

Department of Health

health

# A framework for emergency surgery in Victorian public health services



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Thanks to the following working group members for their contribution:

Associate Professor Daryl Williams – Melbourne Health  
Ms Cath Cronin – Alfred Health  
Mr Martin Smith – Eastern Health  
Associate Professor Elton Edwards – Alfred Health  
Mr Frank Miller – Northeast Health Wangaratta  
Ms Paula Foran – South West Health Care Warrnambool  
Associate Professor Melinda Truesdale – Melbourne Health  
Associate Professor Bob Spychal – Peninsula Health  
Associate Professor Nerina Harley – Melbourne Health  
Professor David Watters – Barwon Health  
Professor Russell Gruen – Alfred Health  
Mr Dhan Thiruchelvam – St Vincent's Health and Eastern Health  
Mr Denis O'Leary – Peninsula Health  
Dr Martin Lum – Department of Health  
Mr Mark Gill – Department of Health  
Mr Terry Symonds – Department of Health  
Ms Sue O'Sullivan – Department of Health  
Ms Sandy Bell – Department of Health  
Ms Lisa Clough – Department of Health

If you would like to receive this publication in an accessible format please phone 03 9096 1287 using the National Relay Service 13 36 77 if required, or email: [Angela.Thiel@health.vic.gov.au](mailto:Angela.Thiel@health.vic.gov.au)

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# Purpose

The availability of timely and high-quality emergency surgery is critical to the functioning of the public health system and is a high priority for the Victorian community.

The framework has been developed by the department in collaboration with the Emergency Surgery Working Group, a sub-group of the Ministerial Advisory Committee on Surgical Services and other key stakeholders.

Implementing continuous improvements and innovation in health services is a priority area of the *Victorian Health Priorities Framework 2012–2022: Metropolitan Health Plan*. The framework contains broad principles that underpin the delivery of safe, high-quality emergency surgical services. These principles have been drawn from published research, expert opinion and the advice of clinical experts on the ESWG. The framework aims to share this up-to-date information and identifies a number of key activities that will assist health services to optimise the quality of their emergency surgery services.

The framework will inform the development of future emergency surgery initiatives, particularly in relation to access, health service capacity and capability and planning for emergency surgery demand.

# Defining emergency surgery

In Victoria, emergency surgery is generally defined as the provision of a surgical procedure which, in the opinion of the treating clinician, is necessary and admission for which cannot be delayed. Emergency surgery is often about saving lives, organs and limbs. Examples of conditions that may require emergency surgery include:

- trauma, including broken bones and blunt penetrating head, chest and abdominal injuries
- gastrointestinal haemorrhage compromising the patient's blood supply
- strangulated hernia
- acute appendicitis
- emergency caesarean section.

Emergency surgery also encompasses other types of urgent surgery for which there are potential threats and risks to quality of life, such as fractured neck of femur.

Following a review of literature and consultations with expert stakeholders, the following definition was agreed for emergency surgery in Victoria:

## **Emergency surgery**

'Surgery where, in the opinion of the treating clinician, the admission or procedure cannot be delayed. This is inscribed with varying degrees of urgency'

The definition of emergency surgery used for the purpose of the framework has some crossover with the definition of elective surgery. In Australia, elective surgery is commonly defined as surgery that, in the judgement of a specialist, is necessary and admission for which can be delayed for at least 24 hours.

An example of the intersection between emergency and elective surgical practice exists in instances where patients arrive at the hospital in an unplanned manner and require surgery within the following week. Often it may be safe for these patients to be sent home and return for admission via an elective surgery pathway within the seven-day timeframe. Another example can be found in cases where patients are admitted to hospital under a non-surgical specialty and are then found to require unplanned surgery.

The definition of emergency surgery used in this framework deliberately includes these groups of unplanned patients because the challenges of surgical scheduling for these groups are similar to more urgent emergency patients. Moreover, these groups are often accommodated via the same processes and resources that are used for urgent emergency surgery patients.

A set of definitions used in relation to emergency surgery has been developed and is outlined below in Table 1.

**Table 1: Definitions relating to emergency surgery**

<b>Term</b>	<b>Definition</b>
Emergency surgery	Surgery where, in the opinion of the treating clinician, the admission or procedure cannot be delayed. This is inscribed with varying degrees of urgency.
Standard-hours surgery	In most hospitals, the standard-hours operating period is between 8 am and 5 pm Monday to Friday. There are minor variations in start or finish times between hospitals.
Twilight sessions	Some hospitals have extended operating hours to 8 pm or 10 pm. These are often referred to as twilight sessions.
After-hours surgery	In most hospitals, after-hours surgery occurs between 5 pm and 12 am Monday to Friday and all weekend.
Night-time hours	In most hospitals, the hours between 12 am and 8 am Monday to Friday are considered night-time hours.
Elective surgery	The Australian Institute of Health and Welfare National health data dictionary (2008) defines elective surgery as 'surgery that, in the opinion of the treating clinician, is necessary and admission for which can be delayed for at least twenty-four hours'.



# The Victorian context

Analysis of the data on emergency surgery in Victoria shows that:

- in 2010–11, 24 per cent (58,546 separations) of acute public hospital surgical separations were emergency surgery cases
- in 2010–11, 87 per cent of all emergency surgery was performed in the public sector
- at some large metropolitan health services, the proportion of emergency surgery admissions has been as high as 38 per cent
- over the last five years health services in Victoria have experienced steady growth in emergency surgery demand
- growth is greatest in metropolitan health services
- at a specialty level, the greatest growth has been in general surgery, neurosurgery and plastic surgery
- over the last five years, tertiary health services have treated more complex emergency surgery patients
- there has been a gradual decrease in length of stay for emergency surgery separations at most Victorian health services.

Some of the factors contributing to the increased demand for emergency surgery are:

- a rise in chronic and complex illnesses
- a growing and ageing population
- a rise in rates of trauma
- the development of new surgical treatment options from advances in medical technology.

More detailed descriptions of trends in the provision of emergency surgery are documented in Appendix 1.

The work of surgical services in Victoria is underpinned by a suite of documents which set directions for provision of clinical services more broadly. These documents include:

*Victorian clinical governance policy framework: a guidebook* (Department of Health 2009b)  
[www.health.vic.gov.au/docs/doc/Victorian-clinical-governance-policy-framework](http://www.health.vic.gov.au/docs/doc/Victorian-clinical-governance-policy-framework)

*Promoting effective communication among healthcare professionals to improve patient safety and quality of care* (Department of Health 2010b)  
[www.health.vic.gov.au/qualitycouncil/downloads/communication\\_paper\\_120710.pdf](http://www.health.vic.gov.au/qualitycouncil/downloads/communication_paper_120710.pdf)

*Victorian Health Priorities Framework 2012–2022: Metropolitan Health Plan*  
(Department of Health 2011d) [www.health.vic.gov.au/healthplan2022/](http://www.health.vic.gov.au/healthplan2022/)

The emergency surgery framework has been developed to complement these resources.

# Principles underpinning provision of emergency surgical services

The department encourages health services to consider applying the following nine principles to the delivery of emergency surgical services in Victoria. The principles are relevant to all emergency surgical services in Victorian public hospitals, including all surgical specialties. These principles have been drawn from published research, expert opinion and the advice of clinical experts on the ESWG.

- 1. Emergency surgery demand, access and performance is routinely measured by health services.**
- 2. Balancing access to elective and emergency surgery is integral to optimal patient care and health service performance.**
- 3. Emergency surgery capacity is matched to demand, and where demand necessitates, elective and emergency surgery streams are separated.**
- 4. Where clinically appropriate, emergency surgery is scheduled in standard hours.**
- 5. Emergency surgical services are consultant-led.**
- 6. Health service policies and processes for emergency surgery use a single statewide system for urgency categorisation.**
- 7. Health services have local escalation plans to support optimal team communication, resource utilisation and conflict resolution to support prompt access to surgery.**
- 8. Health services use common emergency surgery measures for benchmarking and continual service improvement.**
- 9. Health services have local policies and processes for communication with patients and families. This includes information about consent.**

While applying these principles to the delivery of emergency surgery services, enough flexibility needs to be maintained to respond to the needs of local communities, organisational arrangements and priorities.

