TEN YEAR CANCER AUDIT REPORT
ST. JAMES'S HOSPITAL

2003–2012

Compiled by:
Cancer Audit Programme Team, St. James's Hospital.

Table of Contents

Foreword

It gives me great pleasure to contribute a foreword to this Ten Year Audit of Cancer Care at St. James's Hospital. This report complements our previous six year report. The report enables us to benchmark ourselves against National and International standards in a very substantive way.

Safe and efficient cancer care relies on high quality data. By taking responsibility for our clinical data, clinicians can only improve the quality of care and help enhance standards. We have developed structures and processes for the measuring and monitoring of the quality of care, using a core set of performance indicators and comprehensive datasets.

The Hospital Cancer Audit Program is long established at St. James's. The objectives of the program are to highlight patient volumes, complexity of treatment, trends & referral patterns and ultimately the quality of care provided. We are committed to high quality data collection, statistical analysis and reporting. Our goal is the continuous re-evaluation of our data against the findings of this audit and the move to a more robust platform of information capture through more efficient electronic data capture.

During the ten year period, St James's Hospital diagnosed and/or treated almost 29,000 new cancer patients, representing 12% of national cancer activity. It should be noted that this represents a 97% local workload increase over the last ten years. The data is now sufficiently mature to provide a basis for long term outcome analysis. This type of report is unique in Ireland and represents a positive investment in cancer over the last decade.

Cancer care quality measures should:

- Span the continuum of multidisciplinary cancer care and be developed through a coordinated effort:
- Be used to hold providers accountable for demonstrating that they provide and improve quality of care;
- Be disseminated widely and communicated openly and meaningfully to clinicians, our cancer patients and their families, managers, policy makers, and cancer researchers, in a form that is relevant and useful for health care decision-making.

St. James's Hospital has been to the forefront of developing multidisciplinary care for cancer patients in this country for many years. This publication of our ten year cancer audit report is an essential element in driving quality improvement in cancer care. The results of this audit will inform all facets of our collaborative cancer program at the Hospital which can only lead to further improvements to patient outcomes.

I congratulate all those involved in the development of this audit report that helped create a valuable and worthwhile project providing information to better develop cancer care ensuring quality and fairness in the provision of services to all.

Brian Fitzgerald
Chief Executive
St. James's Hospital

In Memory

This ten year report is dedicated to the memory of our great friend and colleague Professor Donal Hollywood who passed away earlier this year at the tragically early age of 53. Donal was a towering presence in the development of cancer services both in St James's Hospital and nationally over the past 20 years. He was appointed in 1994 to the Marie Curie Chair of Clinical Oncology in Trinity College Dublin and as a Consultant Radiation Oncologist in St. James's and St. Lukes's Hospitals. Over the past 18 years he developed a large and successful practice and became a driving force in the multidisciplinary care of cancer patients in St James's Hospital. His achievements in research, teaching and the development of radiation services both on the national and international arenas are well documented. We remember a quiet, thoughtful, courteous colleague, friend and doctor who never failed to go the extra distance for his patients. We will miss his erudition, his kindness and his intellect. As we compile this report, he is very much in our thoughts.

PROFESSOR DONAL HOLLYWOOD

Objective

The primary objective of this report is to present a comprehensive audit of cancer care undertaken at St. James's Hospital from 2003 to 2012, inclusive. The unique dimension in the Irish context is the focus on outcomes of cancer care, stage by stage for each individual cancer. The report also includes patterns in patient volumes and incidence trends, referral patterns, and complexity of care. The outcome and process data can be used to compare against published benchmarks from international cancer centres or national reports.

Audit has driven continuous quality improvement at St. James's Hospital, and during this time period structures including multidisciplinary teams, defined cancer clinics, and rapid-access processes and care pathways, have all evolved to underpin the cancer programme. This audit, unique in the Irish context, provides information that allows patient's information on institution-specific cure rates and outcomes relevant for a particular cancer and stage of disease. The audit also enables detailed information to be provided to the administration and board of the hospital, and relevant bodies including the Department of Heath and Children, the Health Service Executive, the National Cancer Control Programme, and the Health Information Quality Authority. It also provides a framework for measuring the cost of cancer care.

Background

The Cancer Audit Programme (CAP) at St. James's Hospital was established in 2001. The goal is to provide comprehensive prospective data on the structures, processes and outcomes of cancer care provided by the many national, supra-regional and regional cancer programmes in the Hospital. Information on outcomes for all cancers, broken down by stage of disease, is unique in the Irish context and relatively rare internationally. Outcome data provides information to patients, enables audit and continuous quality improving of services, and benchmarking against best international data.

It also informs the Administration and Board of the Hospital, the Health Service Executive and the Department of Health on quality aspects of cancer care, and allows estimates of cost. In 2013, the CAP is also integral to the provision of information to the National Cancer Control Programme (NCCP) and the Health Information and Quality Authority (HIQA). The registry structure also enables the research function of the academic centre, interfacing with translational and clinical cancer research, and clinical trials.

Cancer Audit Structure

The CAP is managed by a Cancer Audit Manager, with dedicated cancer data managers in lung, oesophageal/gastric, breast, haematology, colorectal, gynaecological and head & neck. Each data manager reports to both the Cancer Audit Manager and the clinical lead with a direct responsibility for each cancer. The CAP is clinically driven by the Cancer Audit Director with direct input and output to the CEO office. The technical function of CAP is directly supported by the IMS Department. The existing CAP uses the information system PATS (Patient Analysis Tracking System). There are also a number of other cancer registries associated with cancer care in the hospital, including the Breast Clinic, Rapid Access Prostate Clinic, Barretts Oesophagus, and Cancer Clinical Trials.

Reporting

The first report was in 2004[1], followed by a six year report of incidence and outcome cancer data in 2008, the first report of its kind in Ireland[2]. One of the recent key developments within cancer audit in the introduction of tumour site specific Quality Improvement Programmes (QIP). One of the key aims is to monitor and improve each service in order to ensure the continuous provision of safe, effective, quality cancer care to its patients and community and compliance with all relevant legislation, regulation and both national and international best practice standards. The QIP provides a platform for validation, review and quality assurance of the cancer data and also in-house and NCCP Key Performance Indicators (KPI) produced by individual data managers. The ultimate aim of the programme is to develop a framework and foster a culture of continuous quality improvement, whereby real time data is reviewed regularly at an individual service level and findings that have been put in place to deliver continual improvements in the quality of cancer care.

1 Cancer Programme Audit Report 2004. St. James's Hospital, Dublin.
2 Six-year Cancer Audit Report, St. James's Hospital, Dublin.

Executive Summary

- A marked increase in cancer care took place over this 10 year time period. In 2012, almost 4000 new cancer patients were diagnosed and/or treated in St. James's Hospital. Excluding non-melanoma skin cancer this represents an approximate doubling of new cancer referrals over the study period.
- There has been an approximate 100% increase in new referrals for lung cancer, oesophageal cancer, stomach cancer, head and neck cancer, and malignant melanoma.
- Breast cancer activity has increased by 35%, colorectal cancer by 45%, and gynaecological cancer by 85%.
- The average age of patients diagnosed and/or treated in SJH is 60 years .There were 14677 women diagnosed compared with 14,144 men.
- Cancer outcomes across the spectrum of cancer at St. James's Hospital compares favourably with international benchmarks.
- The average cancer clinical trial involvement over the period is approximately 6%, with a peak of 16% in 2008.
- Imaging for cancer, including MRI, CT, PET/CT and mammography, has doubled, from 30,000 in 2006 to 60,000 in 2012.
- There exists cognate complex cancer surgery for lung, oesophageal and head and neck cancer, which overlap with respect to complexity of surgery, multidisciplinary care, integrated peri-operative care pathways, critical care support, quality of life issues, and cost. These respective services account for between 33-53% of the national workload. There are also strong cognate links between colorectal, urological and gynaecological cancers.
- Lung cancer is the highest volume cancer, with almost 700 new diagnoses in 2012, accounting for approximately 27% of the national workload. Less than 10% of cases are non-smokers, and the incidence is similar in current and ex-smokers. Encouragingly, 47% of patients have clinical stage I or stage II at the time of diagnosis, and can be treated with curative intent.
- St. James's Hospital was recently designated as the National Centre for Oesophageal and Gastric Cancer and the National Centre for Management of Early Upper Gastrointestinal Mucosal Neoplasia. The hospital manages approximately 65% of oesophageal surgical resections nationally. Cure rates are improving, with overall survival at 35%, 65% for node-negative disease, and 75% for Stage I/II disease, outcomes consistent with best international benchmarks.
- Gynaecological cancer care at St. James's Hospital is designated by the NCCP as a regional and national referral centre for the care of women with genital tract malignancies. The service accounts for a significant percentage of national activity accounting for 37%, 28%, 26%, and 20% of vulval, ovarian, cervical, and endometrial cancer workload, respectively, with a 5-year survival of 68%, 48%, 67%, and 68%, respectively.

- Skin cancer is the commonest cancer. The Dermatosurgery Unit in St. James's Hospital is the only unit which provides a Mohs Micrographic Surgery service to public health patients in the Republic of Ireland requiring facial surgery for basal and squamous cell cancer. There has over a doubling of new diagnoses of malignant melanoma since 2003, with 152 patients diagnosed and managed in 2012, and a five year survival rate of 87%.

- There has been a 2.5-fold increase in new urology cancers diagnosed and/or treated in this ten year period with a near 5-fold increase in prostate cancer alone. The urology service accounts for 14% of the national Rapid Access Prostate Cancer activity, with approximately 180 new cancers diagnosed from the Rapid Access service annually. Over 50% of kidney cancer surgery is now performed laparoscopically.

- St. James's Hospital is a high volume centre for colorectal diseases, with minimally invasive (laparoscopic) surgery the preferred approach within the Unit, comprising approximately 55% of operations performed over the last 5 years. There has been a 43% increase in the numbers of new patients over this time period.

- St. James's Hospital Breast Unit was designated as one of the eight specialist centres for Symptomatic Breast Disease Services in Ireland by the National Cancer Control Programme in 2007. A well as managing symptomatic breast patients, our Unit has dedicated family risk clinics for screening and managing women with a genetic predisposition to breast cancer. The overall 5-year survival is approximately 80%, and over 90% for early stage disease.

- The Haematology Oncology Department in SJH provides care for patients with general and malignant haematological disorders including leukaemia, myeloma and lymphoma. The service incorporates the National Adult Bone Marrow Transplant Unit, provides a matched unrelated transplant service to Northern Ireland and a tertiary referral for complex haematological malignancies to haematology colleagues in other units. There has been an increase in autologous and allogeneic transplants over the study period, with 84 and 73 performed in 2012, respectively. The 5-year survival rates are 60% and 49%, respectively.

- Translational cancer research is a key platform linking SJH and Trinity College Dublin. This is greatly enabled by the proximity of the hospital to the Trinity College cancer research laboratories on the same campus. Internationally, the move to formalise the translational process has led to the strategic formation of specialised Institutes of Translational Medicine. Cancer research is also enabled by the new Wellcome Trust-Health Research Board Clinical Research Building.

1

Section 1: General Aspects of Cancer Audit

1.1 Demographic Data

Incidence

St. James's Hospital (SJH) diagnosed and/or almost 4000 new cancers in 2012. When Non Melanoma Skin Cancers (NMSC) are excluded, this represents 12% of national cancer activity[1]. The cancer workload in SJH has increased significantly with a 97% increase in the overall workload in this ten-year period (exc, NMSC). The largest increase in activity has been seen in lung, urology, head and neck and melanomas (table 1.1).

Table 1.1 Cancer Activity in SJH 2003-2012

Cancer Type	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	% Increase in Activity in 10 years
NMSC	383	425	412	517	574	679	677	730	724	804	110%
Lung	280	302	323	348	415	394	446	512	587	648	131%
Breast	202	138	141	134	160	162	210	276	285	272	35%
Oesophagogastric	118	143	134	164	189	197	197	229	278	263	123%
Urology	128	144	203	208	216	226	318	381	448	445	246%
Colorectal	123	139	142	166	168	180	209	198	207	176	43%
Head & Neck	128	153	165	151	183	195	205	240	259	285	123%
Lymphoma	134	152	164	156	149	145	144	172	204	184	37%
Gynaecological	160	153	180	198	197	243	287	288	293	297	86%
Melanoma	68	76	69	99	105	119	139	127	163	152	124%
Hepatic/Pancreas	69	58	62	59	64	70	75	67	122	112	62%
Haematological	141	143	147	142	164	154	158	151	152	137	0%
Bone	3	3	5	4	6	9	7	6	7	8	167%
Endocrine	21	30	36	39	55	52	52	58	69	72	243%
Sarcoma	24	35	24	31	30	49	59	68	66	76	217%
Exotic/Unknown Primary	7	8	12	10	15	16	24	18	23	27	286%

Both day-case and in-patient activity from Hospital In-patient Enquiry System (HIPE) indicate a substantial increase in SJH to the end of 2012 (see fig 1.1/1.2).

1 Based on 2010 SJH versus National Cancer Registry (NCRI) comparisons, the latest available data from the NCRI.

Referral Details

SJH is a national referral centre for many cancers. Tertiary referrals are now patients from outside the Dublin Mid Leinster region, rather than outside the now redundant East Region Health Authority (ERHA) region. A breakdown of this is seen is table 1.2

Basic Demographics

Basic demographics were analysed for patients over the ten year period (exc. NMSC). The ratio of male to female is 1:1 over the ten years and there was little variation again across the ten years (table 1.3).

Table 1.2 Tertiary referral rates for cancer in SJH

Cancer site	Referral rate
Oesophageal	53%
Lung	42%
Gastric	40%
Gynaecology	32%
Haematology malignancy	29%
Lymphoma	28%
Head & Neck	27%
Urology	25%
Melanoma	14%
Colorectal	12%
Breast	9%

Table 1.3 Male to Female Ratio by Year of Diagnosis

Sex	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Female	53%	50%	51%	51%	50%	51%	52%	54%	51%	52%	51%
Male	47%	50%	49%	49%	50%	49%	48%	46%	49%	48%	49%

The average age of patients diagnosed and/or treated in SJH is 60 years [median age is 62 years]. The median age at diagnosis was 59, range [10-103] and was significantly lower ($p<0.01$) in women across the ten year period compared to a median age of 65 in men, range [13-99] (see table 1.4).

Table 1.4 Median Age at Diagnosis by Year

Year	Female	Male
2003	57	64
2004	59	64
2005	60	65
2006	60	64
2007	60	65
2008	60	64
2009	58	65
2010	58	64
2011	60	66
2012	61	66
Total	59	65

32% of women were diagnosed before the age of 50 compared to 18% of males.

Smoking History

Smoking accounts for one in four cancer deaths, and nearly a fifth of all cancer cases.

Smoking is a prime cause of lung cancer but it is also a known risk factor in several other cancers. Approximately 1,500 people develop lung cancer each year and 90% of these cases are directly caused by smoking.

Table 1.5 Smoking Status by Sex

Smoking History	Female	Male
No Smoking History	44%	26%
Smoking History	56%	74%

Smoking status remains difficult to capture, however it has greatly improved since the last report with less missing or unknown data. Where documented, 56% of females (table 1.5) had a smoking history (either current or ex-smoker) compared to 74% of males. The percentage of women smoking over the ten year period has risen and in particular in the last five years. In individual tumour sites, over 90% of lung cancer patients had a smoking history, as did 61% colorectal, 64% head and neck cancers and 69% oesophageal cancer patients. 42% of gynaecological cancers had a smoking history.

Family History

Family history is recorded where available but the recording of family history has improved in the last five years. Any family history of cancer is recorded in table 1.6.

Table 1.6 Family History by Year of Diagnosis

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
25%	22%	25%	20%	19%	21%	24%	26%	21%	19%

51% of gynaecological cancers had a family history of cancer, 44% breast (29% of all breast cancers have a breast family history), 44% colorectal, 41% oesophageal and 35% gastric. 13% of prostate cancer patients had a first degree relative with prostate cancer.

1.2 Multidisciplinary Team (MDT) Meeting

Overview

Eight cancer multidisciplinary team conferences are held weekly in SJH to establish consensus diagnosis and treatment plans for all cancer patients. All MDT conferences require expertise from surgery, pathology, radiology, medical and radiation oncology. Conferences are supported by an MDT co-ordinator who liaises with all specialties within SJH and other hospitals regionally and nationally.

Process

MDT is a standard of care for cancer patients in SJH. SJH is the super regional catchment area for lung, lymphoma and gastrointestinal cancers. The SJH team examines all diagnostic material sent from referring hospitals and present their findings via video conferencing. Medical teams around the country can seek the advice of our expert medical team in SJH and vice versa and produce efficient and timely care for cancer patients.

Cancer MDT Activity

Table 1.7 demonstrates the number of patients discussed at the Cancer MDT meetings over the period 2005-2012.

Table 1.7 MDT Activity by Tumour Site

Tumour Site	2005	2006	2007	2008	2009	2010	2011	2012
Upper & Lower GI	169	429	407	837	846	1059	1167	1109
Urology	62	206	155	557	525	623	781	942
Gynae	297	465	588	814	935	1136	1158	1256
Breast	707	742	888	1469	1906	1947	2122	1935
Lung	424	821	919	1524	1297	1357	1587	1504
Head & Neck	*	160	291	444	495	638	599	689
Lymphoma	177	229	214	267	228	388	387	429
Skin	495	835	718	1421	1343	1491	1599	369

* Head & Neck MDT was not in operation until 2006

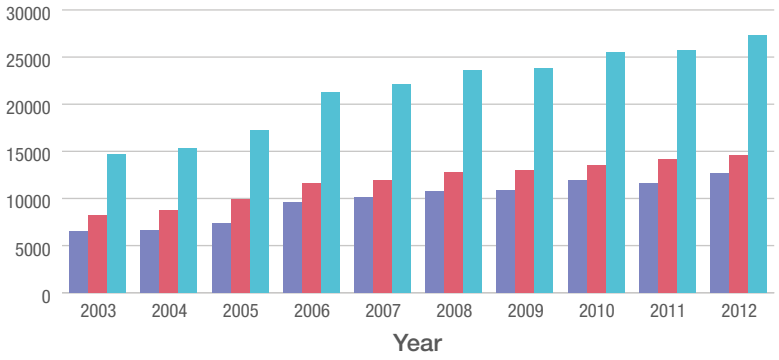
1.3 Systemic Therapy

Haematology oncology and Medical oncology activity continue to increase year on year with 27297 patients attending day services in oncology and haematology.

Haematology Oncology

The haematology department in SJH provides care for patients with general and malignant haematological disorders including leukaemia, myeloma and lymphoma. The service incorporates the National Adult Bone Marrow transplant unit, provides a Matched Unrelated transplant service to Northern Ireland and a tertiary referral for complex haematological malignancies to haematology colleagues in other units.

Figure 1.1 Days activity for Haematology Oncology/Medical Oncology

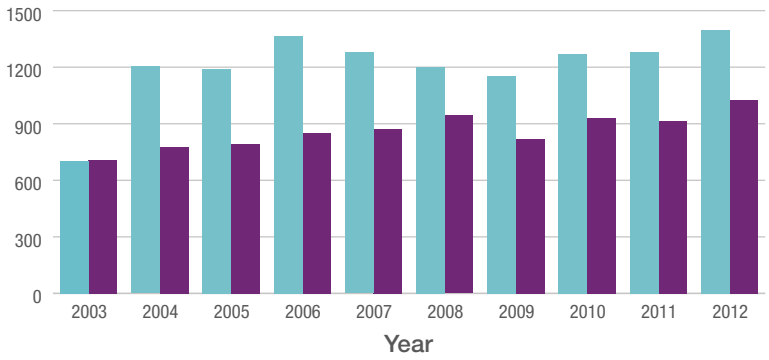


	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Haematology Oncology*	6473	6601	7400	9605	10154	10800	10838	11907	11624	12713
Medical Oncology	8230	8715	9892	11618	11972	12823	12970	13571	14128	14584
Total	14703	15316	17218	21223	22126	23623	23808	25478	25770	27297

*Haematology Oncology data includes coagulation figures which account for 10% of Haematology Oncology activity.

Out-patient attendances have increased significantly since 2008 for haematology oncology, and medical oncology increases year-on-year.

Figure 1.2 In-patient Haematology Oncology and Medical Oncology 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Medical Oncology	703	1204	1190	1367	1278	1199	1152	1272	1281	1399
Haematology Oncology*	709	778	792	849	871	944	818	931	914	1028

*Haematology Oncology data includes coagulation figures which account for 10% of Haematology Oncology activity.

In patient activity has also increased for both medical oncology and haematology oncology with a total of 2427 discharges in 2012.

Medical Oncology

The medical oncology service in SJH has grown over the past ten years in concert with the hospital as a whole, reflecting the emerging position of SJH as the largest cancer hospital in the country. A total of four medical oncologists provide specialised services to patients with the full range of cancers. Services are tightly aligned with our surgical and radiation colleagues through a large programme of multidisciplinary conferences and optimal care is facilitated by development of newer services such as Molecular Diagnostics, PET/CT scanning and on site radiation therapy. Specialist registrars are trained in the programme and large numbers of patients are enrolled on clinical trials.

Activity

Activity has increased enormously over the past 10 years. Annual in-patient admissions have doubled from 700 to 1400 and day treatments have increased from 8,200 to 14,500 annually. Reflecting the specialist surgical oncologic expertise in the hospital and the centralisation of services nationally there have been particularly large increases in the numbers of patients with gynaecologic, lymphatic, lung, upper GI and breast cancers seen in the past ten years.

Developments/Innovations

With the increase in number of medical oncologists to four we have been able to provide site specialised care to patients with most malignancies. With the support of colleagues in the haematology department we have developed a national programme for high-dose therapy in patients with relapsed germ cell tumours. Research activities have expanded not only in the Clinical Trials Unit which is led by Dr. Dearbhaile O' Donnell but also in the Thoracic Malignancies laboratory and in conjunction with Professor Elizabeth Connolly in the Breast Cancer Research Laboratories.

The increased number of patients requires a larger dedicated medical oncology in-patient unit and we are in the process of making this transition. Further expansion of medical oncology services will only be possible with the addition of new consultants.

1.4 Radiation Oncology

Patients attending SJH who require Radiotherapy attend St. Luke's Radiation Oncology Network (SLRON) for treatment. The network operates from three locations - St. Luke's Hospital (SLH), Rathgar, St. Luke's Radiation Oncology Centre (SLROC) at SJH and SLROC at Beaumont Hospital. The new centres opened in March 2011 following an investment of 60 million euros by the NCCP. There are now 12 linear accelerators within the network resulting in faster access for patients requiring Radiotherapy.

