Day Surgery in Ireland: current barriers and determining a consensus driven best practice approach

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Day Surgery in Ireland: Current barriers and determining a consensus driven best practice approach

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To my parents for making this possible, my wife and friends for their continued support and encouragement.

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Abbreviations

A/E	-	Accident and Emergency department
ASA	-	American Society of Anaesthesiologists
BADS	-	British Association of Day Surgery
BMI	-	Body Mass Index
CEO	-	Chief Executive Officer
CNM	-	Clinical Nurse Manager
CXR	-	Chest X-ray
DNA	-	Did Not Attend
DVT	-	Deep Venous Thrombosis
ECG	-	Resting Electrocardiogram
ED	-	Emergency Department
ENT	-	Ear Nose Throat
ESRI	-	Economic and Social Research Institute
FASA	-	Federation for Ambulatory Surgery Association
FASC	-	Society for the Advancement of Free standing Ambulatory Surgery Centres
GP(s)	-	General Practitioner(s)
HAI	-	Hospital Acquired Infection
HIPE	-	Hospital Inpatient Enquiry
HSE	-	Health Service Executive
IAAS	-	International Association for Ambulatory Surgery
LHO	-	Local Health Office
LOS	-	Length of Stay
N/A	-	Not Applicable

NCHD -	Non-consultant Hospital Doctor
NHS -	National Health Service
NICE -	National Institute of Clinical Excellence
NSAID-	Non-Steroidal Non-inflammatory
NTPF -	National Treatment Purchase Fund
OECD -	Organisation for Economic Co-operation and Development
OPD -	Out-patients Department
OT -	Operating Theatre
PHI -	Private Health Insurance
PILs -	Patient Information Leaflets
PONV -	Post Operative Nausea and Vomiting
RCSI -	Royal College of Surgeons in Ireland
REC -	Research Ethics Committee
SSL -	Security Sockets Layer
UK -	United Kingdom
WMA -	World Medical Association
WTE -	Whole Time Equivalent

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Abstract

Recent reports have suggested that day case rates vary significantly across Irish hospitals. **Aim:** To gain an understanding of the structures and processes which currently facilitate or constrain optimisation of day surgery in Ireland and development of recommendations for future practice including how barriers may be overcome. **Method:** A two stage study was undertaken. The first stage aimed to develop an understanding of current day surgery practices. A national survey of private and public hospitals day surgery activity in Ireland was undertaken. This was followed by an in-depth chart review of 200 patient charts from two Irish teaching hospitals to outline current practices in elective surgical services. The second stage built on the first stage and aimed to develop statements of best practice for day surgery. A three round electronic Delphi process (eDelphi) aimed towards gaining consensus among experts in the field was undertaken. **Results:** The national survey demonstrated a wide range of practices in hospitals across the country. The single most important barrier to increased day surgery identified by respondents was custom and practices and a lack of pre-assessment. Through the chart review the lack of pre-assessment and its effects on the day surgery process were confirmed, as well as other reversible barriers. Using the eDelphi process, consensus was achieved on 40 statements of best practice covering the following areas: patient information, pre-admission/pre-assessment, documentation, management of day surgery, discharge protocols and monitoring of services. **Conclusion:** The study is the first of its type in Ireland and has provided clarity on current day surgical practices. There is considerable variation in day surgery practices across Irish hospitals. Statements of best practice based on consensus of experts working in these services were developed and will support a national change in day surgery practices.

Literature review

Chapter 1

Introduction

1.1 Health services in Ireland

Healthcare services in Ireland are provided through a combination of public and private entities.[1] Over the past decade while there has been an expansion in publicly funded services, a growing portion of the Irish population has opted to purchase private health insurance (PHI). This has been facilitated by policy makers placing a high priority on the prominent role for PHI as they regard it to be an integral element to the efforts of improving access to healthcare services.[1] The Irish government has an active role in overseeing the PHI market and its regulation. Current standards reflect the history and practice of PHI in Ireland, maintaining solidarity across the private and public health financing schemes while also promoting competition.[1]

The Irish public health care system is primarily financed through general taxation, while private hospitals are financed entirely though private sources.[1] Eligibility to publicly financed services is divided among two population groups, who are entitled to receive different services. The "*Category I*" population (medical card holders), which includes approximately 30% of the overall population are eligible to receive free coverage of GPs, specialists, public hospital care, dental care, pharmaceuticals, long-term care, rehabilitative care, and home care.[1] Entitlement to a medical card is based on income and age. The rest of the population, "*Category II*" or non-medical-card holders, are entitled to free public hospital coverage in public wards (subject to the payment of statutory charges) and publicly financed specialist care in public outpatient clinics.[1]

Public patients regardless of category are entitled to free hospital care in public hospitals on public wards, with no choice of treating doctor. Those who avail of the private care service whether within a public or private hospital can chose the consultant they wish to attend, but must pay either out-of-pocket or through their PHI for the services. Both medical card holders and category II patients can elect to be treated privately in designated "pay beds" within a public hospital or in private hospitals, thereby enjoying freedom of choice.[1]

There are three different types of hospital in Ireland: voluntary hospitals, which are run on a not for profit basis, and receive most of their funding from the state; public hospitals which are owned and operated by the Health Service Executive (HSE), and the final category comprises entirely privately owned, operated and funded hospitals. Public hospital services are provided in voluntary and public hospitals. Most of these hospitals also provide private health care but they must clearly distinguish between public and private beds. The Irish healthcare system therefore has a mixture of a universal public health service and a fee based private system. Some services are publicly funded and delivered, some are publicly funded but privately delivered, some are privately funded and delivered while some are privately funded but publicly delivered.[2]

The majority of hospital specialists also known as consultants are under public contract but are allowed to engage in privately financed practice within both public and private hospitals (although with the introduction of new consultant contracts, in 2008 newly appointed consultants have none or very limited allowance for private practice compared to consultants appointed prior to the introduction of the new contracts).

Public health expenditure in Ireland accounts for the vast majority of total health expenditures, out-of-pocket expenditures represent about 13.3%, and PHI accounts for 6.8% of the total health expenditure.[1] While the initial function of PHI in Ireland was to fill eligibility gaps in public hospital cover, which was historically offered to the wealthiest segment of the population. This role of PHI has changed significantly over the years.[1] People now purchase PHI in order to enjoy increased choice over the timing and settings of care.

The central demographic projection estimates that the population in Ireland will grow overall from 4.24 million in 2006 to 5.1 million in 2021 assuming positive but decreasing migration, with growth rates highest in the first 5 years of the projection.[3] Life expectancy in Ireland has also been steadily increasing in recent decades and this trend is thought to continue. This has significant implications for healthcare planning and provision as older people are thought to require more healthcare and different services compared to younger people. Inward migration combined with improvements in life expectancy means that Ireland now has a larger population, which will require more resources to provide with healthcare. With limited resources and increasing demand on healthcare services, it has become imperative to restructure the health services and reorganise to maximise their efficiency.

In the Irish national budget for 2008, the estimated spending in the year ending 31 December 2008 for the salaries and expenses of the HSE and certain other services administered by the Executive, including miscellaneous grants was approximately 12.3 billion Euro.[4] This number was an estimate of over-all healthcare spending by the Irish government for the year of 2008.

The priorities for spending in 2008 were to be Health, Education and Social Welfare which accounted for almost 80% of total spending. The pre-budget estimates had shown that nearly 5% higher spending was required to deliver the same services as were provided in the previous year. In order to continue to provide these services without incurring insurmountable debt, the minister pointed out the need for value for money services, which required all departments to monitor closely and examine carefully how efficiently and effectively resources are being utilised in the provision of all public services.[5]

In 2009 the health care spending was estimated at approximately 12.8 billion Euro, which was an increase of 4% from the previous year.[6] However, due to economic turmoil a supplementary budget was introduced in April 2009. Six essential steps to economic recovery were outlined by the Finance Minister, the first and foremost being stabilisation of public finances which was identified as the most urgent matter.[7] This was to be achieved by increasing revenue and reducing expenditure.

In the 2010 budget, health care spending was estimated at approximately 10.5 billion Euro, a reduction of almost 20% from the previous year, and the first reduction in over 10 years. This dramatic reduction with the prospect of further reductions in healthcare spending has raised concerns that the public healthcare system will not be able to provide necessary services. In order to ensure continued provision of high quality healthcare at the required lower cost, there is now an even greater need to maximise efficiency. The estimated health care spending from the year 2000 until 2010 based on the annual budget estimates published by the Department of Finance is shown in Figure 1.

In 2007 the HSE commissioned PA Consulting Group to produce a report with the objective of assessing the acute bed capacity requirements until 2020 to enable the HSE to plan future needs based on evidence, and advise on how to meet the identified needs. The report showed that great variations exist in the provision of day surgical procedures in Irish hospitals.[8] These findings were further confirmed in 2009, when The Economic and Social Research Institute (ESRI) published a national review of day surgery rates in public hospitals using data from the 2006 Hospital Inpatient Enquiry (HIPE) scheme and focusing on basket 24 cases.[3] With the great variation of provision of day surgical services provided in Irish hospitals, if all day surgical procedures are delivered to best practice guidelines, using the most efficient set-up, more patients could be treated and potentially significant savings could be made. In the current situation of reduced resources and an increasing demand for surgical services, expansion of day surgery can provide patients with the quality healthcare required, at the reduced expenses necessary.

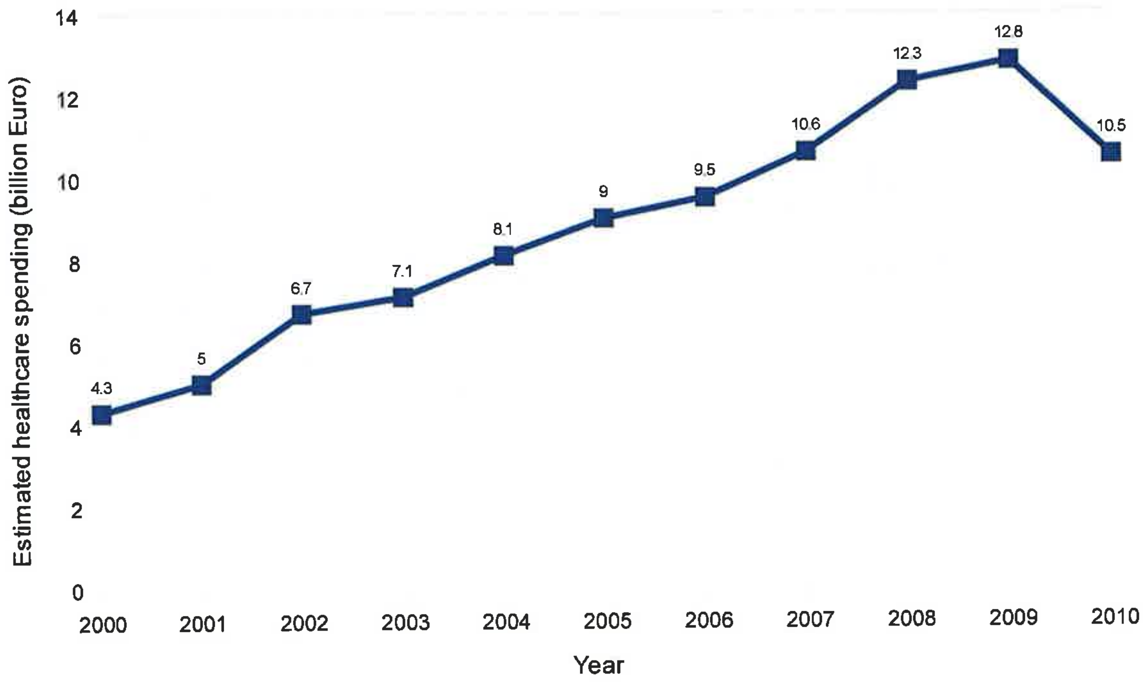


Figure 1. Estimated Healthcare spending in annual budget for the year 2000 to 2010.

1.2 Surgical Services in Ireland

Surgical services are provided by specialist surgeons (consultants) and their respective surgical teams consisting of registrars, senior house officers, and interns, collectively referred to as non-consultant hospital doctors (NCHD). The operative work load for a particular surgical team is a combination of both the number of elective and emergency operations that are performed on a given day. As the name implies, elective operations are pre-planned and the patients are usually assessed by the surgical team prior to the day of surgery. However in cases of emergency operations, patients are admitted from the emergency department and taken for surgery straight away.

Recent healthcare policy has been trending towards increasing rates of elective day surgery and reducing overall in patient length of stay due to limited hospital funding and the costs associated with in patient stay.[8]

HealthStat is a performance information databank from Irish public health services. It uses a range of measures to develop an overall picture of how services are being delivered. These measures can be grouped into three areas: 1. Access, 2. Integration and 3. Resources.[9-10]

Access measures the waiting times that people experience for different services, such as: consultant lead out-patients department (OPD) clinics, diagnostic services, treatments and emergency services. Integration investigates whether the services provided are patient-centred. This involves evaluation of whether patients receive outpatient or day care appropriately, whether the length of stay for in patients are in keeping with national and international standards, and whether access to diagnostic and primary care services are appropriate. Resources assesses whether a hospital or Local Health Office (LHO) is making best use of its human and financial resources. This involves assessment of whether a hospital or LHO serves an acceptable numbers of patients, and whether the budget spending and staff numbers are planned and appropriate.

HealthStat currently provides a detailed account of the monthly results from 30 teaching, regional and general hospitals and 32 LHOs responsible for providing health and social care services in the community.[10] Each month, the information generated through HealthStat is discussed at a HealthStat Forum meeting, led by the HSE CEO and attended by the Regional Director of Integrated Services, the hospital CEOs and Clinical Directors and the LHO managers. The forum helps develop solutions to difficulties and provides suggestions for possible improvements for each hospital or LHO. Furthermore they identify systemic performance issues that need a national approach to reach set goals.[10] The monthly results of HealthStat are published online (http://www.hse.ie/eng/staff/Healthstat/overall/) to encourage hospitals and LHOs to work towards national and local targets. A list of 24 surgical procedures first developed by the Audit Commission, known as Basket 24, are used for assessment of day surgical services by HealthStat, these are shown in Table 1. The Basket 24 was developed as a list of procedures which were recognised to be safe as day surgery in selected patients, and are commonly performed, therefore account for a large volume of surgery.[11] For these reasons they were considered useful for evaluation of provision of day surgical services.

Table 1. Basket 24 cases used for assessment of day surgical services by HealthStat.

Excision of Duputren's Contracture
Carpal Tunnel Decompression
Excision of Ganglion
Arthroscopy (all arthroscopic examination of joints)
Bunion Operation
Removal of Metalware
Orchidopexy
Circumcision
Inguinal Hernia Repair
Excision of Breast Lump
Anal Fissure Dilation or Excision
Haemorrhoidectomy
Laparoscopic Cholecystectomy
Varicose Vein Stripping or Ligation
Transurethral Resection of Bladder
Extraction of Cataracts with or without Implant
Correction of Squint
Myringotomy
Tonsillectomy or Adenoidectomy
Sub Mucous Resection
Reduction of Nasal Fractures
Operation for Bat Ears
Dilation & Curettage / Hysteroscopy
Laparoscopy

1.3 Evolution of Day Surgery

Day surgery or ambulatory surgery refers to the practice of admitting to the hospital carefully selected patients for elective surgery on the day of their planned procedure and discharged on the same day.[12] James Nicoll (1864-1921) was one of the first advocates of day surgery who realised its benefits in a paediatric patient population.[13] The benefits as noted by Nicoll included more effective use of hospital resources and avoiding separation of infants from their mothers. In 1955 Farquharson promoted day surgery further and reported the results of day case hernia repair in adults in the Royal Infirmary of Edinburgh.[14] In 1962 a full hospital based day surgery unit at the

University of California in Los-Angeles, USA, was set up which provided further data in support of day surgery.[15] This data was published in 1966 and showed that day surgery is safe in selected patients and it utilises limited resources better as more cases can be performed at lower cost when compared to in patient procedures. More day surgical units were set up in the following decades with the United States, Canada, the United Kingdom (UK) and Australia taking a leading role. With the growth of day surgery, associations were formed to help promote quality standards, expansion of services, education and research in the field. The first one of the associations to form was the Society for the Advancement of Free standing Ambulatory Surgery Centres (FASC) which was founded in the USA in 1974 and is currently known as the Federation for Ambulatory Surgery Association (FASA).[16] Since then international societies have been set up to help establish internationally accepted terminology, which will further aid comparison of results between centres and countries and allow quicker and safer progress in provision of day surgical services through evidence based medicine. This is however still an ongoing process, and is evident by the different terminologies and definitions used between some of the associations.

While there are no official day surgical associations in the Republic of Ireland, there has always been a close collaboration between healthcare workers in Ireland and the UK. As such the British Association of Day Surgery (BADS) which was founded in 1989 provides a forum for discussion and dissemination of developments within day surgery.

1.4 Benefits of Day Surgery

With advancements in anaesthesia and surgical techniques, more surgical procedures can be performed as day surgery today than ever before. The benefits of performing certain surgical procedures as day cases are now well established in carefully selected patients. These benefits can be broadly divided into three groups; medical, social and economic.

1.4.1 Medical benefits

There is now overwhelming evidence that many surgical procedures can be safely performed as day cases when all recommended guidelines and organizational principles of a day surgery program are followed.[17-23] There is however the added benefit of reduced risk of hospital acquired infections (HAI) with day surgery compared to in-patient surgery.

Three criteria can be used to define HAI[24]: 1) An infection acquired in hospital by a patient who was admitted for a reason other than that infection. 2) An infection occurring in a patient in a hospital or other health care facility in whom the infection was not present or incubating at the time of admission. 3) This includes infections acquired in the hospital but appearing after discharge, and also occupational infections among staff of the facility.

HAI result in patient morbidity, prolonged of hospital stay, increased costs of patient care and in some cases mortality. Longer hospital stay is recognised as an independent risk factor for development of HAI.[25, 26] By reducing the patients length of stay, day surgery reduces the patients risk of developing HAI.

1.4.2 Social benefits

Day surgery is also associated with high levels of patient satisfaction, which can be optimised by good post operative pain management, short waiting time before surgery, courtesy of staff and friendly environment, avoidance of patients feeling that they are being discharged too early or rushed, and follow up by telephone on the following day.[12] Patients want treatment that is safe, efficient and effective, and which provides the least possible disruption to their lives. Day surgery gives this patient-focused care.[27]

1.4.3 Economic benefits

The economic benefits of day surgery over in patient surgery are also well established and are perhaps the main reason for the massive growth in day surgical services in the last two decades. These benefits include:

- More efficient use of hospital beds allowing more operations in shorter time period thereby reducing waiting lists.
- Release of inpatient facilities, allowing for more efficient treatment of emergency and complex cases.
- Planned scheduling of patients reduces cancellation rates and is therefore more efficient use of theatre time.
- Reduced disruption to patients with lower level of absence from work.
- Reduced staffing costs as over night staff requirements are less.

Cost saving in reduced staffing, bed requirements and theatre time do not however translate directly into saving as often times surgical equipment and anaesthetic agents used for day surgery are more expensive than those used for in patients. Despite this, the savings are significant, ranging from 11-46% for laparoscopic cholecystectomy, and can be as high as 70% in hernia repair.[12] Initial concerns that day surgical services will reduce hospital costs at the added extra expense to primary or community care has not been supported by available evidence. In fact it has been shown that patient presentation to primary or community health workers increases the longer stay they had in the hospital.[28] Therefore there is also the benefit of potentially reducing workload on primary care by increasing day surgery capacity.

Concern has also been raised that day surgery transfers extra costs to patients or caregivers. However the lower risk of cancellation and the earlier return to work associated with day surgery can actually reduce the cost for many patients.[12] Extra cost to caregivers is recognised as they are required to stay with the patient for the first 24 hours after their procedure.

1.5 National and International Growth of Day Surgery

In 2001 the department of health and children in Ireland published "Quality and Fairness: A health system for you" in which they outlined the Irish health strategy with four key principles at the heart of it.[29] These principles were equality and fairness, a people centred service quality of care and clear accountability. This was to be achieved by:

- Developing primary care services to deliver an integrated community based service on a round the clock basis.
- Development and reform of acute hospital care through the creation of 3000 extra hospital beds for public patients and a range of other measures to ensure that public patients will wait no longer than 3 months from the date of referral for the scheduling of treatment.
- Expansion of continuing care services for people with disability and older people.
- Implementation of national treatment protocols to ensure that all patients receive a uniformly high quality of care.
- Reform of planning and funding of acute hospital services.
- More direct link between funding and service levels with greater transparency in the planning funding and delivery of services.

Development and promotion of day surgery has become an important part of this strategy as expansion of day surgical services will help in achieving many of these set targets.

1.5.1 International Rates of Day Surgery

In many developed countries there has been an increasing trend towards day surgery in order to maximise the utilisation of limited economic resources and to continue providing high quality care for patients. In developing countries day surgery may be the only feasible treatment for a large number of surgical patients.[30] A world wide study by the International Association for Ambulatory Surgery (IAAS) involving 18 countries, and looking at 37 different surgical procedures reported day surgery rates as a percentage of total procedures.[31] The study showed that the amount of day surgery performed varied greatly between the different countries. It was however noted that compared to previous studies from the end of the millennium all countries surveyed had obtained higher rates of day surgery. In 2003 rates for hernia repair ranged from 6% in Germany to 84.1% in USA. For excision of breast lump they ranged from 16.5% in Finland to 98.1% in USA. Laparoscopic cholecystectomy rates were 0% in France and as high as 49.8% in USA. Rates for haemorrhoidectomy ranged from 2.2% in Poland to 95.8% in USA. Circumcision rates ranged from 41.9% in Portugal to 96% in the Netherlands, and Varicose veins surgery rates ranged from 4.8% in Hong Kong to 89.3% in Denmark.

The proposed rationale for the variations in day surgical rates between countries include, differences in registration activity, organisational and reimbursement systems, culture and tradition, and differences in waiting times in countries.[31]

1.5.2 National Rates of Day Surgery

In a report produced by PA Consulting group in 2007 it was shown that day case rates varied significantly across Irish hospitals, with some hospitals attaining day case rates as low as 15% while others were achieving rates of up to 69%.[8] Over all however Ireland's day case rate was 12% below the Organisation for Economic Co-operation and Development (OECD) average. This was an area which was identified where potential improvements could be made, and in order to help meet the acute bed capacities one of the strategies suggested was increasing day case activity and reducing in patient length of stay over the period of the projections.[8]

In 2009, The ESRI published a national review of day surgery rates in public hospitals using data from the 2006 Hospital Inpatient Enquiry (HIPE) scheme and focusing on the basket 24 cases.[3] In their review, the overall Irish day surgical rates for 2006 was 78.2% with great variation between day surgery achievements between hospitals with similar proportion of available day surgery beds.[3] This further supported the findings of the PA Consulting Group, and it was proposed that the achievement of national objectives in relation to day case rates may need to be more targeted intervention where the rates for individual hospitals are lower than would be expected given the capacity available.[3] Day surgery rates for six commonly performed general surgical procedures from the basket 24, in Ireland as reported by ESRI in 2009 are outlined in table 2.

Table 2. Day surgical rates for six general surgical operations in Ireland[3] and National Health Service (NHS) Scotland[32] for 2006.

Procedure	**Percentage performed as day case**	
	Ireland	**NHS Scotland**
Inguinal hernia repair	32.3	45.8
Varicose veins surgery	49.7	51.5
Laparoscopic cholecystectomy	5.3	6.3
Haemorrhoidectomy	34.9	26.1
Excision of breast lump	56.2	51.9
Circumcision	87	80.7

1.6 Waiting Times For Surgery

Waiting time for elective surgery is seen as one of the most important health system problems in many OECD countries.[33] Part of the reason for this is because general public opinion surveys have shown that waiting times for surgery are extremely unpopular. Important advances in surgical technology and anaesthesia in recent decades have improved greatly the range, safety and effectiveness of the surgical procedures that can be offered by modern heath systems. Many procedures which would have involved high costs and long recovery times are now carried out at a lower unit cost as day cases. As a consequence there have been increases in the demand for surgical procedures by the public, especially for elective (non-urgent) procedures such as cataracts surgery, hip replacement and coronary artery bypass surgery in all OECD countries.[33] The rapid increase in demand for elective surgical procedures is seen as a major underlying cause for the long waiting times in OECD countries. The response of governments and insurers to the rising demand has for a long time been to increasing the funds going into surgery, in varying degrees. However, supply seems to have struggled to keep up with increasing demand in many countries. About half of OECD countries have continued to, or have begun to, experience problems with excessive waiting for elective surgery.[33]

1.6.1 The Need for Waiting Lists

By having waiting times for surgery, patients are temporarily withheld the beneficial effects of surgery and commonly experience a period of decreased perceived health, problems in quality of life, raised anxiety, and limitations in social life.[34] One can assume that the benefits of surgery decrease as waiting time increases. This is assumed as health status is likely to deteriorate without required surgical intervention, and the rate of deterioration is dependent on the underlying surgical problem (with surgical emergency patients deteriorating rapidly, while for many categories of elective surgery the decline would be slow).[33] The cost of supplying surgery for different waiting times is also different. Initially costs fall as waiting times increase because there can be potential savings in surgical capacity if a waiting list is formed and elective patients are called for treatment only when there is a slowing in the flow of emergency patients. However, at some point the administrative costs of maintaining a long waiting list and the need for regular reassessment of patients on the waiting list will outweigh its cost benefits.[33] The cost of supplying surgery at different waiting times is therefore approximately U shaped with initial cost decrease as waiting time increases, followed by an increase when costs of maintaining the waiting list outweigh the cost savings. In any situation where funds are limited, the optimum time for surgery then is when there is maximum health gain for the lowest possible cost. This will determine the optimum waiting list time and therefore policies to change waiting times for elective surgical procedures.

Waiting lists for elective surgery generally tend to be found in countries which combine publicly funded healthcare, with zero or low patient cost sharing and constraints on surgical capacity. This type of healthcare removes the financial barriers to access to surgery while constraints on capacity prevent supply from matching demand. Under such circumstances, non-price rationing, in the form of waiting times for elective surgery takes over from price rationing as a means of equilibrating demand and supply.[33]

1.6.2 Prioritising The Provision Of Surgery

The provision of surgery has to take account of the urgency with which interventions are required. In hospitals where medical and surgical patients from the emergency department compete for available beds, the provision of surgery may also have to take account of fluctuating demands from medical patients. It is necessary therefore to have a classification system of prioritising patients for surgical procedures.

While many different systems have been developed, bellow is example of one such classification system.[33]

1. Emergency surgery - surgery is required immediately (e.g. rupture of abdominal aortic aneurysm);
2. Urgent surgery - surgery is required, prior to discharge home (e.g. colon cancer with obstruction);
3. Elective surgery - surgery is necessary but the patient can be sent home and the timing of the procedure can be scheduled (e.g. stable coronary artery disease).

In the case of emergency or urgent surgery, the time line is relatively short from presentation to hospital until the time of surgery. For elective surgery however, there can be a significant gap from the time patients first present to the hospital until they undergo a surgical procedure as a treatment for their presenting complaint.

In April 2002 the National Treatment Purchase Fund (NTPF) was established in Ireland as a strategy to reduce waiting lists for elective procedures. Public patients who are waiting for an operation or procedure in a public hospital for more than three months can contact the NTPF and register for treatment. Patients who qualify, will receive their treatment in a private hospital. The treatment is purchased by the NTPF and is therefore free of charge to the patient. The NTPF publishes a bi-annual report on waiting times for elective procedures in Ireland. In their report published in April 2010, the median waiting time for surgical procedures was 2.6 months with approximately 4000 patients waiting for surgical treatment more than the target of 3 months.[35]

1.6.3 The Role of the Surgeon in Managing Waiting List

While the patient has a demand for better health, a reduction of symptoms or improvement in prognosis, it is the surgeon who will establish the options for intervention, after making an expert assessment of the patient's condition, the risk of undertaking a particular procedure, the size of any net improvement that might be brought about and the urgency with which any treatment should be given. Therefore it is important to note that the waiting list is not a simple queue of "first come first serve" behaviour.[33] Patients are placed in different prioritisation categories by the surgeon which impacts their waiting time on the waiting list. The inflow of patients into the waiting list is determined by health status of the population and state of medical technology, which determines the range of conditions which are treatable and patient's expectations. Various financial incentives, such as the extent of cost sharing by public patients, the proportion of the population with private health insurance and the price of private surgery, are also likely to be factors influencing demand.[33] The prioritisation and categorisation of patients on the waiting list by the surgeon is therefore a constant and ongoing process as patients health status changes over time and the evolution of medical technology.

When discussing possible options with the patient, the surgeon may be influenced by the effect of the decision on his or her personal income as well as the budgetary restraints of the institution they are working within.[33] The surgeon may also be obliged to consider the necessity for rationing, especially under public programs where resources are limited. These factors may lead the surgeon to raise or lower his or her threshold for offering elective surgery. The demand for elective surgery is therefore always 'surgeon-managed' and may even be 'surgeon-led' or 'surgeon-induced'.[33]

1.6.4 Measuring Waiting Times

There is no agreed upon international period to define the waiting time for elective surgery. While some countries measure the delay from GP referral to the surgeon and the assessment of the specialist (outpatient waiting time), other countries measure the delay between the time a patient is placed on a waiting list and the time the procedure is carried out (inpatient waiting time).[33] A third period measured in some countries is the delay between the time of GP referral and the time the procedure is carried out.[33] It is important to distinguish between inpatient and outpatient waiting times as measures taken to reduce the different waiting periods might not affect or even inversely affect the other.

