Model of Care for Acute Surgery

National Clinical Programme in Surgery

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

RCSI

Tús Áite do Shábháilteacht Othar
Patient Safety First

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Forward

The National Clinical Programme in Surgery is delighted to publish the Acute Surgery Model of Care. The aim of the Surgery Programme is to provide a framework for the delivery of more timely, accessible, safer, cost effective and efficient care for the acute surgical patient. This follows on from the Elective Surgery Model of Care which is currently being rolled out across Ireland. While understanding the difficulties facing healthcare delivery at the present time, we believe that the principles laid out in this document represent best practice that will, in the long term, fundamentally improve surgical care. Change of this magnitude will clearly take time to implement and will impact all care providers and the organisations within which they work. We also acknowledge that the patient care that is provided by surgeons and anaesthetists cannot be delivered without the support of a wide range of other professional and ancillary groups. Finally, we welcome the collaboration with the other programmes charged with the delivery of acute patient care.

This final document could not have been completed without the widespread input and suggestions that we have received from our own team, the surgical and healthcare community as well as patients themselves. We would like to express our sincere gratitude and appreciation to one and all.

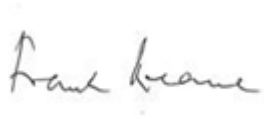

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Table of Contents

1.0 Executive Summary

1. Acute surgical care to patients in Ireland should be organised and delivered to a high quality, safe, uniform and cost effective standard.
2. Planning is difficult in the absence of sufficient data to demonstrate the variation between surgical specialties and their outcomes, the complexities of surgery and anaesthesia that need to be met, as well as the demand on critical independencies and resources required. This needs to be further addressed.
3. The efficient delivery of acute surgery requires it to be as functionally separate as possible from elective surgery and it should not be diminished as a priority in the face of the implementation of the Elective Surgery component of the Surgery Programme.
4. Acute surgical patients should be risk assessed, monitored and prioritised according to their clinical need and be managed appropriately and expeditiously through focused care pathways. These will provide better and safer care for patients as well as better training for surgical teams.
5. Acute surgical care should be consultant-delivered, providing a leadership hub for the clinical team consisting of trainees, nurses, allied health professionals and others who have the appropriate competencies and who are dedicated, at that time, to this specific role.
6. Hospitals receiving acute surgical patients are being organised within designated Groups or networks. These are laid out to ensure appropriate streaming of patients to the correct part of the service, avoiding duplication of assessment and of documentation. [1]
7. The establishment and rationalisation of Hospital Groups within coherent geographical boundaries, under a single governance structure will be a key requirement for the delivery of acute surgical care within Ireland's present capacity and resources.
8. The management of unscheduled surgical care requires clear process, risk assessment and clinical care pathways involving dedicated staff and teams and the utilisation of such modalities as acute surgical admission/assessment units(ASAU's) and, where appropriate, dedicated operating theatres.
9. Allocation of operating theatres should be matched to the emergency surgery workload and managed by good theatre governance as well as dedicated anaesthesia and surgical leadership.
10. Consultant work patterns in acute surgical care should aim to be exclusive of other activities during the time that they are providing acute surgical care.
11. Critical clinical interdependencies such as rapid access to diagnostic services must be part of the process that supports the management of acute surgical patients.

12. There is an urgent need to specifically address the delivery of Trauma and Acute Paediatric surgical care.
13. Capacity planning must be used to predict and plan for flows of both acute and elective surgical patients as well as high risk, critical care patients and all hospital clinical services.
14. Accurate information systems, audits of process and clinical outcomes, including patient reported outcomes, are essential. This should include audits run through the National Office of Clinical Audit (NOCA).
15. Governance structures need to be clearly demarcated from the central government right down to the patient's bedside.
16. There must be mutual alignment of the Acute Surgery Programme with the Elective Surgery Programme and the National Cancer Control Programme, as well as other National Clinical Programmes providing aspects of unscheduled care, notably, Anaesthesia, Acute Medicine, Emergency Medicine, Critical Care, Radiology, Laboratory Medicine and Transport Medicine. This will ensure rapid, safe, effective, cohesive and efficient patient care across all the acute and elective services.

2.0 Glossary of Terms

AC	Appropriateness Criteria
AMAU	Acute Medical Admission/Assessment Unit
AHP	Allied Health Professions
ANP	Advanced Nurse Practitioner
ANZASM	Australia and New Zealand Audit of Surgical Mortality
ASA	American Society of Anaesthesia
ASAU	Acute Surgical Admission/Assessment Unit
AvLOS	Average Length of Stay
BST	Basic Surgical Training
CNS	Clinical Nurse Specialist
DoH	Department of Health
DOSA	Day of Surgery Admissions
DRG	Diagnostic Related Group
ED	Emergency Department
EM	Emergency Medicine
EMP	Emergency Medicine Programme
ESRI	Economic and Social Research Institute
EWTD	European Working Time Directive
HCAI	Heath Care Associated Infections
HIPE	Hospital Inpatient Enquiry System
HIQA	Health Information and Quality Authority
HSE-MET	Health Service Executive – Medical Education and Training
HST	Higher Surgical Training
IASM	Irish Audit of Surgical Mortality

ICU	Intensive Care Unit
INOR	Irish National Orthopaedic Register
JFICMI	Joint Faculty of Intensive Care Medicine of Ireland
NCHD	Non-Consultant Hospital Doctor
NECS	National Emergency Care Systems
NEWS	National Early Warning Score
NOCA	National Office of Clinical Audit
NQAIS	National Quality Audit Information System
PA	Physician Assistant
PACU	Post Anaesthesia Care Unit
PHEC	Pre-Hospital Emergency Care
RCSI	Royal College of Surgeons in Ireland
SASM	Scottish Audit of Surgical Mortality
SHO	Senior House Officer
SpR	Specialist Registrar
TPOT	The Productive Operating Theatre
WHO	World Health Organisation

3.0 Background and Objectives

The National Clinical Programmes represent a strategic initiative between the Health Service Executive's (HSE) Clinical Strategy and Programmes Directorate and the various post-graduate training bodies. Each Programme's aim is to design and implement change initiatives to improve and standardise the quality of care and access for all patients in a cost effective manner. The Programmes are structured with broad cross functional input and with clinical leadership being provided by the training bodies to ensure that the patient remains at the centre of any change recommendation. The National Clinical Programmes all share three core objectives:

- To improve the quality of patient care delivered to all HSE patients
- To improve access to appropriate services
- To improve value

The National Clinical Programme in Surgery commenced in 2010. An overall schematic of its planned journey is outlined in Figure 3.1 below.

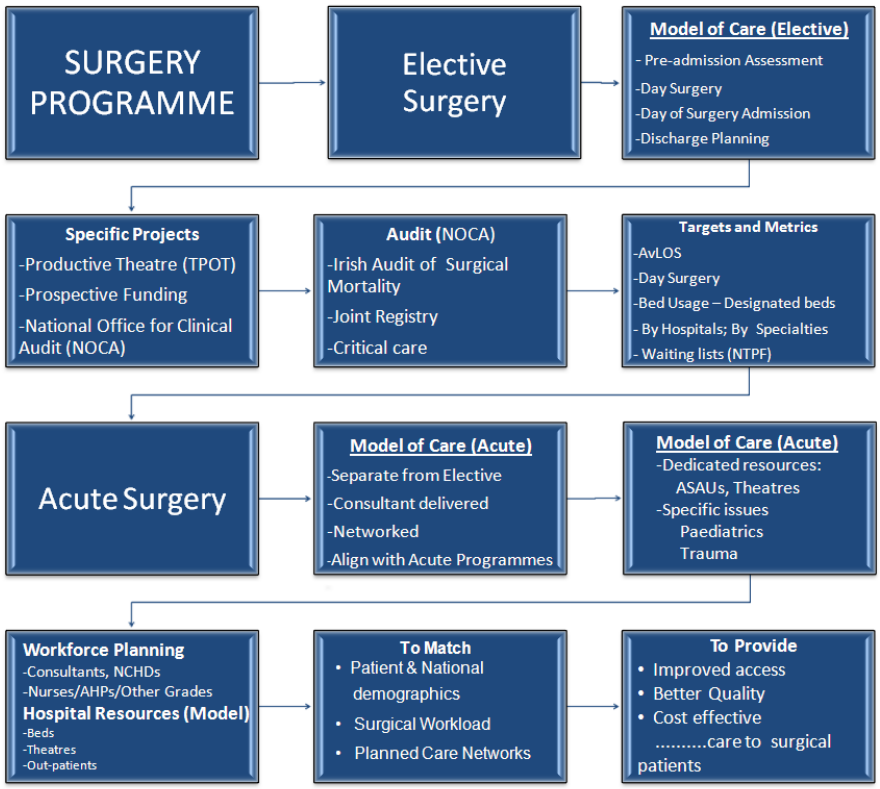


Figure 3.1: Surgery Programme Journey

The Surgery Programme has been aligned to Anaesthesia from the outset and this arrangement has become more formalised since the establishment of the Anaesthetic Programme in 2011. The initial focus of the programme has been on the elective patient journey. The Elective programme has successfully worked to define ways to improve the delivery of elective surgical care through a range of initiatives as follows;

- Standardised models of care guidelines for pre-admission assessment clinics, day surgery, day of surgery admissions and discharge planning.
- Targets for average length of stay of surgical inpatients as well as targets for day surgery across surgical specialties.
- Monitored clinical outcomes through audit and clinical registries.
- The Productive Operating Theatre (TPOT) to improve patient outcomes and experience as well as theatre team performance and resource efficiency.

Following on from the successful launch of the Elective Surgery Model of Care document and the development of the partnership and joint ventures between the Surgery & Anaesthesia Programmes, it is now timely to turn our attention to another area of clinical need, namely, the acutely ill surgical patient. It is important that the 'elective' and 'acute' arms of the programme are considered as equally important, yet interdependent, so that patient outcomes are optimised and maximum resource efficiencies, both clinical and infrastructural, are achieved.

Acute Surgical Care includes:

1. Assessing acutely ill patients referred for surgery and their need for treatment or operative intervention.
2. Undertaking emergency operations when necessary and at any time of the day or night where appropriate.
3. Providing clinical care to peri-operative patients undergoing surgery as well as other patients being managed non-operatively, including acute surgical patients and elective patients who develop complications.
4. Undertaking further operations on those who have recently undergone surgery either as planned procedures or unplanned 'returns to theatre'.
5. Providing assessment, advice and follow up as necessary for those referred from other areas of the hospital including the Emergency and Medical Departments and/or regional services, which may include supporting other hospitals either within or outside their Group.
6. Managing acute pain in conjunction with anaesthetic services.
7. Communicating effectively with patients and families.
8. Timely and effective communication between healthcare professionals.

Patients requiring acute surgical care constitute a major component of the workload of many surgical departments. These patients are frequently the sickest, are elderly and have considerable co-morbidities and poorer outcomes. In the last decade, many professional publications have suggested that the standard of care of surgical emergencies could be a lot better. Emergencies account for 80% to 90% of general surgical deaths and complication rates of emergency operations exceed those of similar elective operations by two to four times. Mortality rates for emergency surgery vary by a factor of three between hospitals and can be as high as 25% for general surgical emergency patients who are admitted to an Intensive Care Unit (ICU). [2,3] While comparable Irish figures are not available, outcomes within our health service are unlikely to be better.

Some surgical specialties have made real progress towards more regionalised models. However, there remain significant issues to resolve around geographical access and the provision of high quality care, staffing levels, call arrangements and distribution of the service burden across hospitals.

3.1 Scope of the Document

Better understanding of the challenges within the delivery of acute surgery allows us an opportunity to examine the provision of acute surgical services across the country and to address those issues pertinent to surgical practice in a more comprehensive manner. As the scope of the Surgery Programme is broadened to address issues in acute surgery, the Programme has set itself the following objectives within the acute surgical space:

- To understand the size and scope of the acute surgical workload.
- To define the key principles that will underpin the delivery of an improved acute surgical service.
- To examine and improve the early assessment of acute surgical patients and to define the role, rationale and operation of Acute Surgical Assessment Units (ASAU's).
- To ensure the appropriate level of functional separation between elective and acute surgical services.
- To make recommendations on the efficient re-structuring and use of human as well as infrastructural resources within a Hospital Group.
- To define appropriate performance indicators for the acute surgical service model across the key dimensions of quality, access and value.

This document thus seeks to define the core principles on which an acute surgical service model should be built and the key strategies that underpin these principles. We

aim to identify the critical considerations necessary to ensure the provision of high-quality acute care for patients in Ireland. Patients should experience:

- Safe, quality care in a suitable environment.
- Appropriate and timely attention from a senior surgical doctor working within a dedicated multidisciplinary team.
- Prompt diagnosis, appropriate treatment and, where necessary, timely surgery.
- Excellent communication and respect for their autonomy and privacy.
- An optimum outcome with good aftercare, support and follow up.

Throughout the document routinely collected data and key performance indicators (KPIs) are mentioned. This emphasises the critical need for minimum data sets and data definitions to underpin these KPIs as well as the importance of data validation. [4,5]

Figure 3.2 represents a schematic interpretation of how the core principles and strategies within this document are integrated in order to guide the delivery of quality acute surgical care that our patients expect and deserve.

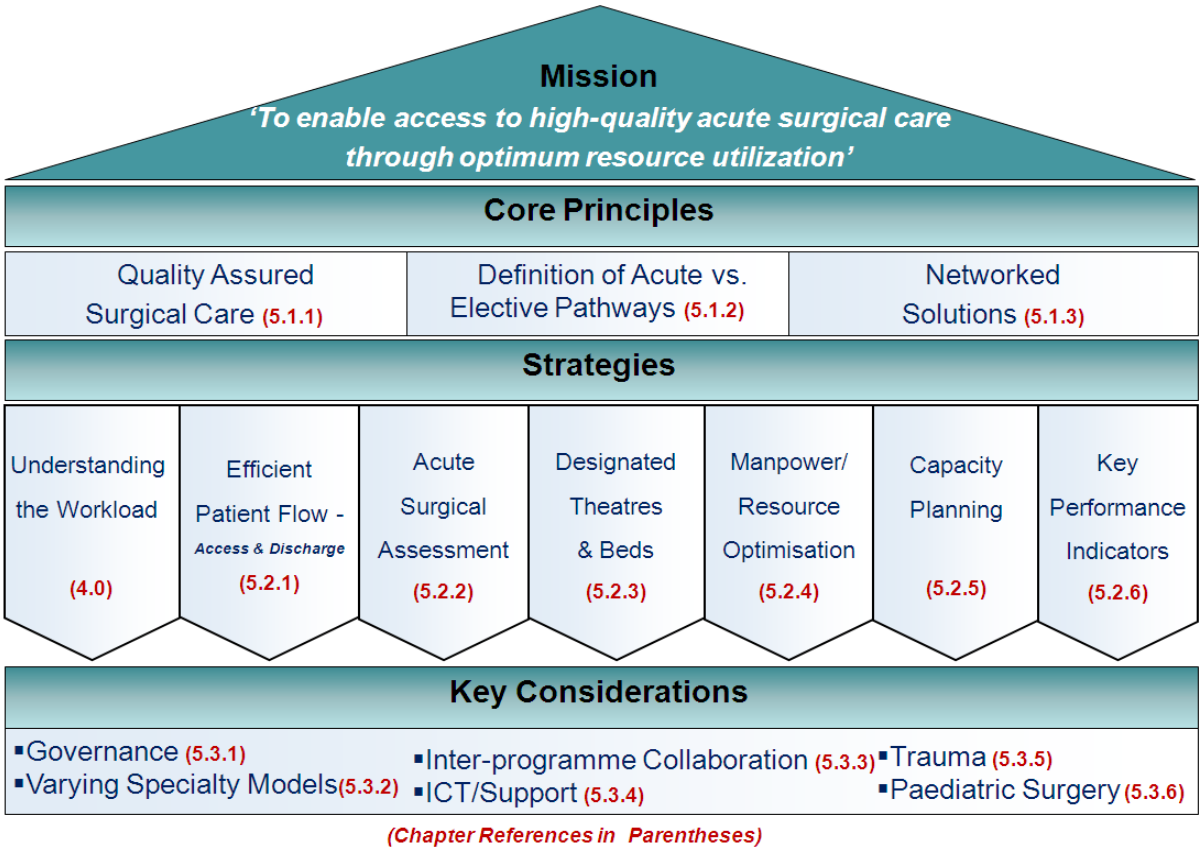


Figure 3.2: Framework and Guide for the Acute Surgery Model of Care

Towards the end of the document (6.0) we have set out a list of important generic and surgical specialty standards designed to inform the delivery of acute surgical care.

Finally, it is perhaps salutary to remind ourselves of the findings of the UK's Francis Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry (2013) which should resonate with all healthcare personnel wherever they work. [6] Some of the inadequacies, highlighted in the Executive Summary, observed:

- A culture focused on doing the system's business – not that of the patients.
- An institutional culture which ascribed more weight to positive information about the service than to information capable of implying cause for concern.
- Standards and methods of measuring compliance which did not focus on the effect of a service on patients.
- Too great a degree of tolerance of poor standards and of risk to patients.
- A failure of communication between the many agencies to share their knowledge of concerns.
- Assumptions that monitoring, performance management or intervention was the responsibility of someone else.
- A failure to tackle challenges to the building up of a positive culture, in nursing in particular but also within the medical profession.
- A failure to appreciate until recently the risk of disruptive loss of corporate memory and focus resulting from repeated, multi-level reorganisation.

In his recommendations Francis summarized what he felt was required. This included the need to:

- Foster a common culture shared by all in the service of putting the patient first.
- Develop a set of fundamental standards, easily understood and accepted by patients, the public and healthcare staff, the breach of which should not be tolerated.
- Provide professionally endorsed and evidence-based means of compliance with these fundamental standards which can be understood and adopted by the staff who have to provide the service.
- Ensure openness, transparency and candour throughout the system about matters of concern.
- Make all those who provide care for patients – individuals and organisations – properly accountable for what they do and to ensure that the public is protected from those not fit to provide such a service.
- Provide for a proper degree of accountability for senior managers and leaders to place all with responsibility for protecting the interests of patients on a level playing field.

- Enhance the recruitment, education, training and support of all the key contributors to the provision of healthcare, but in particular those in nursing and leadership positions, to integrate the essential shared values of the common culture into everything they do.
- Develop and share ever improving means of measuring and understanding the performance of individual professionals, teams, units and provider organisations, the patients, the public, and all other stakeholders in the system.

4.0 Surgical Activity and Bed Occupancy – Acute and Elective

4.1 Introduction

In January 2007, the World Health Organisation (WHO) initiated a programme aimed at improving the safety of surgical care globally. The initiative, Safe Surgery Saves Lives, aimed to identify a core set of safety standards that can be universally applied across countries and settings. [7] Four areas were identified in which dramatic improvements could be made in the safety of surgical care: (i) surgical site infection prevention, (ii) safe anaesthesia, (iii) safe surgical teams and (iv) the measurement of surgical services.

The measurement of surgical services in Ireland allows us to:

- Examine surgical activity nationally, in different regions and in different hospitals.
- Assess the correct proportions of activity between surgical specialties.
- Estimate and separate the relative demands required by acute and elective surgical patients.
- Match activity to external demands such as outpatient and inpatient waiting lists.
- Match activity to internal resources, such as beds and theatres, to provide more even patient flow.
- Identify areas for targeted improvement and monitor outcomes.
- Provide Hospital Groups with the data they require to decide how best to arrange their hospitals to deliver care to an appropriate number of patients with greatest efficiency.
- Organise and develop an appropriate workforce to deliver that care.
- Coordinate effective training to meet the workforce needs.

In parallel, the data enables hospital administrators, clinical directors, directors of nursing and all relevant health workers to identify areas for potential improvement and opportunities for creating greater efficiencies.

The aim of the National Clinical Programme in Surgery team has been to look at surgical activity in public hospitals in Ireland over a one year period. We compared, in most cases, activity in the four Health Service Executive (HSE) regions – Dublin Mid-Leinster, Dublin North East, South and West. For the purposes of this exercise individual hospitals were not compared. However, as part of the programme, it is planned to provide hospitals with their own information in a manner in which it can be compared, as a whole and by specialty, with the aggregate of other hospitals in their own casemix group.

The volumes of acute and elective patients who had a surgical procedure and/or were admitted under surgical care, their bed usage and average length of stay (AvLOS) were examined. Data from specialist maternity, tertiary paediatric and rehabilitation hospitals was not included in this study. The top 10 surgical procedures performed acutely and

electively, as well as those procedures performed on patients who did not have surgery were examined. A bed occupancy profile was also carried out for surgical inpatients.

Surgical activity was sub-divided and examined by each surgical sub-specialty for both their inpatients and day cases. Two consecutive years 2010 and 2011 were compared to assess any change in performance and, finally, the designated bed requirement that would be needed to maintain activity anticipating reduction in AvLOS (i.e. a stretch target) was calculated.

4.2 Methodology

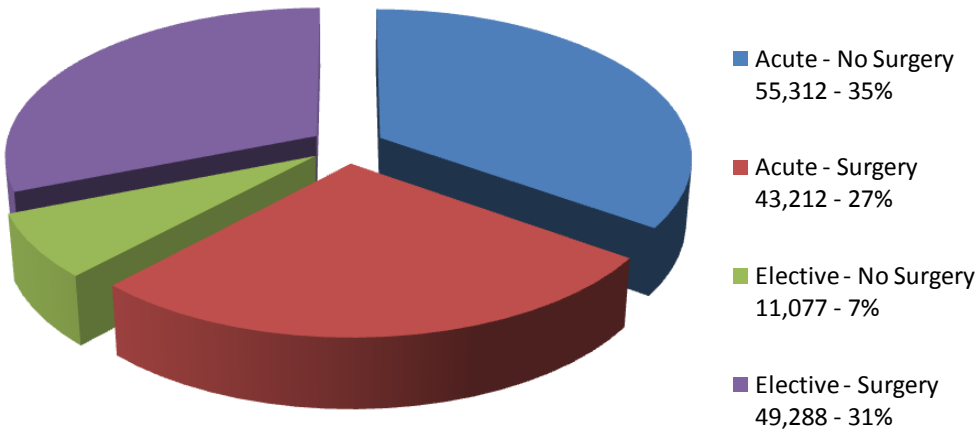
The data used in these calculations was provided from the Hospital Inpatient Enquiry System (HIPE) and validated by the Economic and Social Research Institute (ESRI) from their 2010 and 2011 data set. For the detailed methodology used to calculate the results shown below, including the descriptors of the 'general surgery' specialties, please see Appendix 1.

4.3 Results

Figure 4.1 shows all the inpatients who were discharged in 2011 having been under surgical care. It divides them into acute or elective admissions and whether or not their primary procedure was surgical.

(Note: A patient having "no surgery" may or may not have had what we have called a 'non-surgical procedure' such as an endoscopy, imaging or some other non-surgical intervention)

Figure 4.1: Number of Surgical In-patients Treated Nationally in 2011
(158,889)



Forty two percent of patients admitted under surgical care did not have a surgical procedure as defined in Appendix 1. It is understandable that a proportion of surgical discharges admitted under the care of surgeons do not have a primary surgical procedure. This would include, for example, patients having endoscopic or radiological interventions/investigations (which are not considered surgical procedures in this analysis) or patients kept under observation for diagnoses such as head injury, cellulitis or abdominal pain. However, it is surprising that 56% of acute discharges and 18% of elective discharges fall into this category.

Table 4.1 shows that the pattern does not vary greatly across regions with regard to surgical inpatients. Dublin Mid-Leinster and Dublin North East acute inpatients were more likely to have surgery than in the South or West.

Table 4.1: Number of Surgical Inpatients, acute and elective, who had or did not have surgery – 2011 discharges

HSE Region	Acute Had no surgery	Acute Had surgery	Elective Had no surgery	Elective Had surgery
Dublin Mid-Leinster	14,851 36%	12,439 30%	2,535 6%	11,319 28%
Dublin North-East	9,823 30%	9,878 30%	2,291 7%	10,712 33%
South	15,100 35%	10,389 24%	3,568 8%	14,654 33%
West	15,528 38%	10,516 25%	2,680 6%	12,606 31%

Once again, table 4.2 shows a similar pattern for the number of bed days used across the regions, showing that there were more bed days used for those acute patients who had surgery in Dublin Mid-Leinster and Dublin North East compared to the South and West

Table 4.2: Number of Bed Days used by In--patients, acute and elective, who had or did not have surgery – 2011 discharges				
HSE Region	**Acute Had no surgery**	**Acute Had surgery**	**Elective Had no surgery**	**Elective Had surgery**
Dublin Mid-Leinster	93,444 32%	121,790 42%	13,935 5%	62,431 21%
Dublin North-East	60,277 24%	114,540 45%	14,594 6%	64,635 25%
South	72,868 29%	86,894 35%	23,702 9%	67,695 27%
West	73,743 33%	76,637 34%	14,548 6%	59,485 27%

Table 4.3 shows the AvLOS in each of the categories for the four regions as well as the percentage of patients who had surgery on the day of admission. Average length of stay tended to be shorter in the South and West compared to Dublin Mid-Leinster or Dublin North East. Patients having acute surgery generally spend more time in hospital than patients having elective surgery, where the average difference is 55% more in the West and 93% more in Dublin North East. Patients having surgery (acute or elective) in Dublin north east region spend longer in hospital, on average, than patients in other regions. However surgical admissions who do not have surgery stay longest in Dublin Mid-Leinster (acute admissions) and the South (elective admissions) compared with other regions.

Table 4.3						
	Average Length of Stay - AVLOS (days) For 2011 discharges				**Surgery on Day of Admission**	
HSE Region	**Acute Had no surgery**	**Acute Had surgery**	**Elective Had no surgery**	**Elective Had surgery**	**Acute**	**Elective**
Dublin Mid-Leinster	6.3	9.8	5.5	5.5	38.1%	46.1%
Dublin North-East	6.1	11.6	6.4	6.0	38.0%	52.0%
South	4.8	8.4	6.6	4.6	33.6%	39.8%
West	4.7	7.3	5.4	4.7	43.1%	54.3%

Table 4.4 shows the top 10 surgical procedures performed on patients admitted acutely under surgical care. Again this shows variation from region to region. A patient is more likely to have their appendix removed laparoscopically in Dublin Mid-Leinster or the South compared to Dublin North East or the West. In the West, patients are almost twice as likely to have a non-laparoscopic appendicectomy. Length of stay for a hemi-arthroplasty of the femur is substantially longer for patients in the two Dublin regions than it is for the South and West.