Over 4,000 patients were treated across all three centres in 2011. Each new centre features four new state of the art treatment linear accelerators (LA) as well as two CT scanners and one MRI unit. The LA's (each representing an investment of well in excess of €1m) differ slightly in their specifications. The SJH centre houses a unit capable of delivering Total Body Irradiation (TBI) for haematology patients attending the National Stem Cell Transplantation Centre and in May 2013 the TBI service was transferred from SLH to SJH, which is more convenient for the patients as the vast majority who require this form of treatment, are primarily in-patients in SJH.

Structure

There are six Consultant Radiation Oncologists that work within SLRON and provide Radiotherapy to SJH. They include Dr. Catriona O'Sullivan, Dr. Charles Gillham, Dr. Moya Cunningham, Dr. Sinéad Brennan, Dr. Pierre Thirion and Dr. Nazmy Elbeltagi.

All consultants provide a comprehensive in-patient consultation and out-patient department (OPD) service, and collectively attend all the hospital's oncology MDT meetings.

Nursing support is provided by a Radiation Oncology Liaison Nurse, Ms. Anne O'Hara.

Future developments

They include the imminent opening of 12 designated radiation oncology in-patients beds in SJH which will allow the transfer of more complex cases such as patients with Head and Neck cancer and Upper GI cancer to the St. James's centre for radiotherapy treatment. Although Intensity Modulated Radiation Therapy (IMRT) is available in SLH, treatment delivery time is lengthy. Rapid ARC IMRT which is available in the St. James's centre reduces treatment delivery time which is particularly attractive for these complex cases as it is more comfortable for the patient but also allows an increase in the number of cases that can be treated and a further reduction in treatment planning time for these patients.

By early 2014 extracranial stereotactic radiotherapy will be available in the St. James's centre.

1.5 Surgical Oncology

The Cancer Programme at SJH has been built on a multidisciplinary integrated model, and the importance of cancer surgery within this structure is presented in this report for each cancer site. Currently, approximately 27% of all hospital discharges from the hospital are cancer-related. The key strengths within surgical oncology at the hospital are as follows:

High-volume hospital and high-volume surgeons for oesophageal/gastric, lung, head and neck, maxillofacial, colorectal, breast, gynaecological, urological, and skin cancers.

- National Centre for Oesophageal and Gastric Cancer.
- National Centre for Early Mucosal Neoplasia of the Oesophagus.
- National Maxillofacial Centre.
- Supra-regional Programmes in Lung, Gynaecological and Head and Neck Cancer.
- Surgical site sub-specialisation for all cancer types.
- Rapid-access structured clinics for all cancer sites.
- Integration with gastroenterologists and respiratory physicians in state of the art diagnostic facility that was opened in 2005.
- Five-surgeon plastic and reconstructive unit link closely with head and neck, breast and skin programmes.
- Biobanking of all resected oesophageal, lung, colorectal and prostate tissue enables molecular research in the Trinity Translational Medicine Institute.
- Cancer Clinical Trials aligned with All Ireland Cooperative Oncology research Group (ICORG).
- Cognate linkage for major surgery across several sites: oesophageal and lung, head and neck/maxillofacial with reconstructive, oesophageal and lung, gynaecological, urological and rectal, urological and cardiac.
- Comprehensive vascular and endovascular programme, with significant input into some complex cancer operations and the management of major vascular emergencies.
- Outstanding cross-sectional radiology for cancer staging, including CT/PET and MRI, as well as specialist interventional radiology for the management of complex cancer cases and surgical complications.

1.6 Palliative Care

Background

Palliative care is an approach that improves the quality of life of patients and their families facing the problems associated with life threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems; physical, psychosocial and spiritual.

Palliative care:

- Provides relief from pain and other distressing symptoms.
- Affirms life and regards dying as a normal process.
- Intends neither to hasten or postpone death.
- Integrates the psychological and spiritual aspects of patient care.
- Offers a support system to help patients live as actively as possible until death.
- Offers a support system to help the family cope during the patients illness and in their own bereavement.
- Uses a team approach to address the needs of patients and their families, including bereavement counselling, if indicated.
- Will enhance quality of life and may also positively influence the course of illness.
- Is applicable early in the course of illness, in conjunction with other therapies that are intended to prolong life, such as chemotherapy or radiation therapy and includes those investigations needed to better understand and manage distressing clinical complications.

Palliative care is an essential component of cancer care; despite advances in early diagnosis, surgery and oncology treatments, many patients with cancer will die from their disease.

Early palliative care interventions for patients with cancer are associated with many positive benefits including better symptom control, better quality of life and for some, longer survival. Palliative care also assists family and caregivers through this experience and works to bring solace to those grieving the death of a loved one.

The palliative care service in SJH was established in 1995. It comprises two consultants (23.5 hour sessional commitment), a medical registrar, three clinical nurse specialists, a medical social worker and 0.5WTE of secretarial support.

The direct administrative supervision and governance of the palliative care service is conducted through the HOPE directorate.

The strategic policy direction of the service is in line with the HSE National Clinical Programme for Palliative Care http://www.hse.ie/eng/about/Who/clinical/natclinprog/palliativecareprogramme and is implementing the Programmes' initiatives. These include implementation of the national palliative care service referral form and the palliative care needs assessment form, engagement with the competency framework strategy and implementation of national clinical guidelines on pain, depression and constipation.

Structure

A weekly specialist palliative medicine MDT meeting is held where all patients referred to the service are discussed and a plan of care agreed. Joint palliative medicine and oncology MDT meetings are held twice weekly.

A consultation service is provided to hospital in-patients. A weekly out-patient clinic is held. Patients are also reviewed in the Haematology Oncology Day Centre (HODC) on request.

Hospital in-patients with complex specialist palliative care needs can be referred for symptom control, psychosocial support or end of life care. When patients are discharged from SJH they can continue to receive specialist palliative care through the SJH OPD clinic or through community palliative care services based in Our Lady's Hospice and Care Services (OLH&CS) or if outside the catchment area, their local palliative care service. Some patients are transferred directly to OLH&CS for ongoing care as an in-patient. The two palliative medicine consultants have joint appointments between the two organisations. This supports the safe delivery of care as patients move frequently between different care settings.

Activity

The demand for the service has been increasing year on year. In 2011 the total number of in-patient referrals was 927 patients, in 2012; 1077, and it is projected that by end of 2013 the total number of referrals will be over 1200. The total number of patients referred for out-patient consultation is also increasing ever year. In 2011 164 patients were referred for out-patient consultation, 2012; 173 patients were referred and it is projected that by end of 2013 over 200 patients will be seen in the out-patients. The referral rate of cancer patients with complex needs will continue to rise due to NCCP developments on-site.

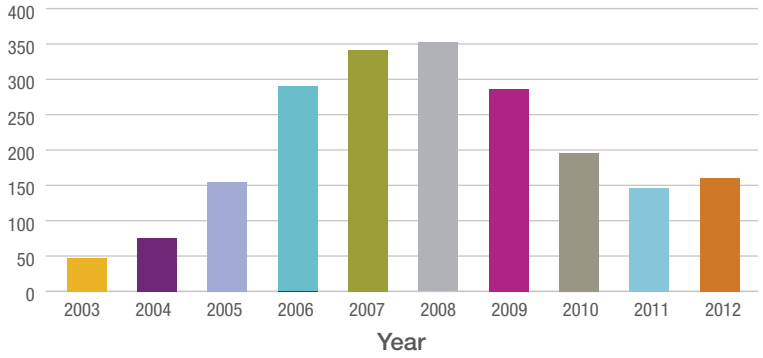
Developments/Innovations

1. The palliative care service is fully integrated in the electronic patient referral (EPR) system, receiving referrals electronically and documenting all patient activity electronically. This ensures that the activity of the service is captured accurately. This supports regular auditing of the service as well as providing accurate statistics for the national acute hospital minimum data set. The service is also linked electronically with OLH&CS through the PAS system. This ensures that the patient journey from SJH to OLH is captured electronically which supports the safe delivery of the service.
2. A novel information tool in the form of a DVD has been developed as a joint initiative between SJH palliative care team and OLH&CS, supported by the Regional Cancer Programme Office, to inform patients and their families of services available to them. This innovative tool further supports effective care through timely information sharing.
3. Bereavement support is a core component of good end of life care and an annual bereavement evening is held to support bereaved relatives of patients that have died while receiving support from the palliative care team. This initiative has been evaluated positively by attendees, and the aim is to run it bi-annually. The format of the evening will be used as a template for other services to provide bereavement support.
4. The service is actively involved in teaching and training of all disciplines both at undergraduate and postgraduate levels. The Introduction to Palliative Care course is run bi-annually in conjunction with the Centre for Learning and Development (CLD). The service is committed to quality improvement through regular audit of practice the results of which are shared though the HOPE directorate governance structures.
5. To further progress the development of a comprehensive specialist palliative care service a fulltime SJH palliative medicine consultant is required as well as a doubling of clinical nurse specialist posts.
6. The recent appointment of Professor Declan Walsh as Professor of Palliative Medicine, Faculty of Health Sciences at TCD, School of Medicine and Medical Science at UCD and OLH&CS will further strengthen the research culture of the service.

1.7 Cancer Clinical Trials Office (CCTO)

The CCTO opened in 2003 and Professor John Kennedy was the Director from 2003 until 2009 when he was succeeded by Dr. D. O'Donnell. The CCTO has recruited patients in the areas of breast, lung, ovarian, oesophageal, mesothelioma, colorectal, melanoma, lymphoma, CML, multiple myeloma, CLL and head & neck cancers over the past 10 years. We have conducted clinical trials in all four phases of drug development, from phase 1-4 and have been involved in numerous translational studies where both blood and tumour samples are collected.

Figure 1.3 Cancer Clinical Trials 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
No. of patients	47	76	155	290	342	352	286	196	146	160

The recruitment over the 10-year period is variable as it is dependant on what trials and studies we have open that particular year. As the years have gone by the trials are not only increasing in complexity but the entry criteria are becoming very restrictive. The CCTO works very closely with ICORG in sourcing clinical trials and our goal is to provide our patients with access to the newest cutting edge therapies.

1.8 Cancer Genetics Service

Service

The majority of referrals to the Cancer Genetics Programme are accepted within the hospital by Electronic Patient Record (EPR). Other referral sources include those from General Practioners (GP) and are accepted for patients whose family members are attending the Cancer Genetic Service. (Referrals not accepted are redirected to The National Centre of Medical Genetics) Other referrals from external consultants are reviewed on a case by case basis.

Structure

A consultant-led cancer genetics service was established in SJH in October 2011.Cancer genetics clinics are held every Wednesday morning in Breast Care Department.

The Cancer Genetics department is staffed by a 0.1 WTE Consultant, a 0.5 WTE CNS, 1.0 WTE CNM 1 and a 0.5 WTE secretary.

Role of the Service

SJH has a dedicated specialist cancer genetics service which provides risk assessment, counselling and genetic testing for individuals and families at increased risk of cancer, mainly breast and ovarian cancer, however individuals and families predisposed to other cancers are also seen. The service aims to provide:

- Risk assessment and screening recommendations.
- Counselling and education for patients and families.
- Diagnostic genetic testing.
- Predictive genetic testing.
- Specific pre and post test counselling.
- Data collation and tracking.
- Collaborative participation in relevant basic/translational/clinical research.

Patients at risk of harbouring a deleterious mutation are counselled regarding the risks and benefits of genetic testing. When no cancer predisposition syndrome is identified for genetic testing screening advice is given based on the diagnoses in the family. In all case where a mutation has been identified genetic counselling/predictive testing is offered to at risk family members and a structured surveillance programme is established for female mutation and this is co-ordinated through the Breast Care services and Gynaecology services in SJH.

Clinical and Translational Research

In addition to providing a clinical service we are actively involved in clinical and translational research. We regularly accrue patients to the SJHbio bank and have developed internal and external research collaborations. In 2012, original research from this department was presented at the American Society of Clinical Oncology (ASCO) Gastrointestinal Symposium in Florida, the ASCO Annual Meeting in Chicago and the European Society of Medical Oncology Annual Meeting in Vienna.

The IMPACT study was also opened in 2012 at SJH. This multi-institutional collaboration led by Professor Eeles at the Royal Marsden Hospital, London investigating the benefit of prostate cancer screening in men genetically predisposed to the disease.

Developments in Cancer Genetics in 2012

- Complete service revision.
- Patient pathway remodelled.
- Administrative processes introduced.
- Staff roles & responsibilities revised.
- Nursing competencies established and second nurse trained to review patients.
- Introduced new 'Predictive' clinics.
- 16 extra consultant clinics held (NCCP funded).

Cancer Genetics Service Goals for 2013

- Service development via NCCP.
- Introduce G2 speech recognition technology.
- Exploration of specific database options.

1.9 Psycho-Oncology

The Psycho-Oncology Service at SJH was formerly launched by the Minister for Health in 2005. It was the first integrated psycho-oncology service nationally and developed the first CNS post for mental health nursing in a general hospital setting. Developed from the existing Psychological Medicine Service, it promotes the same ideals of integrated, multi-disciplinary psychological care across all levels of distress – mild/moderate and severe and provides emergency and elective assessment as well as on-going complex psychological care when needed. The core service includes Principal Clinical Psychologist; Dr Sonya Collier, CNS; Mr. Eugene Beirne; Administrator; Ms. Karen Shine, and Consultant Psychiatrist; Dr Anne-Marie O' Dwyer.

In addition to providing clinical care, the team also provides training, supervision and education for health workers; has presented at national and international conferences on the topic of psycho-oncology and has published in a number of peer reviewed journals. A recent innovation by the service was the development of an award-winning cancer-related fatigue manual and DVD. The service has been the recipient of a number of awards including the 2005 – HSE innovation in Healthcare Awards (First prize in Hospital Category); 2012 Irish Healthcare Awards: First prize in Hospital Category and An Duais Mhor, best project in all categories and was a finalist in the 2013 Healthcare Innovations Awards.

1.10 Allied Health Services

The SCOPe Management Unit comprises of Speech and Language Therapy, Medical Social Work, Clinical Nutrition, Occupational Therapy and Physiotherapy. SCOPe staff members work as an integral part of the cancer MDT at SJH. We aim to provide the highest quality, evidence based care to all cancer patients. SCOPe has secured funding for research and has pioneered many cancer studies and audits over the last number of years.

Clinical Nutrition

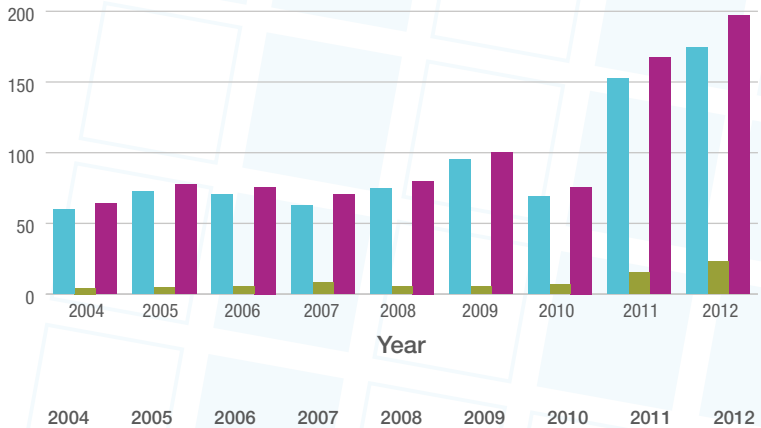
Clinical nutrition activity has increased substantially over the last 10 years, most noticeably in the specialities of upper and lower gastrointestinal cancer surgery, head and neck cancer surgery, gynaecological oncology surgery and medical oncology.

There has been some increase in staffing to help meet the significant growth in activity. However, demand on services continues to grow, reflecting SJH's designation as a cancer centre, increasing patient complexity and the need for intensive clinical nutrition input throughout the patient's cancer journey. The department is fortunate to have two clinical specialists working in the areas of upper gastrointestinal cancer surgery and radiation oncology.

There has been a significant increase in the number of cancer patients managed on both home enteral and parenteral nutrition support, which helps to facilitate early discharge from hospital. We have observed a 30% increase in home enteral feed discharges in upper gastrointestinal cancer surgery between 2008 and 2012 due to improved post-operative nutrition support practices. The number of medical oncology patients discharged on home parenteral nutrition or home intravenous fluids has increased by 100%; over forty patients have successfully been discharged home who previously would have had to remain in hospital. These interventions make significant contributions to the quality of life of patients receiving treatment for cancer in SJH.

Clinical nutrition staff have developed and reviewed resource information on nutrition for cancer patients for use nationally and contributed to the cancer-related fatigue self-help resource for patients developed by Psycho-Oncology services in SJH. Clinical nutrition staff have presented widely on nutrition and cancer including presentations at Grand Rounds, Irish Nutrition and Dietetic Institute study days, on the Royal College of Surgeons in Ireland (RCSI) Specialist Registrar education programme and at multiple Irish Cancer Society (ICS) meetings.

Figure 1.4 Clinical Nutrition Activity in Upper GI Cancer Surgery



	2004	2005	2006	2007	2008	2009	2010	2011	2012
In-patient (weeks)	60	72.5	70.5	62.5	74.5	94.9	68.8	152.3	174.2
Out-patient (weeks)	4.3	4.88	5.3	8	5.43	5.26	6.98	15.3	22.9
Total (weeks)	64.3	77.4	75.8	70.5	79.9	100.2	75.75	167.6	197.1

Audit and Research

The department of clinical nutrition, working in collaboration with Professor John Reynolds, has secured almost €1,000,000 in cancer research funding over the last 10 years, with Dr. Aoife Ryan and Dr. Laura Healy both successfully completing PhDs. The aim of these studies was to gain a better understanding of different cancers (oesophago-gastric, breast and colorectal), and improve patient outcomes and nutritional status throughout treatment for upper gastrointestinal cancer. This work has resulted in 15 peer reviewed publications and numerous international and national conference presentations and associated conference publications, including the first Irish studies linking obesity and metabolic syndrome to cancer.

Future Developments

At the end of 2012, a study to examine the incidence, presentation, diagnosis and management of malabsorption after surgical resection for cancer of the stomach/oesophagus, and its impact on nutritional status and micronutrient levels was initiated.

An enhanced recovery after surgery (ERAS) programme of multidisciplinary peri-operative care, designed to "minimise post-operative organ dysfunction and return the patient to normality" as soon as possible, is being implemented in the area of colorectal cancer surgery.

Medical Social Work

Social workers focus on the psychosocial aspects of patient care, incorporating both emotional and practical support to patients and their families. They provide comprehensive assessment of patients' psychological and social needs as well as assessing any risks to the patient. They provide counselling for patients and families, practical advice and information and advocacy and liaison work with community services to facilitate effective discharge planning and aftercare.

Over the past ten years the social workers have provided a service to an increasing number of patients with cancer in departments other than oncology and haematology particularly head and neck cancer, gynaecology and general surgery. Demographic and socio-economic changes nationally, have been reflected in the increased complexity of patients' circumstances. As a result, many patients have been assisted by social workers including those from different ethnic backgrounds, those with limited family support, families who have been financially devastated by the recession and older patients who are living in extreme isolation.

Developments/Innovations

The social work team have played a leading role in the IASW (Irish Association of Social Workers) Haematology, Oncology Social Work Group, establishing a website in 2012 (www.socialworkandcancer.com) which provides information and advice for patients and their families.

The "Care to Drive" scheme has been successfully established in collaboration with the ICS for SJH patients who are receiving treatment for cancer.

The social work service in SLROC at SJH was established last year.

Occupational Therapy (OT)

Occupational therapy plays an essential role at all stages of the cancer care pathway. The OT works as a key member of the MDT to enable patients achieve their optimum level of functional independence and quality of life.

In January 2005, a 0.5 WTE senior OT was funded to provide a dedicated service to oncology and haematology day cases and out-patients.
A senior OT covers all oncology and haematology in-patients and out-patients, based on need.

Activity

Since the commencement of this post, the OT service has observed a 613% increase in OT time to medical oncology activity and a 75% increase in time to haematology when comparing statistical activity data between 2005 and 2012. The OT delivers approximately 900 individual patient contacts to oncology and haematology in-patients per annum.

Developments/Innovations

Staff grade rotations were commenced to address increasing clinical demand as well as developing a specialist oncology and haematology skill-set amongst staff grade therapists. The OT department has implemented core clinical competencies to support this rotation.

The OT has developed comprehensive haematology and oncology resource folders which have been shown to significantly improve knowledge and expertise amongst therapy staff.

The OT was principally involved with medical and nursing colleagues in prioritising minor capital expenditure following a donation from the Bone Marrow & Leukaemia Trust. These funds were utilised to purchase high level posture and pressure care equipment for in-patients on Denis Burkitt ward. This equipment has been instrumental in facilitating patients to sit out of bed in a more time efficient manner and improving quality of life.

The OT is actively involved in the Association of Occupational Therapists in Ireland Palliative Care and Oncology Advisory Group.

The OT can provide essential enabling equipment in order to facilitate discharge home. This has resulted in decreasing length of stay, facilitating safe discharge home and improving quality of life.

A joint physiotherapy and OT pilot lung cancer breathlessness clinic was run which demonstrated significant improvements.

Future developments

The department is committed to ongoing audit and development of the oncology and haematology OT service. Further development of patient education and self-management strategies are planned.

Physiotherapy

Physiotherapy is essential in the care of a patient with cancer. Trends in cancer incidence and survivorship, along with an aging population, are drivers for the current increasing need for physiotherapy and this will continue for decades to come. With one in three women and one in two men developing cancer in their lifetime, most physiotherapists, regardless of area of specialty, will treat patients who have been touched by cancer.

Physiotherapy has a key role to play in the management of patients throughout their cancer journey. The primary goal is to assist the person with cancer in achieving maximum physical functioning within the limits imposed by their disease and/or treatment.