1.6.5 Policies to Reduce Waiting Times

In a publicly funded health systems two of the key policy levers to achieve optimum surgery rates and optimum waiting times are: changing the rate of surgery (which will depend both on surgical capacity and the productivity with which capacity is used) and changing the rate of patient entry into the waiting lists by influencing the clinical thresholds for admitting patients to lists, a process managed mainly by surgeons.

Government policies may attempt to address the problem of waiting times by affecting the supply of surgery, the demand for surgery or by directly influencing waiting times.[33] Supply side policies may include increasing surgery rates by increasing the capacity in the form of beds and theatre space. Demand side policies may include subsidisation of private health insurance, while policies acting directly on waiting times may include maximum waiting time guarantees. The adoption of the type of policy is dependent on the suspected underlying problem (shortage of capacity or high demand) and the resources available. Table 3 outlines some policies that have been adopted in OECD countries in an attempt to reduce waiting times of patients on waiting lists.

Table 3. a) Supply- and b) demand-side policies for reducing waiting times.[33]

	Description	Advantages	Drawbacks
a) Supply-side policies			
Funding extra activity	By increasing funding, surgical activity is increased and therefore waiting time reduced.	Can introduce a quick reduction in waiting times.	Costly, and if funding is temporary, so are the results and the waiting list will grow once funding is withdrawn.
Introducing activity related payment for public hospitals	Increasing the productivity of hospitals by rewarding those that perform more surgical procedures and potentially reducing the payment to those that perform less.	Gives incentive to providers to increase productivity.	Does not guarantee a reduction in waiting times as increased activity can also increase public demand in the more productive areas, resulting in more cases being performed but waiting lists remaining as before.
Reforming contracts of specialists	1) Providing rewards or penalties to specialists to reach pre-determined targets either for out-put or reduction in waiting times. 2) Limiting the extent to which specialists can have dual practices (public and private)	1) Rewards specialists who reach targets and keep short waiting lists. 2) Removes the incentive for specialists to have long waiting public waiting lists to increase the private work load and income.	Risks specialists moving to the potentially more lucrative private sector, with shortage of specialists in the private sector and increase in waiting times.
Improving management of waiting lists	Optimisation of patient health status prior to admission, facilitation of day surgery, optimisation of operating room scheduling, reducing cancellations, patient education and computerisation of patient data.	Has been shown to reduce waiting times, increase operating room utilisation and reduce unplanned re-admissions.	Has a slow effect on waiting times.
Increasing the use of day surgery	By increasing the use of day surgery, more procedures can be performed over a shorter period of time.	Cost effective.	The less invasive and safer treatments increase demand in patients which can leave waiting times unchanged.
Using capacity in the private sector	Contracting out to privately owned providers some volume of activity.	Perhaps the quickest way of reducing waiting lists.	If specialists are working both in private and public sector, an increase in the activity of the private sector will necessitate a reduction in their work in the public sector.
Using capacity abroad	Some volume of activity is contracted abroad.	Especially helpful in countries where the private sector is small or already at maximum capacity.	Potentially very expensive and dependent on the countries purchasing power.
Increasing choice for patients	Allow patients to select which hospital to undergo their procedures.	Patients are thought to migrate from high waiting list centres to those with lower waiting times.	Gives no incentive to hospitals to be efficient and reduce their waiting times.

	Description	Advantages	Drawbacks
b) Demand-side policies			
Controlling demand on the basis of need	Offering surgery to patients that require it the most based on set guidelines.	By offering surgery to patients with higher need, waiting lists and times can be reduced.	Difficult to decide who requires surgery based on symptoms, and therefore difficult to gain consensus between specialists.
Subsidise private health insurance	Subsidising and therefore lowering the cost of private health insurance will increase its uptake and reduce the demand on public sector.	Can in the short term reduce waiting times for public patients by removing some of the demand.	If waiting times decrease, the need for and take up of private health insurance decreases. This leads to a re-build up of waiting time for patients.

1.7 Day Surgery Guidelines

It is essential that while day surgery is promoted, standards of care are maintained to levels as high or higher than those provided by inpatient surgical services. With ever increasing demand and rapid expansion of day surgical services internationally, guidelines have been developed to help ensure uniformly safe and efficient provision of these services. There are many international bodies that have published guidelines for set-up and operation of day surgical units, and despite minor variations, they all share the core principals of cost effective and safe method of treatment for a range of surgical procedures and development of minimum standards for professional staffing and equipment.

1.7.1 Evolution of Guidelines

With the expansion of day surgery, in their original guidelines on day surgery, the Royal College of Surgeons of England suggested the upper age limit of patients undergoing day surgery should be 65–70 years, and based on biological rather than chronological age.[36] In 1994 the Association of Anaesthetics of Great Britain and Ireland in their guidelines suggested patients should be selected according to physiological status rather than age.[37] The NHS Modernisation Agency published guidelines in 2002, suggesting there should be no upper age limit for day surgery.[38] In guidelines for day surgery today, the recommendations are that patient age should not be a limiting factor for undergoing day surgery, rather it should be based on American Society of Anaesthesiologist classification of pre-operative health status (ASA), Body Mass Index (BMI) and social factors such as having a responsible adult with them for the following 24-48 hours post surgery.[39,-41] This clearly shows the evolution of provision of day surgery internationally, as being limited to young healthy patients initially, then with more data becoming available, it was realised that patient age should not be a limitation to undergoing day surgery.

When patients are referred for day surgery it is essential to ensure that the procedure is suitable, the risk of complications from surgery and anaesthetic are minimised, admission to an in-patient bed following surgery is prevented and patients are adequately supported after discharge home.[42] To address all of these issues, existing guidelines can be broadly divided into three sections; 1) Pre-operative, 2) Intra-operative, and 3) Post-operative. The development and revision of guidelines is an integral part of provision of an efficient and safe day surgery service.

1.7.2 Pre-operative Guidelines

Pre-operatively the guidelines focus on selection of appropriate patients to undergo their surgical procedure as day cases. Some patients may have day surgery in one centre which would be performed as inpatient surgery in another. The decision will reflect the skills of the medical team, the patient's fitness, the technical ease of the procedure, the post operative morbidity and the social circumstances of the patient in relation to the available community resources.[43]

To assess a patients fitness to undergo day case surgery, most guidelines advocate the use of ASA classification. This is a simple and well established method of classifying a patients health status. First developed in 1941, currently it contains six classes as illustrated in Table 4. Most guidelines would advocate patients of ASA class I and II to be suitable for day surgery, and those of class III (or in some cases class IV depending on the operation) being suitable if their disease is well controlled.[39, 40, 42, 44, 45] A further addition which some guidelines advocate as a selection criteria is a patients BMI. This is a measure of obesity and is calculated by measuring the patients mass (in kilograms) and dividing that by the square of their hight (in meters). In general patients with BMI more than 35 are thought to be unsuitable for day surgery. [39, 42, 44, 45]

Table 4. Overview of ASA pre-operative health status classification.

ASA Class	Description
I	A normal healthy patient
II	A patient with mild systemic disease
III	A patient with severe systemic disease
IV	A patient with severe systemic disease that is a constant threat to life
V	A moribund patient that is not expected to survive without the operation
VI	A declared brain dead patient whose organs are being removed for donor purposes

ASA classification status of patients is determined at the time of first consultation. All patients undergoing a surgical procedure are assessed by a surgeon before the decision of surgery is made. It is the recommendation of ASA that there should be a separate anaesthetic consultation for all patients who are planned for day surgical procedures.[41] Patients with high severity of disease or those with low severity of disease but undergoing surgical procedures with high invasiveness should have an anaesthetic consultation prior to the day of surgery. For patients with low severity of disease undergoing procedures with medium or low surgical invasiveness, the initial assessment may be performed on or before the day of surgery.[41]

Appropriate selection of patients to undergo day surgery is essential for optimisation of the services. As previously stated, guidelines advocate the use of ASA classification to assess patient's fitness for day surgery and while pre-operative investigations are an integral part of patient selection, it has been suggested that patient should not undergo routine testing without a specific indication.[46]

While routine investigations can produce a wide range of abnormal results, even in apparently healthy individuals, the clinical importance of the results are uncertain and they lead to change in clinical management in only a small proportion of patients.[46] Similarly the usefulness of preoperative tests to predict adverse postoperative events in asymptomatic patients is also weak. They may however, have greater predictive power in defined high-risk populations.[46]

Pre-operative investigations can be broadly divided into four categories:

- Blood test (e.g. Full blood count, haemostasis tests, renal functions tests, and blood glucose).
- Urine testing (e.g. Urine dipstick, urine microscopy, urinary Human Chorionic Gonadotrophin).
- Radiological (e.g. Chest x-ray).
- Electrocardiogram (resting electrocardiogram, or stress test).

In 2003 the National Institute of Clinical Excellence (NICE) published its guidelines for preoperative tests for elective surgery.[47] The guidelines were based on existing published data and consensus between a panel of experts including: anaesthetists, radiologists, haematologists, biochemists, cardiologists, general surgeons, gynaecologists, orthopaedic surgeons and nurse practitioners. Through that paper NICE provides comprehensive guidelines for clinicians on the use of pre-operative investigations in ASA class I, II and III patients. The guidelines vary based on the physiological stress of the surgical procedures, and the pre-operative health of the patient. Based on the grading system used by the NICE guidelines for physiological stress induced by different procedures, excision of breast lump, circumcision and haemorrhoidectomy would be classified as grade 1 (minor procedures) and varicose veins surgery, inguinal hernia repair and laparoscopic cholecystectomy as grade 2 (intermediate procedures). Appendix 1 outlines the NICE guidelines for grade 1 and 2 surgical procedures for ASA class I patients.

It is also important to take into account a patient's social situation when a decision is made regarding day surgery. Patients should have the support of a responsible, physically able adult who can care for them for approximately 24-48 hours after discharge. An escort must be available to drive or accompany the patient home in a taxi. It is suggested that the patient must have access to a private telephone, and their journey to the hospital not be longer than 90 minutes.[12, 27, 39, 42]

1.7.3 Day of Surgery Guidelines

On the day of their day surgical procedure, patients register their arrival and are admitted to a ward. They might be admitted into a general ward, a day surgery ward or in a dedicated day surgical unit. Suitable wards for unplanned admissions must always be available to maximise the potential for day surgery.[39] Based on existing guidelines a dedicated day surgical unit with its own admissions area, waiting rooms, wards, theatres and recovery is considered the most efficient set-up.[27, 39-40] Patients being admitted to a day surgical ward to undergo their surgical procedure in the main theatre (shared with inpatient surgical procedures) has been found to be less effective. In such cases the day surgical patients should be scheduled to have their surgical procedures first on the list to ensure as much as possible that they can go home on the same day.[27, 39-40] Day surgery performed using inpatient wards and in-patient operating theatres is the least successful set-up and is generally not recommended. In these cases the stay in rate rises from 2.4% (in dedicated day surgical units) to 14% (in an inpatient ward).[27]

The guidelines for theatre facilities and equipment required for day surgical procedures are clear and consistent in that they should be the same as those for inpatient surgical procedures.[40, 43]

The success of day surgery is very much dependent on control of pain, which starts at the time of induction of anaesthesia. Pain is best managed using a multi-modal approach, avoiding long acting opioid agents if possible and using local anaesthesia, non-steroidal anti-inflamatories (NSAIDs), paracetamol and short acting opioid agents where possible.[39]

1.7.4 Post-operative Guidelines

Guidelines for post-operative recovery, the facilities required for the recovery room, and the guidelines for transfer of patients from theatre to the recovery room and then to the ward are the same as patients undergoing in-patient surgery. The patient should be physiologically stable on departure from the operating theatre and the anaesthetist must decide on the need for monitoring during transfer. This will depend on factors such as proximity of the recovery room, level of consciousness and respiratory and cardiovascular status.[48] Once in the recovery room, patients must be observed on a one-to-one basis by an anaesthetist, recovery nurse or other properly trained member of staff until they have regained airway control and cardiovascular stability and are able to communicate. During the recovery period, the following information should be monitored and recorded (ideally in a dedicated section of the anaesthetic chart): level of consciousness, haemoglobin oxygen saturation and oxygen administration, blood pressure, respiratory frequency,

heart rate and rhythm, presence of pain and its intensity, intravenous infusions and drugs administered.[48] The frequency of observations will depend on the stage of recovery, nature of surgery and clinical condition of the patient.

The association of anaesthetists in Great Britain and Ireland[48] suggests that the following criteria must be fulfilled before transfer of patients out of the recovery room to the ward takes place: The patient is fully conscious without excessive stimulation, able to maintain a clear airway and exhibits protective airway reflexes, respiration and oxygenation are satisfactory, the cardiovascular system is stable with no unexplained cardiac irregularity or persistent bleeding, the specific values of pulse and blood pressure should approximate to normal pre-operative values or be at an acceptable level for the planned postoperative care, peripheral perfusion should be adequate, pain and emesis should be controlled and suitable analgesic and anti-emetic regimens prescribed, temperature should be within acceptable limits, and oxygen and intravenous therapy, if appropriate, should be prescribed.[48]

All patients should be seen after their surgical procedure by an anaesthetist and surgeon involved in their care. Assessment of when the patient is ready for discharge however can be performed by nursing staff. Each unit should have clear discharge criteria as part of a written policy for staff to follow. These need to consider social factors as well as a medical assessment of sufficient recovery for discharge.[43, 49] Guidelines of minimal requirements for discharge developed by BADS[49] is shown in Table 5:

Table 5. BADS discharge criteria[49]

vital signs stable for at least one hour
correct orientation as to time, place and person
adequate pain control and has supply of oral analgesia
understands how to use oral analgesia supplied and has been given written information about these
ability to dress and walk where appropriate
minimal nausea, vomiting or dizziness
has at least taken oral fluids
minimal bleeding or wound drainage
has passed urine (if appropriate)
has a responsible adult to take them home
has agreed to have a carer at home for next 24 hours
written and verbal instructions given about postoperative care
knows when to come back for follow up (if appropriate)
emergency contact number supplied

One of the major causes of delayed discharge of day surgery patients is post operative nausea and vomiting (PONV).[50, 51] Risk factors for development of PONV include female sex, non-smoker, previous history of PONV or motion sickness, use of volatile anaesthetics, use of nitrous oxide, use of opioid analgesia, duration of surgery and certain types of surgery (laparoscopic, ear-nose-throat, neurosurgery, breast, strabismus, laparotomy and plastic surgery).[52, 53] Where possible these risk factors should be controlled and minimised. Once all measures are taken to minimise these risks, existing guidelines advocate stratification of patients into low, moderate and high risk groups of developing PONV based on scoring systems. It is suggested that patients falling into a low risk category do not require prophylactic anti-emetics, those at moderate risk should receive prophylactic monotherapy and those at high risk should receive a combination of anti-emetics prophylactically.[52, 53] Using these precautions, the risk of patients developing PONV is minimised and treatment is targeted.

Despite every precaution taken to minimise PONV, it is still a frequent occurrence. In these cases, it is suggested that if PONV occurs within six hours and the patient had received prophylactic anti-emetics, they should not receive a second dose of the same agent, and an alternative agent should be used. An episode occurring after six hours can be treated with any agent except dexamethasone.[52]

Upon discharge from the hospital, any patient who has suffered from severe PONV or is deemed to be at high risk of developing nausea and vomiting post discharge should be provided with take home medication.[53] There must be easy access to inpatient beds for peri-operative complications and if discharge criteria are not met. If day surgery is being undertaken on an isolated site, protocols must be in place for finding an inpatient bed and mechanism of transport for a patient needing an overnight stay.[43]

There are currently no clear guidelines on follow up of patients post day surgical procedures. Although it is suggested that patients receive contact information in case they develop any problems post discharge, no associations has specific guidelines regarding the need to bring patients back for routine follow up. It is however encouraged that follow up by telephone calls be conducted to ensure satisfactory recovery post operatively at home.

1.8 Pre-assessment

The appropriate selection of patients for day surgery is of paramount importance in determining the success of any day surgical service. Inappropriately selected or unprepared patients can lead to late cancellations which are costly to healthcare providers and cause an inconvenience to patients. While there should be local agreement on which procedures may be performed as day surgery, the decision on whether a specific patient is listed for any of these procedures, is managed as a day case, short stay or inpatient should be made at pre-assessment.[54]

Pre-assessment is meant to establish that patients are fully informed and wish to undergo the proposed procedure, that they are fit for the surgery and general anaesthetic and also minimise the risk of late cancellations by ensuring that all essential resources and discharge requirements are identified.[55] While there is some overlap between pre-assessment and pre-anaesthetic assessment, a distinction must be made between the two.

Pre-anaesthetic assessment aims to evaluate the patient's medical condition, optimise the patient for anaesthesia, minimise their risk factors for anaesthesia, plan an anaesthetic technique, inform and educate the patient about anaesthesia, peri-operative care and pain management, and obtain consent for the anaesthesia.[56] The pre-anaesthetic assessment should be carried out by the anaesthetist who is going to carry out the anaesthesia, and should be done in sufficient time prior to the planned surgical procedure to allow adequate preparation of the patient.[56] This can be on the day of surgery for patients of low risk, but should be done before the day of surgery for patients of higher risk for general anaesthetic.

The pre-assessment process should identify patients who require pre-anaesthetic evaluation and refer them for the appropriate assessment prior to arrangement of surgery.

1.8.1 Essentials of Pre-assessment

It is suggested that once the decision is made regarding the need for surgery, patients should attend a pre-assessment clinic as soon as possible.[55] While attending the pre-assessment clinic immediately after the out patients visit as a one stop process is preferred, if this is not convenient, a time should be agreed for the patient to return for their assessment. By performing the pre-assessment as soon as possible, it is ensured that patients that are suitable for day surgery are placed on the correct waiting list, and prompt actions are taken for patients that require further investigations or treatments.

Where general practitioners have the possibility to refer patients directly for surgery, pre-assessment should take place at the primary setting.[55]

Pre-assessment can be performed in a dedicated clinic, over the phone or even on the internet through a structured questionnaire.[55, 57] However having a dedicated clinic where patients can attend provides the opportunity to carry out basic investigations such as blood pressure monitoring, ECG and if required blood tests. It also gives an opportunity for patient education and for them to ask any questions that they might have regarding the planned surgery.

The pre-operative assessment should be performed by a trained and competent pre-operative assessor.[55] They should be able to arrange appropriate investigations, and referrals based on locally agreed guidelines. This can be a specially trained nurse, a member of the surgical team or a member of the anaesthetic team. While most patients can be arranged for day surgery after pre-assessment, some will have to be referred for a pre-anaesthetic assessment to ensure patients are optimised for the planned surgery and the appropriate anaesthetic technique is planned. It is suggested that pre-anaesthetic assessment takes place within two weeks of planned surgery.[57] In the pre-anaesthetic clinic the anaesthetist will make a final decision regarding the need for any further pre-operative investigations and the patients suitability for day surgery.

1.8.2 Record Keeping and Patient Information

Records of the pre-assessment can be kept together with the patient's medical records, but an integrated care pathway form which allows for medical notes, pre-assessment notes, day of admission records, anaesthetic notes and intra-operative notes to be kept together are a recommended format as this minimises duplication of questioning and records and allows for all the information to be kept together.[55]

Pre-assessment allows an excellent opportunity to provide patients with information, to alleviate any fears and prepare them for the day of their operation.[57, 58] Patients should be given information on the procedure to be performed, fasting times (and any other pre-operative preparations that they must do at home), degree of anticipated pain and discomfort post operatively, approximate time needed off work, when it would be safe for them to resume normal activities, what to bring on the day of admission, the need for a carer for 24-48 hours post operatively, and they should be provided with contact details in case of change in medical status or medications, if they cannot attend for their surgery or if they have any further questions at a later time.[55]

1.8.3 After Pre-assessment Communications

By the time pre-assessment is completed patients who are found suitable for day-surgery should have been informed about the procedure and what to expect on the day of their surgery, and appropriate action taken for patients that require further assessment, investigations or optimisation for their surgery.

Patients that are to undergo their planned day surgery within three months of pre-assessment do not require a further assessment.[55, 58] They should however be informed to contact the day-surgical service if they want to change the date of the planned procedure, if there is a change in their medications, or if they develop any illness that might not resolve before the time of the planned procedure. It is good practice to contact patients approximately two weeks prior to the day of surgery to ensure their attendance, no change in their medical status or medications and to repeat their pre-operative instruction.[55, 58]

Patients that have undergone pre-assessment more than three months before their planned surgery should be contacted within six weeks of the planned procedure to ensure no alterations in medical status, medications or social circumstances, confirm the final date for surgery and repeat any pre-operative instructions.[55]

1.9 Developing Best Practice Protocols

The provision of a day surgical services requires the collaboration of many different individuals from different back grounds. These include nursing staff, surgeons, anaesthetist, waiting list managers, ward and theatre clerks, porters and healthcare assistants. It is the collaboration and efficiency of each of these links in the day surgical service which together make up the efficiency and effectiveness of the service provided to patients. In order to address the barriers to optimisation of day surgical services and develop best practice protocols, which are relevant to the problems faced in these services, it is important to allow the exploration and distillation of the opinions of those involved in all the aspects of day surgical services.

1.10 Purpose of study

Having a shared public and private healthcare system provides choice to the consumer, while simultaneously relieving some of cost burdens of healthcare provision from the state. With the expansion of private hospitals and the economic downturn which has resulted in decreased funding for the public sector, efficiency of provision of services in the public sector have come to the forefront of healthcare policy to ensure continued provision of high quality universal healthcare. The provision of increased rates of day surgery within public hospitals has been identified as an area where some of the necessary efficiencies can be achieved.

This study sets out to clarify day surgery issues related to the decision making process which leads some patients to be treated as in patients and others as day surgery cases. The findings of the study will support the development of protocols and care pathways which will have implications for service provision, service utilization, design of health facilities, workforce planning and ultimately contribute to an improved health service.

1.10.1 Research Question

The primary research questions are:

1) What are the factors that either facilitate or constrain the provision of day surgical procedures in the Irish healthcare setting?

2) What are the elements of clinical practice and surgical management that contribute to a best practice protocol for day surgery?

1.10.2 Objectives

1. To gain an understanding of the structures and processes which currently facilitate or constrain optimisation of day surgery.

2. To compare the journey by which some patients undergo surgery as in patients versus day surgery.

3. To analyse the decision making process in relation to patients attending for day-surgery.

4. To develop baseline data which will contribute to the development of best practice protocols for improved utilization of day surgery.

5. To develop recommendations for future practice.

Materials and Methods

Chapter 2

Research Methods

2.1 Introduction

Despite the available evidence indicating the great variation in day-surgical rates between hospitals in Ireland, little work has been done to provide national guidelines. International guidelines do exist and can provide some insight into what has been done elsewhere to improve day surgery rates, however local culture and reimbursement methods mean that those international guidelines can not be directly implemented into hospitals in Ireland and expected to provide the exact same results. In order to improve day surgery rates, it is essential to first identify the barriers to optimisation of day surgical services. Once identified, guidelines can be developed to overcome them. Using the knowledge and expertise of people working in day surgical services in local hospitals to develop the guidelines, ensures that cultural and reimbursement issues that might otherwise hamper implementation of other guidelines are incorporated into and contributes to its success.

This study set out to outline the patient journey from first referral to the hospital to the day of surgery and finally discharge after elective surgery. By mapping out this journey, barriers to optimisation of day surgical services were identified and best practice protocols were developed to overcome them. With this view the study was divided into three sections.

Firstly a national survey of all public and private hospitals was conducted. Through which current practices and barriers perceived by those working in day surgical services in Ireland were identified.

In the second part a retrospective chart review of two Dublin based, Royal College of Surgeons in Ireland (RCSI) accredited teaching hospitals was conducted to obtain quantitative data on current practices and day surgical services. The analysis of this data provided a detailed picture of current elective surgical services, highlighting practices that facilitate or constrain day surgery.

In the third and final part of the study an attempt was made to develop best practice protocols through a consensus process involving experts in healthcare and management in Irish day surgical services. By developing consensus on best practice among experts from a national setting, it is ensured that they were relevant and practical for the Irish healthcare system.

2.2 Health Service Research

The definition of health services research is constantly evolving, furthermore it is described differently by a number of thinkers and organizations. The Agency for Healthcare Research and Quality in 2002 described health service research as examination of how people get access to health care, how much care costs, and what happens to patients as a result of this care.[59] The main goals of health services research are to identify the most effective ways to organise, manage, finance, and deliver high quality care in order to reduce medical errors and improve patient safety.[59]

Health service research is a multidisciplinary field with a diverse purpose, and is often conducted in different settings such as: academia, government and clinical healthcare. For these reasons, multiple methods of data collection and analysis are utilised to conduct health service research. The method of data collection is largely determined by the researchers paradigmatic positioning. In the context of health service research, the researcher's paradigmatic positioning relates to their understanding of the nature of knowledge and of reality.[60] For an interpretivist researcher knowledge is socially constructed and reality is ultimately subjective. Where as a positivist paradigm, will maintain that reality is fixed and that objective knowledge can be produced through rigorous methodology.[60] Methodologies utilized by the former are referred to as qualitative and those by the latter as quantitative.[60] In the context of health service research, it is vital to select the best means to answer a research question. For this purpose both qualitative and quantitative methodologies have an essential role, which means that health service research often requires a mixed method approach rather than being explicitly philosophically driven.[60]

2.3 Descriptive research

Descriptive research is a method of study that can utilize elements of both qualitative and quantitative methodology to outline a given research question. Descriptive studies are observational studies designed to find patterns in relation to variables and find out what is occurring as opposed to experimental studies which look at the effects of an intervention. As such, in descriptive studies while it is not necessary to attempt to control variables, the design must be such that it attempts to evaluate as many variables as possible. Descriptive statistics help in presenting the findings of a descriptive study, while inferential statistics may be used to determine cause and effect.

Quantitative methods have long dominated the health sciences, exemplified by the randomised control trial and its focus on hypothesis testing through experiment controlled by randomisation.[61] Recently, however, health researchers have begun increasingly adopting the use of qualitative methods which have previously been the domain of social sciences.[61] These include research tools such as observational methods, in-depth interviews, case study evaluations, and focus groups. Many scholars argue that the demands of an increasingly complex health care system and the needs of both practitioners and patients have called for new approaches to health services research.[61] The incorporation of qualitative research methods is more and more seen to be a valuable and necessary component of research aimed at improving health services.

Prior to developing guidelines for best practice, it is necessary to evaluate current services to identify which process elements are enhancing the day surgery process and where barriers to a safe and efficient service are encountered. While HIPE data provides extensive information on hospital activity, it is not designed to look in depth at why and where there are barriers to more efficient services. In order to carry out this analysis, a study to evaluate current practices and outcomes must be employed to gather baseline information.

For the study to evaluate every aspect of the day surgical service, it must follow patients from first referral to the hospital through every step until discharge and follow up for adverse events. As this study aimed to collect data on current services and propose possible best practice guidelines it was important to be able to evaluate any possible change that might occur from the implementation of the interventions or guidelines. For this purpose, quantitative rather than qualitative data was collected. Using descriptive statistics, the data could be analysed for current trends in our services and comparisons made in the future if the suggested guidelines were implemented.

2.4 Survey as an investigative tool

A survey is a non-experimental method of descriptive research. The broad area of survey research encompasses any measurement procedure that involves asking questions of respondents.[62] Surveys can be broadly divided into questionnaires and interviews. The selection of type of survey for investigation of a given topic depends on several factors. These include, population issues, sampling issues, question issues, bias and administrative issues.[62]

It is important to consider the population that is to be surveyed to ensure that possible barriers such as language, literacy or cooperation issues are adequately planned for and dealt with.

The sample within the population selected must be identifiable, available and large enough to minimise any risk of bias. The questioning should be designed to obtain data that will ultimately help elucidate the research question at the same time not be loaded or biased in nature. Administrative issues such as cost, facilities, time and personnel are further determining factors regarding what type of survey should be used.

In a survey study, the researcher uses information from a sample of individuals to make some inference about the wider population.[63] Surveys are designed to provide a "snapshot" of how things are at a particular point in time. No attempts are made to control conditions or manipulate variables.[63] As with any method of data collection, surveys have advantages and limitations.

Advantages include:

- Provides empirical data. [63, 64]
- Allows for generalisation of results to populations. [63, 65]
- Allows for collection of large volume of data in timely fashion at relatively low cost. [63, 64]

Limitations include:

- The data produced commonly lacks detail and depth. [63, 64]
- Difficult to secure a high response rate. [63, 65,]

Different types of survey methodologies exist, such as postal questionnaires, face-to-face interviews and telephone questionnaires. While the above mentioned advantages and limitations are common to all types of surveys, some apply more to certain survey methods than others. In postal questionnaires for example, the typical response rate is approximately 20%.[63]

This means that while the survey can be sent to many participants with relative ease, it is difficult to secure adequate response rate to ensure that the demographic profile of respondents is representative of the survey population and sufficiently large data set is collected for analysis.