Positive leadership from senior medical, nursing and management staff will be required to facilitate the adoption of these principles. These staff will be important leaders of change to drive local innovation and service-delivery improvements. Health services can also draw on a range of multi-dimensional strategies available through redesign, service improvement and clinical safety resources to implement the above principles.

The department will work closely with health services to implement the framework. The ESWG will guide and oversee the implementation of key strategic elements of the framework. In addition, the department will engage with individual health services to support implementation of the key activities required to further enhance the quality of emergency surgery services.

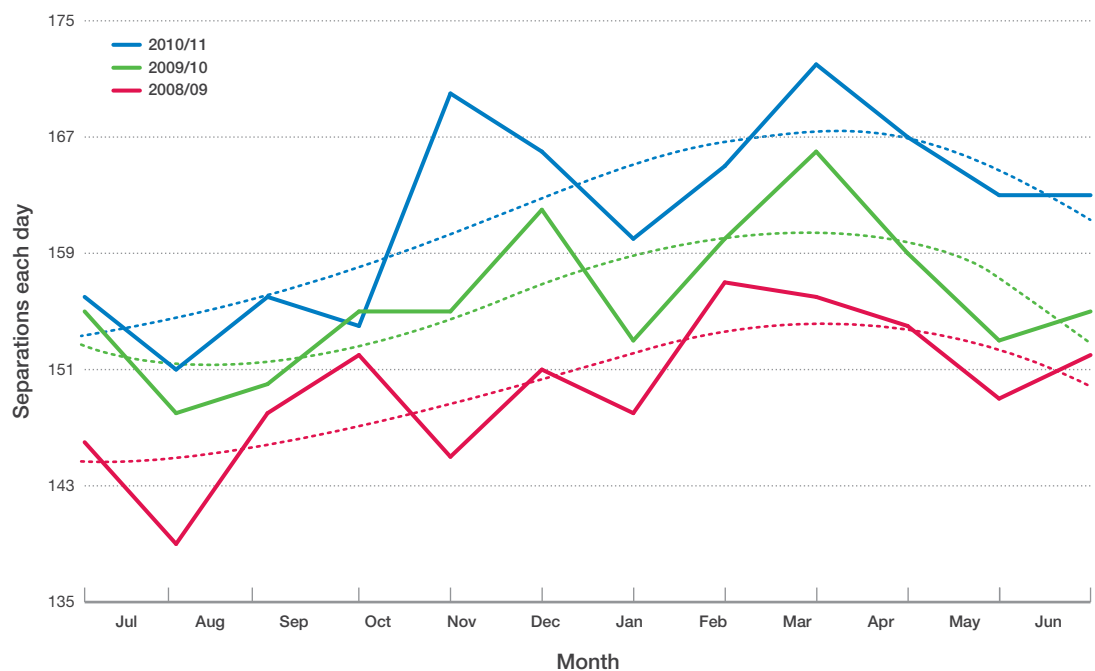
# Translating principles into practice

## Principle 1: Emergency surgery demand, access and performance is measured by health services routinely.

A number of studies in Australia have confirmed that emergency surgery demand is measurable, and at a statewide and local health-service level the demand is predictable, with peaks and troughs in activity occurring at similar times of the year, days of the week and times of the day. Additionally, at a health-service level, emergency surgery demand shows less variability over consecutive years when compared to elective surgery. The predictable nature of emergency surgery means that health services can plan for emergency surgery demand and design models of care that effectively address this demand.

Although the overall demand for emergency surgery has increased, Figures 1 and 2 demonstrate the consistency in demand for emergency surgery in Victoria. Figure 1 shows consistent patterns of the volume of emergency surgery occurring from 2008/9 to 2010/11, with peaks and troughs occurring at similar times each year. This predictability in demand also occurs at a health-service level, however it may be more variable at the speciality-unit level.

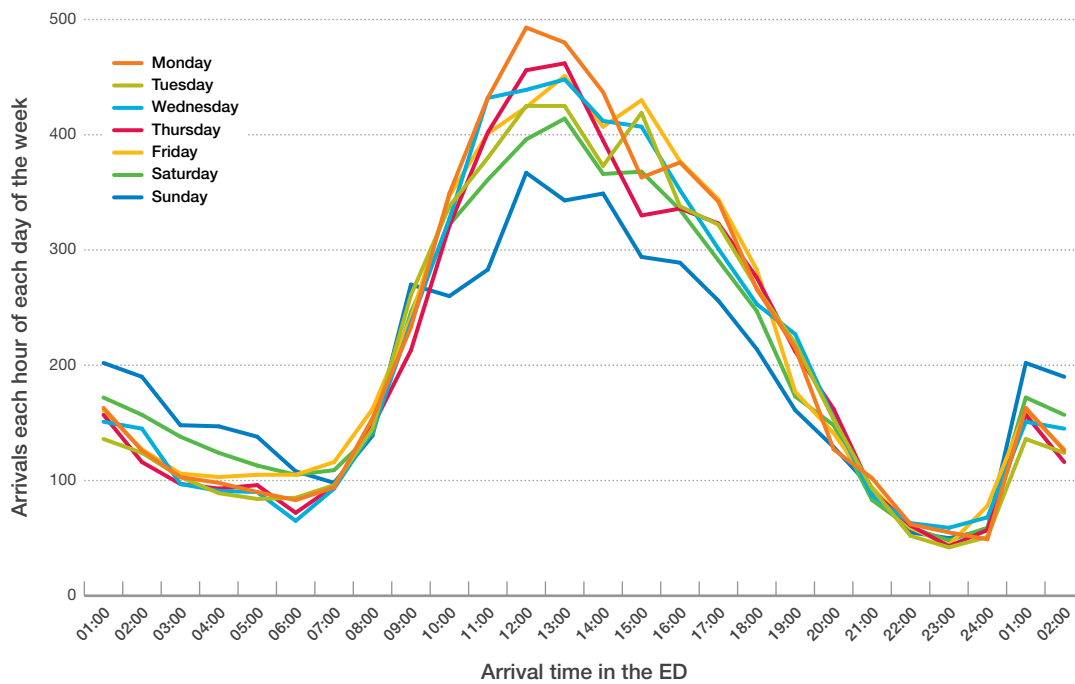
**Figure 1: Volume of emergency surgery performed in Victoria by month, 2008/9 to 2010/11**



Patients requiring emergency surgery come from many sources, such as transfers from other hospitals, inpatient wards, transfers from specialist clinics, elective surgery cases with complications, or presentations to the emergency department (ED). The most common pathway is presentation to the ED.

The number of emergency surgery arrivals via the ED is fairly consistent across all seven days of the week, with emergency surgery patients consistently arriving in the ED at around midday on each day of the week (Figure 2). One-third of all emergency surgery patients present to the ED between 10 am and 2 pm, with nearly 60 per cent presenting between 8 am and 4 pm.

**Figure 2: Volume of emergency surgery patient arrivals in the ED, by time of day and day of the week**



Health services can use ED data to increase understanding of emergency surgery demand and plan for this demand accordingly. However, the management of emergency surgical services requires consideration of challenges along the entire patient journey, from initial presentation at hospital through to transfer of care.

**Key activities and next steps:**

- Systematically collect and analyse ED data in order to understand emergency surgery demand and its impact on elective surgery and ED performance.
- Plan and allocate health service resources to meet anticipated demand.

## Principle 2: Balancing access to elective and emergency surgery is integral to optimal patient care and health service performance.