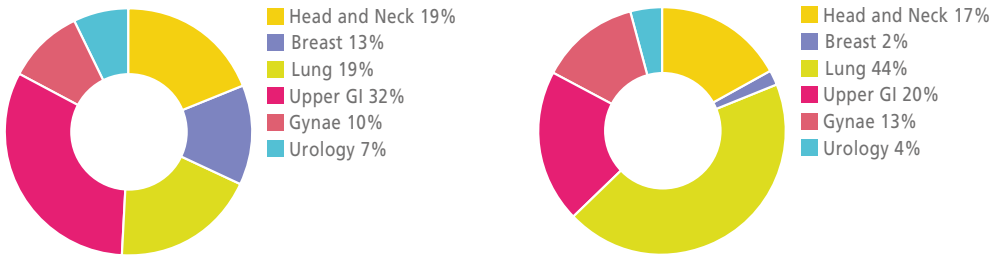
Yet physiotherapy is still not a priority consideration in cancer treatment. Many hospitals offer a one-time post-operative physiotherapy visit only consisting of respiratory care, range of motion and teaching the patient about lymphoedema. However, as with most surgeries, people post-cancer surgery are likely to exhibit musculoskeletal symptoms for weeks or months after surgery.

Here at SJH we believe that physiotherapy is required not only in the post-surgical phase and therefore see patients pre-operatively if possible. We have found that pre-operative management to optimise patients e.g. inspiratory muscle training and pre-rehabilitation in patients with lung cancer, improves patient outcomes. Additionally if we know that a patient will begin chemotherapy and/or radiation after surgery, we believe it is our job to address the impending cardiopulmonary and functional issues. With this in mind the physiotherapy department at SJH worked closely with the ARC unit on the South Circular Road in 2011 and provided a general exercise programme to attendees.

As teamwork is a key standard in cancer care, the physiotherapists meet regularly with the other members of the multidisciplinary teams and have collaborated with the breast care nurses in development of the breast care booklet for patients.

Figure 1.5 represents the breakdown of physiotherapy treatments received by patients attending SJH in all cancer specialties. The figure compares 2002 and 2012.

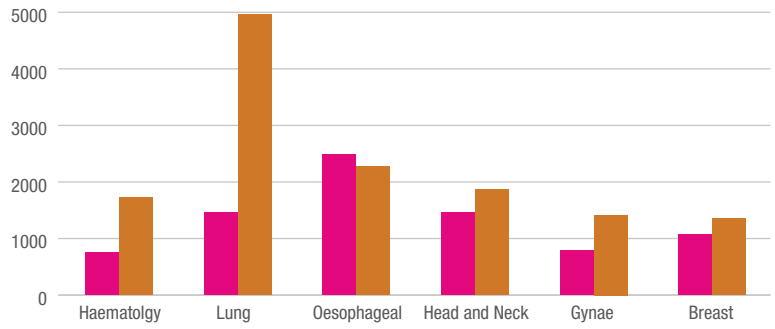
Figure 1.5 Comparative Breakdown of Physiotherapy treatments 2002 vs. 2012



	Head and Neck	Breast	Lung	Upper GI	Gynae	Breast
2002	1461	1066	1465	2487	783	527
2012	1871	215	4963	2277	1415	419

In general, for the national or superregional cancers for which SJH is the centre of excellence there has been a steady increase in the number of treatments given over the 10 year period 2002 – 2012 (see fig 1.6).

Figure 1.6 Physiotherapy Treatments 2002 vs. 2012



	Haematolgy	Lung	Oesophageal	Head and Neck	Gynae	Breast
2002	754	1465	2487	1461	783	1066
2012	1726	4963	2277	1871	1415	1350

Future Developments

In keeping with evidence-based practice, we will develop our role in the area of exercise, cancer and survivorship. An exercise booklet and an individualised exercise programme have been devised by the physiotherapy department for haematology patients. This will be rolled out and audited in the national bone marrow transplant unit. A formal study to examine physical fitness and physical activity levels in a group of patients following haematopoietic stem cell transplant will be completed in the next year.

As exercise can prevent recurrence and increase survival we will be looking at developing specific studies and exercise programmes with our Trinity College Dublin (TCD) discipline of physiotherapy to explore this topic further.

Speech and Language Therapy (SLT)

Speech and Language therapists play a crucial role within the cancer care MDT, from the pre intervention assessment period, through the pre and post surgery, chemo/radiotherapy phases, subsequent in and out-patient rehabilitation and palliative care in the areas of:

- Head & Neck Oncology.
- Oesophageal Oncology.
- Lung Oncology.
- Medical Oncology & Haematology.

Therapists work with patients presenting with communication and/or swallow impairment, also providing psychosocial support and information to patients and carers, including arranging pre-operative visitors who have undergone similar surgery.

We have the largest SLT head and neck cancer service in Ireland with two senior therapists. These provide in and out-patient assessment (including objective assessment with videofluoroscopy & fiberoptic endoscopic examination of swallowing (FEES)) and treatment of the increasingly complex patient profile presenting over the past decade.

SLT attendance at joint head and neck clinics has expanded to reflect the growth in referrals from this service. This facilitates increased ongoing liaison with community/primary care services for this patient group.

We have over 70 out-patient laryngectomies on our caseload to whom we provide long term follow up and maintenance of their alternative communication modalities (Surgical Voice Restoration and Electrolarynx) as well as running support groups.

We have retained our specialist therapists allowing us to continue to provide the necessary specialist standard of care required for this patient group. This has resulted in our department having the expertise to run the Macmillan Surgical Voice Restoration Course for SLTs, with 57 therapists trained to date nationally.

Activity

Head and Neck Cancer: Over the last 10 years there has been significant growth in referrals to the head and neck oncology service: In-patient referrals have grown by 30% and out-patient referrals by 70%. Clinical time spent with this patient group has increased by 73% for in-patients and by 200% for out-patients reflecting the growing demand for service and also the increasing complexity of this caseload.

Oesophageal Cancer: Referrals from upper GI oncology have doubled in the last 5 years, and clinical time has increased by 48%.

Medical Oncology/Haematology: There has been a steady demand for SLT services to this patient group with between 60-85 in-patient referrals annually for the past 5 years.

Lung Cancer: There has been significant growth in the demand for SLT service post thoracic surgery. These patients are often complex tracheostomy cases requiring significant time input regarding communication and swallow.

Developments/Innovations

- Development of a FEES assessment clinic for cancer patients.
- Development of a pureed diet for oral cancer patients, allowing for earlier transition onto oral feeding.
- Development of treatment programs for trismus (difficulty in mouth opening) including provision of Therabite devices, thereby improving quality of life associated with swallowing, oral care and speech functions.
- Development of a basic grade staff rotation into head and neck and oesophageal cancer speciality areas.
- Development of new expertise in communication and swallowing deficits related to combined treatment modalities for patients with the advent of chemoradiotherapy.
- Appointment of an additional senior SLT post for head and neck cancer in 2006, following the appointment of a Consultant Maxillofacial Surgeon in oncology.
- Appointment of a clinical specialist SLT in radiation oncology in 2012.
- Education at undergraduate and postgraduate level in TCD, University of Limerick and Dublin Dental School & Hospital.

Future developments

- Support for and development of our new clinical specialist post for radiation oncology.
- Linking the head and neck surgery and radiation services to provide a more seamless coordinated service for patients.
- Further development of our FEES assessment clinic for cancer patients, with training for speech and language therapists to complete this assessment independently.
- Development of our service to medical oncology/haematology/lung cancer patients.

1.11 Diagnostic Radiology

Diagnostic and interventional radiology is provided by the radiology department. This comprises of 13 consultants, 65 radiographers, 8 nurses and 12 specialist registrars. The department performs approximately 180,000 examinations per annum and a significant amount of the complex departmental activity relates to oncology. The department provides all imaging modalities and has expanded greatly since 2006. In that time period the department has started a PET/CT service, increased the number of clinical MRI units from one to three, opened a research facility with a high strength MRI, opened two SPECT/CT units and a new interventional room. There have also been 6 new consultant radiologist appointments. The department provides both an urgent and routine oncology imaging service and all turn around times are within HSE and NCCP guidelines. The department provides full support to all cancer MDTs, which now represent a substantial workload. The centralisation by the NCCP of oncology care has lead to a significant increase in workload for the radiology department. This is readily illustrated by the mammographic activity change since 2006 (fig 1.9).

The clinical department at SJH has very well developed academic structures with established links to TCD and the faculty of radiology. TCD has funded a research fellow who is assisting with oncology research projects. In 2008 the Centre for Advanced Medical Imaging was opened. This comprises of a high strength 3T MRI scanner and is the only unit of its type in the country. Among its ongoing research projects are both translational and clinical oncology imaging studies.

SJH introduced a Picture Archiving and Communication System (PACS) in the second half of 2006. This has quickly become integral to oncology patient care. In the next few years the department will integrate this with the national PACS network (NIMIS). The NIMIS project was led by staff from SJH radiology and medical physics, notably Professor Neil O'Hare from MPBE. As more hospitals are integrated this will prove of extreme importance in oncology care and research.

In 2009 the national PET/CT unit was opened in SJH. This has become the busiest PET/CT unit in the country performing up to 14 examinations per day. Approximately 40% of these patients are referred from outside the SJH cancer network. We plan to develop the service over the next few years by introducing new radiopharmaceuticals and further integrating PET/CT into radiation oncology planning.

Consultant Staff

Diagnostic Radiology

- Dr. Peter Beddy
- Professor Mary Keogan
- Professor James Meaney
- Dr. Graham Wilson

Interventional Radiology

- Dr. Niall McEniff
- Dr. Michael Guiney
- Dr. Mark Ryan

PET/CT and Nuclear Medicine

- Dr. Grainne Govender
- Dr. Ciaran Johnston
- Dr. Niall Sheehy

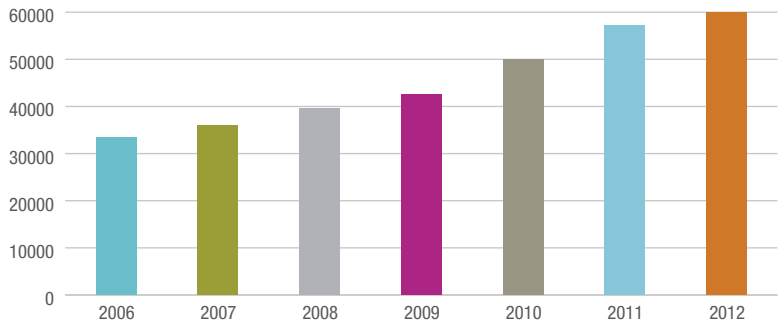
Breast Imaging

- Dr. Susannah Harte
- Dr. Sylvia O'Keeffe
- Dr. Ronan McDermott

Activity

Complex imaging activity has almost doubled since 2006 (fig 1.7). Figure 1.8 demonstrates the range of activity and figure 1.9 shows the units that have undergone the most significant changes. The increase in activity in breast imaging is notable and is a result of the streamlining of breast care by the NCCP and a demonstration of the increased radiology workload that comes with centralisation of oncology care.

Figure 1.7 Complex Diagnostic Imaging activity by patient number since 2006 [Incorporates PET/CT, CT, MRI, US, NM, mammography and Interventional Radiology]



2006	2007	2008	2009	2010	2011	2012
33500	36000	39600	42500	49950	57100	59899

Figure 1.8 Complex imaging by modality since 2006

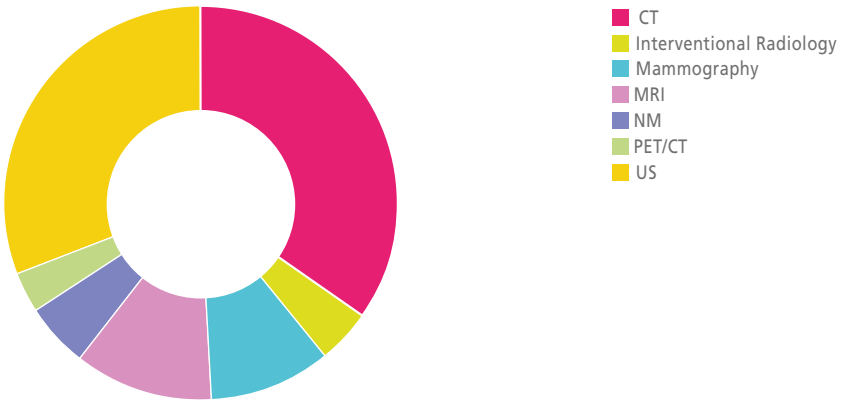
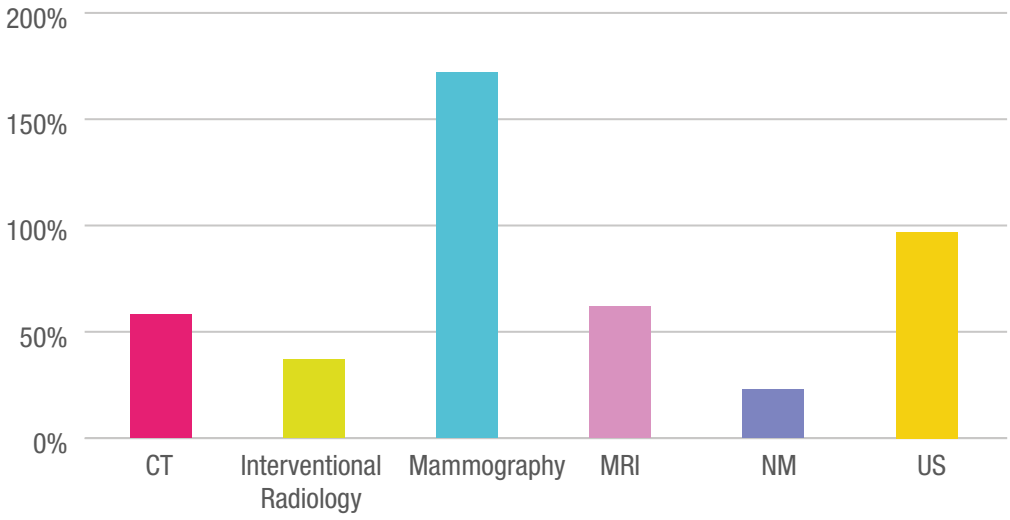


Figure 1.9 Percentage increases in complex imaging 2006-2012



1.12 Histopathology

The Department of Histopathology and Cytology plays an integral role in cancer services in SJH. Diagnostic services are provided to SJH, GPs in the Greater Dublin area, the Dublin Dental Hospital (DDH) and some external hospitals.

The department provides an opinion on all tumour biopsy material as well as diagnosis, grading and staging of tumour resections done within SJH.

The department also provides second opinions on the pathology of all patients referred from outside hospitals to SJH as well as consultation second opinions to hospitals around the country and the UK.

The diagnostic cytopathology service is provided by two specialised cytopathologists who report fine needle aspiration (FNA) and exfoliative cytology that is integral to the diagnosis, staging and management of cancers of the lung, breast, hepatobiliary system and pancreas, head and neck including thyroid and the haematolymphoid system. Rapid on site evaluation of cytologic diagnostic samples is also available on request. In addition, a weekly clinic is provided by the cytopathologists who are expert in performance and interpretation of FNA samples. Hospital in-patients, out-patients and GP patients have access to this clinic.

There are 11 weekly MDT meetings and two fortnightly meetings where the pathology, radiology and clinical features of cases are discussed so that appropriate treatment plans can be devised for patients.

Structure

Subspecialty reporting of cases is a feature unique to SJH. The workload is divided into dermatopathology, gynaecological pathology, pulmonary pathology, breast pathology, gastrointestinal pathology, urological pathology, head and neck/dental pathology, haematopathology, liver pathology and molecular pathology with each pathologist reporting within two or three specialities only.

We work with the Cancer Molecular Diagnostic (CMD) laboratory which is the only accredited molecular diagnostic laboratory in Ireland. To date CMD has provided a de facto National molecular diagnostic service, primarily for haematological malignancies. More recently solid tumour molecular diagnostics have become critical to the appropriate management of patients with common cancers such as breast, colon, lung and malignant melanoma and these requirements will increase hugely over the next number of years. EGFR, KRAS and BRAF testing is performed to satisfy the prescribing requirements of Gefitinib/Erlotinib, Cetuximab/Panitumab and Vemurafinib respectively.

A strong strategic alliance has been forged between Histopathology and CMD and the SPD Translational Laboratory in TCD to develop and validate clinically relevant biomarkers with the support of industrial and academic collaborators.

The laboratory is a European reference laboratory for cancer molecular diagnostics clinical trials. It is partnered with the European Thoracic Oncology Platform which was founded in 2009 with a focus on promoting collaboration in clinical and translations research in lung cancer and mesothelioma in Europe.

Developments/Innovations

The department has been chosen as a centre involved in the recently started colon cancer screening programme.

SJH is the only hospital in Ireland providing a Mohs surgery service to skin cancer patients. A second surgeon has started and the laboratory is involved in sample processing as well as quality control and support.

Molecular pathology will become increasing important in the treatment of cancer. Laboratory testing will be required to assess the specific vulnerabilities of tumours so that patients can be selected for specific treatments. The department is already involved in molecular analysis for some tumours and expects to expand this service.

1.13 Cancer Research

Translational medicine is the key research strength of the SJH and TCD programme. This is greatly enabled by the real proximity of the hospital to the research laboratories. Internationally, the move to formalise the translational process has led to the strategic formation of specialised Institutes of Translational Medicine. The School of Medicine of Trinity College has established the Trinity Translational Medicine Institute (TTMI) in the Trinity Centre on the campus of SJH. TTMI is formed from the merger of the Institute of Molecular Medicine (IMM) and Sir Patrick Dun (SPD) with over 40 Principal Investigators (PI) and 150 scientists.

The mission of the TTMI is to synergise translational research and to develop an international standard research facility on the TCD SJH campus with access to the breadth of patients within Trinity Health Ireland (THI). TTMI will contain the spectrum of translational medical research disciplines from bench sciences to patient-focused research, creating a new model of Trinity Translational Research (fig 1.10). TTMI will also train the next generation of clinicians and basic researchers in translational medicine.

The School of Medicine has, in recent years, significantly increased grant funding for biomedical research from Exchequer and non-Exchequer bodies, such as industry and charities, with particular success from EU schemes. In 2011-12 the School of Medicine was awarded 22.5% of all research grants in TCD. Furthermore, School of Medicine investigators have an outstanding record in the delivery of world-class medical research reflected in high impact publications in the leading international journals. Expertise in translational research in these key areas spans the entire spectrum from cellular based approaches, in vivo animal models to patient-orientated research. Furthermore, the links and proximity with the newly opened Wellcome Trust/ Health Research Board facility will give TTMI a unique position to engage in research as part of clinical trials.

The Institute will be a central component of 'Trinity Health Ireland', an initiative combining the strengths of the College's School of Medicine and its affiliated teaching hospitals and community services. TTMI will combine the excellence of these core institutes across TCD and SJH, and Trinity Health Ireland (see fig 1.11).

Figure 1.10 Model of Trinity Translational Research

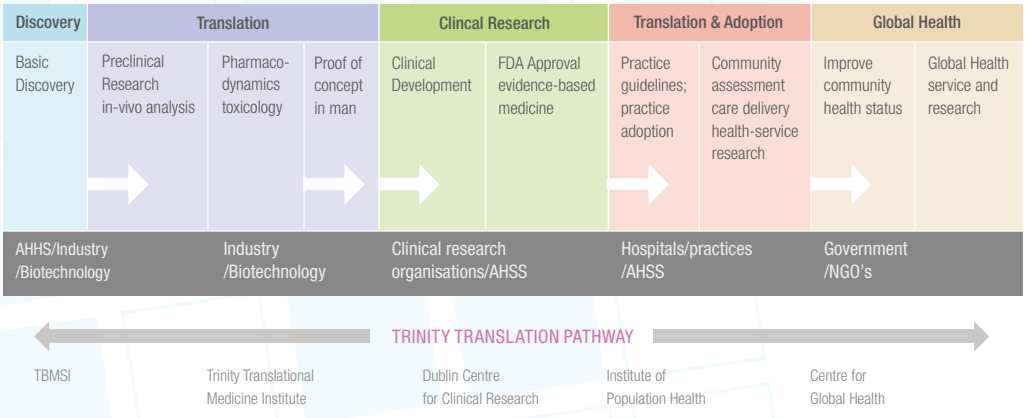


Figure 1.11 Trinity Translational Medicine Institute (TTMI)

The TTMI Translational Cancer focus will cover a wide spectrum of disease sites and examine key drivers of oncogenesis. The research conducted spans oncology and includes all cancer sites, but with a major focus on lung, oesophageal, thyroid, colorectal, gynaecological, breast, skin, and haematological malignancies. Themes include the following: cancer stem cell biology; the metastatic cascade; the inflammasome; resistance mechanisms to chemotherapy and radiation therapy; radiation biology; obesity as a driver of inflammation and cancer; mitochondrial function and cellular energetics; next generation diagnostics in cancer; nanotechnology; disease modelling in cancer; health economics and health services research. Each programme is underpinned by bioresources and many are linked to clinical trials.

TTMI cancer investigators have already been hugely successful in securing Irish and EU funding from Science Foundation Ireland (SFI), Health Research Board (HRB), ICS, The Wellcome Trust, EU 7th FP and grant income over the past 5 years and totals in excess of 60 million euros. This is coupled with significant industrial support from Pfizer, Merck Serono, Lilly Oncology, Abbott, Johnson & Johnson, Roche-Genentech, Randox Laboratories, Clovis and Glaxo-Smith Kline. In addition, several investigators have established their own or work with charitable foundations to raise much needed research income for TCD [e.g. C.R.O.S.S. and Emer Casey Foundation etc.], along with gaining philanthropic donations. Indeed, the Durkan Leukaemia Research Laboratories in IMM were built with philanthropic monies.

Postgraduate Education

TTMI will create a unique translational biomedical research environment for post-graduates. A number of postgraduate courses that are highly successful are already running from TTMI. These include the MSc Molecular Medicine (approximately 25 students per year) that is running for 8 years. Although a more recent course, the MSc Intercalated Masters has growing public popularity. In 2012, a new MSc in Translational Oncology was launched with the first year intake of 20 students which was a great success. Previously IMM was successful in obtaining a HRB PhD training programme and a MMI Clinician Scientist PhD Training Scheme. In 2011-15 TTMI houses a MMI PhD training programme.

A long-term objective is for TTMI to develop future PhD training for basic scientists and PhD/MD training courses for clinician scientists. In particular, due to the proximity of the DCCR the potential to develop schemes with the Wellcome Trust will be explored.