Table 4.4: Top 10 surgical procedures performed on patients admitted acutely under surgical care -2011

DML Primary procedure	Number of patients	Bed days used	AvLOS
Laparoscopic appendicectomy	1343	4675	3.5
Open rdctn fx ankle IF diats/fib/malus	360	1318	3.7
Appendicectomy	354	1375	3.9
Hemiarthroplasty of femur	339	8228	24.3
Laparoscopic cholecystectomy	306	2380	7.8
IF fracture trochanteric/subcapitl femur	287	6501	22.7
Incision & drainage of abscess of SSCT	247	1079	4.4
Endosc fragmentation ureteric calculus	216	734	3.4
Closed rdctn fracture distal radius IF	213	950	4.5
Drainage of perianal abscess	212	587	2.8

DNE Primary procedure	Number of patients	Bed days used	AvLOS
Laparoscopic appendicectomy	860	2709	3.2
Open rdctn fx ankle IF diats/fib/malus	358	2056	5.7
Appendicectomy	342	1170	3.4
Hemiarthroplasty of femur	314	7994	25.5
Open reduction fracture femur with IF	253	5841	23.1
Open rdctn fracture distal radius w IF	249	1002	4.0
Incision & drainage of abscess of SSCT	198	815	4.1
Non exc debridement skin & sbc tissue	185	1707	9.2
Laparoscopy	182	892	4.9
Laparoscopic cholecystectomy	169	1185	7.0

SOUTH Primary procedure	Number of patients	Bed days used	AvLOS
Laparoscopic appendicectomy	1179	3677	3.1
Appendicectomy	499	1846	3.7
IF fracture trochanteric/subcapitl femur	465	7615	16.4
Hemiarthroplasty of femur	436	6971	16.0
Closed rdctn fracture distal radius IF	333	673	2.0
Open rdctn fx ankle IF diats/fib/malus	322	1134	3.5
Laparoscopy	243	1399	5.8
Incision & drainage of abscess of SSCT	227	1468	6.5
Laparoscopic cholecystectomy	207	1551	7.5
Arrest ant nasal haem pack/cauterisation	177	786	4.4

WEST Primary procedure	Number of patients	Bed days used	AvLOS
Laparoscopic appendicectomy	952	3116	3.3
Appendicectomy	862	3315	3.8
Hemiarthroplasty of femur	409	5761	14.1
Open rdctn fx ankle IF diats/fib/malus	389	1214	3.1
Open reduction fracture femur with IF	328	4833	14.7
Closed rdctn fracture distal radius IF	257	537	2.1
Exc debridement skin & sbc tissue	248	1833	7.4
Closed reduction fracture distal radius	204	318	1.6
Laparoscopy	193	874	4.5
Open rdctn fracture distal radius w IF	176	389	2.2

Considerable variation exists among the top 10 surgical procedures performed on patients admitted electively. (Table 4.5). Over twice as many tonsillectomies with or without adenoidectomy are performed in Dublin Mid-Leinster, the South and the West than in Dublin North East. It is more likely that a tonsillectomy in the West will be associated with adenoidectomy than in the other regions.

Dublin Mid-Leinster performs substantially fewer hip and knee replacements (327 and 283, respectively) than the other regions but performs more knee replacements as a proportion of the two. Substantially more hip replacements are performed in the West (1,117), followed by Dublin North East (842) and the South (715). Most inpatient laparoscopic cholecystectomies, are performed in the South (829), whilst the AvLOS for this procedure is best in the Dublin North East (1.6 days). National targets now suggest that 40% of elective laparoscopic cholecystectomies should be performed as day cases – this was a specialty-specific target agreed for the Elective Surgery Programme.

Table 4.5: Top 10 surgical procedures performed on patients admitted electively under surgical care -2011

DML Primary procedure	Number of patients	Bed days used	AvLOS
Tonsillectomy without adenoidectomy	563	754	1.3
Laparoscopic cholecystectomy	473	1141	2.4
Total arthroplasty of hip, unilateral	327	2388	7.3
Total arthroplasty of knee, unilateral	283	1823	6.4
Transurethral resection of prostate	204	1263	6.2
Tonsillectomy with adenoidectomy	201	280	1.4
Excision of lesion of breast	197	464	2.4
Phacoem & aspr cataract w IOL foldable	170	233	1.4
Repair of inguinal hernia, unilateral	157	429	2.7
Abdo hystrectmy w R/O adnexa	153	1416	9.3

DNE Primary procedure	Number of patients	Bed days used	AvLOS
Total arthroplasty of hip, unilateral	842	6729	8.0
Laparoscopic cholecystectomy	611	989	1.6
Total arthroplasty of knee, unilateral	557	4337	7.8
Tonsillectomy without adenoidectomy	220	331	1.5
Repair of inguinal hernia, unilateral	177	317	1.8
Interruption sapheno-femoral jnct VV	176	206	1.2
Simple mastectomy, unilateral	169	736	4.4
Excision of lesion of breast	150	216	1.4
Revision of total arthroplasty of hip	142	1694	11.9
Discectomy, 1 level	119	367	3.1

SOUTH Primary procedure	Number of patients	Bed days used	AvLOS
Laparoscopic cholecystectomy	829	2014	2.4
Tonsillectomy without adenoidectomy	719	999	1.4
Total arthroplasty of hip, unilateral	715	5362	7.5
Total arthroplasty of knee, unilateral	479	3295	6.9
Repair of inguinal hernia, unilateral	339	752	2.2
Phacoem & aspr cataract w IOL foldable	331	734	2.2
Discectomy, 1 level	311	655	2.1
Abdo hystrectmy w R/O adnexa	307	2269	7.4
Transurethral resection of prostate	268	1359	5.1
Vaginal hysterectomy	266	1233	4.6

WEST Primary procedure	Number of patients	Bed days used	AvLOS
Total arthroplasty of hip, unilateral	1117	8692	7.8
Laparoscopic cholecystectomy	703	1578	2.2
Total arthroplasty of knee, unilateral	489	3843	7.9
Tonsillectomy without adenoidectomy	460	674	1.5
Repair of inguinal hernia, unilateral	381	720	1.9
Tonsillectomy with adenoidectomy	339	403	1.2
Abdo hystrectmy w R/O adnexa	278	1948	7.0
Simple mastectomy, unilateral	208	1183	5.7
Excision of lesion of breast	203	554	2.7
Dilation & curettage of uterus [D&C]	162	238	1.5

The first line of Table 4.6 highlights the fact that there are a large number of patients admitted to hospital under surgical disciplines who have no surgical, imaging or coded interventions and stay in hospital for nearly three days on average. It is difficult to speculate why this is the case. Possibly patients are admitted simply for laboratory investigations, for clinical observation or some uncoded intervention, or their intervention code is inadvertently omitted.

The bulk of acute surgical admissions that do not have a surgical primary procedure have some form of diagnostic imaging and stay in hospital for between 5 and 9 days on average.

Table 4.6: Top 20 non-surgical procedures, nationally, performed on patients admitted acutely under surgical care

Primary procedure	Number of patients	Bed days used	AvLOS
No procedure carried out	24764	69814	2.8
Panendoscopy to duodenum with biopsy	2421	13554	5.6
CT abdomen & pelvis w IV contrast medium	2398	12522	5.2
Computerised tomography of brain	2012	12559	6.2
Allied health intervtn, physiotherapy	1989	18229	9.2
CT of abdomen & pelvis	1964	10323	5.3
Computerised tomography of abdomen	1308	7351	5.6
Panendoscopy to duodenum	1043	6641	6.4
Allied health intervention, pharmacy	878	4897	5.6
Allied health intervention, dietetics	736	6208	8.4
Fibreoptic colonoscopy to caecum	662	4778	7.2
Fibreoptic colonoscopy to caecum w Bx	625	4770	7.6
Administration of packed cells	603	5181	8.6
CT abdomen w IV contrast medium	479	2725	5.7
Magnetic resonance imaging of abdomen	456	2972	6.5
CT chest abdo & pelvis IV contrst medium	436	3073	7.0
Magnetic resonance imaging of spine	370	3125	8.4
Bladder catheterisation	309	1974	6.4
CT of chest, abdomen & pelvis	291	2327	8.0
Fibreoptic colonoscopy t hepatic flexure	261	1604	6.1

Although elective surgically-admitted inpatients who do not have a surgical procedure occupy the smallest quartile, representing 7% of surgical inpatients, they exhibit a similar pattern to the acute surgically-admitted inpatient group, which is five times its size (Figure 4.1, table 4.6).

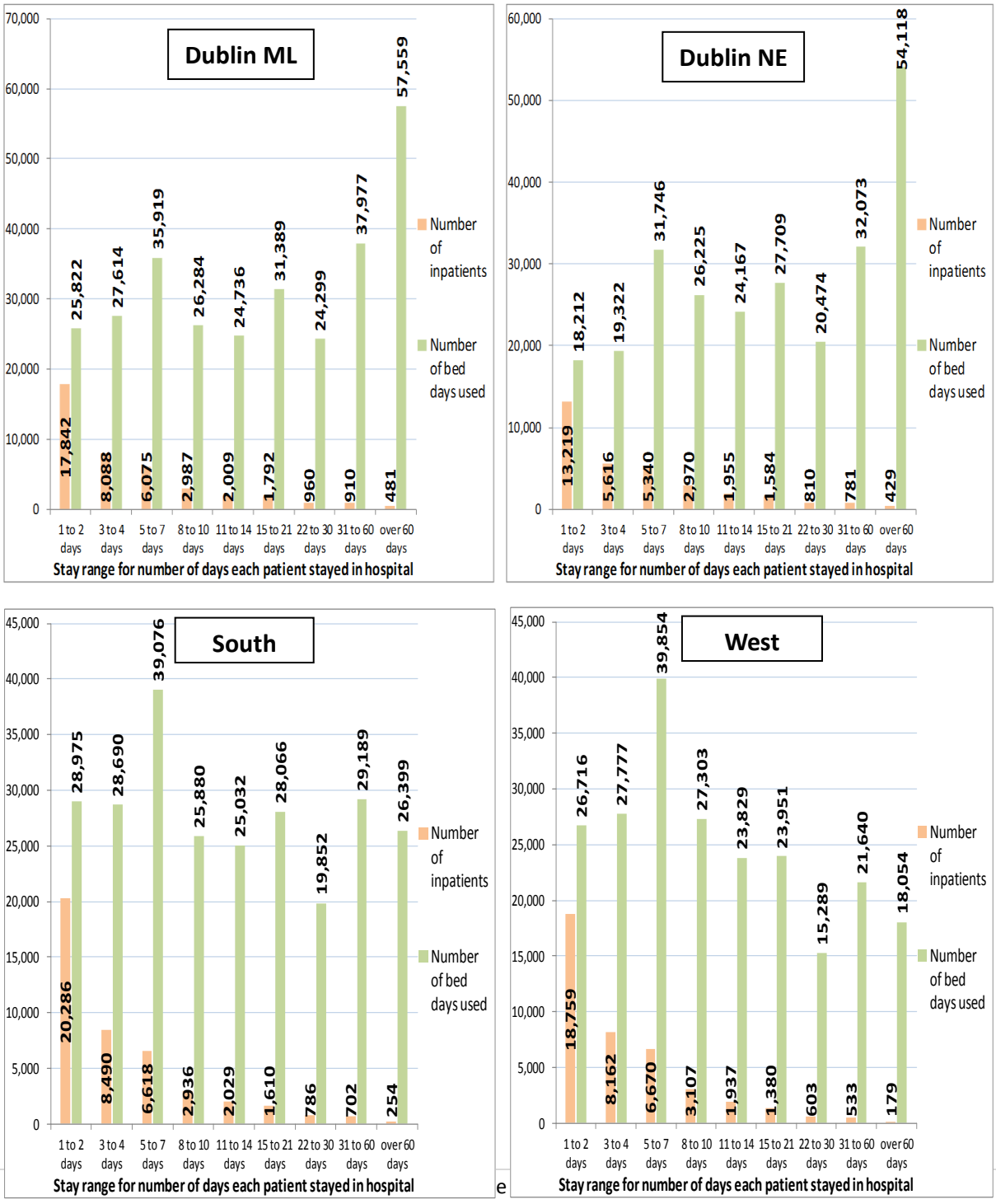
At the head of Table 4.7 is a large group of patients, admitted for over three days on average who have no coded surgical, imaging or intervention during their stay in hospital. Another group of patients, staying more than 12 days, have an allied health intervention by physiotherapy, recorded as their primary procedure.

Table 4.7: Top 20 non-surgical procedures, nationally, performed on. patients admitted electively under surgical care.

Primary Procedure	Number of patients	Bed days used	AvLOS
No procedure carried out	2168	6882	3.2
Allied health intervtn, physiotherapy	1324	16754	12.7
Panendoscopy to duodenum with biopsy	574	2397	4.2
Fibreoptic colonoscopy to caecum	446	1255	2.8
Fibreoptic colonoscopy to caecum w Bx	319	1049	3.3
Perc transluminal balloon angioplasty	263	1119	4.3
Panendoscopy to duodenum	224	1347	6.0
Fibreoptic colonoscopy to caecum w PP	162	435	2.7
Allied health intervention, dietetics	145	2885	19.9
Peripheral arteriography	127	509	4.0
Manipulation/mobilisation of joint NEC	123	325	2.6
Removal other urinary drainage device	110	241	2.2
Laryngoscopy	110	355	3.2
Administration of packed cells	101	674	6.7
Trnscath embolisation bl vesl, pelvis	100	245	2.5
Fibreoptic colonoscopy t hepatic flexure	82	250	3.0
CT abdomen & pelvis w IV contrast medium	82	579	7.1
Other endoscopic dilation of oesophagus	81	382	4.7
Magnetic resonance imaging of spine	68	467	6.9
Magnetic resonance imaging of brain	67	250	3.7

Figure 4.2 plots inpatient numbers against bed days used for both acute and elective surgical patients. The right hand side of the frequency distribution charts shows that a relatively small percentage of long stay patients use a disproportionately high amount of bed days and this is particularly the case for Dublin Mid-Leinster and Dublin North East as compared to the South and West.

Figure 4.2: Number of In-patients plotted against bed days used for all surgical patients - 2011



For inpatients, Tables 4.8 and 4.9 show the breakdown of the 'Acute surgery' and 'Elective surgery' sections of Figure 4.1, respectively, for each of the 15 surgical specialties. It includes a line for the unmapped procedures, conducted less then 20 times a year nationally. Day case management is not generally associated with the care of acute surgical patients, although it should be possible to perform some treatments as day cases, in some circumstances where day facilities are readily available. Indeed, already a considerable number of acute day procedures are performed by Trauma & Orthopaedics and to a lesser extent by General Surgery.

General Surgery has the largest number of inpatients but Trauma & Orthopaedics uses more bed days in the acute setting. There is also a wide variation in AvLOS. Upper GI- Hepato-Biliary(HPB), Colorectal, Vascular and Cardiothoracic have an AvLOS in excess of 20 days and also require relatively high numbers of bed days compared to other specialties. If we compare Tables 4.8 and 4.9, pre-operative lengths of stay are much longer for acute surgical patients especially for Upper GI-HPB, Colorectal, Cardiothoracic and Vascular specialties.

Table 4.8: Summary data for acute Inpatients and day cases by surgical specialty - 2011

Acute for 2011		**Day Cases**		**Inpatients**				
Surgical specialty description	**Total num cases**	**Num Day Cases**	**% Day Cases**	**Num Inpatient**	**Bed Days used**	**AvLOS**	**Pre-op AvLOS**	**% DoSA**
Breast Surgery	209	37	17.7%	172	1,619	9.41	2.42	4.1%
Cardiothoracic	889	3	0.3%	886	18,402	20.77	4.40	2.9%
Colorectal	1,295	9	0.7%	1,286	30,474	23.70	7.35	0.9%
General Surgery	16,005	1,025	6.4%	14,980	99,574	6.65	2.24	1.9%
Gynaecology	903	28	3.1%	875	6,893	7.88	2.04	4.0%
Maxillofacial & Dental	645	18	2.8%	627	2,417	3.85	1.37	11.6%
Neurosurgery	1,149	3	0.3%	1,146	16,941	14.78	1.00	0.1%
Obstetric								
Ophthalmology	811	86	10.6%	725	4,052	5.59	3.09	0.1%
Otolaryngology	1,814	203	11.2%	1,611	14,308	8.88	3.57	3.0%
Paediatric Surgery	219	24	11.0%	195	603	3.09	4.00	0.5%
Plastic Surgery	678	120	17.7%	558	4,646	8.33	1.64	7.5%
Trauma & Orthopaedic	16,255	1,839	11.3%	14,416	128,279	8.90	1.84	1.1%
Upper Gastrointestinal & Hepatobiliary	157	2	1.3%	155	4,627	29.85	7.73	5.2%
Urology	3,360	78	2.3%	3,282	30,543	9.31	4.72	1.1%
Vascular	1,004	18	1.8%	986	21,503	21.81	6.74	1.6%
Unmapped procedures (<20 occurances annually)	1,396	83	6.0%	1,312	14,623	11.14	2.53	3.4%
Total - have surgery	46,789	3,576	7.6%	43,212	399,504	9.25	2.41	38.3%

(% DOSA = Percent Day of Surgery Admissions out of total inpatient admissions)

For elective patients, Table 4.9 shows a wide variation in the levels of day case surgery with Maxillofacial and Dental, Ophthalmology and Plastic surgery carrying out over 90% of their elective procedures as day cases, whereas 95% of Cardiothoracic procedures are inpatient cases. For inpatients, there is, once again, a wide variation in AvLOS where Upper GI-HPB, Colorectal and Cardiothoracic have stays in excess of ten days and require relatively high numbers of pre and post-operative. General Surgery, including its subspecialties, is a substantially bigger user of elective inpatient beds, followed by Trauma & Orthopaedics. The percentage of day of surgery admissions (DOSA) is well below 70% for most specialties except for Paediatrics and Otolaryngology. It should be noted that the figures for paediatrics excludes work done in the specialist childrens hospitals.

Table 4.9: Summary data forelective Inpatients and day cases by surgical specialty - 2011

Elective for 2011		**Day Cases**		**Inpatients**				
Surgical specialty description	**Total num Cases**	**Num Day Cases**	**% Day Cases**	**Num Inpatient**	**Bed Days used**	**AvLOS**	**Pre-op AvLOS**	**% DoSA**
Breast Surgery	8,040	5,732	71.3%	2,308	8,693	3.77	0.92	4.0%
Cardiothoracic	1,377	47	3.4%	1,330	18,067	13.58	1.62	4.5%
Colorectal	3,131	765	24.4%	2,366	28,438	12.02	1.65	0.5%
General Surgery	21,595	13,919	64.5%	7,676	26,775	3.49	1.92	0.6%
Gynaecology	18,230	13,507	74.1%	4,723	20,197	4.28	1.27	0.7%
Maxillofacial & Dental	3,214	2,909	90.5%	305	2,334	7.65	0.72	22.3%
Neurosurgery	1,591	625	39.3%	966	6,942	7.19	6.78	0.2%
Obstetric								
Ophthalmology	27,507	25,749	93.6%	1,758	4,433	2.52	1.10	0.2%
Otolaryngology	18,653	12,585	67.5%	6,068	14,645	2.41	1.18	0.5%
Paediatric Surgery	3,346	3,010	90.0%	336	532	1.58	0.50	0.3%
Plastic Surgery	23,286	22,335	95.9%	951	3,344	3.52	0.83	7.5%
Trauma & Orthopaedic	21,280	10,291	48.4%	10,989	57,651	5.25	0.91	0.5%
Upper Gastrointestinal & Hepatobiliary	704	162	23.0%	542	9,100	16.79	3.55	1.7%
Urology	21,541	17,375	80.7%	4,166	21,184	5.08	1.32	1.8%
Vascular	3,732	2,128	57.0%	1,604	10,102	6.30	4.80	0.5%
Unmapped procedures (<20 occurances annually)	4,749	1,549	32.6%	3,200	21,775	6.81	1.69	2.1%
Total - have surgery	181,976	132,688	72.9%	49,288	254,212	5.16	1.56	47.6%

Table 4.10 shows a comparison of 2010 to 2011 volumes of surgical inpatients and day cases for those who had or did not have a primary surgical procedure. In 2011, an additional 10,444 case were managed surgically. This was split between a 7.4% increase of day case rates equating to 18,584 more day cases and a reduction in inpatient volumes of 8,165. Only 11,309 (136,292 – 124,983) of the increased day cases had a surgical primary procedure, leaving 7,275 new day cases being admitted surgically but not having a surgical primary procedure. There was a decrease of 2,135 (69,035 – 66,900) in the number of inpatients admitted surgically but not receiving a primary surgical procedure. In comparison, the number of inpatients receiving surgery decreased by 6,020 (98,019 – 91,989). Overall, there was a 5,279 increase in the number of patients who had a primary surgical procedure, day case or inpatient. Even though overall case volumes increased by 2.5%, bed day usage decreased by 5.0% giving a bed day usage saving of 60,007 in 2011 compared to 2010. Surgically admitted patients who do not have surgical procedures typically have investigative endoscopy, imaging or other interventions, although more than a third of these inpatients had no procedure of any kind.

Table 4.10: Summary comparison of surgical activity for 2010 and 2011

2010 Inpatient and Day Cases (had surgery or were admitted surgically)

		Day Cases			Inpatients		
Surgical Specialty	**Total num Cases**	**Num Day Cases**	**BedDays Used**	**% Day Cases**	**Num InPatient**	**BedDays Used**	**AvLOS**
Mapped Surgical procedures	223,002	124,983	47,277	56.0%	98,019	711,693	7.26076
Surgical Admit - No surgery	194,869	125,859	54,430	64.6%	69,035	376,450	5.45304
Total have surgery & Surgical admit not have Surgery	417,871	250,842	101,707	60.0%	167,054	1,088,143	6.51372

2011 Inpatient and Day Cases (had surgery or were admitted surgically)

		Day Cases			Inpatients		
Surgical Specialty	**Total num Cases**	**Num Day Cases**	**BedDays Used**	**% Day Cases**	**Num InPatient**	**BedDays Used**	**AvLOS**
Mapped Surgical procedures	228,281	136,292	51,260	59.7%	91,989	652,061	7.08846
Surgical Admit - No surgery	200,034	133,134	57,367	66.6%	66,900	369,156	5.51804
Total have surgery & Surgical admit not have Surgery	428,315	269,426	108,627	62.9%	158,889	1,021,217	6.42724
Case volume change from 2010 to 2011	10,444	18,584			-8,165		
Have surgery bed day usage changes			-3,983			59,632	
Surg admit - no surgery bed day change			-2,937			7,294	

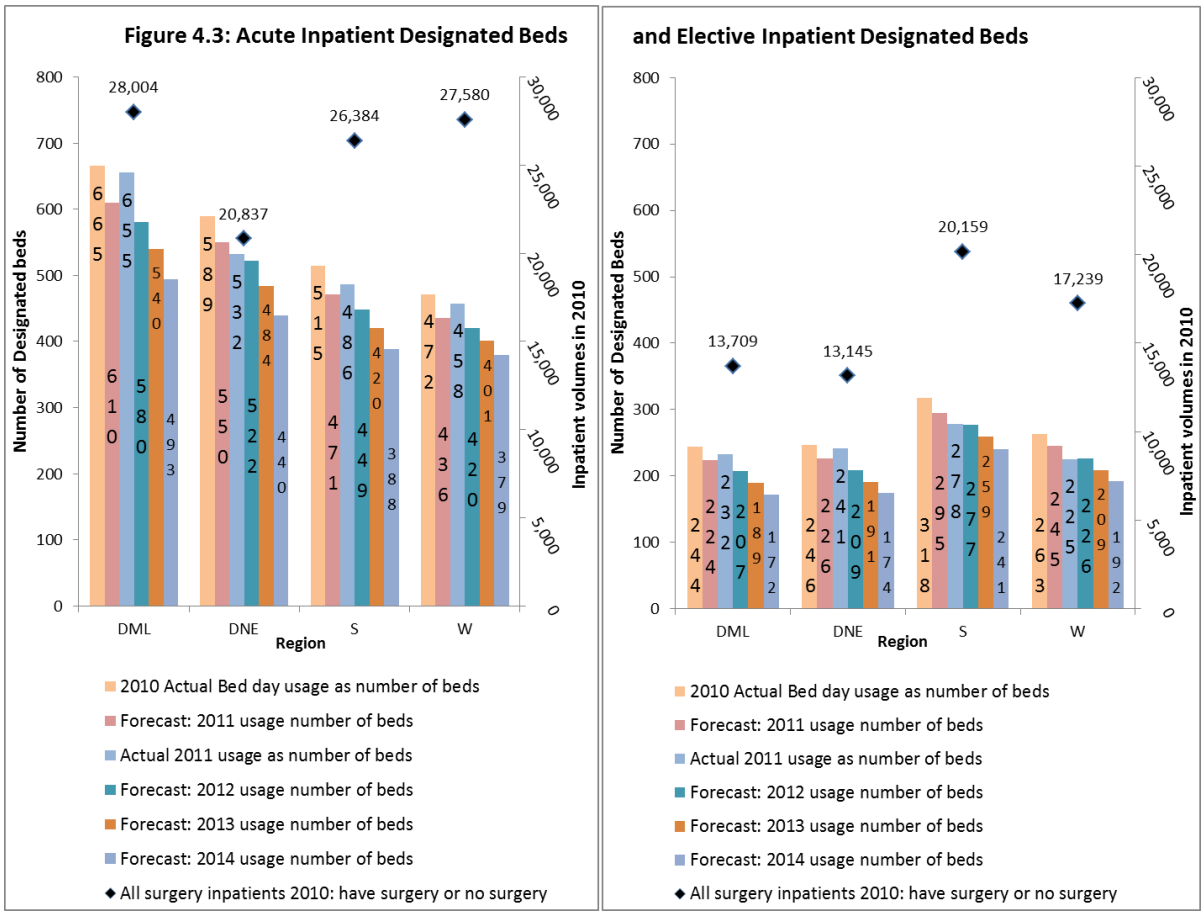
In summary, tables 4.10 and 4.11 highlight the inter-relationship between inpatient AvLOS, the percentage of day cases and the overall volume changes when evaluating hospital bed utilisation. Even though overall case volumes increased by 2.5%, bed day usage decreased by 5.0%, giving a bed day usage saving of 60,007 in 2011 compared to 2010. However, if case volumes had not increased then the actual bed day savings would have been 91,662 bed days. (See rows 1 and 2 in table 4.11) For further analysis of the bed day saving achieved in 2011 relative to 2010 please see Appendix 1.