*Patient-centred surgery: strategic directions for surgical services in Victoria's public hospitals 2010–15* (Department of Health 2009a) identifies the issues in managing the often competing demands of emergency and elective surgery and the current constraints in delivering timely emergency surgery. The document reflects the whole surgical journey, which includes the patient referral, assessment, treatment and recovery processes, and outlines reform directions for emergency and elective surgical services.

It is important to note that emergency surgery demand has direct flow-on effects to other areas of a health service, such as elective surgery, the intensive care unit and the ED. Any service-delivery model for emergency surgery needs to take into consideration these interrelated areas. Performance targets in interfacing areas such as the ED and elective surgery can impact on access to emergency surgery.

A key challenge encountered by health services is balancing elective and emergency surgery demand while ensuring optimal patient care and health service performance. If the allocation of operating theatre time for emergency surgery does not correlate with demand for it, this may have an unintended negative impact on elective surgery performance due to postponements and longer waiting times.

In many health services, both elective and emergency caseloads share the same operating theatres, surgeons and teams. In these situations, elective and emergency surgery are inherently linked in spite of the differences between the patient caseloads. A balanced approach in the provision of emergency and elective surgery can facilitate improved access, and result in improved patient outcomes, decreased cancellations of elective and emergency surgery, shorter waiting times and reduced rates of emergency surgery being undertaken after-hours.

There is no one-size-fits-all approach to determining the appropriate model of care. Balancing the two streams of surgery in a health service needs to be considered in light of local capacity, demand and constraints. The department does not allocate specific funding for emergency surgery to health services. Health services are responsible for allocating funds internally to procedures or clinical areas, such as emergency surgery, in response to changing demands. This funding model allows clinical decisions to be made at the local level.

### Key activities and next steps:

- Improve the utilisation of operating theatres and other high-cost assets and infrastructure by matching capacity with demand.
- Develop tools for prioritising elective and emergency surgery patient groups within and between clinical specialities.
- Minimise non-operating time through efficient patient turn-around.
- Design surgical rosters to take account of both elective and emergency commitments.
- Improve access to support services such as radiology and pathology.
- Minimise multiple cancellations of emergency surgery cases.
- Consider the infrastructure required for emergency and elective surgery when redeveloping existing facilities or developing new facilities.

### Principle 3: Emergency surgery capacity is matched to demand, and where demand necessitates, elective and emergency surgery streams are separated.

Increased demand and complexity mean managing emergency surgery poses a number of challenges for the healthcare system. Emergency surgery models of care need to be flexible so that services can respond to change over time.

One way of minimising the impact of emergency surgery on elective surgery is to separate the two streams, either physically or administratively. This allows for a high volume of elective procedures to be undertaken without cancellations or delays due to emergency surgery demand. Separating elective and emergency surgery is accepted internationally as a way of improving access. Staff can plan a more efficient program of surgery while providing greater certainty to patients.

The National Health and Hospitals Reform Commission (2009) has reported that separating elective from emergency surgery in purpose-built centres is a way for public hospitals to gain efficiencies in the provision of surgical services. In a recent paper, *Surgery futures: a plan for Greater Sydney*, NSW Health reported an 'increase in both procedural and patient-flow efficiencies of 10 to 20 per cent' in sites that separated elective and emergency surgery. Victorian health services have also shown improvement in surgery performance since quarantining elective and emergency surgery. This can be demonstrated by reductions in postponements, length of stay and patients waiting longer than clinically recommended.

Victoria has funded two purpose-built, stand-alone elective surgery centres at Alfred Health and Austin Health. Alfred Health established the Alfred Centre in 2007, which is a separate theatre suite used to treat elective surgery patients, connected to the main campus via a walkway. A slightly different model operates at Austin Health, which has dedicated one of its two hospital campuses to elective surgery only. By removing elective surgery from the main campuses, Alfred Health and Austin Health have been better able to manage their respective emergency surgery loads. For health services with high surgical demand, this can be an effective strategy for balancing elective and emergency surgery streams. This approach may not be warranted at health services with lower levels of emergency surgery demand, where administrative separation may be more appropriate. It is important that administration procedures are complementary and not duplicated when elective and emergency surgical streams are separated.

Where caseloads are high in particular specialties (such as orthopaedics, general surgery, obstetrics or plastic surgery) it may be appropriate for health services to allocate specific operating theatre times for emergency cases in these specialties (based on the level of demand and available surgical capacity).

#### Key activities and next steps:

- Systematically collect and analyse surgery data to determine if demand necessitates separating emergency surgery and elective surgery streams, either physically or administratively.
- Identify and develop good practice in the management of elective and emergency surgery, including potential new models of care and workforce organisation for high-volume conditions requiring surgery.
- Support clinicians to access and apply evidence about surgical procedures and models of care.
- Evaluate the separation of elective and emergency surgery streams regularly to build an evidence base for effective delivery of both elective and emergency surgery.

## Principle 4: Where clinically appropriate, emergency surgery is scheduled in standard hours.

Health services may perform emergency surgery out of hours in an effort to reduce the impact of emergency surgery cases on scheduled elective cases, particularly where resources are fully utilised. However, out-of-hours surgery is often associated with higher risks to the facility.

There is evidence that prolonged hours of work and work at night carry a greater risk of undermining surgical performance and further increase the risk of serious errors that can lead to death or serious morbidity. In recognition of the potentially serious consequences of fatigue, the Royal Australasian College of Surgeons (2007) developed guidelines for safe working hours. These guidelines include on-call and shift rostering, handover, and the responsible management of stress and fatigue. The Royal Australasian College of Surgeons Divisional Group of Rural Surgery (2005) identified that continuous working periods greater than 14 hours, and a lack of sufficient breaks during and between work periods, will increase the risk of fatigue and fatigue-related errors.

In order to assist hospitals and staff to measure the risks associated with their work hours, the Australian Medical Association (2005) published guidelines around safe working hours for doctors working in hospitals. These guidelines incorporate a risk-assessment checklist for surgeons.

One of the key principles of the emergency surgery framework is that where clinically appropriate, emergency surgery should be scheduled in standard hours. Any re-alignment of operating theatre templates should incorporate performing as much emergency surgery within standard hours as possible. Due to the nature of emergency surgery, there will always be a proportion of complex life-, limb- or organ-saving emergency surgery that must occur at night (Faiz et al. 2007). Emergency surgical services need to recognise and incorporate this need. However, other emergency surgical cases are best performed during standard hours.

Evidence from New South Wales and Western Australia indicates that the establishment of specific emergency surgery models which incorporate dedicated in-hours surgeons and access to dedicated in-hours operating theatre time has led to improved time to assessment in the ED, faster admission, faster time to surgery, decreased number of elective surgery hospital-initiated postponements due to emergency surgery, and decreased length of stay (Parasyn et al. 2009; Cox et al. 2010).

Evidence from these same jurisdictions has also shown that bringing emergency surgery into standard hours is clinically safe, cost-neutral and may even save money for the organisation in the long term (Parasyn et al. 2009; Cox et al. 2010). Necessary out-of-hours emergency surgery must be balanced with safe working hours, and health services should instigate operational strategies to manage this balance.

### Key activities and next steps:

- Redesign operating theatre templates to schedule as much emergency surgery as possible within standard hours.
- Monitor theatre data to review patterns of theatre use and to demonstrate reforms to bring surgery within standard hours.
- Support clinicians to access and apply evidence about emergency surgery management of patients and overall models of care to support more surgery being undertaken within standard hours.

## Principle 5: Emergency surgical services are consultant-led.

Evidence suggests that effective emergency surgery models of care are contextually appropriate and based on principles of consultant leadership.

The value of consultant-led emergency care is well recognised and supported by evidence (Parasyn et al. 2009). The benefits of consultant leadership include:

- more accurate and timely decision making
- reduction in unnecessary clinical investigations
- greater trainee supervision and sharing of expertise
- better access to day-time emergency surgery (where designated in-hours operating theatre time is available) and less night-time surgery
- a potential for more cost-effective decision making and financial savings within the health service
- increased staff satisfaction.

