6	J450	PREDOMINANTLY ALLERGIC ASTHMA	705
7	I200	UNSTABLE ANGINA	663
8	N390	URINARY TRACT INFECTION SITE NOT SPEC	597
9	J459	ASTHMA UNSPECIFIED	597
10	S619	OPEN WOUND OF WRIST & HAND PART NOS	587
11	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	502
12	S0180	UNSPEC OPEN WOUND OF OTHER PARTS OF HEAD	494
13	M7919	MYALGIA SITE UNSPECIFIED	484
14	R69	UNKNOWN & UNSPEC CAUSES OF MORBIDITY	483
15	J181	LOBAR PNEUMONIA UNSPECIFIED	436
16	J069	ACUTE URTI UNSPECIFIED	435
17	R55	SYNCOPE AND COLLAPSE	421
18	L039	CELLULITIS UNSPECIFIED	398
19	J050	ACUTE OBSTRUCTIVE LARYNGITIS [CROUP]	363
20	T659	TOXIC EFFECT OF UNSPECIFIED SUBSTANCE	361

Dandenong Hospital - High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	F74	CHEST PAIN	715	880	1.2
2	E69	BRONCHITIS AND ASTHMA	689	1,269	1.8
3	G66	ABDOMINAL PAIN/MESENTERIC ADENITIS	660	828	1.3
4	X62	POISON/TOX EFF-DRUGS,OTH SUBS	631	886	1.4
5	G67	OESOPHAGITIS,GE,MISC DIG SYS	607	1,161	1.9
6	E62	RESPIRATORY INFECT/INFLAMMATIONS	562	3,018	5.4
7	X60	INJURIES	518	728	1.4
8	F72	UNSTABLE ANGINA	516	1,486	2.9
9	E65	CHR OBSTRUCT AIRWAY DISEASE	392	2,392	6.1
10	L63	KIDNEY & URINARY TRACT INFECTIONS	369	1,574	4.3
11	J64	CELLULITIS	336	1,877	5.6
12	B76	SEIZURE	335	664	2.0
13	F62	HEART FAILURE & SHOCK	325	2,082	6.4
14	F60	CIRC DIS W AMI NO INV CARD INV PROC	316	1,575	5.0
15	D63	OTITIS MEDIA AND URI	312	412	1.3
16	T63	VIRAL ILLNESS	288	378	1.3
17	G68	GASTROENTERITIS	270	380	1.4
18	B70	STROKE	263	3,127	11.9
19	F73	SYNCOPE & COLLAPSE	250	475	1.9
20	I74	INJURY- FOREARM,WRIST,HAND,FOOT	249	353	1.4

Frankston Hospital – Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	1850
2	R074	CHEST PAIN UNSPECIFIED	1649
3	R69	UNKNOWN & UNSPEC CAUSES OF MORBIDITY	912
4	T659	TOXIC EFFECT OF UNSPECIFIED SUBSTANCE	883
5	I200	UNSTABLE ANGINA	758
6	J069	ACUTE URTI UNSPECIFIED	683
7	R060	DYSPNOEA	574
8	R55	SYNCOPE AND COLLAPSE	571
9	J459	ASTHMA UNSPECIFIED	553
10	S619	OPEN WOUND OF WRIST & HAND PART NOS	549
11	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	543
12	K529	NONINFECT GASTROENTERITIS & COLITIS NOS	533
13	R11	NAUSEA AND VOMITING	527
14	J450	PREDOMINANTLY ALLERGIC ASTHMA	522
15	J181	LOBAR PNEUMONIA UNSPECIFIED	481
16	S019	OPEN WOUND OF HEAD PART UNSPECIFIED	420
17	N390	URINARY TRACT INFECTION SITE NOT SPEC	377
18	S0180	UNSPEC OPEN WOUND OF OTHER PARTS OF HEAD	371
19	B349	VIRAL INFECTION UNSPECIFIED	367
20	L039	CELLULITIS UNSPECIFIED	348

Frankston Hospital – High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	F74	CHEST PAIN	813	1,073	1.3
2	G67	OESOPHAGITIS,GE,MISC DIG SYS	738	1,504	2.0
3	G66	ABDOMINAL PAIN/MESENTERIC ADENITIS	719	1,089	1.5
4	X60	INJURIES	690	1,100	1.6
5	E62	RESPIRATORY INFECT/INFLAMMATIONS	686	3,698	5.4
6	X62	POISON/TOX EFF-DRUGS,OTH SUBS	641	936	1.5
7	F72	UNSTABLE ANGINA	620	1,253	2.0
8	E69	BRONCHITIS AND ASTHMA	520	1,035	2.0
9	E65	CHR OBSTRUCT AIRWAY DISEASE	518	2,714	5.2
10	I74	INJURY- FOREARM,WRIST,HAND,FOOT	513	625	1.2
11	B70	STROKE	377	2,557	6.8
12	F62	HEART FAILURE & SHOCK	356	1,786	5.0
13	I75	INJ TO SHOULDER,ARM,LEG,ETC	352	760	2.2
14	F60	CIRC DIS W AMI NO INV CARD INV PROC	328	1,270	3.9
15	F71	NON-MAJ ARRHYTHMIA+CONDUCT DIS	316	893	2.8
16	D63	OTITIS MEDIA AND URI	314	467	1.5
17	L63	KIDNEY & URINARY TRACT INFECTIONS	310	1,302	4.2
18	B76	SEIZURE AGE>2	308	581	1.9
19	F73	SYNCOPE & COLLAPSE	299	600	2.0
20	J64	CELLULITIS	297	1,726	5.8

