

Emergency Surgery Guidelines

Document Number GL2009_009

Publication date 23-Jun-2009

Functional Sub group Clinical/ Patient Services - Surgical
Clinical/ Patient Services - Governance and Service Delivery

Summary These Guidelines have been developed by experienced surgical staff routinely coping with the challenges of emergency surgery. The Guidelines define the principles underpinning the redesign of emergency surgery and are to be referenced by Area Health Services when initiating redesign of emergency surgery practices.

Please note the web version of the Emergency Surgery Guideline was updated on 4 November 2009 for consistency with the printed version. Tables, layout and the cover were altered, the contact has not changed.

Author Branch Health Service Performance Improvement Branch

Branch contact Professor Donald MacLellan 9391 9298

Applies to Area Health Services/Chief Executive Governed Statutory Health Corporation, NSW Ambulance Service, Public Hospitals

Audience AHS executive, managers and clinicians

Distributed to Public Health System, NSW Ambulance Service, NSW Department of Health, Public Hospitals

Review date 23-Jun-2014

Policy Manual Patient Matters

File No.

Status Active

EMERGENCY SURGERY GUIDELINES

PURPOSE

The purpose of the Emergency Surgery Guidelines is to provide the principles to be applied to emergency surgery reform and specify the steps required for its redesign. Emergency surgery is a major component of the surgical services workload in many NSW hospitals. The benefits of the redesign of emergency surgery include improved patient outcomes, enhanced patient and surgical team satisfaction and increased trainee supervision in emergency surgery. Significant management benefits may also be realised from higher rates of emergency operating theatre utilisation reduced patient cancellations and reduction in after hours costs.

KEY PRINCIPLES

The Emergency Surgery Guidelines encourage hospitals to plan for the predictable surgical workload for all specialities and to allocate the necessary operating theatre time. This includes immediate access to operating theatres for the most urgent emergency surgery patients.

The guidelines provide principles for the redesign of emergency surgery including:

- Measuring the generally predictable emergency surgery workload;
- Allocation of operating theatre resources that are matched to the emergency workload;
- Designation of hospitals for either elective or emergency surgery or for specific components of each;
- Consultant surgeon-led models of emergency surgery care;
- Standard-hours scheduling where clinically appropriate;
- Load balancing of standard-hours operating theatre sessions with emergency surgery demand; and,
- Specific implementation in Area Health Services.

While the examples provided within the guideline are drawn particularly from specialities where emergency caseloads are high (Orthopaedics, General Surgery, Obstetrics and Gynaecology, Plastic Surgery), the principles are equally applicable to those specialities whose caseloads are significant but less (Neurosurgery, Vascular Surgery, Oral and Maxillofacial Surgery) or even relatively low (Urology, ENT, Cardiothoracic, Ophthalmology).

USE OF THE GUIDELINE

The guidelines have been developed by experienced surgical staff routinely coping with the challenges of surgery.

The guidelines should be used by Area Health Services in partnership with hospital managers and clinicians when undertaking emergency surgery reform and redesign projects.

REVISION HISTORY

Version	Approved by	Amendment notes
June 2009 (GL2009_009)	Director-General	New guidelines

ASSOCIATED DOCUMENTS

1. Surgical Services Taskforce – Emergency Surgery Guidelines

Emergency Surgery Guidelines

Surgical Services Taskforce



NSW DEPARTMENT OF HEALTH

73 Miller Street

NORTH SYDNEY NSW 2060

Tel. (02) 9391 9000

Fax. (02) 9391 9101

TTY. (02) 9391 9900

www.health.nsw.gov.au

This work is copyright. It may be reproduced in whole or in part for study training purposes subject to the inclusion of an acknowledgement of the source.

It may not be reproduced for commercial usage or sale. Reproduction for purposes other than those indicated above requires written permission from the NSW Department of Health.

© NSW Department of Health 2009

SHPN (HSPI) 090187

ISBN 978 1 74187 370 2

For further copies of this document please contact

Better Health Centre – Publications Warehouse

PO Box 672

North Ryde BC, NSW 2113

Tel. (02) 9887 5450

Fax. (02) 9887 5452

Further copies of this document can be downloaded from the
NSW Health website www.health.nsw.gov.au

October 2009

Contents

Foreword	2
Executive Summary	3
1. Introduction	4
2. Redesign of Emergency Surgery	6
2.1 Operational Reconfiguration	6
2.2 Selection of Consultant-Led Models of Emergency Surgery Management	10
3. Redesign of the Interhospital Patient Transfer System in Emergency Surgery	17
3.1 Principles of Interhospital Transfer	17
3.2 Interhospital Transfer System	18
3.3 Interhospital Patient Transfer Process	20
4. Key Performance Indicators	23
5. Definitions	24
6. Appendices	26
Appendix A - Emergency Surgery – Current Profile	26
Appendix B - Benefits of Emergency Surgery Redesign	30
Appendix C - Examples of Procedures Requiring Urgent Operative Management	32
Appendix D - Flowchart of Westmead SARA Unit	34
Appendix E - ScreenShots from Nepean ASU Database	35
Appendix F - Examples of Protocols	37
7. References	41
8. Bibliography	43
9. Acknowledgements	44

Foreword

Emergency Surgery is a major component of every surgical specialty. The welfare and best outcomes of emergency surgery patients have been the central focus of the members of the Emergency Surgery Subgroup of the Surgical Services Taskforce (SST) as they worked on producing these *Guidelines*. The comments of stakeholder groups have contributed substantially.

The emergency surgery principles and models contained in these *Guidelines* are equally applicable to all specialties in surgery.

The *Guidelines* encourage hospitals to plan for the predictable emergency surgical workload for all specialties and to allocate the necessary operating theatre time. This includes immediate access to operating theatres for the most urgent emergency surgery patients.

A partnership between clinicians and managers is vital to the success of the redesign, implementation and ongoing improvements in emergency surgery services. Cooperative planning and agreement on the selection or adaptation of models of emergency surgery are paramount if the delivery of emergency surgery is to be improved. Supportive agreements between hospitals are essential.

When our surgical teams can be confident that hospital resources are appropriately planned and managed for both emergency and elective surgery, further gains in patient safety and quality of care will result.

It is the goal of the Emergency Surgery Subgroup that these *Guidelines* be welcomed and implemented in innovative ways in all Area Health Services (AHS) in order to produce the greatest benefits.

S. Deane
Professor of Surgery
Hunter New England Area Health Service
(Chair Subgroup)

Executive Summary

Emergency surgery is a major component of the provision of surgical services making up a substantial volume of the workload of surgeons in many hospitals in New South Wales. It is often more complex and surgically challenging than elective surgery. Yet little attention has been concentrated on the management or resource requirements of emergency surgery.

Surgeons and their teams have become increasingly disenchanted with the lack of organisation of emergency surgery. It regularly requires after-hours work, is associated with long delays in accessing operating theatre time and is highly disruptive to scheduled elective surgery sessions. Emergency surgery is frequently undertaken after-hours by trainee registrars without consultant supervision, increasing the potential for adverse patient outcomes. Strategies and systems for both emergency surgery and for elective surgery are required.

These *Guidelines* have been developed by experienced surgical staff routinely coping with the challenges of emergency surgery. The *Guidelines* define the principles underpinning the redesign of emergency surgery including:

- n measuring the generally predictable emergency surgery workload;
- n allocation of operating theatre resources that are matched to the emergency surgery workload;
- n designation of hospitals for either elective or emergency surgery or for specific components of each;
- n consultant surgeon-led models of emergency surgery care;

- n standard-hours scheduling where clinically appropriate;
- n load balancing of standard-hours operating theatre sessions with emergency surgery demand; and,
- n specific implementation at Area Health Services.

The benefits of the redesign of emergency surgery will be observed clinically, in the workforce and in resource management. The benefits will be realised by commitment and an active partnership between managers, surgeons and surgical teams. Clinical benefits anticipated include improved patient outcomes, enhanced patient and surgical team satisfaction and increased trainee supervision in emergency surgery. Significant management benefits will ensue from high rates of emergency operating theatre utilisation, reduced patient cancellations and reduction in after-hours costs.

Interhospital patient transfer is increasingly required to deliver the surgical care appropriate for the particular surgical emergency. The prerequisites for patient transfer between facilities are outlined and a set of processes promoted to ensure the safety and efficiency of the transfer.

These *Guidelines* are required to be implemented if sustainable, safe and efficient emergency surgery services are to be provided. Reform of emergency surgery services is a necessity and not a choice. Patients expect nothing less.

SECTION 1

Introduction

Emergency surgery is a major component of the provision of surgical services for the population of New South Wales and is often more complex and surgically challenging than elective surgery. It makes up a substantial volume of the workload of surgeons in many hospitals and is relatively resource intensive. The community rightfully expects that this surgery is easy to access and is expertly performed and managed.

However, despite its predictable nature little attention has been focussed on emergency surgery in New South Wales, whereas waiting lists and elective surgery have had almost exclusive attention in the last few years¹. As a result, major problems in the service are increasingly apparent. The major issues that necessitate operational reconfiguration and the introduction of new clinical models include:

- n matching demand for emergency surgery with resources;
- n matching demand for emergency caesareans with resources;
- n roles of individual hospitals in providing emergency surgery;
- n after-hours workload of emergency surgery;
- n safe working hours;
- n supervision of junior staff;

- n disruption to elective surgery by emergency surgery;
- n sub-specialisation of surgeons and surgical trainees;
- n Inter-hospital transfer of patients with specific conditions;
- n patient handover between surgical teams;
- n recognition of surgeon commitment; and,
- n use of clinical guidelines in emergency surgery.

(Refer to Appendix A for more details on the current profile of emergency surgery in New South Wales).

The allocation of additional health funding in elective surgery has meant there has been little investment in the redesign, organisation or management of emergency surgery. Emergency surgery is frequently scheduled only when time and operating theatre sessions permit and it is often considered to be a tiresome hindrance to the smooth running of elective surgery sessions. Processes for managing emergency surgery have not changed for decades and serious inefficiencies exist.

Surgeons and their teams have become increasingly disenchanted with the lack of organisation of emergency surgery as it regularly requires after-hours work and long delays in accessing operating theatre time. Increasingly, workforce shortages are becoming prominent as surgeons opt out of working in emergency surgery. However, experience and available data show that large components of this work are predictable and therefore amenable to planning and systematic management.

The Surgical Services Taskforce (SST) has recognised that emergency surgery in New South Wales requires a comprehensive overhaul in order to create a sustainable, high quality and safe service. The SST commissioned a sub-group to examine emergency surgery and report back to the SST with its recommendations. It is of interest that during the period that the sub-group has been working, the Special Commission of Inquiry (Garling, 2008)² has also recorded problems inherent in the delivery of emergency surgery and has provided recommendations for its improvement that align with those of the sub-group.

A significant amount of emergency surgery activity relates to the treatment of injuries. There already exists a Trauma Plan for New South Wales³ and guidelines for the management of trauma. These *Emergency Surgery Guidelines* have been developed to complement the Trauma Plan and will particularly assist in improving operating theatre access for the care of emergency surgery and trauma patients. Both trauma and non-trauma surgical emergencies need to be managed cooperatively in the operating theatres of the receiving hospitals.

The purpose of these *Guidelines* is to state the principles that will guide emergency surgery reform and specify the steps required for its redesign. While examples are drawn particularly from specialties where emergency caseloads are high (Orthopaedics, General Surgery, Obstetrics and Gynaecology, Plastic Surgery), the principles are equally applicable to those specialties whose caseloads are significant but less (Neurosurgery, Vascular Surgery, Oral and Maxillofacial Surgery) or even relatively low (Urology, ENT, Cardiothoracic, Ophthalmology).

The principles for managing emergency surgery, outlined in this document, are also relevant to surgery performed on children. In addition, operational strategies for emergency surgery in children have been outlined in the document "Paediatric Surgical Model for Designated Area Paediatric Surgical Sites"⁴.

A significant amount of organ transplantation surgery is now undertaken electively. However, the unplanned elements of organ retrieval and organ implantation will also benefit from the principles outlined in these *Guidelines*.

The advantages of emergency surgery redesign are numerous. It will result in benefits in three main areas:

1. Clinical Performance -

- n reduced morbidity and mortality, and improved patient outcomes;
- n improved predictability of access to surgery;
- n better provision of focussed training in emergency surgery; and,
- n adjustments to sub-specialisation.

2. Service Management -

- n improved emergency theatre utilisation;
- n reduction in elective surgery cancellations;
- n reduction in after-hours surgery;
- n reduction in length-of-stay; and,
- n reduced delays in ED for emergency surgery patients.

3. Resource Utilisation -

- n improved availability of ICU and HDU; and,
- n improved use of radiology and pathology investigations;

(The benefits resulting from emergency surgery redesign are outlined in detail in Appendix B).

It is only through redesign, both operational reconfiguration and the adoption of new clinical models, that a sustainable, high quality and safer emergency surgery service can be delivered.

SECTION 2

Redesign of Emergency Surgery

The management of emergency surgery requires appropriate planning for workload, workforce and resources. It must take into account the unique threats to life, limb and organ function faced by the patients. These threats increase with the passage of minutes or hours.

Emergency surgery redesign necessitates an active partnership between clinicians and managers in its planning and function. This requires time and commitment from surgeons and operating theatre staff. It also needs strong leadership from surgeons fully supported by a majority of their professional colleagues and by the leaders of Surgical Departments or Divisions, where these exist.