It is important to note that clinical leadership does not refer exclusively to surgical staff. Senior medical staff and senior nursing staff are very important in the provision of effective emergency surgical services. For example, a number of health services in Victoria use the leadership of senior anaesthetists to determine the scheduling of emergency surgery cases when several patients of the same clinical priority require surgery.

The Acute Surgery Unit is a model of consultant-led emergency surgery service delivery that has been established in a number of health services in Australia. These health services have reported benefits such as those outlined above. Acute Surgery Unit models vary slightly according to local requirements, however common features include:

- a consultant rostered on for a period of at least 24 hours, including being on-site in standard hours to provide clinical support for all stages of patient care
- a formalised handover process with information based on a standard set of key principles
- dedicated emergency theatre sessions in standard hours
- a consultant being present when surgery is being performed for teaching and supervision purposes
- agreed clinical guidelines or protocols for common emergency surgery admissions
- designated Acute Surgery Unit beds for assessment and management.

Contextual constraints of individual health services mean that different consultant-led models of care will be appropriate at different health services. Strategies to improve emergency surgery services sit alongside, and should be complemented by, a range of infrastructure initiatives and new operational models of emergency care.

### Key activities and next steps:

- Engage lead clinicians to investigate the feasibility of establishing a consultant-led emergency surgery service.
- When considering a consultant-led model of care, health services should consult with health services that have already established consultant-led models to learn from their experience.
- Where a consultant-led model is to be introduced, health services should:
  - support a reorganisation of both the model of care and the working arrangements of medical staff
  - establish health service agreement about theatre and bed access
  - build clinical guidelines for common procedures over time.



## Principle 6: Health service policies and processes for emergency surgery use a single statewide system for urgency categorisation.

The clinical urgency of a case underlies every decision about priority for emergency surgery. These decisions take place in a high-pressure environment that involves non-negotiable time stress, with potential for major personal consequences and adverse patient outcomes (Fitzgerald, Lum & Dadich 2006). Each patient's priority must be considered alongside that of others awaiting emergency surgery, as cases often require rescheduling to make way for those deemed more urgent.

Standardised categories of clinical urgency would facilitate consistent decision making and reconcile differences in professional opinions relating to patient priority (Fitzgerald, Lum & Dadich 2006), thereby contributing to quality patient care.

A single statewide system for emergency surgery urgency categorisation will improve the consistency of decision making across the state, improve communication regarding the relative urgency of patients, and improve the allocation of theatre resources within health services. Furthermore, a single system enables benchmarking across similar health services in Victoria.

The six-level emergency surgery urgency categorisation system documented in Appendix 2 includes indicative time from booking to arrival in the operating suite. This system is based on the current system used in a number of health services in Victoria and in New South Wales (NSW Health 2009). Within this system, there is the opportunity for health services to include more detailed descriptions as required. At health services where obstetric cases share operating theatre resources with other surgical specialties, emergency surgery urgency categorisation should include obstetrics.

### Key activities and next steps:

- Adopt the six-level emergency surgery urgency categorisation system documented in Appendix 2.
- Monitor health service activity against the assignment of urgency categories and patient treatment times.
- Evaluate models of care in relation to the urgency categorisation system and build an evidence base for effective delivery of emergency surgery.

## Principle 7: Health services have local escalation plans to support optimal team communication, resource utilisation and conflict resolution to support prompt access to surgery.

Emergency surgery patients often have complex and challenging problems. These patients can present at any time of the day or night, regardless of staffing levels. The management of emergency surgery must take into account unique threats to life, limb and organ function. In many cases, these threats increase with the passage of minutes and hours.

A number of electronic tools exist for communicating about emergency surgery cases. The most commonly used system in Victoria is the emergency theatre booking system, which allows real-time scheduling, increased transparency of patient bookings, better patient tracking systems and data collection.

Clinical guidelines (also known as clinical protocols) provide a comprehensive care path for surgical teams and aim to ensure routine management for the majority of patients. Clinical guidelines facilitate consistent management of emergency surgery patients but do not replace active clinical judgement, which is required to determine when a clinical guideline is appropriate or when variation in care is required. Clinical guidelines provide an effective and efficient system for monitoring and recording variances in care for the purpose of reviewing and improving patient care (Earley et al. 2006; Tallis & Balla 1995).

Clinical handover is an essential component of all surgical care, including emergency surgery. The Victorian Surgical Consultative Council has developed guidelines for clinical handover (see <[www.health.vic.gov.au/vscc/practice-statements.htm](http://www.health.vic.gov.au/vscc/practice-statements.htm)> for details). Additionally, the Australian Commission on Safety and Quality in Healthcare (2010) has developed the *Organisational leadership, simple solution development, stakeholder engagement, implementation and evaluation and maintenance (OSSIE) guide to clinical handover improvement*. This guide is designed to assist organisations to implement a standardised process for handover that is customised to the local context (see <[www.safetyandquality.gov.au](http://www.safetyandquality.gov.au)> for details). Clinical handover processes have been incorporated into Acute Surgery Units and have been found to aid informal peer review and improve communication between staff.

The key features of an effective governance structure for emergency surgical services are:

- a clear statement of roles and responsibilities
- clear delegations and line management
- participation in quality assurance systems.

Health services have a responsibility to ensure that all services provided to patients are safe, appropriate and within the capability and role of the service (Department of Human Services 2009). Credentialing and defining scope of practice is a mechanism by which the community can be assured that a competent workforce is providing their care (Department of Human Services 2007).

A useful checklist to guide the delivery of safe surgical services has been developed by the World Health Organisation and has been adapted for the local context by the Australian and New Zealand surgical community. This checklist can be found at: [www.anzca.edu.au/resources/endorsed-guidelines](http://www.anzca.edu.au/resources/endorsed-guidelines)

**Key activities and next steps:**

- Consider the use of emergency surgery theatre booking systems to identify and prioritise emergency surgery patients.
- Use clinical guidelines to facilitate consistent emergency surgery patient management.
- Implement standardised clinical handover processes.
- Develop an effective governance structure for emergency surgery to support clinicians to make decisions about clinical prioritisation and to enable escalation where required.

## Principle 8: Health services use common emergency surgery measures for benchmarking and continual service improvement.

The capacity to monitor and evaluate performance is a critical building block for system-wide improvement of healthcare delivery and improved patient outcomes. To inform ongoing service improvement and enable standardised measurement of emergency surgery performance for benchmarking across similar health services, a set of timestamps (Tables 3 and 4) and measures has been developed. Definitions of timestamps are provided to ensure consistency in measurement. These items are based on surveys of Victorian health services and similar work conducted interstate and overseas.

The timestamps in Table 2 allow analysis of the time taken to achieve a definitive treatment decision (using timestamp 1 and 2) and analysis of access to the operating theatre for patients once a definitive plan for surgery is made (timestamps 2, 3 and 4). Timestamps specific to the operating theatre and recovery period (Table 3) allow identification of times and time intervals related to the procedure in theatre, rather than the process of accessing the required procedure (Table 2).

**Table 2: Timestamps for measurement of emergency surgery access**

Timestamp	Definition
<b>1. Patient arrival in the emergency department</b>	Time the patient was first registered or triaged (whichever comes first) by a clerical officer, triage nurse or doctor in the ED. This is consistent with the Victorian Emergency Minimum Dataset (VEMD) definition (Department of Health 2011c), and is the closest reliable measure for when a patient arrives in the ED.
<b>2. Time of surgery booking</b>	Time that the booking for surgery is entered in the theatre booking system. This provides a proxy measure for the time that the decision for surgery was made.
<b>3. Patient arrival in operating theatre</b>	Time when the patient arrives in the anaesthetic bay, or if there is no anaesthetic bay, the time when the patient arrives in the operating theatre or procedure room.
<b>4. Procedure start time</b>	Time when the procedure is begun (for example, incision for a surgical procedure, insertion of scope for a diagnostic procedure). This is consistent with the Victorian Admitted Episodes Dataset (VAED) definition (Department of Health 2011b).