Table 4.11: Analysis and breakdown of bed day usage savings from 2010 to 2011

Breakdown of saving	Have surgery	Surg admit / No surg	Combined
Bed day saving from inpatient AvLOS reduction	15,850	-4,349	11,501
Bed day saving from day case rate increase (converted inpatients).	59,227	20,935	80,161
Less bed days for relative volume increase in inpatients	-15,445	-9,292	-24,737
Less bed days for volume increase in day case patients	-3,983	-2,937	-6,919
Total net bed day saving	**55,649**	**4,357**	**60,007**

Finally, our data analysis also lets us plan capacity requirements in the light of planned future performance improvements and reduction in AvLOS.

Figure 4.3 shows the reduced bed volumes required to provide the 2010 baseline level of service for surgical inpatients by region. The single black diamonds show the 2010 inpatient numbers by region. There are 6 bars for each region - the first shows bed levels that were required to meet inpatient bed day demand in 2010; the second shows the bed levels forecast for 2011 to meet the stretch target; the third shows the actual beds used in 2011 (See table 4.11: 6,020 less inpatients had surgery in 2011); the fourth is the forecast for 2012, the fifth for 2013 and sixth for 2014 by applying the targets for each year.



4.4 Discussion

In this chapter, the surgical activity carried out in two consecutive years, 2010 and 2011, was reviewed. The detailed analysis was provided on the 2011 data, while the baseline for forecasting was based on 2010 data.

The disadvantage of examining a single time period is that it does not correctly anticipate future trends nor accurately identify the present demand for surgery. For example, we know that there are substantial outpatient and inpatient waiting lists in many surgical specialties. Also, surgical patients presenting at Emergency Departments (EDs) can undergo substantial delays before they arrive in theatre or on a ward. In other words, we cannot comment at this stage on whether there is sufficient capacity to meet the demand.

In addition the detailed examination of one year's data does not identify the potential underuse or overuse of surgery as a therapeutic modality. The goal of a surgical quality improvement programme should endeavour to see that the right procedure is performed for the right patient, at the right time and in the right way. However, considerable evidence shows widespread variations in rates of surgical procedures that cannot be explained by patient preference or disease incidence, not only in Ireland but also in many other countries. This has led to the development of the concept of Appropriateness Criteria (AC), for surgical procedures in the USA. [8] There, they have been developed for at least 16 surgical procedures. In the UK, several primary care trusts have generated lists of surgical procedures deemed appropriate for examination and application of thresholds for referral and treatment. Procedure lists include, for example, tonsillectomy, cataract surgery, varicose vein surgery and grommet insertion. [9,10]

The National Treatment Purchase Fund (NTPF) has indicated that over 49,600 patients were waiting for a planned procedure in September 2012. [11] Such is the increase in demand for elective surgical procedures in Ireland that the Health Information and Quality Authority (HIQA) has begun to look at this area as a Health Technology Assessment (HTA). They are currently evaluating the appropriateness and potential impact of introducing clinical referral or treatment thresholds for high volume planned surgical procedures within the higher Irish healthcare system.

As has been stated, it was deemed inappropriate to compare individual hospital figures because of the substantial variations in size, activity and specialty mix. For example, we know that for the 35 hospitals in Ireland that have, up to recently, been described as acute general hospitals, there are nine that perform more than 3000 surgical procedures a year, nine that perform between 1500 and 3000, seven that perform between 700 and 1500 and ten that perform less than 700 procedures each year.

Instead, the activity in the four HSE regions was compared. In 2011, the National Census showed that the Irish population had increased by 341,421 since 2006 to 4,581,269,

equivalent to the catchment population of a district general hospital. [12] Assuming the same population proportions exist as in Census 2006, the HSE Dublin Mid-Leinster has the greatest share of the population at 28.7%, followed by HSE South at 25.5%, HSE West at 23.9% and HSE Dublin North East at 21.9%. [13]

This analysis is open to a number of criticisms. Firstly, we acknowledge that the accuracy of the data is completely dependent on the accuracy of data entered into hospital systems. This should continue to improve as programmes become more engaged and operational management improves.

Secondly, measuring volumes of activity alone does not reflect the diversity, clinical complexity and the needs for resources for treating patients in a hospital. To do this, patients that have been treated in hospitals are best classified into groups with other patients that have the same condition (based on the main and secondary diagnoses and procedures), age, complexity (co-morbidities) and needs. These groups are referred to as Diagnosis Related Groups (DRGs). The Surgery Programme has begun an analysis by DRGs which will provide greater clarity and more accurate information. In the meantime our analysis of surgical procedures does include a record of both age and American Society of Anaesthesia scores (ASA).

Thirdly, an analysis of AvLOS on its own, rather than using the mode or median for length of stay takes into account all patients and does not correct for outliers, such as those patients who have prolonged medical admissions prior to referral for surgey or delayed discharges due to delays in access to elderly care, long term placement or rehabilitation services. Such events will result in a disproportionately high AvLOS. While modes and medians might give a more realistic picture of work patterns, using averages does provide an accurate measurement of bed utilisation.

Finally, because we assigned bed utilisation to surgical specialties and acknowledged only the primary surgical procedure, this will have failed to recognise those patients who also had secondary or subsequent procedures which may have been carried out by a surgeon sometimes from a different surgical specialty. This commonly occurs in specialties such as Plastic surgery. Modelling surgeon workload requires all procedures to be recognised but this is a different exercise from that required for bed utilisation.

The data in this study raise many questions about surgical activity in Ireland. For example, the relatively high pre-operative lengths of stay for acute inpatients and the very large numbers of inpatients admitted under different surgical specialties that do not have a primary surgical procedure needs closer scrutiny. (See Table 4.6)

It may, for example, indicate that, where necessary, an Acute Surgical Assessment Unit (ASAU) with rapid access to appropriately qualified clinicians, diagnostics and surgery, may

be able to reduce the inpatient bed burden, by assuring the reduction of unnecessary delays in pre-operative stay and the efficient, safe discharge of patients who do not need a surgical procedure or investigation that requires immediate hospitalisation.

The high percentage of day cases occurring in elective surgery specialties, indicated in Table 4.9, shows that, while it would not make sense to have most of these specialties provided at smaller hospitals, it would make sense to provide and expand outreach specialist services on regular, pre-agreed dates at smaller hospitals. This would be facilitated by larger hospitals supporting smaller hospitals in an outreach, networked fashion or by sharing resources between mid-sized hospitals.

The bed day saving that occurred in 2011 when compared with 2010 is a substantial early achievement, which in part must acknowledge improvements in performance and process. An important aim of the Surgery Programme is to emphasise the critical importance of designated or protected surgical beds and the importance of this has been emphasised for all hospitals. The forecasting of designated bed requirements, shown in Figure 4.3, projects a progressive improvement year-on-year as the various strategies of the Surgery Programme take effect. Naturally, this will not be sustainable indefinitely and the rate of improvement will tend to decrease as processes, practices and procedures approach optimum levels.

Nevertheless, substantial improvements can continue to be achieved in the short term if key issues are addressed, such as the significant burden of long stay patients in acute beds (Figure 4.3), the long pre-operative length of stay for acute and elective patients (Tables 4.8 and 4.9), the significant number of patients who are surgically admitted and have no identified surgical procedure (Tables 4.6 and 4.7), and the number of day procedures still being performed as inpatient cases.

For the small number of patients who are staying in hospital for long periods of time and much longer than would be normal for post-surgical care the problem is not inconsiderable. In Figure 4.3, we can see that 156,130 bed days are used by patients staying longer than 60 days and a further 120,879 bed days are used by patients staying 31 to 60 days. The longest staying 2.7% of patients are using 27.2% of the bed days.

In Table 4.9, elective surgery is only achieving an average of 47.6% ‘day of surgery admission’ rate (DOSA) and still has an average of 0.9 days pre-operative length of stay, which means that the 52.3% not being admitted on DOSA are staying an average of 1.8 days each before being operated on. The issue is even more pronounced for acute surgery in Table 4.8.

In summary, the data presented in this chapter gives a more complete profile of surgical activity in Ireland. Not only will this better inform the Surgical Programme and the aims to which it aspires but it will also give managers and clinicians a better understanding of this

activity both nationally and within their own clinical and institutional settings so as to plan and improve the future delivery of surgical care.

5.0 The Way Forward

5.1 Core Principles

5.1.1 Quality Assured Acute Surgical Care

It can be inferred from the previous chapter that the range of requirements needed to deliver comprehensive, safe and effective acute surgical services are both multifaceted and extensive. Guiding principles for good clinical governance have been developed by the HSE Quality and Patient Safety Directorate (See Appendix 2).

The remainder of the document will touch on many of these issues and should be taken as a high level guide and reminder of the main principles involved. In the next phase, not covered here, this should lead to the development of more detailed management plans, guidelines and clinical care pathways to address specific topics either at a local or national level.

5.1.1.1 Standards of Care for Acute Surgery

The Surgery Programme fully subscribes to the HIQA National Standards for Safer Better Healthcare and its eight domains which include effective, safe and person centred care and support; the promotion of better health and wellbeing by such methods as preventing accidents and acute surgical illnesses; effective leadership, governance and management; a workforce that is carefully planned, managed and supported; an awareness and judicious use of resources whether they be human, financial or natural; a service that is planned and executed based on quality information that is accurate, valid, timely, reliable, relevant, legible and complete recognising that this must be centrally supported and resourced.[14] Good quality care is cheaper than poor quality care.

All patients should be afforded the opportunity to play an active role in their healthcare and participate as much as they wish in the decisions about their treatment. The Model of Care endorses the HSE's National Healthcare Charter which outlines the proper expectations of patients in this regard [15] . Where familial or carer involvement is the wish of the patient, it should be the responsibility of the healthcare staff to ensure this occurs. Staff should respect the role that family members, friends, carers and advocates may play in the patient's decision making.

We have seen that acute surgical care comprises over 50% of the workload of most surgical specialties. For some specialties, such as Neurosurgery, well over half of admissions are non-elective and the resultant workload is substantially higher. A number of studies have shown an increase in the number of emergency surgical admissions over the last number of years. In Ireland, however, until now there has been insufficient data to demonstrate the variation between specialties in terms of volumes.

Complexity of surgery, the benefits of team working and the time, resources and critical independencies required by acute surgery still need clearer definition. The Surgery Programme is setting out to address these issues.

Anaesthetists are essential members of the acute surgical team. The team also includes non-consultant hospital doctors (NCHD's), nurses, allied health professionals (AHP's) and others who should all have the required range of competencies to comply with the HIQA standards. The reduction in working hours for trainees has led to a decrease in their level of experience and this now impacts critically on consultant workload and service provision. This will, in the future, demand greater consultant input early in the patient pathway, in order to improve outcomes. Where resident junior doctors do not possess the required competence, consultants must be available to take responsibility and see that patients are treated according to their clinical needs.

5.1.1.2 Knowing the Risk

Knowing, understanding and recognising the risks pertaining to the surgical patient whether recently admitted, either electively or acutely, having an operation or in the peri-operative period, is key to their better and safer management. [16] Active monitoring of the acute surgery patient remains extremely important following admission, so that appropriate consultant clinical input can be sought as necessary. The recently introduced National Early Warning Score (NEWS) with its associated educational programme COMPASS, will greatly help doctors and nurses and physiotherapists to quickly recognise the deteriorating patient.[17]

The UK reported the outcomes of care at 30 days for patients aged 16 and over who underwent inpatient surgery (both elective and acute). Because of the high risk of complications, they concluded that all elective high risk patients should be seen and fully investigated in pre-assessment clinics and acute surgical patients should have the same robust work up. Nutritional status should be better assessed and corrected in high risk patients. High risk patients should also have fluid optimisation in a 'higher care level area' pre-operatively and enhanced recovery pathways should be adopted for high risk elective patients. They identified that there is an urgent need to improve the post-operative care of high risk patients.[18]

This higher risk group comprises of 12–15% of cases but contributes to 80% or more of post operative deaths and complications. This group should be identified at an early point and there should be a clearly defined care pathway developed by hospitals as a formal part of the assessment and management of these patients. This should match the needs of the patient and their risk of death with the timing and choice of diagnostic tests, seniority of clinician decision maker, timing of surgery and post operative location of care.[19]

An estimated mortality of 5% defines a high risk patient. High risk procedures should be managed by consultant staff, surgeons, anaesthetists and critical care doctors who should be present for procedures and anaesthesia when the risk of mortality exceeds 10%.

The Physiologic and Operative Severity (POSSUM) score is the most validated risk prediction method for general and vascular patients that takes into account pre-operative and peri-operative factors. P-POSSUM may be used for all patients.[22, 23] There are alternative scoring systems such as the Acute Physiology and Chronic Health Evaluation, APACHE, or the more simple Apgar system.[24,25] Higher risk patients, once identified, should be managed after surgery in a location capable of meeting their need for higher levels of care. A predicted mortality risk ≥10% indicates the need for critical care admission, except for patients on end-of-life pathways.

Hospitals should look critically at their provision of enhanced levels of care as an investment in better peri-operative care would realise benefits for both cost and outcomes. The principal life-threatening complication is the development of severe sepsis. Patients from this group account for the greatest use of ICU beds. Improved assessment and treatment would likely improve outcomes and reduce ICU utilisation.

In summary, patient-risk assessment, in addition to the monitoring of any deterioration, should be assessed and scored from the outset of their surgical journey and there should be clearly defined care pathways for high risk patients.

5.1.1.3 Communicating with Patients

Effective communication with sick and often frightened patients, their families and carers is a crucial part of the work of the acute surgical team, the importance of which should never be overlooked but rather given adequate time and emphasis.

Patient-reported outcomes and patient-experience measures are vital and hospitals should ensure that they have mechanisms in place to capture and monitor these and to take action when a report indicates that improvements should be made.

5.1.1.4 Consent and Patient Safety

Issues of patient consent and safety are as important for the acute surgery patient as they are for the elective surgical patient. Whilst recognising their importance, these topics are not specifically addressed in this document but are implicit objectives of the whole Surgery Programme and the HSE.[26,27]

5.1.1.5 Consultant-delivered Service

There are now real evidence-based benefits to moving to a system of consultant-delivered care. There has been much debate about whether the term consultant "delivered" service is appropriate. Other terms include, consultant "led" and consultant "based" services and some refer to consultant "presence". But now an accepted definition of the term consultant-delivered service is one that provides, *"consultant 24-hour presence, or ready availability for direct patient care responsibility"*. Whilst not all services may require 24-hour presence, it has been considered that the term "consultant-delivered service" was the most useful as "*ready availability*" should be common to all services.[29]

These benefits include:

- Rapid and appropriate decision making
- Improved outcomes
- More efficient use of resources
- General Practitioner access to the opinion of a fully-trained doctor
- Patient expectation of access to appropriate and skilled clinicians and information
- Benefits for the training of junior doctors

Implementing a system centred on consultant-delivered care has its challenges, notably supply and affordability. Achieving the benefits of consultant-delivered care for patients requires greater consultant presence in hospitals than at present and therefore, this will require changes to models of service delivery and the working patterns and practices of consultants. This will need an assessment of the consultant numbers required to deliver acute and elective care when it is recognised that there is a shortage in most surgical specialties in Ireland relative to European and International norms. It will also require a re-examination of the overall career structure for consultants. While recognising that change can only be gradual, particularly in the current environment, nevertheless not moving in this direction for purely financial reasons would likely represent a significant missed opportunity to the improvement of quality of care.

The early assessment of patients with suspected acute surgical pathology should be undertaken as early in their surgical pathways as possible by a senior clinician with the appropriate skills and competencies to recognise when surgery may or may not be required. Studies have shown that the early intervention by senior decision makers early in the patient's pathway improves outcomes for patients with fewer inappropriate admissions, earlier definitive surgical treatment and discharge and makes for a more efficient use of resources. This is particularly important where junior doctors in training are insufficiently experienced to question the need for patient admission, perform diagnostic tests that are inappropriate and may fail to identify critically ill patients early in their clinical course.

Furthermore, initial assessments for patients who may require an early senior surgical assessment may not only be undertaken by surgical staff but also by doctors in Emergency Medicine, Acute Medicine or Paediatrics and others.

Additional pressures supporting the need for consultant-delivered services arise from changes in trainee work practices led by the European Working Time Directive (EWTD) which has resulted in decreased experience of surgical trainees working in shifts with multiple changeovers leading to interruption of the continuity of care with delayed treatment and communication difficulties. Continuity of care by the admitting team is, therefore, essential and may now have to increasingly rely on the admitting consultant.

Clearly, a consultant-delivered service does not imply that it should only be consultants who deliver medical care. Such a service must fully recognise and support the principle that successful care is based on a team approach in which all parties contribute to the delivery of a successful outcome. Trainee doctors will continue to have a crucial role in the delivery of healthcare as part of their training. Equally other clinical professions including nursing, allied healthcare professionals and healthcare science play a fundamental role in the provision of this care. There should be a continual and evolving debate as to which clinical professional is the most appropriate to deliver which aspect of care. (see 5.2.4.2)

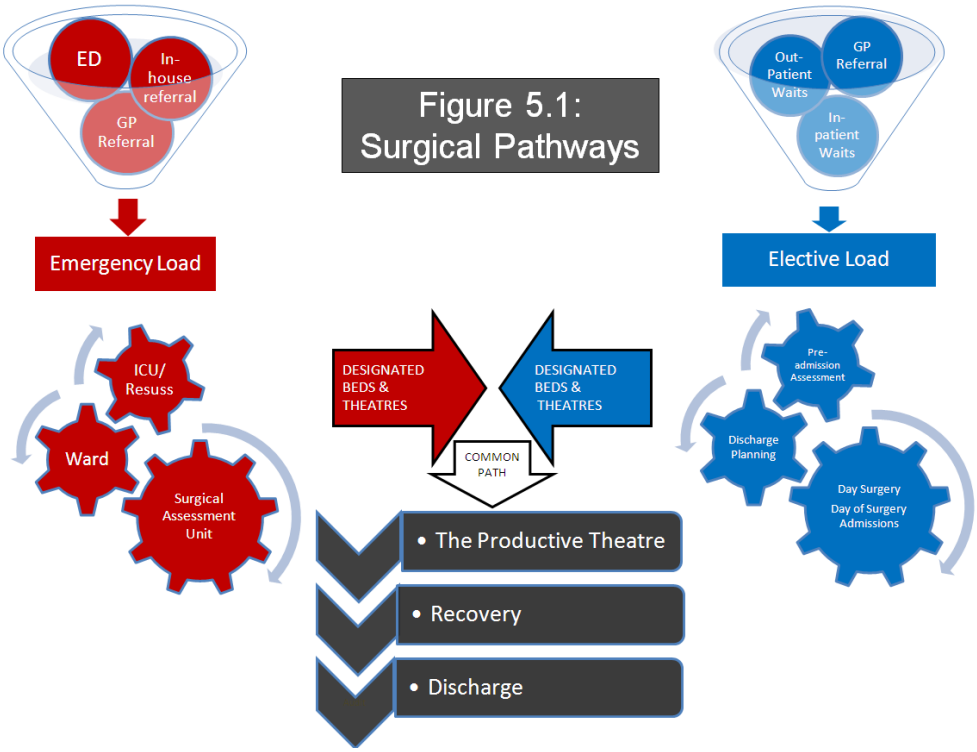
5.1.2 Recognition of Acute vs. Elective Pathways

Acute surgery differs from Elective Surgery in a number of ways (Fig 5.1). Its source of patients is often different and their arrival unpredictable, whereas the flow or load of elective surgery patients should be predictable.

Separating elective care from the pressures of acute surgical admissions through the use of dedicated beds, theatres and staff, if well planned, resourced and managed, can reduce cancellations for elective surgical patients, achieve a more predictable workflow, improve training opportunities, increase senior supervision of complex/emergency cases, allow faster access to theatre for emergency cases and therefore improve the quality of care delivered to all surgical patients.

Ideally both acute and elective surgery should be carried out on the same site, because, generally the same surgical workforce provides both services. But this sometimes becomes impractical in Ireland because of the size of institutions and the competition for space. However, in certain specialties and in some Hospital Groups, it may be preferable to use separate facilities recognising bed and theatre capacity issues across Groups, as is the case for Model 2 and Model 2S hospitals for whom it is planned that no unscheduled surgical care will take place. [28] Where acute surgical care does take place, on the other hand, there must be adequate and dedicated facilities.

Figure 5.1 -The two different pathways of surgical care



Optimum efficiency in the delivery of acute surgery requires it to be as functionally separate as possible from elective surgery and this emphasis should not be diminished in the face of implementing and achieving elective surgery targets. In larger surgical units, this functional separation will require realigning consultant work patterns to better conform to the needs of acute surgery as well as reassigning hospital resources into those that should be appropriately dedicated to acute surgical care.

It has been suggested that the strong focus on access targets for elective surgical care in the UK has had a negative impact on the delivery of acute surgery. [30] The Elective Surgery Programme in Ireland set out to improve the surgical journey for the elective patient by setting targets and developing a standard of care in areas including day surgery, pre-admission assessment clinics, day-of-surgery admissions (DOSA) and discharge planning. Rather than competing with acute surgery it has emphasised the need for designated beds for both elective and acute surgical patients.

The separation of acute and elective surgery will not only benefit patients but should also benefit trainees. With the reduction in working hours, focused experience should enable trainees to acquire the necessary competencies in both disciplines of surgery.

In 2007 a Working Party of Royal College of Surgeons of England concluded that local circumstances should dictate the best method of service delivery. However, their general findings were summarised in the following statements. [31]

1. A physical separation of services, facilities and rotas works best although a separate unit on the same site is preferable to a completely separate location.
2. The presence of senior surgeons for both elective and acute work will enhance patient safety and the quality of care, and ensure that training opportunities are maximised.
3. The separation of acute and elective surgical care can facilitate protected and concentrated training for junior surgeons providing consultants are available to supervise their work.
4. Creating an 'acute team', linked with a 'surgeon of the week' is a good method of providing dedicated and supervised training in all aspects of acute and elective care particularly in high volume specialties.
5. Separating acute and elective services can prevent the admission of acute patients (both medical and surgical) from disrupting planned activity and vice versa, thus minimising patient inconvenience and maximising productivity. The success of this will largely depend on having sufficient beds and resources for each service.
6. Hospital-acquired infections can be reduced by the provision of protected elective wards and avoiding admissions from the emergency department and transfers from within/outside the hospital.
7. The improved use of IT solutions can assist with separating workloads (for example, scheduling systems for appointments and theatres, telemedicine, picture archiving and communication systems, etc.).

Although, not stated amongst these points, the presence and early involvement of a senior anaesthetist is crucially important.

5.1.3 Networked Solutions

5.1.3.1 Hospital Groups

Acute surgical care in Ireland has, up to now, been delivered by a variety of autonomous hospitals, differing in their size and range of specialties and clinical interdependencies. The data we have shown in Chapter 4 indicates that workloads are fragmented across regions with great variations in capacity and throughput. To improve and better standardise patient care and access as well as resource utilisation, plans have now been published to introduce a new governance framework for hospitals in the near future. This will establish Groups of hospitals such that every hospital site will be part of a discrete group possessing a single, consolidated management team with responsibility for performance and outcomes and with a budget and employment ceiling that are clearly defined for that Group. The executive team and administrative board for each Group will have the autonomy to reconfigure services across the group.

The National Clinical Programme in Surgery fully supports the concept of hospital groups as a way of delivering timely access to a more standardised and better quality patient care. Furthermore, the programme is committed to working with the administrative structures in the design of the surgical delivery model across the hospitals within the new Groups.

Hospital Group definition and development has important implications for the delivery of the acute surgical programme. Once again, the primary consideration in the design and planning of Groups must be the delivery of better access to safer, better quality, efficient and cost-effective care to patients. All other interests should be secondary to this principle. Because of the multiplicity of issues, it is self-evident that the rational design of the hospital networks should be defined with reference to:

1. Populations within each catchment area
2. Workload and capacity of existing units
3. Specialty and subspecialty availability
3. Accessibility, transport links and travel times
4. Historical referral patterns based on academic links and previous health board structures where appropriate
5. Potential cross-border services

Surgery covers a range of specialties which vary greatly in volume, acute and elective workload and complexity. Some must remain as national services, while others will be delivered in selected Groups and the remainder need to be represented in every Group. Nevertheless, all surgery should comply with national standards, care pathways and audits.

The new Hospital Group arrangements should allow collaborative working, the development of common standards of care, flexible movement of clinical staff and robust patient transfer arrangements. Expertise and resources from the entire network will enable patients to be treated in the most appropriate hospital, depending on the nature and complexity of the case. The involvement and planning of the transport services will be crucial, to ensure, amongst other things, that there are clear protocols for ambulance bypass and the repatriation of patients to their appropriate setting.

Robust handover arrangements must be agreed and audited for compliance with standards for the transfer of critically ill patients as well as transfers out of a Group.

Bed availability across Groups will require coordination and planning and be managed and linked to primary and community care. High-quality data transfer arrangements for radiology and laboratory services, as well as the exchange of medical records, will be required to support the patient's care.

To be effective, Groups will require unified clinical governance as well as agreed contractual arrangements that will need to have senior clinical and managerial buy in and endorsement. Coordinated protocols for care pathways, close liaison with primary and community care, and network wide audit of process and outcomes will be required for transparent quality-assured care. The sustainable needs of each Group must be supported to match the workload that is appropriate to its catchment population.

