Formed in 1927, the College is a not-for-profit organisation training surgeons and maintaining surgical standards in Australia and New Zealand. A Fellowship based organisation, the College is committed to ensuring the highest standard of safe and comprehensive surgical care for the community we serve through excellence in surgical education, training, professional development and support. As part of this commitment the College strives to take informed and principled positions on issues of public health.

**Executive Summary**

In most Australian and New Zealand hospitals there is no separation of elective and emergency surgery into two distinct streams. Rather, surgical teams move between the two groups as circumstances dictate.

Category 1 emergency patients, those with life threatening or very serious injuries or illness, are dealt with immediately. Those with less urgent conditions are made to wait while elective surgery is performed.

Successfully implemented, the reforms proposed in this paper can lead to the more efficient use of resources, a more effective workforce and, most importantly, better care of the patient.

There is a compelling argument to separate the two streams of emergency and elective surgery so that each group can be managed in a planned, timely and cost efficient manner. With increasing demand for elective surgery, the need for a new model of surgical care in our hospitals has become a pressing issue.

The separation of elective and emergency surgery, tailored to meet the workload and resources of a given facility, can produce a range of benefits as outlined in the benefits table on page two.

In large metropolitan hospitals consideration should be given to developing models such as the Acute Surgical Unit (ASU). The ASU model has proven an effective means of separating elective from emergency surgery in several major Australian and New Zealand hospitals.

In smaller facilities, notably regional hospitals, separation might simply involve the setting aside of designated operating theatre time for emergency procedures.

Irrespective of the model adopted by a given facility, certain key principles should govern arrangements. This paper outlines these principles and demonstrates how their application has dramatically improved patient care at several local hospitals. Significantly, none of these hospitals has ever reversed the decision to implement this reform.
<table>
<thead>
<tr>
<th>Benefit</th>
<th>Patients</th>
<th>Surgeons</th>
<th>Governments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhanced patient outcomes</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>More rapid assessment and better management of the acute surgical patient</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>More timely care</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>The more efficient throughput of patients</td>
<td>✓</td>
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<tr>
<td>Reduced elective surgery waiting lists, due in part to the more efficient use of operating theatres and in part to fewer hospital admissions</td>
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</tr>
<tr>
<td>Reduced costs due to reduced hospital stays, reduced complication rates and fewer call backs of surgeons</td>
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<td>✓</td>
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<tr>
<td>A more predictable workload with safer and more predictable working hours for surgeons and other health professionals</td>
<td></td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Ongoing peer review of surgeons’ work</td>
<td>✓</td>
<td></td>
<td>✓</td>
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<tr>
<td>Improved surgical training</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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</tbody>
</table>
The need for change

In most Australian and New Zealand hospitals there is no separation of elective and emergency surgery into two distinct streams. Rather, patients are managed, both in theatre and in the wards, according to a similar process and structure, with surgical teams moving between the two groups as circumstances dictate. In the majority of hospitals there is little planned emergency surgery; it is “fitted in” rather than planned and managed with a dedicated suite of resources.

Category 1 emergency patients, those with life threatening or very serious injuries or illness, are dealt with immediately. Generally speaking, however, those with less urgent conditions are made to wait while elective surgery and other activities are performed by surgical teams.

This is partly due to the fact that elective surgery waiting lists are a politically charged issue, with hospital administrations coming under pressure from governments and health departments to achieve established benchmarks for elective surgery waiting times.

Among surgeons there is the perception that emergency work is unplanned, under resourced, undervalued and under remunerated. This has given rise to widespread disenchantment and an increasing unwillingness to do emergency work which, of course, only makes matters worse. This has the potential to become a major workforce issue.

Occasionally this chaotic state of affairs is further complicated by oversubscribed emergency lists, with people waiting several days for surgery. This leads to overcrowding in emergency departments which can in turn lead to ambulance ramping and negative publicity. A shift in emphasis to emergency work to relieve the short term pressure can lead to a failure to meet key performance indicators around elective surgery, leading to longer waiting lists and negative publicity of a different flavour.