The concept of sample selection is intrinsic to survey research. As it is usually impractical to collect data from every person in a given population, a sample of the population has to be selected.[63] The sampling method used may be random or non-random. Whichever method is used, it is important to ensure that the sample selected is representative of the larger population to which the results will be inferred. Sampling error is the probability that any one sample is not completely representative of the population from which it has been drawn.[63]

A further consideration in sampling is the sample size to be evaluated in order for the results to be adequately representative and have adequate external validity.[62] A larger sample size reduces sampling error. In a normal distribution curve, one standard deviation from the mean encompasses 68% of the cases in the distribution, while two or three standard deviations encompass 95% and 99% respectively.[62] The confidence interval is the number of standard deviations from the mean and the confidence level reflects the confidence by which one can infer that the "true" result is within the results obtained.[62] It is possible to calculate the sample size required for a given population at different confidence levels if the confidence interval is known. Similarly it is possible to calculate the confidence interval at different confidence levels if population, sample size and percentage are known.[62]

2.5 Retrospective chart analysis

Retrospective research often requires the analysis of data that were collected for other purposes than research, such as: nursing and physicians notes, operating theatre records, and laboratory results. The advantages of conducting such research include: a relatively inexpensive ability to research the rich readily accessible existing data; easier access to conditions where there is a long latency between exposure and disease, allowing the study of rare occurrences; and most importantly, the generation of hypotheses that then would be tested prospectively.[66]

The limitations of this method include, incomplete documentation, including missing charts, information that is unrecoverable or unrecorded, difficulty interpreting information found in the documents, problematic verification of information and difficulty establishing cause and effect, variance in the quality of information recorded by medical professionals, have all contributed to discouraging researchers from adopting this methodology.[66]

By having in place methodological guidelines, the limitations of retrospective chart research can be minimised. Of primary importance is the development and use of a data abstraction instruments.[66] This should be simple and clear, where each variable is given an unambiguous response section. Standardisation of data enhances internal validity and reproducibility.[66] It is also helpful to have pre-determined protocols and guidelines for abstraction of data. By having clear instructions on how data should be retrieved and recorded, the inter-rater reliability of data abstraction is increased.[66] Abstractor blinding reduces bias.

In selection of charts for retrospective analysis, three common types of sampling are used. In cases of convenience sampling, all suitable cases are selected over a specific time frame.

In quota sampling, a predetermined number of cases are sought, and in systematic sampling every "nth" case is selected.[66] The method of sampling is largely determined by the question to be answered, and the time and resources available. As with survey studies, it is important in retrospective chart analysis to select a sample that is representative of the larger population.

Missing data is a major pitfall that is often encountered in retrospective chart analysis. Two methods of overcoming this difficulty include (1) deletion, which requires removal of the case or variable from the study or (2) importing missing response through statistical analysis (averaging or maximum likelihood strategies).[66] While deletion is simple and quick to undertake it can result in hidden or non-response bias. However, in order to apply importing of missing response through statistical analysis, large data bases and often complex statistical methods are required, which can be time consuming.

Retrospective chart analysis as with any research methodology, has advantages and disadvantages. It is important therefore to design the study in such a way that the strengths of this method are maximised and its limitations minimised.

2.6 National Survey

The national survey was conducted via a postal questionnaire developed by the research team. Face and construct validity was assured through a review of the questionnaire by national and international experts in day surgery. The questionnaire was then pilot tested in two sample hospitals and minor changes made following feedback.

This survey sought information on hospital profile; number of beds, provision of services and information related to pre-assessment, peri-operative and post-operative care. The questionnaire was mailed to the General Manager of the selected hospitals and respondents were invited to complete the questionnaire and list in free text the perceived barriers to development of day surgery in Ireland.

From the list of 51 public hospitals in Ireland, the survey was mailed to 38 general hospitals providing day surgery. Paediatric and maternity hospitals were excluded. Seventeen private hospitals were included in the survey. Data collection was completed between July and September 2009. One reminder was sent to all sites.

The results were tabulated into a spread sheet, descriptive statistical analysis was completed using SPSS version 15.0. Univariate analysis performed provided measures of distribution, and dispersion.

2.7 Chart review

An in-depth medical charts review of 200 patients undergoing elective surgery was carried out. Through the chart review every step of the patient journey from first referral, to day of surgery and any post-operative complications was mapped out, to provide further insight into elective surgery practices. Together with the national survey this data gives an accurate account of provision of current services, where there are barriers to day surgery and which processes in current practice facilitate expansion of day surgery.

2.7.1 Location Of The Study

Due to limited time and resources, a sample of public hospitals were selected as sites for data collection. The inclusion criteria for study locations were:

- Public acute hospitals with emergency departments which were fully functional 24 hours a day.
- Day surgical wards already in place.
- General surgical and specialist surgical teams carrying out elective and emergency operations in these hospitals and therefore sharing important resources such as theatre time.
- RCSI accredited teaching hospitals in Dublin.

Paediatric and maternity hospitals were excluded as potential study location.

Two hospitals were selected based on the above criteria. These will be referred to as hospital A and hospital B.

Hospital A is a major teaching hospital providing a range of services including acute medical and surgical services, long stay care, day care, outpatient, diagnostic and support services. The hospital's catchment area extends into West Dublin, Meath and Kildare covering a population of approximately 290,000 people. Emergency services are provided 365 days a year 24 hours a day.[67] Surgical services provided there include general, ENT, gynaecology, plastics, urology, vascular and orthopaedics. There is a 24 bed surgical day ward which is open 5 days a weeks (7:45 – 18:00 Mon-Thur and 7:45 – 19:00 on Friday).[68]

Hospital B is a major academic teaching hospital in Dublin, it is the second largest hospital in the Republic of Ireland and the principal teaching hospital for the RCSI.[69]The hospitals catchment area covers a population of approximately 250,000 people and it also provides full emergency services 365 days a year, 24 hours a day. Surgical services provided there include general, maxillo-facial, neurosurgery, ophthalmology, plastics, urology, vascular surgery, gynaecology, and ENT. Hospital B has a 22 bed day ward which is open 5 days a week (7:30-20:00). In addition Hospital B incorporates a smaller hospital (Hospital C). Hospital C is an acute hospital which provides medical and surgical inpatient care, day-care services, outpatient physiotherapy and radiology services. It does not have an emergency department, but provides an additional 69 beds in four wards. There is a surgical unit which provides 16 inpatient and 10 day surgery beds, and a 6 bed day ward for surgical day procedures. The remaining beds in Hospital C are provided by a 19 bed medical unit and 18 bed rehabilitation unit. Hospital C is under the same management team as Hospital B, and specialist consultants working in Hospital B also provide the services in Hospital C. As there are no surgical OPDs in Hospital C, patients who attend OPD in Hospital B are referred for surgery in either Hospital B itself or Hospital C.

Both hospital A and hospital B (including hospital C), record their day surgical activity using HIPE which collects data on patients procedure, date of admission and their length of stay. They also both have above average day surgery activity compared to other hospitals in the country.[10]

2.7.2 Selection of Surgical Cases for Assessment

The study focused on surgical procedures that have high potential to be provided on a day-surgery basis. From the basket 24, six procedures which can be carried out by general surgeons without specialist training were selected for review. These cases included excision of breast lump, circumcision, haemorrhoidectomy, laparoscopic cholecystectomy, varicose veins surgery and inguinal hernia repair. The cases were then divided into major and intermediate groups using the Bupa classification of surgical procedures.[70]

The breakdown of the procedures was as follows:

Major cases:

- Varicose Veins Surgery
- Laparoscopic Cholecystectomy
- Open Inguinal Hernia Repair

Intermediate cases:

- Laparoscopic Inguinal Hernia Repair
- Excision of Breast lump
- Circumcision
- Haemorroidectomy

2.7.3 Data Collection and Analysis

HIPE was used to compile a list of patients chart numbers who had undergone the selected procedures in the year 2009. Patient charts were selected consecutively according to date of operation, until 100 charts were collected from each site.

Data were collected on; patient demographics, source of referral, waiting times to be seen, seniority of surgeon that saw patient in clinic and made the decision for type of surgery (day or in-patient), whether patient was pre-assessed, any pre-operative investigations done, ASA classification, whether the date of surgery was provided to the patient, waiting time from first seen in clinic to surgery, duration of surgery, length of stay, complication and any further presentations due to their operation within 30 days of surgery (the data extraction instrument is outlined in Appendix 3).

The length of stay information was collected as a number of hours spent in the hospital (rather than days) and subdivided into pre-operative, operative and post operative times in hospital. This allowed for accurate assessment of the services provided for patients who were discharged on same day as their operation and those that had overnight stay. By doing so any delays during the patient's in-hospital journey could be identified.

The statistical trends from the chart review provided the baseline data for identifying current barriers to optimisation of day surgery. This would then allow for developing recommendations to overcome them.

2.7.4 Patient demographics

The patients age was calculated from their date of birth, to the day of their surgery. Only full years passed were recorded. Their address was also recorded and used for estimation of distance to hospital. This was done using the online tool provided by AA Route planner at http://www.aaireland.ie/routes_beta/. The hospital was always entered as the destination (to) and the patients street address used as origin of journey (from) to ensure uniformity of route calculations. The list of medications and co morbidities of the patients were used together with anaesthetic notes to assess patients ASA status.

2.7.5 Referral sources and waiting times

Data were collected on source of referral, date of first referral, date seen in OPD and date of surgery (section 3 and 5 of data collection instrument). Waiting time from first referral until seen in the surgical OPD (out patient waiting time) and waiting time from seen in surgical OPD until surgery (in-patient waiting time) were calculated based on the dates recorded for first referral, first OPD visit and surgery date.

As hospital B incorporates hospital C, all patients that were operated on in hospital C would have been assessed in the surgical OPD in hospital B. There is therefore no referral sources to, or waiting times to be seen in hospital C. Also as these two hospitals share waiting lists, the data gathered for hospital C was incorporated into that of hospital B. Therefore the in-patient waiting time represented for hospital B in the results is that of hospital B and C combined.

Assessing doctor in the surgical out-patients clinic, pre-operative investigations and planned rates of day surgery

Data were collected on grade of assessing doctor in surgical OPD, any investigations requested pre-operatively and whether the assessing doctor specifies the type of surgery as day- or in-patient (section 3, 4 and 5 of data collection instrument). In cases where a note was made that the case was discussed with a more senior member of the team or that the patients was also seen by a more senior member of the team, that person, and not the person making the note was recorded as the clinician seeing the patient on that OPD visit as they were the final decision maker. If there were no such remarks, the clinician making the note was recorded as being the decision maker on that visit.

The last surgical OPD visit note (or where applicable the pre-assessment note) was used when recording the pre-operative investigations that were requested. This would ensure that the investigations recorded would be to assess patients fitness for surgery rather than diagnostic in nature, as the decision for surgery would have already been made at this point. The pre-operative investigations were grouped and recorded as blood tests (full blood count, renal function, and haemostasis), resting electrocardiogram (ECG) and chest x-ray (CXR). A note was also made of when the pre-operative investigations were done (on the same days as surgical OPD or pre-assessment visit, on out patient basis between the surgical OPD visit and day of surgery, or on admission for surgery). The results were correlated with the previous findings of patient ASA classification and comparisons were made between practices in the two hospitals by different grade doctors and NICE guidelines.

The comparison of practices in the two hospitals with the NICE guidelines were limited to ASA class I patients. This was done as the guidelines are most clear cut in this group of patients with fewest tests "to be considered" for which the guidelines dont give specific indications. Also as the guidelines are divided into patients with cardiovascular, respiratory and renal disease, for ASA class II and higher, by limiting the comparisons to ASA class I patients, any error due to patients having multiple organ disease would be excluded.

The OPD note and where available booking forms for surgery were used to assess the type of planned surgery.

2.7.6 Pre-assessments, delays and cancellations

Data were collected on whether patients were referred for pre-assessment, date of pre-assessment, where pre-assessment took place (surgical OPD, pre-assessment clinic or over the phone), if pre-assessment was for day- or in-patient surgery, grade of assessing doctor or nurse in pre-assessment, whether the patient was referred for any investigations, if return pre-assessment appointment was given, whether date of surgery was provided, date that surgery was arranged for, changes in date of surgery due to cancellation and reason for cancellation or change of surgery date (section 4 and 5 of data collection instrument).

The data collected were statistically analysed to assess variations in practices in the two hospitals and their impact on pre-operative investigations and cancellation rates.

2.7.7 Day of surgery

The nursing notes were used to collect data on when patients first presented to the hospital on the day of their surgery. The time recorded on the nursing notes as when the patient was first seen was used as an estimate of when they first presented to the hospital. The anaesthetic notes were then used as an estimate of when the surgical procedure was started. The time from first seen on the ward until start of surgery was used as the patients pre-operative LOS. Duration of surgery was determined using the anaesthetic notes from when patients where anaesthetised until they were woken up from the anaesthetic. Similarly the anaesthetic notes were used to determine the type of anaesthesia (general or spinal) any intra-operative analgesia and anti-emetics that were administered to the patients.

The person named as the primary surgeon on the operating notes was recorded as being the operating surgeon for each surgical procedure and their grade recorded. This was used to determine the percentage of cases carried out by consultants and non-consultants in each hospital.

The post operative length of stay for patients was calculated using the nursing notes recording of the time from when the patients were received back on the ward post-operatively until they were discharged home.

The nursing notes, and doctors clinical notes where used to determine any unexpected delays to patients being discharged and any post-operative complications that occurred. The notes were also reviewed up to 30 days post-operatively to record any re-presentation to hospital due to complications of surgery.

2.8 eDelphi

The national survey and chart review provide an insight into current practices. Providing statements of best practice based on this data and international guidelines, will help in maintenance and dissemination of practices which were identified to facilitate the provision of day surgery simultaneously providing suggestions on how to overcome present barriers.

2.8.1. Delphi Technique

Originally developed in the 1950s by Olaf Helmer at the Rand Corporation as a defence research tool. Delbecq, Van de Ven, and Gustafson in 1975, indicated that the Delphi technique can be used for the following objectives:[71]

- To determine or develop a range of possible program alternatives
- To explore or expose underlying assumptions or information leading to different judgements
- To seek out information which may generate a consensus on the part of the respondent group
- To correlate informed judgement on a topic which spans a wide range of disciplines
- To elucidate the respondent group as to the diverse and interrelated aspects of the topic in question

The Delphi technique may be characterised as a method for structuring a group communication process so that the process is effective in allowing a group of individuals as a whole to deal with a complex problem.[72] The classical Delphi technique seeks to obtain group opinion through an anonymous, multilevel group interaction, relying on a number of rounds supervised by a facilitator to reach consensus. The anonymity aspect avoids problems arising from powerful personalities, group pressure and the effects of status which often manifest more in the hierarchical structure of the health profession.[73] Recently the use of online systems has supported the speedy and cost effective use of the Delphi method which is often referred to as an "eDelphi".[74]

Key to any Delphi study is the use of expert opinion. It is argued that these should be representative of those to whom the results will apply and can be classified as knowledgeable experts.[75-76]

2.8.2 Electronic Delphi Process (eDelphi)

A three round eDelphi technique was employed for gaining consensus among professionals in day surgical services on best practice process elements for day surgery. There is no universally agreed format for round one in Delphi. Commensurate with the objectives of the study multiple methods of recruitment of the expert panel was completed. Recruitment techniques included a presentation of the proposed study at key scientific meetings held in Dublin. Focus groups were held at two national scientific surgical meetings; face to face interviews with surgeons and nurse managers were completed; a letter of invitation to each hospital providing day surgery in Ireland to propose a representative and to mailing lists which included directors of nursing, surgeons, surgical training, nurse managers and anaesthetists. Persons who agreed to study participation were requested to provide an email address through which all communications would take place.

Parallel to recruitment of participants in round 1, participants were asked to give suggestions on statements of best practice and a thorough search of databases and on-line resources was carried out to identify other national standards or guidelines.

The study was completed using a commercially available online survey tool (http://wwwsurveymonkey.com). Security Sockets Layer (SSL) encryption is used by the service to protect data while being transmitted by ensuring a secure connection between a client (participant) and the server. This system offers the advantage of rapid response, instant analysis and supports the use of modern technology in gaining consensus among professionals who often have little time at their disposal. Having obtained the email addresses of respondents an email was issued to each study participant requesting them to open the survey monkey tool, answer the questions and press the submit button.

In round 2 eDelphi participants were requested to address the following areas: patient information, pre-admission/pre-assessment, documentation, management of day surgery, and discharge protocols. Respondents were also requested to volunteer their email address for inclusion in subsequent rounds of eDelphi.

For round two participants were asked to rank each statement developed in round 1, for level of importance on a nine point scale (9 = highest importance and 1 = lowest importance). A free text option was provided at the end to facilitate further feed back and opinions. The scores of each statement at the end of round two were analysed and each statement was pooled in one of three groups. Those that scored 1-3, 4-6 and 7-9. Consensus was set at 70% so that only statements that were deemed important (score of 7-9) by at least 70% of the participants was carried forward to round three.

Similar to round two, the survey was returned to participants for further rating in the third round. What remained after round three was a list of statements which based on the participants consensus if implemented would improve day surgery in Ireland. These statements were grouped and used to develop the best practice process elements of day surgery in Ireland. Figure 2 demonstrates a diagrammatic representation of the eDelphi process used in this study.

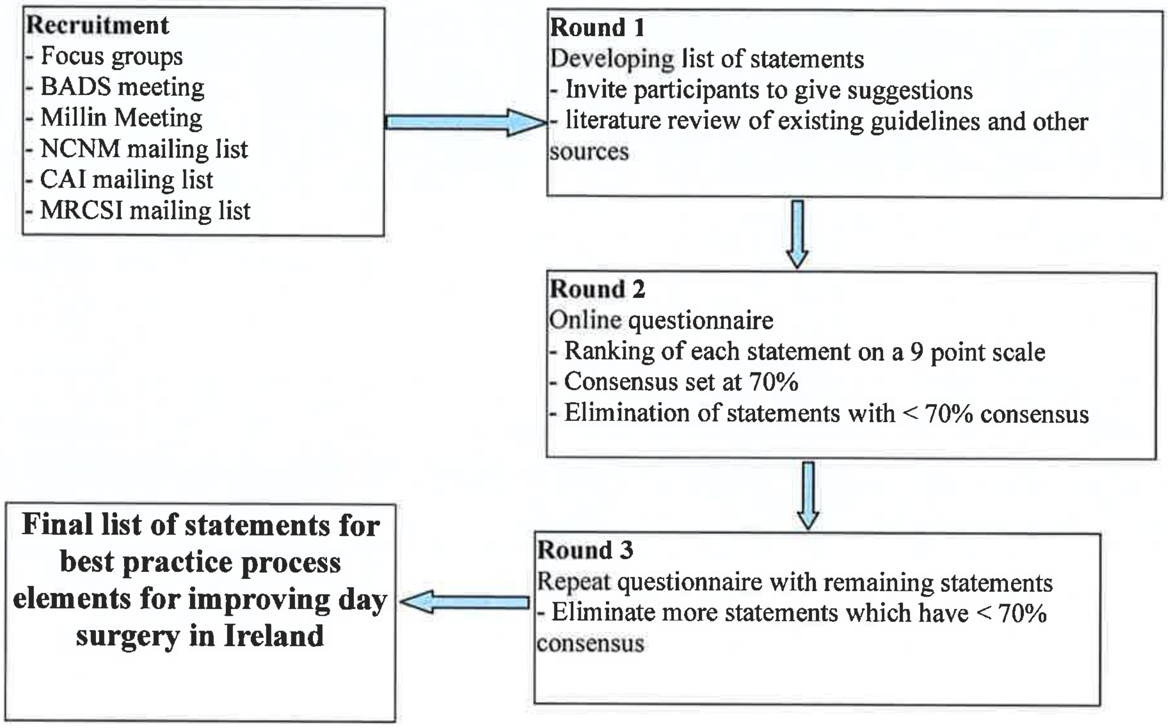


Figure 2. Step by step representation of the consensus process.

2.8.3 Data Analysis

Descriptive statistical analysis was completed using SPSS version 15. Agreement with statements was summarised using median and measures of dispersion.

For the open text box questions qualitative data analysis was completed through thematic content analysis. The list of items from round 1 were read by three team members working independently. Each member grouped similar themes together to develop a final refined list of statements. The team members compared the list of statements and similarities were noted with the final lists. Some differences were resolved through group discussion.

2.9 Reliability, validity and bias

2.9.1 Reliability

Reliability represents repeatability or consistency, in other words, a measure is reliable if it would give the same result repeatedly (assuming what was being measured remains constant).[62, 77] Although it is not possible to calculate an exact value for reliability, its value can be estimated. Different estimation methods exist for this purpose. There are four general classes of reliability estimates: inter-rater reliability, test- re-test reliability, parallel forms reliability, and internal consistency reliability.[62]

Each reliability estimators has its advantages and disadvantages compared to others. Inter-rater reliability is one of the best ways to estimate reliability when measuring an observation.[62] However, it requires multiple raters or observers. As an alternative, one could look at the correlation of ratings of the same single observer repeated on different occasions.

The parallel forms estimator is typically only used in situations where one intends to use two forms of the same data set as alternate measures. Both the parallel forms and all of the internal consistency estimators have one major constraint, namely having multiple items designed to measure the same construct.[62]

The test-retest estimator is particularly useful in most experimental and quasi-experimental designs that use a no-treatment control group.[62] In these designs one always has a control group that is measured on two occasions (pre- and post- test). The main limitation with this approach is that information about reliability is unknown until post test collection is complete.

Each reliability estimator provides a different value for reliability.[62, 77] In general, the test-retest and inter-rater reliability estimates will be lower in value compared to the parallel forms or internal consistency as they involve measurements at different times or with different raters.[62] Since reliability estimates are often used in statistical analyses of quasi-experimental designs such as the analysis of non-equivalent group design. The estimates can differ considerably, therefore making the analysis even more complex.[62]

2.9.2 Validity

Validity is the best available approximation to the truth of a given proposition, inference or conclusion.[62] There are four validity types: conclusion validity, internal validity, construct validity, and external validity. [62] Each of which addresses a different question.

Conclusion validity looks at whether there is a relationship between the variables.[62] Internal validity asks whether the established relationship is causal or not.[62] Assuming there is causal relationship, construct validity asks if the program reflects correctly the construct and that the measures reflected accurately the idea of the construct of the measures.[62] Assuming causal relationship between the construct of cause and the effect, external validity further asks whether these effects can be generalised.[62]

The question each validity type addresses presupposes an affirmative answer to the previous one, meaning that validity types build on one another. For any inference or conclusion, there are always possible *threats to validity* (reasons the conclusion or inference might be wrong). Ideally, one tries to reduce the plausibility of the most likely threats to validity, thereby leaving as most plausible the conclusion reached in the study, thereby increasing its validity.

2.9.3 Bias

Bias is the unknown or unacknowledged error that occurs during the design, measurement, sampling, procedure, or choice of the problem that is being studied.[62] While it is ideal to have a study that is completely objective and void of any bias, in practice this is extremely difficult, especially in a descriptive study where there are often too many variables to be controlled for a completely objective study to be practical. However it is extremely important for the validity of any study to ensure all possible measures are taken to minimise bias.[62]

2.10 Addressing Bias

In carrying out the national survey, to minimise the effects of sampling bias all public and private hospitals were included. However, while including all hospitals minimises any under coverage bias, it does not affect non-response bias. Non-response bias is the bias that results when respondents differ in meaningful ways from non-respondents. The results of the survey and impact of non-response bias are dependent on the response rate. To minimise such bias and increase response rates, one reminder was sent to all sites. In order to ensure appropriate questioning and minimising any bias due to measurement error, the questionnaire was reviewed by national and international experts in day surgery for face and construct validity it was then pilot tested and minor changes were made prior to conducting the national survey.

In the retrospective chart review section of this study, several areas of bias must be acknowledged. Firstly there is the selection of hospitals which are both Dublin based, RCSI teaching hospitals. These hospitals would have very different day surgery activity compared to a rural Irish hospital.

While being able to collect data from all Irish hospitals would have been the ideal process of evaluating day surgical services, by taking two Dublin based hospitals which are known to have relatively high day surgical activity we can assume that the barriers faced in these hospitals are also present in other hospitals where day surgery activity is less. Also by selecting two hospitals with high day surgery activity any elements of practice which are facilitating the day surgery service and process are more likely to be observed than if evaluating hospitals with low rates of day surgery. A further reason for selecting these hospitals was the presence of multiple surgical specialities and 24 hour emergency departments competing for theatre time with the elective surgical services. As indicated by previous studies one of the barriers to increased day surgery rates is overflow of patients from the emergency departments into elective surgical beds.[78] By selecting hospitals where this problem would be most likely to be present, the study could assess the full impact of the problem and how the two hospitals manage it. While selection of the hospitals for the retrospective chart review was not done at random, the selection was made to optimise the chances of detection of factors that either constrain or facilitate day surgery and minimise any bias by avoiding selection of outliers for performance of day surgery.

The second area of bias in the sampling of this study is the cases selected for evaluation. Ideally all the procedures listed in the basket of 24 which are audited by the HSE and published on healthstat should be evaluated to minimise sampling bias. For the purposes of this study only six cases as previously described were selected. This was done based on the fact that the six cases were commonly performed surgical procedures both throughout Ireland and within the selected hospitals, which would allow a sufficiently large sample size to be collected. They were also identified as procedures where day surgery rates in Ireland were lower than targets set by international guidelines. While the selection of cases was not random, the underlying cause for selection of these cases was to maximise identification of factors that constrain or facilitate day surgery in the two hospitals.

The third area of bias identified in the sampling process is the time period in which the study was carried out. The selection of charts for review was started for patients presenting for their surgery from 1st January 2009 and continued until 100 charts were selected from each location. Studies suggest that emergency activity in hospitals is usually at its peak during autumn and winter months.[79-82] Therefore the impact of any overflow of patients from the emergency department into elective surgical beds would be maximised at this time. In order to minimize the seasonal effect of hospital activity as a biasing factor to the study all patients having the selected procedures in the two hospitals during the entire year should have been selected for chart review. In this case time constraints were the underlying cause for 100 charts being selected from each location for review. Selection of a large enough sample size was used as a measure of minimising the biasing effects of seasonal changes on the data collected. However it is acknowledged that there is some degree of bias due to the seasonal effects on hospital activity in the data collected.

For the eDelphi consensus process several precautions were taken to minimise the risk of bias. The selection of participants was made at surgical meetings, face-to-face meetings, focus groups and mailing lists. This allowed for recruitment of as large a group as possible. An attempt was also made to recruit experts from all areas of day surgery to minimise bias from a particular group. While this was an attempt to minimise bias, it does not eliminate it. It is acknowledged that the audience at the meetings and the mailings lists was mostly surgeons, anaesthetists and nurses. Management and other workers within the day surgical service while still represented, were represent in smaller numbers and therefore their input is represented less in the final results.

When conducting a survey, in order to collect the most accurate data from respondents, it is important to minimise bias in the design of the questionnaires. For the purposes of this study the extensive literature review as well as allowing participants to give suggestions for best practice protocols was aimed to develop as comprehensive a list as possible for evaluation through the eDelphi process. As a result by ensuring that as far as possible all statements of best practice were included in the questionnaire the effects of bias were minimised.

2.11 Ethical Considerations

Current evidence based practice is reliant on research. Research within the health service provides information to policy makers and service providers by finding evidence for best practice and how they may be implemented. The World Medical Association (WMA) has developed the Declaration of Helsinki as a statement of ethical principles for medical research involving human subjects, including research on identifiable human material and data. It is the duty of the physicians who participate in medical research to protect the life, health, dignity, integrity, right to self-determination, privacy, and confidentiality of personal information of research subjects.[83] Ethical review of health service research is meant to serve the interests of the public, funding agencies and the research community by ensuring the ethical principals as outlined in the Declaration of Helsinki are adhered to.

In conducting survey research, two important ethical principals to adhere to are confidentiality and informed consent.[63] Confidentiality was ensured by keeping all data collected on password secured computers with only the research team having access. The original surveys were kept in a locked cabinet and the hospitals from which the data was collected were coded and therefore kept anonymous. With every postal survey that was sent, a short explanatory information sheet was provided, which explained the anonymous nature of the study, its purpose and what the data would be used for. Consent was implied if surveys were returned to the research team.

The data collected through the chart review was retrospective in nature, and did not interfere with already established management protocols. There were therefore no ethical concern regarding the protection of life and health of the patients who's charts were selected. However the privacy and confidentiality of personal information of the patients was of paramount concern. All data gathered was anonymous and coded so that they could not be traced back to individual patients. The original data collected on the data collection tool were kept in a locked cabinet to which only the investigators had access. All electronic data was kept on password secured computers to which also only the investigators had access. The hospitals where data were collected were kept anonymous.

As there is not yet a central Research Ethics Committee (REC) in Ireland which allows a multi centre trial to take place, ethics approval was sought for, and granted by the REC of the individual hospitals in which data collection took place.

2.12 Summary

The methodology of using a national survey as well as an in-depth chart review of two hospitals to outline current elective surgical practices has been outlined in this chapter. By assessing current practices, barriers to provision of day surgery can be identified. Only when these barriers are identified, can we develop strategies to overcome them. At present the strategies for improvement of Irish day surgical services has largely been based on international rather than national data. By providing national data through this study, it becomes possible to tailor solutions to barrier faced here rather than on assumptive data.

The development of best practice process elements using an eDelphi method provides further specific solutions to the Irish health care setting. Using the expertise of professionals within the system helps provide solutions that are relevant and aids in their implementation.