**Table 3. Additional operating theatre timestamps**

Timestamp	Definition
<b>Anaesthetic start</b>	Time when anaesthetist begins preparing the patient for an anaesthetic.
<b>Position or prep start</b>	Time when the nursing or surgical team begins positioning or prepping the patient for the procedure.
<b>Procedure or surgery stop</b>	Time when all the instruments and sponge counts are completed and verified as correct; all postoperative radiological studies to be done in the operating or procedural room are completed; all dressings and drains are secured and the surgeons or physicians have completed all procedure-related activities on the patient.
<b>Anaesthetic stop (anaesthetic handover)</b>	Time when anaesthetist hands over care of the patient to a post-anaesthesia care team.
<b>Patient leaves recovery</b>	Time patient leaves recovery.
<b>Time that 'time out' was commenced</b>	Time out is a deliberate pause in activity just before surgery commences. All members of the surgical team verify the following details: <ul style="list-style-type: none"> <li>• presence of the correct patient</li> <li>• type of procedure to be performed</li> <li>• correct procedure site marked</li> <li>• anticipated critical events</li> <li>• availability of required equipment.</li> </ul>

Health services are encouraged to review current timestamps and definitions being used, and to consider incorporation of those outlined in Tables 2 and 3 into local systems. Measurement of the time periods between timestamps may allow identification of particular points of delay in the emergency surgery patient journey.

In addition to the timestamps outlined above, collection and analysis of the following measures of emergency surgery performance is suggested:

- length of hospital stay for index procedures (for example, emergency cholecystectomy, fractured neck of femur, acute appendicitis)
- measurement of after-hours surgical activity (for example, percentage of non-life-, limb- or organ-saving emergency surgery that is performed between 12 am and 7 am)
- percentage of postponements of booked emergency surgery cases that are not due to clinical reasons. This will include cancellations for reasons such as lack of theatre, surgeon, equipment or post-operative bed
- pre-operative waiting time for index conditions (measured from time of arrival in the ED to surgery start time).

It is important to note that these measures should be considered as base measures only, and health services may opt to collect additional measures if they have a specific element of care they wish to monitor. *A guide to surgical services redesign measures for improvement* (Department of Health 2011a) provides an extensive list of possible emergency surgery measures.

Use of consistent timestamps, definitions and measures to monitor trends and performance will allow targeted actions to be undertaken to achieve high standards of emergency surgery care within each health service. Ongoing measurement will allow monitoring of changes in performance over time. Monitoring will also allow health services to benchmark emergency surgery performance with similar health services and to share innovations in service delivery. Consistency in measurement will help ensure that standards of patient safety are uniformly applied across the state.

The *Victorian Audit of Surgical Mortality annual report 2009* (Royal Australasian College of Surgeons 2009) reported that of the audited deaths, delays in referral to a surgical unit were frequently commented on. The majority of surgical deaths in this audited series occurred in elderly patients with underlying health problems, admitted as an emergency with an acute life-threatening condition often requiring surgery.

The most common issues reported were delay in transfer to a surgical unit, inappropriateness of the decision to operate and unsatisfactory pre- or post-operative assessment. It should be acknowledged that a number of these were 'areas of consideration' and were therefore relatively minor criticisms. These findings indicate an opportunity to improve the timeliness of referrals to surgical units. Evidence suggests that consultant-led models, such as Acute Surgical Units, are another possible strategy to address this.

The benefits of sharing innovations in emergency surgery service delivery, models of care and benchmarking performance across health services was identified in the literature review which informed the development of this framework. The *Good practice in management of emergency surgery: a literature review* (Department of Health 2010a) can be downloaded from: [www.health.vic.gov.au/docs/doc/good-practice-in-management-of-emergency-surgery:-a-literature-review](http://www.health.vic.gov.au/docs/doc/good-practice-in-management-of-emergency-surgery:-a-literature-review)

#### **Key activities and next steps:**

- Review current timestamps and definitions and decide on appropriate measures of emergency surgery performance.
- Systematically collect data to monitor performance and trends to identify areas requiring improvement.
- Evaluate models of care to build the evidence base for the effective delivery of emergency surgery and target actions to address areas requiring improvement.
- Benchmark emergency surgery performance with similar health services to share innovations in service delivery.

## Principle 9: Health services have local policies and processes for communication with patients and families. This includes information about consent.

Health services with effective emergency surgical services demonstrate good communication, which is facilitated through organisational support, systems, resources, policies and processes and regular staff education. Receiving timely and adequate information ensures consent is informed, and assists in preparation of patients for surgery by reducing patient and carer anxiety and providing a more positive experience for patients and carers.

Prior to surgery, patients and their carers should receive information about:

- the surgical treatment and care required
- pre-surgery fasting requirements
- the waiting process for surgery
- the possibility of surgery time being changed if more urgent cases arise.

Information to patients should be provided both verbally and in writing. Written information should be supported with translated material and training for staff and delivered in a culturally sensitive manner.

To improve communication with patients and carers, one health service in Victoria has established an Emergency Surgery Coordinator. The role of the Emergency Surgery Coordinator is to:

- facilitate timely access to emergency surgery by maximising in-hours emergency surgery without negatively impacting on elective surgery throughput
- act as a resource for surgical teams to explore all options available to enable surgery in the right setting as quickly as possible
- act as a conduit between patients, carers, surgeons, anaesthetists and nursing staff to manage patient care
- minimise cancellations of elective surgery patients on the day of surgery due to emergency surgery demand
- investigate patient complaints associated with emergency surgical services
- coordinate the introduction of the emergency theatre booking system.

### Key activities and next steps:

- Support patients to be active partners in their care and provide high quality and accessible information about their emergency surgery.
- Review practices for communicating with patients and carers.
- Provide information both verbally and in writing, including translated material for patients and carers from culturally and linguistically diverse backgrounds.