All this will require careful and detailed planning. The multiplicity factors together with international experience of hospital reconfiguration suggest that such an exercise cannot be carried out without resource input. Taking into account the fiscal pressures, as well as the burden of the performance improvement challenges currently underway, it would seem sensible to introduce the Hospital Groups in a measured and stepwise fashion. [27,29]

5.1.3.2 Hospital Models

Hospital groups will be ideally placed to incorporate the various hospital models as defined in the Acute Medicine Programme, so as to efficiently maximise each hospitals capability.[29] All of the four models of hospital have been described within the Acute Medicine Programme. Only Model 3 and 4 hospitals will support undifferentiated care and their main disciplines of Acute Medicine, Emergency Medicine, Critical Care and Acute Surgical Care.

From a surgical perspective Model 2 hospitals will revert to hosting local injury units and provide day case surgery performed by surgeons from other hospitals within the group. In addition, the Surgery Programme has identified the need for a Model 2S hospital, which, like the standard Model 2 hospital, will not take unscheduled patients, but offers the potential to provide elective surgery of greater complexity than day procedures, on fit patients who

require a hospital stay after their surgery. A Model 2S hospital would require additional staff cover and be geographically close to a Model 3 or 4 hospital. In order to efficiently network the different hospital models, specialty provision and capacity issues on all sites will need to be addressed. [28]

The smaller surgical specialties, such as Cardiac surgery or Neurosurgery, are delivered in regional or national units, so little change will be required in the short and medium term in defining their service provision and planning. General surgery however, faces a much greater problem, as this service is delivered in most hospitals. Appropriate volumes of work will be required to justify the separation of elective and acute services in smaller units. The introduction of Acute Surgical Admission Units (ASAUs) and dedicated emergency theatres will be best implemented in larger hospitals, a transition that should occur over time.[33,34] The Programme is committed to play an active role in the operational planning that will be necessary to implement these necessary initiatives.

5.2 Strategies

5.2.1 Efficient Patient Flow - Access & Discharge

5.2.1.1 Importance of Access and Facilities

Acute surgical patients should be prioritised according to their clinical need. In general, they need rapid access to senior decision makers, imaging and, when required, access to fully staffed and resourced theatres. Hospitals receiving acute undifferentiated surgical patients should be designed to ensure appropriate streaming of patients to the correct part of the service avoiding duplication of assessment and of documentation. The ideal configurations should be a series of interlinked facilities where the skills of the emergency medicine physicians, acute physicians, surgeons, anaesthetists, radiologists and critical care specialists work closely together to manage the early phases of the acute illness. Assessing, prioritising and rapidly treating patients in this way will result in a shorter length of stay, a more positive experience for the patient, fewer complications and a lower mortality rate.[35, 36]

Most emergency operative procedures should be performed during the daytime, but often delays in processing through the ED is the result of a system wide problem, often related to acute bed access, leading to trolley waits and overcrowding which, itself, can lead to system delays. Surgery, when it is required, regularly occurs out of hours, in less than ideal circumstances. There are multiple factors contributing to this problem, including shortage of surgeons, increased subspecialisation, as well as limited access to acute operating theatres and lack of a dedicated on-call team. During the past five years, there has been a groundswell of support in Australia, New Zealand, United States, UK and Canada for the establishment of better acute surgical services. Newer models of care have been proposed utilising dedicated surgical teams and/or Acute Surgical Admission Units (ASAUs) together with dedicated theatres.[37, 38, 39, 40] These have not so far received widespread acceptance in Ireland, largely because it is perceived that they may not be either resourced or fully utilised. Internationally, such models have mostly been applied to General Surgery patients but may also have a role in other, particularly the larger, surgical specialties.

5.2.2 Acute Surgical Assessment Units (ASAUs)

Acute Surgical Assessment Units (also known as an Acute Surgical Admission Unit, Acute Surgical Unit or an Emergency Surgical Unit) provide a dedicated, transitory, centralised area where acutely ill surgical patients can be assessed and monitored prior to being admitted to hospital or otherwise treated and discharged. An ASAU's principle function and justification is to improve patient flow and provide better access to assessment, investigation and competent decision makers. ASAUs may be stand-alone, preferably in close proximity to an AMAU in a Model 4 hospital or part of a wider emergency assessment unit with, for example, an AMAU in a Model 3 Hospital. [32]

Two reports, from Ireland, Galway and Limerick, have already demonstrated faster patient journeys and shorter lengths of stay using very different approaches.[41,42,43,44] If designed and managed well, ASAUs can, in addition, provide many other benefits:

1. Admissions are concentrated in one area, allowing rapid transfer from the Emergency Department (Galway approach) or direct referral from Primary Care (Limerick approach). In the Galway approach, patient flow is through ED via a triage nurse, followed by initial assessment by an ED doctor. Rapid referral is made to the on-call surgical registrar, preferably prior to investigation, who admits the patient to the ASAU based on a protocol defining a limited number of common acute surgical conditions. In this model only the surgical team can provide access to the ASAU.
   In the Limerick approach, the ASAU is a direct referral unit for GPs or from a Model 2 hospital for acute surgical patients accessed only after direct phone contact with a triage nurse attached to the unit. It does not usually take patients from the ED. Referred patients are rapidly assessed by a senior registrar or the acute surgeon of the week. Admission is not mandatory.
2. Emergencies can be quickly prioritised by experienced, competent staff.
3. Inappropriate admissions are avoided, by converting potential admissions to ambulatory management where appropriate.
4. Consultant-led assessment can be provided regularly throughout the day.
5. There can be excellent training for junior surgeons when supervised by senior staff. It is good practice for trainees to follow up patients admitted via the ASAU so that they can gain experience of the entire pathway of care.
6. Acute beds are ring-fenced.
7. Same-day imaging and diagnostics should be available and provided for.
8. Nurse-led early discharges are facilitated.
9. ED waiting time targets are supported.
10. 'Safari' ward rounds are avoided.
11. Appropriate aftercare treatment and follow-up is anticipated.

12. Patients have a shorter length of stay, a more positive experience, fewer complications and a lower mortality rate.

In setting up an ASAU the following points need to be considered.

Source of patients

Patient selection is an essential prerequisite for an optimally functioning ASAU. Accurate triage and selection determines whether appropriate patients are selected for rapid intervention. Without critical selection and policing, the unit could become another repository for inappropriate undifferentiated patients. Surgical and nursing leadership is critical and a senior decision maker must be an integral part of the care pathway of the patient. Essentially, the decision maker should be able to assess if the patient needs an operation within the next twelve hours and to make this decision, they need to be at least at surgical registrar level or an experienced, competent Advanced Nurse Practitioner (ANP) in discussion with the on-call consultant. Primary Care referrals and nurse-led triage may fail in this setting unless scrupulously managed. A named consultant should be responsible for the day-to-day management of the unit, although not necessarily on clinical call.

The two different approaches for patient referral are described:

1. Those that take direct referrals from Primary Care and from Model 1 and 2 hospitals.
2. Those that take patients who after self-presentation are initially assessed and managed within the ED. Locally-agreed protocols will enable appropriate surgical assessment and fast-tracking to the ASAU.

Other potential sources of occasional acute surgical admissions include outpatient clinics and consulting rooms. Clear protocols should be in place to manage these also.

Those requiring resuscitation (Manchester triage categories 1 and 2) should be managed by local ED protocol. The model of ASAU selected should be the one that is most suitable to the local environment and the one that offers the least delay to patient care. Patient referral pathways from Primary Care, Model 1 and 2 hospitals, or ED to the ASAU should be clearly defined by local protocol. Internal referrals would not normally be managed in an ASAU.

Bed capacity

This will vary from institution to institution. A retrospective or short prospective study will quickly indicate the average daily admission rate for that surgical specialty together with an assessment of those that are seen and discharged. Larger Model 4

hospitals should have the necessary workload, staffing and capacity, whereas smaller Model 3 hospitals may not have the workload to justify stand-alone ASAUs, in which case they may be co-located with the Acute Medical Admissions Unit (AMAU).

In this case, protocols, such as those governing admitting criteria and length of stay, would need to be aligned.

Staffing

For larger Model 4 hospitals staffing should be supplied by a dedicated team, whereas most Model 3 hospitals have three or four general surgeons on a 1 in 3 or a 1 in 4 rota so local arrangements will dictate the on-call situation. More details on staffing requirements are given under The Surgical Team (See section 5.2.4.1).

Consultant surgeon work practices

1. The surgeon on-call for acute surgical care should be available for management decisions on a 24-hour basis throughout his/her on-call commitment with an active hands-on approach required to ensure efficient and safe patient throughput.
2. In Model 4 hospitals with stand-alone ASAUs and emergency theatre access the surgeon on-call will in general be relieved of all elective duty for the on-call period.
3. In Model 3 hospitals the surgeon on-call should be available for immediate consultation as necessary.
4. In general, consultants will not cover more than one hospital when they are on-call. This requirement may not be feasible or necessary for some of the smaller surgical specialties.
5. Ward rounds and handovers should take place on a twice daily basis or once at weekends and public holidays if a single team is involved.

Developing protocols for common acute conditions

Most conditions can be protocol driven. For General Surgery, for example, this would include abdominal pain due to infection, obstruction or ischaemia, soft tissue infection and abscesses, complicated hernias, soft tissue and abdominal and thoracic trauma, peripheral ischaemia, haemorrhage and head injuries; for Urology, urinary obstruction, testicular tortion, obstructive uropathy, trauma and infection.

Specific features of an ASAU

In planning, an ASAU should set out to:

1. Accept patients aged 16 years or older. Patients below the age of 16 need admission to a dedicated paediatric ward.
2. Remain open 12 – 24 hours daily, 5-7 days/week depending on hospital type, workload and capacity.
3. Be in close proximity/co-located, ideally, with the AMAU.

4. Have rapid access to diagnostics, particularly dedicated radiology, on a 24-hour basis.

5. Have priority access to theatres, specialist endoscopy and surgery wards defined by local protocol, developed with the appropriate specialist areas and bed managers.

6. Have a target that states that patients should spend less than 6 hours from ED registration until an active management decision is made or they are discharged.

7. Implement clear guidelines regarding appropriate nurse triage/rapid throughput for protocol driven conditions.

8. Have robust handovers.

9. Have a clearly defined governance structure with senior administrative and nursing staff and a named surgical lead responsible for organisational planning and outcome analysis.

10. Have a physical infrastructure that is adequate for the proper assessment of surgical patients.

Initial patient management

A multidisciplinary approach is important but the key to success is having the surgical leadership as close as possible to the first point of contact.

1. Where possible, the patient should be registered at the bedside.
2. The nursing staff will prioritise patients according to acuity. In many cases the patient will have been triaged before reaching the unit.
3. Clinical investigation should be commenced at the earliest possible opportunity and should be initiated by nursing staff based on protocols, where appropriate. Nursing staff should have had the necessary training and be competent in performing ECGs, phlebotomy and IV cannulation.
4. An Early Warning Score is carried out on patients at the outset.
5. Health Care Associated Infection (HCAI) assessment should be carried out.
6. Surgical assessment commences at the time that a decision is made to admit the patient to the ASAU and proceeds in a sequence such that all admission and discharge decisions must be ratified by a consultant surgeon within 6 hours during core working times and within 12 hours during non-core working times.
7. Ambulatory patient management should be explored for conditions such as soft tissue infections and abscesses requiring intravenous antibiotic therapy or wound care following same day surgery.

Outcome analysis

KPI's (excluding clinical outcomes such as surgical site infection, medication safety incidents etc.) should include:

1. Patient volumes and diagnoses
2. Times from admission to,
    - Assessment by a senior decision maker

- Completing diagnostics
- Theatre (if surgery performed)
- A ward (if transferred)
- Discharge (if discharged from the ASAU)

3. Unscheduled readmission or reassessment rates
4. Patient satisfaction

Important interdependencies

1. Appropriately trained medical and anaesthetic staff should be available and on site on a 24-hour basis.
2. Strong nursing support and involvement is most important with units utilising the expanded role for ANPs and CNSs as outlined below in 5.2.4.2.
3. Category 1 or 2 ICU beds should be available for all critically ill surgical patients.
4. Rapid access to diagnostics is essential for the provision of acute surgical care. Acutely ill surgical patients routinely require plain radiology, fluoroscopy, ultra-sound and CT scanning on a 24/7 basis which should be performed according to priority - within 30 minutes for high priority to within 2 hours for low priority. MRI scanning and interventional radiology should be available on an on-call basis within each Hospital Group with clear protocols for access/transfer.
5. Allied Health Professionals, including physiotherapists, infection control and social work services should be available throughout the working day, including Saturdays and Sundays, providing an on-call service.
6. Hospital pharmacy support should be available.
7. There should be agreed protocols for transfer of patients from Primary Care and Model 1 and 2 hospitals.
8. Specialist endoscopy services should be available each day, with an on-call service at night.
9. Palliative care should also be available for terminally ill patients and for pain control.

5.2.2.1 Diagnostic Services

Rapid access to diagnostics, in particular laboratory, blood transfusion services and radiology, is an essential requirement for the provision of acute surgical care. From a radiological perspective, acutely ill surgical patients routinely require plain x-rays, fluoroscopy, ultrasound and CT scanning. Less frequent but necessary modalities include interventional radiology and MRI scanning. Safe service provision requires on site 24/7 plain x-rays, ultrasound and CT scanning. MRI scanning should be available within each Hospital Group with clear protocols for access. Interventional radiology will remain limited even within larger hospitals due to staff numbers, training and volumes to maintain skills. Consideration should be given to regional on-call 24/7 interventional radiology access.

5.2.3 Designated Theatres

Without access to emergency theatres, care of the acutely ill surgical patient is frequently compromised. It is not unusual for emergency cases admitted on any day to be left to the end of the list of the following day. Theatre access for the most acute surgical patient frequently requires the interruption of elective surgical lists, leading to inefficiencies in theatre scheduling with either elective surgical patient cancellations or operations being delayed and performed out of hours, often in unfavourable circumstances for emergency patients. With accurate recognition of workloads matched to theatre capacity, each Hospital Group providing acute surgical services should be able to plan their emergency surgical activity in dedicated theatres, preferably on a single site, within the group, with adequate staffing and resources. The availability of emergency theatres for general, trauma and orthopaedic surgery should be mandatory in Model 4 and most Model 3 hospitals on a 24/7 basis. Emergency theatres function best in these larger hospitals when there is an adequate throughput, leading to more efficient care, as well as excellent opportunities for training. Implementation of The Productive Operating Theatre programme (TPOT) for emergency theatres will then consolidate and maximise efficiency gains.

A key determinant in emergency surgery is to identify the surgery that should be performed urgently and how quickly.[45] (Table 5.1) Adequate theatre access must always be available to enable this small proportion of emergency surgical work to be performed without delay or compromise.

Table 5.1 Priority targets for emergency theatre access

PRIORITY TARGETS (Time of booking to arrival in the Theatre)	SEVERITY	DEFINITION
<15 minutes	Immediate Life threatening	The patient is in immediate risk of loss of life, shocked or moribund, resuscitation not providing positive physiological response
<1 hour	Life threatening	The patient has a life threatening condition but is responding to resuscitative measures
<4 hours	Organ/limb threatening	The patient is physiologically stable, but there is immediate risk of organ survival or systemic decompensation
<8 hours	Non-critical, emergent	The patient is physiologically stable but the surgical problem may undergo significant deterioration if left untreated
<24 hours	Non-critical, non-emergent, urgent	The patient's condition is stable. No deterioration is expected.
<72 hours	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

A comprehensive list of emergency conditions requiring urgent surgery is not possible but a reasonably complete list of conditions is given in Appendix 3. Time of day or day of the 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 during standard working hours. 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.

5.2.4 Manpower/Resource Optimisation

5.2.4.1 The Surgical Team

The acute patient should be managed by a surgical team with the requisite skills and competencies. This team is normally comprised of medical staff, nursing staff, allied health professionals, hospital pharmacists and healthcare assistants and functions with the support of administrative staff and portering services. Comprehensive perioperative care is best delivered by a multi-disciplinary team, who communicate effectively to plan and deliver optimum care to the surgical patient.

As stated previously, acute surgery should be consultant-delivered to provide optimum care for the patient and maximise training opportunities. There should be a clear diagnostic and monitoring plan on admission as well as formal clinical care pathways for unscheduled surgical care, this should include assigning acute patients with a risk grade.[46]

Patients requiring emergency surgery should be seen at an early stage by a surgeon with the required skills and competencies. At present, in most cases, this will be a trainee (at least, Basic Surgical Training (BST) year two) with Advanced Trauma Life Support (ATLS) provider status. This doctor must be able to assess the patient and be able to make an initial decision about the seriousness and urgency of their condition. Acute surgical cases may be managed by senior trainees, but all patients admitted as emergencies must be discussed with the consultant surgeon who is responsible for the patient within eight hours of admission and, if immediate surgery is being considered or the patient's condition is deteriorating, there must be an active, audited and immediate consultant opinion. All patients under observation should be seen by a consultant within 24 hours. These response times are minimal and tighter time frames may be set by local ASAU standards or in line with medical response times in shared AMAU and ASAUs.

Knowing the risk to the patient is crucial to the management and surgical treatment and there is an abundance of evidence suggesting that that this remains poor in many centres. (See section 5.1.1.2) High-risk patients with a predicted mortality ≥10% must be discussed with the consultant surgeon on-call and be reviewed by the consultant within four hours, even if the management plan is defined and/or the patient has responded as expected. Patients in this group must have their operation carried out in a timely manner and under the direct supervision of a consultant surgeon and a consultant anaesthetist. Early referral for anaesthetic assessment is essential to optimise perioperative care.

The surgical team will comprise of a consultant and a NCHD team as outlined for an ASAU (described above). Senior clinical nurses and allied health professionals will work as key members of the surgical team at many points in the patient's surgical journey, as well as in their recovery, rehabilitation and ongoing care.

Team composition and number may vary across specialties and according to workload which should be determined by referral patterns and workload. For the provision of acute surgical care it is recommended that, in general, teams work in blocks of dedicated time of up to one week duration but for no shorter period than 48 hours with arrangements made to match local demands. If the workload is excessive, teams may need to draft in a consultant and NCHD colleagues to help.

In Model 4 hospitals with complete separation of acute from elective care, surgical staffing has traditionally required: one Consultant, one Specialist Registrar (SpR)/Registrar, one BST (year one or two) and one Intern (see below for alternative innovative roles). An Advanced Nurse Practitioner (ANP) as part of the team, particularly for the operation of an ASAU, is recommended. Acute surgical teams might share call with colleagues over defined periods, but should be released from all elective work during acute call schedules. At consultant level, undertaking acute care only, 1 week in 6, would be recommended within such a system, but local arrangements might vary from region to region.

Most Model 3 hospitals have three or four general surgeons on a 1 in 3 or a 1 in 4 rota so local arrangements will dictate the on-call situation. The team would again, include one Consultant with one SpR/Registrar, one BST (year one or two), one Intern and an ANP. Work volumes and capacity constraints will always preclude complete separation of acute from elective surgery in Model 3 hospitals hence clear protocols will be required to clarify access of acute patients to senior decision makers and theatres when necessary. Across the planned Hospital Groups, governance structures will need to be robust to ensure that units of this size maintain activity levels with appropriate outcomes in keeping with national standards.

Currently, non-consultant medical staffing remains problematic in many branches of medicine in Ireland. Surgery is no exception and the staffing in many units, both within larger national/regional units and in smaller hospitals, remains difficult. Further problems

are likely to arise from pressures as a result of the EWTD, the shortening of surgical training and the closer matching of trainees to consultant requirements. In Ireland, surgical BST numbers have always greatly exceeded numbers required for SpR advancement. Because of pressures to shorten surgical training, the College of Surgeons has redesigned the surgical career pathway. Current BST years will be reduced from three to two, which will seamlessly continue into six years of SpR training without the gap years. For SpR numbers to continue to match consultant requirements BST numbers are likely to continue to fall, in the coming years, posing serious pressures on service provision in all surgical units. The rationalisation of staffing levels should be helped by grouping hospitals and reorganising acute surgical services. But, more emphasis will need to be placed on the need to develop new and additional grades to cover current BST surgical duties.

Adequate staffing of surgical wards, operating theatres, assessment facilities, anaesthesia departments and recovery units by suitably qualified nurses, with the required competencies, will be essential for the management of the acute surgical patient journey.

In addition, physiotherapists, occupational therapists, dieticians and pharmacists will continue to play an increasing role in the pre and post-operative phases of care, leading to proven improvements in patient outcomes and early discharges.

5.2.4.2 The Need for Innovative Roles

The availability of fewer surgical NCHDs and the effects of the EWTD point to a clear need for the urgent development of new roles to takeover some of the more routine responsibilities of current non-consultant surgical staff. Consultant number expansion is needed in most surgical specialties, but is not the answer on its own. Role substitution by, and expansion of nursing, allied health and clerical staff, as well as the introduction of other new grades should be explored and dictated to by local needs and arrangements. Options for newer alternative staffing roles might include:

Expanding clerical grades - Much of the current work of NCHDs is purely clerical. It would be a small step to embed clerical staff within the medical team freeing up medical staff for clinical duties, such as history taking, medical examination and performing medical procedures, endoscopy and surgery.

Expanding the role of nurses - Role expansion for nurses in many areas is now an accepted policy of government, and already Advanced Nurse Practitioners (ANP) and Clinical Nurse Specialists (CNS) play an important role in patient care delivery across numerous medical specialties.[46,47] Examples include the prescribing of medicinal products (as Registered Nurse Prescribers or RNPs), ordering x-rays, discharge planning, undertaking certain tests such as ECGs, IV cannulation, and first dose administration of antibiotics. In surgery, there are already roles for the CNS in nurse assessment and tissue viability. Currently, ANPs are being recruited for enhanced roles in endoscopy within the National Cancer Control Programme's

colorectal cancer screening programme. Further expanding the role of ANPs in surgery could embrace many of the current BST duties within ED's, ASAUs and operating theatres.

Permanent SHO/Registrar grade - Currently many non-training SHOs and registrars remain in their posts for extended periods of time with little progress in career advancement. A proportion of current chronic post holders may choose to regularise their position with tenure. The postgraduate medical training bodies, the Medical Council and Health Service Executive - Medical Education and Training (HSE-MET) should address, formalise and provide clarity to such arrangements.

Physician Assistant (PA) - The role of the PA is well established in the USA, Australia, Canada, Netherlands and is expanding in other EU States including the United Kingdom and Germany.[48,49,50] Statistics from the American Academy of Physician Assistants indicate that there are 83,466 PAs in clinical practice in the USA. From the outset, PAs have worked as surgical first assistants, and provided pre and post-operative care to patients as members of surgical teams. In the USA, twenty-five percent of clinically practicing PAs work in surgical specialties or subspecialties. PAs are medically and surgically trained health professions who can provide a wide range of services with a surgeon's direction. With a training programme of approximately two years, PAs might offer a rapid and cost effective method of helping to staff surgical departments. RCSI has examined PA training programmes, and further development would need to be in consultation with the Medical Council and HSE-MET and Human Resources.

Enhanced roles for healthcare staff involved in acute surgical care will need to be clearly defined and integrated within the overall team structure, with clear lines of command within an efficient and effective, single clinical governance structure.

Allied Health Professionals (AHPs) – this document does not attempt to cover the range and expanding roles for TPs, including Physiotherapy, Occupational Therapy, Speech and Language Therapy, Dietetics, and others, all of which play increasingly important roles and are integral to the surgical team in the management of acute surgical patients, both pre-operatively and post-operatively. The need for AHPs is unquestioned and is often required on a 24/7 basis to maintain effective cover. Current resources in the therapy professions do not provide for out of hours demand.

Speech and language therapy, for example, is an essential component of plastic, maxillofacial, otorhinolaryngological and upper gastrointestinal surgery work, in addition to that required in critical care units. Podiatrists are an important part of the National Diabetes Clinical Programme and its link to vascular surgery. In services such as plastic surgery, orthopaedics, neurosurgery, vascular surgery and others, the physiotherapist is playing an ever greater role at senior, clinical specialist and advanced practitioner level. They are already involved in therapy-led clinics aimed at reducing orthopaedic waiting lists, in addition to their increasing roles in EDs and respiratory services.

With regard to dietetics, the problem of malnutrition in Irish hospitals, particularly in the elderly is well recognised and nutritional screening should be part of pre-operative assessment and should be carried out on admission. From the report of the two national nutrition screening weeks in Ireland, we know that one in three to four admissions are at risk of malnutrition, with 50% of these being at high risk, while 74% of hospitals do not a have a screening policy in place. Yet in Table 4.6 and 4.7, referrals to dietitians do not reflect this requirement, suggesting that interventions to address malnutrition are being missed in many surgical patients. The role of Occupational Therapy post-surgery is especially important with regard to reconstructive plastic surgery, trauma and orthopaedic, and general surgery. Occupational therapists are key to the discharge process.

Hospital Pharmacy - Hospital pharmacists will, increasingly, provide invaluable medicines information to surgical teams, facilitate seamless care of medicines from the community to acute hospitals, create and maintain drug protocols and prescribing guidelines with clinicians, and supply medicines in accordance with agreed hospital prescribing guidelines. Potential expansion of roles could include history taking, medication reconciliation, medication review, antimicrobial prophylaxis and further support in the management of post-operative complications.

5.2.4.3 Efficient use of Resources

Extending the core hours of service provides the potential for additional capacity, more balanced staffing levels throughout busy periods, and could ensure that senior clinician input is available when required. Dedicated emergency operating theatres and recovery units, where possible, should be maintained throughout the day, by extending the working day facilities and resources across a longer period, for example, from 8am-10pm (including weekend cover). The inclusion of a 'third session' or 'twilight shift' from 5pm to 10pm, offers the ability to complete more planned elective lists, as well as many of the urgent cases, which otherwise would compete for and potentially, overwhelm next day theatre lists. Resource utilisation in this manner should minimise the need to operate between the hours of midnight and 8am.

Evidence suggests that patient care at weekends, under current work patterns, is of a lower standard.[51] This should be corrected by providing adequate staffing and resources appropriate to those hospital sites managing unscheduled care. This would include, as with any extension of the working day, all the required support services, including diagnostic services, etc.