Geelong Hospital – Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	1295
2	R074	CHEST PAIN UNSPECIFIED	1167
3	B349	VIRAL INFECTION UNSPECIFIED	865
4	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	780
5	Z209	CONTCT & EXP UNSPEC COMMUNICABLE DIS	759
6	A09	DIARRH & GASTROENTERITIS PRES INFECTIOUS	713
7	S619	OPEN WOUND OF WRIST & HAND PART NOS	673
8	Z099	F/U EXAM AFTER UNSPEC RX FOR OTH COND	665
9	J459	ASTHMA UNSPECIFIED	640
10	I200	UNSTABLE ANGINA	595
11	S0180	UNSPEC OPEN WOUND OF OTHER PARTS OF HEAD	582
12	R55	SYNCOPE AND COLLAPSE	493
13	S9340	SPRAIN AND STRAIN OF ANKLE NOS SITE	450
14	N390	URINARY TRACT INFECTION SITE NOT SPEC	413
15	T159	FOREIGN BODY ON EXTERNAL EYE PART NOS	393
16	L039	CELLULITIS UNSPECIFIED	359
17	T509	OTH NOS DRUGS MEDICAMENTS BIOL SUBS	309
18	J050	ACUTE OBSTRUCTIVE LARYNGITIS [CROUP]	309
19	J449	COPD UNSPECIFIED	309
20	R69	UNKNOWN & UNSPEC CAUSES OF MORBIDITY	286

Geelong Hospital – High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	F74Z	CHEST PAIN	662	801	1.2
2	X60C	INJURIES	628	1,019	1.6
3	G66B	ABDOMINAL PAIN/MESENTERIC ADENITIS	509	856	1.7
4	I74C	INJURY- FOREARM,WRIST,HAND,FOOT	464	638	1.4
5	E69C	BRONCHITIS AND ASTHMA	439	910	2.1
6	G67B	OESOPHAGITIS,GE,MISC DIG SYS	433	1,067	2.5
7	E62C	RESPIRATORY INFECT/INFLAMMATIONS	387	2,502	6.5
8	X62B	POISON/TOX EFF-DRUGS,OTH SUBS	382	581	1.5
9	I75C	INJ TO SHOULDER,ARM,LEG,ETC	360	861	2.4
10	E65A	CHR OBSTRUCT AIRWAY DISEASE	353	2,506	7.1
11	F72B	UNSTABLE ANGINA	317	835	2.6
12	F62B	HEART FAILURE & SHOCK	296	2,223	7.5
13	B70B	STROKE	277	2,823	10.2
14	I68C	NSURG NECK,BACK W PAIN MAN PR/MYELOGRAM	268	929	3.5
15	F71B	NON-MAJ ARRHYTHMIA+CONDUCT DIS	256	646	2.5
16	B76B	SEIZURE AGE>2	248	685	2.8
17	F73B	SYNCOPE & COLLAPSE	235	660	2.8
18	L63C	KIDNEY & URINARY TRACT INFECTIONS	232	1,365	5.9
19	T63B	VIRAL ILLNESS	217	394	1.8
20	F60C	CIRC DIS W AMI NO INV CARD INV PROC	205	1,377	6.7

Goulburn Valley Hospital - Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	Z711	PERS W FEARED COMPLAINT NO DX MADE	1692
2	Z099	F/U EXAM AFTER UNSPEC RX FOR OTH COND	1380
3	R074	CHEST PAIN UNSPECIFIED	847
4	J069	ACUTE URTI UNSPECIFIED	770
5	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	639
6	B349	VIRAL INFECTION UNSPECIFIED	560
7	S699	UNSPECIFIED INJURY OF WRIST AND HAND	518
8	S609	SUPERFICIAL INJURY OF WRIST & HAND NOS	478
9	S999	UNSPECIFIED INJURY OF ANKLE AND FOOT	456
10	J039	ACUTE TONSILLITIS UNSPECIFIED	445
11	A09	DIARRH & GASTROENTERITIS PRES INFECTIOUS	412
12	H669	OTITIS MEDIA UNSPECIFIED	407
13	S099	UNSPECIFIED INJURY OF HEAD	375
14	T07	UNSPECIFIED MULTIPLE INJURIES	362
15	T639	TOXIC EFF CONTACT W NOS VENOMOUS ANIMAL	361
16	J459	ASTHMA UNSPECIFIED	352
17	T159	FOREIGN BODY ON EXTERNAL EYE PART NOS	313
18	N390	URINARY TRACT INFECTION SITE NOT SPEC	296
19	T659	TOXIC EFFECT OF UNSPECIFIED SUBSTANCE	285
20	S899	UNSPECIFIED INJURY OF LOWER LEG	279