The redesign of emergency surgery entails reform in two distinct areas. Firstly, operational reconfiguration is required at AHS and hospital levels. (Refer to Section 2.1 and Figure 1). Secondly, specific clinical models of emergency surgery management must be selected that best suit the hospital role and its emergency surgery volume. (Refer to Section 2.2 and Figure 2).

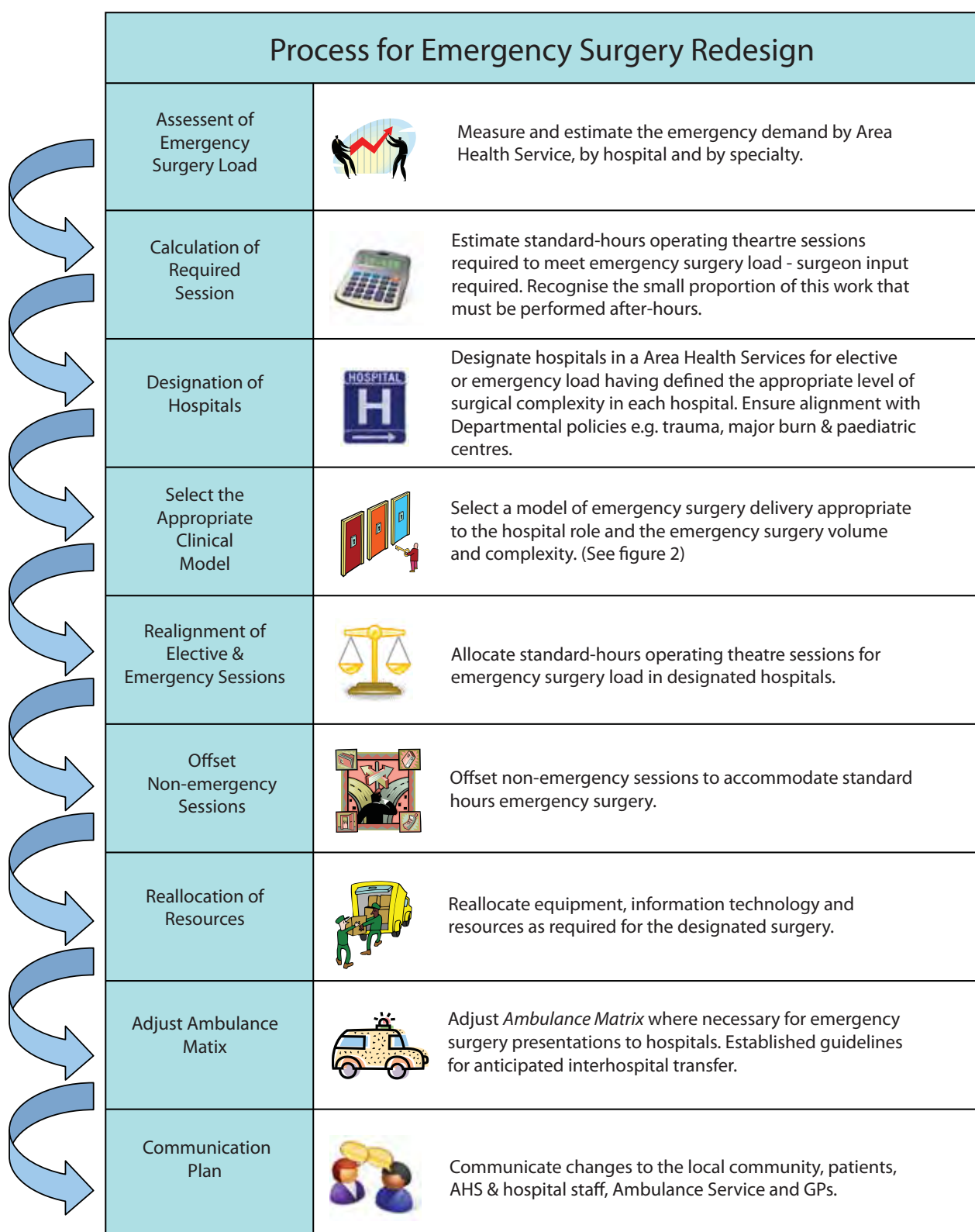
2.1 Operational Reconfiguration

The principle components in the reconfiguration of emergency surgery are:

- n standard-hours scheduling where clinically appropriate;
- n load balancing of standard-hours operating theatre sessions with emergency surgery demand;
- n designation of hospitals for either elective or emergency surgery or for specific components of each;
- n allocation of operating theatre resources that are matched to the emergency surgery workload; and,
- n reallocation of surgery resources appropriate to roles of the designated hospitals.

There are a number of steps required to achieve the most suitable emergency surgery configuration for a hospital. These steps are outlined in Figure 1 and explained in the following text.

Figure 1: Process for Emergency Surgery Redesign



2.1.1. Assessment of Emergency Surgery Load

The initial step in the operational reconfiguration is to estimate the emergency surgery demand by specialty at AHS and facility levels. Although emergency surgery is generally predictable in volume, it is to be expected that spikes in activity will occasionally occur. A range of emergency surgery caseloads should be recognised and will influence the type of service model selected, such as:

- n Where caseloads are high in a hospital, the small variations in volume week-to-week will be accommodated in planning the OT sessions.
- n Where caseloads are high in a specialty (e.g. Orthopaedic, General, Obstetric or Plastic Surgery) an emergency surgery model for that specialty will be worthy of consideration.
- n Where caseloads are low in a number of specialties, the combined specialty caseload may facilitate adoption of an emergency surgery model to meet the combined needs of those specialties.
- n Where caseloads are so low in a metropolitan hospital that there is no predictability, it would be appropriate to consider whether an emergency surgery service is justifiable after-hours, and possibly even in standard-hours.
- n Even in hospitals with high emergency surgery caseloads, occasional irregular peaks of activity can occur. An escalation plan needs to be developed so that these irregular peaks are managed in an organised manner.
- n Hospital, Regional and State Disaster Plans already exist to deal with the unpredictable and potentially overwhelming activity spikes.

2.1.2. Calculation of Required Sessions

A key determinant in emergency surgery is to identify the surgery that should be performed urgently, i.e. life and limb threatening. Adequate OT access must always be available to enable this small proportion of emergency surgical work to be performed without delay or compromise. Time of day or day of week should present no limitation in hospitals designated to provide 24 hour access for emergency surgery. All other surgery should be planned and scheduled to occur in standard-hours (Appendix C).

The decision to operate after-hours should be based on whether the patient will be clinically compromised if they do not receive an urgent operation. It should not be undermined by a lack of access to standard-hours operating theatre sessions.

There are a number of hospitals where the clinical units have already adopted this principle. For example, orthopaedic surgeons in Liverpool Hospital defined what clinically constituted an orthopaedic emergency requiring immediate intra-operative treatment. Many procedures that previously had been performed after-hours were clinically non-urgent and could safely wait until the next standard-hours emergency theatre session.

Availability of surgeons to undertake the standard-hours emergency surgery will generally require adjustments to their rostering arrangements for emergency surgery and their allocated elective surgery sessions.

In some hospitals and specialties, standard-hours may even be redefined on some days of the week to extend to 2000 hours or even 2200 hours ('twilight lists') or to include routine weekend daytime and evening sessions for scheduled emergency surgery. For example, emergency orthopaedic surgery at John Hunter Hospital is planned for 0800 to 2200 on 7 days of the week.

If staffing shortages threaten the availability of operating theatre sessions, those sessions allocated for emergency surgery must not be automatically targeted for closure.

Scheduled emergency surgery sessions are at least as important as elective surgery sessions, if not more so.

Advantages of standard-hours emergency surgery include:

- n predictability for patients and families with respect to scheduled operating theatre time;
- n predictability for surgeons and surgical teams;
- n increased consultant-led emergency surgery management;
- n increased registrar/junior staff supervision;
- n increased access to fully staffed radiology/pathology/allied health services;
- n reduced number of call backs/after-hours operating for surgeons, anaesthetists and their teams;
- n reduced elective case cancellations;
- n improved outcomes for patients; and,
- n predictability for staff rostering and budgets.

2.1.3. Designation of Hospitals

Not all hospitals have the full complement of services required by every patient presenting in need of emergency surgery. It is appropriate, where possible, that patients receive their treatment close to their home. Nevertheless, some patients will be required to travel or be transported to more distant hospitals in order to receive the specialised emergency surgical care they require.

The separation of elective from emergency surgery in hospitals and wards has been successfully implemented in New South Wales. Examples exist in general surgery, orthopaedic surgery, obstetrics, trauma surgery and hand surgery. More widespread application of the principles must now be achieved to provide emergency surgery in the most efficient and safe manner and to the highest levels of satisfaction for patients and clinicians.

Separation of emergency surgery from elective surgery between hospitals in a network will require cross appointment of surgeons for their elective and emergency contributions.

2.1.4 Select the Appropriate Clinical Model

This step is explained in detail in section 2.2 and Figure 2.

2.1.5 Realignment of Elective and Emergency Sessions

In designated hospitals, realignment of elective and emergency surgery sessions will be necessary to allocate standard-hours operating theatre sessions for emergency surgery.

Holidays and Reduced Activity Periods

Historically, these periods have been managed by providing an after-hours level of staffing and operating theatre access with varying degrees of enhancement. Almost uniformly, these ad hoc arrangements have not resulted in efficient and predictable access. The planned operating theatre session allocation for emergency surgery should not be significantly different during these periods than for corresponding days of the week over the rest of the year. However, this may need some adjustment based on:

- n altered regional population in holiday periods; and,
- n previous emergency surgery activity during the specified period.

2.1.6. Offset Non-emergency Sessions

To accommodate the required standard-hours sessions for emergency surgery a number of options can be considered:

- n opening unused operating theatre sessions;
- n improving operating theatre utilisation (on-time start for first case, improved change-over times, supervision of trainees, reducing over runs etc);
- n moving elective surgery to other hospitals in the network;
- n removing non-surgical procedures from operating theatres (e.g. colonoscopy, ERCP, cystoscopy, hysteroscopies etc); and,
- n reallocating some after-hours operating theatre resources to standard-hours.

2.1.7 Reallocation of Resources

Where necessary equipment, IT and other resources will need to be relocated to meet the needs of the reconfigured emergency surgery service.

2.1.8 Adjust Ambulance Matrix

The Ambulance Matrix will need to be adjusted for emergency surgery presentations to hospitals, as well as the establishment of guidelines for interhospital transfers.

2.1.9 Communication Plan

As with all clinical redesign programs, it is crucial to communicate the changes to all the relevant stakeholders, including the local community, patients, AHS and hospital staff, GPs and the ambulance service.

2.2. Selection of Consultant-Led Models of Emergency Surgery Management

The principle objectives in the clinical restructure of emergency surgery are to provide:











- n consultant surgeon-led models of care;
- n improved supervision of surgical staff in training;
- n standardised patient handover; and,
- n appropriate standardised patient management.

There are a number of tasks in defining the most appropriate consultant surgeon-led model of emergency surgery care for a hospital. Each specialty unit should determine the optimal model for them, in conjunction with the operational configuration of the facility.

The required tasks are outlined in Figure 2.

It is important to note that the first three boxes in Figure 2 are stepped processes. The remaining six boxes are important issues to consider once the most suitable model has been chosen.

Figure 2: Consultant-Led Emergency Surgery

Consultant-Led Emergency Surgery		
	Emergency Surgical Conditions suitable for Standard-hours Scheduling	 <p>Determine the surgical conditions/procedures, by specialty, that can safely wait to be performed in standard-hours</p>
	Calculation of Standard-hours Emergency OT Sessions	 <p>Work with hospital managers to calculate the standard-hours OT sessions, by specialty, required for the emergency surgery load.</p>
	Determine Model of Care for designated Emergency Surgery for that Hospital	 <p>In hospitals with designated emergency surgery load, each specialty group of surgeons determine the most appropriate model of care. This might be a specialty specific model to accommodate multiple specialties.</p>
	Rosters & Cover for Planned & Unplanned Leave	 <p>Determine consultant surgeon roster pattern, process for roster swaps and cover for planned and unplanned leave.</p>
	Processes for Management of Emergency Surgery Cases	 <p>Determine processes for emergency surgery case management including the process for handover of patient care, options for continuing on-going care after on call period, process for handling in-hospital consultations and patient follow up after hospital discharge.</p>
	Handover Procedures	 <p>Determine the appropriate handover system that uses reliable tools including an electronic handover system.</p>
	Patient Management Protocols	 <p>Determine patient management plans and protocols for high volume emergency surgery.</p>
	Data Collection & Analysis	 <p>Define required data collection and analysis for emergency surgery performance and quality and safety monitoring.</p>
	Communication	 <p>Determine a communication system for day to day operational aspects of the service, e.g. rosters. Ensure that there is a robust system of communication between clinicians who participate in the service and with hospital management.</p>

2.2.1. Consultant Surgeon-led Models of Care

Consultant surgeon-led models of emergency surgery care already exist in New South Wales. The specifics of the model selected will be determined in part by the emergency surgery volume, the role of the designated hospital and surgical staff availability in the hospital. Indeed, where emergency surgery caseload is low in the metropolitan areas, it would be appropriate to question whether that emergency surgery capacity is justifiable after-hours and possibly even in standard-hours.

A number of consultant surgeon-led models of emergency surgery care (both the Acute Surgery Unit model and others) are described below to stimulate practical re-design.