5.2.5 Capacity Planning

The majority of patients admitted to general hospitals in Ireland are admitted under the umbrella of Acute Medicine, Care of the Elderly or Surgery, both acute and elective. It is these disciplines that largely define the resources and the bulk of bed capacity that is required in hospitals. Working out bed requirements for these disciplines is both variable and complex. It is, nevertheless, an essential exercise, in order to guide better practice and appropriate allocation to acute medical specialties, so as to address ED congestion, In-patient and Out-patient waiting times, and avoidable encroachment onto the resources of surgery and thus preventing the streaming of surgical patients.

5.2.5.1 Predicting Flows into Unscheduled Surgical Care

An important component of the acute surgical programme has been to examine the surgical workload in relation to capacity across hospitals and regions. (See Chapter 4).

The inability to routinely align hospital capacity with patient demand for services results in both system stress and widespread waste and inefficiency. Overcrowding in the emergency department (ED) and other service areas, nursing stress, medical errors, delays, cancellations and underutilization of existing resources can be attributed to how hospitals' schedule procedures and admissions and to poor management of patient flow. Scheduled/elective admissions and procedures (e.g., Operating Theatres, Cath. Lab.) are often at the center of the problems experienced by hospitals in managing patient flow due to their competition for hospital resources (e.g., beds) with many other departments. Multiple studies have documented that suboptimal scheduling practices are frequently the cause of hospital overcrowding, nurse burnout, readmissions, medical errors, hospital acquired infections, mortality, delays and lack of preferred beds, cancellations and underutilization of existing resources, and inflated cost.

The traditional solutions of adding more physical capacity or increasing staffing are no longer feasible in today's healthcare environment. The recent focus on consumer driven healthcare and information transparency, while important, does not address the cause of these problems and, therefore, will not solve these operational challenges. Rather, it will exacerbate them as a result of more demanding consumers and increased patient volume attending our hospitals. The solution to these operational issues is the effective management of variability in patient need and demand for services through applying variability methodology and other operations management techniques.. By applying these techniques, hospitals can substantially reduce variability in patient flow and thereby significantly reduce cost and increase quality.

Unscheduled care pathways are driven only by the flow of patients who arrive at hospital entrances. Whilst there may be opportunities to modify the way the general public, and the

primary and community care services access the hospital, once they arrive, the patients' needs have to be met promptly, safely and efficiently.

The present target for patients who present to an ED is that they complete assessment and definitive treatment within six hours.[52] Hospitals must, therefore, have a good understanding of the anticipated flow of unscheduled patients into its various specialties to ensure that it has appropriate resources available. To do this, it must also keep a close watch on the actual versus the anticipated demand on an hour-by-hour basis, and be able to escalate resources appropriately, if demand rises or bottlenecks appear.

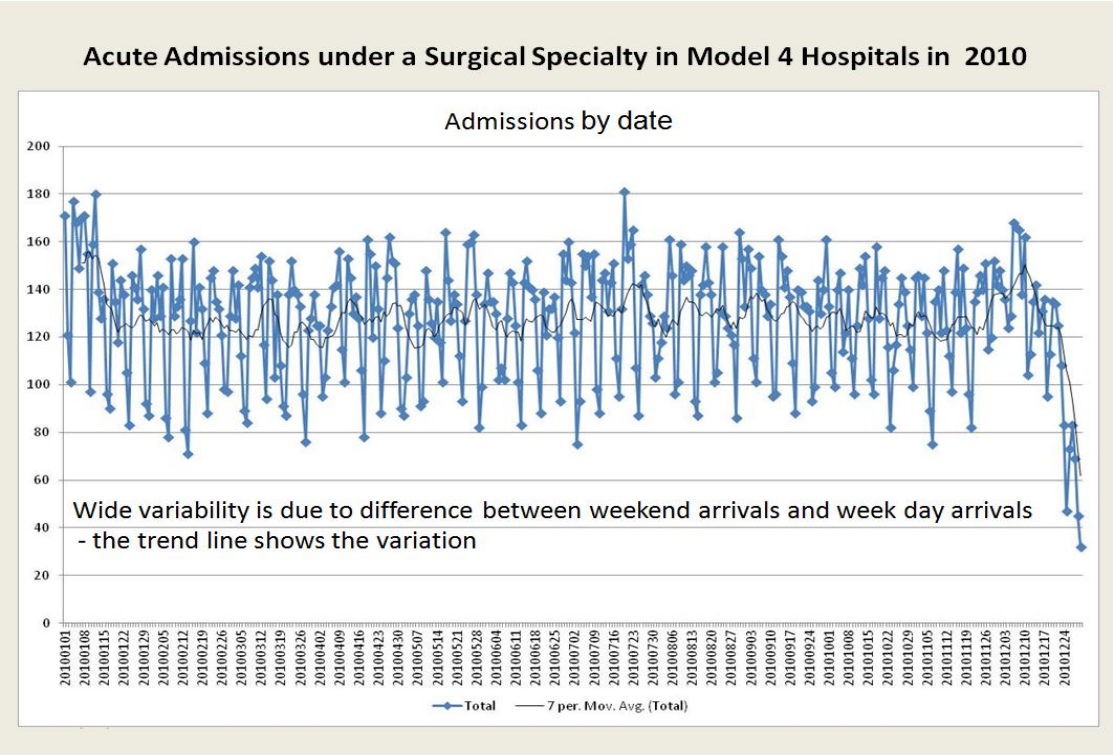
A key point to understand is that the primary driver of resource usage at the front door is patient demand and not what may be going on within the hospital. Nevertheless, just how efficient unscheduled care services will be for patients will be profoundly affected by the effectiveness of downstream care by the hospital, by the length of stay, by discharge planning and by the onward health and community support, particularly for the 20% or so of frailer patients, whose needs on leaving hospital are often complex. To achieve this, teams should have a dedicated discharge planner.

Analysis of information from data sets, including the Patient Administration Systems and Hospital Episode Statistics, can be used to design and test clinical service plans to improve the effectiveness, safety and efficiency of patient experience.[53]

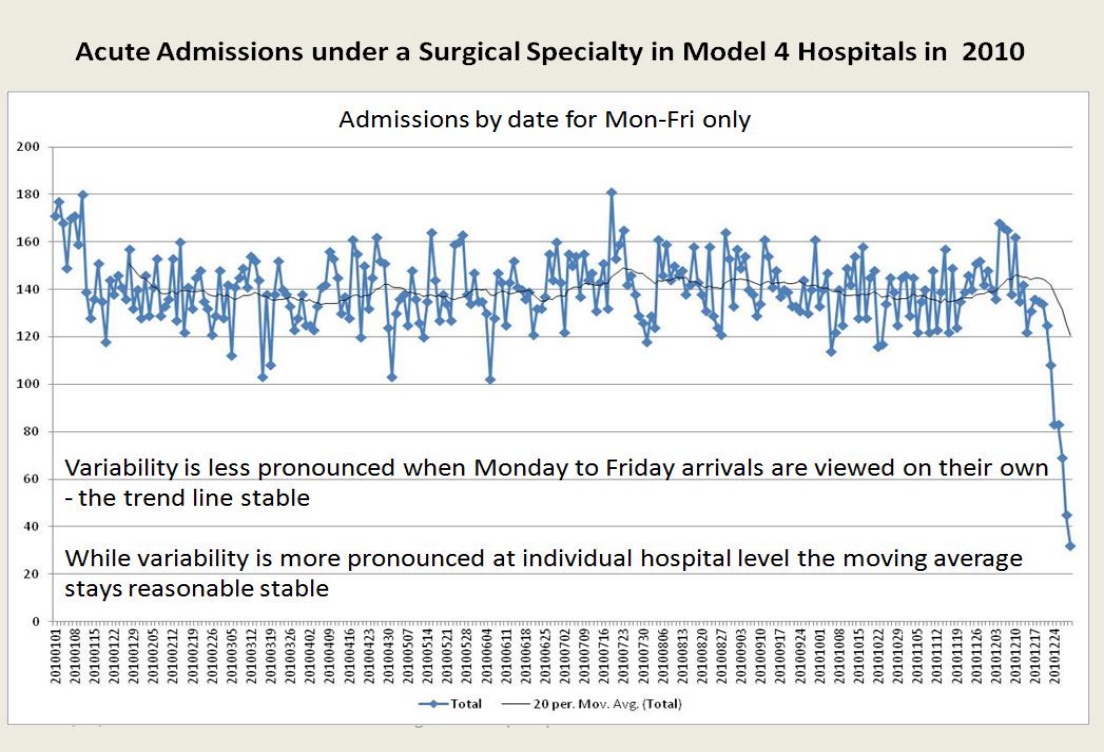
These data sets usually demonstrate a high degree of predictability of unscheduled care workloads, but may also show differences in day-to-day demand within each working week, and substantial opportunities to reduce length of stay. They can provide enough information about the pattern of patient arrivals during each 24 hours to help ensure that available resources, including staffing at all levels, can be organised to respond in a timely, safe and effective way.

In Figures 5.2 (a), (b) and (c), we show the cumulative acute surgical admissions for all Model 4 Hospitals for 2010 by date, by date for Monday to Friday only and a calculation of mean number of admissions, including the addition of one standard deviation to allow capacity to meet variations in demand, respectively. This exercise can and should be done at individual hospital level and at individual ward levels and even within specialty disciplines. Bed occupancies persistently at 100% or greater may indicate maximal use of resources but, paradoxically, contribute to inefficiencies when it comes to capacity planning.

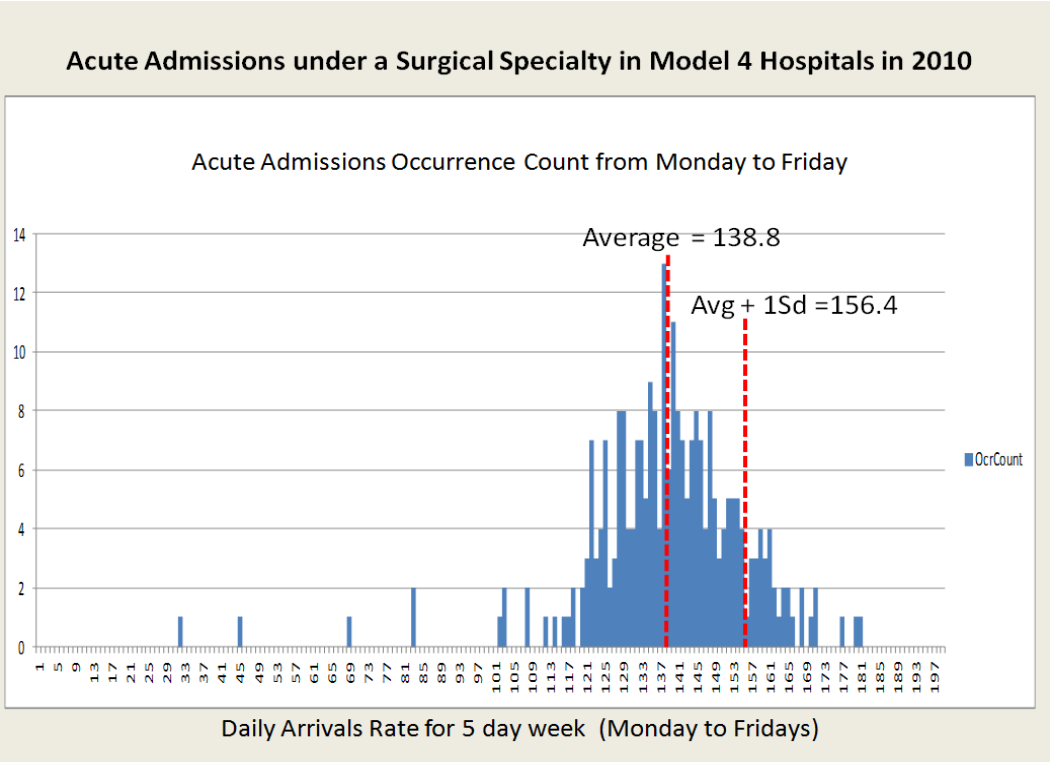
Figures 5.2 (a)



Figures 5.2 (b)



Figures 5.2 (b)



Detailed analysis can generally be conducted on 13 weeks of data from a quarter. Activity modelling does not get any more precise with larger aggregations but loses reliability as smaller subsets are used.

Pattern of demand for surgical beds

There are generally small differences in demand for non-elective surgical admission during the week, and a substantial reduction in the total number of admissions on Saturday and Sunday, because there are fewer elective admissions. Usually, the total elective and non-elective demand for beds is highest on Monday and Tuesday.

When planning resources to meet this pattern of demand, the use of 'mean' data would underestimate the workload for about half of the days. (Table 5.2) It is generally agreed that prudent capacity planning should be based on the 85th centile of the variation in demand.

Table 5.2: Plotting length of stay against percent of admissions

LoS days	% Admissions
0	20
1	20
2	15
3	10
4	7
5	5
6	4
7	3
8	2
9	2
10	1
>10	11

It is possible to create a profile of the time patients are admitted surgically in 4-hour blocks over a 24 hour period. This probably lags behind the time of their arrival by at least 2-3 hours. It has also been demonstrated that the lag between the GP and the patient agreeing to a hospital referral and the arrival time may represent a further 3 or more hours of delay.

Surgical Non-elective Length of Stay

Table 5.3: A sample profile of lengths of stay and bed requirements

Surgical Admissions; Non-Elective and Elective					
	Emergencies		**Elective**		**Total Beds required**
	Mean	85th centile	Mean	85th centile	
Monday	16	**21**	14	**20**	**41**
Tuesday	15	**20**	14	**20**	**40**
Wednesday	15	**19**	12	**16**	**35**
Thursday	14	**18**	13	**18**	**36**
Friday	14	**18**	12	**16**	**34**
Saturday	11	**14**	3	**5**	**19**
Sunday	11	**15**	4	**7**	**22**

Two thirds of all patients have less than four nights in hospital. There is probably scope to speed up the departure of patients further and shorten length of stay by seeing, where possible, that patients leave the hospital before the third night. In this context, the availability of an ASAU is an important resource. It should not be acceptable to plan in the expectation that patients will have to wait for many hours, often in a busy and congested

Emergency Department. Care pathways for common presentations, such as abdominal pain and superficial abscesses/cellulitis, should allow ED teams to arrange for patients to move to an ASAU whilst surgeons are otherwise engaged. The consultant surgeon responsible for unscheduled care or one of his/her team must be free of other commitments to attend.[54]

In summary, operational capacity and flow planning should be regularly undertaken by all the major clinical divisions within hospitals, including surgery, for both scheduled and unscheduled care. Such information gathering and the resultant planning, and re-engineering of resources has been shown to impact beneficially on overcrowding, patient mortality and readmissions, as well as costs, medical errors, nurse shortages and staff well-being. [55,56]

5.2.5.2 Critical Care Capacity Planning

Critical care capacity is a determinant of the outcome of critically ill surgery patients, including critical care capacity appropriate to critically ill surgery patients requiring regional and supra-regional specialty surgery services, such as that required for neurosurgery.
Critical care capacity refers to both bed capacity and transport capacity.
Level 2 and Level 3 critical care bed provision must be sufficient to support the anticipated emergency surgical workload. This requires that there be adequate critical care capacity planning for the different hospital models appropriate to surgery volumes and demands. The Joint Faculty of Intensive Care Medicine of Ireland (JFICMI) has defined levels of critical care with Level 3s care as the critical care need of a patient requiring a supra-regional or national surgical specialty service, in addition to Level 2 and Level 3 and the service they provide.

5.2.5.3 Discharge Planning

Discharge planning is the development of an individualised discharge plan for a patient prior to their leaving hospital, with the aim of improving patient outcomes and ensuring best value for money and care, in the most appropriate setting. Discharge planning should ensure that patients are discharged from hospital at an appropriate time in their care, thus influencing both the length of hospital stay and the pattern of care within the community, by bridging the gap between hospital and home, with adequate step down facilities where required

The importance of starting discharge planning at the earliest stage of a patient's journey is well covered in other documents, whilst recognising that the process cannot begin for the acute surgical patient as early as it can for the elective patient.[57, 58, 59, 60] In most cases, it should be nurse-facilitated and should follow the principles outlined below:

- Discharge planning should be part of the acute surgical integrated care plan at each stage of the patient's journey and be the responsibility of the whole team
- There should be a dedicated Discharge Coordinator
- All patients should be provided with an estimated length of stay
- There should be a policy to discharge patients before 11.00am on the day of discharge
- The discharge should be nurse-facilitated
- The role of AHPs is most important
- All patients should receive a uniform and agreed Immediate Discharge Document forwarded to primary care.
- Discharge activity and patient experience should be monitored using appropriate metrics
- Discharges should be facilitated by Community Intervention Teams who should participate in follow-up care and the prevention of unscheduled readmission

5.2.5.4 Acute Surgical Inpatients who do not have a surgical procedure

It will have been seen in Chapter 4 that, in 2011, while acute inpatients accounted for 62% of surgical admissions, some 44% of those had no surgical procedure performed. The question then arises, could a cohort of these patients be better managed sooner outside the hospital environment. The possibility of ambulatory care will depend on the condition of the patient, the disease process, the nature of investigations and treatments required, as well as their social circumstances and the availability of community support circumstances. Earlier discharge is already becoming more feasible with the advent of less invasive interventions, such as those in vascular surgery.

Table 5.4 lists the 25 most frequent clinical diagnoses (ICD 10 AM version 6/ACS) of inpatients admitted under surgical care in 2011 who did not have a surgical procedure. These are divided into those that were inpatients, with their lengths of stay, and those that were managed on a same day basis.

Table 5.4: Top 25 Diagnosis for acute surgically admitted patients but do not have a surgical primary procedure.						
	Total	Inpatients			Day Case	
Diagnosis Code & description	Patients	numb	Bed Days	AvLOS	numb	% day Case
R103: Pain localised to oth parts low abdomen	3,669	3,020	7,239	2.4	649	17.7%
R104: Other and unspecified abdominal pain	2,874	2,337	5,779	2.5	537	18.7%
L0311: Cellulitis of lower limb	1,762	1,734	11,705	6.8	28	1.6%
R101: Pain localised to upper abdomen	1,355	1,143	3,237	2.8	212	15.6%
S099: Unspecified injury of head	1,274	871	1,308	1.5	403	31.6%
K590: Constipation	893	769	2,442	3.2	124	13.9%
K922: Gastrointestinal haemorrhage unsp	859	779	4,801	6.2	80	9.3%
K5730: Divertic lrg intest wo perf abs or haem	856	831	3,890	4.7	25	2.9%
N390: Urinary tract infection site not spec	738	663	3,236	4.9	75	10.2%
J039: Acute tonsillitis unspecified	732	710	1,677	2.4	22	3.0%
T8141: Wound infection following a procedure	724	683	4,633	6.8	41	5.7%
K566: Oth & unsp intestinal obstruction	719	695	5,090	7.3	24	3.3%
T810: Haem & haematoma comp a procedure NEC	699	651	1,951	3.0	48	6.9%
N832: Other and unspecified ovarian cysts	687	589	1,329	2.3	98	14.3%
K859: Acute pancreatitis, unspecified	675	665	4,707	7.1	10	1.5%
K297: Gastritis unspecified	620	552	1,701	3.1	68	11.0%
K810: Acute cholecystitis	610	600	3,273	5.5	10	1.6%
K8020: Calc gallb wo cholecystitis wo obs	593	550	2,392	4.3	43	7.3%
K8000: Calculus gallb w ac cholecystitis wo obs	583	560	2,965	5.3	23	3.9%
A099: Gastroenteritis & colitis unsp origin	548	499	2,375	4.8	49	8.9%
K5732: Diverlitis lrg intest wo perf abs haem	534	524	2,537	4.8	10	1.9%
R31: Unspecified haematuria	519	479	2,137	4.5	40	7.7%
N200: Calculus of kidney	500	447	1,174	2.6	53	10.6%
S0602: LOC brief dur [less than 30 minutes]	450	330	598	1.8	120	26.7%
N459: Orchitis epididymitis wo abscess	408	370	1,168	3.2	38	9.3%
S098: Other specified injuries of head	402	294	624	2.1	108	26.9%

The most frequent diagnosis is abdominal pain, non-specific, with all its variations. Like head injuries, these need to be managed for periods that are dictated by clinical circumstances, often by periods of observation.

Therapies that offer the potential for management outside the hospital environment include the treatment of soft tissue and other infections by outpatient parenteral antimicrobial therapy (OPAT), and at the same time, conform to the Guidelines for Antimicrobial Stewardship in Hospitals in Ireland.[61,62,63] The treatment of deep venous thrombosis by outpatient anticoagulation is also well established.[64,65] Such treatments need clear protocols and close liaison with community care teams.

5.2.6 Key Performance Indicators

5.2.6.1 Data, Outcomes and Quality Indicators

In Ireland, there is only very limited data as regard to the timeliness of surgical intervention. The outcomes of acute surgical care are variable and also poorly measured. Such information is required to understand the workload demanded by, and to facilitate the planning of, safer treatment for emergency surgical patients. To enable effective audit of the acute surgery pathway, the time of the decision to operate and the time of the operation should be recorded in the patient's notes. (See KPIs for ASAUs)

High level indicators, in a number of acute clinical situations, have shown very variable practice and outcomes in Ireland, such as the time taken to surgery for hip fractures, mortality rates after hip fracture and emergency colectomies.[66] Poorly delivered or delayed emergency surgical care not only increases mortality rates but can increase costs substantially. This may be due to increased complications, returns to theatre or ICU, and increases in length of stay. The outcome is, not just a cost to society, but more importantly, a personal cost to patients and their families, in terms of quality of life, morbidity and mortality.

In order to more accurately understand the scope and burden of acute surgery within the provision of surgical health care, it is important that patients are clearly and accurately demarcated as to whether they are either elective or acute. Currently, it is likely that acute procedures are over-coded because elective patients, for example with cancer, or some other pressing condition, are admitted as an emergency when this is truly not the situation but only used as a means of gaining admission when there is pressure on beds. Acute surgical cases should only be coded as such when this is truly the case.

National surgical performance measures that are being undertaken as part of the Elective Surgery Programme

These are aimed at increasing clinical engagement with the Hospital Inpatient Enquiry (HIPE) system, in order to improve the accuracy of both national and local data. This includes targets for performance for such measures as pre-operative and total or average length of stay, day of surgery admissions, bed usage. As indicated in Chapter 4, casemix and complexity differences should also be acknowledged by correcting for variables such as age, ASA grade and diagnostic related groups. Surgeons and managers need contemporaneous data, in order to be aware of their own and their institutions' clinical and process outcomes so that they can play a more active part in operational planning. To this end, the Elective Surgery Programme has developed a suite of metrics using the National Quality Audit Information System (NQAIS) and other reporting tools and these have now been extended to include acute surgical patients. (See Chapter 4)

5.2.6.2 Audit (IASM, INOR and Critical Care audit)

Everyone admitted to an Irish hospital for a procedure should be entitled to know what outcome to expect. This is not currently the case. Indeed, clinical outcomes are more difficult to measure on a national scale, although there is good evidence that this can be done.[67] The National Office of Clinical Audit (NOCA) has recently been launched as a partnership between RCSI and other training bodies, and the National Directorate of Quality and Patient Safety of the Health Service Executive. Under its governance three clinical audits have been funded. These are:

1. Irish Audit of Surgical Mortality (IASM)
2. Irish National Orthopaedic Register (INOR)
3. National Intensive Care Audit (ICU audit)

Good clinical governance dictates that all surgical departments engage in local audit review processes, including morbidity and mortality meetings, and take part in relevant national audits.

The Irish Audit of Surgical Mortality (IASM) is the first audit and will commence in 2013, and is clearly relevant to both acute and elective patients in many surgical specialties. This audit is based on the Scottish Audit of Surgical Mortality (SASM) and has been successfully replicated in Australia and New Zealand (ANZASM). All deaths within surgical units will be reviewed, including those following both elective and acute admission, with or without surgery. IASM will allow participating surgeons, both within the public and private sector, to engage in a confidential peer-review process, allowing each participant to bench mark their practice against best national and international practice. While participation within such audits is voluntary, it is expected that current professional standards require national audits of this nature to form an integral part of a surgeon's professional practice.

Engagement should satisfy the clinical audit component of the Medical Council's professional assurance appraisal.

The objectives of the audit of surgical mortality in Ireland will be to review all deaths that occur following an episode of surgical care, elective or acute, and to provide opportunities for improvements in patient outcomes by:

- Reducing mortality associated with surgery and peri-operative care
- Increasing patient safety, confidence and overall experience
- Promoting and encouraging reflective practice
- Providing surgeons and anaesthetists the opportunity of participating and contributing to measurable clinical audit.

The longer term objectives of IASM are to provide regular, documented, critical analysis of the outcomes of surgical care. The gathering of information from multiple sources over time, will allow detection of system issues and emerging trends. In addition, in consultation with SASM and ANZASM, Irish clinicians will be ideally positioned to benchmark clinical outcomes against international standards.

While participation in this audit is voluntary, it is most important that all deaths under surgical care are recorded in each hospital to provide the denominator. This record must be kept at a single, named site within hospitals so that the total number can be recorded and logged by the NOCA office.

The Irish National Orthopaedic Register (INOR) will define the epidemiology of joint replacement surgery in Ireland, provide timely information on the outcomes of joint replacements and identify risk factors for a poor outcome. As such this register is more directly related to elective surgical practice.

INOR will use a patient scoring system, adverse event recording system and surgical revision rate to monitor implant performance and patient outcome. This will provide continuous feedback to participating centres and surgeons enabling the detection of:

- Poorly performing implants
- Optimally performing implants, based on local epidemiology
- Suboptimal pre-operative, peri-operative and post-operative surgeon or centre performance

The introduction of INOR will lead to reduction of surgical revision rates and allow significant reduction in cost of service. Conservative comparisons with international registers denote expected annual savings in the region of €2.5m to deliver service by the third year of a fully operational register. In addition, it will provide orthopaedic surgeons the opportunity to contribute to measurable clinical audit.