Goulburn Valley Hospital- High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	E62	RESPIRATORY INFECT/INFLAMMATIONS	253	1,455	5.8
2	F74	CHEST PAIN	246	471	1.9
3	F72	UNSTABLE ANGINA	193	752	3.9
4	G67	OESOPHAGITIS,GE,MISC DIG SYS	185	661	3.6
5	F60	CIRC DIS W AMI NO INV CARD INV PROC	170	1,147	6.7
6	E69	BRONCHITIS AND ASTHMA	170	454	2.7
7	G66	ABDOMINAL PAIN/MESENTERIC ADENITIS	160	351	2.2
8	X62	POISON/TOX EFF-DRUGS,OTH SUBS	159	282	1.8
9	E65	CHR OBSTRUCT AIRWAY DISEASE	151	1,174	7.8
10	F71	NON-MAJ ARRHYTHMIA+CONDUCT	140	602	4.3
11	O40	ABORTION W D&C,ASP CURETTAGE/HYSTEROTOMY	139	150	1.1
12	I74	INJURY- FOREARM,WRIST,HAND,FOOT	128	145	1.1
13	J64	CELLULITIS	122	637	5.2
14	G07	APPENDICECTOMY	121	336	2.8
15	F62	HEART FAILURE & SHOCK	120	687	5.7
16	T63	VIRAL ILLNESS	120	229	1.9
17	D63	OTITIS MEDIA AND URI	109	221	2.0
18	G68	GASTROENTERITIS	98	191	1.9
19	I13	HUMERUS,TIBIA ETC PROCS	97	410	4.2
20	B70	STROKE	93	752	8.1

Maroondah Hospital - Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	Z099	F/U EXAM AFTER UNSPEC RX FOR OTH COND	1011
2	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	923
3	R074	CHEST PAIN UNSPECIFIED	857
4	S619	OPEN WOUND OF WRIST & HAND PART NOS	660
5	J459	ASTHMA UNSPECIFIED	517
6	T659	TOXIC EFFECT OF UNSPECIFIED SUBSTANCE	486
7	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	485
8	S9340	SPRAIN AND STRAIN OF ANKLE NOS SITE	424
9	S0180	UNSPEC OPEN WOUND OF OTHER PARTS OF HEAD	423
10	B349	VIRAL INFECTION UNSPECIFIED	311
11	L039	CELLULITIS UNSPECIFIED	299
12	N390	URINARY TRACT INFECTION SITE NOT SPEC	292
13	J181	LOBAR PNEUMONIA UNSPECIFIED	292
14	R55	SYNCOPE AND COLLAPSE	287
15	I200	UNSTABLE ANGINA	274
16	F329	DEPRESSIVE EPISODE UNSPECIFIED	264
17	S019	OPEN WOUND OF HEAD PART UNSPECIFIED	264
18	Z478	OTHER SPEC ORTHOPAEDIC FOLLOW-UP CARE	240
19	N23	UNSPECIFIED RENAL COLIC	238
20	S529	FRACTURE OF FOREARM PART UNSPECIFIED	237

Maroondah Hospital - High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	F74	CHEST PAIN	452	550	1.2
2	X62	POISON/TOX EFF-DRUGS,OTH SUBS	415	580	1.4
3	G67	OESOPHAGITIS,GE,MISC DIG SYS	355	772	2.2
4	G66	ABDOMINAL PAIN/MESENTERIC ADENITIS	303	464	1.5
5	E62	RESPIRATORY INFECT/INFLAMMATIONS	289	1,870	6.5
6	X60	INJURIES	269	439	1.6
7	E65	CHR OBSTRUCT AIRWAY DISEASE	258	1,655	6.4
8	F62	HEART FAILURE & SHOCK	233	1,453	6.2
9	F72	UNSTABLE ANGINA	230	565	2.5
10	E69	BRONCHITIS AND ASTHMA	207	582	2.8
11	J64	CELLULITIS	172	871	5.1
12	B70	STROKE	171	1,397	8.2
13	F60	CIRC DIS W AMI NO INV CARD INV PROC	167	724	4.3
14	G07	APPENDICECTOMY	166	580	3.5
15	I68	NSURG NECK,BACK W PAIN MAN PR/MYELOGRAM	160	499	3.1
16	I75	INJ TO SHOULDER,ARM,LEG,ETC	159	466	2.9
17	B76	SEIZURE AGE>2	159	279	1.8
18	L64	URINARY STONES AND OBSTRUCTION	147	179	1.2
19	I74	INJURY- FOREARM,WRIST,HAND,FOOT	145	198	1.4
20	L63	KIDNEY & URINARY TRACT INFECTIONS	137	689	5.0

Monash Medical Centre - Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	R074	CHEST PAIN UNSPECIFIED	2148
2	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	1571
3	B349	VIRAL INFECTION UNSPECIFIED	1478
4	A09	DIARRH & GASTROENTERITIS PRES INFECTIOUS	1379
5	J450	PREDOMINANTLY ALLERGIC ASTHMA	1121
6	R69	UNKNOWN & UNSPEC CAUSES OF MORBIDITY	943
7	R55	SYNCOPE AND COLLAPSE	648
8	R060	DYSPNOEA	606
9	N390	URINARY TRACT INFECTION SITE NOT SPEC	602
10	J069	ACUTE URTI UNSPECIFIED	582
11	J459	ASTHMA UNSPECIFIED	536
12	S0180	UNSPEC OPEN WOUND OF OTHER PARTS OF HEAD	536
13	I200	UNSTABLE ANGINA	525
14	J181	LOBAR PNEUMONIA UNSPECIFIED	485
15	S619	OPEN WOUND OF WRIST & HAND PART NOS	472
16	R11	NAUSEA AND VOMITING	471
17	R509	FEVER UNSPECIFIED	466
18	Z044	EXAM & OBS FOLL ALLEGED RAPE & SEDUCTION	444
19	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	433
20	J050	ACUTE OBSTRUCTIVE LARYNGITIS [CROUP]	429