Acute Surgery Units

A tertiary referral hospital with a large emergency General Surgery load can support the establishment of an Acute Surgery Unit (ASU). Similar models are applicable for Orthopaedic Surgery in such hospitals. Some components of the ASU model may also be applicable to hospitals with smaller emergency surgery load. The ASU model is consultant-led with surgeons limiting or relinquishing all competing commitments (e.g. consulting in private rooms, private sector operating) during periods on-call. The on-call frequency for the consultants will be influenced by the emergency surgery caseload.

The main features of an ASU are:

- n consultant surgeon-led with consultant surgeon on site in standard-hours;
- n consultant rostered on for a period of at least 24hrs;
- n limited, or no other commitments, during period as the rostered ASU surgeon;
- n dedicated emergency theatre sessions in standard-hours;
- n surgeon control of case priority in operating theatre sessions;
- n surgeon present, teaching, and supervising when surgery is being performed;

- n formalised handover process to the incoming surgeon with information based on a standard set of key principles;
- n daily rounds of the patients in the ASU;
- n registrar or Fellow and RMO assigned to the ASU;
- n clinical nurse consultant assigned to the ASU;
- n agreed clinical guidelines for most common emergency surgery admissions;
- n designated ward or beds for assessment and management of ASU patients;
- n provision of consultation service for inpatients that require emergency surgical review and assessment;
- n formalised process for follow up of ASU patients; and
- n priority outpatient access for emergency surgery patient assessments.

A number of hospitals in New South Wales have already established an ASU - Prince of Wales,^{5, 6} Nepean, Westmead and John Hunter Hospitals. The specific ASU model adopted by these hospitals varies in some ways (e.g. surgeon ASU rostering).

The benefits of a dedicated ASU include:

- n clarity of admitting surgeon and assured consultant surgeon availability;
- n increased consultant surgeon involvement in management and treatment decisions;
- n improved and standardised patient handover with agreed timing;
- n consultant-to-consultant case review;
- n increased surgical registrar supervision with increased learning opportunities for junior surgical staff;
- n reduction in call backs and after-hours operating;
- n reduced conflicts of priorities for surgeons working in both the public and private sectors; and,
- n opportunity to appoint additional surgeons, who have appropriate skills, to the ASU to enable them to make a contribution to emergency surgery in their specialty.

Additional Models of Emergency Surgery Care

Hospitals with a lesser load of emergency surgery or specialty units with lesser case volumes can also redesign their emergency surgery service without the establishment of an ASU. There are a range of consultant-led models of care already implemented in various hospitals in New South Wales.

Emergency Load and Consultant Roster Realignment

In Lismore Hospital, the General Surgery consultant is rostered on for an extended period (one week) which is appropriate for the emergency surgery load received by the hospital. Dedicated emergency surgery OT sessions match the demand. Similar to other ASU models, all general surgical patients are admitted under the rostered surgeon for their management and those patients remaining as inpatients after surgery or who have not received definitive treatment at the time of surgeon change over, are handed over to the incoming surgeon for their further management.

Options for continuing in-patient care include:

- n handover of all patients at end of on-call period;
- n handover of selected patients to appropriate sub-specialist during standard-hours; and,
- n selected transfer from ASU to one consultant (e.g. all post-operative patients, sub-specialty expertise, terminal palliative care, chronic pain syndromes etc).

In some hospitals (e.g. Nepean, John Hunter), the on-call change over time has been altered from a traditional morning hour (e.g. 0600 or 0800) to an evening hour (e.g. 1800 or 1900), resulting in further opportunities to plan surgical procedures for the following day.

Options for Planning Operating Theatre Sessions

Options for prioritising operating sessions are determined by a number of factors including availability of surgical time and the elective surgery load. The options for prioritising elective surgery are as follows:

- n Mixed emergency & elective sessions – this is suitable where emergency surgery load and case complexities are low. Sessions must be planned to accommodate the expected emergency cases and any variation in emergency surgery load could be covered by short notice elective cases. This may be particularly suitable for planning of urgent caesarean sections into Gynaecology lists.
- n Designated emergency & elective sessions (Auburn Hospital model⁷) – suitable where emergency surgery load and case complexity are relatively low. Full day sessions are divided into a set amount of time for elective surgery and a set amount of time for emergency surgery. In the Auburn Hospital model, elective sessions run from 0830 to 1430 hours and emergency surgery from 1430 to 1830 hours.
- n Designated daily full emergency surgery sessions for single specialties – when the emergency surgery load is sufficient, fully designated emergency surgery sessions should be allocated. This requires availability of the appropriate surgeon to ensure full utilisation of the session. This will be particularly applicable in General and Orthopaedic Surgery.
- n Designated full emergency sessions – less frequently than daily for lower volume specialties. This may be particularly applicable to Plastic Surgery, Oral and Maxillofacial Surgery, Urology and Vascular Surgery. In some hospitals and specialties, patients have been able to go home pre-operatively and be readmitted in a few days or less as urgent Category 1 elective surgery patients onto one of these lists. Port Macquarie Base Hospital has a designated half day (five hour) session available for emergency surgery from Monday to Friday. The emergency surgery booking system allows patients to be scheduled by clinical urgency to this session without disruption to elective surgery or staffing.
- n Designated full emergency sessions for mixed specialties. This is more applicable when emergency surgery caseloads are low. It is more difficult to implement efficiently due to the need to coordinate multiple consultants.

- n Late Afternoon session – traditionally, operating theatre sessions have run between 0800 and 1700 hours and are frequently divided into a morning and an afternoon session. However, the addition of a session from 1700 to 2100 or 2200 hours ('twilight session') provides an option for emergency surgery that facilitates patient preparation during the day and surgeon availability in the late afternoon.

Dedicated Beds for Emergency Surgery

Identifying a ward or a portion of a ward area to accommodate emergency surgery patients particularly for General, Plastic and Orthopaedic surgery can be a significant benefit for the surgical teams and patients. As these patients are all located in one area, this can lead to:

- n much more efficient and effective ward rounds;
- n greatly improved clinical teaching;
- n reduced waiting time for the commencement of treatment;
- n more effective involvement of allied health staff;
- n improved communication between the emergency department and the surgical ward staff;
- n improved ward staff satisfaction (recruitment and retention);
- n reduced access block in the emergency department; and,
- n improved care management and length of stay.

The Surgical Acute Rapid Assessment Unit (SARA) in Westmead Hospital is an example of one of these units (Appendix D). The SARA unit provides an area where acute surgical admissions can be rapidly assessed, treated and/or discharged. The SARA unit works in tandem with Westmead Hospital's ASU. The unit has quarantined beds and adheres to strict patient selection criteria with a predetermined maximum length of stay, regular patient reviews and effective and ongoing communication between key clinicians and unit managers.

Improved Supervision and Credentialing of Surgical Staff in Training

Supervision of surgical registrars is a requirement of their training. The level of supervision should depend on the level of competence of the registrar but varies within and between hospitals. Operating on patients late into the evening or during the early hours of the morning often occurs with the registrar making the decisions and operating with limited or no supervision. It is known that unsupervised registrars take longer to perform operations. This alone may lead to increased complications due to their relative inexperience.

The benefit of an ASU is that the level of supervision increases due to the consultant presence. This has benefits for the registrar, consultant and the patient. Registrars can still progress to independent performance of surgical procedures but this should be planned, supported and monitored. This is best achieved with consultants directly assessing technical competence of registrars and reporting these observations to specialty training review meetings of colleagues.

2.2.2 Rosters and Leave Cover

Regardless of the specific consultant-led model of care adopted, the consultant roster for emergency surgery should ensure there is a balance between the appropriate periods of time on the roster and adequate periods of time off the roster. The rosters should also have provision for roster swaps, planned leave and unplanned leave e.g. due to sickness.

2.2.3. Processes for the Management of Emergency Surgery Cases

There should be an agreement between the surgeons on the emergency surgery case management including process for handover of patient care, options for continuing on-going care after on call period, process for handling in-hospital consultations and patient follow up after hospital discharge.

2.2.4 Standardised Emergency Surgery Patient Handover

Handing over a patient's care from an outgoing surgeon to an incoming surgeon is essential for ensuring the safety, quality and continuity of care.

The goal of handover is to provide the high quality clinical information required for continuity of care by the incoming surgeon. In the AMA document 'Safe Handover: Safe Patients' a formalised and structured approach to handover is described⁸.

The Australian Commission on Safety and Quality in Healthcare also promotes improvements in clinical handover. The 'OSSIE' guide to clinical handover has been published to assist clinicians improve handover processes⁹. In addition, the Australian Medical Association has outlined the ten critical elements for efficient and effective patient handover¹⁰.

While the content of the clinical handover is important so is the need for systems to support the transfer of information. A Patient Information System must have the ability to reliably identify, track and transfer patients managed on a surgical unit or team (such as an ASU). It must also be a reliable platform for clinical audit.

One example of an electronic handover is the Nepean ASU Data Base, used in Nepean Hospital (Appendix E). The Nepean ASU Data Base program allows patient details to be updated, pathology and other results to be recorded and pending investigations to be followed up.

2.2.5 Clinical Protocols in Emergency Surgery

Protocols provide a comprehensive care path for medical, nursing and allied health services. They express the agreed clinical leadership decisions of the involved specialists. They encourage stability in the continuity of patient management by registrars, RMO's and case managers when individual consultants are handing over care. They provide an effective and efficient system for monitoring and recording variances for the purpose of reviewing and improving patient care^{11, 12}.

The implementation of event driven protocols for a range of emergency surgical conditions will enhance training, improve predictability in patient journeys and provide a framework for discharge planning. Examples of emergency surgical pathways for acute appendicitis and fractured neck of femur are provided (Appendix F).

2.2.6 Data Collection and Analysis

Sufficient data should be gathered and analysed to determine that the management of emergency surgery is both efficient and safe and that the emergency surgery model of care adopted has the continued support of clinicians and management.

2.2.7 Communication

Once the advance roster plan for the service has been finalised, a communication process and distribution system (verbal, electronic and paper based) ensures all necessary clinical staff and management are informed.

The same system and distribution system should also be used to communicate roster changes for clinical leave (both planned and unplanned).

A senior clinician or manager should be responsible for ensuring all roster changes are actioned and communicated to the relevant staff and departments.

2.2.8 Caesarean Sections

A special note needs to be made concerning caesarean sections and labour ward management.

Options for Caesarean Sections

As there are a limited number of operating theatre sessions for caesarean sections, patients are often scheduled for a caesarean section close to their due date.

The two consequences of this are:

- n many patients go into labour prior to their scheduled date of caesarean section and thus need an emergency caesarean section; and,
- n elective lists then have vacancies because elective caesarean section patients have already delivered.

If elective caesarean access can be available on most days of the week then the elective caesarean section patients can be booked as close as possible to their completed gestation.

The amount of operating room access for Gynaecology has been dropping as many procedures are now able to be undertaken without the need of operating theatres. Thus, there is potential to:

- n reorganise inefficient half day Gynaecology lists and replacing them with all day lists;
- n move minor Gynaecology procedures to endoscopy/ procedure suites to increase capacity in operating theatres; and,
- n allocate time in Gynaecology list for emergency caesarean section.

Labour Ward Director

The position of 'Labour Ward Director' exists outside Australia. The primary roles of the director are:

- n to book all inductions; and,
- n to co-ordinate all caesarean section bookings.

Intervention decisions in obstetrics, outside established criteria, should be booked on a consultant-to-consultant basis with the Labour Ward Director. This will require willingness by both consultants to question and examine the decision process. This is especially important for elective caesarean sections outside standard criteria as a first caesarean section commonly leads to further elective caesarean sections in future pregnancies.

Ideally, a senior clinician should be on-site for at least 12 hours each day in all major obstetric units (deliveries of high risk and numbers >2500 per year)¹³. Similar precautions should be considered in some hospitals with a smaller number of deliveries. It must be recognised that this requires a major cultural shift in obstetric practice.

Redesign of the Interhospital Patient Transfer System in Emergency Surgery

Interhospital transfer of a patient is necessary when the clinical requirements or resources for patient management are not available in the referring hospital¹⁴. It is imperative that the patient is transferred safely and efficiently. An agreed process for patient transfer has been established for critically ill patients¹⁵, but transfer guidelines for non-trauma emergency surgery patients are not standardised.

3.1. Principles of Interhospital Transfer

- n Interhospital patient transfers are of equally high priority for access to a facility than patients presenting directly to that facility.
- n A patient with a condition which cannot be managed safely or effectively in the patient's current location must be transferred to a facility that can adequately manage the patient's condition.
- n The decision to transfer must be based on the current clinical condition, prevailing local conditions and in consultation with the relevant clinicians in the receiving facility. The final authority for this decision rests with the referring clinician, who may be guided or assisted by discussion with other clinicians.
- n Some patients with life threatening conditions are better off having necessary surgery at the referring hospital before transport to the receiving hospital for post-operative support or further surgery.








This strategy is best planned by discussion at the time between surgeons and anaesthetists in the referring and receiving hospitals.

- n Transparent and timely communication between referring and receiving medical officers is vital. This should occur at the consultant specialist level and should include the relevant surgeons from the referring and receiving hospitals.
- n If a patient can receive equivalent safe and effective treatment in a less specialised hospital, particularly where this is socially advantageous, the patient may be transferred to that facility.
- n Where circumstances may impede or delay the transfer, referral must be made to senior management at the earliest possible opportunity. Issues impacting on a timely transfer should be resolved and/or mitigated without undue delay.

3.2. Interhospital Transfer System

An optimal system for interhospital patient transfer involves establishing transfer prerequisites and a standardised transfer process to enable safe and efficient implementation. These are outlined in Figure 3. This figure presents the important management issues, all of which need to be covered.