There is a compelling argument to separate the two streams of emergency and elective surgery so that each group can be managed in a planned, timely and cost efficient manner. With increasing demand for elective surgery, the need for a new model of surgical care in our hospitals has become a pressing issue.

Cultural change is required

The successful implementation of any model that separates elective from emergency surgery will require a change in surgical and hospital culture. As part of this model, hospitals must realise that they provide a surgical service, not a surgeon. And surgeons must accept that arrangements whereby a single surgeon takes responsibility for a patient, from the moment of admission to the moment of discharge, are no longer efficient.

The surgical team, functioning effectively, is a formidable instrument of healthcare, with several built-in strengths. It promotes and encourages surgical excellence, with an inbuilt process of informal peer review which is effectively a continuous form of surgical audit.

Members of a surgical team, having relinquished responsibility for a patient to a relieving surgeon, can go off duty knowing that they will not be called back to work. This predictability of working hours, and the lifestyle benefits flowing from it, is cited by surgeons as a key strength of the model.

With responsibility for a patient’s care shifting between members of a surgical team, protocols and checklists are essential to the success of this model. And central to its success is an efficient, comprehensive and recordable process of patient handover.

Hospital staff and members of surgical teams should be able to plan their day, confident in the knowledge that work starts promptly at a given time, irrespective of how many patients were admitted for emergency surgery overnight. And members of surgical teams will know that at a given point on a given day they will be doing elective or emergency work, not an unpredictable mix of both.

It has been noted that nurse practitioners are particularly good at helping implement this cultural change.

Assessing need and tailoring models

Irrespective of the model of separation chosen by a facility, the underlying principles are the same. Activity must be measured and, in the light of this information, need must be assessed. Models can then be tailored to suit the resources and workload of a given hospital.
The first step in the design of an appropriate model is to measure workload. While several factors affect waiting lists, the elective surgery workload is largely determined by the emergency surgery workload, the measurement of which is quite straightforward. As stated in a consensus paper prepared after a workshop on emergency surgery hosted by the Royal Australasian College of Surgeons in November 2009:

“NSW Health figures show that there is a distinct and measurable volume of emergency surgery cases, whether they are common and high volume operations such as appendicectomy or femoral neck fractures, or specialty cases such as vascular or spinal surgery. It is therefore possible to predict demand for resources, and plan to manage periods of peak requirement. In so doing, emergency surgery workload can be managed more efficiently and effectively.”

Once workload has been measured, and appropriate resources allocated, a model for the separation of elective and emergency surgery can be designed which matches measured need.

Operating theatre configuration should be designed to meet the particular needs of a facility. In smaller facilities it might simply be a matter of devoting the first two hours of the day to those emergency cases which have come in overnight. Thereafter the operating theatres are used for elective cases.

An alternative model option involves an emergency list in the late morning or early afternoon, as often patients who arrive overnight may not be ready for surgery by 8 am.

It is a question of boundaries – designing them, establishing them and, whenever possible, observing them. They might be geographical boundaries (i.e. dedicated facilities, or dedicated operating theatres within a facility) or they might be temporal boundaries (i.e. hours dedicated exclusively to elective or emergency surgery).

Implementation

Two broad categories of separation models warrant attention.

Geographical Separation

The most compelling argument for the geographical separation of elective and emergency surgery is one of resource allocation. By limiting a given hospital to particular specialties or procedures, and directing the resources for this particular work to that one hospital, authorities avoid the costly duplication of resources.

Moreover, by concentrating experts in a particular clinical field in one hospital, that facility can, over time, develop into a recognised centre of excellence, with significant flow-on benefits in terms of research and teaching.

Such geographical separation of surgical services already happens. For example, major burns and trauma patients are currently taken directly to designated burns and trauma centres. It is possible that with appropriate planning in some areas, certain hospitals may be given an expanded emergency surgery role and others may have a greater elective focus. It is most unlikely, however, that a single institution would exist exclusively to deliver emergency surgery, as surgical staff would need appropriate access to elective work.