Results and Discussion

Introduction

The structure of, and developments in, the Irish Health Care system have changed significantly in the past two decades. Such changes can be attributed to a range of factors including improvements in technology, improved clinical expertise, greater investment in education training and research and the shift towards the provision of day services. Important reports such as; 'The Report of the Commission on Patient Safety and Quality assurance', 'Quality and Fairness; a health service for you', 'Health Transformation Programme' and 'Projecting the impact of demographic change on the demand for and delivery of health care in Ireland', have identified not only the need for further change in terms of efficiency, effectiveness and appropriate resource utilization but have consistently recognized the need to develop the provision of day services in Ireland as a means of achieving some of this change.[3, 12, 29, 84] Effective planning to achieve the goals set out in these reports is crucial and the provision of reliable data is a pre-requisite to this process.

Auditing of performance indicators in all Irish public hospitals are carried out by the HSE with the help of the ESRI on a monthly basis. These results are published online and updated as part of an initiative to improve existing services. The data used for the audit is largely obtained using the HIPE scheme which is a national database managed by the ESRI in association with the HSE. Information that is collected by HIPE includes: dates of admission and discharge, day case indicator, admission type (booked or emergency), discharge destination (home, transfer, self-discharge or death), date of birth, sex, marital status, area of residence by county, general medical services status (i.e. Medical Card), diagnoses (principal and up to 19 additional secondary diagnoses), and procedures (principal and up to 19 additional secondary procedures).

While essential in giving an overview of performances in hospitals, the HIPE data does not provide the detailed information required for mapping out the patients journey from first referral to discharge from hospital. In order to identify specific areas where there are barriers to day surgery, a detailed and closer look at every step of the patient journey is required.

Though there is a body of research related to day surgery from a health service and systems perspective there is a paucity of research which have assessed practices at the point of care. Internationally, there is agreement that pre-assessment enhances the surgical process and provides advantages for the patient, the service and rates of day surgery.[85-87] However, the pre-assessment process requires further scrutiny in order to determine how some patients are offered day surgery versus in-patient surgery and if such differences are patient, surgeon or hospital related.

The patient journey can be broadly divided into three section: 1) Pre-operative, when the patient is referred to the hospital, assessed in surgical OPD and decision made to proceed with a surgical procedure. 2) Day of surgery, when the patient presents on the day of their planned surgery, is admitted and enters the operating room. 3) Post-operative, when the operation is completed, patient is brought back to the ward for recovery and finally discharged from the hospital. Together, section 2 and 3 as described are sometimes referred to as the peri-operative period.

Internationally, reconfiguration of healthcare systems has focused attention on improving efficiency and cost effectiveness while simultaneously improving patient outcomes. Advances in anaesthesia and surgical techniques, contribute towards this goal as a greater number and range of surgical procedures can now be performed as day surgery, the benefits of which have been well documented.[12] This is supported by the provision of standards for day surgery. However, standards from one health jurisdiction are not readily transferable to other settings as national health strategy and policy are influencing factors. In Ireland there is currently a strategic national focus on surgical care and enhancement of day surgery is a particular objective. To achieve the goals of increasing day surgery rates it is necessary to engage people working in these services in the process of developing standards for day surgery which are appropriate in the Irish healthcare system and take cognisance of established international best practice.

In the coming chapters, the results of the national survey, retrospective chart review, and eDelphi consensus process are represented and discussed.

Chapter 3.

National survey of the provision of day surgery across public and private hospitals in Ireland.

3.1 Response

Thirty seven replies (30 public, 7 private) were received, yielding an overall response rate of 67%. Table 6 gives an overview of the results by hospital type.

3.2 Service Provision

The average number of day services beds was 24 and of these, averages of 16 day surgery beds were available (range 3-39). Day beds included chairs and trolleys. Only 14 (38%) hospitals had dedicated day surgery units while twelve of these also had dedicated day surgery theatres. Other specialities performing day surgery included endoscopy, general theatres, ENT departments, oncology, haematology, orthopaedics and OPD clinics.

Day services were staffed by a mean of 11 whole time equivalent staff (WTE). This question did not differentiate the grades of staff and where further information was supplied these staff included ward assistants, clerical staff, nursing and medical staff. Thirteen (35%) units had staff working in pre-assessment as part of the day surgery units. No unit had a consultant in charge of day surgery. Day to day management of the unit was mainly by Clinical Nurse Managers (CNM) grade 2 (n=29, 78%).

3.2.1 Pre-assessment

Twenty one units (57%) had a dedicated pre-assessment clinic. The OPD was the primary source of referral to day surgery in most units while others received referrals from a multiple of sources including A/E, in-patients and GPs. Fourteen units (38%) received direct referrals from GPs, the majority did not (n= 20, 54%). Twenty nine units (78%) had selection criteria when assessing patients for day surgery.

Attendance at pre-assessment was high with less than 5% failing to attend. This figure was an estimate in the majority of units. In many units, patients were assessed following directly from their OPD appointments, thus negating the need for further appointments. Once screened, less than 10% were deemed unsuitable for day surgery. Pre-assessment via telephone was available in 15 (40%) units and this was always reserved for younger patients or for specific minor procedures.

Patient information leaflets were made available in 36 (97%) units. Of these, ten units had more than 75% of their leaflets procedure specific.

3.3 Peri-operative

Only eight units (22%) reported 'did not attend' (DNA) rates at peri-operative level and this was a mean of < 5%. This figure was provided as an estimate by most units. Theatres tended to be in use all week with a mean of 40 hours per week. Fifteen units never cancelled an operating list in the last year while seven cancelled twice. Reasons for cancellations were external to the Day surgery units including: equipment failure or maintenance, industrial action, unexpected sick leave, overcrowding.

3.4 Post-operative

The majority of units (97%) provided discharge leaflets to patients with contact details. Only five units (14%) phoned patients following discharge and these were specific to either the procedure or the patients and were not for all patients. Twenty four units (65%) had protocols in place to allow nurses to discharge. Comments suggested that this was limited to specific procedures, and if the patient had a local anaesthetic. Most units reported stay-in rates but similar to previous rates this was often an estimate. This tended to be low as 76% of units had rates less than 10%. Return visits to the hospital were also low with 65% of units having return rates less than 3%.

Eight units had completed studies to determine adverse event rates following day surgery while 23 units (62%) had completed patient satisfaction surveys in the last two years. Eight units (22%) had changed their practice based on the surveys.

3.5 Barriers to Day Surgery

Respondents were asked to provide, in free text, their opinion on the current barriers to the development and optimisation of day surgery in Ireland. Seven main themes emerged. The single most frequently cited barrier was the lack of dedicated day surgery theatre. This resulted in day cases being operated on in general theatres and therefore not always receiving priority and in many cases being pushed back or cancelled due to emergencies. This then resulted in insufficient recovery time for patients necessitating admission. The following seven themes were identified:

1. Custom, practice and culture including lack of clinical governance and clinical leadership. Calls to move to a culture of day surgery as a 'norm'.
2. Lack of, or need for equipment including day surgery theatres and capital investment.
3. Organisational. People suggested that units should be open until 9pm to allow longer recovery time for patients. The need for pre-assessment clinics was identified.
4. Patient factors. The age profile of patients and patient knowledge and education about day surgery was cited as a barrier.
5. Geographical. For many patients the distance from day surgery was too far and thus they were admitted as in-patients.
6. A/E influence. Many responses cited trolleys being used by A/E departments, overflow from A/E.
7. Lack of community back up and support.

Table 6: Results by hospital type

Item	Overall Result n (%)	Public, n (%)	Private, n (%)
Response rate	37 (67%)	30(79%)	7(41%)
Number of day services beds	24.35 mean 18 median 15 mode	22.83 mean	30.86 mean
Number of day surgery beds	16.41 mean 15 median	15.17 mean	21.71 mean
Surgery carried out in a dedicated day surgery unit	14 (38%) yes 23 (62%) no	10 (33%) yes 20 (67%) no	4 (57%) yes 3 (43%) no
Dedicated day surgery operating theatre	12 (32%) yes 25 (68%) no	9 (30%) yes 21 (70%) no	3 (43%) yes 4 (57%) no
The total number of whole time staff equivalents in day services	Mean 11 Median 10		
Pre-assessment clinic staff part of day surgery unit staff allocation	13 (35%) yes 23 (62%) no 1 missing data	12 (40%) yes 17 (56%) no 1 missing data	1 (14%) yes 6 (86%) no
Grade of staff who manages day services unit	CNM3: 6 (16%) CNM2: 29 (78%) CNM1: 1 (5%)	5 (17%) 25 (83%) 0	1 (14%) 4 (57%) 2 (29%)
Availability of a pre-assessment clinic?	21 (57%) yes 16 (43%) no	20 (67%) yes 10 (33%) no	1 (14%) yes 6 (86%) no
Who manages pre-assessment clinic?	Consultant: 3 (8%) Registrar: 2 (5%) House Officer: 1 (3%) CNM: 18 (49%) Staff Nurse: 2 (5%) Missing data: 11	3 (10%) 2 (7%) 0 16 (53%) 2 (7%) 7 missing data	0 0 1 (14%) 2 (29%) 0 4 missing data
Protocols or selection criteria available for day surgery	29 (78%) yes 6 (16%) no 2 missing data	25 (83%) yes 4 (11%) no 1 missing data	4 (57%) yes 2 (29%) no 1 missing data
Direct referral system from GP to day surgery in place	14 (38%) yes 20 (54%) no 3 missing data	10 (33%) yes 17 (57%) no 3 missing data	4 (57%) yes 3 (43%) no
DNA rate for pre-assessment	8 (22%) rate of< 5% 13 (35%) unknown 16 (43%) missing data	8(27%)rate<5% 11 (37%) 11 (37%)	0 2 (29%) 5(61%)
% of patients not deemed suitable for day surgery	7 (19%) rate of < 10% 17 (46%) unknown 13 (35%) missing data	6 (20%) 16 (53%) 8 (27%)	1 (14%) 1 (14%) 5 (71%)
Are procedure specific PILs available	33 (89%) yes 4 (11%) missing data	26 (87%) yes 4 (13%) missing data	7 (100%) yes
Are patients given individual appointments or blocked booked	21 (57%) individual 6 (16%) blocked 10 (27%) missing data	19 (63%) 5 (17%) 6 (20%) missing data	2 (29%) 1 (14%) 4 (57%) missing data
Is a specific date and time of procedure given at pre-assessment?	27 (73%) yes 8 (22%) no 2 (5%) missing data	21 (70%) 7 (23%) 2 (7%)	6 (86%) 1 (14%)
Are pts reminded of pre-assessment appointments?	11 (30%) yes 14 (38%) no 12 (32%) missing data	8 (27%) 14 (47%) 8 (27%)	3 (43%) 0 4 (57%) missing data
Is telephone pre-assessment available?	15 (40%) yes 18 (49%) no 4 (11%) missing data	14 (47%) 13 (43%) 3 (10%) missing data	1 (14%) 5 (71%) 1 (14%) missing data

Are patients contacted to remind them of procedure date?	15 (40%) yes 18 (49%) no 4 (11%) missing data	13 (43%) 15 (50%) 2 (7%) missing data	2 (28%) 3 (42%) 2 (42%) missing data
Provision of dedicated paediatric days?	6 (16%) yes 29 (78%) no 2 (5%) missing data	5 (17%) 23 (77%) 2 (7%) missing	1 (14%) 6 (86%)
What is the DNA procedure rate?	8 (22%) < 5% 5 (14%) unknown 24 (65%) missing data		
How many occasions in the past year have day surgery operating lists being cancelled?	Never 15 (40%) Once per week 1 (3%) Once per month 3 (8%) Once per 2 mths 3 (8%) Once per quarter 1 (3%) Twice per year 8 (22%) Once per year 4 (11%) Missing data 2 (5%)	11 (37%) 1 (3 %) 3 (10%) 2 (7%) 1 (3%) 7 (21%) 3 (10%) 2 (7%)	4 (57%) 0 0 1 (14%) 0 1 (14%) 1 (14%) 0
Are patients phoned post discharge	5 (14%) yes 32 (86%)no	5 yes (17%) 25 no (83%)	0 yes 7 (100%) no
Can nurses discharge per protocol	24 (65%) yes 12 (32%) no 1 missing data	19 (63%) yes 10 (33%) no 1 missing data	5 (71%) yes 2 (29%) no
The stay-in rate post procedure	28 (76%) < 10% 9 (24%) missing data	25 (83%)< 10% 5 missing data	3 (43%) < 2% 4 missing data
Return admission rate	24 (65%) < 3% 13 (35%) missing data	22 (73%)<3% 8 missing data	2 (29%) < 2% 5 missing data
Completed a survey of adverse events in past two years	8 (22%) yes 26 (70%) no 3 (8%) no	3 (10%) yes 24 (80%) no 3 missing data	5 (71%) yes 2 (29%) no
Completed a survey of patient satisfaction in past two years	23 (62%) yes 11 (30%) no 3 (8%) missing data	16 (53%)yes 11 (37%) no 3 missing data	7 (100%) yes

3.6 Discussion

There has been rapid increase in the last few years towards day case work for both routine and complex work. The HSE anticipates 679,510 patients being treated as day cases in 2010 (includes surgical and non-surgical).[88] Achieving these targets requires purposeful planning and improved efficiencies together with addressing some of the barriers to expansion of day surgery as identified in this study. An expansion of day surgery will have profound implications for the design of health facilities and the composition of the healthcare workforce.

In Ireland, the settings for day surgery vary from traditional theatres to specially constructed day surgery units and treatment rooms. Over 60% of hospitals do not have dedicated day surgery units.

Lack of such a facility was identified as a barrier to expansion and resulted in inefficiencies in the system. For example, the lack of dedicated day surgery theatres result in emergencies receiving priority and day cases being deferred until later in the day with consequent insufficient recovery time necessitating over-night hospital admissions.

The current economically constrained environment means that capital investment in day surgery units may be limited, thus, challenging the HSE to explore means by which increases in rates of day surgery can be achieved. The variability reported by O'Reilly et al in the activity rates for day surgery across public hospitals is reflected here in the wide variations in the structure of day surgery.[3] Some units had as few as 3 dedicated day surgery beds, with the largest unit having 39.

3.6.1 Rates

It is difficult to make direct comparisons on activity rates with other countries as national activity rates in Ireland are only available from public hospitals based on the HIPE system. In contrast, some international figures include public and private facilities.

Importantly, the variation in day case rates across hospitals with similar proportions of day beds would suggest that the achievement of national objectives in relation to day case rates may need a more targeted intervention where the rates for individual hospitals are lower than would be expected given the capacity available.[3]

The variation observed in the volume and mix of day case rates in the report by O'Reilly et al indicated that any national policy aimed at increasing day service rates will have to be specifically targeted at the individual hospital level while targeting specific procedures may also be required.[3] As one example, nationally, the percentage of laparoscopic cholecystectomies performed as day surgery remains low at 5% but some units achieve rates up to 20%.[3] The British Association of Days Surgery (BADS) recommends that 75% of such procedures could be performed as day surgery. Greater emphasis should be placed on understanding why such figures are so low. This may be due to waiting times or availability of expertise to perform this procedure at a local level.

3.6.2 Staffing

According to the Audit Commission, a senior consultant should be in overall charge of day surgery to ensure that consistent policies are adopted in its various specialities and day surgery units.[11] No unit, either public or private achieved this parameter. Most units (95%) had a Clinical Nurse Manager CNM 2 or higher grade in charge of day to day management, achieving one of the key recommendations of the Audit Commission. A review of staffing is recommended as inappropriate staffing may be a contributory factor in poor utilization.[11] The number of WTE staff among units varied. However, some units included all staff members in their numbers whilst others excluded non-clinical staff, thus making inferences on staff ratios to unit size difficult. There is limited evidence on the most appropriate staffing models for the different types of day-surgery units. In the UK, staffing levels range from 0.2 to 3.2 WTE staff for each staffed bed, chair or trolley.[85]

As day surgery requires a multi-disciplinary approach for successful outcomes active participation by all players is necessary.[12] A successful model of day surgery in Ireland is likely to involve more focused and stronger working models of interdisciplinary working practices. The development of such a model may be the next step to optimize the provision of day surgery.

3.6.3 Pre-assessment and Patient Selection

The initial steps in providing day surgery are careful identification and selection of patients, followed by pre-operative assessment in a designated day surgery clinic.[54] Whilst most units in our survey had selection criteria in place our survey suggests it was not surgical or medical criteria which were a barrier to patient selection but rather distance from the hospital together with lack of available community follow up. Notwithstanding these barriers provision of pre-assessment clinics was very high in the public hospitals. In contrast, only 14% of private hospitals had pre-assessment clinics. This may be explained by the reimbursement system, whereby private medical insurance does not 'pay' for such out-patient clinic appointments.

The benefits of pre-assessment clinics have been well documented and this is reflected in our study in the low DNA rates for both pre-assessment and procedures.[15, 27, 36-41, 43, 45] Only eight units reported how many patients were deemed unsuitable for day surgery following pre-assessment and this was < 10%. It is worth noting that in some hospitals patients were seen in out-patient clinics and when the decision for day surgery was taken, the patient was assessed immediately in the pre-assessment clinic thus negating the need for additional appointments.

Currently nurses manage pre-assessment. There is potential here to develop nurse-led pre-assessment as part of a team approach to day surgery. This could be achieved with the strong support of a consultant surgeon and the development of management protocols. Nurse-led services are now well established and recognised in many areas where clinical nurse specialists or advanced nurse practitioners provide high quality healthcare to patients.[89-92]

Patient information leaflets (PILs) are important in providing written information to support oral information and preparing patients for their procedures. Almost 100% of units provided both pre-procedure leaflets and post-operative written information. It was encouraging that most units were working towards making more leaflets procedure specific. Compared to those undergoing traditional surgery, patients undergoing day surgery have an increased responsibility for their preoperative preparation and their recovery from surgery at home.[12] Therefore, provision of appropriate information about all phases of the surgical process is important, not only to ensure the success of the procedure but also for patient safety.[12]

3.6.4 DNA Rates

The 'did not attend' (DNA) and 'stay-in' rates are proposed as being important indicators of good management.[11] These rates have implications for resources and planning of operating lists. Only 22% of units provided DNA procedure rates and whilst low at <5%, this was often cited as being an estimate, while the majority of hospitals did not know these rates or did not answer. Stay-in rates were < 10%. It is not possible to comment on the magnitude of this rate but it may be explained by previous comments in which the lack of dedicated day surgery theatres results in higher stay-in rates.

3.6.5 Follow-up

Unanticipated admission after day surgery can be a good indicator of quality as it concerns the basic goals of same day discharge. The return admission rates in our survey of < 3% compare favourably with rates in other surveys with rates ranging from 0.3% to 9.5%.[93-94] Studies have shown that unplanned admissions following surgery can be decreased through the use appropriate clinical pathways.[95] This latter study showed that pathway implementation was associated with an increase in same-day discharges from 21% to 72% for laparoscopic cholecystectomy.[95]

Patient satisfaction surveys were performed by the majority of units and only two units followed patients for adverse events. Many studies have demonstrated that day surgery is a safe approach when all the recommended guidelines and organisational principles of day surgery programme are followed.[12] Knowledge of adverse event rates at a local and national level may help in convincing some surgeons of the safety and potential benefits of day surgery versus in-patient surgery.

Internationally, barriers to expansion of day surgery have been well documented. These include regulatory, economic, educational, facility design, local home and community support, information and organisational.[12] The identification of barriers to provision of day surgery in Ireland are in keeping with international barriers and provide valuable insight to areas in which improvements can be made. Some of the barriers to provision of day surgery found by the UK Audit Commission[11] in its original report on day surgery in 1990 still apply today such as clinician's preferences for inpatient surgery. It is reassuring that many of these barriers are not insurmountable, even in the current economically constrained environment.

The most notable areas for improvement are: provision of pre-operative assessment, reminding patients of their procedure appointments and collection of data on adverse events, stay-in-rates and readmission rates.

3.7 Summary

The national provision of day surgical services has been outlined in detail through this survey. The findings are consistent with other studies in that there is great variation in the provision of services across our hospitals. Overall however, there is a need for improvement in the provision of pre-assessment, reduction in stay-in-rates and monitoring of adverse events across most surveyed hospitals.

Chapter 4.

Retrospective chart analysis of day surgery practices in two hospitals

4.1 Demographics

The patient demographics from each hospital were found to be very similar, with only slight variation in the male to female ratio. Seventy one percent (n = 71) of the patients were male in hospital A compared to 50% (n = 50) in hospital B. The mean age of the patients in each hospital was identical at 46.1 years, and the mean distance travelled by patients to get to the hospital varied only by 3 Km. Table 7 demonstrates the patient demographics in each hospital.

Table 7. Patient demographics

	Hospital A	**Hospital B+C**
Male (%)	71	50
Female (%)	29	50
Mean age (years) [Median]	46.1 +/- 16.3 [45]	46.1 +/- 15.2 [43]
Mean distance travelled to hospital (Km)	14.8 +/- 12.4	17.8 +/- 30.2

The age groups of patients who underwent their surgery in the two hospitals was also similar, with patients in the age group of 30-40 years being the most common in hospital A, accounting for 24% (n = 24) of the patients. In hospital B, patients in the age group of 40-50 years were the most common accounting for 27% (n =27) of patients. Figure 2 demonstrates further breakdown of patient age groups in each hospital and figure 3 demonstrates patients ASA classification in each hospital.

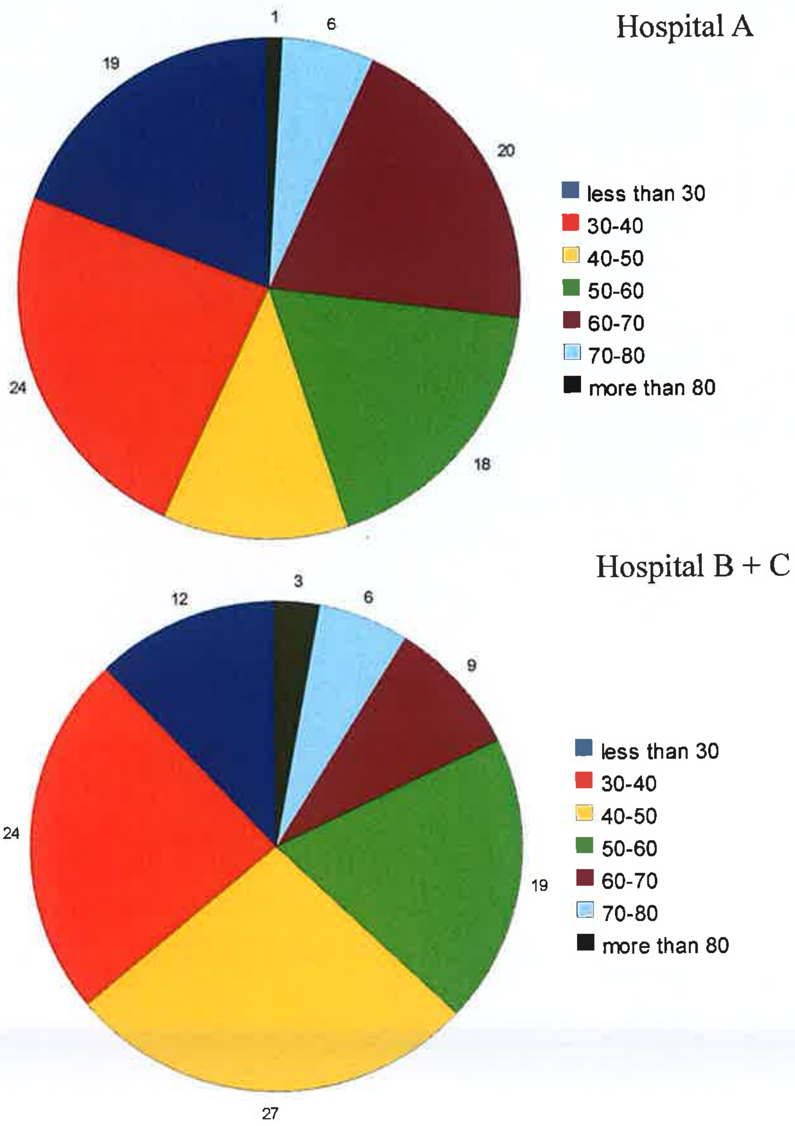
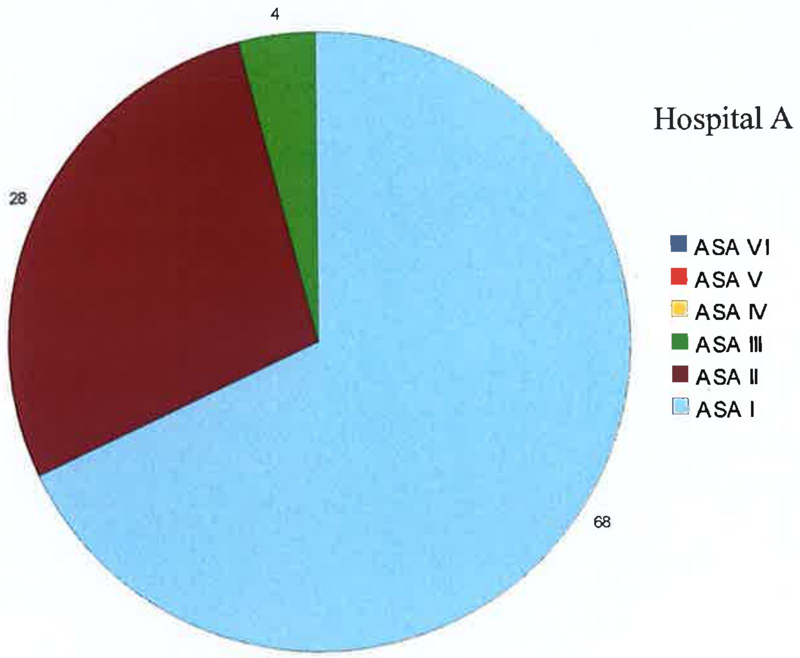


Figure 3. Percentage breakdown of patients according to age group.



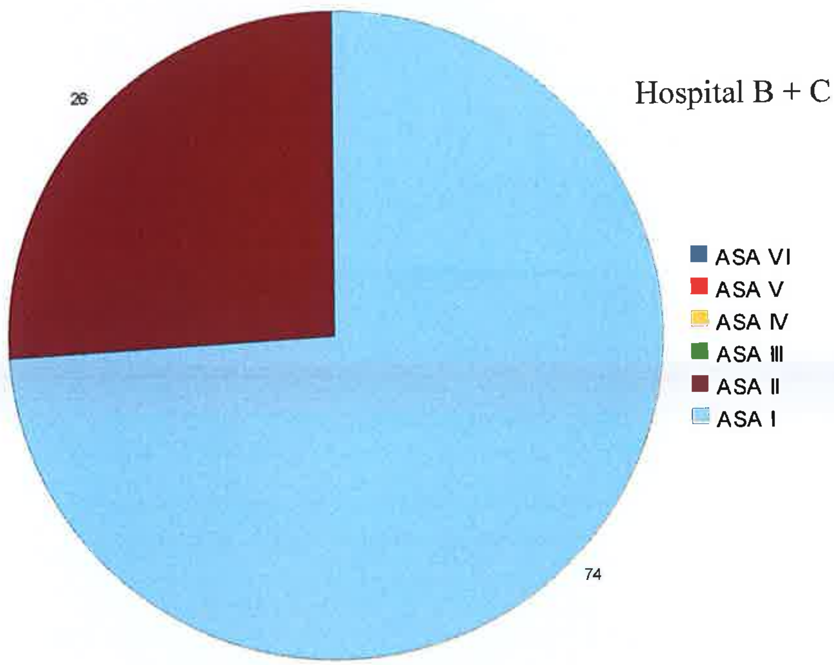


Figure 4. Percentage breakdown of patients ASA classification in each hospital.

4.2 Procedures

The most common procedure performed in hospital A during the period was open unilateral inguinal hernia repair which comprised 35% (n = 35) of the cases. Of the 100 charts selected for review between hospital B and hospital C, 31% (n =31) of the cases were performed in hospital B and 69% (n = 69) performed in hospital C. The most common procedure performed in hospital B was circumcision which accounted for 35% (n = 11) of the cases, and the most commonly performed procedure in hospital C was varicose veins surgery with accounted for 49% (n = 34) of the cases. The breakdown of distribution of cases performed in each hospital is demonstrated in Table 8.

Table 8. Distribution of cases performed in each hospital.

Cases	Hospital A (%)	Hospital B (%)	Hospital C (%)
Laparoscopic cholecystectomy	26 (n = 26)	0 (n = 0)	20 (n = 14)
Varicose veins surgery	17 (n = 17)	0 (n = 0)	49 (n = 34)
Lapaparoscopic inguinal hernia repair	7 (n = 7)	6 (n = 2)	0 (n = 0)
Open inguinal hernia repair	36 (n = 36)	32 (n = 10)	10 (n = 7)
Circumcision	11 (n = 11)	35 (n = 11)	14 (n =10)
Haemorrhoidectomy	3 (n = 3)	0 (n =0)	6 (n = 4)
Excision of breast lump	0 (n = 0)	26 (n = 8)	0 (n = 0)

4.3 Referral sources and waiting times

The referral sources of patients to the surgical out patients included:

1. General practitioners
2. In-patients department (patients that have been admitted through the emergency department for treatment, who are then discharged and brought back to the surgical OPD for evaluation and are then arranged to have surgery).
3. Same team OPD (patients that have attended the surgical OPD on at least one previous occasion and were being investigated for ongoing symptoms, were diagnosed, and are on the last OPD visit arranged to undergo surgery).
4. Other team OPD (patients that have been attending a different team OPD on at least one previous occasion, were being investigated for ongoing symptoms, were diagnosed and are referred to the surgical OPD where they are arranged to undergo surgery).
5. Emergency department (ED) (these are patients that presented to the ED with symptoms which did not warrant in-patient admission. Instead their symptoms were treated and they were referred to surgical OPD for further assessment and were then arranged for surgery).
6. Operating theatre (OT) (These patients have previously attended the surgical OPD on at least one occasion, been diagnosed and undergone a surgical procedure, are brought back for review in the surgical OPD and arranged for a further procedure. They would include patients with varicose veins surgery who are to undergo surgery on the other leg, or re-excision of breast lumps).