Figure 3: Redesign of the Transfer Process for Emergency Surgery

Redesign of the Transfer Process for Emergency Surgery		
Measure and Review		Measure the volume and review recent history of surgically related transfers by specialty and by hospital at AHS level and collate.
AHS Responsibility		Established a protocol on the designated receiving hospitals within and outside each AHS, including specific specialty contact numbers.
Escalation Process		Provide the escalation process, including the hospital or AHS executive contacts, if the designated receiving hospital is unable to accept the transfer.
Transport Logistics		List available transport options and their booking lag time, estimated transport time and requirement for clinical support personnel and equipment.
Clinical Information Transfer Checklist		Develop a clinical information transfer checklist which includes: clinical minimum data set, investigation results, clinical images and procedure reports.
Repatriation Plan		Ensure a repatriation plan is developed for each patient, including estimated date of return.
Communication Plan		Communicate transfer protocols by specialty to the local community, patients, AHS & hospital staff, ambulance service and GPs.

3.2.1. Measurement and Review

As with all redesign programs, the first requirement is data. This involves an Area-wide estimation of the volume and a review of the recent history of emergency surgery transfers by specialty and by hospital.

3.2.2. AHS Responsibility and Designation of Hospitals

For most emergency surgery patients the clinical needs can be met by transfer, when indicated, to one or more tertiary referral hospitals within the same AHS. Limitations exist when an AHS does not have a tertiary referral hospital or when a particular surgical specialty is not established. These limitations must be recognised and documented. For each such specialty service, a designated responsible hospital (or specialty unit) must be agreed. For an AHS with such limitations, one designated responsible tertiary referral hospital will usually provide this support for all surgical specialties as presented in the New South Wales Critical Care Adult Tertiary Referral Networks¹⁶. This responsibility must be explicit.

To assist timely patient transfer an agreed referral plan should be established with each specialty in the receiving hospital. Once agreements are in place, the receiving hospital must facilitate the patient transfers without delay.

Clinical need and the planned configuration and capacity of relevant clinical services need to override patient choice with respect to hospital destination. However, in exceptional circumstances, and when it is in a patient's best interest, a more directed, surgeon-to-surgeon referral may be sought which over-rides the agreed protocol.

3.2.3 Escalation Process

If the nominated hospital in the referral agreement is unable to accommodate the patient then an agreed escalation plan must be activated. This should be initiated by contacting the on-call AHS Executive member. In the event that the patient needs ICU support, the Aero Medical Retrieval Service (AMRS) will be able to assist.

3.2.4. Transport Logistics

Before identifying the most appropriate means of transport for the patient transfer, clinical staff should know about local transport resources and the choice of transport should be considered in light of the clinical urgency of the patient's condition.

The local transport knowledge required by clinical staff making transfer decisions include:

- n availability of fixed wing, helicopter & road transport;
- n lag time for booking these transport systems;
- n the estimated transit time of each transport option;
- n availability of and requirement for equipment during transfer; and
- n staffing requirements for transfer.

3.2.5. Clinical Information Transfer Checklist

An agreed standardised checklist needs to be developed and implemented within interhospital transfer networks. Minimal requirements of clinical information, investigations, results and reports are essential for safe and efficient patient transfers.

3.2.6. Repatriation of patients

Once higher-level care is no longer required by the transferred patient and the patient can receive appropriate safe and effective treatment in a less specialised hospital, the referral agreement must also facilitate the repatriation of the patient to their original hospital. This is essential to maintain capacity in the receiving hospitals.

Within 72 hours of the patient transfer, a conversation between staff (e.g. PFU's) at the receiving and referring hospitals should take place to clarify the appropriateness and estimated timing of repatriation. Once it is agreed a patient is ready for repatriation, this should occur within 24 hours.

3.2.7 Communication Plan








To ensure implementation of redesigned interhospital transfer processes, a communication plan should be developed and actioned to inform health professionals and the community of the changes.

3.3. Interhospital Patient Transfer Process

Appropriate transfer will be determined by the clinical requirements of the patient, logistics of the transport, level of clinical skill and types of equipment required to transfer the patient.

Figure 4 represents the stepped process needed to be followed when a patient requires transfer.

Figure 4: Interhospital Patient Transfer Process

Interhospital Patient Transfer Process		
Clarify & Record Need for Transfer		Record reason, urgency, specific investigative or procedural requirements for surgery.
Consultant to Consultant Communication		Refer to agreed protocol for designated receiving hospital by specialty. Consultant-to-consultant discussion including need for transfer, clinical urgency and timing. Consider requirement for surgery prior to transfer (definitive or damage control). Involve Patient Flow Units/Bed Managers in discussion. Involve other specialties as required e.g. Anaesthesia and ICU. Transfer clinical information electronically where possible e.g. PACS.
Arrange Logistics		Activate transfer checklist. Involve Patient Flow Unit/Bed Managers. Arrange mode of transport based on patient need. Identify arrival location (e.g. ED, ICU, OT, acute surgery ward).
Complete Transfer Checklist		All information collated and equipment assembled to accompany patient to receiving hospital (unless previously received electronically).
Bed Allocation		Patient Flow Unit/Bed Manager confirms allocated bed at receiving hospital. Patient Flow Unit may be required to resolve bed allocation whilst patient is in transit or in operating theatre. Patient Flow Unit notifies and confirms with relevant location (e.g. ED, ward, OT) of expected transfer.
Escalation Process		Activate the escalation process including hospital or AHS executive contact if the designated receiving hospital is unable to accept the transfer.
Communication from Receiving Hospital		Ensure there are appropriate mechanism to communicate patient's progress with patient's next of kin. Feedback information on the patient's outcome to referring consultant.

3.3.1. Clarify and Record the Need for Transfer

In order for the appropriate consultation and clinical and logistic planning to occur, the reason for the interhospital transfer of an emergency surgery patient (such as anticipated post-operative ICU support) needs to be clarified and recorded.

3.3.2. Consultant-to-consultant Communication

Ideally, the process for referral should begin with a consultant-to-consultant call (usually at surgeon level) and cover the need for the transfer, clinical urgency and timing.

Patient Flow Unit

In those AHS that have established a Patient Flow Unit (PFU) all transfer requests from peripheral hospitals are handled by the PFU e.g. Hunter New England AHS.

The process entails the referring specialist, the receiving specialist and the patient flow unit communicating via three-way phone conversation. Arrangements are agreed for the transfer during the single phone call.

The bed manager of the receiving hospital is then notified by the PFU of the need to accommodate the patient and the agreed transfer timeframe. The PFU then arranges transport and monitors the transfer until completed to ensure the clinically agreed timeframes are not being exceeded.

Alternative Process

Where a PFU does not exist, the process still requires specialist consultant-to-consultant communication prior to patient transfer and the involvement of the patient flow managers or bed managers in both referring and receiving hospitals.

New South Wales Bed Board System

The medical officer in the referring hospital advises their patient flow manager or bed manager of the agreed transfer arrangements. This information is then entered into the New South Wales Bed Board system. This board can be viewed by both referring and receiving hospitals, and provides the staff with the transferring patient details and the urgency category of the transfer (below, Figure 5).

Figure 5: Bed Boards Urgency Business Rules

Request a New Transfer		
Urgency Business Rules		
Category 1 - Immediately life threatening Being transferred for life-saving procedure or treatment (within 1 hour) Examples: Ruptured AAA Intracerebral bleed requiring urgent surgery Acute coronary syndrome requiring immediate angioplasty Acute fluid overload or intoxication requiring urgent haemodialysis	Category 2 - Limb threatening/ Urgent treatment Needs surgery or medical treatment to avoid significant complications. Delay in treatment likely to affect clinical outcome. (within 8 hours). Examples: Amputation for re-attachment Haemodialysis due that day Specialty service not available at other site - e.g. Plastics, ENT Pacemaker insertion (patient not acutely unstable)	Category 3 - Transfer for non-urgent reasons Delay in transfer will not affect clinical outcome. (within 24 hrs). Examples: Changing consultant team Relocating closer to family Obtaining another specialist opinion.

3.3.3. Arrange Logistics

Once the decision to transfer a patient has been confirmed, the logistics of the local transfer process should be actioned. These include the completion of the transfer checklist, notification of the patient flow units or bed managers, arranging the most clinically appropriate transport and identifying the arrival location.

3.3.4. Patient Transfer Checklist

To ensure that all patient details are completed for the transfer, a transfer check list is a valuable aid. The checklist includes patient vital signs, investigation results, infection risk status and other essential case details. In addition, the information sent with the patient should contain all relevant details (e.g. operation reports) that will be required by the clinicians and managers in the receiving hospital.

3.3.5. Bed Allocation

Where possible, it should be agreed that interhospital transfer patients are sent to a specific acute treatment unit or operating theatre suite, rather than to the Emergency Department (ED) of the receiving hospital.

If a patient requires ED assessment or intervention, the senior Emergency Medicine Physician should be informed. The Patient Flow Manager must supply a suitable bed prior to the patient arriving to prevent delays in moving the patient out of the ED. However, finding a suitable bed in the receiving hospital must not delay the transfer of an emergency surgery patient.

3.3.6. Escalation Process

Refer to section 3.2.3 for details on the escalation process if the designated receiving hospital is unable to accept the patient transfer.

3.3.7. Communication from Receiving Hospital

Almost as important as communicating a patient's clinical condition during transfer, is the establishment of a process for 'feeding back' information to the referring hospitals. This information is important for informing patient's relatives and families and may form a component of a clinical audit.

3.3.8. Repatriation of the Transferred Patient

Effective repatriation of transferred patients will maximise accessibility to high level or tertiary care for other patients. Once the higher level of care requirements no longer exist, the patient should be transferred back to the referring hospital or to their local hospital of choice when the following applies:

- n the local hospital can provide the level of clinical care which they require;
- n the required specialty or general care is available in the local hospital;
- n the patient's condition is stable and there is a clear ongoing management plan; and,
- n they are clinically fit to travel.

The receiving hospital will hand over care of the patient as soon as the patient can be safely clinically managed at the original referring hospital or an appropriate less specialised hospital. The process for repatriation of the patient should be the same as for the initial transfer. All patients should have had an expected date of discharge established on admission and this should be notified to the identified local hospital.

SECTION 4

Key Performance Indicators

The monitoring of emergency surgery performance is not currently a standardised practice in New South Wales hospitals. The performance measures chosen should reflect the quality of care the patients will experience after a change in the delivery of emergency surgery, the education and training benefits afforded to registrars and the improved access to emergency surgery.

Monitoring the appropriateness of patient transfers and the safety and efficiency of the transfer is an important component of the transfer system and should form part of the key performance indicators for emergency surgery.

Suggested indicators may include:

- n performance according to emergency surgery urgency category; (see following priority table 1);
- n emergency surgery theatre utilisation;
- n supervision of registrars (consultant surgeon in operating suite);
- n length of hospital stay for index conditions (emergency cholecystectomy, fracture neck of femur, acute appendicitis);
- n clinical outcomes for high volume cases (e.g. acute cholecystitis, fractured neck of femur, acute appendicitis);
- n measurement of after-hours activity;
- n postponements of emergency cases;
- n time from Emergency Department arrival to operating theatre entry for index cases;
- n measurement of distribution of emergency surgery performance across days of the week, hours of the day (standard-hours, after-hours, after 10pm), weekends;
- n patient transfer times; and,
- n appropriateness and safety of transfers.

The SST has endorsed the following Priority System for emergency surgery, with associated key performance indicators.

Table 1: Clinical Priorities

Priority (Time of booking to arrival in the Operating Suite)	Key Performance Indicator
<15 minutes ¹ ; Immediate Life threatening	100%
<1 hour; Life threatening	
<4 hours; Organ/limb threatening	85%
<8 hours; Non-critical, emergent	85%
<24 hours; Non-critical, non-emergent, urgent	85%
<72 hours; semi-urgent, not stable for discharge	95%

Definitions

- n **Immediate Life threatening** - The patient is in immediate risk of loss of life, shocked or moribund, resuscitation not providing positive physiological response.
- n **Life threatening** - The patient has a life threatening condition but is responding to resuscitative measures.
- n **Organ/limb threatening** - The patient is physiologically stable, but there is immediate risk of organ survival or systemic decompensation.
- n **Non-critical, emergent** - The patient is physiologically stable but the surgical problem may undergo significant deterioration if left untreated.
- n **Non-critical, non-emergent, urgent** - The patient's condition is stable. No deterioration is expected.
- n **Semi-urgent, not stable for discharge** - The patient's condition is stable. No deterioration is expected but the patient is not suitable to be discharged.

¹ It is recognised that in some facilities, where after-hours "on call" staff are permitted to have 20 - 30 minutes time to travel, that these facilities may fall outside benchmark time. However, the SST believes the incidence of this will not be significant – as most life threatening cases will fall into the less-than-1-hour category.

SECTION 5

Definitions

Elective Surgery Patient

The nationally agreed definition of elective surgery, as specified by the Australian Institute of Health and Welfare is surgery which, although deemed necessary by the treating clinician, in their opinion can be delayed for at least 24 hrs. Elective surgery patients who fit this definition are generally booked on to the elective surgery waiting list and their detailed surgical requirements provided on a completed Request for Admission (RFA) form. This gives rise to various alternative descriptions for these patients including elective, planned or booked surgical patients.

In this document, these patients are described as elective surgery patients.

Emergency Surgery Patient

An emergency procedure is one being performed on a patient whose clinical acuity is assessed by the clinician as requiring the surgery within 24 hrs or in less than 72 hours where the patient is not physiologically stable enough to be discharged from hospital prior to the required surgery. A definition of emergency surgery has not been specified by the Australian Institute of Health and Welfare. Some patients are admitted under the care of surgeons while the possible need for emergency surgery is assessed.