If there is to be geographical separation of elective and emergency surgery it must happen as part of a broader process of hospital networking, sensitively managed and with efficient arrangements for the transfer of patients between hospitals.

Co-location of elective and emergency surgery

There are three persuasive arguments for the co-location of elective and emergency surgery streams within the one facility.

The first relates to community expectations. Governments will not in the foreseeable future countenance the removal of emergency services from hospitals that have for decades provided this service to local people. What may appear to those involved in healthcare delivery as a rationalisation of services is perceived by local communities as a loss of local services and is not accepted.
Over time, provided timely access to emergency care in a local region is assured, some hospitals may be able to scale back or cease emergency work. This would only be possible, however, if supported by data which confirms improved patient outcomes.

Co-location is therefore much easier to “sell” than a rationalised network of hospitals doing different work and developing expertise in specific fields of healthcare.

The second argument is clinical. Complex elective surgery demands expertise not unlike that required in the delivery of emergency surgery. The co-location of both streams within the one institution facilitates the quick and efficient crossover of such expertise.

The types of elective surgery that can be moved away from emergency surgery are those that do not require complex support systems to deliver the patient care. These might include hernia surgery, laparoscopic biliary surgery and some orthopaedic procedures. In contrast, more complex elective work, such as hepatic, colorectal, oesophageal and pancreatic surgery, requires the same support as emergency surgery. This includes radiology, medical and ICU support. Accordingly, in most of the hospital models that currently exist in Australia and New Zealand, major elective surgery needs to be performed in the same location as emergency surgery.

The third argument is cultural. Surgeons themselves are likely to resist change which entails the removal of existing specialties or procedures from the hospital within which they work. Some clinicians are loyal to a single hospital and would resist the idea of dividing their time between two or more facilities. This is an obstacle to change which will have to be overcome.

It should also be recognised that in regional or provincial areas the majority of hospitals currently providing emergency surgical services must continue to deliver emergency and elective services at the same facility. Most, if not all provincial centres will need to have co-located elective and emergency streams.

The logistics of co-location

While the co-location of elective and emergency streams will require administrative reform it must not involve the duplication of bureaucratic functions. The job of hospital administrations under any model of separation should be to stream patients into either the elective or emergency areas of a given facility.

Such changes have occurred almost seamlessly in hospitals such as Sydney’s Prince of Wales and Nepean Hospitals and at Fremantle Hospital in Perth.

It must also be acknowledged that the range of elective procedures now performed is such that there will need to be streaming within a stream. Complex, resource intensive and technology dependent elective surgery is quite different from those relatively simple procedures that are done in a matter of minutes. Similarly, co-morbidities might require a patient to be placed within a complex elective surgery stream.

Avoiding the mistakes of the past

It is essential that a process of reliable rostering ensures surgical teams are regularly exposed to both elective and emergency work. This will enable surgeons to maintain their skills across the breadth of their specialty and avoid the mistakes made in some jurisdictions – both abroad and in Australasia.

In some parts of the world, notably the United States and some Western European countries, emergency surgery is considered a surgical specialty of its own – a specialty in which one is specifically trained and to which one devotes one’s professional life. This is at odds with the College’s view that all specialties should equip their surgeons to do emergency work within that specialty.

In the United States senior surgeons are concerned that a generation of surgeons has been deskilled as a result of trauma specialisation, and a process of reskilling is now underway. Recent attempts in the United States to merge trauma and emergency surgery reflects that country’s significant reduction in trauma workload and the attendant need for trauma surgeons to contribute in another area of surgery. It also reflects a difference in training and skills. Trauma surgeons in the United States run the ICU; with a reduction in trauma workloads they have taken over emergency work and brought relevant cases into their ICU departments. This is quite different from the Australasian skills mix.

Any reforms must avoid situations where, by force of circumstance, clinicians lose skills. While networking has irrefutable efficiencies, it is not without its dangers, and these need to be addressed. The price of any future networking must not be deskilled surgical teams, as this has potentially major consequences for the surgical workforce.
Whilst recognising that there is a trend towards sub-specialisation, it is imperative that each specialty society ensures a sufficient number of its members develop and maintain competency in specialty specific emergency surgery. This is fundamental to sustaining the model of the acute surgical unit. It is important, therefore, that expertise in emergency surgery remain a key feature of surgical training.