A National Intensive Care Audit

A National Intensive Care Audit is being implemented in fulfilment of key objectives of the Critical Care Programme and the Joint Faculty of Intensive Care Medicine of Ireland (JFICMI), and will have direct relevance for outcome analysis of acutely ill surgical patients. Ten ICU units have been identified for implementation initially and it is intended to expand the network in 2013. The ICU Audit will, through the utilisation of a long established reporting tool Intensive Care National Audit & Research Centre (ICNARC), measure quality of patient care in ICUs. Directors of ICUs and ICU nurses will utilise the audit to drive improvements in ICU standards and quality. It is intended that the measurement of levels of activity will help

inform capacity and resource planning nationally. The ICU Audit, by monitoring Health Care Associated Infections (HCAIs), will additionally drive improvements in surgical care.

As resources allow, more specific audit exercises will be undertaken as we move forward, for example, in specific areas such as hip and tibial fractures, vascular surgery outcomes, hernia repair, head injuries, stab wounds, and the management of the acute abdomen.

Audits of patients and their care outcomes

The importance of these cannot be overstated. The ongoing assessment of the impact of the surgical models of care on patient safety and their quality of care will greatly assist successful implementation. In busy clinical environments, patient audits often do not receive the priority they merit. These audits should be conducted regularly, as capturing patient-reported outcomes and patient experiences will provide a robust picture of how the models of care are impacting on patient outcomes and service delivery. Such audits could also highlight procedures which are resulting in poor patient care or unnecessary inefficiencies, as well as assisting in hospital accreditation and licensing.

Health outcomes also refer to changes in the health status of individuals which can be attributed to an intervention or series event interventions. These changes can include better or worse physical functioning such as the ability or not to perform daily tasks, in addition to mental health and coping skills. Unfortunately, to date, these are not routinely measured in Irish hospitals

5.3 Key Considerations

5.3.1 Governance

It is a time of great change in hospital healthcare driven by the need to:

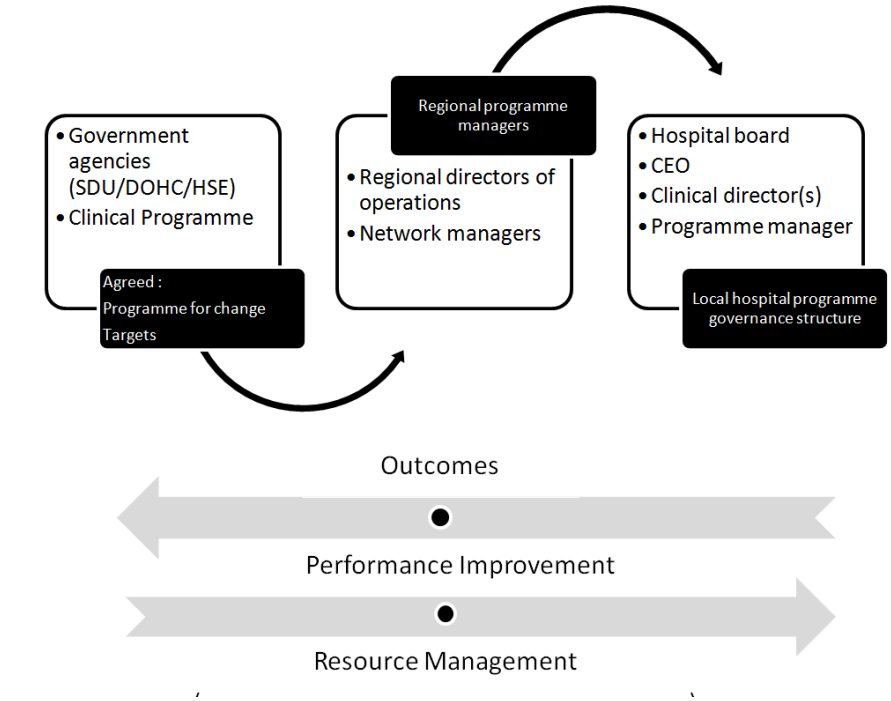
- Meet government targets aimed at tackling long inpatient and outpatient waiting lists and overcrowding in EDs.
- Meet the challenges of clinical programmes aimed at providing better patient care by standardising clinical pathways and processes.
- Address these issues in a time of severe financial constraint.

It is apparent that these challenges will not be successfully addressed without the very active participation of all clinicians, including doctors, nurses and many others, together with government agencies, managers and patients themselves.

A clinical programme, such as surgery, is not simply a constellation of ideas and aspirations condensed into reports that have no traction, but a programme for change that has to be agreed, implemented and the changes sustained into the future. It is, therefore, critical that there is an operational coordination and agreement between clinicians, managers and government agencies. Communication is vital so that each understands what the other is doing and that they are all engaged in a synchronised and harmonised plan. The elements of the programme must be clear and agreed and then transmitted through the various government and clinical agencies to hospitals and to the clinical staff working within them.

The method and pathway of communication must be clear and explicit. Outcomes should be fed back up through the system, as well as informing clinicians on the ground. Based on outcomes and informed metrics, it is the government then that has the responsibility of imposing sanctions or rewards as the case may be, but this is not the role of clinical programmes. Clinical programmes must have realistic expectations, but cannot be responsible for failed implementation where manpower and resources are clearly inadequate.

Figure 5.3 Governance model for a Clinical Programme such as Surgery



Underpinning the measurement of outcome should be a clearly defined governance framework that should exist within all hospitals and Groups. A suggested structure is outlined in Figure 5.3. Change management is a daunting exercise but should not be made overcomplicated or excessively bureaucratic. It needs patience, understanding, team working and cooperation.

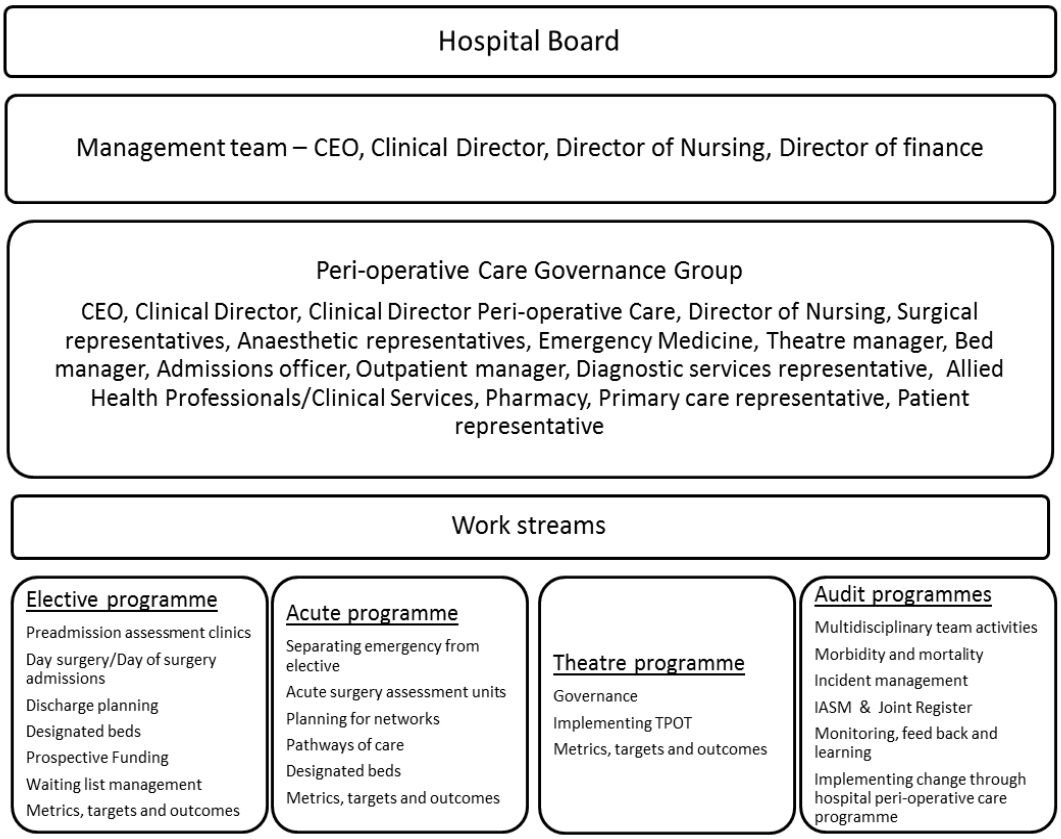
Participation in prescribed national clinical audits is likely to become mandatory for surgical competence assurance. In time, NOCA will publish outcomes, at organisation, group and hospital level, in a way that is easily understood by clinicians and patients, in a format that also contains the appropriate level of detail required to enable clinicians and health providers to identify concerns and seek improvements when necessary. Individual confidential reports for each individual surgeon will also be produced allowing benchmarking against national norms. Flexibility with these processes should also allow surgeons in the private sector to positively engage for their competence assurance and hospital licensing needs.

The role of clinical directors and, more specifically, the Group Clinical Director of Peri-operative Services, once groups have been established, will be of great importance as it is they who will have the authority to implement the changes necessary to realise the aims of the Surgery Programme.

The interaction between clinical programmes will also be necessary with their alignment being managed through the office of the Director of Clinical Strategy and Programmes, HSE.

At a hospital level a structure for the governance of peri-operative care is suggested below in Figure 5.4.

Figure 5.4: A model for governance of peri-operative care at hospital level



5.3.2 Surgical Specialties – Their Role in Acute Care

As with the hospital service in Ireland, surgical specialties have developed and evolved, for the most part, in an uncoordinated manner. To an extent, this will always be the way as medicine and medical technology changes and develops, and disease profiles and priorities ebb and flow. Nevertheless much should be anticipated and planned for.

The current workload of each specialty is shown in Chapter 4. Surgical specialties have very different demands, be they acute or elective. In creating generic or overarching principles, it is most important that it is recognised that exceptions, where necessary, are accepted and understood. For example, the separation of acute and elective practice may not be appropriate for some specialties. Some may not require dedicated emergency theatres because the workload does not demand it and ASAUs may be inappropriate. The introduction of hospital groups will have less implication for those surgical specialties that are already based in national centres. In Chapter 6, specific standards of surgical care are outlined for each specialty in relation to their delivery of acute care.

5.3.3 Integration with other Stakeholders & Clinical Programmes

Those delivering acute surgical care in hospitals must work in close liaison with the services of primary and community care. They must also work closely with other in-hospital services, including the following:

Acute Medicine	Laboratory Medicine
Cardiology	Nephrology
Care of the Elderly	Neurology
Critical Care	Pathology
Diagnostic and Interventional Radiology	Rehabilitation Medicine
Endocrinology	Respiratory/Bronchoscopy
Gastroenterology/GI endoscopy	Transport Medicine
Haematology and Blood banking	Medicines Management and Pharmacy

The Surgery Programme recognises and fully endorses the strategy laid out by the partnership between the Irish Postgraduate Training Bodies and the Directorate of Clinical Strategy and Programmes. Health service and hospital care is complex. It is, therefore, important to recognise the interdependence of the National Clinical Programmes, both at a national and local, and the contribution of each which, when combined, will provide not just mutual support but also add greater value, in terms of quality to the health service as a whole.

5.3.3.1 Acute Medicine Programme

The Acute Medical Programme has introduced a number of initiatives with which the Surgery Programme is entirely compliant whilst recognising that there are issues for which surgery needs to develop its own strategy or modifications.[29] The main issues include:

The Models of Hospitals

Four models of hospitals have been described. While recognising that this has set a useful benchmark there will be surgical modifications, for example, with regard to the delivery of surgical services in Model 2 hospitals.[28]

Acute Medical Units

Acute Medical Units (AMU) are being established in all major hospitals (>500 beds or Model 4 hospitals) and similarly functioning but smaller Acute Medical Assessment Units (AMAU) will be established in smaller acute hospitals (<500 beds or Model 3 hospitals). These units will facilitate the immediate medical assessment, diagnosis and treatment of medical patients who suffer from a wide range of medical conditions.

Acute surgical admission units (ASAUs) are being established and promoted on similar principles. Clearly, the close proximity of AMUs and ASAUs and the sharing of AMAUs and ASAUs would offer significant advantages, and these should be developed initially on pilot sites. Combined AMAUs and ASAUs will require clearly defined shared protocols including, for example, clear response times and maximal length of stay.

National Early Warning Score

The national early warning score (NEWS) was developed to identify the severity of illness of deteriorating patients, predict their outcome and direct an appropriate response. This has now been established tool together with its accompanying COMPASS training programme and both have been endorsed by RCSI and the surgical programmes. [17]

Training

A new programme of training has begun, led by the RCPI to train Acute Medicine Physicians with a specific module for Critical Care and Emergency Medicine. Likewise, Emergency Surgery may require a review of current specialty profiles, particularly within the basket of General Surgery, in order to meet future requirements of acute care.

Navigation Hub

The programme proposed navigation hubs (an ICT facilitated central resource) which will give visibility of bed availability across geographic areas, in hospitals and community services. This will allow for an improved patient flow allowing patients to access available beds in the appropriate care area. The implications and advantages of such a system for surgery are apparent.

Seven day ward rounds and 'Home before 11'

Many of these practices aimed at more efficient and expeditious patient care are already part of surgical team working pattern. Nevertheless, the Surgery Programme endorses any means by which its allied and medical specialties can contribute to providing more flexible and accessible hospital capacity.

5.3.3.2 Emergency Medicine Programme

The aim of the Emergency Medicine Programme (EMP) is to improve the safety and quality of care and reduce waiting times for patients in EDs by developing models of care to improve patient access, ensure continuous quality improvement and maximise value across the emergency care system.[52] This is to be delivered through a National Emergency Care System (NECS) and networks of EDs. Emergency Care Networks (ECNs) will include:

- 24/7 EDs

- Local Injury Units (LIUs), where patients with non life-threatening or limb-threatening injuries can receive care
- The potential role of Local Emergency Units (LEUs) providing daytime-only emergency services may be considered on a limited number of sites.

There will be standard evidence-based processes in all EDs with an emphasis on effective patient streaming supported by national clinical guidelines and KPIs.

The availability and timeliness of a surgical response for patients who present in ED with surgical emergencies is a critical component of acute surgical care and Emergency Medicine has important interfaces with all surgical specialties. Rapid access to senior decision-makers in surgical specialties for Emergency Medicine admissions will be greatly supported by the creation of dedicated acute surgical teams, clear care pathways and ASAU's (The Report of the National Emergency Medicine Programme refers to Surgical Assessment Units, or SAUs). These should be developed to provide rapid access for GP and ED referred patients with surgical problems. All patients within an ECN should have equitable emergency access to all surgical sub-specialties, whether locally or through networked services.

The EMP access standards for acute care require that patients who are referred for surgical care should be assessed by a senior decision-maker within one hour of referral with two hours being allowed for the completion of assessments. These targets will be greatly aided by the presence of on-call surgical teams, as well as rapid triage to ASAUs. Each surgical sub-specialty within a hospital or Group should provide clear lines of communication for ED clinicians who require an opinion as to the appropriateness of off-site transfer or follow-up of an ED patient. This, of course, assumes that surgery has access to adequate out-patient facilities and diagnostic services.

Clinical guideline and care pathways have been developed for a number of common conditions such as ureteric colic and head injury. Such guidelines should be both extended and more widely adopted, so as to avoid admissions where possible, or expedite earlier diagnosis, avoid unnecessary investigations and expedite treatment.

Detailed service requirements by ED of surgical sub-specialties are outlined in the Report of the National Emergency Medicine Programme.

5.3.3.3 Transport Medicine Programme

The National Transport Medicine Programme's core mission is about getting the right patient, to the right care, in the right condition, and at the right time across a service model that includes adults, paediatric patients and neonates.[68] Its aim is to provide:

- More enhanced access to high level health care services for a wider proportion of the population
- Safer retrieval/transfer of severely injured/critically ill patients for Critical Care and other specialist care in tertiary level hospitals.
- Better clinical outcomes for severely injured / critically ill patients, due to earlier appropriate decision to transfer, stabilisation prior to transport and specialised care en route

From a surgical perspective, interhospital transfers of patients become necessary when the clinical requirements or resources for patient management are not available in the referring hospital. It is imperative that the patients are transferred safely and efficiently and that agreed processes for patient transfer are standardised.

Principles of Interhospital Transfer

- Interhospital patient transfers are of equal priority to those presenting directly to that facility.
- Patients whose condition cannot be managed safely or effectively in their current location must be transferred to a facility that can adequately manage them.
- The decision to transfer must be based on the current clinical condition, prevailing local conditions and in consultation with the relevant senior clinicians in the receiving facility. If necessary, wherever possible, this should be consultant to consultant. The final authority for this decision rests with the referring clinician, who may be assisted by discussion with other clinicians.
- 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, anaesthetists and critical care doctors in the referring and receiving hospitals.
- 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.
- Where circumstances 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 without delay and impediments to transfer audited.

Transport Logistics

A decision to transfer a sick surgical patient and the logistics of their transport must be made in consultation with senior anaesthetic and critical care colleagues. Before identifying the most appropriate means of transport for 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:

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

Clinical Information Transfer Checklist

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

Repatriation of patients

Once higher level care is no longer required by the transferred patient and they 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 patient transfer, a conversation between staff 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.

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.

5.3.3.4 Critical Care Programme

Critical care embraces a crucial component of the management of acutely ill surgical patients. A person may become critically ill at many different locations. The underlying cause may be due a medical condition, for example, a complicated acute myocardial infarction or due to a surgical condition, such as a perforated viscus or multiple trauma. Thus, a critically ill patient's journey begins and continues until their needs are fully met, the

so-called “chain of survival“, a chain that is dependant for its success on a series of vital and interconnected links.

The journey of the critically ill patient whose illness arises out of hospital should then include effective pre-hospital emergency care (PHEC) by advanced paramedics, following appropriate ambulance dispatch, which is then followed by safe transfer to an appropriate high-volume critical care centre, perhaps using a bypass procedure dictated as to when a cardio-respiratory arrest patient has received bystander CPR and deployment of AED, or a patient who has had multi-trauma or an acute MI requiring intervention.

A presenting undifferentiated medical or surgical patient may, on clinical evaluation, be acutely ill requiring admission to an acute Model 3 or Model 4 Hospital. Alternatively, a patient may have a differentiated, low-risk condition and may be admitted to a Model 2 Hospital. A differentiated patient may also deteriorate and become critically ill. This deterioration may be detected using the National Early Warning Score system (NEWS). Following detection and resuscitation, the deteriorated patient may then be transferred to a Model 3 Hospital. There are many different scenarios.

Once in hospital the Critical Care Programme[69] describes the following levels of critical care:

Table 5.4: Levels of Critical Care

Acute care	Level 0	Hospital ward clinical management
	Level 1	High level of management e.g. PACU
Critical care	Level 2	Active management by critical care team to treat and support critically ill patients with primarily single organ failure
	Level 3	Active management by critical care team to treat and support critically ill patients with two or more organ failures
	Level 3s	Level 3 with regional/national service

It describes a Critical Care Service as one that is appropriate for the care of patients requiring Level 2, 3, and 3s critical care generally delivered within a High Dependency (HDU) or Intensive Care Unit (ICU). The term Critical Care Unit refers to HDU and ICU.

The National Critical Care Report analyses the current situation with regard to the provision of Critical Care in Ireland and sets out a hub and spoke model of service delivery, making recommendations on staffing, capacity planning and the requirement for audit. Recommendations are also made for the management of hospital acquired infections, cardiothoracic critical care, including extra-corporeal life support (ECLS), multi-trauma and solid organ and bone marrow transplantation.

5.3.3.5 National Cancer Control Programme

The National Cancer Control Programme (NCCP) was the first clinical programme, drawn up in 2006, and has achieved a great deal in the centralisation and delivery of cancer care nationally.[70] We have no doubt that this is, and will continue to be, reflected in significantly better outcomes for patients. Nevertheless, a great deal has changed since that time, not least the challenge of delivering health care, in its widest sense, in a much tighter fiscal environment. Just as with the cancer programme, the elective and acute surgery programmes have uncovered and started to address significant inadequacies in the process, management and outcomes of surgical patients. At the same time we all have to compete for a dwindling resource in an infrastructure that we cannot afford to significantly alter or add to.

As previously stated, the Surgery Programme very much welcomes the concept of hospitals working as Groups. This offers the great potential of rationalising individual services onto single sites within Group, while Groups themselves can act effectively as a single unit.

The NCCP goal has been to concentrate complex, multidisciplinary cancer care into eight national cancer centres. This policy has been endorsed by government. This offers the advantage of merging all who participate in cancer care into single sites. From a cancer surgery perspective, by far the greatest emphasis and workload is on planned, scheduled surgery, but cancers also present acutely.

Surgery is affected in two ways by the NCCP policy. Firstly, it has taken complex cancer surgery out of small, and some larger hospitals, in which cancer formerly contributed to a substantive part of their planned workload. In the meantime, these same hospitals have continued to provide acute surgical care, including care to acute cancer patients.

The new hospital groups will, by way of rationalisation, also lead in time to the centralisation of acute surgical care within the groups and if these centres are also cancer centres, this will be better for patients.

This, however, leads to the second issue, which raises the question as to whether there will be the capacity for single centres within groups, to accommodate, at the same, all acute surgery and all cancer surgery, particularly in the short and medium term while resources are limited. In the event of such capacity constraint, a rational approach may be to redistribute resources (as in, ‘money follows the patient’), which could either be maintained or developed at an appropriate level of acuity. At the same time, it would be the view of the NCCP and the Surgery Programme that complex benign and malignant disease in a single surgical specialty should not be delivered on separate sites.

5.3.4 Information and Communication Technology support (ICT)

A major barrier to providing quality care to patients is the way health information is collected and stored in paper-based records, often in locations remote from where care is provided. Paper-based record systems are more susceptible to errors and permit fewer checks than electronic systems. There is now good evidence that the routine use of ICT will contribute greatly to the use of real-time data to support clinical decisions, thereby supporting healthcare workers and patients to more easily accessible and reliable health information and reduce medical errors. Good examples include, computerised patient records and physician order entry systems for medication prescribing.

Almost every aspect of acute surgical care could be improved with better communication and data entry and retrieval systems. It is therefore difficult to prioritise where in our present system the need is greatest. We know that patient care could be greatly enhanced by patient and data information sharing which, in turn, would greatly benefit from the long overdue introduction of a unique identifier for patients in Ireland. The rollout of other communications systems for radiology and pathology is welcome; a national patient management system needs standardising while configured IT systems for ASAUs and theatre use would offer substantial advantages. The activities of NOCA will be IT driven, as will the improvement in operational processes that require accurate data entry and the timely feedback of information to surgeons and their teams. At the same time, it is very important that the clinical professions and their teams play a greater role in data entry, coding and ownership. Priority setting for the surgical requirements of ICT should be undertaken as a specific task.

5.3.5 Trauma

A significant component of acute and emergency surgery includes the management of trauma. The word 'trauma' means wounding due to physical injury that can occur in many ways, such as road traffic accidents, falls, sporting injuries, occupational hazards, knife and gun injuries, etc. Trauma is a disease entity in its own right and a leading global public health problem affecting 135 million people a year and is responsible for about 5.8 million deaths annually (approximately 10% of all deaths). The global burden of disease due to trauma is expected to increase dramatically in coming years, becoming the third leading cause of death by 2020. [71]

'Major trauma' is defined as those patients with an injury severity score (ISS) of >15. The exact number of major trauma patients in Ireland is unknown, due to a lack of robust, population-based data but major trauma admissions to hospital are estimated at 27–33/100,000/year (about 40% of trauma deaths occur at the scene of the incident.) About 15% of all injured patients have sustained major trauma. Major trauma represents less than 1 in every 1,000 ED admissions.

The major trauma patient pathway is described as a 'trauma chain of survival'. Lives of trauma patients are saved by immediate pre-hospital interventions and then transfer to specialist surgical facilities in which bleeding can be controlled, traumatic brain injury managed and specialist critical care instituted. The trauma chain of survival, therefore, depends on an optimised pathway that includes pre-hospital care, EDs, specialist operating teams and Critical Care facilities. The chain then continues into a phase of reconstruction, in which injuries are repaired and rebuilt, followed by rehabilitation and reintegration into society.

Trauma services and their regionalisation in Ireland have yet to be described. Trauma systems aim to reduce mortality and disability from injury by expediently matching available resources with patient need. Much of the evidence for regionalised trauma care is related to reducing the number of deaths. This is because mortality is almost invariably recorded and, therefore, relatively easy to measure. Whilst saving lives is important, it should not be the only strategy. Patients may survive their injuries but be left with long-term disabilities, and so improving functional outcomes and quality of life should be regarded as an equally important aim.

Trauma deaths can occur immediately at the scene of the injury, either due to severe neurological injury or torrential haemorrhage; within four hours of injury from slower haemorrhage, or after days or weeks typically due to infectious complications. This is the, so-called, tri-modal, distribution, where while death may be unavoidable in the first phase, it should be avoidable in the latter two phases. It is likely that the potential for saving lives and improving long-term outcomes from trauma in Ireland would be significantly improved by regionalising trauma services, similar to a system that has been proposed for Scotland.

Trauma centres should be divided into Major Trauma Centres (MTCs) or Trauma Units (TUs). A MTC should have all the surgical specialties and support services to provide care for major trauma patients regardless of their pattern of injury. It should also support other TUs, pre-hospital care and rehabilitation providers in the region. The centre should have a regional leadership role with responsibility for optimising the pathways and care of major trauma patients, wherever they are injured in the region.

A TU is responsible for the management of trauma patients who are not classified as having major trauma. TUs may also receive major trauma patients either due to under-triage errors or because patients require immediate life-saving interventions prior to continued care at an MTC. TUs should, therefore, have close links with the MTC, through a network and immediate transfer agreements with the centre when a major trauma patient is received at a TU.