These patients whether undergoing surgery or not, are also described in various ways including emergency, unplanned, unbooked, acute or urgent surgery patients. In this document, these patients are described as emergency surgery patients.

Standard-hours Surgery

In most hospitals, the standard-hours operating period is between 0800 and 1700 Monday to Friday with minor variations in start or finish times between hospitals. This period in daylight hours is when most hospitals have the maximum number of their health services operational and have maximum staffing levels. The majority of elective surgery operations are scheduled in standard-hours.

In some hospitals, standard-hours may be redefined on some days of the week and extend to 2000 hours or even 2200 hours ("twilight sessions").

After-hours Surgery

After-hours operations generally occur between 1700 and 0800 Monday to Friday and all weekend. Much of the emergency surgery operating occurs during this time period. It is a time when many of the hospital services are either closed, on a call back system or working at reduced or minimal levels. Penalty salary rates for most staff escalate after-hours.

During holiday periods (e.g. Christmas, Easter) and during other periods of reduced clinical activity, the resourcing of operating theatres tends to resemble that occurring after-hours.

Obstetric Emergencies

The definitions applied to caesarean sections in Obstetrics differ from other definitions of surgical emergencies and are as follows:

- n an elective caesarean is a section in a non-labouring woman;
- n an elective caesarean section may be urgent;
- n an emergency caesarean is a section in a labouring woman; and,
- n an emergency caesarean section is sometimes (not often) non-urgent.

Referring Hospital

A hospital from which a patient needs to be referred and transferred to a higher level of hospital care is described in this document as a referring hospital.

The terminology is maintained for that same hospital even when a patient is repatriated to that hospital for continuing care.

Receiving Hospital

A hospital to which a patient is transferred, usually for higher level care than can be provided in the referring hospital is described in this document as a receiving hospital. The terminology is maintained for that same hospital even when a patient is transferred back from its care to that of the original referring hospital.

Handover

The transfer of professional responsibility and accountability for some or all aspects of care for a patient or group of patients, to another person or professional group on a temporary or permanent basis¹⁵.

Appendices

Appendix A: Emergency Surgery - Current Profile

1. Matching Demand and Resources

The impact of the emergency surgery demand is felt throughout the healthcare system including ambulance transport, emergency department load, operating theatre scheduling, ICU, HDU and ward bed access and staff rostering. However, little in the way of planning is undertaken for emergency surgery workload, particularly in comparison to the planning undertaken for elective surgery. The perception exists that emergency surgery is less amenable to planning but this ignores the fact that the demand and sub-specialty volumes of emergency surgery are relatively predictable on a daily or weekly basis e.g. fractured neck of femur, caesarean sections, hand surgery and abdominal conditions (Figure 6).

As a result of the failure to adequately measure and plan for emergency surgery, this work has not been properly resourced and the attention to its management has been deficient. It has been regarded as unpredictable work that the operating theatres must cope with using a range of inefficient historical strategies, many of which rely on goodwill. Emergency surgery is viewed by many surgeons as a necessary inconvenience at best but more frequently as a significant disruption to their complex daily and weekly schedules and a source of continual frustration after-hours (i.e. the 'on call burden'). The most predictable aspect of emergency surgery performance in many hospitals is how completely unpredictable operating theatre access can be.

The amount of operating theatre time allocated to emergency surgery is almost never proportionate to the demand. Emergency surgery competes for operating theatre time with standard-hours elective surgery. The lack of planned standard-hours access for emergency surgery places a significant impost on operating theatre scheduling and on-call surgeon availability.

It creates potential 'flashpoints' when the prioritising of emergency cases (e.g. caesarean section) competes

with elective surgery across a range of specialties and particularly when elective surgery cancellations occur. Many emergency surgery patients have after-hours operations, regardless of their urgency requirements, as the prospect of an available standard-hours operating session is negligible. In order to manage the tension, trainee surgeons may be allocated to perform the surgery with less than optimal supervision. Alternatively, surgeons enter into conflict with other surgeons, anaesthetists, theatre managers and hospital administrators to try to achieve timely access for their patients.

2. Emergency Caesarean Load

Obstetrics contributes a substantial proportion of patients to the emergency surgery workload. The most common obstetric emergency requiring urgent access to the operating room is a caesarean section. Many of the problems identified for other emergency surgery apply equally to dealing with caesarean sections. An obstetric service should determine the best system to manage its emergency workload, to reduce after-hours operations and to adopt a consultant-led model of care.

Caesarean section rates across Australia are approaching 30%. A 12 month analysis of caesarean section data from a major Sydney hospital reveals that more than half of the total numbers of caesarean sections were classified as emergency (Figure 7). This is supported internationally and thus, a significant reduction in caesarean section numbers is unlikely.

New South Wales Health policy states that caesarean section should be performed as close as possible to 39 weeks gestation¹⁷ and is designed to address neonatal morbidity.

Obstetric interventions carry significant risk for the requirement of caesarean sections. Therefore, they are best reserved for patients already confirmed as 'at risk'. If obstetric interventions are delayed until the latter part

of the day due to workload or bed issues, there will be an overall increase in caesarean sections performed after-hours and an increase in high risk patients undergoing caesarean sections at a time when less clinical support is readily available.

Planning for obstetric interventions must be a consultant-led process with a policy to avoid social or unnecessary interventions.

3. Roles of Individual Hospitals

The hospital resources required for the management of emergency surgery are largely described in the Hospital Role Delineation document of New South Wales Health¹³. Access to ICU, HDU, pathology and radiology services and specific health professional skills govern the complexity of emergency surgery that a hospital should be able to safely manage. Patient transfers and emergency surgery load distribution within and between AHS are required in

order to match the individual hospitals with the essential supportive services for emergency surgery.

While redefinition of roles of hospitals within some AHS has been progressing with respect to elective surgery, a more definitive approach to role delineation is required for emergency surgery. Further definition of elective and emergency surgery should be planned within hospital networks, resulting in clear decisions regarding the roles of each hospital in providing particular elements of elective and emergency surgery. Resources can then be adjusted and enhanced to enable the work to proceed in an orderly, satisfying and efficient manner. There are a limited number of hospitals that have the resources to manage the full range and load of emergency surgery. There are also some hospitals that maintain costly access for emergencies when their emergency surgery caseload is small, support services are not adequate and more sustainable emergency surgery services are geographically nearby.

Figure 6: Emergency and Planned Surgery Admissions

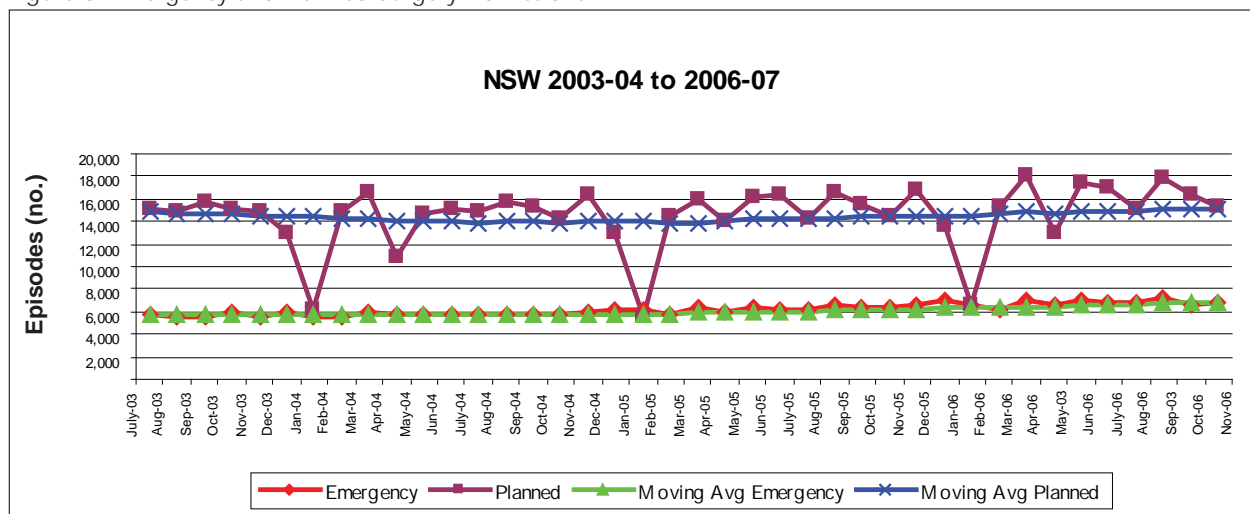
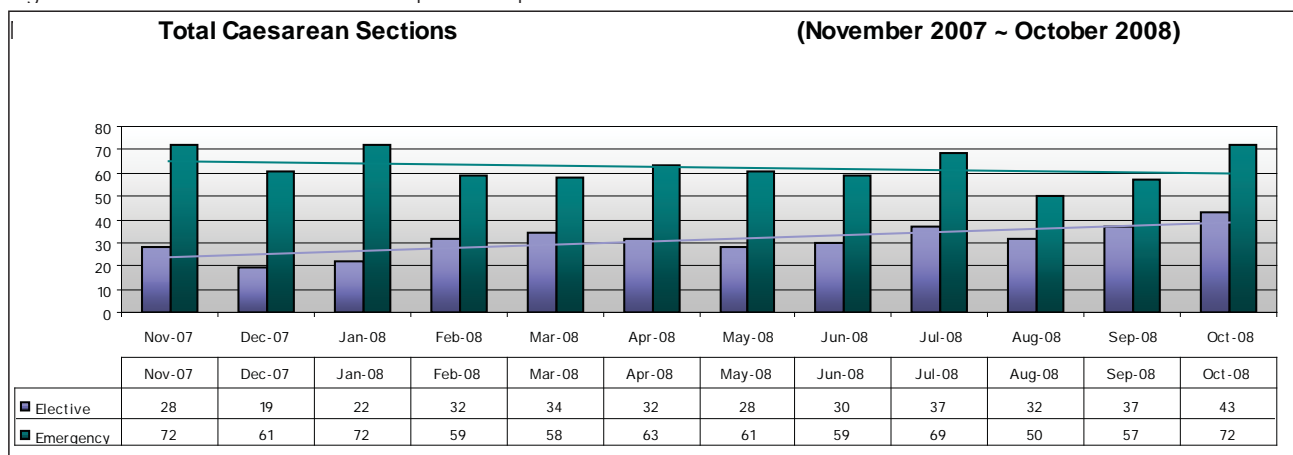


Figure 7: Total Caesarean Sections Nepean Hospital



4. After-hours Workload of Emergency Surgery

Emergency surgery frequently presents and is managed after-hours (1700 - 0800). This is at a time when most hospitals have the least number of their health services operational and when they are staffed at their leanest level. Yet, emergency surgery assessment frequently requires a high degree of investigative and diagnostic activity relating to its complexity. Rapid pathology testing and diagnostic imaging are often required. Some complex support services (e.g. GI endoscopy, ERCP and interventional radiology) are required less frequently but are often urgent.

Significant workforce resources are needed to perform the surgery itself, including anaesthetists, surgeons, nurses, operating theatre and recovery staff. It would be expected that such resource intensity would lead to the clinical urgency of the emergency presentation determining the priority for and timing of surgical intervention after-hours. However, clinical urgency is not the main determinant of when the surgery occurs. It is frequently the lack of access to the operating theatres during daylight hours that determine the after-hours timing of operative interventions. Similarly, it is often the knowledge that there will be no reliable operating theatre access on the following day that determines late night operations on acutely admitted emergency surgery patients. This impacts on the financial cost of the services provided at those times.

5. Safe Working Hours

The introduction of the 'safe working hours' environment for staff affects a hospital's ability to adhere to the traditional on-call roster. Past practices of surgeons and their teams working continuously for 24 hours or more are no longer appropriate and are in breach of well researched safe practices¹⁸.

In a number of hospitals, 'on-call' rosters are used for emergency surgery. The operating theatre staff 'on-call' are frequently the same staff required to be available for the elective surgery workload on the following day. Thus, it is not surprising when the surgeons are 'called back' that the surgery scheduled for the following day is either delayed or cancelled to allow the staff to catch up on sleep. Not infrequently, the next day's surgery may be compromised by sleep deprivation.

6. Supervision of Junior Staff

After-hours supervision and training of surgical and anaesthetic registrars and other junior staff are not optimal in many hospitals. Junior staff or registrars are assessing, managing and performing operations on patients after-hours, when surgical and anaesthetic consultants or other senior clinical staff support are not present. Supervision is often distant (i.e. by telephone). This raises significant quality and safety issues and important concerns about the quality of training in emergency surgery procedures. It also gives rise to questions about efficient use of operating theatre time since it is well known that unsupervised registrars take longer to perform operations.

7. Disruption to Elective Surgery by Emergency Surgery

The allocation of operating theatre time for emergency surgery is often suboptimal and leads to disruptive competition with elective surgery when the "unexpected" emergency case arrives or when urgent unplanned surgery cases "unexpectedly build up". As a result, most surgeons have experienced cancellation of their planned elective load in order to accommodate the emergency load.

Even when operating theatre sessions are provided for the accumulated emergency load in standard-hours, the non-availability of surgical staff, in particular, reduces the utilisation of these resourced sessions. This results in treatment delays for emergency surgery patients and wastage of resources.