This can be achieved by ensuring balanced rosters. In the case where there is geographical separation of elective and emergency surgery, this will involve the movement of both surgeons and patients, in a planned fashion, between two or more facilities.

Time allocation is fundamental to the success of any model. A surgical team might be dedicated to elective procedures one day, and rostered to an emergency theatre the next.

Trainees must be a part of this mix, dividing their time between elective and emergency cases. This should involve pre-operative assessment and post-operative management as well as operative work. Notwithstanding the fact that the presence of a trainee can reduce theatre efficiency, their role is crucial to the sustainability of any model. Their involvement is the key component of training, which is a core function of the public sector. The exclusion of trainees from any elective workload created by a redistribution of resources is unacceptable.

In the United Kingdom the separation of elective and emergency surgery has been so complete that elective surgery “factories” have developed, with experienced surgeons performing the same procedure on a never ending procession of patients. While this might appear a model of efficiency it is in fact unsustainable, as trainees have been excluded from this elective work. The result is that, over time, a situation has developed where surgeons have to be flown in to do certain elective procedures. The United Kingdom model is excellent in terms of throughput in the short to medium term but disastrous in terms of training and, therefore, in terms of long term sustainability.

Successful local reform models

In contrast to these overseas systems of care, several public hospitals in Australia and New Zealand have successfully implemented models that feature the separation of elective from emergency surgery in co-located facilities. (See appendix 1.)

Most notably, Sydney’s Prince of Wales Hospital, Western Sydney’s Nepean Hospital, and Fremantle Hospital in Perth have all improved efficiency and patient outcomes as a result of such separation.

It needs to be stressed, however, that the streaming of elective and emergency general surgery cases has not been the only reform at these hospitals; rather, separation has been a central feature of a package of reforms.

Data from Australian hospitals indicates improved patient outcomes in terms of reduced hospital stays, fewer call backs of surgeons, and a complication rate reduction of one third. It must also be appreciated that a key patient outcome is the timeliness of care; this is a more significant benchmark than the time to surgery.

Surgeons implementing this reform at the aforementioned hospitals attribute the improved patient outcomes in large part to the fact that emergency surgery is consultant led rather than the traditional registrar led service. The presence of a consultant, dedicated to the provision of emergency care and free from other distractions, facilitates the separation of elective from emergency surgery and enables a much greater proportion of surgery to occur in normal working hours. This results in fewer errors being made, a more fulfilled surgical workforce and better patient outcomes.

Surgeons strongly support these changes because of the lifestyle improvements that predictable working hours afford.

More efficient use of operating theatres equals shorter waiting lists

Another benefit to flow from the separation of emergency and elective surgical streams is the more efficient use of operating theatres. Writing in the ANZ Journal of Surgery (Vol. 79 No. 1/2, January/February 2009) surgeons at Sydney’s Prince of Wales Hospital concluded that the establishment of an acute care surgical unit had led to improved theatre block utilization:
“There are 11 theatres used for mainly elective surgery in our institution. A 2-month (October and November 2005, project period) snapshot of theatre utilization was analysed retrospectively across the entire block. This was compared to the same time period in the previous year (2004, pre-project period). An 8.1% increase in in-hours theatre utilization was noted across the theatre block.”

The more efficient use of operating theatres is highly significant – it is of fundamental importance to reducing elective surgery waiting lists.

**More efficient triage equals shorter waiting lists**

Experience indicates that the separation of elective and emergency surgery leads to more effective triage in emergency departments, resulting in fewer admissions. This frees up beds for elective surgery.

**The costs**

Clearly the construction of stand-alone, dedicated facilities for the delivery of elective surgery represents a new and significant expense, but the streaming of elective and emergency surgery in an existing facility need not be. This is due to the fact that efficiencies resulting from the reforms offset the expense of their implementation.