Current Postgraduate Courses

- MSc Molecular Medicine
- MSc Translational Oncology
- MSc Intercalated Masters
- MMI Scholars PhD


CAUTION
CAUTION

Section 2: Site Specific Cancer Audit

2.1 Lung Cancer

Structure

Rapid Access Lung Centre

SJH is one of the eight nationwide rapid access centres specialising in lung cancer. The centre provides rapid access diagnostic and staging to patients within a 4-6 week time frame. All bronchoscopies are provided on a next list basis which means there is no waiting list for any patient needing this service. The service aims to be in a position to determine appropriate primary therapy within 4-6 week time frame. Where CT and Bronchoscopy are the only investigations required this is usually achieved within 2 weeks. Where additional investigations such as CT guided biopsy, US guided biopsy, EBUS, PET, MRI or mediastinoscopy are required, the aim is within 6 weeks of initial contact. The respiratory consultants in SJH specialise in providing bronchoscopy under fluoroscopy and EBUS guided TBNA for mediastinal staging.
The Rapid Access Lung Centre continues to reach and exceed targets in 2013.

Rapid Access lung figures have been submitted to the NCCP since mid 2010. 46% of all patients diagnosed in SJH in 2012 came via RAL clinic.

Multidisciplinary Team (MDT)

We implement a long established weekly multidisciplinary team meeting, with MDT approach to management of all patients. This includes regular tele-link with tertiary hospitals in Mullingar, Tullamore, Letterkenny, Limerick and Waterford. The MDT is organised by a full time MDT coordinator. There is also a MDT planning meeting which takes place at the end of every week to ensure patients waiting for difficult or complex biopsies are discussed with radiology consultants post bronchoscopy lists and the patients who are having surveillance scans as part of the follow up care are discussed in a multidisciplinary environment.

Radiology

The radiology department has an essential role in the work up and treatment of patients with lung cancer in SJH. Initial CT staging is complemented by PET/CT. There are four thoracic radiologists who help present the lung cancer MDT and they also perform over 200 percutaneous CT guided lung biopsies per year for tissue diagnosis. The Centre for Advanced Medical Imaging (CAMI), based in the radiology department, is developing new imaging techniques to image lung cancer, including diffusion and perfusion MRI.

Cardiothoracic Surgery

Our cardiothoracic surgical unit at SJH opened in 2000. It has two cardiothoracic surgeons and an experienced dedicated MDT delivering expert surgical care to patients throughout Ireland. Thoracic surgeons in SJH accept referrals from supra-regional hospitals including AMNCH, Beaumont hospital and tertiary hospitals which link in through our weekly MDT meetings. The lung cancer surgical service in SJH is unique in Ireland both in terms of volume and complexity.

The surgeons have a special interest and experience in extended resections for the treatment of locally invasive lung cancers.

On average, over the last ten years 35% of patients each year are treated with curative lung surgery which is a rise of 10% since 2003. The cardio thoracic team carries out over 45% of curative lung cancer resections in Ireland.

Radiation Oncology

The radiation oncology department provides a referral and review service for SJH patients who may require radiotherapy treatment. There is also a specialist liaison nurse based in SJH.

Medical Oncology

SJH have a dedicated medical oncologist for lung cancer, Dr Sinead Cuffe. We provide in-patient and out-patient chemotherapy, non-surgical treatment of cancer and supportive and palliative care. A patient may also be eligible to take part in a clinical trial of a new cancer treatment, and SJH have an active lung cancer clinical trials service.

Radiofrequency and Microwave Ablation treatment

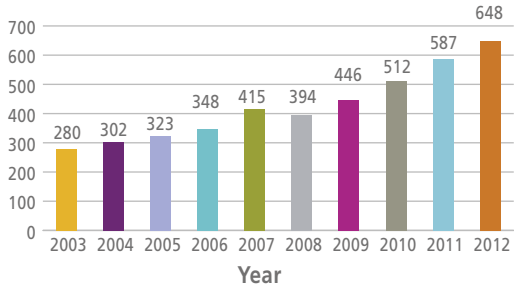
Radiofrequency and Microwave Ablation (RF&MA) treatment is a relatively new minimally invasive technique for treating lung cancer. Both techniques involve percutaneous placement of a heat probe into a tumour under CT guidance. RF&MA are ideally suited to patients who are medically unfit for surgery. They are well tolerated by most patients and have equivalent response rates when compared to stereotactic radiotherapy. They are suitable for the treatment of primary and secondary lung tumours under 3 cm and have been performed in SJH by Dr. P. Beddy and Dr. M. Guiney for the past year. RFA treatment is a speciality only performed in SJH under our specialist pulmonary radiology consultant.

Lung Cancer Trends

Lung cancer is the leading cause of cancer related death in Ireland; the incidence of lung cancer has been rising. The rate has increased more rapidly in women and from 2003 to 2012 the rate of increase is 61% in SJH female patients. The increase in men since during 2003 to 2012 is 53% in SJH. In 2011 lung cancer became the leading cause of cancer related death among women in Ireland, overtaking breast cancer.

The following is a report on 4,256 newly diagnosed and/or treated lung cancers in SJH. There has been a 127% increase in lung cancer diagnoses in the last ten years making this by far the largest cancer service in SJH.

Figure 2.1 Lung Cancers 2003-2012

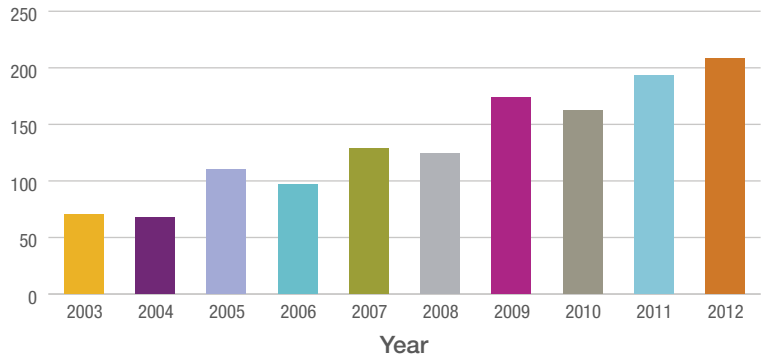


While smoking is the most common risk factor associated with lung cancer, a significant percentage occurs in never-smokers. Radon, second-hand smoking, occupational exposure, indoor air pollution and genetic predisposition are risk factors for the development of lung cancer in non-smokers. Lung cancer not related to smoking has different clinical, pathological and molecular findings. It is commonly adenocarcinoma. It occurs more frequently in women, particularly women of Asian ancestry. It tends to occur at a younger age and has a better prognosis than lung cancer in smokers. Mutations in EGFR and EML4-ALK occur more commonly in never-smokers or light smokers enabling targeted therapy with tyrosine kinase inhibitors and crizotinib respectively.

Table 2.1 Smoking Incidence SJH patients

	Female	Male
Never Smoker	137 (7%)	107 (4%)
Ex- Smoker	724 (40%)	1,109 (45%)
Current Smoker	832 (46%)	1,074 (44%)
Unknown	97 (5%)	157 (6%)
Lives with Smoker	13 (2%)	6 (1%)
	1,803	2,453

Figure 2.2 Lung cancer surgery 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Surgery	70	68	110	97	129	124	174	162	193	208
% of patients who had surgery	25%	22%	34%	30%	32%	31%	40%	33%	34%	33%

On average one third of all lung cancer patients are treated with curative resection.

Table 2.2 Comparison of National versus SJH workload

Caseload of SJH in comparison to National Figures	2007	2008	2009	2010	2011
Total new lung cancer cases nationally	1,976	2,069	2,061	2,255	2,172
Total new lung cancer case SJH	415	394	446	512	587
% of national workload	(21%)	(19%)	(22%)	(23%)	(27%)
Total who had surgery nationally	311	345	381	391	400
% of national patients who had surgery	(16%)	(17%)	(18%)	(17%)	(18%)
Total who had surgery in SJH	129	124	174	162	193
% of patients in SJH who had surgery	(41%)	(36%)	(46%)	(41%)	(48%)

The average age of diagnosis is 66, median age is 68 and in comparison to UK where the average age is 71 and median age is 72. The average age at diagnosis across the 10 year period has remained comparable year-on-year.

Table 2.3 Age at Diagnosis 2003-2012

2003-2012	Female	Male
0-20	2	3
21-30	9	11
31-40	19	18
41-50	100	117
51-60	347	454
61-70	615	868
71-80	550	763
81-90	158	217
91-100	3	2

7% of patients are under the age of 50 at time of diagnosis. Within this group 8% of females and 6% of males diagnosed with lung cancer are under 50 years of age. This figure dramatically increases to 87% for females and 85% for males diagnosed in the 50-70 age group.

Clinical and Pathological Staging

Table 2.4 Clinical Staging

Clinical Stage[a]	2003-2009 6th edition	2010-2012 7th edition
Stage IA	303	363
Stage IB	394	164
Stage IIA	12	124
Stage IIB	134	124
Stage IIIA	195	244
Stage IIIB	321	107
Stage IV	427	360
Unknown	292	72

a) Please note the above table excludes mesothelioma patients and small cell lung cancer patients

Table 2.5 Clinical Staging - Small Cell Lung Cancer

Small Cell Lung Cancer	2003-2012
Limited Stage Disease	214
Extensive Stage Disease	288
Unknown	42

Table 2.6 Pathological Staging

Pathological stage	6th edition 2003-2009	7th edition 2010-2012
Stage 0	0	5
Stage IA	183	197
Stage IB	192	94
Stage IIA	32	97
Stage IIB	128	46
Stage IIIA	143	114
Stage IIIB	52	2
Stage IV	16	8

Table 2.7 Pathological Staging for Small Cell Lung Cancer

Pathological stage	6th edition 2003-2009	7th edition 2010-2012
0	0	1
IA	2	4
IB	2	0
IIA	3	0
IIB	2	0
IIIA	0	0
IIIB	0	0
IV	0	0

Table 2.8 Tumour Morphology 2003-2012

Morphology	Occurrences	Percent
Adenocarcinoma	1,553	36
Squamous	1,463	34
SCLC	547	13
NSCLC	305	7
Mesothelioma	122	3
Typical Carcinoid	103	2
Not Histologically Proven	51	1
Pleomorphic	29	0.7
Large Cell	25	0.6
Mixed Cell	23	0.5
Atypical Carcinoid	23	0.5
Adenosquamous	21	0.5
Large Cell Neuroendocrine	14	0.3
Br/Alve	12	0.3
Other	9	0.2
Baseloid	3	0.1
Undifferenciated	3	0.1
Neuroendocrine	2	0
Spindle Cell	1	0

Table 2.9 Position of Tumour 2003-2012

Position	Occurrences	Percent
RUL	1207	28
LUL	1090	25
RLL	644	15
LLL	553	13
RML	206	5
Bronchus	114	3
Right Lung	98	2
Pleural Effusion	95	2
Left Lung	89	2
Pleura	75	2
Mediastinum	73	2
Both Lungs	15	0.3
Lymph Nodes	12	0.3
Unknown	31	0.7

Table 2.10 Treatment given to patients 2003-2012

Treatment Given 2003-2012	Occurrences	Percent
Surgery	1,388	33
Best Supportive Care	802	19
Oncologist Referral	762	18
Surgical Procedure	581	14
Chemotherapy	581	14
Palliative Radiotherapy	423	10
Chemo/Radiotherapy	337	8
Adjuvant Chemotherapy	286	7
Radiation Oncology referral	274	6
Palliative Chemotherapy	238	6
Radiotherapy	175	4
Radical Radiotherapy	111	3
Adjuvant Radiotherapy	94	2
Neo Adjuvant Chemotherapy	85	2
Surgical Referral	51	1
No Active Cancer Treatment	47	1
Neo Adjuvant Radiotherapy	15	0.4
Radio Frequency Ablation	5	0.1
No Treatment given at present	4	0.1
Brachytherapy	2	0
Unknown	7	0.2

Figure 2.3 Overall Lung Cancer Survival

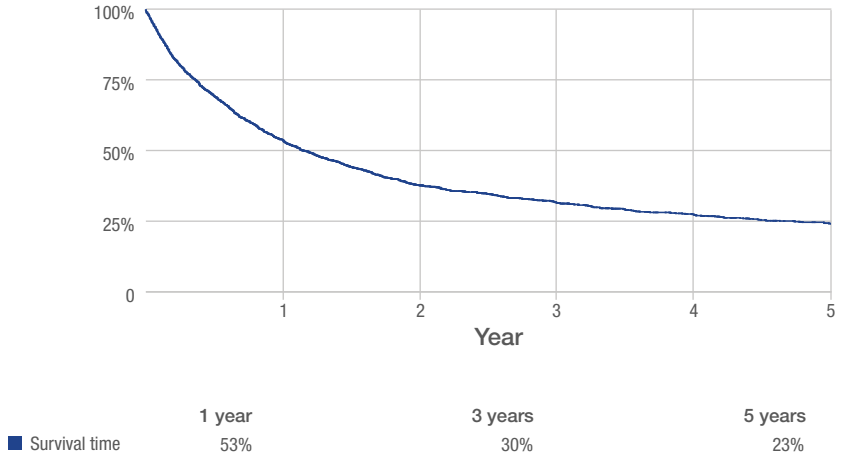
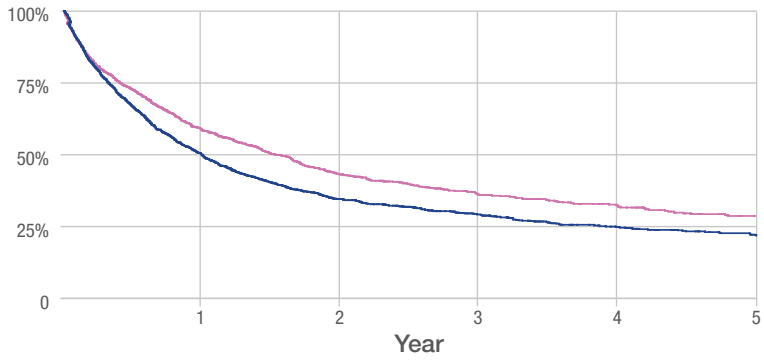
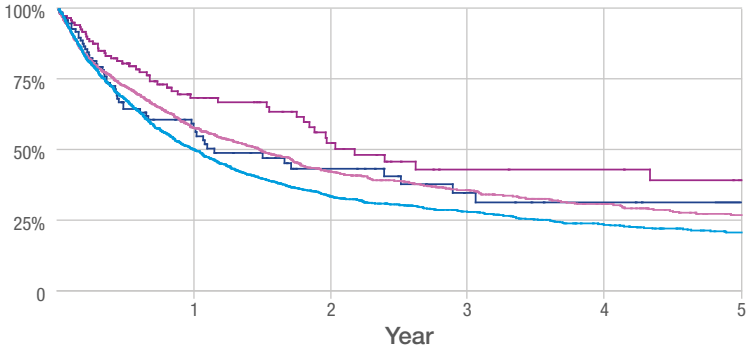


Figure 2.4 Overall Survival by Gender



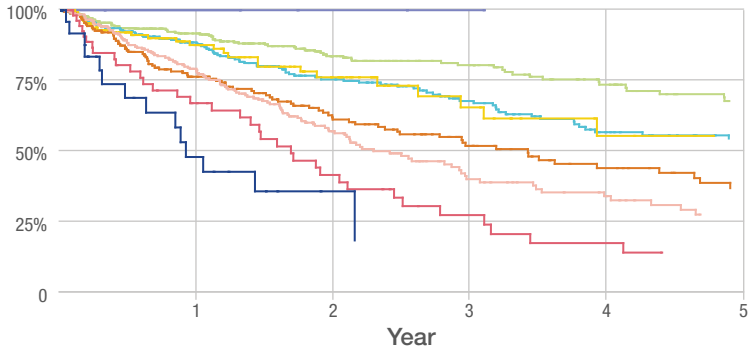
	1 year	3 years	5 years
Male	49%	27%	20%
Female	58%	34%	27%

Figure 2.5 Overall Survival of Smoking History by Gender



	1 year	3 years	5 years
Non Smoking Female	68%	43%	39%
Smoking Female	57%	34%	26%
Non Smoking Male	55%	34%	31%
Smoking Male	49%	27%	19%

Figure 2.6 Overall Post Operative Survival by Stage



	1 year	3 years	5 years
Stage 0	100%	100%	100%
Stage IA	92%	80%	68%
Stage IB	89%	68%	54%
Stage IIA	87%	65%	55%
Stage IIB	76%	53%	36%
Stage IIIA	79%	42%	27%
Stage IIIB	67%	27%	13%
Stage IV	47%	18%	0%

2.2a Oesophageal and Oesophago-gastric Junction

Summary Points

The NCCP announced in July 2012 that SJH is designated as both the National Centre for Oesophageal and Gastric Cancer and the National Centre for Management of Early Upper Gastrointestinal Mucosal Neoplasia (i.e. early tumours arising in Barrett's Oesophagus). Professor John Reynolds has been appointed as the National Lead for oesophageal and gastric cancers.

The key summary points in ongoing prospective audit are as follows:

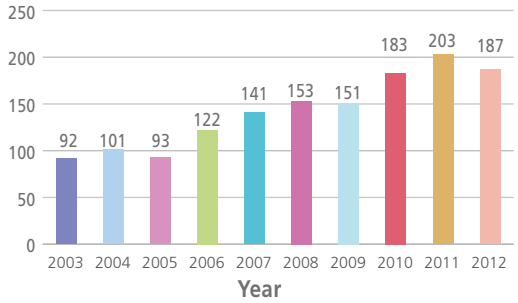
- Based on NCRI figures, for years 2007-2010, approximately 65% of surgical resections for oesophageal cancer in Ireland are undertaken at SJH.
- 80% of all referrals are tertiary, testimony to its national role up to now and its recent designation as National Centre.
- Rapid Access clinics take place on Wednesdays and Thursdays, with major surgery performed on Mondays and Fridays.
- In 2012, 82 complex major upper gastrointestinal resections were performed, 50 for oesophagectomy, and 32 for total gastrectomy.
- Endoscopic surgery, particularly endoscopic mucosal resection (EMR) has increased in frequency, with 30 additional patients undergoing this procedure for early cancer.
- The team over the time period of the audit includes Professor John Reynolds and Mr. Narayamasamy Ravi (surgeons); Professor Dermot O'Toole and Dr. Finbar Mc Carthy (specialist gastroenterology for endsoscopic ultrasound (EUS) and endoscopic resection (EMR); the late Professor Donal Hollywood and Dr. M. Cunningham (radiation oncology); and Professor Ken O'Byrne and Dr. S. Cuffe (medical oncology). Ms. Jennifer Moore is the Cancer Nurse Specialist.
- A major advance at the end of 2012 was the launch of the neo-AEGIS trial, led by SJH. This is an investigator-led international randomised trial comparing preoperative chemotherapy with preoperative chemotherapy and radiation therapy in patients with adenocarcinoma of the oesophagus and oesophago-gastric junction. The trial nurse co-ordinator at SJH is Ms. Geraldine Lee.
- Multidisciplinary model is well established, in particular for clinical trials of multimodality therapy and related molecular and scientific research.
- All oesophageal tumours biobanked for DNA and RNA research.
- TCD Departments of Surgery and Medicine have a long-established major focus on oesophageal disease, including oesophageal cancer and Barrett's oesophagus, with grant income of approximately 5 million euro.
- The standards and performance indicators for oesophageal cancer are well inside internationally-accepted benchmarks in high volume centres: an in-hospital post-operative mortality of 2.5%, 1% in the last 100 cases (5-10% are international figures); integrated care pathways operational; and patients linked to the cancer clinical trials programme.
- Programme strengths include cognate tertiary services in thoracic and head and neck surgery, interventional radiology, critical care and medical gastroenterology.
- Defined linkage with St. Luke's Hospital (SLH).

In 2012, there were 25 clinical and research papers published from the oesophageal and gastric cancer programme.

Oesophageal Cancer Trends

This report looks at 1426 oesophageal cancer patients diagnosed and/or treated in SJH from 2003 to 2012. This shows the upward trend, with a 102% increase of oesophageal cancer patients presenting to SJH over the 10 year period.

Figure 3.1 Oesophageal and Junctional cancer 2003-2012



Gender & Age Analysis

Gender analysis revealed oesophageal cancer incidence has remained stable at 32% female, and 68% male. Ages ranged from 20-97 years, and the median age was 67. 62% of patients were aged between 61 and 80 years.

Tumour Site

Table 3.1 Tumour Site

Tumour Site	Occurrences	Percent
Upper Oesophagus	54	4%
Middle Oesophagus	284	20%
Lower Oesophagus	259	18%
OG Junction	821	57%
Post Cricoid	16	1%

66% of these cancers were adenocarcinoma morphology.

Clinical Staging

Table 3.2 Clinical Stage

Clinical Stage	Occurrences	Percent
Stage 0/HGD	73	5%
Stage 1	156	11%
Stage 2	402	28%
Stage 3	375	26%
Stage 4	353	25%
Unable to assess	51	4%
Unknown	16	1%

Pathological Staging (n = 538)

Table 3.3 Pathological Stage

Pathology Stage	Occurrences	Percent
Stage 0	57	11%
Stage 1	119	22%
Stage 2	147	27%
Stage 3	191	36%
Stage 4	24	4%

Treatment Options

The MDT conference aims to discuss oesophageal cancer patients in the presence of the members of the MDT. The purpose of this is to co-ordinate the sequence of treatment modalities. 95% of patients were discussed at the conference over the last 5 years.

Table 3.4 Treatment Options for Oesophageal Cancer

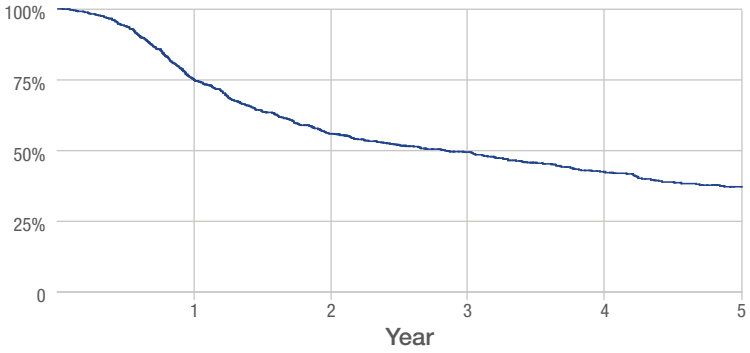
Treatment Options for Oesophageal Cancer	Occurrences*	Percent
SURGERY	550	39%
Neo-adjuvant	343	24%
Radical Radiotherapy/Chemotherapy	148	10%
Adjuvant Chemotherapy/Radiotherapy	59	4%
Endomucosal Resection (EMR)	82	6%
Radiofrequency Ablation	46	3%
Chemotherapy alone	14	1%
Radiotherapy alone	20	1%
Endoscopic Dilatation	266	19%
Stenting	238	17%
Psychiatric Consult	40	3%
Palliative Care	325	23%
Palliative Chemotherapy	264	19%
Palliative Radiotherapy	118	8%
No Treatment/Surveillence only	26	2%

*Please note patients may have more than one treatment.
62% (842) of patients were approached with curative intent.