8. Sub-Specialisation of Surgeons and Surgical Trainees

Emergency surgery places a heavy demand on surgeons particularly due to the after-hours component of the service. Some surgeons are restricted in their ability or preference to deal with the range of surgical presentations because of the extent of their sub-specialisation. This places even more demands on the surgeons with the wider range of emergency surgery skills and may lead to unsustainable workloads and rosters. Unfortunately, the increasing trend of sub-specialisation across all specialties is deterring or precluding many surgeons from participating in emergency surgery rosters.

The emergency surgery demand is largely met in the public sector. The increasing amount of elective surgery undertaken in the private sector may also reduce the availability of surgeons in the public sector as elective private work can be seen as stable and more attractive and conducive to a lifestyle of daylight working hours.

9. Inter-hospital Transfer of Patients with Specific Conditions

A patient who cannot be managed by the clinicians in a particular hospital requires assessment, stabilisation and subsequent transfer to a hospital able to cope with that emergency presentation. The process of identifying an appropriate hospital to accommodate a patient can be a frustrating and time consuming process despite many previous attempts to resolve this issue in New South Wales.

A number of publications identify transfer policies and guidelines for patients with specific conditions:

- n The New South Wales Newborn and Paediatric Emergency Transport Service (NETS)¹⁹;
- n The Paediatric Surgery Model⁴;
- n The Critical Care Adult Tertiary Referral Networks- Intensive Care Default Policy¹⁶ that defines both the standard tertiary referral links in New South Wales and the following specialty referral networks:
 - n Severe Burns Injury;
 - n Acute Spinal Cord Injury;
 - n Major Trauma;
 - n Rural Cardiac Catheter Services; and,
 - n High Risk Obstetric referrals.

However, patients who do not present with these specific clinical conditions have less formalised processes guiding their transfer. Consistency needs to be established within AHS for the process of identifying the most appropriate hospital for the transfer, the most appropriate timing of the transfer, a contact person to arrange the transfer and the documentation, equipment and staff required for the transfer. The receiving hospital is required to assist with the arrangement of the transfer and to adequately accommodate and clinically manage transferred patients.

Regretfully, the transfer of patients remains a source of high risk for adverse outcomes.

10. Patient Handover between Surgical Teams

With the growing emphasis on more appropriate and safer working hours and increasing reliance on multiple medical/surgical teams to direct the care of inpatients at different times, safe and effective methods of handover and communication are required. However, handover is not standardised and is not traditionally well accepted or documented by surgeons and their teams. Continuity of patient care must remain both the goal and the outcome.

11. Recognition of Surgeon Commitment

There is a high level of commitment by surgeons who provide an emergency surgery service. They are expected to deal with emergencies, often after-hours, and provide close supervision of trainees. Social and family disruptions are the norm.

Current approaches to the remuneration and recognition of surgeons who provide emergency surgical care require review. Surgeons who retain and develop a core competency in emergency surgery should be recognised and rewarded by the health system.

12. Use of Clinical Guidelines in Emergency Surgery

The use and benefits of clinical pathways are well documented in the medical literature. Treatment protocols, clinical pathways, critical pathways or care paths can standardise and streamline the evidence based care that an individual patient receives. However, guidelines for emergency surgery patients are not widespread or well adopted within New South Wales. This can leave patient management open to wide variations and can lead to treatment delays and omissions especially if the direction of that clinical care passes in an unplanned fashion from one surgeon to another. For such guidelines to work, they must be agreed upon by the relevant surgeons in the particular hospital.

Appendix B: Benefits of Emergency Surgery Redesign

The redesign of emergency surgery services will result in benefits for clinical performance, service management and resource utilisation.

1. Clinical Benefits

1.1 Reduced Morbidity and Mortality, and Improved Patient Outcomes

Improvements in morbidity and mortality have resulted from consultant-led models of care. For example, thirty day mortality rates for fractured neck of femurs have been shown to have reduced from 4.4% in 2006 to 1.9% after the introduction of an ASU at Liverpool Hospital. The patient benefits are due to improved planning and supervision of their care by consultant surgeons and an enhanced hospital experience, as well as reduced length of stay.

1.2 Improved Predictability of Access to Surgery

This will greatly improve patient satisfaction, as well as surgeon, operating theatre team and ward staff satisfaction.

1.3 Better Provision of Focussed Training in Emergency Surgery

An ASU will provide consultant surgeons, registrars, nursing and allied health staff with an increased exposure to surgery with a concentrated emergency surgery focus. This will enhance their experience in dealing with emergency surgery patients and it would be anticipated that clinical benefits for the patients will result.

1.4 Adjustment to Sub-specialisation

Departments that wish to embrace an ASU need to ensure that all surgeons agree to accept and manage the patients presenting during their rostered period. Surgeons participating in an emergency surgery roster will have exposure to a wide range of surgical patients and access to a pool of colleagues willing to assist in the management of this patient group. Telephone or on-site advice from subspecialty colleagues would be encouraged. Some surgeons will develop special expertise in emergency surgery within their particular specialty.

2. Service Management Benefits

2.1 Improved Emergency Theatre Utilisation

Improving theatre utilisation is not the primary aim of an ASU. However, once the ASU surgeon is on-site they are able to organise the first case for the next scheduled emergency theatre session. This results in improved on-time starts and increased overall theatre utilisation.

2.2 Reduction in Elective Surgery Cancellations

With appropriate operating theatre sessional planning for the emergency surgery load in place a significant reduction in delays and cancellations should occur. Elective surgery sessions should largely proceed undisturbed by emergency surgery sessions in the same operating theatre suite.

2.3 Reduction in After-Hours Surgery

Access to standard-hours operating theatre sessions will reduce the requirement for after-hours surgery in a significant number of conditions. This will be appreciated by surgeons and anaesthetists and will reduce after-hours costs for the hospital.

2.4 Reduction in Length of Stay

A consultant-led model of emergency surgery, using agreed clinical guidelines, has considerable potential to not only improve a patient's care throughout the hospital stay, reduce unnecessary delays to treatment, but also reduce the length of stay. The complication rate of emergency surgery patients should also be reduced with less delays, more certain operating theatre access, increased supervision of registrars and the increase in consultant supervised emergency operations.

2.5 Reduced Delays in ED for Emergency Surgery Patients

A consultant-led model has the capacity to reduce delays in management decisions for emergency surgery patients presenting to an emergency department. This will assist in reducing off-stretcher ambulance delays and total ED time. It might also be expected, when clinically appropriate, that the consultant surgeon will decide to discharge a stable emergency surgery patient but bring them back as a planned admission the following day for their operation, thus saving inpatient bed days.

3. Resource Utilisation Benefits

3.1 Improved Availability of ICU and HDU

Improved planning for emergency surgery should result in better alignment of ICU and HDU resources for complex emergency surgical cases.

3.2 Improved use of Radiology and Pathology Investigations

The use of agreed clinical guidelines will standardise requests for radiology and pathology services. With consultant surgeons more involved in the diagnostic decisions, the appropriateness of diagnostic tests will improve and their volume will decrease.

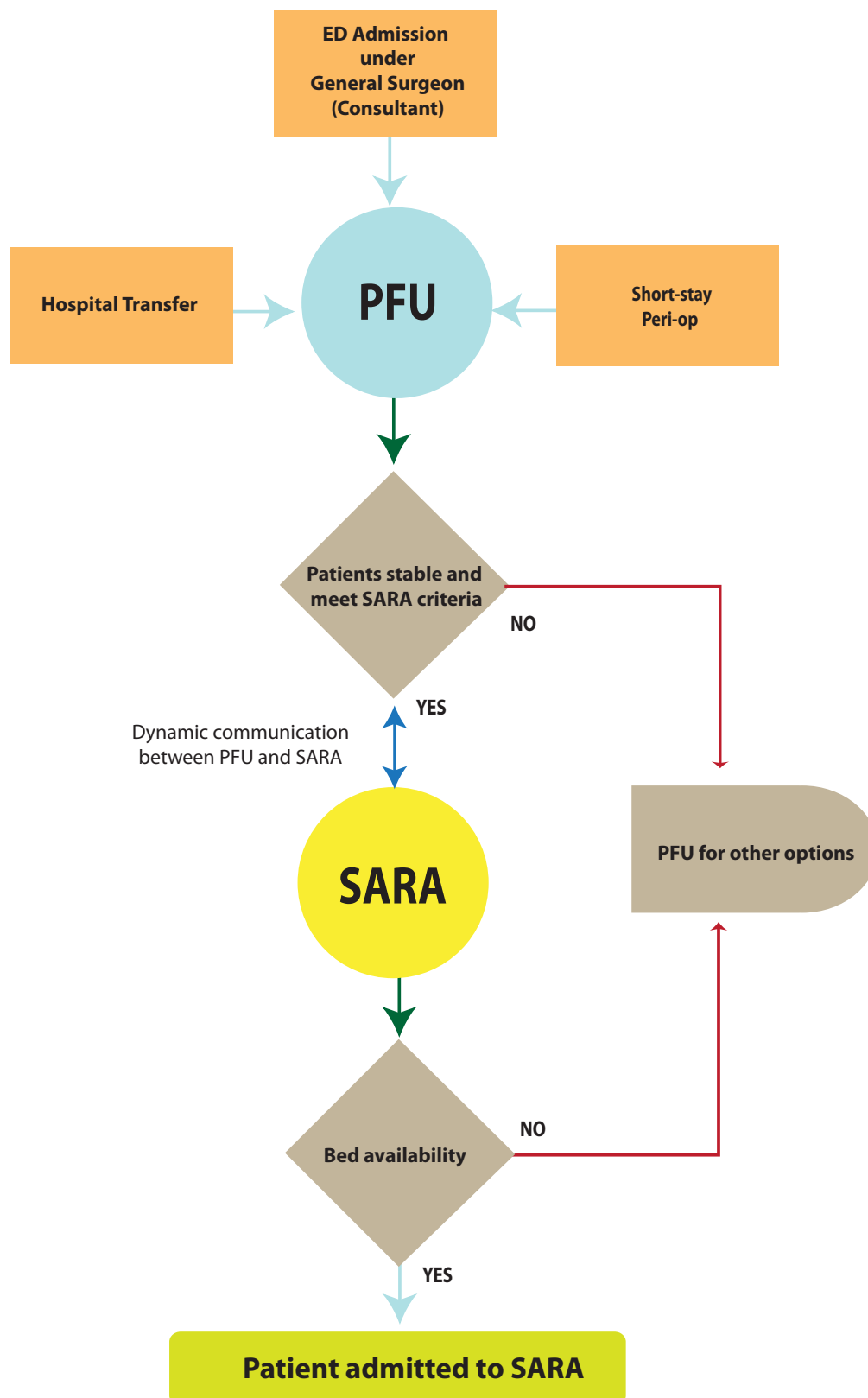
Appendix C: Examples of Procedures Requiring Urgent Operative Management.

The examples proposed may be applied to adult and paediatric patients where appropriate.

Specialty	Procedures
Orthopaedics	Dislocations
	Compartment syndrome
	Contaminated wounds
	Vascular compromise
	Skin under tension
ENT	Haemorrhage Airway obstruction or airway compromise Neck or deep space abscesses Caustic & lye ingestion and some cases of smoke inhalation Some cases of ingestion of foreign bodies Per orbital abscess associated with severe proptosis/ loss of visual acuity Large cervical haematoma following surgery Haematoma or infection causing reconstructive flap compromise following major head and neck resections Diminishing visual acuity following endoscopic transeptal transphenoidal surgery or endoscopic sinus surgery Nasal or mid facial fractures with uncontrollable haemorrhage or CSF leak Penetrating injuries/crush injury/ gunshot wounds affecting neck/larynx/airway Quinsy
Urology	Testicular torsion
	Exsanguinating renal injuries
	Gunshot wounds or penetrating injuries involving the urinary tract
	Complete anuria due to bilateral ureteric obstruction. Also consider patients with solitary kidney
	Intraperitoneal bladder rupture
	Rupture of membranous urethra in conjunction with pelvic fracture
	Fournier's gangrene
	Severe clot retention in the bladder
	Ureteric avulsion
	Injury to urinary tract in conjunction with other intra abdominal trauma
	Complications arising from laparoscopic urological surgery to upper or lower urinary tract or genital tract
General Surgery	Acute abdomen Peritonitis Intra abdominal bleeding Ruptured tumours Severe necrotising infections Severe soft tissue sepsis Severe/major intra abdominal sepsis Haemorrhage Gunshot and some cases of knife wounds Perforated viscus including oesophagus, stomach, duodenum, small bowel, large bowel, appendix and gall bladder Necrotising fasciitis (1st presentation or deteriorating patient) Return to theatre for bleeding, especially intra abdominal
Colorectal	Peritonitis - ruptured diverticulum
	Large bowel obstruction - in the frail patient with co-morbidities
	Major retroperitoneal trauma
	Inflammatory bowel disease with toxic colon
	Impending ischemia
	Septicemia with radiologically undrainable abscess
	Some cases of perianal abscess
	Haemorrhage