The additional costs associated with a consultant led service, in which the consultant is at the hospital rather than on call, are offset by the reduced out of hours work and fewer call backs.

It should be noted that there is an additional cost to the surgeon. Surgeons doing a dedicated period of emergency surgery rather than on call work earn a lower income as they are not consulting or operating on private patients. If there is to be widespread change, and more consultants doing dedicated periods of emergency surgery, the service they provide must be valued – it must be recognised, rewarded, resourced and remunerated.

While the costs associated with the separation of elective and emergency surgical streams can be measured, it is difficult to measure the benefits. Any balance sheet is therefore incomplete and potentially misleading. This is partly due to the fact that separation has typically been implemented as part of a package of reforms, and any efficiencies achieved must therefore be attributed to a range of factors.

Notwithstanding the difficulty of quantifying the benefits achieved, there is overwhelming evidence that reforms implemented at several Australian and New Zealand hospitals have resulted in efficiencies which offset the cost of their implementation. These include fewer callbacks of surgeons, shorter hospital stays – which free up beds for elective work, lower cancellation rates due to more efficient theatre and bed usage, and lower complication rates.

Significantly, a study done by surgeons at Christchurch Hospital (*ANZ Journal of Surgery, Volume 80, Number 6, June 2010*) found that the establishment of a dedicated surgical assessment and review area, or SARA, led to a more efficient system of triage and could potentially reduce the number of acute admissions. The study also found that 72.3% of procedures could potentially be managed as day stay or 23-h day stay post operatively.

It is important to remember, of course, that all of the aforementioned efficiencies do not just represent cost savings – they are evidence of better patient care and better patient outcomes.

**Conclusion**

The separation of elective and emergency surgery, **tailored to meet the workload and resources of a given facility**, can produce a range of benefits. These include:

- Enhanced patient outcomes;
- More rapid assessment and better management of the acute surgical patient;
- More timely care;
- The more efficient throughput of patients;
- Reduced elective surgery waiting lists, due in part to the more efficient use of operating theatres and in part to fewer hospital admissions;
• Reduced costs due to reduced hospital stays, reduced complication rates and fewer call backs of surgeons;
• A more predictable workload with safer and more predictable working hours for surgeons and other health professionals;
• Ongoing peer review of surgeons’ work; and
• Improved surgical training.

Fundamental to the successful separation of elective and emergency surgery is an understanding that hospitals provide a surgical service.

This service should involve surgical teams working to a common goal, that goal being to provide timely care of the highest possible quality to patients.

Any sustainable model of reform must be firmly founded on the understanding that surgeons and trainees should do both elective and emergency surgery, but do them according to a roster which ensures safe and predictable working hours and the most efficient use of operating theatres. Almost all surgery, apart from life threatening emergencies, can be done during normal working hours.

Given the political realities of public hospital reform, and the fact that elective and emergency surgery, even when separated, are complementary, the co-location of the two types of surgery within the one facility is currently the most appropriate model. Hospital networks, involving dedicated elective and emergency facilities, can only succeed with efficient inter-hospital transfer arrangements.

In large metropolitan hospitals consideration should be given to developing models such as the Acute Surgical Unit. The ASU model has proved an effective means of separating elective from emergency surgery in several major Australian and New Zealand hospitals.

Smaller hospitals can adopt these principles, while tailoring them to meet local circumstances. In these smaller facilities, notably regional hospitals, separation might simply involve the setting aside of designated operating theatre time for emergency procedures.

Irrespective of the model adopted by a given facility, certain key principles should govern arrangements.

• Whether the separation of elective and emergency surgery is occurring on a regional basis or within a single facility, it is imperative that workload be measured and resources allocated accordingly. Fundamental to this process is the recognition of the fact that surgical workload, including emergency surgery, is predictable. Peaks and troughs obviously occur but, over time, these too become predictable and can be managed accordingly.

• Under any model of separation, it is important to avoid the duplication of administrative services. Rather than allowing two management teams to evolve, the model must ensure that one management team implements an effective streaming process.