Monash Medical Centre - High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	F74	CHEST PAIN	1,182	1,447	1.2
2	G66	ABDOMINAL PAIN/MESENTERIC ADENITIS	919	1,347	1.5
3	E62	RESPIRATORY INFECT/INFLAMMATIONS	847	5,100	6.0
4	E69	BRONCHITIS AND ASTHMA	763	1,457	1.9
5	G67	OESOPHAGITIS,GE,MISC DIG SY	711	1,355	1.9
6	X60	INJURIES	709	1,129	1.6
7	X62	POISON/TOX EFF-DRUGS,OTH SUBS	689	1,079	1.6
8	B76	SEIZURE AGE>2	566	1,564	2.8
9	B70	STROKE	492	4,643	9.4
10	E65	CHR OBSTRUCT AIRWAY DISEASE	488	2,463	5.0
11	L63	KIDNEY & URINARY TRACT INFECTIONS	469	1,939	4.1
12	F72	UNSTABLE ANGINA	461	1,252	2.7
13	F73	SYNCOPE & COLLAPSE	453	1,049	2.3
14	F62	HEART FAILURE & SHOCK	413	2,295	5.6
15	F71	NON-MAJ ARRHYTHMIA+CONDUCT DIS	403	990	2.5
16	B77	HEADACHE	377	638	1.7
17	I68	NSURG NECK,BACK W PAIN MAN PR/MYELOGRAM	349	768	2.2
18	D63	OTITIS MEDIA AND URI	347	599	1.7
19	L64	URINARY STONES AND OBSTRUCTION	341	371	1.1
20	I75	INJ TO SHOULDER,ARM,LEG,ETC	331	925	2.8

Latrobe Regional Hospital - Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	692
2	Z099	F/U EXAM AFTER UNSPEC RX FOR OTH COND	688
3	R074	CHEST PAIN UNSPECIFIED	675
4	B349	VIRAL INFECTION UNSPECIFIED	634
5	N390	URINARY TRACT INFECTION SITE NOT SPEC	628
6	J069	ACUTE URTI UNSPECIFIED	624
7	K529	NONINFECT GASTROENTERITIS & COLITIS NOS	527
8	S619	OPEN WOUND OF WRIST & HAND PART NOS	460
9	J459	ASTHMA UNSPECIFIED	452
10	M7919	MYALGIA SITE UNSPECIFIED	438
11	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	424
12	S9340	SPRAIN AND STRAIN OF ANKLE NOS SITE	356
13	J039	ACUTE TONSILLITIS UNSPECIFIED	325
14	S609	SUPERFICIAL INJURY OF WRIST & HAND NOS	318
15	S0080	SUPERFICIAL INJURY OTH PARTS HEAD NOS	316
16	I200	UNSTABLE ANGINA	303
17	L039	CELLULITIS UNSPECIFIED	299
18	T159	FOREIGN BODY ON EXTERNAL EYE PART NOS	290
19	Z480	ATTENTION TO SURG DRESSINGS & SUTURES	285
20	H669	OTITIS MEDIA UNSPECIFIED	277

Latrobe Regional Hospital - High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	F72	UNSTABLE ANGINA	245	729	3.0
2	E62	RESPIRATORY INFECT/INFLAMMATIONS	221	1,528	6.9
3	J64	CELLULITIS	176	1,167	6.6
4	E65	CHR OBSTRUCT AIRWAY DISEASE	167	1,036	6.2
5	E69	BRONCHITIS AND ASTHMA AGE	156	375	2.4
6	F62	HEART FAILURE & SHOCK	153	970	6.3
7	F60	CIRC DIS W AMI NO INV CARD INV PROC	141	726	5.1
8	X62	POISON/TOX EFF-DRUGS,OTH SUBS	133	221	1.7
9	G07	APPENDICECTOMY	122	298	2.4
10	G67	OESOPHAGITIS,GE,MISC DIG SYS	117	334	2.9
11	B70	STROKE	115	1,074	9.3
12	F71	NON-MAJ ARRHYTHMIA+CONDUCT DIS	110	413	3.8
13	F7Z	CHEST PAIN	100	140	1.4
14	G6B	ABDOMINAL PAIN/MESENTERIC ADENITIS	89	148	1.7
15	T6B	VIRAL ILLNESS	88	182	2.1
16	I74	INJURY- FOREARM,WRIST,HAND,FOOT	88	105	1.2
17	I13	HUMERUS,TIBIA ETC PROCS	83	258	3.1
18	L63	KIDNEY & URINARY TRACT INFECTIONS	81	415	5.1
19	I75	INJ TO SHOULDER,ARM,LEG,ETC	81	163	2.0
20	D63	OTITIS MEDIA AND URI	79	149	1.9