At present, there is no nationally co-ordinated policy for the care of the severely injured. It is estimated that one third of all deaths occurring after major injury are preventable. Ideally, patients who are severely injured should have timely access to a hospital possessing all necessary surgical and other disciplines together with necessary investigative and theatre resources. In Ireland, trauma centres need not be Level 1, but mechanisms must exist to permit timely access to multidisciplinary trauma care. A hub and spoke model of trauma care, where trauma is channelled to a designated trauma centre using agreed protocols has been recommended by the Irish Institute of Trauma Orthopaedic Surgery(IITOS). [72] They have recommended that for a hospital to be a designated trauma centre it should possess 24/7 access to Orthopaedic surgery, emergency operating facilities, CT scanning with an on call radiologist, a trauma anaesthetic service, designated trauma nursing staff, as well as access to General and Plastic surgery. Access to an ICU/HDU would be mandatory and the selection of a particular hospital as a "receiving trauma unit" should be based on the achievement of acceptable standards and satisfactory outcomes of trauma care in that unit. More work in this area is urgently required, and this would be greatly benefited by participation in the trauma audit promoted by Trauma Audit Research Network (TARN). [73]

5.3.6 Paediatric Surgery

In 2006, the HSE commissioned and endorsed a McKinsey report.[74] This report suggested that there should be a single Tertiary Paediatric Centre of Excellence in Ireland, and that this should be in Dublin, ideally co-located with a leading adult academic hospital, at the nexus of an integrated paediatric service, and should also provide care for the secondary needs of greater Dublin. Following this, the HSE has set about planning for the new National Paediatric Hospital (NPH) to be located in the St James's Hospital campus.

Management consultants were also engaged to define a high level framework brief for the new hospital. The subsequent report set out the important next steps and actions for the project, to determine the detailed configuration of services nationally, indicating that the new model should include:

- Designated regional hospitals providing secondary in-patient, day and out-patient care operating within specialty-specific clinical networks.
- Regional and designated local hospitals and healthcare facilities hosting outreach clinics from the NPH tertiary centre.
- Periodic rotation of staff between the NPH tertiary centre and regional and local hospitals, to develop and maintain and exchange skills for integrated care pathways and protocols branded from NPH.
- Consideration of an integrated 24/7 neonatal paediatric transfer and retrieval service in advance of the NPH tertiary centre.

In taking the project forward, it was recommended that:

1. A comprehensive mapping of current outreach arrangements should be undertaken.
2. The future roles of local and regional hospitals in the provision of paediatric services should be determined against agreed criteria in terms of critical mass, staffing requirements and infrastructure.
3. There should be agreed and explicit assumptions about the anticipated changes in community and primary care infrastructure, and what this means for the NPH and its network of paediatric units.

The HSE, Health Information Unit, began to profile paediatric services currently being delivered across the acute system, and to analyse the paediatric population distribution and projections, to inform decisions on the designation of centres to develop appropriate paediatric services, including paediatric surgery. More recently, a National Paediatric Clinical Programme has been established and undertaken its own report.

Whilst acknowledging the national concerted approach to the delivery of children's services in Ireland, the RCSI has long recognised that there is a looming crisis in the delivery of general Paediatric surgical care in regional and local hospitals in Ireland. The underlying problem has been the failure to train and recruit competent General surgeons, with appropriate paediatric surgical skills and experience to replace their predecessors. It is well recognised that occasional Paediatric surgery or anaesthetic practice should be avoided and, indeed, that children should not be treated in local hospitals unless adequately trained and experienced surgeons and anaesthetists are available, paediatric medical care is on-site and that the whole is delivered in a child-centred environment with appropriate nursing skills.

A Consensus Statement from the RCSI proposed the following principles or assumptions:

1. That the organisation of paediatric surgical services outside of Dublin should dove-tail or be commensurate with the national decisions that have already been taken as outlined above.
2. That no paediatric surgical specialty or service should be looked at in isolation, but that each should be cognisant of other surgical disciplines in terms of shared facilities and economies of scale. This applies especially to those surgical specialties that are most frequently practised on children, namely, ENT, Orthopaedics, General, Urology, Ophthalmic, Plastic and Reconstructive and Dental Surgery.
3. That children should not be treated other than in specific hospitals or units, with adequately trained and experienced surgeons and anaesthetists, where there is available paediatric medical and nursing care, and where the whole service is delivered in a child-centred environment.

4. That surgeons and anaesthetists in peripheral secondary paediatric surgical units should be competent in the management of common conditions, both elective and emergency.
5. That secondary surgical services and acute surgical care are provided in a distributive manner, that best serves the overall population of the country, offering patients realistic distances for access.
6. That the current provision of general paediatric training for general surgeons is unsatisfactory, inadequate and unattractive to trainees and needs to be actively addressed.
7. That regular networking, outreach and communications systems, together with managed care pathways, must be developed between the NPH and the specified regional secondary paediatric surgical units.
8. That an integrated 24/7 neonatal and emergency paediatric transfer and retrieval service be set up in advance of the NPH tertiary centre.

For General surgery, there needs to be a fundamental re-think on how General Paediatric surgery can be delivered by General surgeons in the future. This might require:

1) Looking again at the possibility of General surgical trainees spending a mandatory period of time training in Paediatric surgery during their specialist training. As many General surgical trainees will never practice Paediatric surgery in their ultimate careers, this might appear to be a wasteful exercise. Nevertheless, there are a range of skills that can be gained in Paediatric surgery, including tissue handling that could be beneficially translated into adult practice.

2) Those taking up appointments with a Paediatric practice undertaking a proleptic training appointment. This strategy will likely need to be adopted in the short or medium term.

While it is accepted that neonatal emergencies have to be transferred to the NPH tertiary centre, there are acute surgical procedures that can be performed on paediatric patients in peripheral centres, provided that appropriate conditions and competencies are met.

Currently, the National Paediatric Programme has a working committee in place and has developed a draft document, “Improving Services for General Paediatric Surgery – Policy and Standards of Care for General Paediatric Surgery in the Republic of Ireland”.[75] It provides a very clear template aimed at general surgical treatment of children, excluding neonates outside the NPH tertiary centre. It describes a Regional Surgical Facility (RSF) and a Local Surgical Facility (LSF). The main difference between the two, being that the RSF does more volume and, somewhat, more complex work, is able to operate safely on children under the age of 12 and is on call 24/7 with availability for anaesthetic, surgical, and nursing services. Meanwhile, an LSF would not provide 24/7 cover and would mostly provide common, straightforward elective procedures. All neonatal and complex paediatric surgery should be performed in the tertiary paediatric surgery unit. The document not only defines

the standards for these peripheral centres, but also those procedures that can be performed safely.

It recommends that regional hospitals identify surgeons to undertake the basket of general paediatric surgery cases, so that this surgery is prioritised for attention in paediatric hospitals, and designated lead surgeons and anaesthetists should conduct regular multidisciplinary meetings analysing surgical outcomes.

As the document is at a high level, it does not indicate where RSFs and LSFs might be located. It could be speculated that there would be two to three RSFs outside the Tertiary Centre, but it is unclear the number of LSFs that will be required. Whatever the number, paediatric general surgery should be performed at sites where other paediatric surgical disciplines are also active, particularly orthopaedics, otolaryngology and dental. Competent anaesthetic support is crucial. The number of competent paediatric general surgeons required to man RSFs and LSFs is also unclear, but must become clearer with the advent of Hospital Groups. It is recommended that the provision of an effective hub and spoke model of general paediatric surgery will require additional paediatric surgeons as an interim measure, prior to the establishment of RSF centres.

However, all this will impact on the training requirements of general surgeons undertaking these posts. The document proposes that, “Paediatric surgery should become a mandatory component of general surgical training. For those surgeons in training, there must be at least six months spent in training between years 4-6 of the Higher Surgical Training (HST) programme.” This proposal requires urgent consideration.

6.0 Standards for Acute Surgical Care

6.1 Generic Standards for Acute Surgical Care

Leadership and governance

1. The acute surgical service has an identified medical, nursing, allied health professional, managerial and administrative lead, ideally separate to the leads for elective provision. This may be linked to and include elective surgery in smaller units.

2. There is commitment from the executive team and senior staff to the provision of a high quality acute surgical service.

3. There is a defined governance structure to assure the quality of the service and allow for continuous improvement.

4. Activity and outcomes are monitored and discussed at meetings.

5. There is participation in and data entered into the NOCA as appropriate, such as, the Irish Audit of Surgical Mortality (IASM).

Acute flow separate from elective

6. Wherever possible, emergency and elective surgical pathways are separated, and both services are managed effectively to minimise the adverse impact of one upon the other.

Reception and facilities

7. There is immediate availability of trained personnel, and a fully staffed and equipped resuscitation room.

8. There are agreed specialty risk scoring mechanisms in place and these are applied to all patients admitted as an emergency.

9. Patients admitted for unscheduled surgical care are cared for by nursing staff with the required competencies and managed in a surgical ward or critical care environment.

10. All children are admitted and operated on in an environment with facilities and staff that meet the standards for children's surgery.

11. All admitted patients have an estimated discharge date, as part of their management plan, as soon as possible and no later than 48 hours post admission.

Staffing and consultant input

12 There is a surgical team available with the required range of competencies in order to deal simultaneously with all the essential elements of an acute surgical service.

13. In specialties with a high acute workload, the surgical team is free of elective commitments when covering emergencies.

14. All services are consultant-led and adequately staffed.

15. A consultant is available at all times for telephone advice.

16. The designated consultant is able to attend his/her base site within 60 minutes at all times.

17. As an absolute minimum, for patients not considered high risk, all acute surgical admissions are discussed with the responsible consultant within 12 hours of admission.

18. If the patient is admitted but not taken to theatre (i.e. they are admitted for observation and conservative treatment), as a minimum they are seen by a consultant surgeon within a maximum of 24 hours of admission.

19. All patients considered as high risk have their operation carried out under the direct supervision of a consultant surgeon and consultant anaesthetist. Early referral for anaesthetic assessment is made to optimise peri-operative care.

20. Pharmacy and Therapy Professionals are engaged early and on a continuing basis in the management of acute surgical patients, including Physiotherapy, Occupational Therapy, Speech and Language Therapy, Dietetics and others.

Specialties

21. In specialties with a high acute surgical workload, consultants do not cover more than one site. They should be available to attend on-site as needed.

22. In specialties provided over a defined regional network and with less onerous acute surgical workloads, consultants are on-call to provide cover at their base hospital, but also may be required to provide telephone advice to a number of units across a Hospital Group.

Critically ill and deteriorating patients

23. Critically ill patients have priority over elective patients. This includes the delay of elective surgery to accommodate acute surgical patients if necessary.

24. Agreed escalation protocols are in place to deal with the deteriorating patient including the use of the National Early Warning Scoring System (NEWS).

25. Those considered at high risk are discussed with the consultant and reviewed by a consultant surgeon/anaesthesia/critical care within four hours, if the management plan remains undefined and the patient is not responding as expected. (e.g. patients with a predicted mortality of ≥10% using the appropriate specialty risk scoring mechanism, such as P-Possum for surgery evaluation, ASA for anaesthetic evaluation and organ failure assessment – SOFA- for critical care evaluation).

26. In cases with predicted mortality of ≥10%, consultant surgeon and consultant anaesthetists (CCT holder) are present for the operation, except in specific circumstances where adequate experience and the appropriate workforce is otherwise assured.

For those requiring surgery

27. Emergency theatres and recovery rooms are staffed appropriately at all times.

28. The time from decision to operate to actual time of operation is recorded in patient notes and audited locally. Logistical delays are minimised.

29. Adequate emergency theatre time is provided throughout the day to minimise delays and avoid emergency surgery being undertaken out of hours when the hospital may have reduced staffing to care for complex post-operative patients.

30. There are separate, dedicated theatres for Orthopaedic and General surgery and, where necessary, for other specialties as defined by audit of the requirements of each specialty.

31. Unscheduled returns to theatre always involve a consultant surgeon.

32. A consultant surgeon/anaesthetist is always present if there is likelihood that the experience of the surgical/anaesthetic team is insufficient.

Patient communication

33. Arrangements are in place to ensure that guidance on consent for treatment and sharing information with supporters is followed.

34. Patients, relatives and careers are able to access a dedicated member of staff on the ward with whom they can arrange to discuss treatment options, diagnostic findings, expected recovery timescales, complications, etc.

Hospital Groups

35. There is an identified group lead Clinical Director and Director of peri-operative services.

36. There is close communication with all those delivering acute surgical services within the groups and a forum for sharing best practice.

37. Acute surgical services delivered within groups have arrangements in place for image transfer and telemedicine and agreed protocols for ambulance bypass/transfer.

38. Careful planning ensures adequate beds are available across Hospital Groups to reduce delays for patients being transferred.

39. Standards for the transfer of critically ill patients are adhered to and regularly audited.

40. There is regular Hospital Group review of patient outcomes and experience.

41. Processes are in place to identify and monitor Group risks and critical incidents.

Support Services

These are what we suggest as minimal standards which are dealt with more explicitly and fully elsewhere and under the appropriate disciplines.

In hospitals that admit emergency surgical patients:

42. For Diagnostic Radiology: all imaging departments should have access to appropriately staffed, 24/7 plain films, ultrasound, CT and MRI. Where MRI is not available, clear patient pathways are in place to obtain the necessary imaging from a different provider.

43. For Interventional Radiology: hospitals should have access to 24/7 interventional radiology, staffed by fully trained interventional radiologists, interventional nurses and interventional radiographers.

44. For Pathology: there is a consultant-led, 24-hour laboratory service.

45. For Haematology and Blood Transfusion: there is 24-hour test availability including FBC, sickle cell screen, coagulation screen, group and save, and availability of blood components within a programme that conforms to national guidelines (See "Guidelines for the Administration of Blood and Blood Components". National Blood Users Group. January 2004 http://www.giveblood.ie/About_Us/Publications_Guidelines/Other_Documents/Guidelines_for_the_Administration_of_Blood_and_Blood_Components.pdf).

46. For Clinical Biochemistry: there is 24-hour availability of tests including urea and electrolytes, liver function, C-reactive protein, glucose, lactate, amylase, calcium, magnesium, blood gases and human chorionic gonadotrophin.

6.2 Surgical Specialty Standards for Acute Surgical Care

This section contains standards of best practice across the surgical specialties for those hospitals that provide unscheduled surgical care. More detailed information can be found from each surgical specialty association.

6.2.1 Cardiothoracic Surgery

The following provide generic cardiothoracic standards. For more specific guidelines, see The Society of Cardiothoracic Surgeons of Great Britain and Ireland (www.scts.org)

Best practice

Outside the Cardiothoracic centre

1. Immediate advice is available from a consultant cardiothoracic surgeon on a 24 hour basis to units receiving unscheduled and acute surgical patients.

2. Cardiac and respiratory emergencies are managed in combination with anaesthesia, critical care, cardiology and respiratory medicine (who each have their own links with a cardiothoracic centre)

3. All acute cases, especially those requiring operative intervention or where transfer to the cardiothoracic unit is not appropriate must be discussed with the consultant cardiothoracic surgeon on call.

4. There are image link facilities between all referring hospitals with the ability for immediate consultant decision regarding management.

5. There are agreed transfer protocols between cardiothoracic and referral centres for cases of chest and cardiac trauma.

6. Acute cardiothoracic surgical guidelines are developed and adhered to.

Within the Cardiothoracic centre

1. A consultant cardiothoracic surgeon can be available on site within 60 minutes in a cardiothoracic centre.

2. Patients are reviewed by an appropriate consultant within 12 hours of admission, or before if their condition dictates.

3. Adequate theatre facilities with trained nursing support, imaging/interventional imaging and radiology support, cardio-pulmonary bypass, anaesthesia and critical care facilities are available on a 24-hour basis.

4. Cardiothoracic anaesthesia, critical care medicine and interventional radiologists are available at all times and are consultant-led.

5. Daily wards rounds are carried out by senior trainees (BST3 or HST1) with consultant cover.

6. Unscheduled cardiothoracic admissions are audited using routinely collected data.

7. When surgery is required, an appropriate team and cardiothoracic theatre is available.

8. Outcomes for acute cardiothoracic surgical practice are audited, using routinely collected data.

6.2.2 General Surgery

The following provide generic general surgery standards. For more specific guidelines, see Issues in Professional Practice - Emergency General Surgery, Association of Surgeons of Great Britain and Ireland (2012). (www.asgbi.org.uk).

In addition to operating, the acute general surgical service plays a key hospital role in the assessment of acute referrals and the management of critical surgical (and sometimes medical) illness. Patients with complications of surgery and acute surgical admissions who do not require surgery also require complex ongoing unscheduled care.

The acute general surgical operations most frequently performed are incision and drainage of abscess, appendicectomy and cholecystectomy. Abdominal infections (including peritonitis) and bowel obstructions (with or without ischaemia) form the sizeable but mixed group which makes up the majority of major operations, deaths and complications. They utilise considerable healthcare resources and are, for example, the largest general user of level 3 critical care, i.e ICU.

Because of the relative shortage of consultants in Ireland, it is likely that acute general surgery will continue to be performed by the range of general surgical subspecialists. The 'General Surgeon with an interest in Emergency Surgery', although promoted in other countries, is unlikely to be developed in the near future, because of the relatively small size of our hospitals. For the immediate future, acute general surgery will continue to be performed by both Gastrointestinal (GI) and non-GI specialists with vascular services gradually separating off. It will take some time before there are enough pure GI surgeons to provide 24/7 cover in all hospitals. For the same reason, any suggested division of emergencies between upper GI and lower GI teams would not be practical. Adequate acute surgical training and experience for a population of general surgeons, is therefore, crucial.

The following outlines the standards for General Surgery:

Best practice

1. Patients requiring acute general surgical care are under the direct daily supervision of a consultant surgeon (on the Register of Medical Specialists in General Surgery). In addition, each surgical department should have a consultant surgeon in administrative charge, with appropriate management/audit support.

2. Patients are managed by an appropriately staffed surgical and operative team, which will currently comprise a consultant surgeon (CCT holder), a surgical registrar (Specialist Registrar or current BST year 3), a BST trainee year 1-2 and/or a surgical intern. This will also include, nursing and administrative staff. Major acute surgical procedures often require an operating surgeon and two assistants.

3. Clear referral arrangements are in place during times of major surgery when teams are in the operating theatre and managed by administrative staff.

4. The acute general surgical service has an entire team available free of other commitments.

5. Facilities are available to manage all acute patients, in a dedicated area, for an efficient service.

6. The acute general surgical patient has access to adequate theatre and critical care facilities and senior acute medicine, radiology and anaesthesia support.

7. Patients requiring acute surgical intervention are managed with an urgency which is graded according to their degree of illness, and the timescales of intervention are defined and monitored:

- Patients with on-going haemorrhage require immediate surgery.
- Patients with septic shock who require immediate surgery have access to appropriate staff and emergency ICU and theatre care within three hours.
- Patients with severe sepsis and organ dysfunction and who require surgery are operated on within six hours.
- Patients with sepsis without organ dysfunction and who require surgery should have this within a maximum of 18 hours.
- Patients without sepsis and who require surgery are managed so as to minimise operative delay, to improve outcome and shorten the hospital stay.
- Specific surgical conditions may necessitate a greater degree of urgency for given cases.

8. Timely delivery of appropriate care is the key to the delivery of an acute surgical service. Hospitals Groups have agreed integrated care pathways to facilitate the care of the acute surgical patient along a defined timescale:

- By a trained surgeon (with, at minimum, Membership of the Royal College of Surgeons (MRCS) and Advanced Trauma Life Support (ATLS) provider status)
- For senior anaesthetic and surgical review
- For appropriate imaging, including CT
- For access to critical care support
- For defined treatment (surgical/radiological/medical)

9. The deteriorating patient is managed according to the Early Warning Scoring System (NEWS). Low and medium scoring patients are managed within agreed timescales by consultant staff. Resuscitation should not delay surgery and is managed within whatever setting it is needed, with transfer to an ICU/anaesthetic room/theatre setting, as necessary.

10. When high-scoring patients are resuscitated overnight, they must have priority in the emergency theatre in the morning or, if necessary, ahead of elective surgery if one is not available.

11. Vascular services are provided according to guidance from the Vascular Society of Great Britain and Ireland

- Patients with critical vascular conditions require access to a specialist vascular surgical unit. These conditions include, ruptured aortic abdominal aneurysm, acute ischaemic limbs, trauma with major vascular injury and, in conjunction with a stroke service, the management of patients with an evolving stroke.
- Emergency referral must be discussed at consultant level.
- Vascular surgical units receiving emergency transfers have a vascular surgeon on-call on a 24-hour basis
- Hospitals accepting transfers of acute vascular patients have the following resources available on a 24-hour basis: interventional radiology, anaesthetic support, access to intensive care, appropriate imaging, such as CT scanning and emergency theatres, which are appropriately staffed.
- On recovery, repatriation to referring hospitals is undertaken for convalescence and rehabilitation.
- Allied health professionals (AHPs) with specialist skills are available to support the care of the vascular surgery patient
    - There are adequate AHPs available, appropriate to the volume and patient mix for the patients being cared for.
    - Psychological advice and support is available, as necessary.

6.2.3 Neurosurgery

The following provide generic neurosurgical standards. For more specific guidelines, see the Society of British Neurological Surgeons (www.sbns.org.uk).

Best practice

Outside the neurosurgical centre

1. Immediate advice is available from a consultant neurosurgeon on a 24-hour basis to units receiving unscheduled and acute surgical patients.

2. All acute cases, especially those that might require operative intervention or where transfer to the neurosurgical unit is not appropriate, must be discussed with the consultant or senior neurosurgeon on call.

3. There are image link facilities between all referring hospitals with the ability for immediate consultant decision regarding management.

4. There are agreed transfer protocols between neurosurgical and referral centres for cases of trauma, intracranial haemorrhage, spinal cord compression, acute hydrocephalus and other acute conditions.

5. Existing guidelines (such as, Adult Traumatic Brain Injury, Suspected Spinal Trauma, Suspected Subarachnoid Haemorrhage, Suspected Malignant Brain Tumours in Adults, Spinal Tumours and Suspected Spinal Infection) and future guidelines are adhered to.

6. Allied health professionals (AHPs) with specialist skills are available to support neurosurgical patient care.

- There are adequate AHPs available, appropriate to the volume and patient mix for the patients being cared for.
- Psychological advice and support is available, as necessary.

Within the neurosurgical centre

1. A consultant neurosurgeon must be available on site within 60 minutes in a neurosurgical centre.

2. Patients are reviewed by an appropriate consultant within 12 hours of admission, or before if their condition dictates.

2. Adequate theatre facilities with competent nursing support, imaging/interventional imaging and radiology support, anaesthesia and critical care facilities are available on a 24-hour basis.

3. Neuroanaesthesia, critical care medicine and neuroradiologists are available at all times and are consultant-led.

7. Daily wards rounds are carried out by senior trainees (at minimum, BST3 or HST1) with consultant cover.

8. Unscheduled neurosurgery admissions are audited using routinely collected data.

6.2.4 Oral and Maxillofacial Surgery (OMFS)

The following provide generic oral and maxillofacial surgery standards. For more specific guidelines, see the British Association of Oral and Maxillofacial Surgeons (www.baoms.org.uk).

Best practice

1. There must be specific facilities with appropriately trained staff to manage OMFS unscheduled care patients, on a 24-hour basis and available on site within 60 minutes.

2. Defined referral processes are available to divert appropriate semi-urgent referrals into an ambulatory care setting, with sufficient daytime review and theatre facilities.

3. Daily wards rounds are carried out by senior trainees (BST3 or HST1) with consultant cover.

4. Outcomes for acute OMFS surgical practice are audited, using routinely collected data.

6.2.5 Otorhinolaryngology

The following provide generic Otorhinolaryngology standards. For more specific guidelines see the British Academic Conference in Otolaryngology and the British Association of Otorhinolaryngologists, Head and Neck Surgery (www.entuk.org.uk).

Best practice

1. There are specific facilities with appropriately trained staff to manage otorhinolaryngology unscheduled care patients on a 24-hour basis.

2. Paediatric facilities and staffing are appropriate to manage paediatric patients.

3. Defined referral processes are available to divert appropriate semi-urgent referrals into an ambulatory care setting, with sufficient daytime review and theatre facilities.

4. Daily wards rounds are carried out by senior trainees (BST3 or HST1) with consultant cover.

5. Specific protocols are in place to deal with post-tonsillectomy complications, foreign body ingestion and epistaxis management with defined time scales for consultant input.

6. Joint Paediatric and Otorhinolaryngology consultant input is available for the care of otorhinolaryngological-related sepsis in children, with specific shared care protocols detailing provision of IV access, phlebotomy, antibiotic prescribing and review regimens.

7. Agreed protocols are present to ensure consultant otorhinolaryngology, ophthalmology and radiology review for the management of patients with orbital cellulitis.

8. Appropriately trained anaesthetic staff is available for airway management for both paediatric and adult patients.

9. Outcomes for acute otorhinolaryngology surgical practice are audited, using routinely collected data.

6.2.6 Paediatric Surgery

The following provide generic standards for the acute treatment of children. More specific guidelines can be found at the British Association of Paediatric Surgeons (www.baps.org.uk).

Best practice

1. A national network that underpins delivery of a safe paediatric surgical services at both local and national level.

2. Consultants work within the limits of their professional competence and there are nationally agreed guidelines which assist in deciding which cases are managed locally and those that need to be transferred with regard to age, co-morbidities, complexity of surgery and degree of trauma.

3. There are written policies regarding the age range of children anaesthetised within the hospital, for the standard surgery hours and out-of-hours surgery.

4. All hospitals admitting emergencies have the required resources and equipment to resuscitate and stablise children and infants at all times.

5. Mechanisms are in place for senior assessment of children presenting to hospitals that care for children.

6. Defined protocols are in place for the transfer of the seriously ill child to tertiary referral paediatric hospitals.

7. Critically ill children with life threatening conditions are assessed by the appropriate consultants and the decision to operate or transfer is made promptly.

8. Emergency surgery is only undertaken in hospitals with comprehensive paediatric facilities, 24-hour paediatric cover, paediatric nursing support and paediatric trained anaesthetic support.

9. For acute surgical conditions not requiring immediate surgery, children do not normally wait longer than 12 hours from the decision to operate to undergoing surgery.

10. Ongoing surgical care is managed by senior trainees (BST3 or HST1 or above) and consultants on children's wards that have paediatric trained nurses.

11. Written information on common acute surgical conditions is available for children and their parents.

12. Parents/carers are allowed to accompany their child in the anaesthetic and recovery areas, unless there are specific contraindications.

13. There is a written pain management policy in place.

14. Acute surgical paediatric practice is audited, using routinely collected data, which should include, time from decision to time of operation, length of stay and significant morbidity and mortality.