Survival

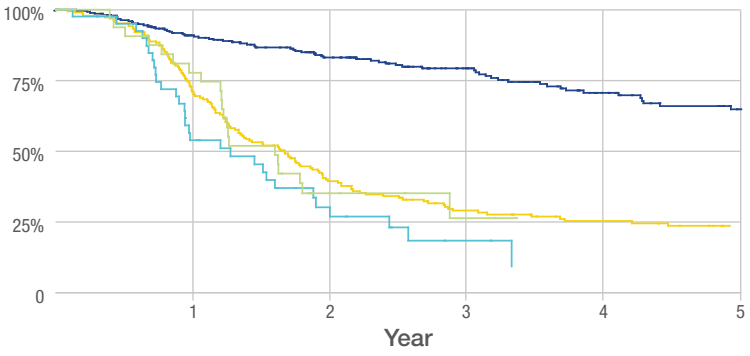
The overall oesophageal cancer survival rate at 5 years is 22%. This rate includes oesophageal cancers diagnosed at all stages and treatment intents. For the 842 patients treated with curative intent the following graph shows actual survival, with 3 year survival at 47%. This rate is comparable with the UK's 3 year survival of 43% for curative intent patients, published in their National Oesophao-gastric Cancer Audit 2012.

Figure 3.2 Curative Intent Oesophageal Cancer survival



Survival time	0 years	1 year	3 years	5 years
No of patients	882	627	248	103
% Survival	100%	74%	47%	35%

Figure 3.3 Oesophageal Cancer survival by Pathological Node Stage (pN or ypN)



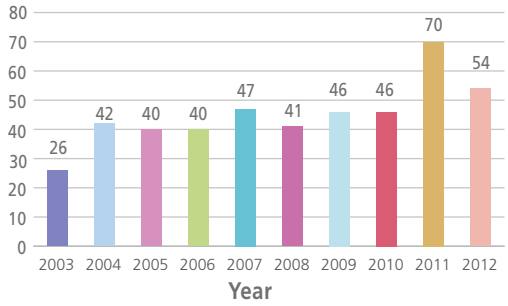
	Survival time	0 years	1 year	3 years	5 years
N0	No at Patients	274	229	122	59
	% Survival	100%	91%	79%	65%
	Median survival N0 = 95 months				
N1	No at Patients	189	143	44	23
	% Survival	100%	70%	29%	24%
	Median survival N1 = 20 months				
N2	No at Patients	41	26	4	2
	% Survival	100%	54%	18%	9%
	Median survival N2 =15 months				
N3	No at Patients	32	25	4	2
	% Survival	100%	78%	26%	26%
	Median survival N3 = 19 months				

2.2b Gastric Cancer (excluding junctional)

Gastric Cancer Trends

The following report looks at 452 new gastric cancer patients diagnosed and/or treated in SJH 2003-2012.

Figure 3.4 Gastric Cancer 2003-2012



Gender & Age Analysis

Gender analysis revealed gastric cancer incidence was 41% female and 59% male. Ages ranged from 21-95 years, and the median age has remained stable at 70 years. 57% of patients were aged between 61 and 80 years.

Clinical Staging

Table 3.5 Clinical Staging

Clinical stage	Occurrences	Percent
HGD	15	3%
Stage 1	61	14%
Stage 2	84	19%
Stage 3	70	15%
Stage 4	152	34%
Unable to assess	37	8%
Unknown	32	7%

The most common morphology was adenocarcinoma, accounting for 86% of all tumours.

Treatment Options

Table 3.6 Treatment Intent

Treatment intent	Occurrences	Percent
Radical	210	47%
Palliative	232	51%
Uncertain intent	7	1.5%
Unknown	2	0.5%

Table 3.7 Treatment Options for Gastric Cancer

Treatment Options for Gastric Cancer	Occurrences*	Percent
SURGERY	167	37%
Neo-adjuvant	36	8%
Adjuvant Chemotherapy	24	5%
Endomucosal Resection (EMR)	14	3%
Chemotherapy alone	21	5%
Radiotherapy alone	8	2%
Endoscopic Dilatation	26	6%
Psychiatric Consult	8	2%
Palliative Care	155	34%
Palliative Resection	18	4%
Palliative Chemotherapy	107	23%
Palliative Radiotherapy	8	2%
No Treatment/Surveillence only	20	4%

Please note patients may have more than one treatment

Pathological Staging (n = 166)

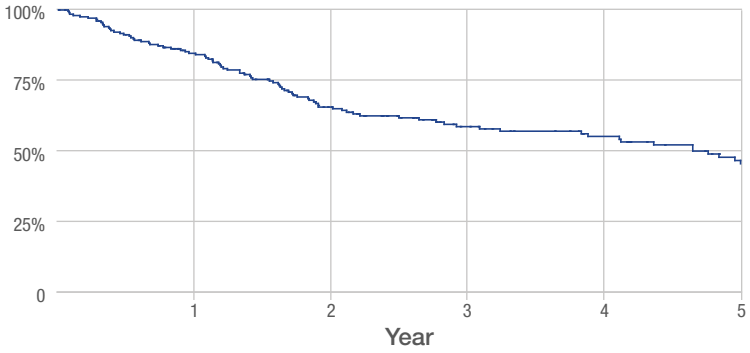
Table 3.8 Pathological Stage

Pathology Stage	Occurrences	Percent
Stage 0	6	4%
Stage 1	51	31%
Stage 2	47	28%
Stage 3	48	29%
Stage 4	14	8%

Survival

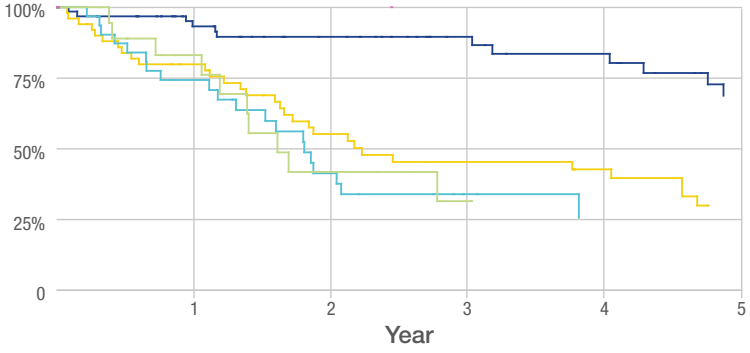
The overall gastric cancer survival rate at 5 years is 23%. This rate includes gastric cancers diagnosed at all stages and treatment intents. For the 210 patients treated with curative intent, the following graph shows actual survival, with 3 year survival at 58%. This rate is comparable to the UK's 3 year survival of 49% for curative intent patients, published in their National Oesophago-gastric Cancer Audit 2012.

Figure 3.5 Curative Intent Gastric Cancer survival



	1 year	3 years	5 years
	84%	58%	46%

Figure 3.6 Gastric Cancer survival by pathological node stage (pN or ypN)



	Five Year Survival Rate	Median Survival
N0	68%	98 months
N1	30%	26 months
N2	28%	28 months
N3	31%	31 months

2.3 Skin Cancer

Summary Points

There is an increasing burden of both melanoma and non-melanoma skin cancers (NMSC) in Ireland. There are approximately eight hundred new cases of malignant melanoma diagnosed in Ireland each year while the number of NMSC (primarily basal cell and squamous cell carcinomas) is approximately twenty to twenty-five thousand per year, with approximately 7000 new patients a year being diagnosed with their first tumour.

The delivery of skin cancer management in SJH is via an integrated, multidisciplinary model. The dermatosurgery unit in SJH is the only unit which provides a Mohs Micrographic Surgery service to public health patients in the Republic of Ireland. The unit consists of two consultant dermatologists who are fellowship-trained Mohs Micrographic surgeons.

The dermatosurgery unit provides a local and regional service for both melanoma and NMSC patients. It is also the tertiary referral centre for the management of complex and high-risk skin cancer patients.

Suspected melanomas or squamous cell carcinomas are now triaged into rapid access clinics performed by both the dermatosurgery and plastic surgery services. "See and Treat" clinics have been developed to expedite management of these patients.

Structure

The delivery of skin cancer care (in SJH) is through a closely integrated, multidisciplinary model. Management is optimised through the close cooperation between the following services: dermatosurgery, plastic surgery dermatopathology, E.N.T., and maxillofacial surgery. There are also close ties with the relevant oculoplastic services in the city. SJH is fortunate to have two of the four dermatopathologists in the country which greatly aids in the management of both melanoma and NMSC cases (Dr. Niamh Leonard and Dr. Mairin McMenamin). The programme is complimented by the role of SJH as the National Centre for Maxillofacial Surgery, and Burns, and its major head and neck and reconstructive programmes.

The Mohs Micrographic Surgery service was established by Dr. Patrick Ormond in 2006. Dr. P. Ormond was Chairman of the NCCP Programme for skin cancer, and a founding member of both the Irish Skin Foundation and the Irish Melanoma Forum. It provides a local and tertiary referral service. Currently, Mohs Micrographic Surgery is performed two and a half days a week. The recent appointment of a second consultant Mohs Micrographic Surgeon (Dr. Rupert Barry) enabled this increased activity. The service does not receive any dedicated funding and the expansion has resulted in an increased need for investment in both staffing and physical infrastructure in the short to medium term.

Currently, the dermatosurgery unit provides a Mohs Micrographic Surgery service for patients with aggressive or high risk tumours. It also provides a skin cancer service for the cohort of immunosuppressed patients in the hospital (HIV, solid organ transplant recipients, haematology patients as well as those on immunosuppressive mediations), as well as those attending services elsewhere in Ireland. High risk patients, who are genetically predisposed to developing high risk skin cancers, such as the Epidermolysis Bullosa patients, are also closely followed by the MDT in dermatology.

The Dermatology department is involved in the education of both undergraduate and postgraduate staff (SpR's, regional nursing

staff, GPs). Three of the Department's registrars have successfully obtained Mohs micrographic surgery fellowship in the UK and Canada. The dermatosurgery unit regularly presents at peer-reviewed national and international meetings and has had recent publications in peer-reviewed international journals .Dr. R. Barry has spoken at the Annual Meeting of the American College of Mohs Surgeons and has been an invited speaker at the International Society of Dermatologic Surgery. Both Drs R. Barry and P. Ormond have been invited speakers and members of faculty at meetings of the British Society for Dermatologic Surgery.

Skin Cancer Trends

This report examines both NMSC and melanomas from 2003-2012. There were over 800 new patients diagnosed in SJH with NMSC in 2012, this represents a 110% increase in newly diagnosed NMSC patients over the last ten years. Please note that this figure represents new patients diagnosed and not new NMSCs diagnosed on a previously diagnosed patient. Therefore this doesn't reflect the true workload of the department.

Figure 4.1 NMSC 2003-2012

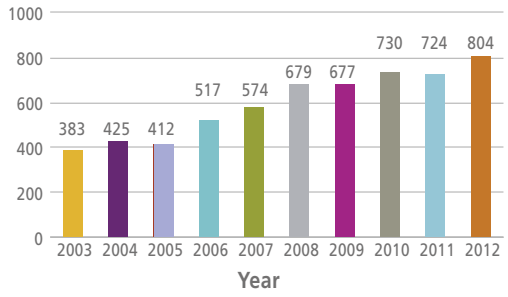
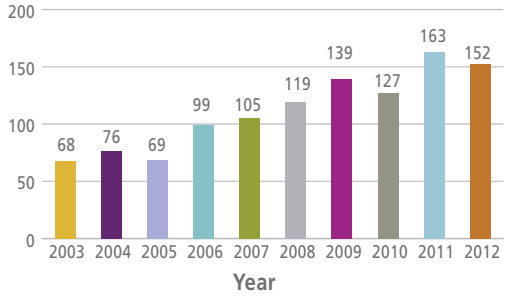


Figure 4.2 Melanomas 2003-2012



For melanoma, there has been a 124% increase in new diagnoses since 2003.

Skin Cancer MDT

The first skin MDT in Ireland was established in April 2005. The team consists of a dermatologist as the lead clinician, a plastic surgeon, a dermatopathologist, a radiation oncologist medical oncologist, a maxillofacial surgeon, and data manager. There is a 0.5 WTE MDT co-ordinator. Selected complex or inadequately excised NMSCs and all melanoma cases are discussed. 88% of all melanomas have been discussed at MDT since 2005. The Skin MDT in SJH is the only MDT in the country to include (and discuss) complex NMSC patients.

Table 4.1 Melanoma MDT discussion

Year	Percent
2005	91%
2006	97%
2007	70%
2008	86%
2009	85%
2010	99%
2011	93%
2012	96%

Melanoma Audit

There were 1117 new patients with 1142 melanomas diagnosed and treated in SJH over the last ten year period. The average age at diagnosis was 60 years with a range from 13-98 years. There has been little variation in the age of diagnosis over the ten year period. 58% of patients were female.

15% had a previous NMSC at the time of diagnosis. 9% had a previous melanoma or melanoma in situ. 6.5% had a previous malignancy, although this data is underestimated as this information is often unavailable in the patient's history.

94% of patients were treated with curative intent. 98% of patients had a surgical excision as part of their primary treatment.

Table 4.2 Tumour Site (n=1117, 1142 tumour sites)

	Occurrences	Percent
Face	214	18.6
Posterior Trunk	154	13.4
Left Lower Limb	122	10.7
Right Lower Limb	107	9.3
Right Upper Limb	98	8.5
Left Upper Limb	86	7.5
Neck	57	5
Anterior Trunk	54	4.7
Forehead	73	6.4
Nose	34	3
Ears	32	2.8
Metastatic disease only (No primary found)	27	2.4
Scalp	25	2.2
Vulva	11	1
Eyelid	9	0.8
Lips	4	0.4
Anal	3	0.3
Eye	3	0.3
Penile	2	0.2
Other	19	2.2
Not specified	3	0.3

39% of melanomas are found on the head and neck region.

Table 4.3 Melanoma Type

	Occurrences	Percent
Superficial Spreading Melanoma	360	31.5
Lentigo Maligna/Melanoma in situ	348	30.5
Lentigo Maligna Melanoma	182	15.8
Malignant Melanoma-not specified	115	10.1
Nodular Melanoma	84	7.4
Acral Lentiginous Melanoma	25	2.2
Desmoplastic melanoma	9	0.8
Spindle cell melanoma	8	0.7
Other	11	1

Table 4.4 Histological features of Invasive tumours (n=779)

Histological features	Occurrences	Percent
Ulceration	153	19
Mitoses present	364	46
Extra capsular spread	12	1.5
Perineural Invasion	24	3
Vascular Invasion	40	5
Regression	201	25
Tumour Infiltrating Lymphocytes		
Non Brisk	266	33.5
Brisk	44	5.5
Microsatellites	5	4.6
Co-existent naevus	206	26

10-15% of patients were unknown histologies.

Table 4.5 Breslow Depth

Breslow Depth	Occurrences*	Percent
Tis (melanoma in situ)	321	28.1
<1 mm (T1)	365	32
1.01-2 mm (T2)	132	11.6
2.01-4.0mm (T3)	107	9.4
>4.0mm (T4)	128	11.2
Unknown/Not recorded	89	7.7

50% of patients had a Breslow depth of less than 1mm at the time of presentation.

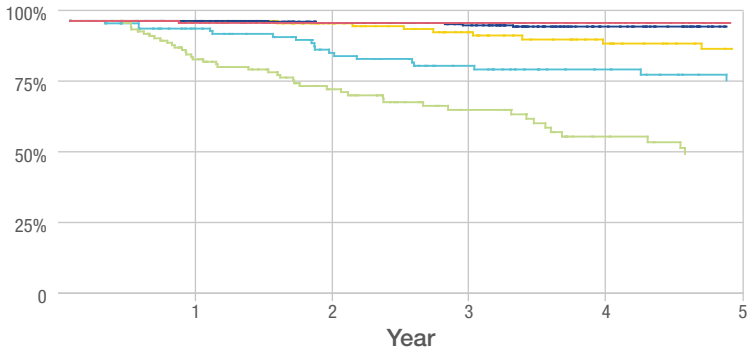
Table 4.6 Overall pathological Stage (n=1117, 1142 tumour sites)

Pathological Stage	Occurrences*	Percent
Stage 0	342	29.9
Stage Ia	266	23.3
Stage Ib	175	15.3
Stage IIa	75	6.6
Stage IIb	43	3.8
Stage IIc	57	5
Stage II	3	0.3
Stage IIIa	41	3.6
Stage IIIb	23	2
Stage IIIc	27	2.4
Stage III	8	0.7
Stage IV	43	3.9
Not recorded/Unknown	38	3.2

12.6% of all patients present with stage 3-4 disease at the time of presentation. 222 (19.4%) patients had a sentinel node biopsy (SNB) at the time of diagnosis. Of that group, 35% were found to have a positive SNB. 91% of those went on to have a complete lymph node dissection. This analysis does not include patients who had a SNB or lymph node dissection for a suspected recurrence.

Survival Analysis

Figure 4.3 Overall Survival by Breslow Depth (Cancer free survival)



	Survival time	0 years	1 year	3 years	5 years
T0	No at Patients	321	275	204	126
	% Survival	100%	99%	99%	99%
T1	No at Patients	365	322	200	113
	% Survival	100%	100%	98%	98%
T2	No at Patients	132	122	75	45
	% Survival	100%	100%	96%	89%
T3	No at Patients	107	92	58	37
	% Survival	100%	97%	83%	77%
T4	No at Patients	128	95	43	24
	% Survival	100%	85%	66%	49%

2.4 Head & Neck Cancer

Structure

Head and Neck cancer patients within SJH are taken care of by two main teams, the Otolaryngology-Head & Neck Surgery and Maxillofacial Surgery, which ensures that patients in this group have access to the combined surgical strength of both departments.

The patient treatment pathway benefits from the combined academic strength of two Trinity College Professors of Surgery (Professor Conrad Timon and Professor Leo Stassen) and from the academic focus of the Department of Pathology in TCD (Professor John O'Leary, Professor Orla Shiels and Dr. Mary Toner). There is a linkage with AMNCH through a single department structure, (headed by Mr. John Kinsella) and agreement that all complex major cancer surgery is performed at SJH. There is also a co-operation with Dublin Dental School (DDS) and SJH for the management of oral cancers. All major surgery is undertaken at SJH and is managed by Professor Stephen Flint/ Dr. Marie-Louise Healy (Oral Medicine), working closely with Dr. Mary Toner (Oral Pathology) who is a joint appointment between the DDS and SJH.

Surgery for this group of patients is complex and difficult, often requiring multiple surgical teams to play a part. A cancer centre model of combined multi-surgeon operations is in use for the most complex cases, with close interface with the plastic and reconstructive team, the oesophageal team, and the thoracic service.

Multidisciplinary team meetings

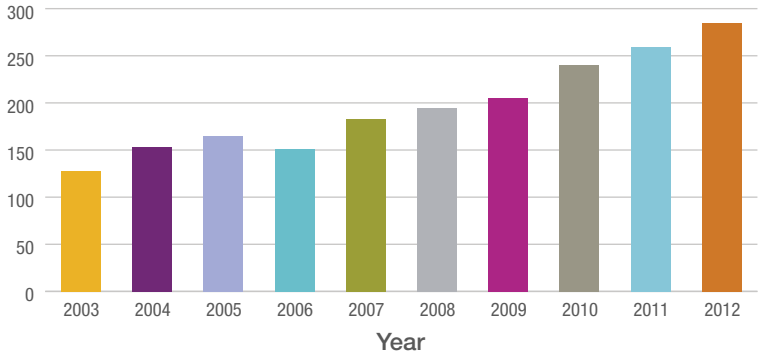
Weekly Head and Neck MDT meetings commenced in March 2006. Meetings are attended by all relevant stake holders and offer immense value to both patients and clinicians. From the clinician's point of view they provide a forum of support and advice from peers to discuss difficult cases and to gain consensus on a pathway of care. For patients the meeting ensures that their treatment is based on the combined experience of all the relevant consultants present who bring all of their academic research and experience to bear on their decisions. Surgical decisions are determined by combined opinion of Prof. C. Timon, Mr. J. Kinsella, Mr. Paul O Neill, Prof. L. Stassen and Mr. Padraig O'Ceallaigh. Two specialist nurses are also present, Ms. Catherine O'Farrell and Ms. Joanne McDonagh. Radiation oncology is represented by Dr. S. Brennan. Radiology provides a large input on the decision making process with the majority of patients having PET/CT imaging prior to surgery.

Head and Neck Cancer Trends

Outcome data for Head and Neck is not available at this time due to maternity leave. A full report for Head and Neck cancer will be available in 2014.

There were 1964 new Head and Neck cancer cases (ICD C01 -14, C30-32, C73.9) diagnosed and/ or treated in SJH between 2003 and 2012, with an average of 196 new patients per year. A year on year increase in the total numbers is noted with a percentage increase of 123% over the 10 year period. A total of 259 head and neck cancer patients were diagnosed and/or treated in 2011 with 285 diagnosed in 2012. The latest available national figures from the NCRI show that there were an average of 523 head and neck cancers diagnosed nationally between 2008 – 2010 which suggests that the Head and Neck cancer team in SJH treated almost 41% of this group.

Figure 5.1 Newly Diagnosed Head & Neck Cancer 2003 - 2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Head & Neck Cancer	128	153	165	151	183	195	205	240	259	285

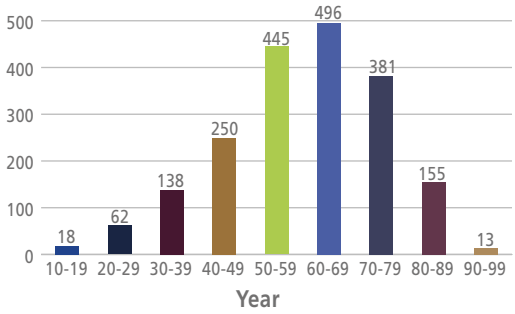
Head & Neck cancers affect more males than females. In its latest report the NCRI data[1] showed that over a 17 year period (1994 – 2010) the ratio of men to women was almost 1.7:1. Over a 5 year period in SJH (2007 – 2012) the ratio of men to women was similar at 1.8:1.