• To make emergency work more attractive and sustainable hospitals should ensure that emergency surgery is valued – that it is recognised, rewarded, resourced and remunerated.

• Emergency surgery must remain a core competency within the nine surgical specialties. This is fundamental to the wellbeing of patients. Only with regular exposure to emergency surgery can a surgeon manage the complications that sometimes arise in the course of performing elective procedures. The skills honed performing one type of surgery equip surgeons with the expertise to perform the other type. A failure to appreciate this fundamental truth has led to the failure of reform models overseas.

• Perhaps the most compelling argument for the separation of emergency and elective streams of surgery is that no hospital in Australia or New Zealand to implement this initiative has ever reversed it. They have all concluded that the reform has led to the more efficient use of resources, a more effective workforce and, most importantly, better care of the patient.
Appendix 1. Successful local reform models

Case study 1 – Nepean Hospital

Writing in the ANZ Journal of Surgery (Vol. 80 No.6, June 2010), members of the Department of Surgery at Nepean Hospital, Penrith, New South Wales, report on the development of a new model of care, the Acute Surgical Unit, in 2006.

Based on the principles of a model introduced at Sydney’s Prince of Wales Hospital in 2005, the Nepean model was modified to suit local workload and environment.

Five key principles govern the Nepean model:

- The ASU functions the same way 7 days a week, including weekends and public holidays;
- All acute general surgical admissions are admitted to the ASU;
- The ASU is an independent unit which has its own registrars, junior medical staff and nurse practitioners;
- The ASU is a consultant led service. Each consultant does a 24-h period; and
- Patients are admitted under the ASU bed card and stay within the ASU until they are discharged or transferred to other units.

The role of the consultant is one of clinical leadership and supervision of the assessment, care plan and operative procedures performed during their 24 h of duty. The consultant starts at 7 pm with the formal handover from the previous consultant. Overnight they are on remote call. The consultant is in the hospital from 7 am to 7 pm, with their sole responsibility for that day being the ASU.

Handover is a critical component of the ASU and is facilitated by the ASU database. A summary of outstanding operative cases is given, along with a summary of any serious problems that are anticipated. Each patient is discussed, and the plan for the coming day explained and revised, including operations, investigations, treatment changes, consultations and planned discharges.

At 7 am the day team meets with the night registrar in the ED, where all overnight admissions are assessed and management plans organised. On completion of the ED round, a “paper round” is performed by going through the patient list generated by the database. This facilitates the bedside ward rounds and allows the team to disperse if operations need to be performed. Wherever possible, the consultant stays on the morning ward round with the full team.

The ASU database enables complete and comprehensive handover of all patients. Four reports are generated from the database:

- Ward round summary, listing patients’ ward location, demographic details and diagnosis;
- Individual patient report, which is a more detailed clinical history and assessment;
- Discharge summary, given to patients to take back to their General Practitioner and consultant; and
- Audit report, which may be for all patients or for specific diagnoses or operations, and which is used for the monthly Department Morbidity and Mortality Meeting.

Nepean Hospital has eight operating theatres that are fully allocated during the working week. There is one emergency list per day, which is shared between all units, including the ASU. There are three independent trauma lists per week for emergent, orthopaedic and plastic surgery cases. Over weekends and public holidays (except Christmas Day) there are two all day operating theatres and one overnight theatre.

The introduction of the ASU has resulted in more effective use of the theatre time for acute general surgical cases, with a greater utilisation of theatre time during daylight hours.