Northern Hospital - Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	R074	CHEST PAIN UNSPECIFIED	1706
2	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	1294
3	S619	OPEN WOUND OF WRIST & HAND PART NOS	818
4	J069	ACUTE URTI UNSPECIFIED	787
5	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	724
6	Z099	F/U EXAM AFTER UNSPEC RX FOR OTH COND	678
7	T659	TOXIC EFFECT OF UNSPECIFIED SUBSTANCE	667
8	B349	VIRAL INFECTION UNSPECIFIED	636
9	K529	NONINFECT GASTROENTERITIS & COLITIS NOS	570
10	L039	CELLULITIS UNSPECIFIED	539
11	J459	ASTHMA UNSPECIFIED	538
12	N390	URINARY TRACT INFECTION SITE NOT SPEC	506
13	J450	PREDOMINANTLY ALLERGIC ASTHMA	486
14	R101	PAIN LOCALIZED TO UPPER ABDOMEN	481
15	N23	UNSPECIFIED RENAL COLIC	460
16	S0180	UNSPEC OPEN WOUND OF OTHER PARTS OF HEAD	433
17	S019	OPEN WOUND OF HEAD PART UNSPECIFIED	418
18	A09	DIARRH & GASTROENTERITIS PRES INFECTIOUS	411
19	K590	CONSTIPATION	398
20	J180	BRONCHOPNEUMONIA UNSPECIFIED	392

Northern Hospital - High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	E62C	RESPIRATORY INFECT/INFLAMMATIONS W/O CC	486	3,197	6.6
2	F74Z	CHEST PAIN	471	584	1.2
3	G66B	ABDOMINAL PAIN/MESENTERIC ADENITIS NO CC	403	556	1.4
4	E69C	BRONCHITIS AND ASTHMA AGE<50 W/O CC	379	908	2.4
5	X62B	POISON/TOX EFF-DRUGS,OTH SUBS <60 NO CC	370	529	1.4
6	G67B	OESOPHAGITIS,GE,MISC DIG SYS >9 NOC/S CC	355	905	2.5
7	F72B	UNSTABLE ANGINA W/O CATASTROPH/SEVERE CC	333	1,021	3.1
8	F60C	CIRC DIS W AMI NO INV CARD INV PROC,DIED	317	1,803	5.7
9	E65A	CHR OBSTRUCT AIRWAY DISEASE W CAT/SEV CC	307	1,873	6.1
10	F62B	HEART FAILURE & SHOCK NO CATASTROPHIC CC	299	1,717	5.7
11	L64Z	URINARY STONES AND OBSTRUCTION	290	371	1.3
12	J64B	CELLULITIS >59 W/O CATAST/SEV CC OR <60	267	1,469	5.5
13	L63C	KIDNEY & URINARY TRACT INFECTIONS < 70	243	1,054	4.3
14	I74C	INJURY- FOREARM,WRIST,HAND,FOOT<75 NO CC	239	259	1.1
15	F71B	NON-MAJ ARRHYTHMIA+CONDUCT DIS NO C/S CC	234	776	3.3
16	X60C	INJURIES AGE < 65	212	324	1.5
17	G07B	APPENDICECTOMY NO CATASTROPHIC/SEVERE CC	210	657	3.1
18	B70B	STROKE W OTHER CC	193	1,831	9.5
19	B76B	SEIZURE AGE>2 W/O CATASTROPHIC/SEVERE CC	157	329	2.1
20	L63C	KIDNEY & URINARY TRACT INFECTIONS < 70	154	487	3.2

Royal Children's Hospital - Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	B349	VIRAL INFECTION UNSPECIFIED	4858
2	A09	DIARRH & GASTROENTERITIS PRES INFECTIOUS	3474
3	J069	ACUTE URTI UNSPECIFIED	2954
4	J450	PREDOMINANTLY ALLERGIC ASTHMA	2631
5	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	1467
6	J219	ACUTE BRONCHIOLITIS UNSPECIFIED	1373
7	J050	ACUTE OBSTRUCTIVE LARYNGITIS [CROUP]	1116
8	H669	OTITIS MEDIA UNSPECIFIED	1096
9	S0180	UNSPEC OPEN WOUND OF OTHER PARTS OF HEAD	1006
10	K590	CONSTIPATION	982
11	N390	URINARY TRACT INFECTION SITE NOT SPEC	870
12	R11	NAUSEA AND VOMITING	830
13	R509	FEVER UNSPECIFIED	773
14	J039	ACUTE TONSILLITIS UNSPECIFIED	664
15	S529	FRACTURE OF FOREARM PART UNSPECIFIED	645
16	S069	INTRACRANIAL INJURY UNSPECIFIED	534
17	R69	UNKNOWN & UNSPEC CAUSES OF MORBIDITY	513
18	J181	LOBAR PNEUMONIA UNSPECIFIED	479
19	R05	COUGH	475
20	Z099	F/U EXAM AFTER UNSPEC RX FOR OTH COND	466

Royal Children's Hospital - High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	E69	BRONCHITIS AND ASTHMA AGE	946	1,338	1.4
2	G68	GASTROENTERITIS	644	1,396	2.2
3	T63	VIRAL ILLNESS	474	860	1.8
4	E70	WHOOP COUGH+AC BRONCH'TIS	448	1,340	3.0
5	E62	RESPIRATORY INFECT/INFLAMMATIONS	439	1,250	2.8
6	D63	OTITIS MEDIA AND URI	337	699	2.1
7	L63	KIDNEY & URINARY TRACT INFECTIONS	278	871	3.1
8	D64	LARYNGOTRACHEITIS AND EPIGLOTTITIS	245	323	1.3
9	I74	INJURY- FOREARM,WRIST,HAND,FOOT	243	263	1.1
10	Q60	RETICULOENDOTHELIAL+IMM DIS	241	1,323	5.5
11	G66	ABDOMINAL PAIN/MESENTERIC ADENITIS	227	381	1.7
12	G69	OESOPHAGITIS & MISC DIG SYS DISORDS <10	213	509	2.4
13	B76	SEIZURE	206	414	2.0
14	J64	CELLULITIS	184	465	2.5
15	X62	POISON/TOX EFF-DRUGS,OTH SUBS	183	236	1.3
16	P06	NEONATE>2499G	176	716	4.1
17	K60	DIABETES	174	783	4.5
18	E65	CHR OBSTRUCT AIRWAY DISEASE	174	335	1.9
19	G07	APPENDICECTOMY	166	728	4.4
20	B80	OTHER HEAD INJURY	160	195	1.2