In both hospitals the majority of patients were referred to the surgical OPD by their GPs. This accounted for 67% (n =67) and 71% (n = 71) in hospitals A and B respectively. Figure 5 demonstrates the referral sources according to hospital.

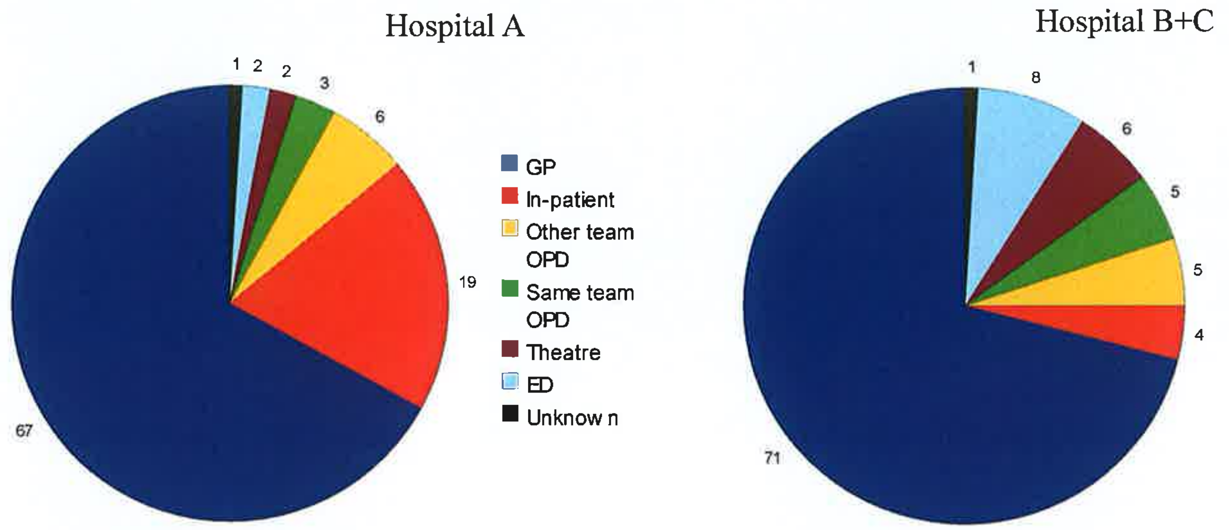


Figure 5. Percentage breakdown of referral sources to each hospital

4.4 Waiting times

The outpatient waiting time was not applicable (N/A) in 20% (n = 20) of patients in hospital A. These were patients that were either already attending the same team OPD (3%), those that were referred directly from in-patients for their surgery without an OPD visit in between (15%) or patients that were referred from one surgery to another without an OPD visit in between (2%). In 4% (n = 4) of cases from hospital A, the waiting time from first referral until surgical OPD visit could not be obtained due to missing or undated referral notes. In the remaining 76% (n = 76) of patients in hospital A, the mean out-patients waiting time was 66.2 days.

For hospital B, the out patients waiting time was N/A in 9% (n = 9) of cases. These were patients that were either attending the same team OPD (5%) were seen in the ED by the surgical team (but not admitted) and referred for surgery (2%) or referred from one surgery to another without an OPD visit in between (2%). In 2% (n = 2) of cases from hospital B, the waiting time from first referral until surgical OPD could not be obtained due to missing or undated referral notes. In the remaining 89% (n = 89) of patients in hospital B, the mean out-patients waiting time was 74.5 days. Table 9 demonstrates further breakdown of out patient waiting times for each of the hospitals.

Table 9. Out patient waiting times in each hospital.

	Hospital A (days)	**Hospital B (days)**
Overall mean waiting time	66.2 +/- 40.5	74.5 +/- 51.1
Overall median waiting time	55	67
Majors mean waiting time	70.6 +/- 43.8	82.1 +/- 50.1
Majors median waiting time	58	74
Intermediates mean waiting time	34.5 +/- 13.2	60.3 +/- 50.7
Intermediates median waiting time	50	28
Unknown or N/A	24 (6 intermediate and 18 major)	11 (4 intermediate and 7 major)

The procedure with the shortest out-patient waiting time in hospital A was laparoscopic inguinal hernia repair with a mean waiting time of 46.1 days for patients to be seen in surgical OPD from first referral. The procedure with the longest out-patient waiting time in hospital A was varicose veins surgery with mean waiting time of 77.1 days. The procedure with the shortest out-patient waiting time in hospital B was excision of breast lump with a mean waiting time of 15.8 days, and the procedure with the longest out-patient waiting time was varicose veins surgery with a mean waiting time of 92.0 days. Figure 6 demonstrates the mean waiting times for each procedure in each hospital for further comparison.

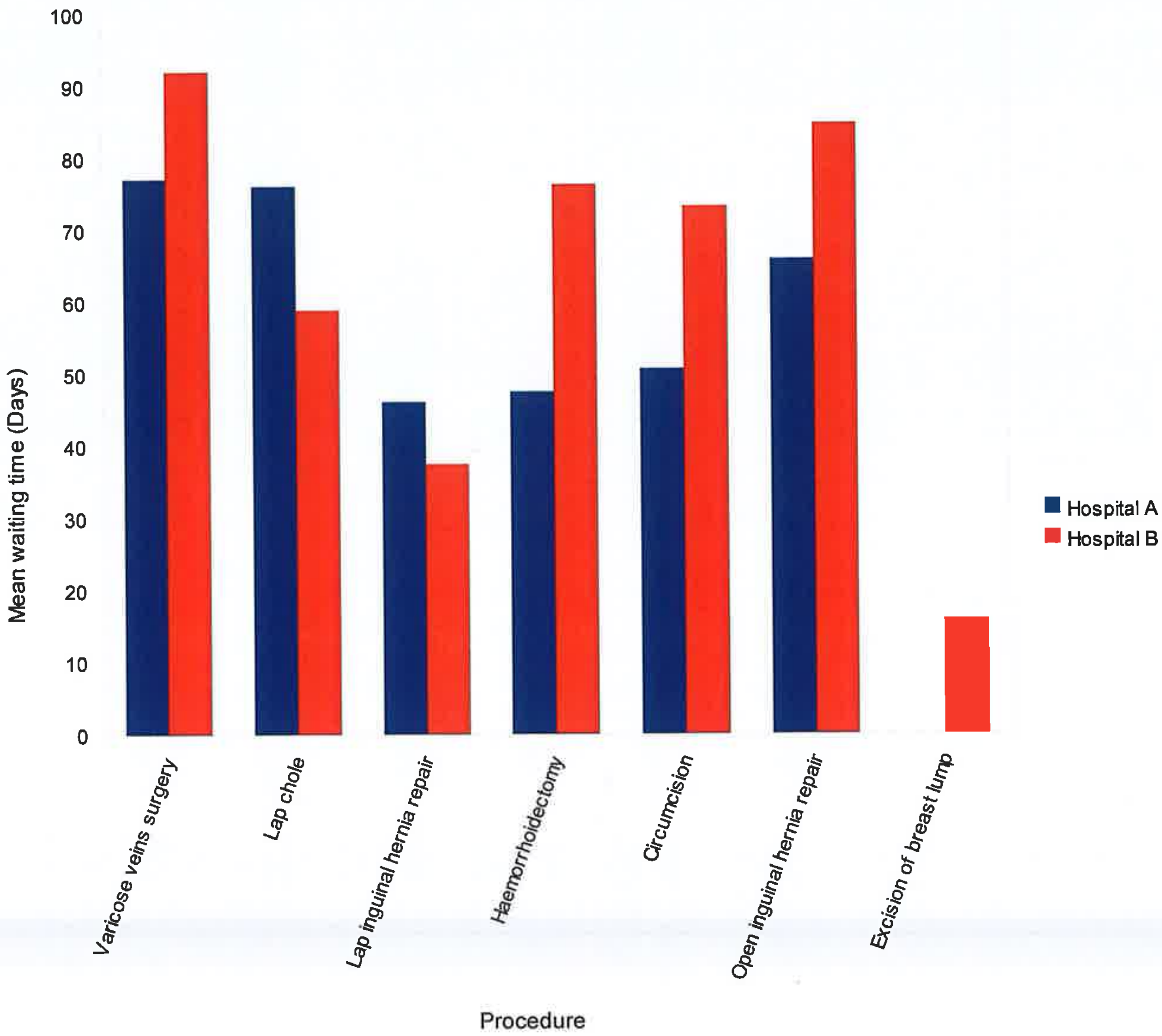


Figure 6. Mean out-patient waiting times for procedures in each hospital.

The in-patient waiting time for patients in hospital A was N/A in 7% (n = 7) of cases. These were patients that were either referred directly from the in-patient department for surgery or from one surgery to the next without an OPD visit in between. In 2% (n = 2) of cases from hospital A, the in-patient waiting time could not be obtained due to missing first OPD note. In the remaining 91% (n = 91), the mean waiting time was 102.9 days.

In hospital B, the in-patient waiting time for 1% (n = 1) of patients could not be obtained due to missing first OPD visit notes. In the remaining 99% (n = 99) the mean in-patient waiting time was 84.3 days. Table 10 demonstrates further breakdown of in-patient waiting times for the two hospitals.

Table 10. In-patient waiting times in each hospital.

	Hospital A (days)	**Hospital B (days)**
Overall mean waiting time	102.9 +/- 93.8	84.3 +/- 88.6
Overall median waiting time	76	51
Majors mean waiting time	107.2 +/- 96.9	98.6 +/- 87.3
Majors median waiting time	76	76
Intermediates mean waiting time	88.8 +/- 83.1	58.2 +/- 86.1
Intermediates median waiting time	49	27
Unknown or N/A	9 (0 intermediate and 9 major)	1 (0 intermediate and 1 major)

In hospital A the procedure with the shortest mean in-patient waiting time was circumcision with a mean waiting time of 58.7 days. In hospital B, the procedure with the shortest mean in-patient waiting time was open inguinal hernia repair with mean waiting time of 32.1 days. The procedure with the longest mean in-patient waiting time for both hospitals was was varicose veins surgery

with mean waiting time of 173.5 days in hospital A and 141.4 days in hospital B. Further breakdown of mean in-patient waiting times for the different procedures in the two hospitals is demonstrated in Figure 7.

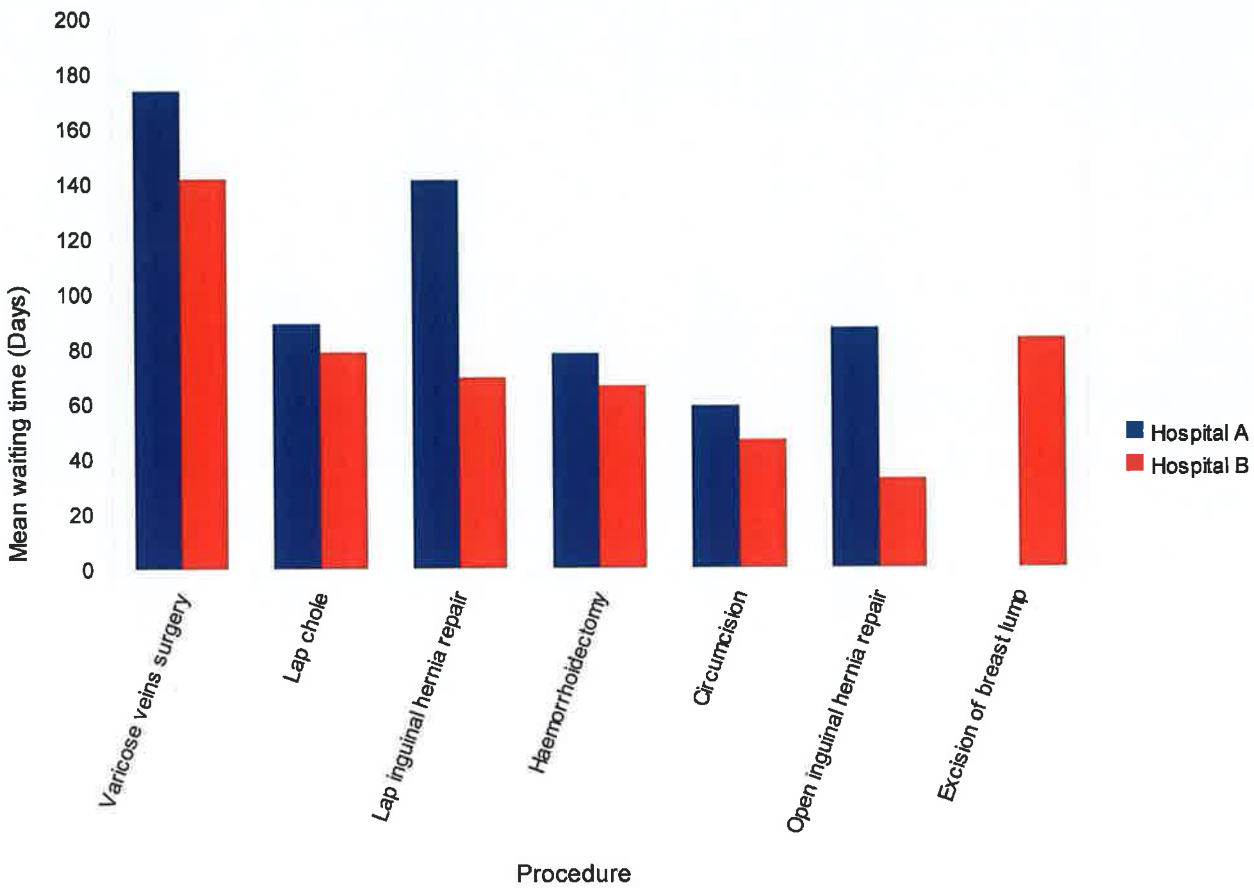


Figure 7. Mean in-patient waiting times for the different procedures in each hospital.

4.5 Assessing doctor in surgical OPD

The results indicated that 16% (n = 16) of the patients in hospital A were not seen in the surgical OPD prior to their surgery (these were patients that were either referred directly from the in patient service for surgery or those that were referred from one surgery to the next). This accounted for 2% (n = 2) of patient in hospital B. Of the remaining patients (n = 84 in hospital A and n = 98 in hospital B), 44% (n

= 37) in hospital A and 68% (n = 67) in hospital B were seen by consultants. In hospital A 50% (n = 42) of patients were seen by registrars, compared to 22% (n = 22) in hospital B. The remaining patients were seen by the Senior House Offices (SHO) in each hospital. Table 11 outlines the assessing doctors in each hospital.

Table 11. Assessing doctors in surgical out patients.

Assessing doctor in OPD	**Hospital A (%)**	**Hospital B (%)**
Consultant	44	67
Registrar	50	22
Senior House Officer	6	9

4.6 Pre-operative investigations

Pre-operative investigations were performed on 53% of patients in hospital A and 43% of patients in hospital B, with patients of ASA class I and II being more likely to undergo pre-operative investigations in hospital A than hospital B. Table 12 demonstrates the pre-operative investigations performed according to hospital and ASA score.

Great variation was noted in the location in which the pre-operative investigations were performed. While 76% (n = 41) of patients in hospital A had their investigations on the ward on the day of their admission and 24% (n = 13) had their investigations in OPD, in hospital B 67% (n = 29) of patients had their investigation in OPD, 16% (n = 7) had their investigation on the ward and 16% (n = 7) had their investigations in pre-assessment clinics.

Table 12. Pre-operative investigation according to hospital and ASA score.

Pre-operative investigations Intermediate procedures	Hospital A			Hospital B+C		
	ASA I	ASA II	ASA III	ASA I	ASA II	ASA III
None	94% (n = 15)	66% (n= 2)	0% (n = 0)	83% (n =24)	17% (n = 1)	N/A
Blood tests	0% (n = 0)	33% (n = 1)	67% (n = 2)	14% (n = 4)	33% (n = 2)	N/A
ECG	6% (n = 1)	33% (n = 1)	100% (n = 3)	10% (n = 3)	83% (n = 5)	N/A
X-ray	0% (n = 0)	33% (n = 1)	67% (n = 2)	3% (n = 1)	17% (n = 1)	N/A
Pre-operative investigations Major procedures						
None	47% (n = 25)	20% (n = 5)	0% (n = 0)	56% (n = 25)	35% (n = 7)	N/A
Blood tests	49% (n = 26)	76% (n = 19)	100% (n = 2)	36% (n = 16)	60% (n = 11)	N/A
ECG	43% (n = 23)	80% (n = 20)	100% (n = 2)	24% (n = 11)	45% (n = 9)	N/A
X-ray	21% (n = 11)	52% (n = 13)	100% (n = 2)	7% (n = 3)	30% (n = 6)	N/A

It was noted that in both hospitals, patients due to undergo major surgery who were seen by consultants in the surgical OPD underwent less pre-operative investigations compared to those being seen by non-consultants. Figure 8 and 9 demonstrate pre-operative investigations for ASA class I and II patients undergoing major procedures in hospital A, while figure 10 and 11 demonstrate pre-operative investigations for ASA I and II patients undergoing major procedures in hospital B+C.

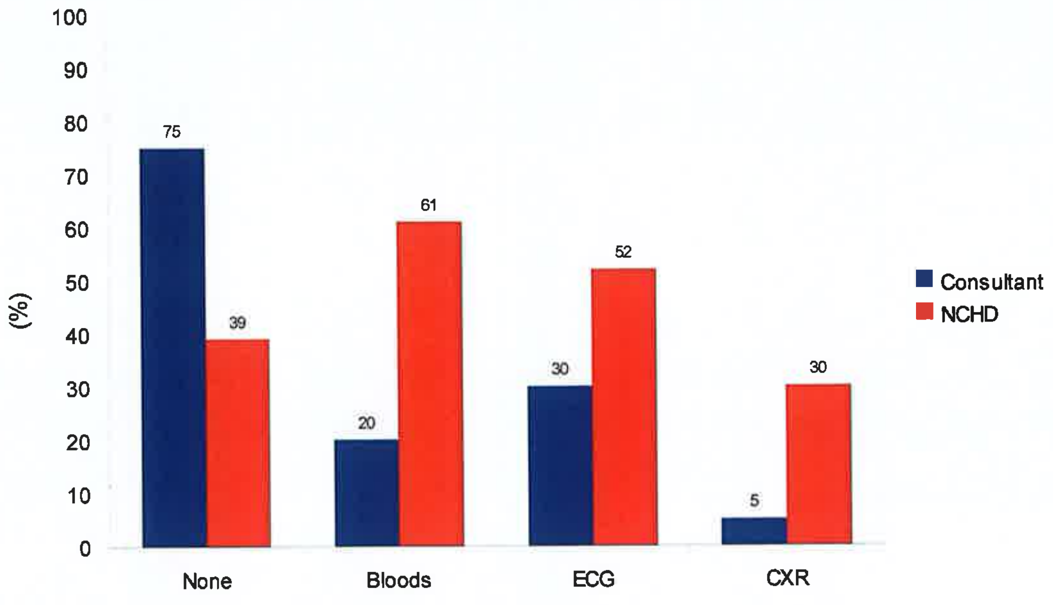


Figure 8. Pre-operative investigations for ASA I patients undergoing major surgery in hospital A.

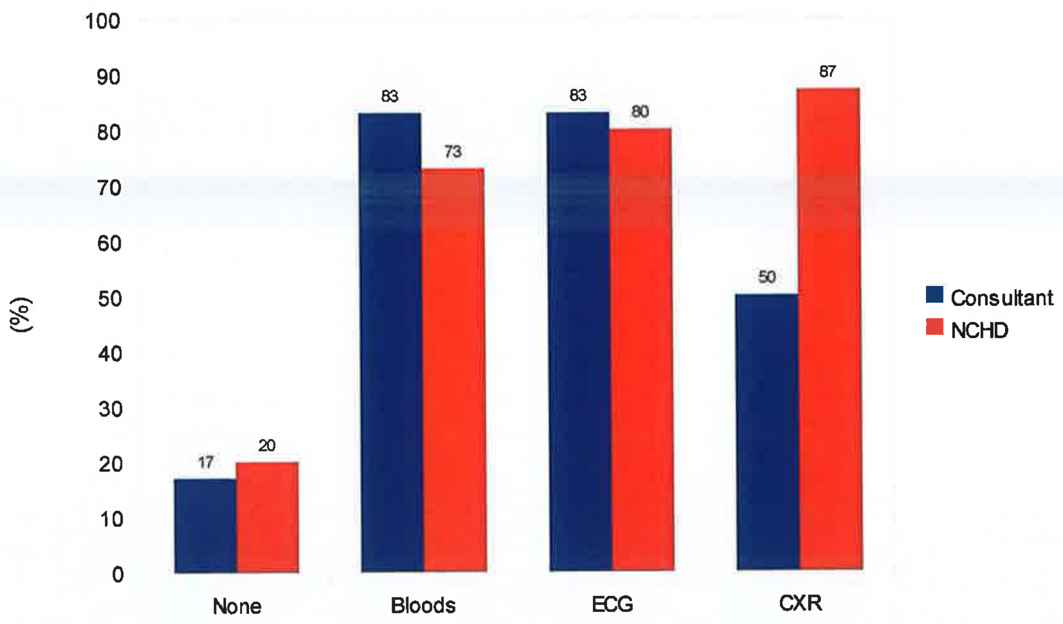


Figure 9. Pre-operative investigations for ASA II patients undergoing major surgery in hospital A.

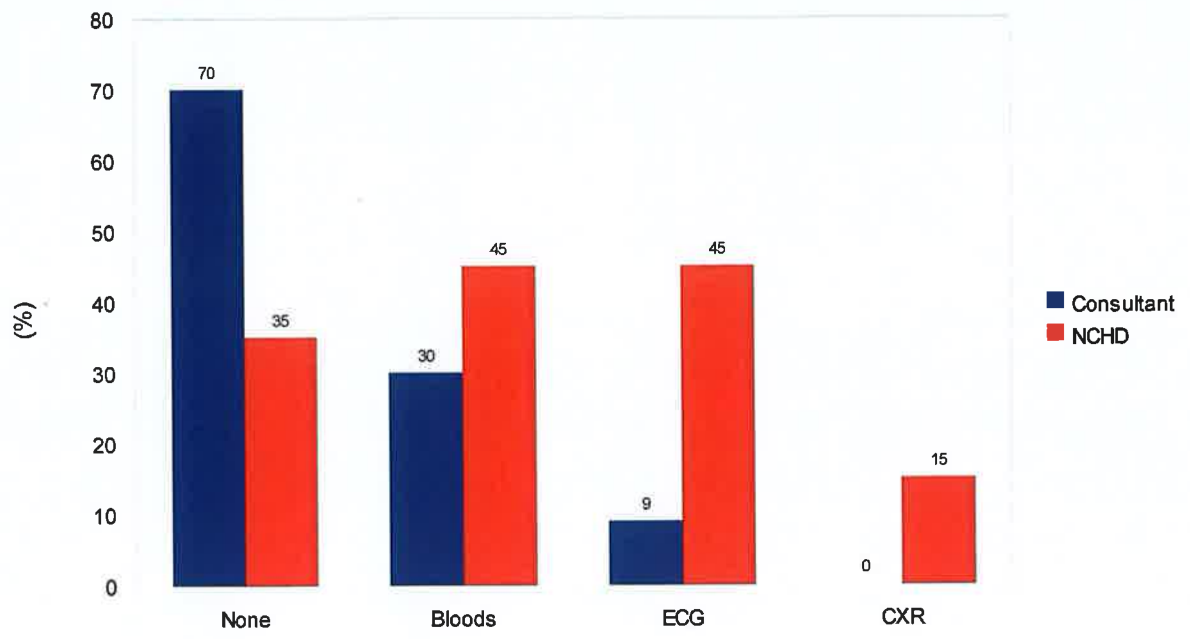


Figure 10. Pre-operative investigations for ASA I patients undergoing major surgery in hospital B+C.

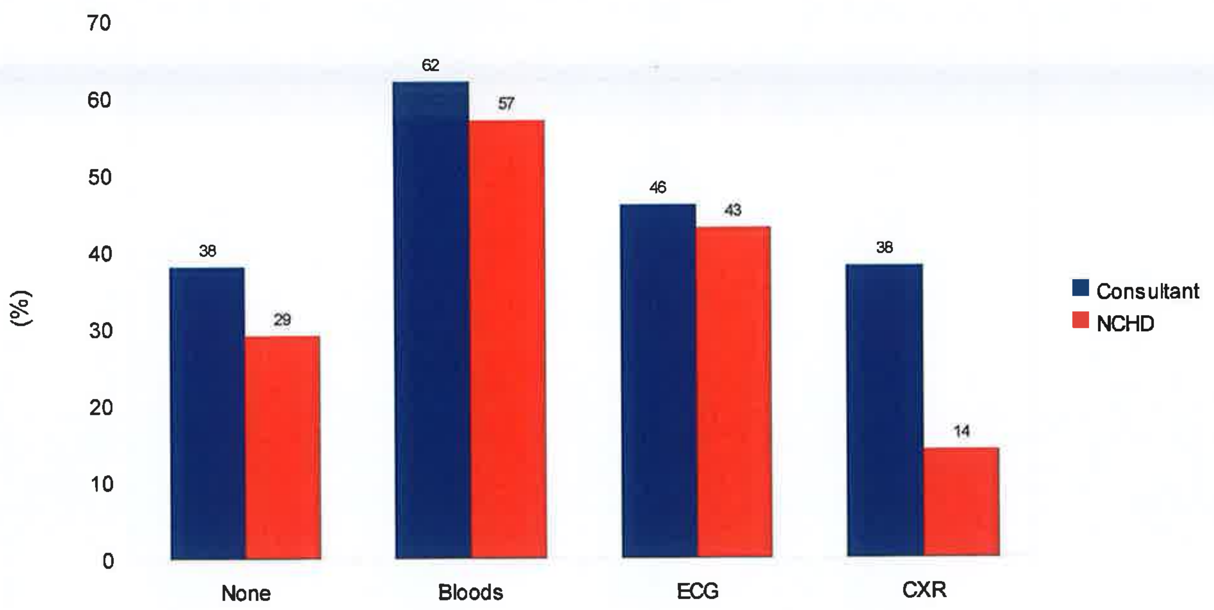


Figure 11. Pre-operative investigations for ASA II patients undergoing major surgery in hospital B+C.

For patients due to undergo intermediate surgery, consultants and non-consultants requested few pre-operative investigations. Figure 12 and 13 demonstrates pre-operative investigations requested by different grade doctors in hospital A, while figure 14 and 15 demonstrates the same data for hospital B and C.