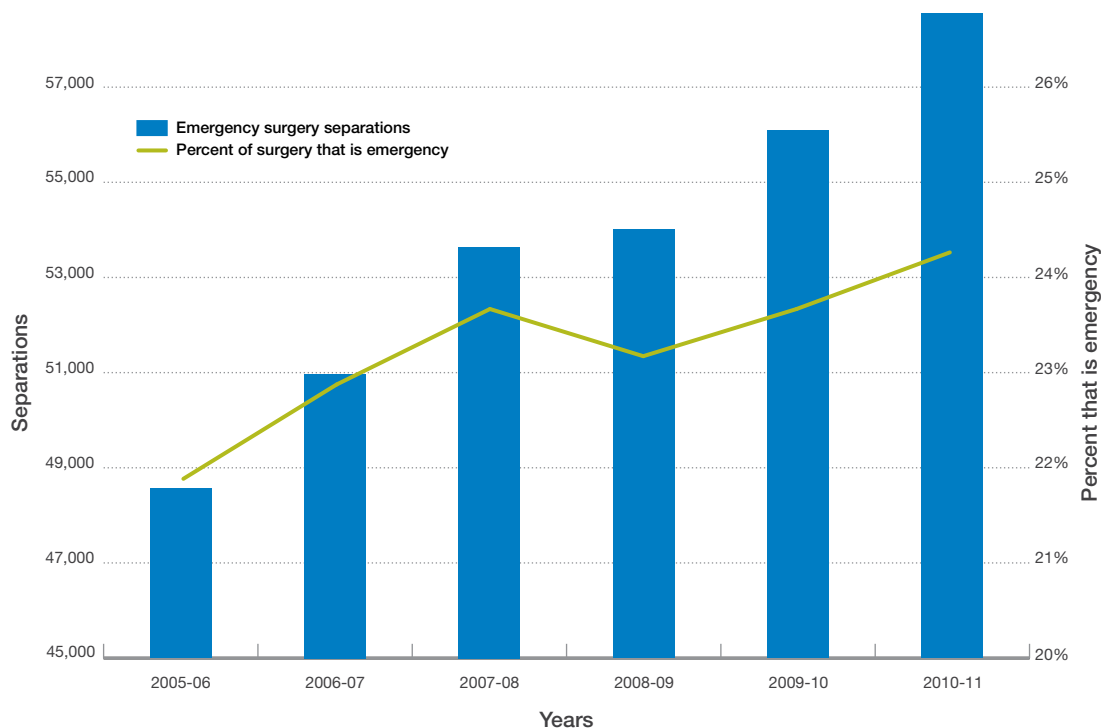
# Appendices

## Appendix 1: Analysis of emergency surgery in Victoria

### Victoria's emergency surgical services

In 2010–11, 24 per cent of acute hospital<sup>1</sup> surgical separations were emergency surgery cases, which equates to 58,546 emergency surgery procedures according to Victorian Admitted Episodes Dataset (VAED) data. At some large metropolitan health services the proportion of emergency surgery admissions can be as high as 38 per cent. Figure 1 shows the proportion of emergency surgery separations in acute public hospitals in Victoria and shows a gradual increase in demand for emergency surgery. In 2010–11, 87 per cent of all emergency surgery procedures performed in Victoria were provided in the public sector.

Figure 1: Proportion of emergency surgery in acute hospitals in Victoria



Two major factors that have led to the growth in demand for emergency surgery have been an ageing Australian population and increasing rates of trauma.

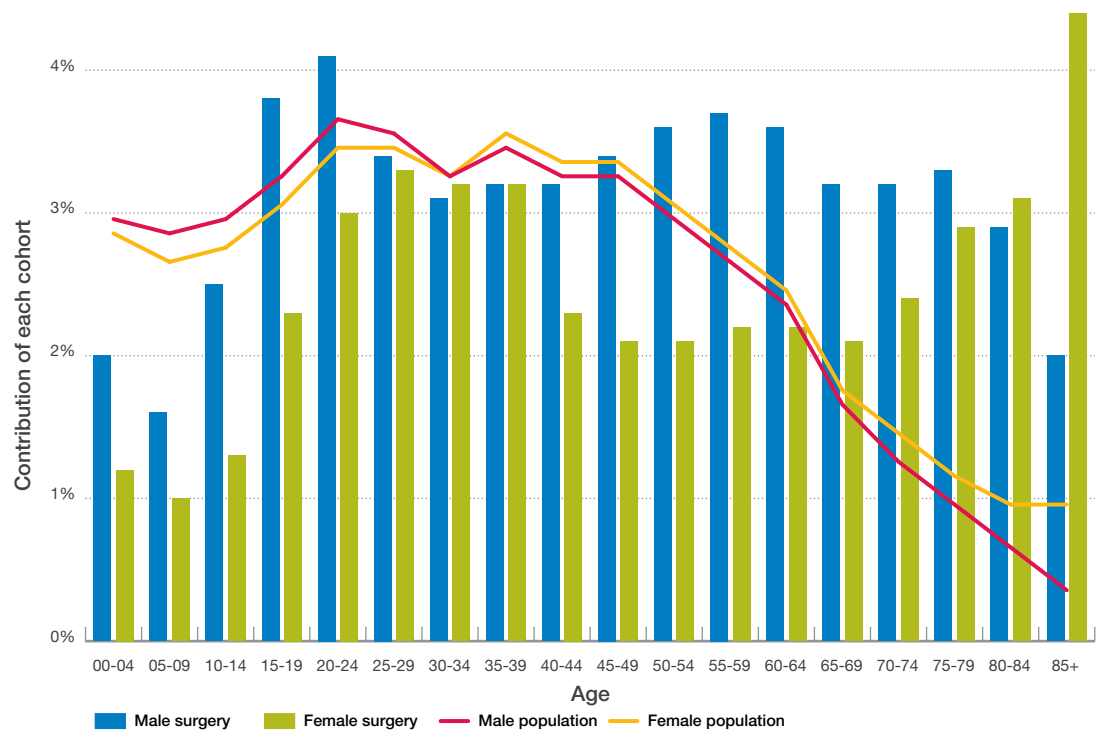
1 An acute hospital is a hospital with an emergency department.



## Ageing and population growth

An important impact of an ageing population is the increase in the number of older patients with higher acuity and multiple comorbidities undergoing emergency surgery. Figure 2 shows that in Victoria, older patients require proportionally more emergency surgery than younger patients.

**Figure 2: Emergency surgery separations by age and gender, with comparison to Victorian population**



## Trauma

Since the Victorian State Trauma Registry (VSTR) has had full statewide coverage, the rate of trauma has increased (Department of Health 2010c). The VSTR recorded 2,646 hospitalised major trauma patients in 2008–09 compared to 2,379 in 2007–08. The overall annual rate of hospitalised major trauma in Victoria was 49 per 100,000 population, compared to 44 in 2007–08, 46 in 2006–07, and 42 in 2005–06. Since 2001–02, there has been an average annual increase in the rate of hospitalised major trauma of 8.0 per cent. While the majority of major trauma cases are typically young people, there has been a substantial increase in cases involving people aged 75 years and over, from 10.3 per cent in 2001–02 to 19.1 per cent in 2008–09. This change could be explained by improved coverage of the VSTR, improvements in case identification, changes in approaches to diagnosis and management in the elderly, and the ageing population (Department of Health 2010c). This is demonstrated by the rise in percentage of hospitalised major trauma patients related to low falls of 24.6 per cent in 2008–09 compared to 19.6 per cent in 2005–06.

For the purposes of analysis, the 58,546 emergency surgery procedures performed in Victoria in 2010–11 have been broken down into four hospital clusters: tertiary, metropolitan, regional and sub-regional (Table 1).

**Table 1: Victorian hospitals by cluster**

<b>Tertiary</b>	<b>Metropolitan</b>
Austin Hospital	Box Hill Hospital
Geelong Hospital	Casey Hospital
Monash Medical Centre – Clayton	Dandenong Hospital
The Royal Children’s Hospital	Frankston Hospital
The Royal Melbourne Hospital	Maroondah Hospital
St Vincent’s Hospital	Mercy Hospital for Women
The Alfred Hospital	Mercy Public Werribee
	The Royal Women’s Hospital
	The Royal Victorian Eye and Ear Hospital
	Rosebud Hospital
	Sunshine Hospital
	Sandringham and District Memorial Hospital
	The Northern Hospital
	Western Hospital
	Williamstown Hospital
<b>Regional</b>	<b>Sub-regional</b>
Ballarat Hospital	Bairnsdale Regional Health Service
Bendigo Hospital	Central Gippsland Health Service
Goulburn Valley Health Care	Echuca Regional Health
Latrobe Valley Health	Hamilton Base Hospital
	Northeast Health Wangaratta
	Mildura Base Hospital
	Swan Hill District Hospital
	South West Healthcare Warrnambool
	West Gippsland Healthcare Group
	Wimmera Base Hospital
	Wodonga Regional Health Service
	Wonthaggi and District Hospital

When considered in these clusters, 84 per cent of emergency surgery is performed by the tertiary and metropolitan hospitals, with 16 per cent being performed by regional and sub-regional hospitals (Table 2). Although Geelong Hospital is usually classified as a regional hospital, data would suggest that for the purposes of this analysis, due to the high numbers of emergency surgery cases, it should be included in the tertiary cluster.