Ophthalmology	Penetrating eye injuries requiring exploration Repair of eyelid & periocular facial / orbit injuries and fractures (compound especially) Acute glaucoma (very high intraocular pressure) not adequately controlled by medical treatment Retinal detachment repair (including vitrectomy) required for impending or recent "macular off" retinal detachment Vitrectomy for severe cases of infective endophthalmitis Orbital exploration/ abscess drainage for orbital cellulitis
Neurosurgery	Trauma craniotomy for acute extradural, subdural and intracerebral haematoma, or penetrating injuries and skull fractures. Burr hole for insertion of extra ventricular drain Decompressive laminectomy or other spinal operations for cord or cauda equina compression, caused by trauma, large disc herniations or infection Craniotomy to drain cerebral abscess Craniotomy for tumours that are causing critical raised intracranial pressure Craniotomy for spontaneous intracerebral haematoma or any other intracranial conditions with imminent risk of 'coning'
Vascular	Abdominal aortic aneurysm Haemorrhage (including returns to theatre and other specialty operations requiring vascular assistance) Grafts requiring revascularisation Organ donation/harvest Some cases of fistula formation
Dental/Faciomaxillary	Haemorrhage/mid face bleeding Risk of inhalation (tooth or fragment) Trauma associated with any of the above
Obstetrics	Caesarean sections Postpartum haemorrhage Prolapsed cord Major obstetrics tear +/- 4th degree tear Ruptured uterus Trial of forceps
Gynaecology	Ectopic pregnancy with vascular instability Incomplete miscarriage with ongoing haemorrhage Returns to theatre
Plastics	Free flaps requiring return to theatre Haemorrhage due to facial fractures Impending nerve compromise due to fracture dislocation
Hands	Amputations for reimplantation/ revascularisation
Paediatric	Torsion of testis Peritonitis Severe blunt trauma Trauma associated with haemorrhage - vascular instability despite 50% blood volume replacement (crystalloid or colloid) in first 2 hours, or after whole blood + 50% BV of crystalloid/colloid Severe GI bleeding Penetrating trauma Perforated hollow viscus Necrotising enterocolitis Abscess with systemic sepsis Ureteric avulsion Exsanguinating haemorrhage Urethral rupture Necrotising fasciitis Return to theatre for transplants with bleeding or vascular occlusion

Appendix D: Flowchart of Westmead Hospital SARA Unit



Appendix E: Screen Shots From Nepean Hospital ASU Data Base

Nepean ASU Database

Add New Case | Open Case List | Reports | Closed Cases

MRN
0450740

Surname
Anonymous

Firstname
Anne

Birthdate
18/11/1987 **Age** 22

Sex(M/F)
F

Admit Date **Ward**
11/03/2009 2G

Protocol? ☐ Yes ☒ No **Allergies**

Provisional Dx 21F ?Appendicitis DDx endometriosis

Final Dx

Presenting Signs and Symptoms
2/7 Hx of severe suprapubic non-radiating non-shifting tenderness, hot/cold, nausea, anorexia. Involuntary guarding, afebrile, WCC normal.

Significant Medical/Social Problems
Had laparoscopy for endometriosis. States pain different from endometriosis

Non ASU Management/Input

Follow Up [Select]

Alerts

Complications:

Planned Procedures
No procedures have been entered for this case.

Existing Management Plan Details

Start	End	Plan	Change
11/03/2009		For lap appendix	<input type="button" value="Change"/>

Imaging Results
No previous imaging reports available.

Pathology Results
No pathology results available.

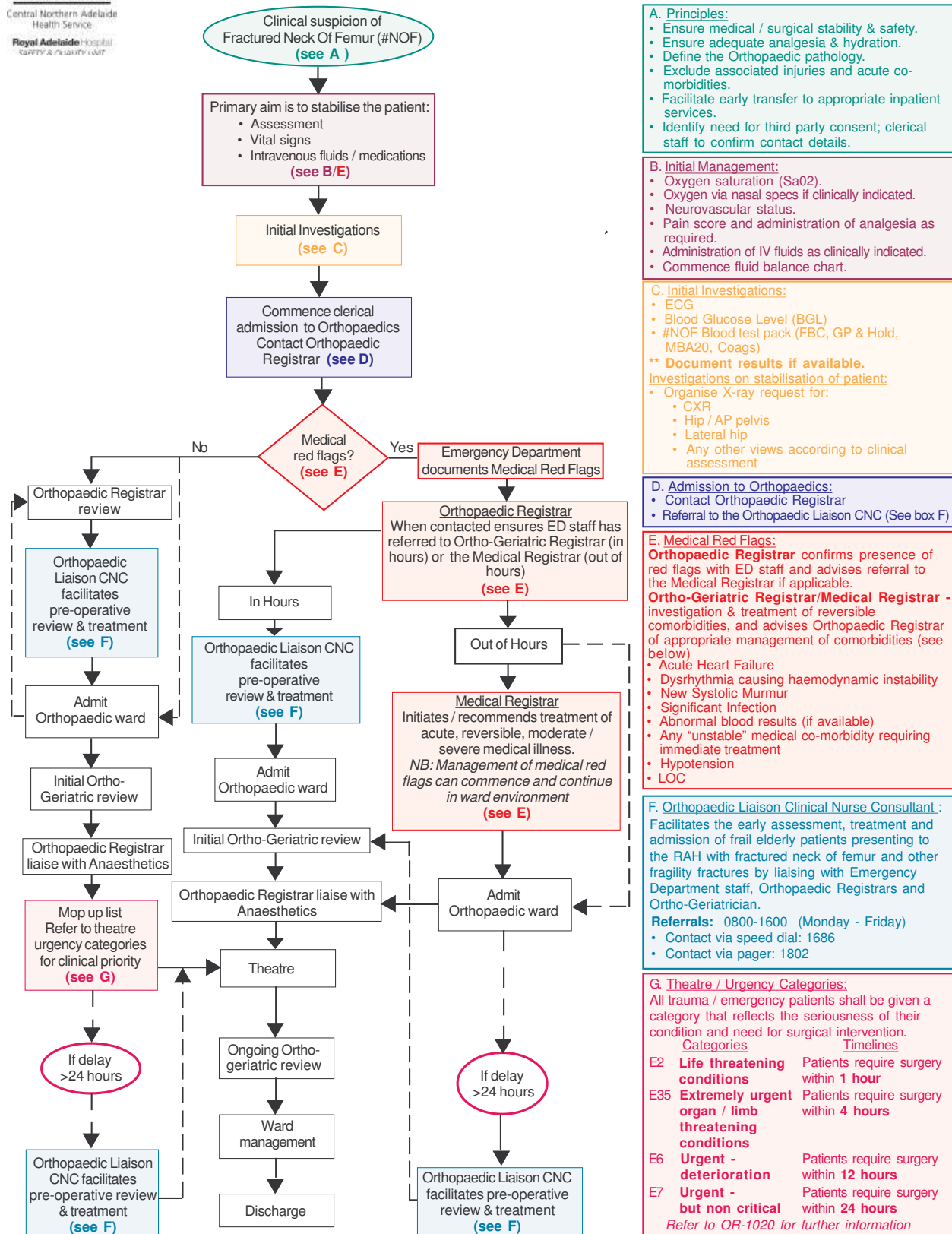
ASU Open Case List

MRN	Name	Ward	Admitted	Presenting Problem
0819543	A **** H ****	2G	10-Mar-09	46 yo M with history of perianal pain, constipation and urinary retentin afibrile on exam tender on 10 O'clock, Previous history of perianal abscess which drained Booked and concentrated for OT
Procedures: Drainage perianal abscess				
0814005	S **** J ****	2G	11-Mar-09	21 yo M with 3/7 history of perianal pain and tenderness, abscess detected on exam booked and concentrated for OT
Procedures:				
0401495	T **** M ****	2G	09-Mar-09	23yo choledithiasis - multiple stones on U/S, 8:52 post-partum LFTs OK
Procedures: Laparoscopic cholecystectomy				
0819375	J **** O ****	2G	06-Mar-09	27 Hx constant, RIF pain, worsening, no bowel or urinary symptoms. Abdo soft, tender at McBurney's point, no peritonism, temp 37.5 C, WCC 14.6, CRP 167 Abdo CT: Conglomerate mass in RIF w/ closely adherent SB loops, no definite abscess
Procedures: Open appendicectomy				
0520188	M **** Q ****	2G	09-Mar-09	2/7 rectal pain - worsening, BNO 5/7 Hx of haemorrhoids, Dx 8 yrs ago - no surgery No assoc PR bleed Temp 37.3, PR: tender lump posterior wall rectum, no stool palpable, no blood on glove, no fissures. WCC 13.8
Procedures:				
0572630	A **** R ****	2G	10-Mar-09	presents with RUQ pain since 0300 sharp, severe, non-radiating. First episode 8yrs ago, 4 episodes past 1/12. Assoc Nausea. No recent U/S ?u/s 8yrs ago. O/E abdo soft, tender RUQ, Murphy's -ve. WCC 7.7, LFT normal. U/S performed- verbal report of choledithiasis, +ve sonographic murphy's, thickened GB wall. NBM + IVF + heparin.
Procedures: Laparoscopic cholecystectomy				
0718400	A **** T ****	2G	10-Mar-09	33 y.o. M p/w abscesses on R wrist & L thigh, worsening over last 4/7 Type II DM. Afebrile, WCC 13.6, CRP 25. Both abscesses were I/D in OT.
Procedures: Drainage of abscess				
0450740	T **** V ****	2G	11-Mar-09	2/7 Hx of severe suprapubic non-radiating non-shifting tenderness, hot/cold, nausea, anorexia. Involuntary guarding, afebrile, WCC normal.
Procedures:				
0590861	J **** B ****	4A	07-Mar-09	96 yo F with 1/7 history of epigastric pain and vomiting transferred from Hawksbury hospital Spiked temperature BG open cholecystectomy stable and afebrile now Tender in epigastrium and RUQ, Wbc 19 amylase 1408, ALT 300, BIL 11 for IV ab x3 and us mane
Procedures:				
0038910	J **** B ****	4A	11-Mar-09	Anaemia for 1/12 No abdo pain. GP investigation = FOB negative. CT showed large retroperitoneal haematoma. PI stable haemodynamically.
Procedures:				
0819437	P **** E ****	4A	08-Mar-09	60Y old female. Vomiting and diarrhoea. CT Distal SBO near old appendix scar. PH open appendicectomy at age 2y Tender RIF. Afebrile, Bloods normal.
Procedures: Division of adhesions				

Appendix F: Example of Fractured NOF and Appendicitis Protocols



RAH Guidelines for patients presenting to the Emergency Department with Fractured Neck Of Femur (#NOF)



Roles and Responsibilities of the Multidisciplinary Team

EMERGENCY DEPARTMENT

1. Stabilises patient.
2. Identifies need for third party consent, ED clerical staff obtains / confirms contact details.
3. Initial investigations.
4. Pain relief, fluid management
5. Identifies and documents 'medical red flags' and initiates treatment of reversible co-morbidities
6. Triage based on medical red flags.
7. Liaises with the Orthopaedic Registrar and Orthopaedic Liaison CNC.
8. Do not delay admission to ward if patient awaiting medical review of red flags.

ORTHOPAEDIC REGISTRAR

1. Assessment, diagnosis and management of fractured neck of femur and other fragility fractures (Refer to Femoral Neck Fractures guidelines).
2. Organises surgery / theatre bookings / patient insurance status.
3. Obtains consent (3rd party if required) for surgery and femoral head donation if hemiarthroplasty or replacement* (Refer to the Patient Tissue Consent guidelines).
4. Confirms presence of medical red flags with ED staff and advises of need for referral to the Medical Registrar and Anaesthetics.
5. Contacts medical registrar for review / assessment as appropriate / requested by anaesthetist
6. Ensures Anaesthetics aware of third party consent.
7. Records / documents recommendations for care in the patients medical record
8. Commences appropriate prophylactic antibiotics as per Surgical Antibiotic Prophylaxis Guidelines
9. Undertakes appropriate venous thromboembolism risk assessment. Initiates anticoagulation as per Hip Arthroplasty Guidelines
10. Communicates plan of action to the hospital team, the patient, carer, family and general practitioner
11. Refers to / liaises with the Orthopaedic Liaison CNC.
12. Do not delay admission to ward if patient awaiting medical review of red flags.

ORTHOPAEDIC INTERN / RMO

1. Follow through and continue treatment of 'red flags' as initiated by Medical Registrar and Anaesthetist.
2. Complete admission to ward (Refer #NOF Management Guidelines)
3. Contact cardiology for urgent review and pre operative ECHO if required.
4. Consider giving patient alternative hydration if fasting for extended periods of time.

MEDICAL REGISTRAR

1. Investigation & treatment of reversible co morbidities.
2. Reviews patients requested by Orthopaedic Registrar / Anaesthetists
3. Advises intern / resident of appropriate management of medical co morbidities.

ORTHOPAEDIC LIAISON CLINICAL NURSE CONSULTANT (CNC)

1. Facilitates the early assessment, treatment and admission of frail elderly patients presenting to the Royal Adelaide Hospital Emergency Department with fractured neck of femur and other fragility fractures by liaising with Emergency staff and Orthopaedic Registrars.
2. Performs initial patient assessment and determines acuity.
3. Communicates patient findings, status and proposed plan of care with the primary care Orthopaedic Registrar.
4. Arranges and interprets radiological and pathological examinations to aid in the diagnosis of injuries and existing co morbid conditions
5. Facilitates pre-operative review and treatment by liaising with appropriate health care professionals.
6. Initiates appropriate and timely risk / complication prevention strategies / secondary prevention programs
7. Case manages a select group of patients.
8. Liaises, plan of care / action to patient, carer / family, ward team including Ortho-Geriatrician.

ANAESTHETISTS

1. Reviews / assesses patients for suitability and / or fitness for anaesthesia at the earliest convenience.
2. Identifies and treats reversible co morbidities by:
 - Advising intern / resident of appropriate steps or;
 - Advising the intern / resident to contact General Medicine.Involvement of GM only where significant co morbidity requires immediate assessment or needs to be optimised by medical management prior to surgery.
 - Advises the intern/resident if ECHO needed urgently
3. Obtains / confirms anaesthetic consent (3rd party if required)
4. Considers and recommends appropriate pain relief (regional block preferred), fluid management, regional anaesthesia.