1. Cancer in Ireland 2013: Annual Cancer Report of the National Cancer Registry.

Table 5.1 Breakdown of Male vs. Female Cancers

Year	Men	Women
2003	87	41
2004	92	61
2005	101	64
2006	90	61
2007	117	66
2008	125	70
2009	135	70
2010	161	79
2011	155	104
2012	189	96

Figure 5.2 Age Analysis at Diagnosis



The age distribution of the SJH group (see fig 5.2) reflects the pattern of the NCRI, with the average age over a 10 year period in the NCRI being 63 years. The average age of patients in SJH is 60 years.

2.5 Colorectal Cancer

Service

- The colorectal service is involved in the management of over 9% of the national colorectal cancer workload.
- There is a well-developed multimodal treatment model for rectal cancer, with integrated staging, treatment planning, audit and follow-up.
- SJH is a high volume centre for colorectal diseases, with laparoscopic surgery the preferred approach within the Unit.
- All colorectal cancer cases are discussed at a weekly MDT conference where the most appropriate treatment modality is proposed for the individual patient.
- Our rates for sphincter preservation, anastomotic leaks, in-hospital morbidity and mortality, and stage for stage survival are consistent with international benchmarks.
- Our standards are defined and linked with the Association of Coloproctology of Great Britain and Ireland (ACPGBI), and audit shared with and accredited to this Association.
- There is close alignment with gynaecology oncology and urological oncology services.

Colorectal Service Structure

- Colorectal Consultant Surgeons, Mr. Richard Stephens (retired), Mr. Robert Quill (retired) Mr. Brian Mehigan and Mr. Paul McCormick provide specialised joint care to all in-patients, working as an integrated team with senior and junior registrars in the GEMS Directorate. This team based care includes ward rounds, operating lists and flexible out-patient clinics.
- Two senior specialist registrars work in a level 3 colorectal training post as approved by the ACPGBI.
- Consultant oncologists, Professor Peter Daly (retired) Prof. J. Kennedy and Professor Kenneth O'Byrne (has left SJH service), provide specialised oncology care for patients with colorectal cancer including involvement in new chemotherapy trials. The medical oncology service is also supported by a colorectal oncology liaison nurse.
- The Consultant Radiation oncology service was initially provided by the late Prof. D. Hollywood and Dr. C. Gillham joined the service in 2008 providing specialised radiation oncology care for patients with colorectal cancer. The radiation oncology service is also supported by a radiation liaison nurse.
- Specialist GI Cancer Consultant Histopathologists, Dr. D.Sean O'Briain, Professor Eoin Gaffney, Dr. Cian Muldoon, Dr. Stephen Finn and Dr. Richard Flavin review all colorectal specimens and histology.
- Consultant Radiologists, Prof. M. Keoghan, Dr. C. Johnson, Prof. J. Meaney, Dr. N. Sheehy, Dr. P. Beddy and Dr. G. Wilson have expertise in colorectal cancer staging providing radiological services.
- Consultant Gastroenterologists, Prof. P. Keeling (retired), Professor Donald Weir (retired), Professor Nasir Mahmud, Dr. Susan McKiernan, Prof. Suzanne Norris, Professor Dermot O'Toole and Dr. Finbarr MacCarthy; provide diagnostic and therapeutic endoscopic services, including endoscopic ultrasound, to colorectal cancer patients.

- Palliative Care Consultants Dr. Liam O'Siorain (has left SJH Service), Dr. Peter Lawlor (has left SJH Service), Dr. N. O'Leary and Dr. L. Balding provide in-patient and out-patient palliative care services to colorectal cancer patients. The service is also supported by Palliative Care clinical nurse specialists.
- Liaison Psychiatry Consultants Dr. AM. O'Dwyer, Dr. J. Cooney and Dr. S. Collier provide psychiatric services and access to psychological support services.
- Dr. D. Gallagher and Prof. A. Green provide genetic counselling services to patients with a personal or family history suggestive of an underlying inherited predisposition to colorectal cancer.
- The GI Function Lab provides rectal manometry to appropriate colorectal cancer patients.
- Full time colorectal nurse co-ordinators, Ms. Delia Flannery and Ms. Katrina O'Connor facilitate the management and support of the colorectal cancer patient as they follow the pathway through referral, diagnosis, treatment and follow-up.
- Stoma care clinical nurse specialists, Ms. AnneMarie Stuart (full time) and Ms. Anna Fearon and Ms. Siobhan McGovern (job sharing), review all patients that may potentially require a stoma during planned surgery. They provide in-patient and out-patient education and counselling for colorectal cancer patients who have had a stoma formed.
- Full time colorectal data manager, Ms. Charlotte Stuart, ensures full prospective collection of all patient parameters, carries out regular audit and provides data for research and reporting purposes.

Colorectal Service Process

- An average of 4 colorectal OPD clinics per week.
- An average of 5 specialised colorectal endoscopy sessions available per week. There are 2 x-ray rooms to facilitate colonic stenting and 1 endoscopic ultrasound room.
- 7 theatre sessions weekly.
- There is 1 day surgery session per week.
- Access to regular in-patient and out-patient x-ray facilities, for example: MRI scans (2 weekly dedicated appointment slots), CT scans (2 weekly dedicated appointment slots), Rectal and anal ultrasound, Barium studies, PET scans and CT Colonography are available for colorectal cancer patients.
- Access to once weekly sessions on rectal manometry.

Colorectal Services and Quality Assurance

- Once weekly MDT meetings which are organised by experienced MDT co-ordinators, provide a structured and co-ordinated approach to the delivery of cancer care. The MDT meeting is attended by a Consultant Liver Surgeon from St. Vincent's Hospital on a fortnightly basis. The meeting links with Tullamore General Hospital allowing discussion of their cancer patients.
- A full range of open, laparoscopic and transanal resectional surgery with, where necessary, pouch reconstruction, is practiced in the colorectal unit.
- Colonic stenting is provided as a bridge to surgery for patients presenting with obstructing tumours and for palliation of obstructive symptoms.

- A Colorectal Cancer Care Pathway is in place using evidence based research and guidelines from the ACPGBI and is regularly reviewed and updated.
- Colorectal cancer data is submitted annually for inclusion in the National Bowel Cancer Audit which was developed by the ACPGBI and is correlated and managed by the Clinical Audit Support Unit in the NHS in England.
- A weekly nurse-led follow up clinic for patients who have curative surgery for colorectal cancer. The follow up clinic provides a more complete and accurate patient follow up in a patient focused environment.
- An electronic colorectal cancer database, in place since 2001, enables the capture of all information relating to the patient journey, including referral, diagnosis, treatments and follow-up ensuring quality assurance.
- The stoma care department run a bi-annual Stoma Foundation course for staff nurses within the hospital. This course is category 1, An Bord Altranis approved.
- The stoma care department work closely with UCD providing education to the post graduate colorectal oncology students whilst on placement in SJH.
- 2011 saw the introduction of stoma care pre admission clinics; which aims to reduce patient stress and anxiety by offering the most up to date information regarding treatment in a patient focused setting.
- The second patient satisfaction survey is underway to assess the service being provided by the Nurse Led CRC Follow-Up clinic.
- Development of an Enhanced Recovery after Colorectal Surgery programme. This programme was launched in April 2013. The principle of ERAS is to enable the patient to have a more rapid recovery from surgery in order to leave hospital sooner by minimising the stress responses on the body during resection surgery.
- The Key Performance Indicator programme for colorectal cancer was introduced in 2010 to measure the timeliness of access to services, investigations and treatment of colorectal cancer patients. These standards are under regular review at quarterly KPI meetings to ensure their suitability and to measure compliance.
- Ms. Delia Flannery, CRC Co-ordinator and Ms. AnneMarie Stuart, Stoma Care CNS, have successfully completed a level 9 post graduate diploma in colorectal cancer nursing. Ms. Katrina O'Connor, CRC Co-ordinator began this course in September 2013.
- The colorectal team are currently trialling day of surgery admission for colorectal cancer patients which includes a colorectal pre admission clinic supported by the CRC Consultants, Anaesthetists and co-ordinated by the CRC nurses and the Day Surgery CNS's.
- Colorectal Cancer Screening has commenced in SJH offering free screening to men and women aged between 55-74 years. The service is supported by the screening CNS, Ms. Linda Foy, who assesses patient's suitability for colonoscopy and guides them through the screening process.

CRC Audit 2003-2012

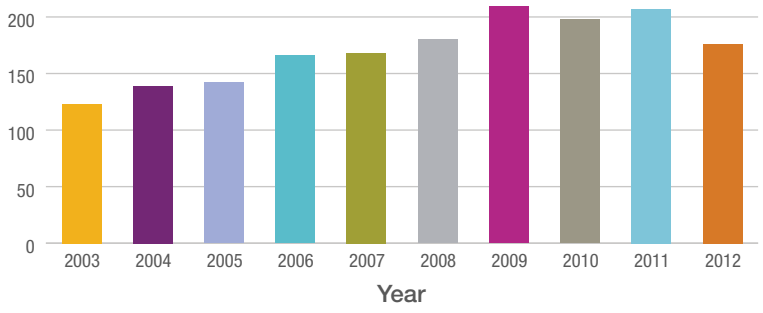
During the period 2003 to 2012 a total of 1,708 patients were referred to, diagnosed with and/or treated in SJH for colorectal cancer. This report focuses in detail on 1,453 of these patients referred to or diagnosed in SJH with colorectal cancer who had full treatment; surgery alone or adjuvant therapy. The remaining 255 patients were referred specifically for the opinion of the GI oncology MDT, a small percentage of patients were referred for lung resection, chemotherapy or palliative care for recurrence of colorectal cancer having been initially diagnosed and treated elsewhere.

Colorectal cancer includes malignant tumours of the appendix, colon, rectum and anus. Approximately three new cases of colorectal cancer are diagnosed or referred to SJH weekly. This accounts for almost 6% of the total SJH cancer workload and 8% of the national workload (NCR 2012).

Colorectal Cancer Trends

Since 2003, there has been a 43% increase in the number of new patients referred to the colorectal cancer service in SJH.

Figure 6.1 Colorectal Cancer 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Colorectal Cancer	123	139	142	166	168	180	209	198	207	176

Gender & Age Analysis

Gender analysis revealed colorectal cancer incidence was 42% female and 58% male. Colorectal cancer incidence is more common in the over 75 age group and 34% of patients fell within this category. The average age of patients at time of diagnosis was 67.37 years. Ages ranged from 16 to 99 years and the median age was 69. Approximately 83% of patients were aged between 55 and 99 years.

Tumour Site

The vast majority of colorectal cancers are moderately differentiated (75%) adenocarcinomas (90%), with the most common sites for tumour occurrence being the rectum (33%) and the sigmoid colon (19%).

Table 6.1 Tumour Site (2003-2012)

	No. of Tumours*	Percent
Rectum	490	33%
Sigmoid colon	288	19%
Caecum	175	12%
Ascending colon	110	7%
Transverse colon	82	6%
Rectosigmoid	82	6%
Hepatic flexure	59	4%
Descending colon	55	4%
Splenic flexure	47	3%
Appendix	43	3%
Anus	31	2%
Site not specified	14	1%
Small bowel	9	1%
Terminal ileum	5	<1%

*Some patients may have synchronous tumours.

Treatment Options

The focus on a multidisciplinary approach to patient care has seen patients discussed at the weekly MDT conference increase by 286% since 2003. The MDT facilitates the planning and co-ordination of the sequence of treatment modalities. Treatment options for colorectal surgery can be seen in the table below.

Table 6.2 Treatment Options 2003–2012

	Colon Cancers	Rectal Cancers
Surgery	657	350
Chemotherapy	398	276
Non resection surgeries*	230	265
Radiotherapy	49	254
Endoscopic	63	21
No treatment	63	20
Colonic Stent	48	12

Note: Treatments are not mutually exclusive.
*Some patients may have multiple surgeries including stoma formation/stoma reversal.

Colon Cancers

- Colon cancer patients were treated with a curative intent in 67% of cases.
- Metastatic disease was present in 27% of patients at time of diagnosis.
- Prior to 2008 10% of all colon cancer resection surgeries were laparscopic; this figure has increased to 58% for the last 5 years.
- Anastomotic leak rate is 2.9%. (Based on 580 anastomosis formed).
- Median lymph node harvest was 15.

Rectal Cancers

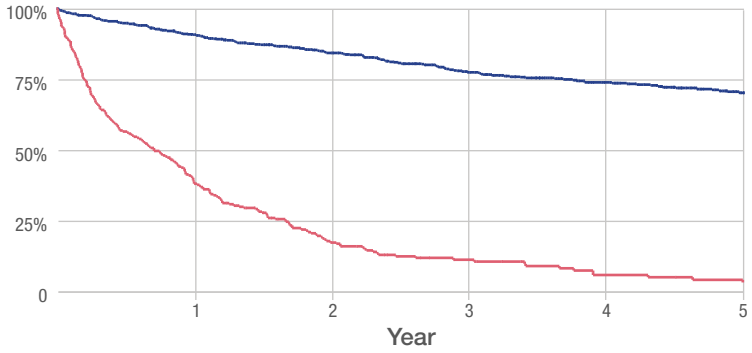
- Rectal cancer patients were treated with a curative intent in 73% of cases.
- Metastatic disease was present in 18% of patients at time of diagnosis.
- 202 patients had neoadjuvant therapy prior to rectal cancer resection.
- Prior to 2008 6% of all rectal cancer resection surgeries were laparscopic; this figure has increased to 56% for the last 5 years.
- Anastomotic leak rate is 5.8%. (Based on 222 anastomosis formed).
- APER rate is 23.9%. (ACPGBI recommend it to be <30%).
- Median lymph node harvest was 12.

Lead Times

Lead times are recorded for use as a clinical indicator of a quality service:

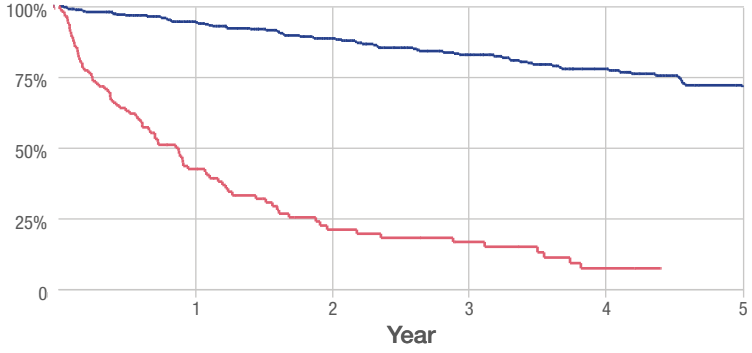
- 83% of urgent referrals were seen within 1 month.
- 87% of patients were diagnosed within a month of initial referral.
- 70% of patients started their treatment within a month of diagnosis.

Figure 6.2 Colon Cancer Survival by Treatment Intent



	Survival time	0 years	1 year	3 years	5 years
Curative	No at Patients	650	548	359	202
	% Survival	100%	91%	78%	70%
Palliative	No at Patients	276	113	20	5
	% Survival	100%	41%	12%	4%

Figure 6.3 Rectal Cancer Survival by Treatment Intent



	Survival time	0 years	1 year	3 years	5 years
Curative	No at Patients	356	298	193	102
	% Survival	100%	95%	84%	71%
Palliative	No at Patients	113	48	12	3
	% Survival	100%	44%	17%	8%

2.6 Gynaecological Cancer

Gynaecological cancer care at SJH is accredited by the NCCP as a regional and national referral centre for the care of women with genital tract malignancies. The gynaecological surgical facility at SJH is now dedicated exclusively to the provision of care of women with cancer and those with complex benign diagnoses. This arrangement has been facilitated by our sister Trinity gynaecological units at the Coombe Women's & Infants' University Hospital (CWIUH), Adelaide Meath/Tallaght (AMNCH) and a robust referral mechanism has been developed.

The Colposcopy service is located at CWIUH & AMNCH. Dr. Tom D'Arcy is director of the colposcopic/pre-invasive cervical cancer programme for the Trinity Hospitals.

The GynaeOncology Division has three subspecialist trained surgical gynaecological oncologists, Dr. Noreen Gleeson, Dr. T. D'Arcy. Dr. Waseem Kamran (locum tenens). Specialist medical oncologist for gynaecological cancers is Dr. Dearbhaile O'Donnell. Specialist radiation oncologist for gynaecological cancers is Dr. Charles Gillham.

Clinical nurse specialists in gynaecological cancer care are Ms. Debra McKnight and Ms. Ciara Donohoe. Data management is completed by Ms. Therese Brown.

Minimal access (laparoscopic) approach to surgery is standard of care for cervical and endometrial cancers. The gynaecological oncology division supports the genetic breast/ovary clinic with a risk reduction surgical service.

The three gynaecologic oncologists are subspecialist trainers and the training programme is approved by the Royal College of Obstetricians & Gynaecologists (RCOG). SJH is the only unit in the republic of Ireland that is RCOG accredited for senior fellowship training. The large case volume and increasingly more complex clinical caseload in a multidisciplinary setting provides a high quality training framework.

Research is undertaken in conjunction with ICORG/GCIG for clinical trials and TCD for basic science/laboratory projects. The basic science facilities are directed by Professor John O'Leary, Dr. Lucy Norris & Dr. Sharon O'Toole. The research activity includes gynaecological cancer biology, pathology, coagulation, genomics and oncometabolomics. Basic science research fellowships are available for clinicians in training.

The gynaecological cancer care programme is based around a weekly multidisciplinary conference that is attended by all relevant specialists.

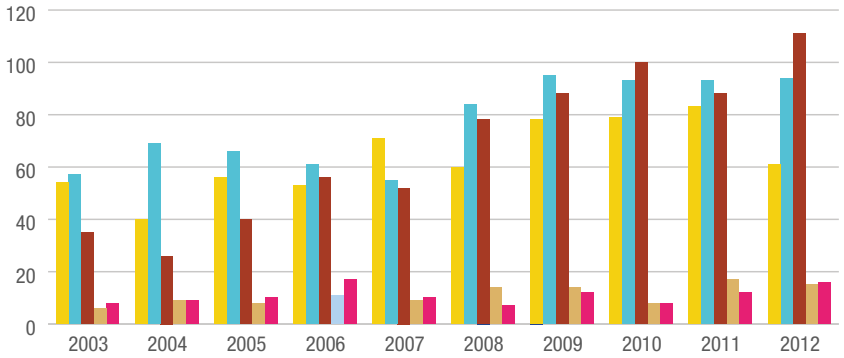
Table 7.1 Gynaecological Cancer MDT discussion

2006	2007	2008	2009	2010	2011	2012
93%	93%	92%	96%	95%	96%	98%

Gynaecological Cancer Trends

There were 2262 new gynaecological cancer patients diagnosed and/or treated in SJH over the last ten years. This figure includes 33 patients with more than one tumour site. Over this ten year period there has been an 86% increase in the gynaecological oncology service workload (See table 7.2).

Figure 7.1 Gynaecological Cancers by Tumour Site



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Cervix	54	40	56	53	71	60	78	79	83	61
Ovary	57	69	66	61	55	84	95	93	93	94
Endometrium	35	26	40	56	52	78	88	100	88	111
Vulva	6	9	8	11	9	14	14	8	17	15
Other	8	9	10	17	10	7	12	8	12	16

The following is a breakdown of patients diagnosed and treated in SJH for the years 2003 to 2012. There were 32 patients with two tumour sites, and one patient with three tumour sites. The 2262 newly diagnosed patient's tumour sites are divided as follows.

Table 7.2 SJH 10 year Gynaecological Cancer data by year by tumour site

Tumour Site	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Cervix	54	40	56	53	71	60	78	79	83	61	635
Ovary	57	69	66	61	55	84	95	93	93	94	767
Endometrium	35	26	40	56	52	78	88	100	88	111	674
Vulva	6	9	8	11	9	14	14	8	17	15	111
Others	8	9	10	17	10	7	12	8	12	16	109
Total	160	153	180	198	197	243	287	288	293	297	2296

Table 7.3 SJH figures as a percentage of National Gynaecological malignancies

Tumour Site	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cervix	27%	20%	22%	23%	24%	23%	22%	24%	26%
Ovary	15%	21%	20%	17%	17%	24%	27%	26%	28%
Endometrium	12%	9%	12%	18%	15%	20%	20%	24%	20%
Vulva	17%	19%	21%	21%	20%	29%	26%	19%	37%

SJH accounts for a significant amount of the national workload with approximately one quarter of all gynaecological malignancies diagnoses or treated in SJH.

Cervix Uteri

There were 635 new cervical cancers diagnosed in this period. The median age was 53, and the age range was from 22 years to 98 years.

Table 7.4 Cervical Cancer – Morphology

Morphology Type	Percent
Squamous Cell Carcinoma	69
Adenocarcinoma	18
Adenosquamous	4
Other/Unknown	9

Ovarian Cancer

There were 767 new ovarian cancers diagnosed in this period, including 138 of which were Borderline. The median age was 53, and the age range was from 15 years to 95 years.

Table 7.5 Ovarian Cancer – Morphology

Morphology Type	Percent
Adenocarcinoma	22
Papillary Serous	34
Borderline	18
Clear Cell	7
Other/Unknown	19

Uterine/Endometrial Cancer

There were 674 new endometrial (uterine corpus) cancers diagnosed in this period. The median age was 63, and the age range was from 27 years to 94 years.

Table 7.6 Endometrial/Uterine Cancer – Morphology

Morphology Type	Percent
Endometrioid Adenocarcinoma	58
Adenocarcinoma	21
Papillary Serous	6
Other/Unknown	15

Vulval Cancer

There were 111 new vulval cancers diagnosed in this period. The median age was 59, and the age range was from 24 years to 88 years.

Table 7.7 Vulval Cancer – Morphology

Morphology Type	Percent
Squamous Cell Carcinoma	74
Melanoma	8
Other/Unknown	18

Treatment Details

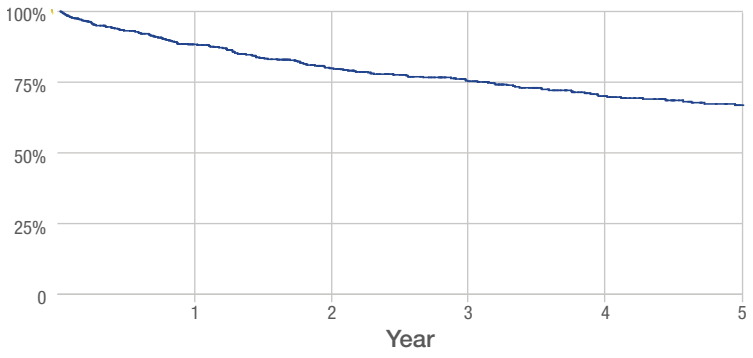
Cancer treatments for patients in 2012 are summarised below for each tumour site.