Royal Melbourne Hospital - Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	R074	CHEST PAIN UNSPECIFIED	1801
2	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	1660
3	R69	UNKNOWN & UNSPEC CAUSES OF MORBIDITY	1476
4	I200	UNSTABLE ANGINA	804
5	T148	OTHER INJURIES OF NOS BODY REGION	797
6	S619	OPEN WOUND OF WRIST & HAND PART NOS	794
7	Z711	PERS W FEARED COMPLAINT NO DX MADE	678
8	J459	ASTHMA UNSPECIFIED	627
9	N390	URINARY TRACT INFECTION SITE NOT SPEC	625
10	L039	CELLULITIS UNSPECIFIED	576
11	R51	HEADACHE	562
12	R55	SYNCOPE AND COLLAPSE	557
13	J181	LOBAR PNEUMONIA UNSPECIFIED	556
14	Z099	F/U EXAM AFTER UNSPEC RX FOR OTH COND	548
15	T07	UNSPECIFIED MULTIPLE INJURIES	518
16	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	500
17	R961	DEATH <24 HOURS FM ONSET SYM EXPLAIN	490
18	N23	UNSPECIFIED RENAL COLIC	478
19	I64	STROKE NOT SPEC HAEMORRHAGE OR INFARCT	467
20	S9340	SPRAIN AND STRAIN OF ANKLE NOS SITE	455

Royal Melbourne Hospital - High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	F74	CHEST PAIN	1,087	1,522	1.4
2	G66	ABDOMINAL PAIN/MESENTERIC ADENITIS NO CC	1,040	1,376	1.3
3	X60	NJURIES AGE < 65	1,037	1,519	1.5
4	G67	OESOPHAGITIS,GE,MISC DIG SYS >9 NOC/S CC	835	1,738	2.1
5	X62	POISON/TOX EFF-DRUGS,OTH SUBS <60 NO CC	611	835	1.4
6	E62	RESPIRATORY INFECT/INFLAMMATIONS W/O CC	564	3,206	5.7
7	B70	STROKE W OTHER CC	473	5,402	11.4
8	I68	NSURG NECK,BACK W PAIN MAN PR/MYELOGRAM	468	1,094	2.3
9	F72	UNSTABLE ANGINA W/O CATASTROPH/SEVERE CC	461	1,559	3.4
10	B77	HEADACHE	460	682	1.5
11	E65	CHR OBSTRUCT AIRWAY DISEASE W CAT/SEV CC	371	1,797	4.8
12	F62	HEART FAILURE & SHOCK NO CATASTROPHIC CC	369	2,154	5.8
13	B76	SEIZURE AGE>2 W/O CATASTROPHIC/SEVERE CC	347	1,039	3.0
14	F73	SYNCOPE & COLLAPSE W/O CATAST/SEVERE CC	346	756	2.2
15	J64	CELLULITIS	340	1,572	4.6
16	E69	BRONCHITIS AND ASTHMA	322	635	2.0
17	U60	MENTAL HEALTH TREATMENT,SAMEDAY,W/O ECT	315	315	1.0
18	L63	KIDNEY & URINARY TRACT INFECTIONS	310	1,232	4.0
19	F62	HEART FAILURE & SHOCK	308	1,279	4.2
20	J64	CELLULITIS	306	1,247	4.1

St Vincent's Hospital - Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	R074	CHEST PAIN UNSPECIFIED	1019
2	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	824
3	L039	CELLULITIS UNSPECIFIED	520
4	S619	OPEN WOUND OF WRIST & HAND PART NOS	495
5	F100	MENT/BEH DISRD DT ALCOHOL USE AC INTOX	494
6	I200	UNSTABLE ANGINA	462
7	J459	ASTHMA UNSPECIFIED	450
8	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	390
9	F99	MENTAL DISORDER NOT OTHERWISE SPECIFIED	385
10	F349	PERSISTENT MOOD [AFFECTIVE] DISORDER NOS	377
11	S0180	UNSPEC OPEN WOUND OF OTHER PARTS OF HEAD	376
12	R55	SYNCOPE AND COLLAPSE	372
13	S0080	SUPERFICIAL INJURY OTH PARTS HEAD NOS	370
14	I500	CONGESTIVE HEART FAILURE	330
15	J181	LOBAR PNEUMONIA UNSPECIFIED	316
16	N23	UNSPECIFIED RENAL COLIC	312
17	M7969	PAIN IN LIMB SITE UNSPECIFIED	306
18	R568	OTHER AND UNSPECIFIED CONVULSIONS	299
19	N390	URINARY TRACT INFECTION SITE NOT SPEC	295
20	Z099	F/U EXAM AFTER UNSPEC RX FOR OTH COND	279