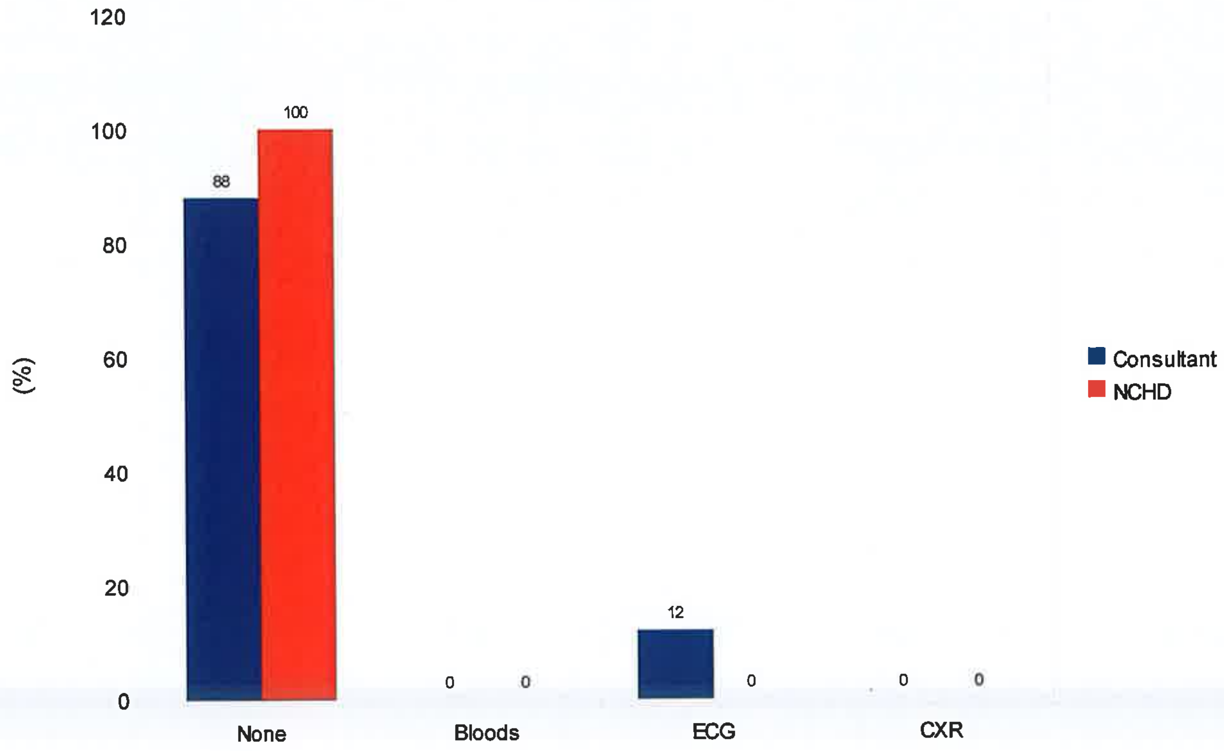


Figure 12. Pre-operative investigations for ASA I patients undergoing intermediate surgery in hospital A

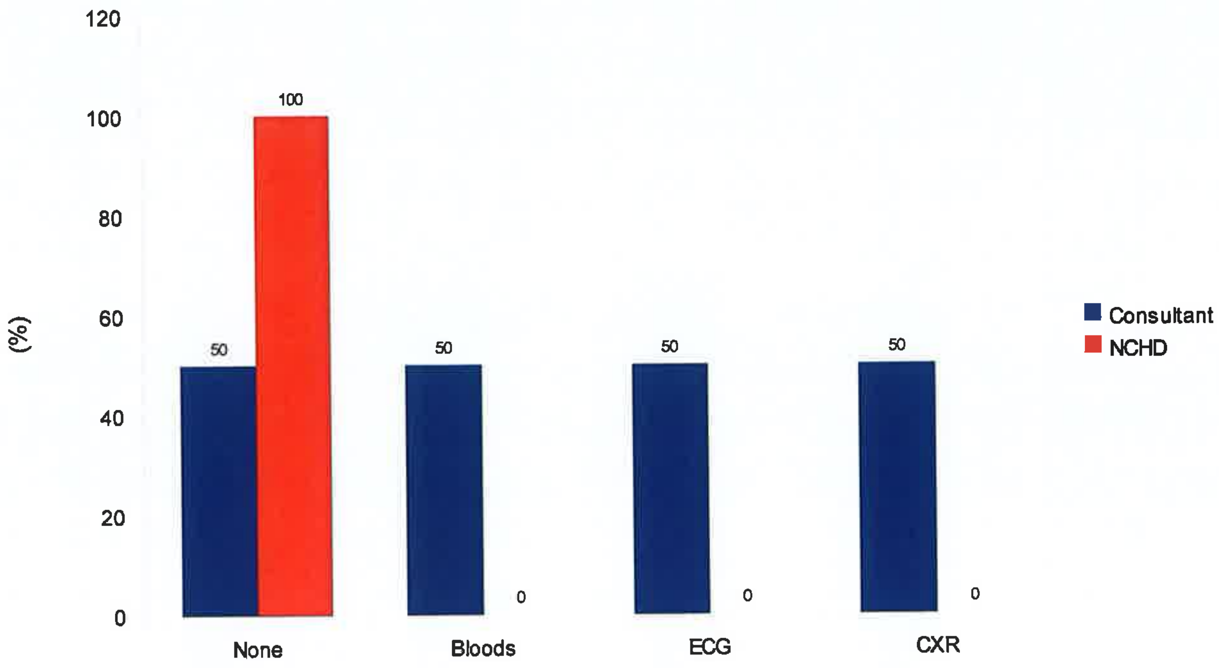


Figure 13. Pre-operative investigations for ASA II patients undergoing intermediate surgery in hospital A.

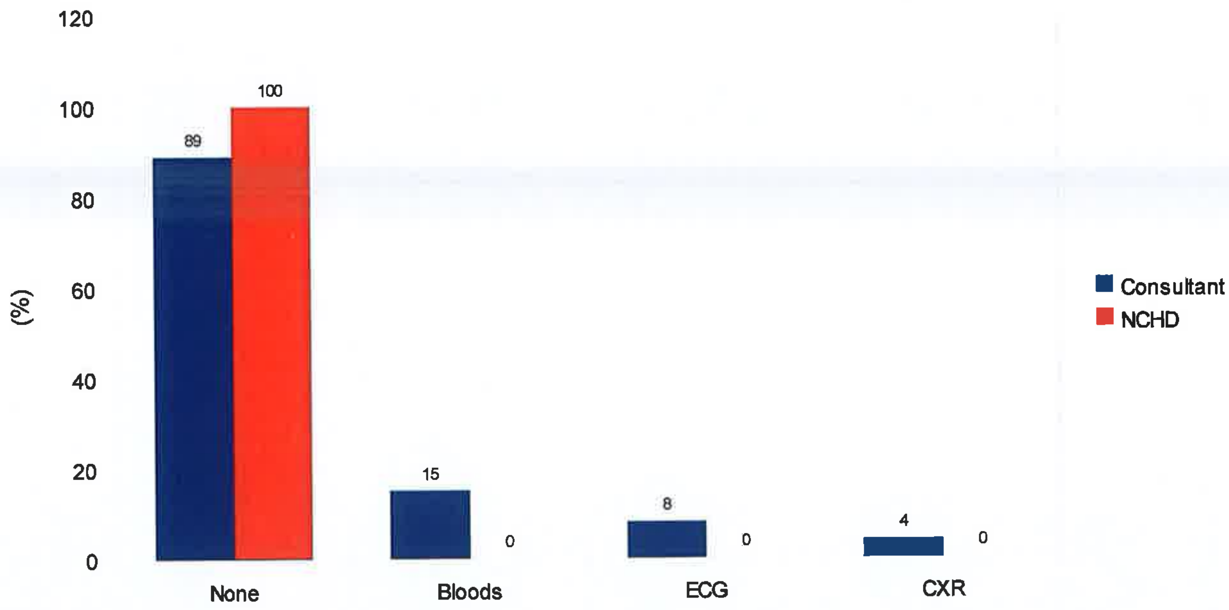


Figure 14. Pre-operative investigations for ASA I patients undergoing intermediate surgery in hospital B+C.

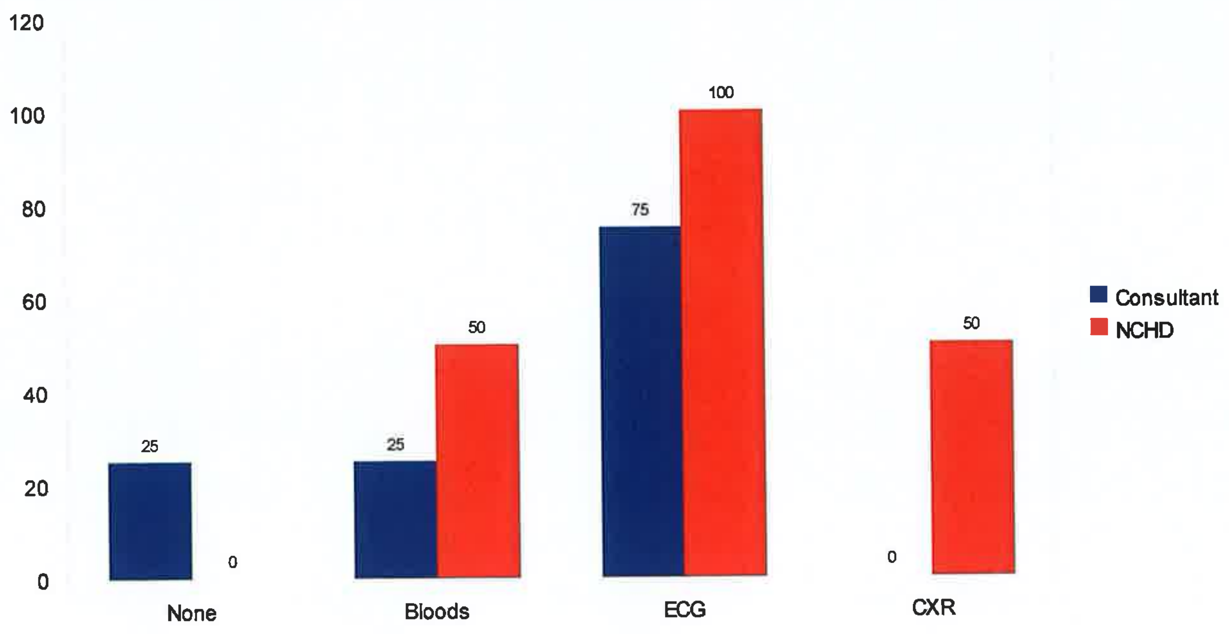


Figure 15. Pre-operative investigations for ASA II patients undergoing intermediate surgery in hospital B+C

4.7 Pre-operative investigations and conformity with NICE guidelines

In hospital A, there were 16 patients of ASA class I who underwent intermediate procedures. Of these 50% (n = 8) were seen by consultants in surgical OPD, 31% (n = 5) were seen by non-consultants and 19% (n = 3) did not attend the surgical OPD. All investigations requested for these patients conformed with the NICE guidelines. There were 49 ASA I patients in hospital A who underwent major procedures, 41% (n = 20) were seen by consultants, 41% (n = 20) by registrars and 18% (n = 9) were not seen in OPD prior to their operation. Pre-operative investigations for these patients conformed with NICE guidelines in 95% (n = 19) of those seen by consultants, 60% (n = 12) of those seen by non-consultants and 30% (n = 3) of those not seen in surgical OPD.

In hospital B and C there were 29 ASA class I patients that underwent intermediate procedures, 93% (n = 27) of these patients were seen by consultants in surgical OPD and 7% (n = 2) by registrars. Pre-operative investigations conformed with NICE guidelines in 85% (n = 23) of those seen by consultants, and 100% (n = 2) of those seen by non-consultants. In 38% (n = 11) of cases patients were referred to pre-assessment, 85% (n = 9) of whom underwent investigations as recommended by NICE guidelines. There were 45 patients of ASA I who underwent major procedures in hospital B and C, 51% (n = 23) of whom were seen by consultants in surgical OPD, 44% (n = 20) by non-consultants, and 4% (n = 2) who did not attend surgical OPD prior to surgery. Pre-operative guidelines conformed with NICE guidelines in 97% (n = 22) of those seen by consultants, 65% (n = 13) of those seen by registrars and 100% (n = 2) of those not seen in surgical OPD prior to surgery. Of all the ASA I patients in hospital B and C who underwent major procedures, 18% (n = 8) underwent pre-assessment, all of whom underwent pre-operative investigations that conformed with NICE guidelines.

4.8 Planned rates of day surgery

Patients attending surgical OPD in hospital A were arranged for day surgery in 58% (n = 58) of cases, in-patients surgery in 36% (n =36) and the type of surgery not specified in 6% (n = 6) of cases. Patients seen by consultants were arranged for day surgery in 81% (n = 30) of cases, those seen by non-consultants were arranged for day surgery in 51% (n = 24) of cases and those who did not attend surgical OPD were arranged for day surgery in 25% (n = 4) of cases. In patients for whom the type of surgery was specified, the decision made regarding day- or in-patient surgery remained unchanged in 97% (n = 36) of patients seen by consultants, 96% (n = 45) of patients seen by non-consultants and 87% (n = 14) of those who did not attend surgical OPD. Of the patients who did not have the type of surgery specified, 17% (n = 1) were seen by consultants and 83% (n = 5) by non-consultants. From the total 16 patients that did not attend surgical OPD prior to their surgery, 25% (n = 4) were arranged to have day surgery with the remaining 75% (n = 12) arranged for in-patients surgery, 17% (n = 2) had the type of surgery changed from in-patient to day surgery on the day of their procedure.

Patients attending surgical OPD in hospital B were arranged for day surgery in 34% (n = 34) of cases, in-patient surgery in 4% (n = 4) of cases and the type of surgery unspecified in 62% (n = 62) of cases. Patient seen by consultants were arranged for day surgery in 39% (n = 26) of cases, those seen by non-consultants in 25% (n = 8) of cases and those who did not attend surgical OPD arranged for day surgery in 0% (n = 0) of cases. In patients who's type of surgery was specified, it remained unchanged in 97% (n = 37) of cases, with only one patient seen by non-consultant who had arranged a patient to undergo day surgery having it changed to in-patient surgery on the day of the operation. Of the 62% (n = 62) patients who did not have the type of surgery specified, 24% (n = 15) underwent day surgery with the remaining 76% (n = 47) having in-patient surgery. Consultants notes accounted for 63% (n = 39) of not specified types of surgery in hospital B, with non-consultants notes accounting for 34% (n = 21) and those who did not attend OPD the remaining 3% (n = 2).

Patients that were seen in hospital B and arranged for their surgery in hospital B, were arranged for day surgery in 77% (n =24) of cases, in-patient surgery in 3% (n = 1) and type of surgery not specified in 19% (n = 6) of cases. In comparison, patients that were seen in hospital B and arranged to undergo their surgery in hospital C were arranged for day surgery in 14% (n = 10) of cases, in-patient surgery in 4% (n = 3) and the type of surgery unspecified in 81% (n = 56) of cases. Figure 16 demonstrates the percentage of patients that were arranged for day-, in-patient and unspecified type of surgery on their arrival to each hospital.

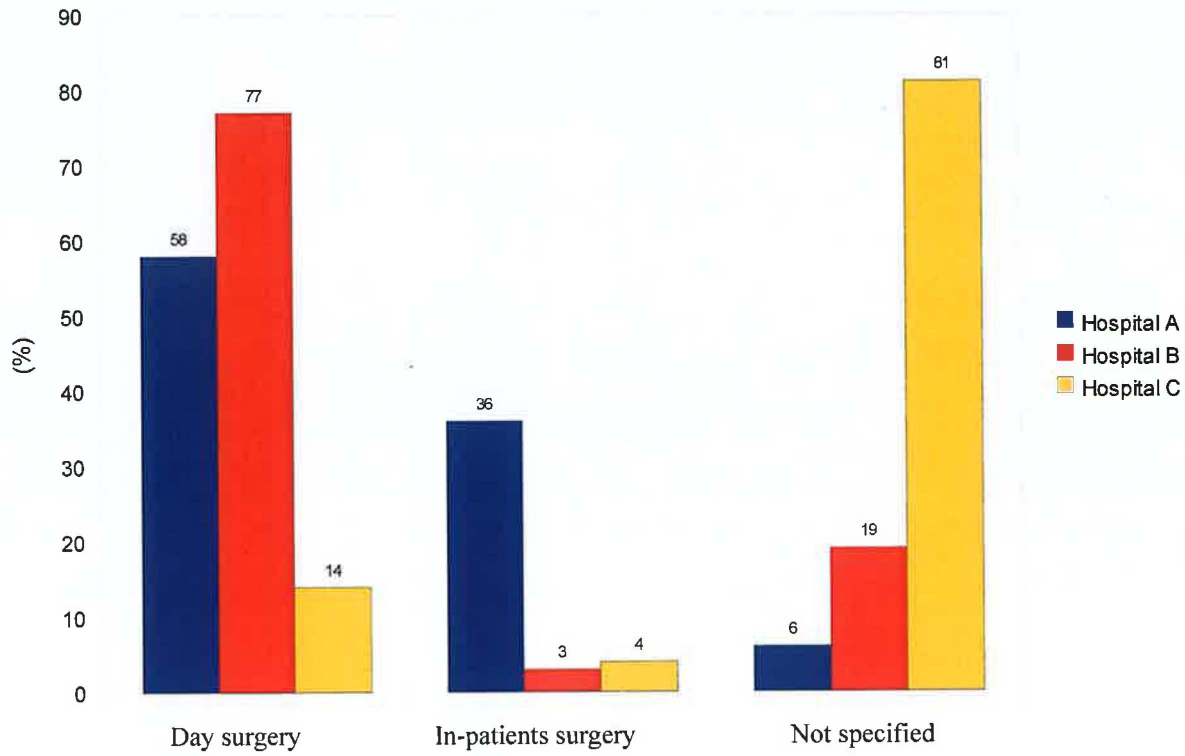


Figure 16. Percentage of patients that were arranged for day-, in-patient and unspecified type of surgery on their arrival to each hospital.

4.9 Pre-assessment

There were no formal pre-assessment services in hospital A, therefore no patients were seen specifically for purposes of pre-assessment. A note was made however of one case in which the assessing clinician in surgical OPD discussed the patients case with a consultant anaesthetist to ensure patients fitness for general anaesthesia and that they were optimised for it.

The results indicated that 25% (n = 25) of patients referred from hospital B for surgery had pre-assessment, 88% (n = 22) of whom were arranged for day-surgery, 0% in-patient surgery and 12% (n = 3) the type of surgery was unspecified. The vast majority of the patients referred for pre-assessment were ASA I patients at 76% (n = 19), with the remaining 24% (n = 6) being ASA II patients. Patients undergoing major surgery accounted for 40% (n = 10) of the pre-assessed patients with those undergoing intermediate surgery accounting for the remaining 60% (n = 15). It was also noted that 81% (n = 24) of patients seen in hospital B who also had their surgery in hospital B had pre-assessment compared to 1% (n = 1) of patients seen in hospital B who underwent their surgery in hospital C.

In all cases pre-assessment was carried out by nursing staff. This took place either in a clinic or over the phone. Where appropriate, patients were referred for pre-anaesthetic assessment which always took place in a clinic. It was noted that 72% (n = 18) of pre-assessment took place in a clinic and 28% (n = 7) over the phone with 20% (n = 5) of pre-assessed patients being referred to pre-anaesthetic clinic, 20% (n = 1) of whom were ASA class I patients and 80% (n = 4) ASA class II.

The results indicated that 36% (n = 9) of pre-assessment took place on the same day as surgical OPD. The mean waiting time from surgical OPD until pre-assessment in the remaining 64% (n = 16) of pre-assessed patients was 53 +/- 94 days, with a median of 23 days. The mean waiting time from pre-assessment until surgery was 19 +/- 40 days with a median of 6 days. In one case the waiting time from first pre-assessment until surgery was longer than three months and a further over the phone pre-assessment took place two weeks prior to the arrange surgery date.

4.10 Provision of date for surgery

In 18% (n = 18) of cases, patients seen in hospital A were given their date for surgery while they attended the hospital. In the remaining 82% (n = 82) the patients were contacted at a later date and informed of the date of their surgery. Similarly in hospital B, 33% (n = 33) of patients received the date for their surgery while attending the hospital, with the remaining 67% (n = 67) of patients being contacted at a later date to be informed of their surgery date. Table 13 outlines further breakdown of when patients attending the different hospitals where informed of the date of their surgery.

Table 13. When patients were informed of their surgery date.

	Hospital A (%)	Hospital B+C (%)
Surgical OPD	8	8
As in-patients	9	0
After one surgery	1	2
Pre-assessment	0	23
By telephone after hospital attendance	82	67

4.11 Delays and Cancellations

In hospital A there was a 4% (n = 4) cancellation rate. Seventy five percent (n = 3) of the cancellation was due to bed shortages and 25% (n = 1) due to patient factors (patient was on anticoagulant that should have been stopped pre-operatively and was not). There were no cancellations recorded for patients undergoing their surgery in hospital B and C.

4.12 Pre-operative Length of Stay

The pre-operative LOS was represented as the time from when the patients were first seen on the day of admission, until the patient is anaesthetised in the operating room. In hospital A the total pre-operative LOS for the 100 elective patients was 369 hours. Of the total 100 patients, 15% (n = 15) were admitted to the hospital the night before their operation. These accounted for 57% (n = 209.5 hours) of the total pre-operative LOS. The remaining 85% (n = 85) of patients were admitted on the day of their procedure and they accounted for 43% (n = 159.5 hours) of the total pre-operative LOS. Table 14 demonstrates the total, mean and median pre-operative LOS for patients in hospital A.

Table 14. Pre-operative LOS for patients attending hospital A.

Pre-operative LOS	All patients	Admitted night before operation	Admitted on the day of operation
Total (h)	369	209.5	159.5
Mean (h)	3.69	14	1.9
Median (h)	1.5	14	1

The 15 patients that were admitted the night before their operation in hospital A were seen in the surgical OPD by consultants in 27% (n = 4), and by non-consultant in 40% (n = 6) of cases. In the remaining 33% (n = 5) there was no assessing doctor in surgical OPD as the patient was referred for surgery from another source (in-patient or theatre). The results indicated that 53.3% (n = 8) of the patients admitted the night before their operation were ASA class I, 33.3% (n = 5) were ASA class II and 14.3% (n = 2) were ASA class III. Of the patients admitted over night, 73% (n = 11) were to undergo laparoscopic cholecystectomy, 20% (n = 3) were due to undergo open inguinal hernia repair, and 7% (n = 1) were due to undergo varicose veins surgery.

The 85 patients that were admitted on the day of their operation in hospital A were seen by consultants in 39% (n = 33) and non-consultants in 48% (n = 41). In the remaining 13% (n = 11) there was no assessing doctor in OPD as the patient was referred directly for surgery from another source (in-patient or theatre). The ASA classification of the patients admitted on the day of their surgery was ASA I in 71% (n = 60), ASA II in 27% (n = 23) and ASA class III in 2% (n = 2) of cases. The planned surgical procedure for the patients who were admitted on the day of their surgery was laparoscopic cholecystectomy in 18% (n = 15), varicose veins surgery in 19% (n = 16), laparoscopic inguinal hernia repair in 8% (n = 7), open inguinal hernia repair in 39% (n = 33), circumcision in 13% (n = 11) and haemorroidecomy in 4% (n = 3) of cases.

In hospital B the total pre-operative LOS for the 100 elective patients was 228 hours. Of the total 100 patients, 1% (n = 1) were admitted to the hospital the night before their operation. These accounted for 7% (n = 16 hours) of the total pre-operative LOS. The remaining 99% (n = 99) of patients were admitted on the day of their procedure and they accounted for 93% (n = 212 hours) of the total pre-operative LOS. Table 15 demonstrates the total, mean and median pre-operative LOS for patients in hospital B.

Table 15. Pre-operative LOS for patients attending hospital B and C.

Pre-operative LOS	All patients	Admitted night before operation	Admitted on the day of operation
Total (h)	228	16	212
Mean (h)	2.28	16	2.1
Median (h)	2	N/A	2

The one patient that was admitted the night before their operation in hospital B was seen in the surgical OPD by a consultant, that patient was classified as ASA class II and underwent an open left inguinal hernia repair.

In hospital B, 99% (n = 99) of patients were admitted on the day of their operation. Consultants had been the assessing doctor for 67% (n = 66) and non-consultants the assessing doctor in 31% (n = 31) of these cases. In the remaining 2% (n = 2) there was no assessing doctor in OPD as the patient was referred directly from one operation to another without an OPD visit in between. The ASA classification of the patients admitted on the day of their surgery was ASA I in 75% (n = 74) and ASA

class II in the remaining 25% (n = 25). The planned surgical procedure for the patients who were admitted on the day of their surgery was laparoscopic cholecystectomy in 14% (n = 14), varicose veins surgery in 34% (n = 34), laparoscopic inguinal hernia repair in 2% (n = 2), excision of breast lump in 8% (n = 8), open inguinal hernia repair in 16% (n = 16), circumcision in 21% (n = 21) and haemorroidecomy in 4% (n = 4) of cases.

There were 25 patients in hospital B that were admitted on the day of their operation and had been pre-assessed prior to admission. The total pre-operative LOS for these patients was 42.5 hours with a mean of 1.7 hours and median of 1.5 hours.

4.13 Intra-operative

In hospital A, 40% (n = 40) of the surgical procedures were performed by consultants and 60% (n = 60) by registrars. Table 16 demonstrates the breakdown of different procedures performed by consultants and registrars in hospital A.

Table 16. Procedures performed by consultants and registrars in hospital A

	Consultant (%)	Registrar (%)	Total (%)
Lap Chole (%)	9 (35)	17 (65)	26 (100)
V. V. Surgery (%)	9 (53)	8 (47)	17 (100)
Lap Hernia (%)	7 (100)	0 (0)	7 (100)
Open Hernia (%)	4 (11)	32 (89)	36 (100)
Haemorrhoidectomy (%)	2 (66.6)	1 (33.3)	3 (100)
Circumcision (%)	9 (82)	2 (18)	11 (100)
Total (%)	40 (40)	60 (60)	100 (100)

The total duration of surgery (intra-operative LOS) for patients in hospital A was 144.5 hours. Table 17 demonstrates the breakdown of durations of surgery for the different procedures performed by consultants and registrars in hospital A.

Table 17. Duration of surgery in hospital A

a) Performed by Consultants

	Total duration (hours)	Mean (hours)	Median (hours)
Lap Chole	17.5	1.9	2
V. V. surgery	12.5	1.4	1.5
Lap Hernia	8	1.1	1
Open Hernia	5	1.3	1
Haemorrhoidectomy	1	0.5	0.5
Circumcision	4.5	0.5	0.5
All major surgical procedures	38	1.5	1.5
All intermediate surgical procedures	10.5	0.7	0.5

b) Performed by Registrars

	Total duration (hours)	Mean (hours)	Median (hours)
Lap Chole	32.5	1.9	2
V. V. surgery	14.5	1.8	1.5
Lap Hernia	0	N/A	N/A
Open Hernia	46.5	1.5	1.5
Haemorrhoidectomy	0.5	0.5	N/A
Circumcision	2	1	1
All major surgical procedures	47	1.9	2
All intermediate surgical procedures	49	1.4	1.5

In hospital B, 71% (n = 71) of the surgical procedures were performed by consultants and 29% (n = 29) by registrars. Table 18 demonstrates the breakdown of different procedures performed by consultants and registrars in hospital B.

Table 18. Procedures performed by consultants and registrars in hospital B and C

	Consultant (%)	Registrar (%)	Total (%)
Lap Chole (%)	11 (79)	3 (21)	14 (100)
V. V. Surgery (%)	31 (91)	3 (9)	34 (100)
Lap Hernia (%)	2 (100)	0 (0)	2 (100)
Open Hernia (%)	5 (29)	12 (71)	17 (100)
Haemorrhoidectomy (%)	4 (100)	0 (0)	4 (100)
Circumcision (%)	10 (48)	11 (52)	21 (100)
Excision of breast lump (%)	8 (100)	0 (0)	8 (100)
Total (%)	71 (100)	29 (100)	100 (100)

Intra-operative LOS for the patients in hospital B and C was in total 95.5 hours. Major procedures accounted for 50% (n = 48) of that time with intermediate procedures accounting for 50% (n = 47.5). Table 19 demonstrates the breakdown of durations of surgery for the different procedures performed by consultants and registrars in hospital B and C.

Table 19. Duration of surgery in hospital B and C

a) Performed by Consultants

	Total duration (hours)	Mean (hours)	Median (hours)
Lap Chole	13	1.2	1.5
V. V. surgery	24.5	0.8	1
Lap Hernia	3.5	1.8	2.5
Open Hernia	6	1.2	1
Haemorrhoidectomy	2.5	0.6	0.5
Circumcision	7	0.7	0.5
Excision of breast lump	7	0.9	1
All major surgical procedures	41	0.9	1
All intermediate surgical procedures	22.5	0.8	1

b) Performed by Registrars

	Total duration (hours)	Mean (hours)	Median (hours)
Lap Chole	3.5	1.2	1
V. V. surgery	3.5	1.2	1
Lap Hernia	0	N/A	N/A
Open Hernia	16	1.3	1
Haemorrhoidectomy	0	N/A	N/A
Circumcision	9	0.8	1
Excision of breast lump	0	N/A	N/A
All major surgical procedures	7	1.2	1
All intermediate surgical procedures	25	1.1	1

4.14 Anaesthesia, intra-operative analgesia and anti-emetics

In hospital A all the patients reviewed had their surgery under general anaesthetic, except one who underwent unilateral inguinal hernia repair under spinal anaesthetic. Similarly all patients in hospital B and C had their surgery under general anaesthesia except one who underwent varicose veins surgery under spinal anaesthesia.

Intra-operative analgesia were used in 96% (n = 96) of cases in each hospital, with multiple agents being used for most patients. All patients who had their operation under general anaesthetic (n = 99 in hospital A and n = 99 in hospital B+C) were given the short acting opioid fentanyl at the time of induction of anaesthesia. Following fentayl, paracetamol was the most commonly used analgesic in hospital A, being used in 100% (n = 96) of patients that received intra-operative analgesia. This was followed by morphine which was used in 89% (n =85) of cases. In hospital B, the most commonly used intra-operative analgesic after fentanyl was also paracetamol, which was administered to 98% (n = 94) of patients that received analgesia, followed by diclofenac which was administered to 77%

(n = 74) of patients that received analgesia. Table 20 demonstrates the breakdown of intra-operative analgesics used in the different hospitals.

Table 20. Use of intra-operative analgesia in each hospital.

Analgesic agent	Hospital A (%)	Hospital B+C (%)
None	4	4
Paracetamol	96	94
Diclofenac	74	74
Tramadol	1	0
Pethidine	1	0
Morphine	85	39

Intravenous ondansetron and dexamethasone were the intra-operative anti-emetics used in all cases. In hospital A, 9% (n = 9) of patients did not receive anti-emetics intra-operatively, 87% (n = 87) were given ondansetron and 34% (n = 34) given dexamethasone. In hospitals B and C, 23% (n = 23) of patients did not receive any intra-operative anti-emetics, 69% (n = 69) were given ondansetron and 29% (n = 29) were given dexamethasone. Table 21 gives an overview of the use of intra-operative anti-emetics.

Table 21. Use of intra-operative anti-emetics in each hospital.