Table 7.8 Treatment Details of Gynaecological Cancers (2012)

Cervix (n=61)	Occurrences	Percent
None	1	1.6
Surgery Only	14	23
Surgery with adjuvant Radiotherapy	7	11.5
Surgery with adjuvant Chemoradiotherapy	7	11.5
Radiotherapy	10	16.4
Chemotherapy	3	4.9
Palliative Care/Best Supportive Care	3	4.9
Chemoradiotherapy	15	24.6
Unknown	1	1.6
Ovary (n=94)	**Occurrences**	**Percent**
None	1	1.1
Surgery Only	32	34
Surgery with adjuvant chemotherapy	36	38.3
Surgery with adjuvant radiotherapy	1	1.1
Surgery with adjuvant chemoradiotherapy	1	1.1
Chemotherapy	7	7.4
Palliative care/best supportive care	1	1.1
Primary Chemotherapy with adjuvant Surgery	14	14.9
Unknown	1	1.1
Endometrial (n=111)	**Occurrences**	**Percent**
None	2	1.8
Surgery Only	54	48.6
Surgery with adjuvant chemotherapy	8	7.2
Surgery with adjuvant radiotherapy	25	22.5
Surgery with adjuvant chemoradiotherapy	8	7.2
Radiotherapy	1	0.9
Chemotherapy	3	2.7
Palliative care/best supportive care	4	3.6
Primary Chemotherapy with adjuvant Surgery	2	1.8
Unknown	4	3.6
Vulva (n=15)	**Occurrences**	**Percent**
Surgery Only	9	60
Surgery with adjuvant radiotherapy	4	26.7
Surgery with adjuvant chemoradiotherapy	1	6.7
Chemoradiotherapy	1	6.7

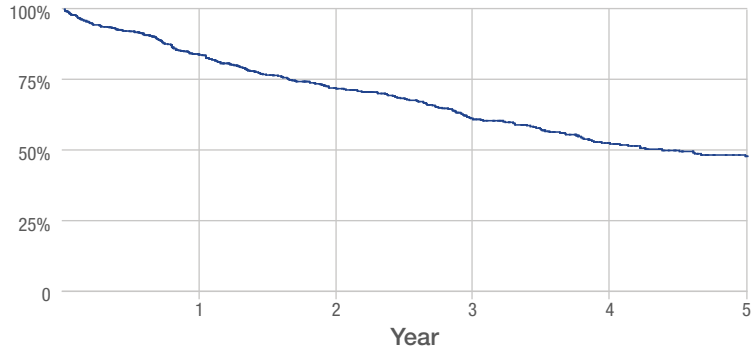
Survival Analysis by Tumour Site

Figure 7.2 Survival Analysis of Cervical Cancer



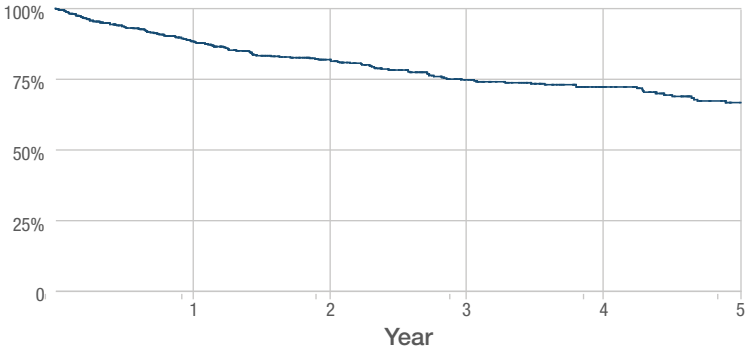
1 year	3 years	5 years
88%	75%	67%

Figure 7.3 Survival Analysis of Ovarian Cancer



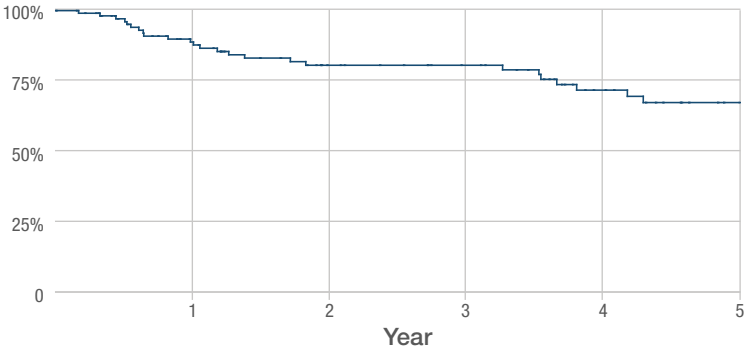
1 year	3 years	5 years
84%	61%	48%

Figure 7.4 Survival Analysis of Uterine Cancer



1 year	3 years	5 years
88%	76%	68%

Figure 7.5 Survival Analysis of Vulval Cancer



1 year	3 years	5 years
88%	81%	68%

2.7 Urology Cancer

Structure

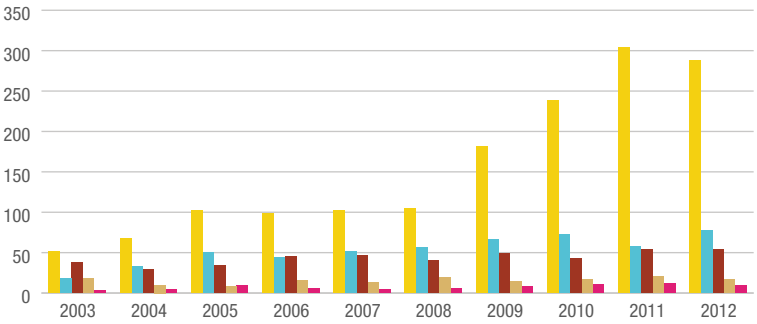
- Well developed MDT approach to urological cancers provided by Professor Thomas Lynch, Mr. Ted McDermott and Mr. Rustom Manecksha (Mr. Ronald Grainger retired in 2012).
- The service is supported by a high standard of nursing care to patients by four CNS's in Urology; Ms. Marion O'Brien, Ms. Lynn Casey, Ms. Sonya Bowen and Ms. Tanya Conroy. Ms. L. Casey is currently undertaking an MSc. in Advanced Nursing Practice.
- Consultant Oncologist, Dr. D. O'Donnell provides specialised oncology care for patients with urology cancer.
- Consultant Radiation Oncologists, Dr. N. Elbeltagi and Dr. M. Cunningham provide specialised radiation oncology care for patients with urology cancer. The radiation oncology service is also supported by a radiation liaison nurse.
- High volume radiological input from the department of diagnostic imaging.
- SJH was the first hospital to offer laparoscopic surgery for urological malignancies.
- Academic unit led by Prof. T. Lynch with a special interest in laboratory based research in prostate cancer with a close working relationship to the Institute of Molecular Medicine (IMM) and the Conway Institute.
- Majority of prostate cancers biobanked for DNA and other research projects. Urine and blood also biobanked from patients undergoing prostate biopsies.
- Recognised centre for higher specialist training in urology surgery.
- SJH has been established as one of eight National Rapid Access Prostate Clinics (RAPC) in Ireland. These clinics provide rapid access to a prostate clinic where they will be assessed by an Urologist and will have access to a Urology CNS. The clinics have been established in an effort to speed up the process of referring men with a possible prostate cancer, to bypass waiting times for out-patient clinics and to provide access to prostate biopsy more quickly for those who need it.
- There are two RAPC each week and three 'one stop' haematuria clinics.
- All cases discussed at MDT have access to special palliative care and psychological oncology services if required.

Urology Cancer Trends

There were 2717[a] urology cancers diagnosed and/or treated in SJH between 2003 and 2012. The Urology service is the second largest service in SJH. There has been a 248% increase in new urology cancers diagnosed and/or treated in this ten year period with a 464% increase in prostate cancer alone.

a Some patients had 2 synchronous urology cancers.

Figure 8.1 Urology Cancers 2003-2012 by Tumour Site



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Prostate	51	68	102	98	102	105	181	238	304	288
Kidney	18	33	50	44	51	56	66	72	58	77
Bladder	38	29	34	45	46	40	49	43	54	54
Testis	18	10	8	15	13	19	14	17	20	17
Other	3	4	9	6	4	6	8	11	12	9

Prostate Cancer

The RAPC was established in SJH in 2008. Audited data was submitted to the NCCP mid 2010 and figures listed in table 8.1 are for the years of 2011 onwards. Ninety nine per cent of all patients referred to the service are offered an appointment within the guidelines specified by the NCCP of 20 working days. Based on 2011 RAPC activity, SJH accounts for 14% of the national RAPC activity. Approximately 180 new cancers are diagnosed with cancer from the RAPC service annually.

In the ten year period, there were 1536 prostate cancer patients diagnosed and/or treated in SJH. The average age at diagnosis is 66 with men diagnosed from ages 39 to 99 years. The average age at diagnosis has reduced over the ten years from 70 to 65 years. SJH accounts for approximately 9% of national prostate cancer activity (based on 2010 data – latest available from NCRI).

The Urology MDT commenced in 2007 and the numbers discussed at MDT continue to increase year-on-year.

Table 8.1 RAPC activity 2011-2012

Clinic details	2011	2012
No. of new patients	361	363
No. of return patients	357	358
Total patients	**718**	**721**
No of clinics	86	93
New cancer diagnoses	**187**	**180**
Recurrent cancers	2	1
Other diagnoses, e.g. ASAP[c]	17	15

c Atypical Small Acinar Proliferation

Table 8.2 Prostate MDT activity by year

2007	2008	2009	2010	2011	2012
55%	66%	70%	79%	83%	86%

Table 8.3 Gleason Score (GS) Prognostic Grade (Epstein Grading System)[b]

Gleason Prognostic Grade	Occurrences	%
Prognostic Grade I (GS</=6)	305	19.9
Prognostic Grade II (GS 3+4=7)	560	36.5
Prognostic Grade III (GS 4+3=7)	199	13.0
Prognostic Grade IV (GS=8)	180	11.7
Prognostic Grade V (GS 9-10)	157	10.2
Not recorded/Unknown	135	8.7

b Prognostic Gleason grade grouping: data - based on the modified Gleason scoring system – Epstein, JI. BJU Int. May 2013.

Almost half of patients had a GS of seven (49.5%) (See table 8.3). Over half of patients had a clinical stage 1-2.

Table 8.4 Prostate Cancer Clinical Stage

Clinical Stage	Occurrences	Percent
Stage I	179	11.6
Stage II	627	40.8
Stage III	304	19.8
Stage IV	159	10.4
Unknown/Not specified	267	17.4

Sixty one per cent were treated with curative intent. Fifteen per cent were started on an active surveillance program. Overall, 19% had palliative treatment. The remaining patients with unknown intent were often diagnosed in SJH and followed up privately or in the referring hospital.

Table 8.5 Planned Primary Treatment Options

Planned Treatment Options	Occurrences	Percent
None	9	0.6
Radiotherapy and Hormone therapy	538	35.2
Surgery only (Prostatectomy only)	328	21.4
Active surveillance/Active monitoring*	226	14.8
Hormone therapy only	200	13
Radiotherapy only (External beam or Brachytherapy)	55	3.6
Surgery and adjuvant Radiotherapy	48	3.1
Palliative Care - Best Supportive Care	19	1.2
Palliative Chemotherapy and Hormone Therapy	5	0.3
Surgery and adjuvant Hormone Therapy	5	0.3
Neoadjuvant Hormone therapy_ Surgery and adjuvant Radiotherapy	3	0.2
Surgery and neoadjuvant Chemotherapy	3	0.2
Hormone therapy_ Radiotherapy and Brachytherapy boost	1	0.1
Surgery and neoadjuvant Hormone Therapy	1	0.1
Surgery and neoadjuvant Chemotherapy/ Radiotherapy	1	0.1
Palliative Radiotherapy	1	0.1
Unknown/Not stated	88	5.8

During this ten year period, the percentage of patients having curative treatment remained similar, although the percentage of patients starting out in an *active surveillance programme increased from 4% in 2003 to 24% in 2012. In this ten year period, 478 patients underwent surgery for their prostate cancer, either radical surgery or a TURP. A breakdown of their surgery type is seen in table 8.6.

Table 8.6 Prostate surgery Type (n=478)

Prostate Surgery	Occurrences	Percent
Prostatectomy	351	73.4
TURP	102	21.3
Cystoprostectomy	16	3.3
Other	4	0.9
Unknown	5	1.1

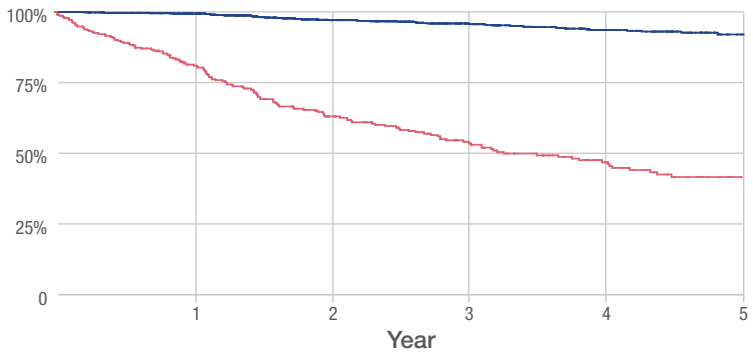
For the prostatectomy and cystoprostatectomy patients the following table lists the breakdown of pathology stage (table 8.7).

Table 8.7 Pathology Stage (n=367)

Pathology Stage	Occurrences	Percent
Stage I	12	3.3
Stage II	264	71.9
Stage III	62	16.9
Stage IV	3	0.8
Unknown	26	7.1

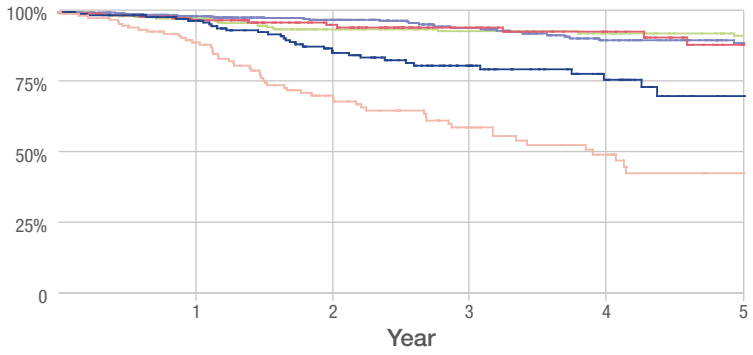
Overall survival is used for prostate cancer patients which includes 179 patients who died for reasons other than their prostate cancer.

Figure 8.2 Prostate cancers by Intent



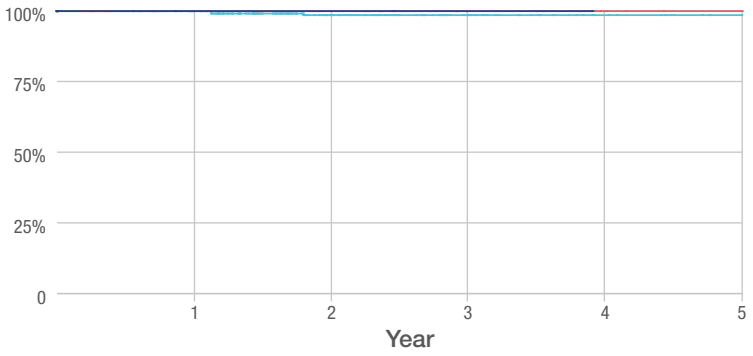
	1 year	3 years	5 years
Curative	99%	96%	92%
Palliative	81%	54%	41%

Figure 8.3 Prostate cancers by Prognostic Gleason Grade (Epstein 2013)[b]



	1 year	3 years	5 years
Grade I	98%	93%	92%
Grade II	99%	95%	89%
Grade III	97%	95%	89%
Grade IV	97%	82%	71%
Grade V	90%	61%	45%

Figure 8.4 Prostate Cancer survival by Pathological Stage (cancer specific survival)



	Survival time	0 years	1 year	3 years	5 years
p Stage I	No at Patients	12	9	7	4
	% Survival	100%	100%	100%	100%
p Stage II	No at Patients	264	238	118	84
	% Survival	100%	100%	99%	99%
p Stage III	No at Patients	62	54	24	15
	% Survival	100%	100%	100%	100%
p Stage IV	No at Patients	3	3	2	1
	% Survival	100%	100%	100%	100%

Kidney Cancer (515 patients, 525 tumour sites)

SJH is a major tertiary referral centre for treatment of kidney cancers with over 60% diagnosed elsewhere and referred to SJH for treatment. It was the first hospital to offer laparoscopic surgery for kidney cancer nationally. There has been a 250% increase in kidney cancers over this time period. The average age at diagnosis was 63 years with a range of 22-95 years. The average age at diagnosis has remained similar over this ten year period. Over one third were found incidentally and this has become more apparent in the last five years. Approximately two-thirds of all diagnoses were male.

Sixty per cent had treatment of curative intent. Approximately 5% started on an active surveillance programme.

Table 8.8 Planned Primary Treatment Options (515 patients)

Treatment Options	Occurrences	Percent
None	2	0.4
Surgery only	322	62.5
Minimally Invasive Treatment (Embolisation/RFA)	43	8.4
Radical Nephrectomy + adjuvant Systemic Therapy	31	6.0
Systemic Therapy	29	5.6
Active surveillance/Active monitoring	28	5.4
Palliative Care - Best Supportive Care	27	5.2
Palliative Radiotherapy	11	2.1
Surgery and Neoadjuvant Chemotherapy	4	0.8
Palliative Radiotherapy/Systemic Therapy	2	0.4
Hormone therapy only	2	0.4
Surgery and adjuvant Radiotherapy	2	0.4
Unknown/Not stated	12	2.4

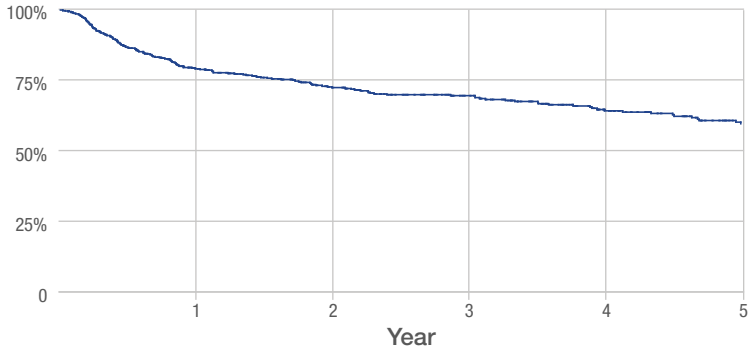
Table 8.9 Kidney surgery Type (n=374)

Type of Surgery	Occurrences	Percent
Open Nephrectomy (full or partial)	134	35.9
Laparoscopic Nephrectomy	190	50.8
Laparoscopic Nephrectomy (Partial)	30	8.0
Laparotomy	8	2.1
Other	12	3.2

Table 8.10 Pathology Stage (n=381)

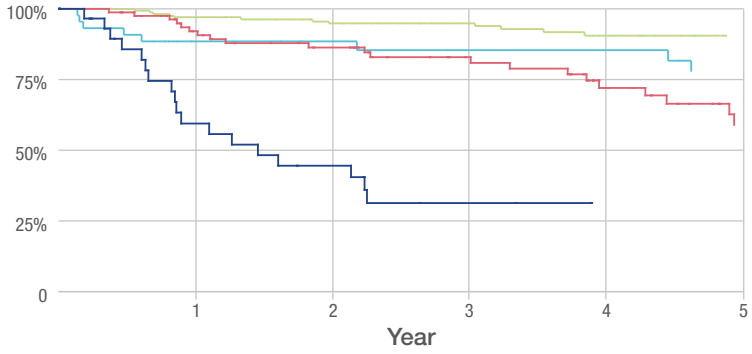
Pathology Stage	Occurrences	Percent
Stage I	184	48.3
Stage II	45	11.8
Stage III	87	22.8
Stage IV	33	8.7
Unknown/Not specified	32	8.4

Figure 8.5 Overall Kidney Cancer survival



	1 year	3 years	5 years
	79%	69%	60%

Figure 8.6 Kidney Cancer survival by Pathological Stage



	1 year	3 years	5 years
p Stage I	97%	95%	91%
p Stage II	89%	86%	74%
p Stage III	94%	83%	59%
p Stage IV	71%	32%	32%

Testicular Cancer

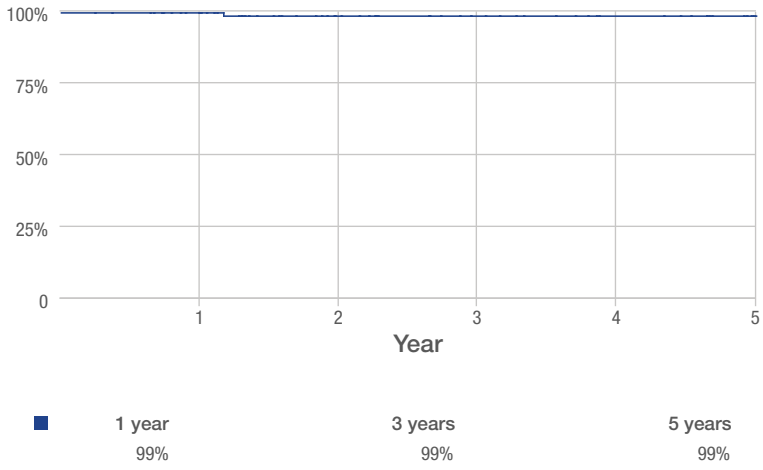
There were 151 testicular cancer diagnosed and/or treated in SJH over the last ten years. Because of the demographic distribution of the immediate catchment area in that period, the number of patients presenting with testicular cancer and having front line treatment is relatively low. However, the total number also includes a small (n=46) but highly complex group of patients with high-risk relapsed or progressive testicular cancer. They are referred from all over the country for an opinion about high-dose therapy with autologous stem cell support in the National Bone Marrow transplant unit.