6.2.7 Plastic Surgery

The following outlines the standards for Plastic Surgery. For more specific guidelines see the web sites of the Irish Association of Plastic surgeons (www.plasticsurgery.ie) and the British Association of Plastic, Reconstructive and Aesthetic Surgeons (www.bapras.org.uk).

Best practice

1. Arrangements are in place for senior telephone advice that is available across Groups and nationally and for transfer, if required, within 60 minutes.

- Contact details are available for on-call consultants at all times.
- Priority is given to the urgent transfer of patients requiring specialist care.

2. Burns units comply with the International Burn Care Standards, including data collection.

- All burn patients are cared for in an appropriately designated burn unit.
- All burn patients are entered into a data collection and audit programme.

3. Plastic surgery units have access to appropriately equipped and staffed theatres that are available on a 24-hour basis.

4. Should allow for access to a 24-hour trauma theatre with consultant availability, as per the generic guidelines. It may be feasible in units to share access with other specialities with a high volume of trauma cases, e.g. Trauma Orthopaedics or Maxillofacial surgery. Where dedicated emergency theatres are unavailable, and capacity exists within scheduled plastic surgery lists for acute care, within clinically appropriate timescales, unscheduled plastic surgery admissions can be operated during the extended working day. With life or limb emergencies, scheduled elective cases may need to be cancelled to facilitate them. These should be operated on without delay at any time of the day.

5. Arrangements are in place to manage appropriate, unscheduled referrals with hand and soft tissue injuries to an ambulatory care setting.

6. Defined referral processes are available to divert appropriate semi-urgent referrals into an ambulatory care setting, with sufficient daytime review and theatre facilities.

7. Specialist orthopaedic and plastic surgery capacity exists for management of open fractures of the lower limb. Unscheduled orthopaedic/plastic surgery admissions can be operated during the extended working day, with both plastic and orthopaedic consultants.

8. The peri-operative care of patients is managed by senior trainees (current BST3 or HST1), with consultant support. They are, in turn, supported by competent nursing staff, experienced in plastic surgery and burn injury patients. All unscheduled plastic surgery patients are seen every day by a consultant or, if unavailable, a senior trainee. Day-to-day management is directed by a consultant in plastic surgery, with the availability of immediate review of any patient, as required.

9. Patients are cared for in dedicated plastic surgery wards, burns units or children's wards, as necessary.

10. Allied health professionals (AHPs) with specialist skills are available to support plastic surgery patient care.

- There are adequate AHPs available, appropriate to the volume and patient mix for the patients being cared for.
- Psychological advice and support is available, as necessary.

11. Unscheduled Plastic surgery outcomes are audited, using routinely collected data.

6.2.8 Trauma and Orthopaedic Surgery

The following outlines the standards for Trauma and Orthopaedic Surgery. For more specific and detailed guidelines, see the British Orthopaedic Association (www.boa.ac.uk).

Best Practice

General trauma

1. Units accepting orthopaedic surgical emergencies have daily access to routine trauma lists, which are independent of general emergency surgical theatres.

2. Trauma patients are managed within regional trauma networks. Complex injuries are managed in centres with appropriate expertise.

3. Consultant-led trauma teams are available in all units receiving seriously injured patients.

4. Radiological imaging in patients with multiple injuries is available on a 24-hour basis.

5. There is standardised transfer documentation of patient details, injuries, investigations and imaging results for patients undergoing transfer.

6. Allied health professionals (AHPs) with specialist skills are available to support trauma surgery patient care.

- There are adequate AHPs available, appropriate to the volume and patient mix for the patients being cared for.
- Psychological advice and support is available, as necessary.

Paediatric trauma

1. Care is in accordance with the BOA's 'Children's Orthopaedic and Fracture Care'.

2. There are arrangements within Hospital Groups to treat the complex, injured child appropriately. Most injuries will be treated within non-specialist centres.

3. There is daily access for children to dedicated orthopaedic emergency theatres.

4. Each centre has up-to-date guidelines available that:
   - Recognises available skills and limitations of the centre
   - Outlines transfer arrangements to specialised paediatric centres within a Group and nationally

Hip fractures

1. Care is in accordance with the British Orthopaedic Association Standards for Trauma.

2. Time to surgery is within 36 hours from arrival or diagnosis.

3. Patients are admitted under the joint care of consultants in Care of the Elderly Medicine and an Orthopaedic Surgeon with agreed protocols for pre-operative and after-surgery care.

4. Data are submitted to the Irish National Orthopaedic Register (INOR) database.

Cervical spine

1. Care is in accordance with British Orthopaedic Association Standards for Trauma.

2. Spinal clearance is required for all trauma patients.

Pelvic and acetabular fracture management

1. Care is in accordance with British Orthopaedic Association Standards for Trauma, aiming to achieve specialist care for displaced and unstable fractures.

2. Protocols should be in place for the initial management of pelvic and acetabular fractures.

3. Within non-specialist centres, transfer arrangements to a specialist centre will be arranged within 24 hours of diagnosis.

Severe lower limb fractures

1. Care is in accordance with British Orthopaedic Association Standards for Trauma.

2. The aim is to achieve timely specialist surgery, rather than emergency surgery by less experienced teams.

3. Centres that cannot provide combined plastic surgery, vascular and orthopaedic care for complex tibial fractures have processes in place for the early transfer to an appropriate specialist centre.

6.2.9 Urology

The following outlines the standards for Urology. For more specific guidelines, see the British Association of Urological Surgeons (www.baus.org.uk)

Best practice

1. Consultant urologist is available for immediate advice on a 24-hour basis and can be available on site within 60 minutes.

2. All acute cases requiring operative intervention must be discussed with the urology consultant on-call.

3. Adequate theatre facilities appropriately staffed with competent theatre nursing staff, imaging/interventional imaging and radiology support, anaesthesia and critical care facilities are available on a 24-hour basis.

4. A senior trainee (HST 1 or above), with consultant cover manages conditions such as the obstructed bladder and testicular torsion.

5. Patients with urosepsis/septic shock and evidence of obstructive uropathy require intervention within 3 hours of presentation. Delayed management leads to increased mortality.

6. Ongoing care of patients with urosepsis/septic shock are managed by a senior trainee (BST3 or HST1+) and consultants.

7. Daily wards rounds are carried out by senior trainees (BST3 or HST1) with consultant cover.

8. Unscheduled urology admissions are audited, using routinely collected data.

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8.0 Appendices

Appendix 1 – Methodology for Surgical Activity and Bed Occupancy - Acute & Elective

This appendix is provided as explanatory support for Chapter 4. The Surgical Workload – Acute and Elective.

The data used in the calculations was provided by the Hospital Inpatient Enquiry System (HIPE) and validated by the Economic and Social Research Institute (ESRI) from their 2010 data set. (2011 figures)

A "surgical procedure" was defined as one where surgery, in the accepted sense, was performed in an operating theatre, but did not include other procedures mostly performed in other hospital departments, such as gastrointestinal endoscopy. In the Republic of Ireland procedures are currently coded using the 6th edition of ICD-10-AM/ACHI/ACS and so all codes and description follow international standards.

Analysis and enrichment of the data developed mapping tables which identified 830 surgical procedures and another 660 non-surgical procedures performed 20 or more times annually. The 830 surgical procedures were coded under 15 named surgical sub-specialties as follows: Cardiothoracic, Gynaecology, Maxillofacial and Dental, Neurosurgery, Ophthalmology, Otolaryngology, Paediatric surgery, Plastic surgery, Trauma Orthopaedics and Urology. General surgery was divided into its component parts, as follows: General Surgery included all those cases commonly performed by most general surgeons, namely Appendicectomy, Hernia Repair, Cholecystectomy, Pilonidal Sinus surgery etc.; and then Breast, Colorectal, Upper GI-HPB (Gastrointestinal-Hepato-Pancreatico-Biliary) and Vascular. Liver and renal transplantation were included under Upper GI-HPB and Urology respectively. Obstetric data, including Caesarean sections, Evacuation of Retained Products of Conception (ERPOC) and other obstetrical procedures have not been included.

Where surgical procedures were performed by two or more surgical specialties (such as with thyroid surgery performed by general surgeons and otolaryngologists, spinal surgery by neurosurgeons and trauma-orthopaedic surgeons and urinary continence/pelvic floor procedures by urologists and gynaecologists) they were coded under the specialty that performed that procedure most commonly, at a national level. Varicose vein surgery was coded under Vascular whilst recognising that many such operations are performed by General surgeons.

This mapping process added to our dimensional knowledge of the approximately 4,000 different procedures conducted annually across the public hospital service in Ireland.

The primary detailed analysis of surgery was conducted on acute and elective admissions and the data included the most commonly performed 830 operative surgical procedures

(performed 20 or more times per year nationally) and represented over 93% of surgical discharges. It was split between elective procedures and acute procedures. An acute patient arrives in the hospital through an acute process and their management is largely 'unscheduled' whereas, an elective patient is scheduled to have their procedure in a predictable manner which involves pre-admission consultation, planned admission etc. To allow for variability in patient arrival and delayed discharge we used a utilisation factor of 90% bed occupancy.

A secondary analysis was conducted on inpatients that were admitted under surgical care but did not receive a surgical procedure as their primary procedure. In total 3,974 procedures of all sorts were carried out on surgical patients including non-surgical endoscopy, radiology, radiotherapy, chemotherapy and many more. A patient's discharge record included the primary surgical procedure code, that of the most complex procedure ranked by the HIPE coding process. This created four distinct groups of patients discharged after surgery: elective patients that had a primary surgical procedure; elective patients that did not have a primary surgical procedure; acute patients that had a primary surgical procedure and acute patients that did not have a primary surgical procedure.

The analysis also identified patients as to whether they were managed as day cases or inpatients. Day case patients were admitted to hospital, had their procedure and were discharged on the same day, whereas inpatients were discharged from hospital at least one day later than the date on which they were admitted (i.e. they stayed in hospital one or more nights during their hospital visit).

This paper analysed and compared the four HSE regions. The data for the regions was based on the aggregation of data for the hospitals in each region. The hospitals studied included the large, casemix 1, Model 4 hospitals (9); regional and general, case mix 2, model 3 hospitals (17); non-casemix, Model 2 hospitals (10) and specialist orthopaedic (5) and the Royal Victoria Eye and Ear hospitals. Specialist maternity, tertiary paediatric and rehabilitation hospitals were not considered in this study.

A forecasting algorithm was developed to generate a balanced forecast improvement in average length of stay (AvLOS) for each hospital taking into account the nature of the hospital, its position in its casemix group relative to other hospitals for AvLOS and the relative volumes of procedures done in each of the 15 surgical specialties in that hospital. The algorithm operated in heuristic steps as follows.

The projected improvement in AvLOS was calculated separately for four quadrants of inpatients in each hospital (where the quadrants are occupied by surgical patients divided into (i) elective admissions who have a primary surgical procedure, (ii) acute admissions who have a primary surgical procedure, (iii) elective surgical admissions who do not have a primary surgical procedure and (iv) acute surgical admissions who do not have a primary

surgical procedure). The target AvLOS value for each quadrant had to have a minimum improvement of 3% and a maximum improvement of 12%.

Within each quadrant, hospitals were divided into casemix groups and within the group they were sorted from best performing AvLOS to poorest. The best performing third of hospitals in each casemix group were challenged to reach an AvLOS equal to that of the weighted average of the top 10% of hospitals in that group. The lower performing two thirds of hospitals were challenged to reach an AvLOS equal to the weighted average of the top 50% of hospitals in their respective casemix group. Each hospital was assigned a hospital casemix target AvLOS for each quadrant (i.e. acute have surgery, acute no surgery, elective have surgery and elective no surgery).

For the elective and acute 'have surgery' quadrants a further step was added in setting the target AvLOS. The weighted AvLOS for the top 10% and top 50% of procedures within each surgical specialty and within each case mix group was calculated. The algorithm assigns each hospital 15 different AvLOS values, one for each specialty based on where the hospital fitted for that specialty in its casemix group (i.e. in top one third or bottom two thirds). The algorithm then generated a weighted specialty mix AvLOS for the hospital based on that hospital's relative volumes for each specialty in 2010. Each hospital now had a possible new specialty mix based AvLOS for the acute 'have surgery' and elective 'have surgery' quadrants. If the new specialty mix AvLOS required a smaller stretch than the casemix group AvLOS calculated earlier for the relevant quadrant for that hospital, then the new specialty mix AvLOS should be used for that quadrant for that hospital.

Each of the quadrant target AvLOS for each hospital was checked and adjusted if necessary to give a minimum 3% improvement and a maximum 12% improvement. The bed capacity requirement was calculated for each quadrant and for each hospital based on the combination of the 2010 inpatient volumes for that hospital in each quadrant, the newly assigned target AvLOS for that quadrant in that hospital and the utilisation factor of 90% occupancy in beds.

The forecasts that were generated for 2011 to 2014 were based on the calculation just described, with the addition of a dampening effect to adjust for the ramp up in change processes and governance to create this process in each of the hospitals. The dampening effect is relaxed in subsequent years so that the effect is reduced in each successive year. For example, the applied forecast for elective estimates was 50% of the full year forecast in year 1; 70% of the full year forecast in year 2; 85% in year 3 and 95% in year 4. The applied forecast was 30%, 50%, 70% & 90% for the acute quadrants because acute care pathways and rollout process started after the elective programme. Regardless of the dampening effect, a minimum of 3% improvement, year on year, was enforced in all quadrants.

The regional forecasts for surgical bed requirements are an aggregate of the hospital requirement within each region.

Detailed analysis of the bed day saving achieved in 2011 relative to 2010

Further analysis of the bed day saving achieved in 2011 relative to 2010, can be broken into the part attributable to inpatient AvLOS reduction, the relative shift of patient from inpatient to day case or the reverse and the effect of change in overall case load. (See Table 4.11) The reduction in AvLOS for inpatients who have surgery from 7.26076 in 2010 to 7.08846 generates a saving of 15,850 bed days when multiplied by the number of inpatients who had surgery in 2011. Similarly, the increase in AvLOS for surgically admitted patients who do not have surgery generates an increase of 4,349 bed days used.

In Table 4.10, there was an increase in the day case rate for patients having surgery, which represented an 8.32% shift of inpatient activity to day case, representing an 8,157 procedure shift. This was offset by a relative increase of 2,127 inpatients having surgery giving a net decrease in inpatients having surgery of 6,030. The equivalent bed day saving was 59,227 for inpatients moving to day cases and was reduced by 15,445 bed days for the increased inpatient activity. Similarly, there was an increase in day case rate for patients surgically admitted but not having a surgical procedure of 5.56% which translated into a 3,839 shift of inpatients to day cases. This was offset by a relative increase of 1,704 inpatients surgically admitted but not having a surgical primary procedure which gives a net decrease in inpatients having surgery of 2,135. The equivalent bed day saving was 20,935 for inpatients moving to day cases and was reduced by 9,292 bed days for the increased inpatient activity. (See lines 2 and 3 of Table 4.11).

In table 4.10 there was an overall reduction of 59,632 bed days for inpatient admissions for those who had surgery and an increase in day bed usage of 3,983 to cater for the increase in day cases. This equated to 55,649 bed day savings overall from both inpatients and day cases. There was a decrease in volume of surgically admitted inpatient and an increase in day case patients not having surgery which resulted in a saving of inpatient bed day usage of 7,294 and a net increase of day case bed usage of 2,937 which equated to an overall bed days saving of 4,357.

Tables 4.10 and 4.11 highlight the inter-relationship between inpatient AvLOS, the percentage of day cases and the overall volume changes when evaluating hospital bed utilisation performance. Even though overall case volumes increased by 2.5%, bed day usage decreased by 5.0% giving a bed day usage saving of 60,007 in 2011 compared to 2010. However, if case volumes had not increased then the actual bed day savings would have been 91,661 bed days. (See rows 1 and 2 in Table 4.11)

Definitions

Acute admission – a patient who enters through the emergency department or ambulatory service in an unscheduled fashion.

AvLOS – Average length of stay – the sum of the number of days a group of inpatients spend in hospital divided by the number of patients in that group. A patient stays one day in hospital for every night they spend in hospital. A patient who does not stay overnight is not an inpatient and has not spent a day in hospital. (See Inpatient and Day case).

Day case – a patient who is admitted and discharged on the same date.

Bed days – number of days one or more patients spend in hospital.

DOSA – Day of surgery admission – the patient is admitted on the same day as their primary surgical procedure.

Elective case – a patient who enters hospital in a planned fashion either prior to or on the day of having a procedure done. (Also referred to as a planned or scheduled case)

Inpatient – a person who spends at least one night in hospital and has a discharge date greater than or after the admission date.

Primary procedure – the procedure coded by HIPE coders as the most important or difficult procedure conducted on the patient during that visit to hospital.

Pre-op AvLOS – is the sum of the number of days a group of patients spend in hospital before having their primary procedure divided by the number of patients in that group. A patient admitted on the same day as their primary procedure has a Pre-Op AvLOS of zero and is known as a DOSA.

Quadrant – A division of patient into one of four groups - elective have surgery, acute have surgery, elective but not have surgery and acute surgical admission but do not have surgery.

Surgical admission – a patient who is admitted by a consultant with a primary specialty deemed to be a surgical specialty based on mapping tables developed by the Surgery Programme.

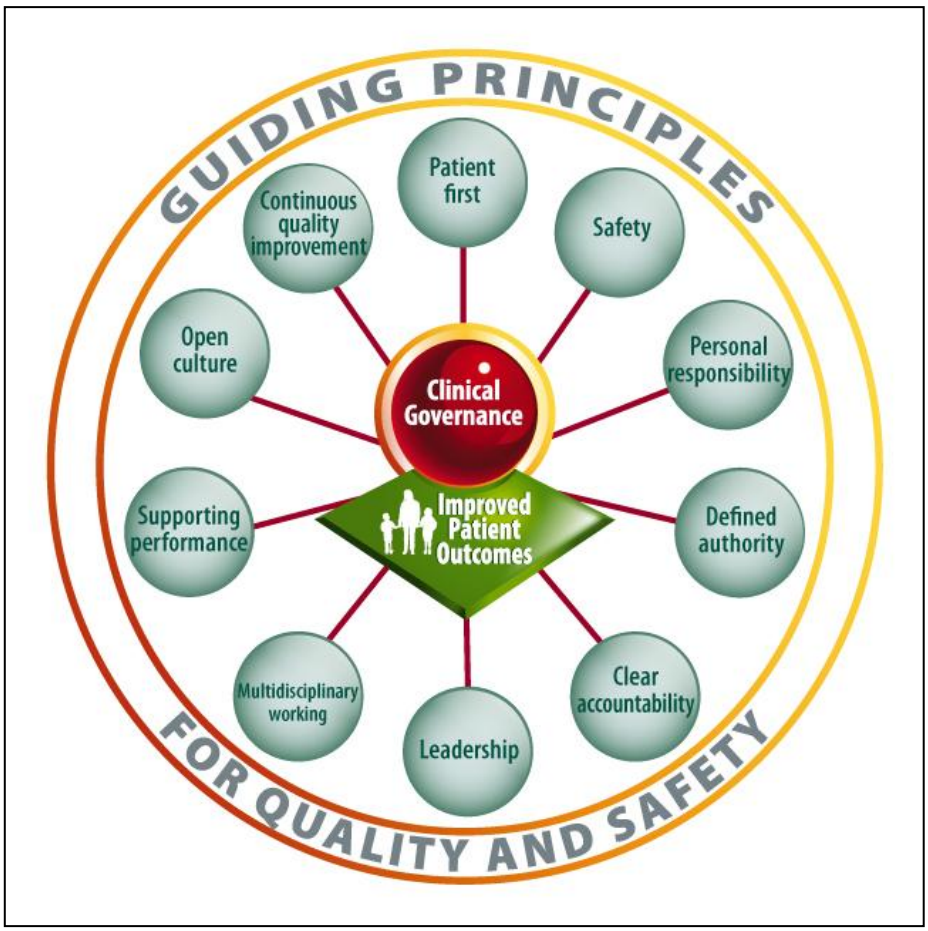
Surgical procedure – a primary procedure deemed to be a surgical procedure based on mapping tables developed by the Surgery Programme.

Unmapped procedure – is an uncommon procedure performed less than 20 times per year nationally across all hospitals which has not been considered for mapping.

Appendix 2 – Guiding Principles for Quality and Safety

Guiding Principles

To assist healthcare providers, a suite of ten principles for good clinical governance, for the Irish health context, were developed with a title and descriptor (See image below). The principles developed by an interdisciplinary working group were reviewed for comprehensiveness, clarity and usefulness by health mangers, clinical directors, senior nurses and midwives, health and social care professionals and patient groups. It is proposed that the principles inform each action and provide the guide for mangers and clinicians in choosing between options.



It is recommended that each decision, at every level, in relation to clinical governance development be tested against the principles set out in Figure 2 and described in Table 1.

Guiding principles descriptor

Principle	Descriptor
Patient first	Based on a partnership of care between patients, families, carers and healthcare providers in achieving safe, easily accessible, timely and high quality service across the continuum of care.
Safety	Identification and control of risks to achieve effective, efficient and positive outcomes for patients and staff.
Personal responsibility	Where individuals as members of healthcare teams, patients and members of the population take personal responsibility for their own and others health needs. Where each employee has a current job description setting out the purpose, responsibilities, accountabilities and standards required in their role.
Defined authority	The scope given to staff at each level of the organisation to carry out their responsibilities. The individual's authority to act, the resources available and the boundaries of the role are confirmed by their direct line manager.
Clear accountability	A system whereby individuals, functions or committees agree accountability to a single individual.
Leadership	Motivating people towards a common goal and driving sustainable change to ensure safe high quality delivery of clinical and social care.
Inter-disciplinary working	Work processes that respect and support the unique contribution of each individual member of a team in the provision of clinical and social care. Interdisciplinary working focuses on the interdependence between individuals and groups in delivering services. This requires proactive collaboration between all members.
Supporting performance	Managing performance in a supportive way, in a continuous process, taking account of clinical professionalism and autonomy in the organisational setting. Supporting a director/manager in managing the service and employees thereby contributing to the capability and the capacity of the individual and organisation. Measurement of the patients experience being central in performance measurement (as set out in the National Charter, 2010).
Open culture	A culture of trust, openness, respect and caring where achievements are recognised. Open discussion of adverse events are embedded in everyday practice and communicated openly to patients. Staff willingly report adverse events and errors, so there can be a focus on learning, research and improvement, and appropriate action taken where there have been

	failings in the delivery of care.
Continuous quality improvement	A learning environment and system that seeks to improve the provision of services with an emphasis on maintaining quality in the future not just controlling processes. Once specific expectations and the means to measure them have been established, implementation aims at preventing future failures and involves the setting of goals, education, and the measurement of results so that the improvement is ongoing.

Appendix 3 – Examples of Conditions that Require Urgent Operative Management

(Priority for surgery will be defined by the severity of the condition – See Table 5.1)

Cardiothoracic

Penetrating trauma - thoracic/cardiac injury/tamponade
Cath Lab emergencies - failed/complicated stenting, pacemaker injury
Oesophageal perforation
Intrathoracic haemorrhage
Aneurysm – rupture/dissecting
Massive PE
Aortic transection

General Surgery (including Colorectal and Upper GI-HPB)

Acute abdomen/peritonitis/perforated viscus, including oesophagus, stomach, duodenum, small bowel, large bowel, appendix and gallbladder
Uncontrolled GI haemorrhage
Large bowel obstruction - in the frail patient with co-morbidities
Intra abdominal bleeding, secondary to trauma or other causes
Complicated tumours
Severe necrotising infections/fasciitis
Severe soft tissue sepsis
Severe/major intra abdominal sepsis
Inflammatory bowel disease with toxic colon
Septicemia with a radiologically undrainable abscess
Some cases of perianal abscess
Gunshot and some cases of knife wounds
Major retroperitoneal trauma
Intestinal ischaemia
Return to theatre for bleeding, especially intra abdominal and abdominal wall dehiscence

Gynaecology

Ectopic pregnancy with vascular instability
Incomplete miscarriage with ongoing haemorrhage
Returns to theatre

Maxillofacial/Dental

Haemorrhage/mid-face bleeding
Risk of inhalation (tooth or fragment)
Trauma associated with any of the above

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

Ophthalmology

Penetrating eye injuries requiring exploration

Repair of eyelid and 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

Otolaryngology

Haemorrhage

Airway obstruction or airway compromise

Neck or deep space abscesses

Caustic and lye ingestion and some cases of smoke inhalation

Some cases of ingestion of foreign bodies

Per orbital abscess associated with severe proptosis/loss if 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 trans-septal, trans-sphenoidal 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 (Peritonsillar abscess - PTA)

Paediatric Surgery

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 and 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

Plastic Surgery

Free flaps requiring return to theatre
Haemorrhage due to facial fractures
Impending nerve compromise due to fracture dislocation
Amputations for reimplantation/revascularization
Return to theatre for transplants with bleeding or vascular occlusion
Major Burns requiring escharotomies/airway management or urgent debridement

Trauma Orthopaedics

Dislocations
Complicated fracture dislocations
Compartment syndrome
Contaminated wounds
Vascular compromise
Skin under tension
Crush/degloving injury
Amputations for reimplantation/revascularization (with Plastic surgery)

Urology

Testicular torsion
Exsanguinating renal injuries
Gunshot wounds or penetrating injuries involving the urinary tract

Complete anuria in a patient with solitary kidney or due to bilateral ureteric obstruction
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

Vascular Surgery

Abdominal aortic aneurysm
Peripheral aneurysm rupture
Haemorrhage (including returns to theatre and other specialty operations requiring vascular assistance)
Peripheral occlusive embolism
Intestinal ischaemia
Traumatic vascular injury
Grafts requiring revascularisation
Organ donation/harvest
Vascular intestinal fistula

9.0 Acknowledgments

Professor Frank Keane and Mr Ken Mealy, Joint Leads of the National Clinical Programme in Surgery, would like to thank those who participated in the preparation of this document and acknowledge those who were asked to review it in draft form, listed below. Feedback from most of you is greatly appreciated.

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Irish Heart Foundation
Therapy Reference Group (National Clinical Programmes)
Patient Consultative Forum
Surgical Nursing Special Interest Group

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