Anti-emetic agent	Hospital A (%)	Hospital B+C (%)
Ondansetron	87	69
Dexamethasone	34	29
None	9	23

4.15 Post-operative LOS and delayed discharges

The total post-operative LOS for the patients in hospital A was 1873 hours. Patients undergoing major procedures accounted for 88% (n = 1642.5 hours), and those undergoing intermediate procedures the remaining 12% (n = 230.5 hours) of the total post-operative LOS. The total post-operative LOS for the patients in hospital B and C was 2482 hours, with patients undergoing major procedures accounting for 86% (n = 2142.5 hours) and those undergoing intermediate procedures 14% (n = 339.5 hours) of the total post-operative LOS. Table 22 gives a further breakdown of post-operative LOS in the two hospitals.

Table 22. Post-operative LOS in each hospital.

a) Post-operative LOS for all surgical procedures (major and intermediate)

	Hospital A (hours)	Hospital B+C (hours)
Total Post-operative LOS	1873	2482
Mean post-operative LOS	18.7 +/- 26	24.8 +/- 45
Median post-operative LOS	7.5	20

b) Post-operative LOS for major surgical procedures

	Hospital A (hours)	Hospital B+C (hours)
Total Post-operative LOS	1642.5	2142.5
Mean post-operative LOS	20.8 +/- 28.3	33 +/- 53.6
Median post-operative LOS	7.5	23

c) Post-operative LOS for intermediate surgical procedures

	Hospital A (hours)	Hospital B+C (hours)
Total Post-operative LOS	230.5	339.5
Mean post-operative LOS	11 +/- 8.9	9.7 +/- 15.5
Median post-operative LOS	7	5

Varicose veins surgery had the shortest mean post-operative LOS for patients in hospital A at 7.9 hours, with laparoscopic cholecystectomy having the longest mean post-operative LOS at 27.9 hours. In hospital B and C the shortest mean post-operative LOS was for patients undergoing excision of breast lump at mean post-operative LOS of 4.8 hours. Table 23 gives the breakdown of post-operative LOS for different procedures in the different hospitals.

Table 23. Post-operative LOS for different procedures performed in the different hospitals.

a) Laparoscopic cholecystectomy

	Hospital A (hours)	Hospital B+C (%)
Total post-operative LOS	724.5	570.5
Mean post-operative LOS	27.9 +/- 18.7	40.8 +/- 17.3
Median post-operative LOS	21	45.5

b) Varicose veins surgery

	Hospital A (hours)	Hospital B+C (hours)
Total post-operative LOS	135	1158
Mean post-operative LOS	7.9 +/- 5.6	34 +/- 67.4
Median post-operative LOS	5.5	22.5

c) Open inguinal hernia repair

	Hospital A (hours)	Hospital B+C (hours)
Total post-operative LOS	783	414
Mean post-operative LOS	21.8 +/- 37.4	24.4 +/- 42
Median post-operative LOS	7	7.5

d) Laparoscopic inguinal hernia repair

	Hospital A (hours)	Hospital B+C (hours)
Total post-operative LOS	84	27
Mean post-operative LOS	12 +/- 9.1	13.5 +/- 14.1
Median post-operative LOS	5.5	13.5

e) Haemorrhoidectomy

	Hospital A	Hospital B and C
Total post-operative LOS	32	149.5
Mean post-operative LOS	10.7 +/- 10.7	37.4 +/- 37.3
Median post-operative LOS	5.5	25

f) Circumcision

	Hospital A (hours)	Hospital B+C (hours)
Total post-operative LOS	114.5	124.5
Mean post-operative LOS	10.4 +/- 7.8	5.9 +/- 3.1
Median post-operative LOS	8.5	5

g) Excision of breast lump

	Hospital A (hours)	Hospital B+C (hours)
Total post-operative LOS	N/A	38.5
Mean post-operative LOS	N/A	4.8 +/- 1.2
Median post-operative LOS	N/A	4.8

In hospital A, 55% (n = 55) of patients had no overnight in hospital stay, 26% (n = 26) spent one night, 9% (n = 9) spent two nights, 9% (n = 9) spent three nights, and 1% (n = 1) spent 10 nights in hospital.

While some patients were arranged to have in-patient surgery and were expected to stay in hospital for at least one night post operatively, some patients had complications or other reasons causing a delay in planned discharge. The reasons for why patients were unexpectedly kept in hospital overnight post-operatively included: delayed voiding (not urinary retention), PONV, for overnight observation, wound haematoma, and lower respiratory tract infection (LRTI). Table 24 demonstrates reasons for patients post-operative over night stay, the number of patients admitted due to the different causes and the total number of nights that were spent in hospital due to each cause.

Table 24. Reasons for post-post operative over night stay, in hospital A.

	Total number of cases admitted for this reason	Total number of nights spent in hospital for this reason
Delayed voiding	3	3
PONV	1	1
Overnight observation	4	4
Wound haematoma	1	2
LRTI	1	10

In hospital B and C, 43% (n = 43) of patients had no over night in hospital stay, 44% (n = 44) spent one night, 7% (n = 7) spent two nights, 2% (n = 2) spent three nights, 2% (n = 2) spent four nights, 1% (n = 1) spent eight nights and 1% (n = 1) spent 17 nights in hospital in the immediate post operative period.

The reasons for why patients were unexpectedly kept in hospital overnight post-operatively included: delayed voiding (not urinary retention), PONV, for overnight observation, for overnight heparin infusion, due to post operative leg swelling, and wound infection. Table 25 demonstrates reasons for patients post-operative over night stay in hospital B and C.

Table 25. Reasons for post-post operative over night stay in hospital B or C.

	Total number of cases admitted for this reason	Total number of nights spent in hospital for this reason
Delayed voiding	1	1
PONV	1	1
Over night observation	2	2
Heparin infusion	1	1
Leg swelling	1	17
Wound infection	1	8

In hospital A, there were no readmissions in the week following patient's surgery due to any complications of their surgery. From the patients who underwent their surgery In hospital B and C, one patient was admitted in the week following their surgery. The patient was admitted through the emergency department in hospital B with a deep venous thrombosis (DVT), and stayed in hospital for 15 nights on that admission.

4.16 Total length of Stay

The total LOS was calculated as the time from when a patient was admitted to the hospital for their surgical procedure until discharge on that admission. If a post operative adverse event required the patient to stay in hospital post operatively, this time is included in the total LOS. However if a patient was discharged and returned to the hospital due to an adverse event, the time spent in hospital on the re-admission is not included in the total LOS.

In hospital A, the total LOS of all 100 patients was 2386.5 hours, with a median of 10.5 hours. For major procedures, the total LOS was 2097 hours, with a mean of 26.5 +/- 30.8 hours. While for intermediate procedures the total LOS was 289.5 hours, with a mean of 13.8 +/- 8.6 hours.

In hospital B and C, the total LOS for all 100 patients was 2805.5 hours, with a median of 23.5 hours. For major procedures the total LOS was 2369 hours, with a mean of 36.4 +/- 54.3 hours. Wile for intermediate procedures the total LOS was 436.5 hours with a mean of 12.5 +/- 15.8 hours.

Translating the total LOS into number of bed days used, the results indicate that for several of the procedures in each hospital, the mean number of bed days used per procedure is greater than one. Figure 17 demonstrates the mean number of bed days used per procedure in each hospital.

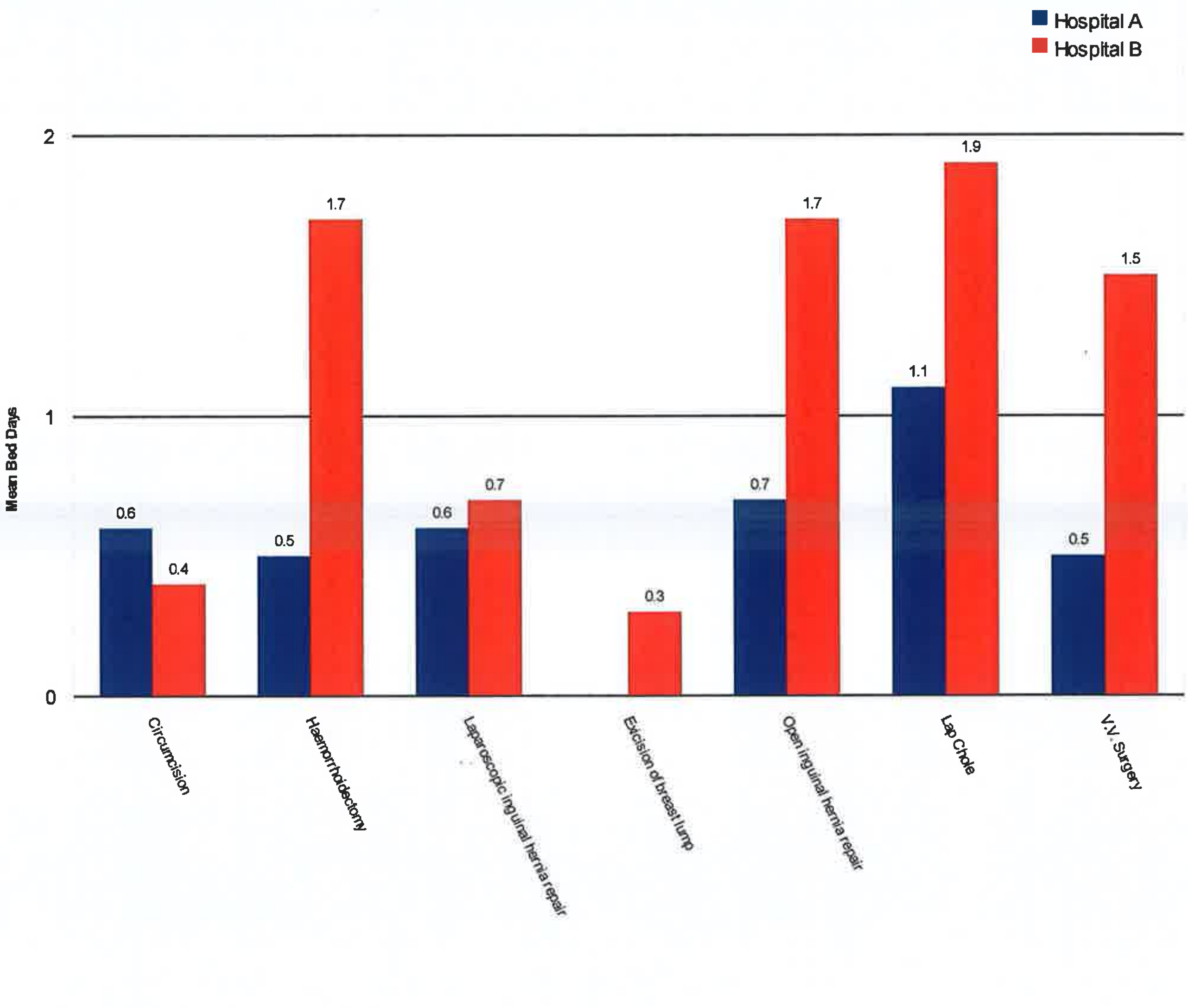


Figure 17. Mean bed days used per procedure in each hospital.

4.17 Discussion

As the most efficient and beneficial (to both patient and healthcare provider), day surgery is now the recommended type of elective surgery for the procedures that were investigated in this element of the research. With the growing demand on surgical services in Ireland and the need to reduce the costs in the public healthcare system, expansion and increased efficiency in day surgical services has been suggested as a possible solution. While international guidelines do exist which provide a roadmap as to how such expansion and efficiencies can take place, none of these guidelines are specific to the Irish healthcare system.[36, 38-41] The results of this study give a snapshot view of what was done for 100 patients in each of the hospitals, however without further interpretation of the results possible barriers to a more optimised day surgical oriented service might not be apparent.

4.17.1 Summary of key findings

Processes that were identified through the chart review which to different extents constrain the provision of day surgery included: long out-patient and inpatient waiting times, low rates of planned day surgery at the time of surgical OPD, limited use of formal pre-assessment, overflow of emergency department patients into day-wards, high rates of admission the night before the planned surgery, and high rates of over night stay without specific indication.

There were also trends noted which despite the available international evidence did not appear to have an impact on day surgery rates. These included: low numbers of patients receiving the date of their surgery at OPD visit and the use of long acting opiate analgesia intra-operatively.

A recurring finding of this study was the variation between the two studied locations at multiple stages of patient contact with the hospital. These variations in practice resulted in different barriers to day surgery between the two hospitals. As a consequence initiatives to improve day surgery rates in one hospital would not necessarily provide benefits in the other, and a broader guideline for provision of a more uniform service is necessary to ensure that a safe and efficient service is being provided to patients regardless of location.

4.17.2 Demographics

A recent survey sent to all day surgery centres in Ireland indicated that one of the perceived barriers to being able to provide higher rates of day surgery was the patient age and the distance they had to travel to hospital.[96] The patient demographics in this study was well matched in terms of patient age, ASA classification and distance travelled to hospital. This can therefore be excluded as one of the possible reasons for discrepancy between the rates of day surgery provided in the assessed hospitals, and other explanations must be found.

The results indicated that the vast majority of patients are referred to the surgical OPD by their GP, and the out-patient waiting time is approximately 2 months for both hospitals, with waiting times being longer for major procedures in both hospitals compared to intermediate procedures. The longest waiting time is for varicose veins surgery in both hospitals. The shortest waiting time is for excision of breast lumps in hospital B with a mean waiting time of approximately two weeks (mean waiting time of 15.8 days).

There was 16 hours of consultant led breast clinics in hospital B per week, provided by 6 consultants and their respective teams.[97] Similarly there was 21.5 hours of general surgical clinic provided in hospital B by 4 surgical consultants and their respective teams (excluding colorectal, upper G.I. and vascular clinics).[98] In the general surgical clinic a range of different patients would be seen, some new and some return, where as in the breast clinic only patients with breast lumps or those for review of results are seen. The specific nature of the breast clinic might be the underlying reason for its efficiency in processing of patients and the short waiting times from first referral until seen. While there is a paucity international data on the efficiency of specialist clinics compared to general surgical clinics, the

data in this study suggests that the specialist breast clinics have a shorter waiting time than general surgical clinics. This finding raises the possibility that specialist surgical clinics such as hernia, varicose veins or haemorrhoid clinics might provide similar benefits in processing of patients. A possible further advantage of such a set up would avoid a situation in which one consultant and their team gets a large number of referrals and therefore a back log in their out patients clinic while another gets very few and has vacant clinic time. Alternatively there is evidence that having direct day-surgery access for GPs would reduce out-patient waiting times as patients could be referred directly from primary care to surgery.[99-101] This would involve developing guidelines and facilities for GPs to refer patients with certain conditions (inguinal hernia, varicose veins, confirmed and uncomplicated galls stones or haemorrhoids) of ASA class I and II to a day-surgical unit where they could be assessed by a surgeon and operated on the same day.

Although this type of intervention reduces the out-patient waiting time, it does not necessarily effect the in-patient waiting time if the surgical capacity is already at maximum. Direct access surgery will also potentially increased workload on surgeons, anaesthetists and GPs as extra effort must be taken to ensure appropriate patient selection as this is vital to the success of direct access surgery.[99]

The results indicated that once the decision regarding surgery was made, the planned rates of day surgery were low in both hospital A and B. While in hospital A approximately half of the patients were arranged to undergo their surgery as day surgery, only about a third of patients in hospital B were arranged for day surgery. Neither the patients age, ASA classification or the distance travelled to hospital explains this low rate of arranged day surgery in the two hospitals. Over one third of patients in hospital A were arranged to have in-patient surgery with at least one night stay in hospital while less

than 5% of patients in hospital B were arranged to undergo in-patient surgery. The type of surgery whether in-patient or day-surgery was not specified in a high number of cases in hospital B and very low number of cases in hospital A. Whether the type of surgery was specified or not appeared to have some correlation to whether patients were seen by consultants or non-consultants in hospital A at their out-patients visit as non-consultants were found to more frequently not specify the type of surgery. By having in place local guidelines and protocols which outlines which patients are suitable as day case and which patients are not, this barrier can easily be overcome. Part of the role and importance of formal pre-assessment is that it allows locally developed and agreed upon protocols to guide a patients suitability, and in cases where further investigation or assessment is required appropriate action such as referral to pre-anaesthetic assessment can be made. This process ensures appropriate patient selection and uniformity of decision making between consultants and non-consultants.

In hospital B there were high rates of not specifying the type of surgery (day- or in-patient) both by consultants and non-consultants at booking. Patients seen in the surgical OPD in hospital B who were arranged to undergo their surgery in hospital C were the group of patients identified as having the highest non-specified type of surgery at booking. In contrast, patients seen in the surgical OPD in hospital B, who also underwent their surgery in hospital B were specified as day surgery patients in the vast majority of cases during booking.

Hospital C is primarily used for elective day-surgery cases referred from hospital B, it also allows for overnight admissions when required without new bed arrangements being made. This is a safe set-up which conforms well with international guidelines on easy access to in-patient beds in cases of post operative complications. However, this easy access from day-cases to in-patient beds in the light of

high rates of not specifying the type of surgery poses a possible barrier to increased day-surgery as indicated by the results. The post operative LOS of patients undergoing surgery in hospitals B and C was much longer than those undergoing their surgery in hospital A. This was largely due to overnight stay of patients undergoing major procedures in hospital C which should have been carried out as day-surgery based on patient factors and the absence of post operative complications. The results indicated that patients that were referred to hospital C to undergo their surgery, who did not have the type of surgery specified as either day- or in-patient had a high over night stay in rate. Based on guidelines developed for the NHS, all patients undergoing elective surgery should be listed as day surgical patients unless there is a specific reason for them not to be, in which case the patient can be referred to a pre-anaesthetic clinic for further evaluation.[58, 102] By adopting this recommendation one would potentially increase the number of patients referred for day-surgery and limit the number of patients being sent for anaesthetic assessment as only the ones in which the assessing doctor had concerns gets referred. This also eliminates the problem of not specifying the type of surgery as all patients would be assumed to be for day surgery unless specified otherwise.

4.17.3 Pre-assessment

Screening of day-surgery patients is essential to ensure their safety, as well as to minimise late cancellations and disruption to operating lists. Although there are many opportunities to carry out such screening of patients, doing so in a dedicated pre-operative screening and assessment service is thought to improve efficiency and can enhance patient care.[57, 103] The screening process allows for identification of patients who require no pre-operative investigations, target investigations in those that require them (the results of which must be available to the anaesthetist before the day of surgery), patients that require further optimisation prior to arrangement of surgery, and those that are not suitable to undergo the panned surgical procedure as day surgery.[57, 58]

By having in place a pre-assessment clinic in which patients are assessed before the day of their surgery, appropriate investigations can be arranged, patients optimised for the planned procedure and where indicated those that fulfil the criteria referred to pre-anaesthetic clinic. This process ensures appropriate selection of patients for day-surgery, appropriate referral of patients to pre-anaesthetic clinic, and minimises the "on the day" cancellation of procedures due to patient factors (medical and social).

The overall rates of dedicated pre-assessment was found to be low in the two hospitals as there was no pre-assessment available in hospital A and only a quarter of patients in hospital B were pre-assessed. Existing guidelines promote the use of pre-assessment to ensure that appropriate patients are selected to undergo day-surgery and keep cancellations to a minimum. However in hospital A without a dedicated pre-assessment team in place only 1% of patients were cancelled due to patient factors which would possibly have been avoided if patients were being appropriately pre-assessed. Although there was no dedicated pre-assessment in hospital A, it is likely that some degree of pre-assessment was taking place by the clinicians at surgical OPD or before as evident by the case that was discussed with the anaesthetist regarding patient suitability for general anaesthetic. This type of pre-assessment can be formalised by using simple questionnaires developed by the anaesthetists, which will help ensure no aspects of pre-assessment are overlooked. Doing so provides formal pre-assessment as suggested by guidelines without the need to dedicate further resources as are already being used. These questionnaires can even be distributed to general practitioners who can complete them at the time of referral of patients to the surgical OPD.

Where formal pre-assessment was in place for patients seen in hospital B, it was mostly being offered to patients of ASA class I and to a much smaller extent ASA class II patients. ASA class I patients are by definition physically healthy patients without any pre-existing medical conditions. These patients should all be undergoing these surgical procedures as day-surgery and are in least need of formal pre-assessment. As previously discussed even in the absence of pre-assessment, patients in hospital A were undergoing day surgery at a higher rate than in hospital B and C. This indicates that pre-assessment by being offered to mainly ASA class I patients was limiting the benefits that it can provide to increased day surgery rates. All patients who are referred for surgery should go for pre-assessment, and it is arguably patients at higher ASA class that benefit most from pre-assessment. In a day-surgery environment contact with patients is short and intense, also patients are largely responsible for their pre-operative preparation and post operative recovery is carried out at home. This makes appropriate patient information extremely important. While provision of patient information leaflets is largely accepted as a good way providing this information, they should be given the opportunity to ask questions from the appropriate members of the day-surgery team.[104] A further benefit of having dedicated pre-assessment is that it provides patients with this opportunity.

4.17.4 Provision of Date for Surgery

The number of patients receiving the date for their surgery at the time of their attendance to the hospital was low in both hospitals, with most patients being contacted by telephone to be informed of their surgery date. This did however not appear to have an impact on cancellation rates. The main reason for cancellations was overflow of patients from the emergency department into the surgical day ward and shortage of beds which accounted for the majority of cancellations recorded in hospital A. There were no recorded cancellations in hospitals B and C. This finding emphasizes the importance of keeping elective surgical beds protected from emergency admissions to minimize cancellations.

4.17.5 Processes on Day of Surgery

On the day of their planned surgical procedure, patients present to the hospital and are admitted by either a nurse or doctor to a day ward, short stay ward or in-patient ward. In cases where patients have been pre-assessed, the admission process is facilitated, as the main reason for the admission is to ensure no changes in patient's health status which might otherwise delay the planned procedure. On the ward the results of any pre-operative tests that have been performed are reviewed and patients that have not until this point been seen by an anaesthetist, are seen. A pre-operative check list is performed, to ensure that all necessary and pertinent data have been obtained and appropriately interpreted and acted upon.

Once the above is completed, the patient is ready to be transferred to the operating theatre. In the operating theatre, the patient is anaesthetised and the operation commences. When the operation is completed, the patient is taken to a recovery area. After sufficient recovery has taken, the patient is once again returned to the ward.

The final stages of recovery will take place on the ward, where it is ensured that there are no immediate post operative complications, the patient is able to eat and drink, their pain is managed appropriately, they are not suffering from PONV, they have adequate information about their recovery period at home and emergency contact telephone numbers, and that there is a responsible adult present to accompany the patient home and stay with them for the next 24 hours. Once these criteria are satisfied, the patient is discharged home.

The pre-operative LOS is one indicator which helps determine how efficient the limited number of beds allocated to elective surgery are being used, as shorter pre-operative LOS would allow a faster turnover of patients. Patient's admission to the hospital before the day of their surgery was a rare occurrence in hospital B and C, while in hospital A this accounted for a large portion of the pre-operative LOS of patients. It was noted in the results that in hospital A, that patients classified as ASA class I and II who based on existing guidelines should undergo these procedures as day surgery were being admitted to the hospital the night before their planned surgical procedure. Up to 15% of the patients in hospital A were found to be admitted the night before their procedure, which accounted for over half of the total pre-operative LOS, while only 1% of patients in hospitals B and C were admitted the night before their planned surgery, accounting for only 7% of their total pre-operative LOS. It was also noted that patients who had undergone pre-assessment in hospital B and C had almost a 20% shorter mean pre-operative LOS compared to the total mean pre-operative LOS. This correlated with the fact that a large number of investigations were being performed for patients on the ward at the time of admission for patients in hospital A while patients in hospital B and C would more commonly have their pre-operative investigations on an out-patient basis with the results being available on the day of their planned surgery. One of the effects of emergency department overcrowding leading to overflow of patients into elective surgery beds is late cancellations, which causes distress to patients.[78] However a further and more indirect effect is that consultants are encouraged to arrange for patients to be admitted to the hospital before the day of their planned operation in order to ensure that the patient is given a bed and the surgery can go ahead as originally intended.

Studies suggest that emergency departments go through peak times both during different times of day and different days of the week.[102, 105] By looking at the trends of these peak times and planning elective surgical services to be at highest capacity when emergency departments are at their lowest, it is believed that more planned surgical procedures can be performed and emergency department overcrowding minimised.[102, 105] This should also result in less need to admit elective surgical patient to the hospital before the day of their planned procedure and thereby increase day-surgery activity. As hospital C has no emergency department there is no risk of overflow of patients onto the elective surgery beds. Similarly the day-ward beds in hospital B are protected from overflow of patients from the emergency department. The guarantee of availability of elective surgical beds in these hospitals might explain the large discrepancy between the number of patients admitted the night before their procedure in hospital A and those in hospitals B and C.

The mean intra-operative LOS for patients being operated on by non-consultants was longer than those being operated on by consultants. For this reason in hospital A where the registrars carried out a larger portion of the procedures patients had a longer intra-operative LOS compared to hospitals B and C where more surgical procedures were carried out by consultants. It is understandable that the trainee surgeons take longer to perform operations compared to the consultants.

The high cost of training surgeons in the operating room has long been recognised, and supplemental training outside of the operating room explored in the form of simulators and virtual reality operating environments.[106, 107] As these methods become more refined with improved technology, it will become possible to incorporate more such courses into the surgical training to minimise the requirements of training on day-surgery efficiency. It will however always be a requirement to train surgeons in the operating theatre and some delays will be caused due to this training. It must however be noted that the calculated intra-operative LOS used for the purpose of this study do not directly reflect operating time. While the anaesthetic notes keep record of when the patient was anaesthetised and when recovery was initiated, that does not necessarily correlate directly with operative time as there might be significant delays from initiation of anaesthesia until start of the operation. Therefore, the difference in intra-operative LOS as found in this study reflects the efficiency in patient processing in theatre rather than pure operation duration.

4.17.6 Intra-operative Analgesia

Multi-modal intra-operative analgesics where used in the vast majority of cases. While paracetamol was the most commonly used analgesic in all hospitals, patients undergoing their surgical procedure in hospital A were given opiate analgesia intra-operatively in a very high number of cases. This compared to less than half of cases in hospitals B and C. The higher use of intra-operative opiate administration was accompanied by higher use of intra-operative use of anti-emetics. However this was only marginally higher in hospital A compared to hospitals B and C at 81% and 77% respectively. Also, the higher use of intra-operative opiates and anti-emetics did not appear to have any adverse effect on patients requiring over night admission due to PONV as 10% of unexpected delays to discharge in hospital A were found to be due to PONV compared to 14% in hospitals B and C. Existing guidelines advocate the use of multi-modal analgesics and when opiates are required, short acting opiates (such as fentanyl) rather than long acting opiates (such as morphine and pethidine) should be used.[39] As for the use of anti-emetics, most guidelines would suggest a scoring system to assess a patients risk for developing PONV, based on the score, the decision is made regarding prophylactic intra-operative anti-emetics.[108, 109] The results of this study indicate that while local protocols for the use of intra-operative

analgesia and anti-emetics varied greatly between the hospitals, post operative pain and PONV were managed well in all hospitals and did not appear cause any obstruction to the day-surgery process.

4.17.7 Post-operative

The results indicated that in hospitals B and C over half of the patients had at least one night stay in hospital, while only a small proportion of those were unexpected or due to complications. Similarly in hospitals A slightly less than half of all patients had at least one night stay in hospital with less than 10% being due to unexpected reasons. One of the concerns that has traditionally encouraged surgeons to keep post-operative patients overnight is the risk of post-operative complications. However, there is now overwhelming evidence that these procedures can and should be performed on a day surgery basis as any immediate complications will become evident prior to discharge and any short term complications tend to present themselves after 24 hours and therefore there is no benefit in keeping these patients overnight for observation without a specific indication.[17, 110] Sometimes patients are kept overnight as their procedure ends near the time day-surgery wards close, and patients have to be transferred to in-patient wards where they are then automatically kept overnight. In other situations where there is no specification on the admission form regarding the type of surgery (day- or in-patient) patients are seen by junior members of the team post-operatively and kept overnight as a precaution, and in some cases it is simply surgeons preference to keep patients overnight as they are used to managing their patients in that manner and prefer not to change their practice. Existing evidence suggests that significantly increased day-surgery rates can be obtained simply by specifying that patients are to have their surgery as day-case where there are no indications not to.[102] This would avoid the situation where junior doctors keep patients over night unnecessarily, and encourages change in culture of keeping patients over night as a precaution. Some have also suggested that day-wards should stay open for longer hours to allow patients that are operated on at the end of the operating list to recover on the day-ward rather than being transferred to an in-patient ward and therefore having to stay over night.[96] These simple measures can reduce the post-operative LOS of patients after day-surgery significantly without having any adverse effect on patient care.

Chapter 5

Consensus on best practice for Day Surgery

The survey conducted in chapter three identified customs and practices as a major barrier to increasing day surgery rates. Similarly the survey results suggested varying practices in different hospitals, a finding which was confirmed through the chart review study conducted in chapter four. Through the provision of national guidelines, which are tailored to the Irish healthcare system a uniformally safe and efficient day surgery service can be established in all hospitals. The purpose of this study is to develop consensus based statements of best practice for day surgery which are specific, measurable, timely and appropriate to the Irish healthcare setting using a novel eDelphi technique.