Table 2: Emergency surgery separations by hospital cluster, 2010–11

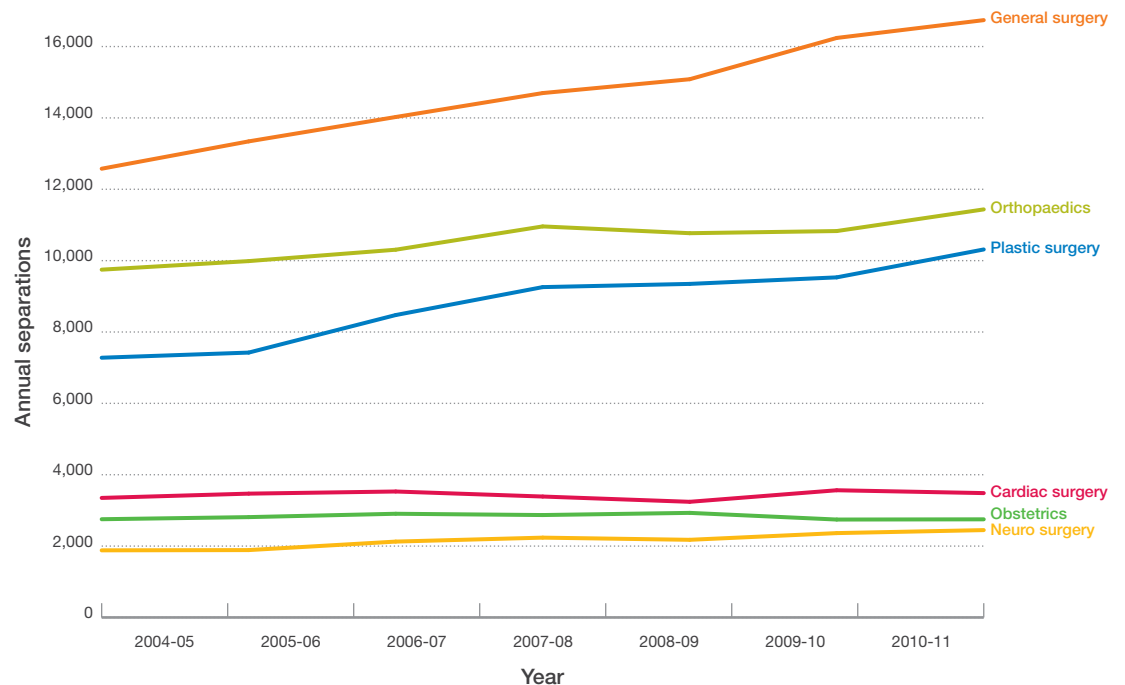
Hospital cluster	Total emergency surgery separations	Contribution to state total
Tertiary	24,154	41.3%
Metropolitan	24,844	42.4%
Regional	5,517	9.4%
Sub-regional	4,031	6.9%

(Peter MacCallum Cancer Centre and Albury Hospital not included).

### Growth in emergency surgery

The greatest volume of emergency surgery is in the specialties of general surgery, orthopaedics and plastic surgery (Figure 3). The greatest growth in emergency surgery over the last five years is demonstrated in the specialties of general surgery, neurosurgery and plastic surgery.

Figure 3: Surgical specialties with highest volume of emergency surgery activity in Victoria, 2006–07 to 2010–11



In Victoria, there has been a steady increase in demand for emergency surgery since 2006–07 (Figures 4 and 5). Data indicates that this growth has been greatest at metropolitan hospitals. Figure 5 shows the growth over five years at the four metropolitan hospitals that had the most number of emergency surgery separations in 2010–11.

Figure 4: Emergency surgery activity by hospital cluster, 2006–07 to 2010–11

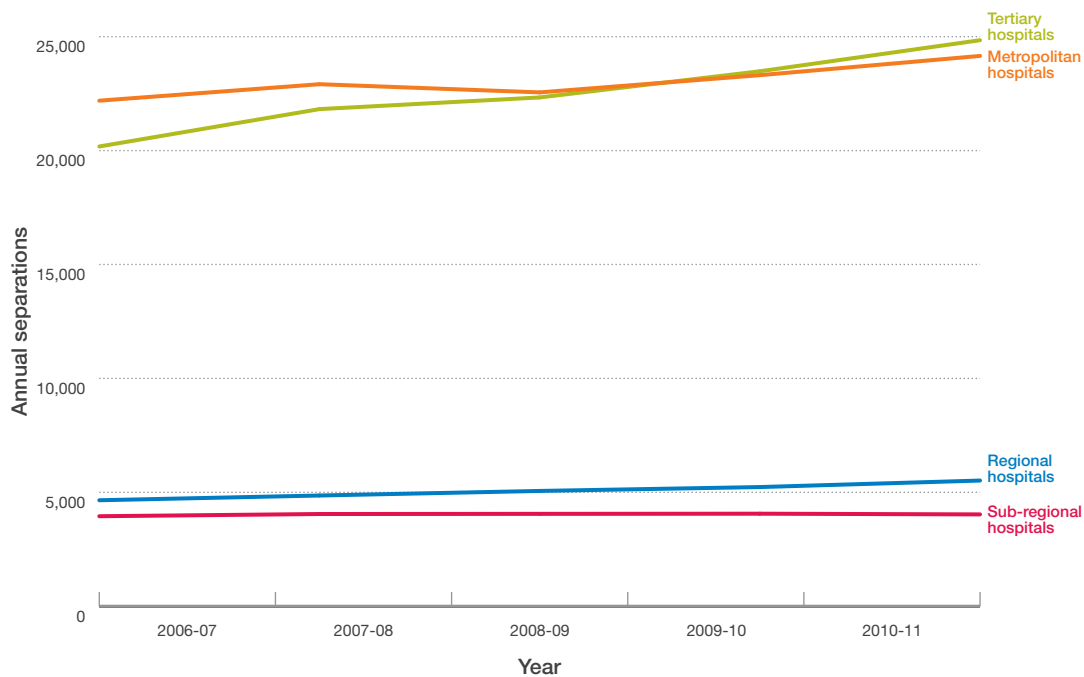
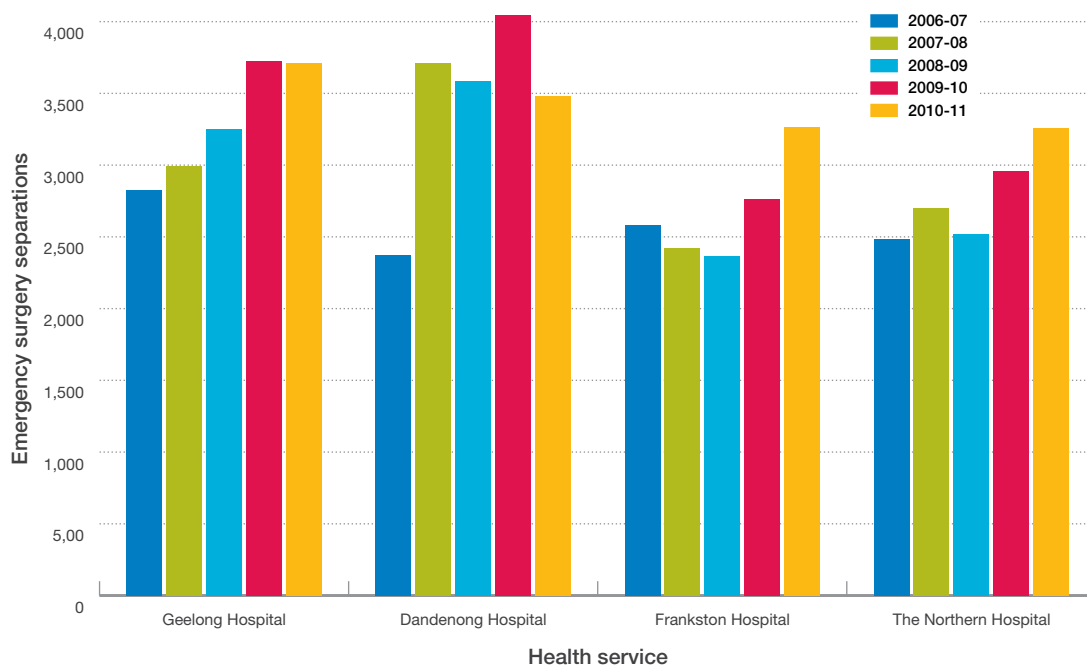