St Vincent's Hospital - High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	F74	CHEST PAIN	658	912	1.4
2	X62	POISON/TOX EFF-DRUGS,OTH SUBS	552	820	1.5
3	G66	ABDOMINAL PAIN/MESENTERIC ADENITIS	494	691	1.4
4	G67	OESOPHAGITIS,GE,MISC DIG SYS	490	1,083	2.2
5	X60	INJURIES	411	639	1.6
6	E65	CHR OBSTRUCT AIRWAY DISEASE	342	1,869	5.5
7	E62	RESPIRATORY INFECT/INFLAMMATIONS	340	2,096	6.2
8	F62	HEART FAILURE & SHOCK	322	1,675	5.2
9	B76	SEIZURE AGE>2	268	583	2.2
10	F71	NON-MAJ ARRHYTHMIA+CONDUCT DIS	252	793	3.1
11	V60	ALCOHOL INTOXICATION AND WITHDRAWAL	249	351	1.4
12	F73	SYNCOPE & COLLAPSE	230	572	2.5
13	B70	STROKE	223	2,148	9.6
14	K60	DIABETES	223	1,044	4.7
15	J64	CELLULITIS	222	1,041	4.7
16	L63	KIDNEY & URINARY TRACT INFECTIONS	217	1,000	4.6
17	E69	BRONCHITIS AND ASTHMA	208	609	2.9
18	L64	URINARY STONES AND OBSTRUCTION	190	261	1.4
19	B77	HEADACHE	189	247	1.3
20	B80	OTHER HEAD INJURY			

Sunshine Hospital - Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	B349	VIRAL INFECTION UNSPECIFIED	2513
2	Z099	F/U EXAM AFTER UNSPEC RX FOR OTH COND	1582
3	A09	DIARRH & GASTROENTERITIS PRES INFECTIOUS	1292
4	J069	ACUTE URTI UNSPECIFIED	1025
5	J450	PREDOMINANTLY ALLERGIC ASTHMA	1016
6	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	961
7	H669	OTITIS MEDIA UNSPECIFIED	637
8	J050	ACUTE OBSTRUCTIVE LARYNGITIS [CROUP]	582
9	S0180	UNSPEC OPEN WOUND OF OTHER PARTS OF HEAD	573
10	O200	THREATENED ABORTION	503
11	J219	ACUTE BRONCHIOLITIS UNSPECIFIED	495
12	K529	NONINFECT GASTROENTERITIS & COLITIS NOS	473
13	K590	CONSTIPATION	462
14	N939	ABNORMAL UTERINE & VAGINAL BLEEDING NOS	418
15	N390	URINARY TRACT INFECTION SITE NOT SPEC	367
16	J459	ASTHMA UNSPECIFIED	363
17	S529	FRACTURE OF FOREARM PART UNSPECIFIED	348
18	J039	ACUTE TONSILLITIS UNSPECIFIED	298
19	R69	UNKNOWN & UNSPEC CAUSES OF MORBIDITY	295
20	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	259

Sunshine Hospital - High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	E69	BRONCHITIS AND ASTHMA	529	724	1.4
2	O40	ABORTION W D&C,ASP CURETTAGE/HYSTEROTOMY	242	251	1.0
3	G68	GASTROENTERITIS AGE<10	232	316	1.4
4	I74	INJURY- FOREARM,WRIST,HAND,FOOT	188	215	1.1
5	T63	VIRAL ILLNESS	168	260	1.5
6	G66	ABDOMINAL PAIN/MESENTERIC ADENITIS	166	204	1.2
7	E70	WHOOP COUGH+AC BRONCH'TIS	146	351	2.4
8	O65	OTH ANTENATAL W MODERATE/NO COMP DIAG	130	281	2.2
9	D63	OTITIS MEDIA AND URI	100	166	1.7
10	D64	LARYNGOTRACHEITIS AND EPIGLOTTITIS	100	105	1.1
11	E62	RESPIRATORY INFECT/INFLAMMATIONS	95	190	2.0
12	X62	POISON/TOX EFF-DRUGS,OTH SUBS	86	91	1.1
13	L63	KIDNEY & URINARY TRACT INFECTIONS	84	192	2.3
14	G07	APPENDICECTOMY	82	309	3.8
15	N62	MENSTRUAL+OTH FEM REPRO SYS DISORD	78	104	1.3
16	X60	INJURIES	78	86	1.1
17	X06	OTH PROCS FOR OTH INJURIES	66	100	1.5
18	I75	INJ TO SHOULDER,ARM,LEG,ETC	59	70	1.2
19	J64	CELLULITIS	58	137	2.4
20	O63	ABORTION NO D&C,ASP CURETTE/HYSTEROTOMY	55	58	1.1

The Alfred - Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	R961	DEATH <24 HOURS FM ONSET SYM EXPLAIN	1160
2	R074	CHEST PAIN UNSPECIFIED	1145
3	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	794
4	S619	OPEN WOUND OF WRIST & HAND PART NOS	733
5	R69	UNKNOWN & UNSPEC CAUSES OF MORBIDITY	605
6	R55	SYNCOPE AND COLLAPSE	541
7	I200	UNSTABLE ANGINA	515
8	T07	UNSPECIFIED MULTIPLE INJURIES	501
9	S0180	UNSPEC OPEN WOUND OF OTHER PARTS OF HEAD	500
10	J459	ASTHMA UNSPECIFIED	487
11	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	440
12	J181	LOBAR PNEUMONIA UNSPECIFIED	412
13	N390	URINARY TRACT INFECTION SITE NOT SPEC	391
14	S019	OPEN WOUND OF HEAD PART UNSPECIFIED	350
15	L039	CELLULITIS UNSPECIFIED	317
16	I499	CARDIAC ARRHYTHMIA UNSPECIFIED	307
17	J449	COPD UNSPECIFIED	301
18	K590	CONSTIPATION	289
19	R11	NAUSEA AND VOMITING	287
20	L219	SEBORRHOEIC DERMATITIS UNSPECIFIED	278