5.1 Results

Over 500 personnel working in day surgical services were informed about the study during the consultation and recruitment process in round one. Verbally proposed items for best practice were obtained through face to face interviews and focus groups, which were conducted at two separate occasions at national surgical meetings. Comments were also received via email.

A total of 54 email addresses were obtained for experts wishing to participate in the development of best practice protocols. Some of the email addresses were representative of groups while others were personal email addresses.

The aim of the study was to allow as broad a range of professionals working within day surgery to contribute to the study and thus emphasis was placed on diversity as well as numbers.

In round one a total of 261 statements were received with many recurring themes. The most commonly occurring theme at this point was the need for pre-assessment clinics. The statements received were grouped and refined by the research team to 62 analysis statements. These were then forwarded to participants to rate each item in round two.

There were 78 respondents to round 2, with surgeons accounting for 79.5% (n = 62), nurses 14,1% (n = 11), administrative staff and anaesthetists at 1.3% (n =1) each and other groups accounting for the remaining 3.8% (n = 3). A total of 21 statements from the original 62 were eliminated in this round as they did not meet the 70% consensus (score of 7-9 by at least 70% of expert panel) required for inclusion in the next round. As is expected with any Delphi process, there was a fall off in numbers participating in each round with the final round having 35 participants of which: 25.7% (n = 9) surgeons, 25.7% (n = 9) anaesthetists, 37.1% (n = 13) nurses, 5.7% (n = 2) administrators and 5.7% (n = 2) others. Only one statement was eliminated in this round, leaving a final list of 40 statements.

The overall top five statements for best practice which were identified as very high importance by 97% (n = 34) of the expert panel in the final round were: 1) establishment of clear guidelines and protocols for admission to day surgery unit, 2) establishing patient selection criteria, 3) monitoring and audit of stay in rates, 4) provision of Information leaflets to give clear explanations of steps to be taken in the event of post discharge complications, 5) ensuring adequate post operative pain relief prior to discharge.

The final forty statements were categorised under the following sections:

1 1. Patient information

2 2. Pre-admission/pre-assessment

3 3. Documentation

4 4. Management of day surgery

5 5. Discharge protocols

6 6. Monitoring of services

The statements of best practice developed, as well as how they should be monitored are shown in appendix 4.

5.2 Discussion

While there has been a rapid expansion of day surgery in Ireland in the past decade, recent studies suggest a lack of uniformity in service provision, leading to discrepancies in rates of day surgery achieved across hospitals that have a similar proportion of day surgery beds and operating facilities.[96] Using the expertise and agreement of those working in day surgical services, a list of best practice statements for ensuring the provision of a uniformly safe and efficient day surgical services have been developed in this study. Although many of the statements used were draw from existing guidelines and recommendations [27, 38, 40, 57, 85, 87] they have undergone a rigorous, stepwise consensus process to target the specific needs and challenges faced in the Irish healthcare setting.

5.2.1 Patient information

Patients undergoing day surgery are largely in charge of their own pre-operative preparation and post operative recovery takes place at home. Such patients often have concerns which are different to those of patients undergoing surgery as in-patients. Patients undergoing day surgery often have concerns regarding whether they will be discharged too soon, if their condition deteriorates after they are discharged, would they receive adequate rest post operatively, whether they would becoming a burden on their family members, and managing postoperative complications (eg, pain or PONV).[111] Therefore it is essential for patients to not only receive adequate information to be prepared for their surgery but also be comfortable at the time of their discharge. The informing and education of patients is therefore essential to ensure cancellations and overnight admissions are minimised. This was reflected in the best practice statements developed in this study as the expert panel provided recommendations on requirements for pre-operative patient information and discharge information. Recommendations on pre-operative patient information included: information on the day surgery unit, procedure specific information for all patients, and information on the type of anaesthesia, all of which should be in the first language of the patient. Suggestions on discharge information included: advise on how to deal with common post operative problems such as pain and emetic control, when to seek medical attention, what to do in case of emergency, as well as contact details for the unit or hospital.

5.2.2 Pre-admission/Pre-assessment

In order to increase the frequency of day surgery and reduce the risk of adverse events, it is necessary to appropriately select patients and optimise those who are at a high risk.[112] Pre-assessment of patients provides this opportunity in a safe and efficient manner. In this study while the expert panel acknowledged the importance of pre-assessment and provided statements pertaining to requirements at pre-assessment, a clear distinction was made between pre-assessment and pre-anaesthetic assessment. The recommendations were that pre-assessment of patients should be a nurse led per protocol process. Where patients fail to meet the selection criteria for day surgery at pre-assessment, they should be referred to a pre-anaesthetic clinic conducted by a consultant anaesthetist where further assessment and optimisation can take place. The implications of this process is that patients that are immediately found suitable for day surgery at pre-assessment are put forward for day surgery, while those that do not meet the criteria at first assessment are investigated further and any necessary treatment initiated at pre-anaesthetic assessment. At pre-anaesthetic assessment, some patients will undergo investigations after which they will be found suitable for day surgery, some patients will require further medical management prior to becoming suitable candidates for day surgery and finally some patients will be found unsuitable candidates for day surgery. This process ensures that all patients are assessed for day surgery based on their individual physical status rather than arbitrarily selected based on age, BMI or ASA cut off points, thereby ensuring appropriate selection of patients to provide safe services to as many patients as possible and increasing overall day surgery rates.

5.2.3 Documentation

Good record keeping is a crucial part of safe and effective healthcare provision. Integrated care pathways provide a detailed, stepwise schema that objectively states the essential steps in the care of patients with a specific clinical problem.[113] The expert panel recommended that such integrated care pathways should be used in the day surgery setting in order for information to be easily accessible between the multidisciplinary team and the patients themselves. It was recommended that standardised integrated care pathway forms should be used for documentation from surgical OPD to pre-assessment, to day surgery and through to post discharge follow up. The recommendations further included that the care pathway forms should contain a consent form, which should be signed at the time of surgical OPD.

5.2.4 Management of Day Surgery

Strong leadership and management of day surgery units is a key factor to its success.[12] The implementation of policies that provide the advantages of day surgery to the patients, the healthcare professionals and the community at large is determined by those managing the service. In this study the expert panel provided several recommendations which could potentially improve day surgery rates. Of primary importance was providing dedicated day surgery theatre times. This would avoid late cancellation of day surgery cases, thereby increasing overall day surgery rates. Furthermore by developing working time tables which take into account peaks and troughs in emergency department activity levels, and where available extending day ward opening hours from 8AM to 8PM will further reduce overnight admission rates and late cancellations. It was also part of the expert's recommendations that a senior nurse should be in charge of the day surgery ward, and that patients should be contacted (telephone or text message) 48 hours prior to their appointment to remind them and ensure their attendance.

Some of these recommendations are already in practice in various hospitals across the country, however others may require changes such as the reorganisation of staffing in order for them to work effectively. This highlights the overall role of the statements of best practice that were developed in this study as they provide many criteria that should be set as targets for day surgery units to strive towards. As such they should be regularly evaluated and updated.

5.2.5 Discharge Protocols

Protocols provide guidance and ensure uniformity of care for patients across different healthcare services. Having in place predetermined discharge criteria helps avoid unnecessary over night admissions. The recommendations of the expert panel in this study highlighted the importance of adequate pain and emetic control as well as providing patients with information in case of emergency. Although currently very few hospitals follow up patients once they are discharged[96], it was the recommendation of the panel that patients should be contacted within 24 hours post discharge to ensure adequate progress. This should be done through a telephone call by specially trained nursing staff who are familiar with the procedures, common post operative complications and their presentation. Doing so provides insurance that patients will be followed up in the short post operative period at home, and if any problems are encountered written protocols should be in place for actions to be taken. While some patients will have to be brought back to hospital, others may require further assessment in the community. It is therefore important as part of the discharge protocols that a link is also made between community based care and the day surgery unit so that in cases where the need arises, patients can be directly referred back to the hospital without having to go through the emergency department.

5.2.6 Monitoring of Services

Clinical indicators are quantitative measurements related to one or more dimensions of performance and can be used to monitor, evaluate and improve the quality of patient care.[12] It is important that clinical indicators are both valid and reliable. As such, the panel of experts agreed that monitoring of stay in rates, adverse events, readmissions, cancellation rates and patient satisfaction surveys when taken together, would provide an overall assessment of quality and provision of services.

By monitoring and auditing stay in rates, specific areas where improvements are required can be identified and addressed to ensure post operative stay in rates are kept to a minimum. These may include areas of clinical care such as use of long acting opiate analgesia for post operative pain control as was found in chapter 4, or it include management issues such as day surgery patients having their surgery after in patients and therefore not having enough recovery time. It is only through regular monitoring that such issues can be identified and appropriately addressed.

Monitoring of adverse events and readmission rates will help ensure that national and international targets of safety of day surgery procedures are maintained. Where rates are higher than should be expected, rapid action can be taken to address any underlying cause.

Late cancellations are a recognised barrier to increasing rates of day surgery. By monitoring late cancellation rates and addressing recurring reasons for late cancellations, higher day surgery rates can be achieved.

While monitoring of service provision to increase efficiency was an important part of the recommendations, it was also recognised that patient satisfaction is an equally important part of service provision. It would not be desirable to improve efficiency at the cost of patient satisfaction. The recommendation of the expert panel therefore placed particular emphasis on conduction of patient satisfaction surveys. Any intervention taken to improve service efficiency should be evaluated not to adversely impact on patient satisfaction.

5.3 eDelphi as a Method of Achieving Consensus

There is limited reporting of the use of eDelphi in the literature. This study found the eDelphi process and online surveys to be economic in terms of investigator time and funding and facilitated rapid communication between the experts from different geographical locations and the research team thereby making it possible to reach a consensus in a timely fashion.

The fall off in response rate over the rounds of Delphi has been identified as a limitation in other studies, however the strength is that the process is longitudinal and is building consensus over time. Hsu Chia-Chien (2007)[114] suggest that this shortfall in losing participants is thought to be due to the fact that participants are asked to rate the same statements multiple times and can therefore lose interest. Despite the fall in response rate and changes in the background of experts participating in each round, the final results showed a wide range of areas where consensus was achieved.

5.4 Role of Statements of Best Practice

The role of statements of best practice is to provide a baseline guide on set-up and operation of day surgery services which can apply to all day surgery providers in the Republic of Ireland. By going through the rigorous process of determining current existing barriers and gaining consensus among those working in day surgery services across the country on what are the statements of best practice, it is ensured that the process is transparent to those who will ultimately implement them and validated by the same professionals. It has been suggested that frequently the lack of the impact from new guidelines and standards is due to clashes in normative assumptions between the guidelines and their users.[115] While such clashes may never be completely avoided, the consensus method employed in this study facilitated an open discussion among professionals which would help ensure the statements are valid and accepted by those providing the services.

Implementation of the final statements of best practice requires appropriate training of staff and in many cases re-organisation of day surgical services. Making changes in healthcare settings is often a difficult process especially when multiple disciplines are involved.[116] However going through the rigorous process of gaining consensus among the multidisciplinary teams that provide day surgery ensures that the recommendations are relevant and welcome by those who will eventually be implementing them. While this study outlines how consensus was achieved in developing statements of best practice for day surgery among experts, the effect of implementation of these remains to be elucidated. The project will now move on to the implantation phase of introducing the best practice statement in to a clinical setting.

Chapter 6.

Conclusion

6.1 Introduction

Day surgery is the preferred method of surgery for many elective procedures as it provides the necessary care for patients in the most safe and cost efficient manner. With the increasing demand for healthcare and restricted resources, expanding the provision of day surgical services in Ireland has been identified as one possible solution. Some studies have suggested that while certain hospitals are attaining day surgery rates as high as, or higher than the OECD average, the overall rates of day surgery in Ireland are still lower than the average OECD country. This study set out to identify the main barriers to day surgery in the current healthcare system and develop best practice process elements using the expertise and consensus of those working in these services. A national survey of all private and public hospitals in Ireland conducted to evaluate the provision of services, provided a macro perspective on the barriers impacting on day surgery. This was followed by an in-depth chart review which provided a micro perspective on the issues that influenced decision making processes and resultant current practices. Using a novel eDelphi approach, practitioners from all backgrounds and disciplines, as the experts were engaged in a three round process to gain consensus on best practice on day surgery.

6.2 National Survey

This study, which was the first of its kind in Ireland, identified the current provision of day surgery across public and private hospitals. It clearly identified the variability in the structure and organization of day surgery across different hospitals, even those with similar number of beds. The findings indicate that more emphasis should be placed on follow-up post discharge in many of the surveyed hospitals, as such information would contribute to improved planning and support the argument for greater number of procedures being performed as day surgery. Nationally, Ireland has achieved 50% of the key indicators listed, leaving considerable room for improvement.[10-12]

Reassuringly, many of these improvements can be achieved at a local level and would not require additional funding such as recording of DNA and stay-in rates or return admission rates.

6.3 Review of Patient Charts

This study echoes findings of other similar studies in that management of patients undergoing elective surgery varies significantly across hospitals.[3, 8] While the lack of pre-assessment can potentially increase the workload on the day of surgery and lead to excessive pre-operative investigations, it did not appear to be a major factor in reduced rates of day surgery. Although post operative complication rates were found to be low in the studied locations, so was the overall day surgery rates for the evaluated surgical procedures.

The finding suggest that there is a lack of local guidelines for many aspects of the day surgery process, or in some cases where there are guidelines, they are not adhered to. This is a leading factor in variation in pre-operative investigations, selection of patients for day surgery, discharge of patients post-operatively and ultimately day surgery rates.

Several initiatives are available to reduce waiting times and increase day surgery rates without requiring extra resources.[12, 15-20, 27-28, 33, 38-41, 45, 58] For maximum impact the initiatives need to target the specific areas discussed throughout this study and other similar studies, which have identified the main barriers to day surgery in Irish hospitals. To achieve this, it is important to involve those professionals who are currently working in day surgery as it will ensure any initiatives are relevant, appropriate and aids implementation.

6.4 Best Practice Process Elements

By using an eDelphi process of gaining consensus among experts working in day surgical services in Ireland, a list of best practice statements were developed in a timely fashion. The statements cover the entire patient journey from first presentation and assessment of suitability for day surgery to post operative discharge protocols and follow-up. Some of the best practice statements developed in this study are already present in most Irish hospitals, while others will take considerable time and restructuring to implement. An important aspect in the development of the best practice process elements is gaining consensus among the experts who are ultimately going to implement them in a clinical setting.

6.5 Limitations of the study

While efforts have been made throughout this study to obtain valid and reliable results at every stage, it is important to acknowledge the limitations of the study. The first stage of the study commenced with a national survey which was sent to hospital managers of all public and private general hospitals in Ireland, the response rate of which was 67%. The response bias of this survey must be acknowledged as hospitals which are facing greater difficulties, and perhaps have less favourable outcomes are less likely to respond to such a questionnaire. Similarly, those that do respond, might provide information which makes their hospital appear more favourable than it actually is. No attempt was made to validate the results of the questionnaire in each individual hospital which responded, however part of the next stage of the research project was to evaluate further the survey findings through an in-depth chart review.

In the second stage of the research, while the chart review confirmed some of the findings of the national survey and provided a detailed picture of the patient journey in two teaching hospitals, it too had limitations. The chart review only evaluated 100 patients at each location. This is a relatively small sample size which was selected based on consecutive cases. Ideally to minimise any sample selection bias, and allow for seasonal variations, all patients during a one year period should have been selected. Furthermore the study only evaluated patients undergoing six of the Basket 24 surgical procedures. While these are procedures which have through other studies been identified as high volume cases where increases in day surgical activity are necessary, the statistical data obtained can not be extrapolated to all surgical cases. A further limitation of this study is that it only evaluated two Dublin based teaching hospitals. While this was a deliberate choice for site selection to make an attempt to find areas of improvement in already highly rated hospitals, any data gathered from hospitals outside of Dublin might be radically different. Barriers faced in rural versus urban hospitals in day surgical services are likely to be very different, and the results obtained are not representative of all Irish hospitals.

When developing consensus on best practice process elements, the methodology of using eDelphi has the advantage of allowing the opinions of a large number of experts to be distilled to reach agreement. It does not however guarantee that the agreement reached is the best possible option for dealing with the problem at hand. Furthermore, due to the repeated process of asking the same question from the panel of experts, it is recognised that there is a drop off in response rate. This was a clear limitation in this study.

It must also be acknowledged that this study was limited in terms of resources and time. Response rates in the national study and eDelphi might have been improved upon if there were more resources available to provide incentives. Similarly, more man power and time could have allowed for delivery and collection of questionnaires in person and might have further improved response rates. However, as this study was conducted for the purpose of obtaining a higher degree through research, the limitations in time and resources are part of the learning process. As such the scale of this study was limited to ensure completion in a timely manner with the resources available.

6.6 Future Perspectives

Having identified barriers to increased rates of day surgery, the best practice process elements propose how these may be overcome to provide a uniform, safe and efficient day surgical service in hospitals which adopt them. It is however still unknown what impact the implementation of the best practice process elements will have.

It is the intention of the research team to continue this study by implementing these process elements in a pilot site and evaluate their impact on patient satisfaction and day surgery rates. The challenge going forward is to develop national guidelines from these process elements which can be implemented to achieve the necessary goals of increased rates of day surgery, at the same time improving patients satisfaction with the provided services.

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Appendix

Appendix 1

NICE guidelines for pre-operative investigations in grade 1 and 2 procedures for ASA class I patients.

RECOMMENDATION	DEFINITION
YES	Test recommended
NO	Test not recommended
CONSIDER	Test to be considered The value of carrying out a preoperative test is not known, and may depend on specific patient characteristics

Test	>16 to <40	>40 to <60	>60 to <80	>80
Chest x-ray	No	No	No	No
ECG	No			Yes
Full blood count	No	No		
Haemostasis	No	No	No	No
Renal function	No	No		
Random glucose	No	No	No	No
Urine analysis[a]				

[a] Dipstick urine testing in asymptomatic individuals is not recommended (UK National Screening Committee)

Grade 1 surgery for patients of ASA class I.

Test	>16 to <40	>40 to <60	>60 to <80	>80
Chest x-ray	No	No	No	No
ECG	No			Yes
Full blood count	No		Yes	Yes
Haemostasis	No	No	No	No
Renal function	No	No		
Random glucose	No			
Urine analysis[a]				

[a] Dipstick urine testing in asymptomatic individuals is not recommended (UK National Screening Committee)

Grade 2 surgery for patients of ASA class I.

Appendix 2

Ethical approval

Beaumont Hospital
Ethics (Medical Research) Committee

Chairperson: Professor Gerry McElvaney
Convenor: Professor Alice Stanton
Administrator: Gillian Vale

2nd February 2010

Professor Arnold DK Hill
Consultant Surgeon
Beaumont Hospital

Dear Professor Hill

09/Oth/46 – Mr. Babak Meskat under the supervision of Prof. ADK Hill – Day Surgical Services in Ireland (Current Barriers to Optimisation of Day Surgical Services) – a review of 100 Beaumont Hospital patient charts

Further to e-mail correspondence dated 18th January 2010, and 21st October 2009 from Mr. Babak Meshkat, the Committee confirms that the approval of Beaumont Hospital Ethics (Medical Research) Committee is not required in order for this retrospective 'chart review' to proceed.

You are advised however to pay particular attention to whom will be accessing patient charts' for the purposes of this review. Secondly, 'anonymous' data only should be extracted from charts.

Our current advice from the office of the Data Protection Commissioner is as follows:

> *"Irrevocable anonymisation of personal data puts it outside data protection requirements as the data can no longer be linked to an individual and therefore cannot be considered to be personal data."*
>
> *"Equally, it is recognised that the need to link episodes of care and prevent duplication of data in research, in some instances, requires that information may need to be capable of being matched or linked. This can be achieved through appropriate pseudonymisation (e.g., use of initials, coding) methods without the need to retain all identifying characteristics with the data."*
>
> *"Similar to the advice above in relation to anonymisation, where pseudonymisation methods are used, it is recommended that extra efforts, beyond use of initials etc, be incorporated where a condition is particularly rare. Where sufficient measures are put in place to ensure that personal data is not accessible or likely to be identifiable by parties external to the data controller, the requirement to capture consent to use the data for research purposes, in such circumstances, will no longer apply"[i]*

Ethics (Medical Research) Committee Beaumont Hospital Dublin 9
Tel: 353-1-809 2680 Email: gillianvale@beaumont.ie www.beaumontethics.ie

Your correspondence has now been forwarded to the Clinical Governance Department.

The Clinical Governance Department is led by:
Ms. Helen Ryan and Mr. Patrick Broe
01 809 4771
E: helenryan@beaumont.ie

Kind Regards

Prof. Alice Stanton
Convenor
Ethics (Medical Research) Committee

c.c. Dr. Babak Meshkat
Research Registrar
Surgical Department
c/o Mr. Eadbhard Mulligan
Connolly Hospital
Dublin 15

[1] Data Protection Guidelines on Research in the Health Sector, available on www.dataprotection.ie

CONNOLLY HOSPITAL BLANCHARDSTOWN

Certificate of Research Ethics Committee Approval

Date: 6th November, 2009

To: Dr B Meshkat

From: Dr Eamon Leen, Chairman

Protocol title: Day Surgery in Ireland

The Research Ethics Committee approved human subject involvement in your research project on 6th November, 2009.

There is no expiration date for this approval, but the protocol must be reviewed by the Ethics Committee before December 31st 2012. If this project is to continue beyond that date, please submit an updated proposal one month prior to the expiration date. If this proposal is used in conjunction with any other human experimentation or if it is modified in any way, it must be re-approved for these special circumstances.

Note that the following should be reported to the Ethics Committee: 1) all serious adverse events, occurring at this institution, regardless of whether or not they are thought to be study related should be reported within 2 business days to one of the members of the Research Ethics Committee, 2) any unanticipated problems, and/or 3) and injuries to subjects enrolled.

Please remember that all data including all consent form documents must be returned for a minimum of three years past the completion of the research. Additional requirements may be imposed by your funding source, your department, or other entities. This institution protects personal health information of human subjects.

Dr E Leen, Chairman

Approval Period: 6th November, 2009 - 31st December 2012

Appendix 3

Data Extraction Instrument

Day Surgery in Ireland

Medical chart review form [WP2].

Section 1:

– Hospital Name

– Date of Data Collection

– Data Collector:

Comments

Section 2: Patient Details

- Age
- Gender Male Female
- Home address
- List all medications

1. ____________________
2. ____________________
3. ____________________
4. ____________________

- List all secondary diagnosis

1. ____________________
2. ____________________
3. ____________________
4. ____________________

Comments

Section 3: Referral Source and OPD visit

This section relates to the referral from the source to the surgical Out-Patient Department (OPD).

3) Source of referral
    1. A/E Department
    2. In-Patient department
    3. Other Out-patient service
    4. GP
    5. Other (please state)
4) Date of first referral
5) Date seen in OPD
6) Grade of assessing doctor in OPD (Please tick all that apply)
    1. SHO
    2. Registrar
    3. Consultant
7) Did medical chart state
    1. Day surgery
    2. In-Patient
    3. Not stated
8) Was patient referred to pre-assessment? Yes No Not Known

Comments

Section 4: Pre-assessment

- Date of pre-assessment visit
- Was pre-assessment for
  - Day surgery
  - In-Patient surgery
- Grade of assessing doctor in pre-assessment (Please tick all that apply)
  - House Office
  - SHO
  - Registrar
  - Consultant
- Grade of nurse assessing patient
  - Staff Nurse
  - CNM1
  - CNM2
  - CNM3
  - Unknown
- Was patient referred for medical investigations (please state)
  - X-ray
  - Scan
  - ECG
  - Bloods (list)
  - State all investigations
    - ______________________________
    - ______________________________
- ASA Classification
- If return pre-assessment appointment given please state
  - Yes
  - No
- Was surgery date provided
  - Yes
  - No

Comments

<u>Section 5: Surgery</u>

- Date of Surgery
- Was Surgery
  - In-Patient
  - Day Surgery
- <u>If Day</u> Surgery
  - Grade of operating surgeon
  - Time of Surgery
  - Duration of Surgery
  - Type of anaesthetic
  - Time of discharge
  - If not discharged
    - Was patient admitted over night? Yes No
    - Reason for admission________________________________
    - Length of stay
- <u>If inpatient</u> Surgery
  - Grade of operating surgeon
  - Time of surgery
  - Duration of surgery
  - Type of anaesthetic

Comments
Length of stay

Section 6: Post-operatively

7 Please list any post-operative complications which were diagnosed while the patient was in the hospital.

1 ____

____

____

8 Was this patient readmitted to the hospital? Yes No

1 If yes:

1 Date of readmission

2 Reason for readmission

3 Source of readmission

1 GP

2 A/E

3 Other

4 Length of stay

5 Date of discharge

Comments

Appendix 4

Standards for the process of day surgery in Ireland

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1 1.0 Patient information

1.1 Pre-operative information

Patients should be provided with procedure specific information prior to the date of surgery. This should include information on:

- Details about the unit, how it works, opening times ect.
- The procedure and any pre-operative or post-operative instructions related to this procedure.
- The type of anaesthetic
- Pre-operative fasting time for foods and drink.
- Contact details of the unit.
- Information should be in the first language of the individual where possible and be given in verbal and written format. This information should also be available on the hospital website.
- Information leaflets should be assessed for readability.

1.2 Discharge information

- Advice on how to deal with common postoperative problems such as control of pain, nausea and vomiting. It should include what to do themselves and when to seek further advice.
- Discharge information should provide a step by step guide on what to do in case of emergency.
- Contact details of the unit and/or the hospital for queries and emergencies.

1 1.3 Standards and targets of best practice in provision of patient information

- Information provided at the out-patients clinics and/or pre-assessment clinics.
- % of procedures carried out in the day unit for which suitable information leaflets exists.
- % of patients who are satisfied with the information they received when questioned after surgery.

2 2.0 Pre-admission / Pre-assessment

- Clear guidelines and protocols developed locally with the help of consultant anaesthetists for patient selection criteria for direct admission to day surgery unit/ward should be in place.
- Patient selection and assessment for day surgery should take place in a pre-assessment clinic, ideally within six weeks of surgery.
- Pre-anaesthetic clinics led by consultant anaesthetists, and managed by senior nursing staff should be provided for further assessment and optimisation of patients who do not meet the selection criteria for direct admission to day surgery ward/unit.
- Patient's social requirements for day surgery should be assessed and ensured prior to the day of surgery. This includes ensuring home support for 12-24 hours post operatively and that the patient has access to telephone post discharge.

1 2.1 Standards and targets for best practice in provision of pre-admission / pre-assessment

- Existence of guidelines and protocols
- 100% of patients should be pre-assessed prior to day of surgery.
- 0% of patients who have been pre-assessed should have (pre-existing) problems discovered later when make them unsuitable for day surgery.
- DNA and late cancellation rates should be below 5% and/or show a year-on-year reduction.

3 3.0 Documentation

- Standardised integrated care pathway forms should be used for documentation which will follow the patient from surgical OPD to pre-assessment to day of surgery and through to post discharge follow up.
- The care pathway forms should include a consent form which (ideally) should be signed at the time of surgical OPD.

1 3.1 Standards and targets for best practice in documentation

- Integrated, clear, easily accessible forms should be provided to follow the patient from presentation at OPD through to discharge. This may not be available for all specialities but should show a year-on-year improvement.
- % of patients who have consent completed prior to day of surgery

4 4.0 Management of day surgery

- There should be dedicated day surgery theatre times, with appropriate scheduling of day surgery cases.
- Working time-tables and operating scheduling should be monitored and designed to minimise hospital admissions including where available extending day ward/unit opening hours from 8AM to 8PM.
- A senior nurse should be in charge of the day surgery units, which should have its own unit/desk for patient admission (separate to in-patient admissions).
- The day surgery unit should contact patients 48 hours prior to surgery to confirm attendance.

1 4.1 Standards and targets for best practice in documentation

- Timetables and schedules in place
- % of patients contacted 48 prior to procedure.

5 5.0 Discharge protocols

The discharge process can be a nurse led, per protocol process, where patients must fulfil predetermined discharge criteria prior to discharge.
Discharge criteria must include adequate pain and emetic control.
Patients should be provided with written discharge information with contact details in case of emergency (see section xx).
In cases where patients do not meet the discharge criteria, written protocols should be in place to facilitate transfer of patient to an in-patient setting.
A link between primary care and day surgery unit should be established and patients followed up with a phone call from the day surgery unit 24 hours post discharge to monitor and ensure adequate progress.

1 5.1 Standards and targets for best practice in discharge protocols

- Discharge protocols should be in place
- % of patients who achieved agreed discharge criteria prior to discharge.
- % of patients who have written instructions on discharge.
- % of patients phoned within 48 hours post discharge to monitor progress
- % of patients for whom discharge home (if this was the original plan) was not achieved. This should be as low as possible

6 6.0 Monitoring

Regular monitoring and audit of day surgical services should be carried out. These should include monitoring of stay in rates, occurrence of adverse events, return visits to hospital, operation cancellation rates, and patient satisfaction surveys.

1 6.1 Standards and targets for best practice in discharge protocols

- % of stay in rates. Should include reasons for stay in. Should be less than 5%.
- % of patients who return to A/E department or for admission to hospital with a day surgery procedure related problem. Should be less than 2%.
- Operation cancellation rates and reason for cancellations.
- Follow-up of adverse event rates within two weeks of discharge. Should be conducted annually.
- Patient satisfaction surveys. Should be conducted annually.