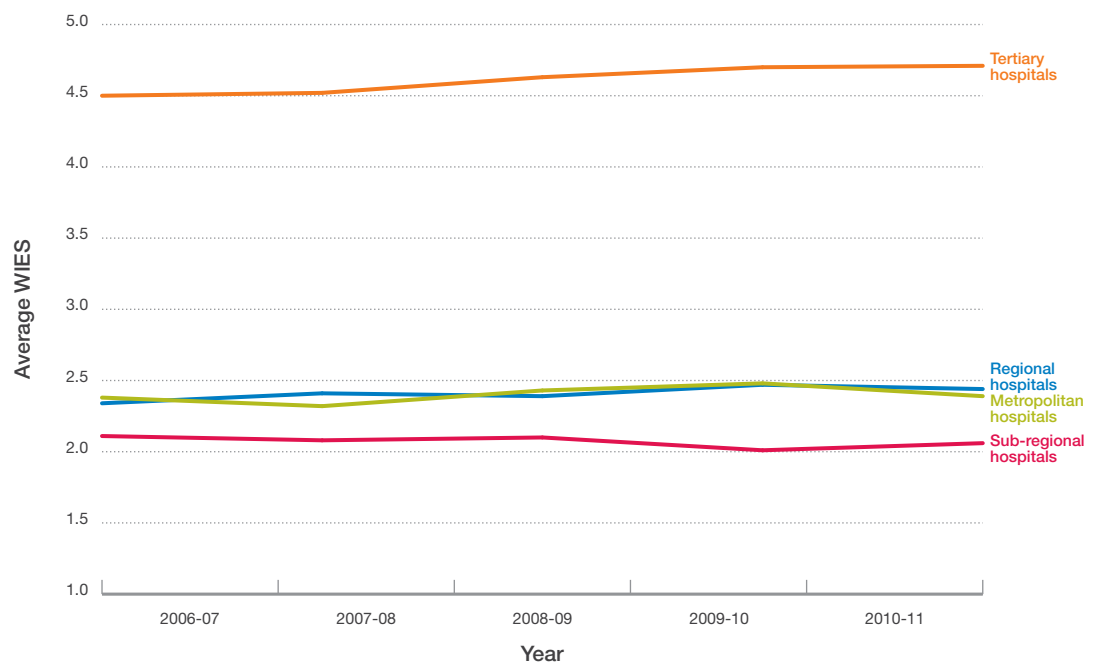
Figure 5: Emergency surgery activity in selected health services, 2006–07 to 2010–11



### Trends in acuity

Data shows that higher Weighted Inlier Equivalent Separation (WIES) weight is distributed to tertiary health services, reflecting the higher complexity of their emergency surgery patients (Figure 6).

Figure 6: Emergency surgery average WIES by hospital cluster, 2006–07 to 2010–11



## Trends in length of stay

Figure 7 demonstrates that for all hospital clusters there has been a reduction in length of stay for emergency surgery since 2006–07.

Figure 7: Emergency surgery length of stay by hospital cluster, 2006–07 to 2010–11

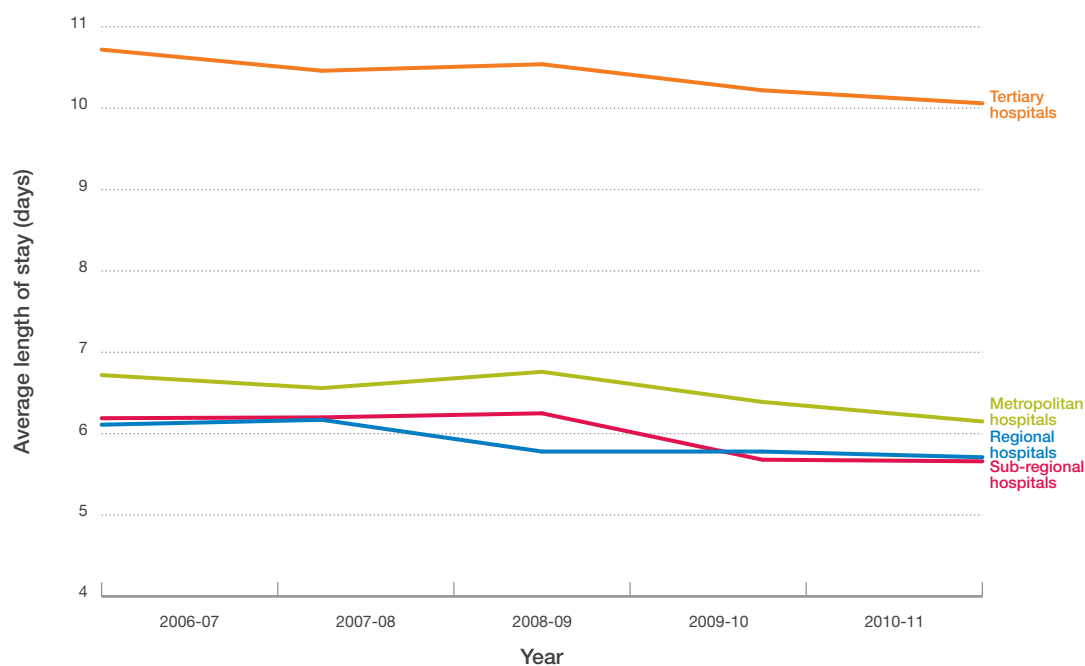


Table 3: Emergency surgery separations, average length of stay and acuity for surgical specialties with the largest volume of separations, 2010–11

Specialty	Emergency surgery separations	Average length of stay (days)	Acuity (average WIES)
General surgery	16,740	7.35	2.53
Orthopaedics	11,436	7.86	2.85
Plastic surgery	10,313	4.31	1.55
Cardiology	3,485	5.39	3.39
Obstetrics	2,750	1.48	0.62
Neurosurgery	2,448	10.57	5.03

Table 3 demonstrates that general surgery accounted for the greatest volume of emergency surgery separations in 2010–11 (16,740 separations). Of the six surgical specialties with the greatest volumes of emergency surgery separations, neurosurgery cases had the longest average length of stay and acuity.

## Appendix 2: Emergency surgery urgency categorisation system

Urgency categories as agreed in stakeholder consultations are outlined in Table 1 below. This document should be read in conjunction with the VAED manual (Department of Health 2011b) and the VEMD manual (Department of Health 2011c) which provide data items, definitions and codes relevant to data submissions to the VAED and the VEMD.

**Table 1: Emergency surgery urgency categorisation system**

Priority level	Timeframe for surgery (time from booking to arrival in operating theatre)	Obstetric cases	Definition
1	< 15 minutes; immediate life-threatening	Category 0 and 1 (includes code green)	<b>Immediate life-threatening</b> The patient is in immediate risk of loss of life, shocked or moribund, resuscitation not providing positive physiological response.
2	< 1 hour; life-threatening	Category 2	<b>Life-threatening</b> The patient has a life-threatening condition, but is responding to resuscitative measures.
3	< 4 hours; organ- / limb-threatening / obstetric morbidity	Category 3	<b>Organ- / limb-threatening / obstetric morbidity</b> The patient is physiologically stable, but there is immediate risk of organ survival or systemic decompensation.
4	< 8 hours; non-critical, emergent	Includes Category 4	<b>Non-critical, emergent</b> The patient is physiologically stable but the surgical problem may undergo significant deterioration if left untreated.
5	< 24 hours; non-critical, non-emergent, urgent		<b>Non-critical, non-emergent, urgent</b> The patient's condition is stable. No deterioration is expected.
6	< 48 hours; semi-urgent, not stable for discharge	Category 5	<b>Semi-urgent, not stable for discharge</b> The patient's condition is stable. No deterioration is expected but the patient is not suitable to be discharged.

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