The Alfred - High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	X60	INJURIES AGE < 65	968	1,193	1.2
2	F74	CHEST PAIN	796	974	1.2
3	X62	POISON/TOX EFF-DRUGS,OTH SUBS	582	894	1.5
4	G67	OESOPHAGITIS,GE,MISC DIG SYS	578	1,055	1.8
5	G66	ABDOMINAL PAIN/MESENTERIC ADENITIS	540	698	1.3
6	E62	RESPIRATORY INFECT/INFLAMMATIONS	454	2,575	5.7
7	E65	CHR OBSTRUCT AIRWAY DISEASE	426	2,443	5.7
8	F62	HEART FAILURE & SHOCK	361	1,711	4.7
9	F73	SYNCOPE & COLLAPSE	338	479	1.4
10	I75	INJ TO SHOULDER,ARM,LEG,ETC	314	584	1.9
11	L63	KIDNEY & URINARY TRACT INFECTIONS	289	872	3.0
12	F71	NON-MAJ ARRHYTHMIA+CONDUCT DIS	287	747	2.6
13	B70	STROKE	273	2,971	10.9
14	I68	NSURG NECK,BACK W PAIN MAN PR/MYELOGRAM	264	658	2.5
15	B76	SEIZURE AGE>2	252	522	2.1
16	V60	ALCOHOL INTOXICATION AND WITHDRAWAL	245	273	1.1
17	I74	INJURY- FOREARM,WRIST,HAND,FOOT	244	329	1.3
18	J65	SKIN TRAUMA, SUBCUT TISSUE & BREAST	231	283	1.2
19	E69	BRONCHITIS AND ASTHMA AGE	228	761	3.3
20	F72	UNSTABLE ANGINA	217	456	2.1

Western Hospital - Emergency Department Presentations

	ICD-10	Diagnosis Description	Presentations
1	R074	CHEST PAIN UNSPECIFIED	1543
2	R104	OTHER AND UNSPECIFIED ABDOMINAL PAIN	1402
3	S619	OPEN WOUND OF WRIST & HAND PART NOS	1034
4	Z099	F/U EXAM AFTER UNSPEC RX FOR OTH COND	860
5	I200	UNSTABLE ANGINA	786
6	N390	URINARY TRACT INFECTION SITE NOT SPEC	644
7	J459	ASTHMA UNSPECIFIED	588
8	J181	LOBAR PNEUMONIA UNSPECIFIED	559
9	N23	UNSPECIFIED RENAL COLIC	555
10	R55	SYNCOPE AND COLLAPSE	548
11	S628	FRACTURE OTH/UNSPEC PARTS WRIST & HAND	546
12	L039	CELLULITIS UNSPECIFIED	520
13	J449	COPD UNSPECIFIED	507
14	I500	CONGESTIVE HEART FAILURE	504
15	T07	UNSPECIFIED MULTIPLE INJURIES	480
16	S9340	SPRAIN AND STRAIN OF ANKLE NOS SITE	479
17	J22	UNSPEC ACUTE LOWER RESPIRATORY INFECTION	466
18	S0180	UNSPEC OPEN WOUND OF OTHER PARTS OF HEAD	456
19	R51	HEADACHE	430
20	M7919	MYALGIA SITE UNSPECIFIED	408

Western Hospital - High Volume Separations

	DRG	Diagnosis Description	Seps	Bed Days	ALOS
1	F74	CHEST PAIN	1,043	1,638	1.6
2	G67	OESOPHAGITIS,GE,MISC DIG SYS	768	1,636	2.1
3	E65	CHR OBSTRUCT AIRWAY DISEASE	689	3,714	5.4
4	E62	RESPIRATORY INFECT/INFLAMMATIONS	682	4,230	6.2
5	X62	POISON/TOX EFF-DRUGS,OTH SUBS	624	1,132	1.8
6	F62	HEART FAILURE & SHOCK	574	3,311	5.8
7	G66	ABDOMINAL PAIN/MESENTERIC ADENITIS	562	757	1.3
8	F72	UNSTABLE ANGINA	523	1,591	3.0
9	X60	INJURIES	504	866	1.7
10	B70	STROKE	462	4,964	10.7
11	F60	CIRC DIS W AMI NO INV CARD INV PROC	420	2,294	5.5
12	L63	KIDNEY & URINARY TRACT INFECTIONS	351	1,633	4.7
13	L64	URINARY STONES AND OBSTRUCTION	347	550	1.6
14	F71	NON-MAJ ARRHYTHMIA+CONDUCT DIS	343	989	2.9
15	I68	NSURG NECK,BACK W PAIN MAN PR/MYELOGRAM	325	946	2.9
16	B76	SEIZURE AGE>2	322	928	2.9
17	J64	CELLULITIS	320	1,520	4.8
18	E69	BRONCHITIS AND ASTHMA	284	855	3.0
19	B77	HEADACHE	278	322	1.2
20	F73	SYNCOPE & COLLAPSE	277	701	2.5

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