The table below compares operation numbers and theatre utilisation rates pre and post the introduction of the ASU model.
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<thead>
<tr>
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<tbody>
<tr>
<td>Total no. of procedures per day</td>
<td>2.26 Mean 2 Median Range 0-7</td>
<td>3.29 Mean 3 Median Range 0-9</td>
<td>3.34 Mean 3 Median Range 0-9</td>
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<tr>
<td>Total operating time per day in minutes</td>
<td>225.8 Mean 256 Median Range 0-923</td>
<td>299.7 Mean 302 Median Range 0-844</td>
<td>310.7 Mean 312 Median Range 0-975</td>
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<td>Procedures commencing between 8 am and 6 pm</td>
<td>474 (57.5%)</td>
<td>831 (69.3%)</td>
<td>905 (69.9%)</td>
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<tr>
<td>Total (% operating time (min.) commencing between 8 am and 6 pm</td>
<td>47 323 (57.4%)</td>
<td>78 682 (71.9%)</td>
<td>87 654 (77.5%)</td>
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<tr>
<td>Procedures commencing between 6 pm and 12 midnight</td>
<td>221 (26.8%)</td>
<td>249 (20.8%)</td>
<td>214 (17.7%)</td>
</tr>
<tr>
<td>Total (% operating time (min.) commencing between 6 pm and 12 midnight</td>
<td>22 923 (27.8%)</td>
<td>20 395 (18.6%)</td>
<td>15 149 (13.4%)</td>
</tr>
<tr>
<td>Procedures commencing between 12 midnight and 8 am</td>
<td>130 (15.8%)</td>
<td>120 (10%)</td>
<td>92 (7.8%)</td>
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<tr>
<td>Total (% operating time (min.) commencing between 12 midnight and 8 am</td>
<td>12 153 (14.7%)</td>
<td>10 297 (9.4%)</td>
<td>10 516 (9.3%)</td>
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<td>825</td>
<td>1200</td>
<td>1211</td>
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<tr>
<td>Total operating time (min.)</td>
<td>82 399</td>
<td>109 374</td>
<td>113 319</td>
</tr>
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The authors conclude that the ASU model at Nepean Hospital has produced advantages for all concerned.

For patients:

“Each patient is reviewed by a consultant on a daily basis. Under the old model, the consultant review may be as infrequent as once a week, but was rarely a daily occurrence. The daily review by the consultant provides an effective mechanism for peer review and provision of a second opinion … The ASU provides a consultant led assessment, management and treatment program for each patient. There are a higher proportion of operations that are consultant supervised and performed between 8 am and 8 pm.”

For junior medical staff:

“The junior medical staff (interns and residents) are provided with better on the job training, clinical and assessment, due to the presence of a consultant in the hospital all day.”

For training registrars:

“The ASU term quickly became popular with trainees …The term provides training in the assessment and management of acute general surgical conditions with close oversight and teaching by consultant surgeons. There is an excellent operative case workload, as evidenced by the logbook summaries of the accredited trainees…”

For ward nursing staff:

“There is improved communication between the nursing staff in the ED, the wards and the Operating Theatre with the team managing the acute admission … This improved communication results in more rapid assessment and management of the acute surgical patient, improved access and transfer to the operating suite and improved ongoing management at a ward level.”
In the ED:

“The presence of a consultant surgeon on site for 12 h during the day allows for a more rapid assessment of the severely ill surgical or trauma patient … For most Australian and New Zealand hospitals, there is insufficient trauma workload to justify the presence of an independent trauma surgeon. The ASU model provides an on-site consultant surgeon for trauma and other acute general surgical patients. The ASU model addresses the poor outcomes in the trauma patients and is likely to improve the outcome of acute general surgical patients.”

For consultant surgical staff:

“Although some consultants were unconvinced of the benefits of the ASU at its commencement, all are now strong supporters of the ASU model. The ASU controls their acute workload and removes the ongoing responsibility for the care of acute surgical patients. This allows better planning for the working week, with a significant reduction in the number and duration of unexpected or unplanned activities, which interrupt their other elective clinical work, administrative work, academic work, social and family activities.”

Case study 2 – Fremantle Hospital

Writing in the *ANZ Journal of Surgery* (Vol. 80 No.12, December 2010), members of the Department of General Surgery at Fremantle Hospital, Perth, recall the manner in which surgery has been traditionally managed:

“In Western Australia, hospitals have occupied staff during office hours with elective work. As a result, semi-urgent emergency procedures were routinely delayed afterhours, or alternatively, if theatre time became available during the day, junior staff sometimes performed surgeries without adequate supervision. This may contribute to poor outcomes.”