ORTHO-GERIATRICIAN

1. Reviews all #NOF patients > 65 years old Mondays, Thursdays and as clinically indicated.
2. Advises on assessment and management of significant co morbidities
3. Medication reviews as required, facilitates / initiates secondary prevention treatment for osteoporosis.
4. Attends Orthopaedic & Trauma Service discharge planning meetings.

NURSING (in accordance with the RAH Standards of Nursing Care)

1. Assessment
2. Care Planning
3. Clinical Intervention (as indicated in protocol)
4. Communication
5. Continence & elimination
6. Cultural sensitivity
7. Discharge Planning
8. Documentation & Record Keeping
9. Mobility
10. Nutrition & Hydration
11. Personal & Oral hygiene
12. Safety & Risk Assessment

PHYSIOTHERAPY

1. Physiotherapy / Nursing staff mobilise day 1 - unless otherwise directed.
2. Refers to operation record regarding weight bearing status. Routine full weight bearing (FWB). Exceptions to be noted in orders and justified on operation record.
3. Encourages sitting out of bed.
4. Teaches exercises to increase ROM and strength.
5. Chest physio or other physio as required / assessed by Physiotherapist.
6. Days 2-7 - teach independent transfers and mobilisation with frame. Progress to 2 sticks if able.
7. Teaches step prior to discharge.
8. Organises walking aid and equipment.

OCCUPATIONAL THERAPY

1. On referral.
2. Assessment of pre-admission and current level of function, education in adaptive aids or compensatory techniques, equipment prescription and home assessment as indicated.

SOCIAL WORK

1. On referral
2. Inform patient and families of discharge options (eg rehab, return home with increased supports, respite / permanent placement, TCP packages).
3. Work with patient's and families in determining if returning home is a realistic goal. Provide counselling and support when it is not a realistic.
4. Where it is determined that placement is the best outcome, facilitate placement process and ongoing communication with patient / family, treating team and placement coordinator re progress of placement; provide support and counselling as required.

DIETITIAN

1. On referral (as per nutrition screening).
2. (NB. Nutritional state often compromised in the elderly)

Disclaimer: The information and protocols in this document are offered only as a guide to clinical practice at Royal Adelaide Hospital.

Endorsed by Fractured Neck of Femur Work Group
RAH Operations Committee



Appendicitis

CC1.165

Initial medical and nursing assessment and management

Medical

Look for RIF tenderness, fever, tachycardia and signs of peritonism

- WCC, ELU, U/A, CXR (if sig comorbidities)
- PR exam
- BC if temp > 38.5

If female

- βHCG, gynae exam



Initial management

- Fast and IVT (0.9% saline)
- 4/24 obs
- Fluid Balance Chart
- Analgesia
- DVT prophylaxis as per GI services protocol

If signs of peritonitis present, commence IV abs (see over page for details) and arrange urgent operation



Decision for operative or conservative treatment to be made by registrar in consultation with senior staff. Laparoscopic preferred for all patients (depending on surgical experience).

Atypical history/examination/ findings

RIF, peritonism, fever, raised WCC

Laparoscopy/Appendicectomy – refer overleaf



Conservative treatment - medical

Continue initial management, review progress (minimum BD by Surgical Registrar)
Assess pain levels, repeat WCC

- If pain settles, diet as tolerated
- If pain does not settle within 24 hours, order a CT scan with contrast (if concern re gynae pathology/pregnancy - U/S not CT). Registrar or consultant to review result
- If normal treat on merit, diet as tolerated
- If abnormal, treat cause and/or refer on

Clinical deterioration requires operation



Discharge when

- tolerating diet
 - haemodynamically stable
 - bowel function returning to normal
- Advise patient to see their GP within 7 days*

Nursing

- Complete nursing assessments as per normal admission
- Assess level of pain and document – *indiscriminate use of parenteral analgesia is to be avoided - patient requires review if ↑ abdo pain for signs of peritonitis*
- Assess bowel function and document
- Take urinalysis and document – report abnormalities
- Ensure βHCG (if female) performed in Emergency Department – complete if not

Observations (BP, TPR, pain level)

- 4/24 - report abnormalities or deterioration
- Fluid balance chart
- Record if passing flatus/bowel movements

Diet and fluids

- Maintain IV therapy
- Ice chips only – document level of tolerance
- Fast until decision re surgery has been made

Mobility

- Can mobilise as tolerated (assist prn) – document level of mobility

Patient education

- Educate why patient needs to rest gut
- Encourage to mobilise as tolerated to prevent complications of bed rest



Conservative treatment - nursing

Continue obs as above
If pain settles, check with MO then diet as tolerated

Once ready for discharge

- Provide written and verbal discharge information to patient/family
- Complete D/C checklist
- Check if OPD appointment required
- Check if sick certificate is required
- Discharge time is by 1100 (transfer to Discharge Lounge if discharge to occur later)



Appendicitis

CC1.165

Patient for appendicectomy

Medical

Pre and intra op care

- Obtain consent
- Book for surgery (consult registrar/consultant re urgency/timing)
- If normal appendix found
 - leave behind if other pathology is found that explains symptoms
 - remove otherwise

Antibiotics

- Give a single dose IV cephazolin 1 gm and IV metronidazole 500mgs at induction of anaesthesia (unless antibiotics were commenced preoperatively for signs of peritonitis)
 - *Normal appendix* - no further antibiotics required
 - *Mildly inflamed* - no further antibiotics required
 - *Necrotic/Purulent appendix or for signs of peritonitis pre op* - commence IV ampicillin 1 gm 6 hrly, IV gentamicin* 4-6mgs/Kg daily (subsequent dose will vary according to daily gentamicin levels, age, creatinine clearance), IV metronidazole 500mgs 8 hrly
 - Complete a 5-7 day course depending on clinical response (cease when afebrile for >24 hours and normalising WCC)
 - Consider changing from IV to oral after 48 hours if responding well. (Augmentin Duo Forte one 12 hrly)

**If gentamicin is contraindicated by renal impairment, etc. Timentin 3.1 gms 6 hrly*

Post op care

- Diet when tolerated, maintain IVT until then

Discharge once patient is

- Tolerating diet
- Haemodynamically stable
- Bowel function returning to normal

OPD

- Casenote review of histopathology in 2/52 for routine patients (ask ward clerk to organise)
- 2/52 patient attended OPD for complicated patients

Nursing

Pre op care

- If no surgical consent obtained - contact registrar / intern
- If no anaesthetic consent obtained - contact theatre coordinator on 64269
- Surgical shave to be performed in operating theatre
- Fast for a minimum of 6 hours
- Maintain IV therapy

Post op care

- Routine post op obs
- Diet when tolerated, maintain IVT until then
- Encourage to mobilise as tolerated to prevent complications of bed rest
- Encourage regular analgesia to allow effective mobility

Discharge preparation

- Provide written and verbal discharge advice to patient +/- family
 - No vigorous exercise or lifting >10kg for 4 weeks. Increase exercise slowly
 - Can shower as tolerated
 - Can drive a motor vehicle when able to move comfortably (2-3 weeks)
 - Normal diet as tolerated
 - Contact L.M.O or hospital if fever, wound inflammation or excessive nausea occurs
- Complete D/C checklist
- Check if OPD appointment required
- Check if sick certificate is required
- Discharge time is by 1100 – (transfer to Discharge Lounge if discharge to occur later)

This protocol has been developed for FMC practice setting only. It is intended to guide practice and does not replace clinical judgement. Modification will occur according to internal audit processes and literature review. Issued, October 05 by Colorectal and Hepatobiliary Units. Revised, February 2007. Due for review February 2010

Page 2 of 2

SECTION 7

References

1. MacLellan DG et al. Applying clinical redesign methods to planned arrivals in New South Wales hospitals. *The Medical Journal of Australia* 2008; 188 (6) 23-26.
2. Garling P. Final report of the special commission of inquiry into acute care services in New South Wales public hospitals, 2008.
www.lawlink.New South Wales.gov.au/lawlink/Special_Projects/II_splprojects.nsf/pages/acsi_finalreport
3. New South Wales Department of Health. State Trauma Plan. New South Wales Department of Health, 1991.
4. New South Wales Department of Health. Paediatric Surgery Model for Designated Area Paediatric Surgical Sites. New South Wales Department of Health, 2008.
http://internal.health.New South Wales.gov.au/pubs/2009/paediatric_surgery.html
5. Parasyn A et al. Acute-care surgical service: a change in culture. *Australian and New Zealand Journal of Surgery* 2009; 79:12-18.
6. Deane SA. Acute-care surgical services: a personal perspective. *Australian and New Zealand Journal of Surgery* 2009; 79 6-7.
7. Singh N et al. The Auburn elective surgery pilot project. *Australian and New Zealand Journal of Surgery* 2005; 75: 768-775.
8. Safe Handover Safe Patients. Guidance on clinical handover for clinicians and managers. Australian Medical Association, 2006.
www.ama.com.au/system/files/node/4064/Clinical_Handover.pdf
9. The OSSIE guide to clinical handover improvement: for clinician-leaders and managers. Australian Commission on Safety and Quality in Health Care, 2009.
[www.safetyandquality.gov.au/internet/safety/publishing.nsf/Content/D0CEDF80C4623FF2CA25757D007F7828/\\$File/OSSIE.pdf](http://www.safetyandquality.gov.au/internet/safety/publishing.nsf/Content/D0CEDF80C4623FF2CA25757D007F7828/$File/OSSIE.pdf)
10. Kemp C et al. The top 10 list for a safe and effective sign-out. *Arch Surg* 2008; 143 (10) 1008-1010.
11. Earley A et al. An acute care surgery model improves outcomes in patients with appendicitis. *Annals of Surgery* 2006; 244 (4): 498-504.
12. Tallis G and Balla J. Critical path analysis for the management of fractured neck of femur. *Australian Journal of Public Health* 1995; 19 (2) 155-159.
13. New South Wales Department of Health. Guide to the Role Delineation of Health Services Third Edition, New South Wales Health Statewide Services Development Branch, 2002
14. Wong K and Levy R. Interhospital transfers of patients with surgical emergencies: areas for improvement. *Australian Journal of Rural Health* 2005; 13 290-294.
15. Australian and New Zealand College of Anaesthetists. Minimum standards for intrahospital transport of critically ill patients. Australian and New Zealand College of Anaesthetists. ANZCA Professional Document PS39, 2003.
www.acem.org.au/media/policies_and_guidelines/min_stand_intrahosp_crit_ill.pdf

16. New South Wales Department of Health. Critical Care Adult Tertiary Referral Networks- Intensive Care Default Policy. New South Wales Health, 2006. www.health.New South Wales.gov.au/policies/pd/2006/pdf/PD2006_046.pdf
17. New South Wales Department of Health. Maternity- Timing of Elective or Pre-Labour Caesarean Section Policy, 2007. www.health.New South Wales.gov.au/policies/pd/2007/pdf/PD2007_024.pdf
18. Royal Australasian College of Surgeons. Standards for safe working hours and conditions for fellows, surgical trainees and international medical graduates. Royal Australasian College of Surgeons, 2007. www.surgeons.org/AM/Template.cfm?Section=Fellowship_Services&Template=/CM/ContentDisplay
19. New South Wales Department of Health. Emergency Obstetric and Neonatal Referrals-Policy. New South Wales Health, 2005. www.health.New South Wales.gov.au/policies/PD/2005/pdPD2005_156.pdf

SECTION 8

Bibliography

1. Emergency general surgery: the future. A consensus statement. Association of Surgeons of Great Britain and Ireland, 2007.
2. Separating emergency and elective surgical care: recommendations for practice. The Royal College of Surgeons of England, 2007.
3. Position Statement of Emergency Surgery. Royal Australasian College of Surgeons, 2008.
www.surgeons.org/AM/TemplateRedirect.cfm

SECTION 9

Acknowledgements

NSW Health and the Surgical Services Taskforce would like to acknowledge the work of the Emergency Surgical Subgroup in developing these *Guidelines*.

- | | |
|--|---|
| n Professor Stephen Deane, Professor of Surgery
HNEAHS (Chair sub Group) | n Professor Donald MacLellan, State-wide Program
Director of Surgery, NSW Health |
| n Dr Teresa Anderson, Director of Clinical Operations,
SSWAHS | n Dr Hugh Martin, Paediatric General Surgeon,
The Children's Hospital Westmead |
| n Ms Deb Cansdell, Nurse Manager,
St George Hospital | n Mr. Gavin Meredith, Senior Project Officer
Emergency Surgery, NSW Health |
| n Professor Michael Cox, Professor of Surgery,
Head of General Surgery, Nepean Hospital | n Dr John Pardey, Obstetrician,
Nepean Hospital |
| n Dr Patrick Cregan, Chair SST, General Surgeon,
SWAHS | n Dr Arthur Richardson, General Surgeon,
Westmead Hospital |
| n Mr. Kelvin Genn, Director, Quality & Safety,
NSW Health | n Dr Phil Truskett, General Surgeon,
SESIAHS |
| n Professor Ian Harris, Orthopaedic Surgeon,
Liverpool Hospital | n Dr Hunter Watt, Urologist,
Area Program Director of Surgery, SESIAHS |
| n Dr Martin Jones, General Surgeon,
Nowra Hospital | n Ms Judy Willis, Principal Project Officer Surgery,
NSW Health |
| n Dr Elie Khoury, Orthopaedic Surgeon,
Albury Base Hospital | |