They also identify financial and sociological factors at play, and conclude:

“In an era of increasing financial pressure and the recent introduction of ‘safe work hours’ practices, the need for a new system which optimized available resources became apparent.”

In response to this need, general surgeons at Fremantle Hospital have implemented a consultant-led service with a ‘day surgeon’ during normal working hours free from elective commitments. The hospital’s Department of General Surgery is now divided into four units: three elective and one for emergency admissions – the acute surgical unit (ASU).

The consultant’s roster works on a 24 hour basis, and the system ensures there is a registrar in house at all times. Arrangements are such that ASU continuity is ensured, and registrars share night and weekend work.

Comprehensive handover is undertaken between 7 am and 8 am daily. This involves a review of each patient’s history. Further less formal handover occurs at the end of the day team’s shift at 5 pm and at the end of the evening registrar’s duty at 9 pm. Senior review of patients is carried out on each morning ward round.

Patients in the ASU are tracked on a separate computerised list accessible throughout the hospital.

The ASU has a dedicated operating theatre assigned to it, commencing at 8 am daily, including weekends. The night service registrar is responsible for creating a theatre list order so that theatre can start on time. Radiology has also created a 7 am session to facilitate imaging necessary for the 8 am theatre start. Afterhours operating, especially between 10 pm and 8 am is discouraged other than for life or limb saving procedures.

Significantly, these changes did not involve any additional costs as staff numbers were not increased. The department’s structure was just reorganised, from four elective teams to three elective and one acute team.
To measure the effectiveness of the new arrangements data were collected during February, March and April 2009. These data were then compared with similar information from the same calendar period the previous year. The table below provides some of the key findings of the comparative study.

<table>
<thead>
<tr>
<th>Year</th>
<th>February-April 2008</th>
<th>February-April 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency referrals</td>
<td>901</td>
<td>974</td>
</tr>
<tr>
<td>Emergency admissions</td>
<td>688</td>
<td>771</td>
</tr>
<tr>
<td>Average daily referral rate</td>
<td>10.12</td>
<td>10.94</td>
</tr>
<tr>
<td>Mean wait time in ED</td>
<td>3.17</td>
<td>2.05</td>
</tr>
<tr>
<td>Operative intervention</td>
<td>396 (56%)</td>
<td>418 (54%)</td>
</tr>
<tr>
<td>Timing of operation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>07.00 – 18.00</td>
<td>286 (72.2%)</td>
<td>358 (85.6%)</td>
</tr>
<tr>
<td>18.01 – 06.59</td>
<td>110 (27.7%)</td>
<td>60 (14.4%)</td>
</tr>
<tr>
<td>Appendicectomies performed</td>
<td>111</td>
<td>104</td>
</tr>
<tr>
<td>Positive histology</td>
<td>73 (66%)</td>
<td>76 (73%)</td>
</tr>
<tr>
<td>Weekend discharge rates</td>
<td>133</td>
<td>180</td>
</tr>
<tr>
<td>Duration of stay (days)</td>
<td>4.2</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition to these key measures, the authors of the article identify other important advantages that flow from the new arrangements. The increased proportion of surgery performed during daylight hours makes it more likely that trainee surgeons will be involved. They write:

“Dealing with emergency surgical presentations on a daily basis is an invaluable experience for the trainee surgeon. We feel that subtle clinical signs become more apparent, and this, together with increased senior input, is beneficial to both the patient and the trainee.”

The authors also state:

“It is notable that weekend discharge rates increased in 2009, and this is likely because the ASU provides a service 24 h a day, 7 days a week with daily review of patients and their management plans. Increasing the numbers of discharges at weekends has created a more efficient system, thereby contributing to the number of free beds and as a result, promoting hospital turnover of patients.”

The authors conclude that while there were some administrative hurdles to the implementation of change, the real obstacle was one of attitude:

“…the greatest challenge has been to modify our own preconceptions about standards and methods of surgical care. Despite the entire history of surgery teaching us an ethos of a close and individual doctor-patient relationship, we believe that we have successfully demonstrated a model of practice where a team-patient relationship exists instead.”