These patients are currently seen by Dr. D. O'Donnell and Dr. P. Hayden, and, if, after MDT discussion, high-dose chemotherapy is felt appropriate, it is performed under the joint supervision of Oncology and Haematology.

The average age at diagnosis was 33 with a range from 15 to 78 years. 39% were seminoma patients.

The main survival curve (figure 8.7) includes only those patients (n=106) who received first-line treatment in SJH.

Figure 8.7 Overall Testicular Cancer survival



2.8 Haematological Malignancies

Introduction

The haematology department in SJH provides care for patients with general and malignant haematological disorders including leukaemia, myeloma and lymphoma. The service incorporates the National Adult Bone Marrow transplant unit, provides a matched unrelated transplant service to Northern Ireland and a tertiary referral for complex haematological malignancies to haematology colleagues in other units.

The service is provided in a 21 bedded dedicated leukaemia/bone marrow transplant unit and a shared day unit with medical oncology. A dedicated haematology/medical oncology ward will open in 2014. Apartments are provided for patients from the country following bone marrow transplantation by the charitable endeavours of the 'Bone Marrow for Leukaemia Transplant' charity.

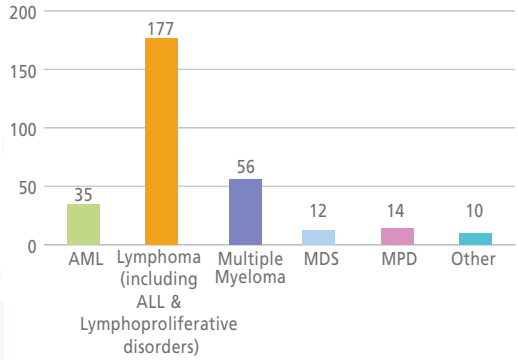
Structure

The Haematology department is part of the HOPe directorate chaired by Dr. Eibhlin Conneally and includes medical oncology, radiation oncology, cancer genetics, palliative care and the 'National Centre for Coagulation and Haemostasis Disorders (NCHCD).' The Haematology service is provided by Professor Paul Browne, Dr. Eibhlin Conneally, Dr. Catherine Flynn, Dr. Patrick Hayden and Professor Elizabeth Vandenberghe with a team of four level-3 specialist registrars, two registrars and three senior house officers.

The National Adult Allogeneic Bone Marrow transplant service under the directorship of Prof. P. Browne forms an integral part of the haematology department. Dr. Diarmaid O'Donghaile from the Irish Blood Transfusion Service provides expertise in HLA typing/matching, specialist transfusion expertise and the provision of matched unrelated donors.

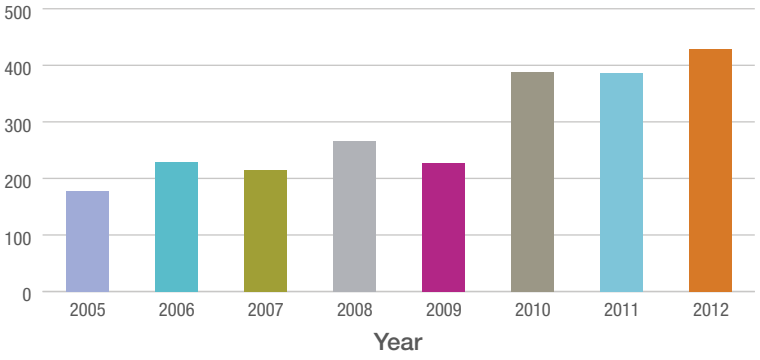
The consultants provide sub-specialist service for leukaemias, myeloprolifertive, lymphoproliferative and multiple myeloma patients in designated specialist clinics. The lymphoma service is delivered by a combined haematology/oncology team. Access is therefore provided to an integrated treatment pathway for all haematology patients including standard chemotherapy/biological therapy, clinical trials and transplantation. There were 304 patients diagnosed with Haematological malignancies in 2012.

Figure 9.1 Haematological Malignancies 2012



Multidisciplinary working is integral to haematology and includes several weekly multidisciplinary team meetings (MDT's). These include a bone marrow transplant planning meeting, a Haematology MDT and a Lymphoma MDT. There has been a significant increase in the number of patients discussed at the Lymphoma MDT (Fig 9.2).

Figure 9.2 Lymphoma MDT conference (patients reviewed)



	2005	2006	2007	2008	2009	2010	2011	2012
Lymphoma MDT	177	229	214	267	228	388	387	429

Care provision is delivered in a multi-disciplinary setting with two bone marrow transplant co-ordinators, 1.4WTE (Whole Time Equivalent) clinical nurse specialist in post transplant management and 1.6 WTE clinical nurse specialists in haematology.

The long term follow up (LTFU) clinic post bone marrow transplantation reviews patients at least annually and is one of the oldest services in Europe with patients attending since the early 1980s. Patients from the National Paediatric Transplant Service are transferred to the LTFU at SJH at 18 years of age. Care is provided by Dr. E. Conneally, Dr. P. Hayden and Prof. E. Vandenberghe with support from a .5WTE LTFU nurse.

Dr. C. Gillham and Dr. C. O'Sullivan provide a radiation oncology service for the haematology, lymphoma and BMT service.

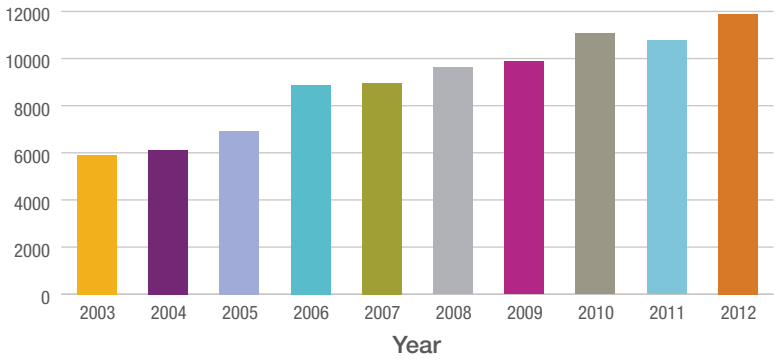
The haematology clinical trials service form part of the cancer trials office and include clinical trial nurses and data managers. There are 11 active haematology trials in progress.

The haematology laboratory (including the only haematological diagnostic molecular service in Ireland) provides an integrated diagnostic service to the clinical haematology service as well as providing a tertiary diagnostic service to other haematology units in Ireland; it is managed by Prof. E. Vandenberghe. Dr. Richard Flavin, Dr. Michael Jeffares and Dr. Barbara Dunne provide a specialist haematopathology diagnostic service. Dr. P. Hayden is medical director of the 'Stem Cell Laboratory' which underpins the BMT cell procurement and storage service under an Irish Medicine Board (IMB) licence.

Process

Patients attend the out patient and day service in the Haematology Oncology daycare centre (HODC) with attendances increasing year on year. In 2012 a total of 11884 patients attended the HODC, which equates to a 50% increase in day case activity in the past 10 years (figure 9.3).

Figure 9.3 Day Care Attendances



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Day Cases	5910	6122	6927	8871	8964	9614	9870	11068	10770	11884

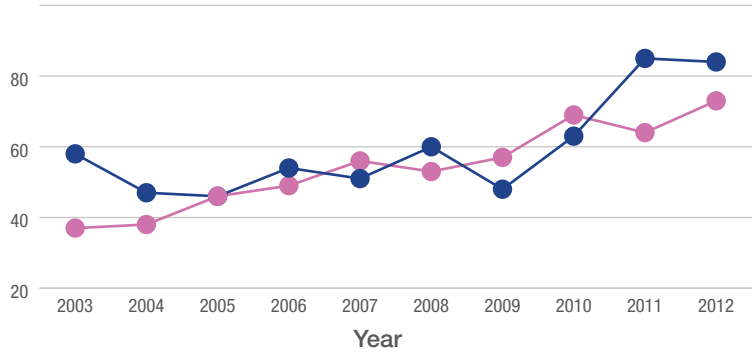
- Weekly consultant delivered counselling clinics are provided for all haematology patients being considered for transplantation, clinical trials or with complex diagnostic/management requirements. A donor clinic runs weekly for the assessment of family donors and for matched unrelated donors (in conjunction with the Irish Blood Transfusion Service (IBTS).
- Five weekly consultant-led and disease specific clinics are provided weekly for patients post transplant or on active treatment for their haematological malignancy.
- Two weekly haematology clinics are provided for the follow-up and management of patients who have completed treatment.
- Three weekly consultant delivered LTFU clinics provide ongoing care with 686 attendances in 2012. This LTFU service has built up relationships with specialists in SJH who provide specialist input for this group of patients (Dr. Maire-Louise Healy, endocrinology, Dr. Ruairi Fahy, respiratory medicine, Professor Bernard Walsh, bone health and Dr. Ross Murphy, cardiology) and liaise with local haematology services to ensure optimal care for this complex group of patients.
- The day unit staffed by clinical nurse managers ensure delivery of chemotherapy, blood products and assessment of patients undergoing treatment in a dedicated day unit with access to isolation facilities.

BMT Unit

The BMT unit is licensed by the IMB, accredited with the European Blood and Marrow Transplant (EBMT) European and International registry and is working towards JACIE accreditation in 2015. All outcome data is provided to the EBMT to be bench-marked and is commensurate with European and International outcomes. The consultant staff are members of specialist international committees on leukaemia, multiple myeloma, lymphoma, aplastic anaemia, chronic lymphocytic leukaemia and myeloproliferative disorders and the late effects of BMT, thus ensuring that practise remains current.

The total volume of stem cell transplants carried out within our BMT unit has grown substantially (figure 9.4) in the past 10 years with a 60% increase in activity. This increase in transplant activity is in line with the Haematology department which has seen large growth in activity over the past 10 years.

Figure 9.4 Autologous and Allogeneic Transplants



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Autologous	58	47	46	54	51	60	48	63	85	84
Allogeneic	37	38	46	49	56	53	57	69	64	73

With advances in treatment and increased activity in the haematology department the diseases now considered for transplant has also grown. The department carries out Autologous and Allogeneic stem cell transplants for a very wide range of Haematological malignancies.

Figure 9.5 Allogeneic Transplants Disease Type

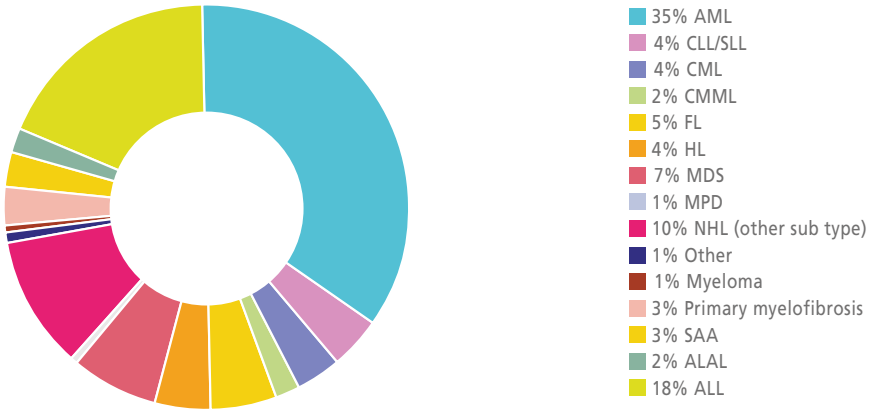
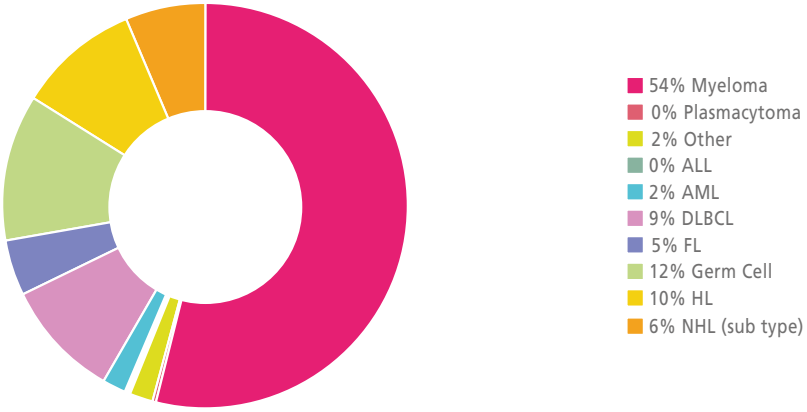
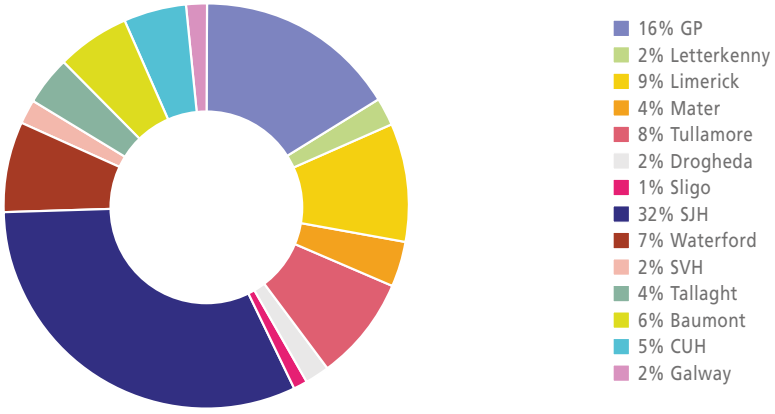


Figure 9.6 Autologous Transplants Disease Type



SJH is the national centre for allogeneic stem cell and also performs transplant and as a result receives a large number of referrals for transplant and other specialist treatments. SJH is the only adult allogeneic transplant hospital and performs about 70% of all autologous transplants in Ireland. Many patients will have complex management pathways defined at SJH and then will deliver management in a shared approach with referring hospitals so that some elements of care can be delivered locally to the patient with the more intensive elements delivered at SJH (figure 9.7). In 2012 over 50% of SJH Haematology patients were referred from other hospitals in Ireland.

Figure 9.7 Referring Centres to SJH 2012



Survival analysis has been carried out on all patients treated with an allogeneic or autologous bone marrow transplant SJH over the past 5 years. The 5 year survival rate for all patients treated with an allogeneic transplant is 49%, and 60% for all patients treated with an autologous transplant. The results are illustrated in the following curves.

Figure 9.8 Five year survival post allogeneic transplant

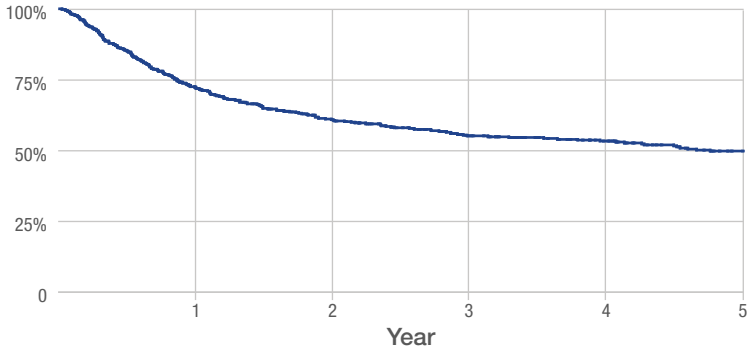
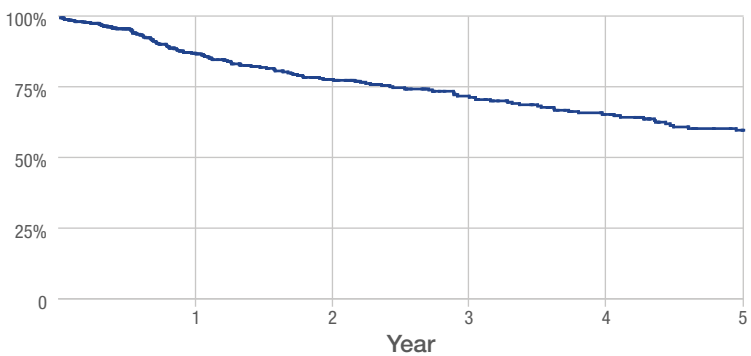


Figure 9.9 Five year survival post autologous transplant



2.9 Breast Cancer

Summary Points

St. James's Hospital Breast Unit was designated as one of the eight specialist centres for Symptomatic Breast Disease Services in Ireland by the NCCP in 2007. This has led to an increase in our catchment area size and has resulted in a large increase in referrals into the service over the past number of years.

The Breast Care Unit at SJH provides services to patients with symptomatic breast disease, including breast cancer. The specialist breast MDT includes surgeons, radiologists, pathologists, medical oncologists and specialised breast care nurses. This team work together in order to ensure patients are seen and investigated promptly and once diagnosed, receive the highest quality of individually planned treatment and care. As well as the Symptomatic breast service the Breast Care unit in SJH provides a high risk screening breast clinic to women at increased risk of breast cancer either due to a family history of this disease or other such risk factors e.g. previous high dose radiation exposure. This high risk Clinic involves using scoring systems based on their family history to identify those who require intensive breast surveillance and or genetic testing which can be done on site by Dr. David Gallagher. Depending on the level of risk identified these patients are entered into a screening programme using a combination of clinical exam, Mammogram and with the addition of breast MRI in those with identified high risk mutations e.g. BRCA1/BRCA 2 gene or equivalent risk. We also discuss the option of prophylactic mastectomy and immediate reconstruction with the gene positive women. There is a high risk breast cancer MDT run monthly which includes surgeons, radiologists, a geneticist, genetic nurse counsellors and breast care nursing team.

Structure

SJH Breast Service includes:

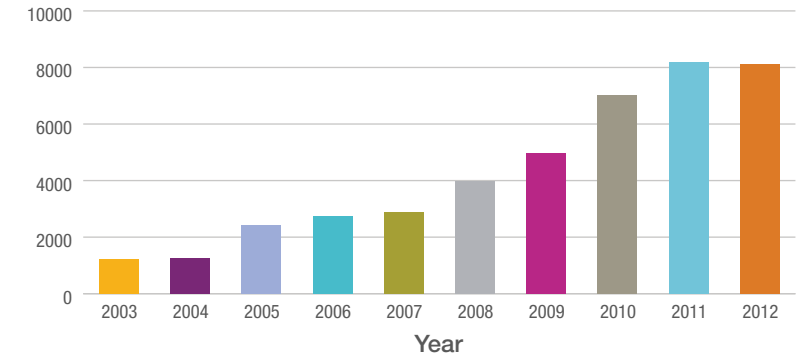
- Consultant led triple assessment, review clinics and family risk clinics.
- Prompt access to all required diagnosis services and treatments.
- A team of specialist breast care nurses who attend all the clinics and are available to answer patient queries or concerns directly.
- Weekly MDT meetings, where each patient's management plan is discussed and agreed.
- Monthly High risk breast cancer MDT for discussion of those patients with strong family histories of breast cancer.
- Direct referral service to specialist medical oncologists, radiation oncologists, breast reconstructive surgeons, specialist genetic service and a well established psycho-oncology service.
- Access to a range of physical and psychological support services.
- Dedicated genetic risk assessment and counselling service.

Breast Care Trends

This report examines the details of 1980 patients with breast cancer managed at SJH from 2003 to 2012. On average, 2700 women are diagnosed with breast cancer annually. SJH manages over 10% of the national breast cancer workload.

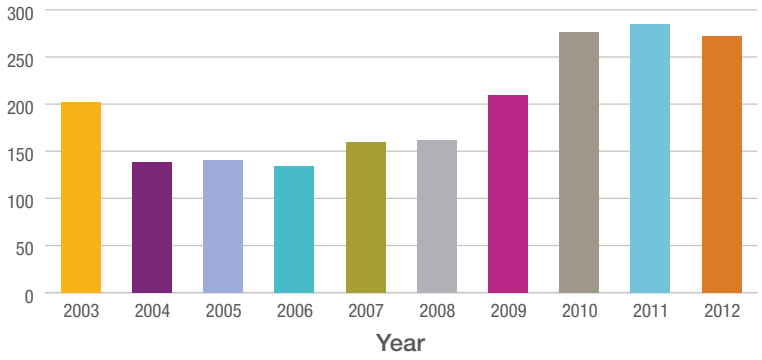
Figure 10.1 illustrates breast clinic activity by year at SJH over this ten year period. There has been a 572% increase in clinic activity over the last ten years.

Figure 10.1 St James's Hospital Breast Clinic Activity 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Activity	1210	1239	2437	2745	2888	3965	4977	7019	8190	8127

Figure 10.2 St James's Hospital Breast Cancer Activity 2003-2012

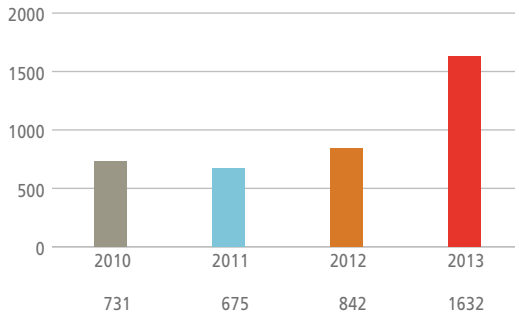


	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Breast Cancers	202	138	141	134	160	162	210	276	285	272

Figure 10.2 illustrates breast cancer activity by year at SJH over this time period. There has been a 35% increase in cancer activity during this period of time.

When analysing data from SJH Breast Care department, it is clear to see the upward trend in both breast clinic activity and breast cancer diagnosis. A drop in breast cancer numbers for the years 2004 to 2006 is a reflection of the introduction of Breastcheck, the national breast-screening programme for all women between the ages of 50 to 64 years. However since the reconfiguration of breast cancer services in 2007 it is evident that SJH Breast Care department is experiencing a dramatic increase in its patient activity as demonstrated in figures 10.1 and 10.2.

Figure 10.3 Family Risk Clinic Activity



*Please note figures for 2013 are projected figures based on data for the first nine of 2013

Figure 10.3 shows the increase in activity in the family risk clinics since 2010 to present. Currently we have over 1740 patients on our family risk database which contains information on patients seen in this clinic over the last two years. Over 740 of these are in the high risk category with 152 identified BRCA carriers. Over the last two years for every 1000 women seen in this clinic, 17 screen detected breast cancers have been detected.

Breast cancer referral lead times

- Lead times have been reported to NCCP as part of their Key Performance Indicator (KPI) program for symptomatic breast clinics since 2010.
- 100% of urgent new patients are reviewed in the Triple Assessment Breast Clinic within 10 working of receipt of referral.
- 100% of semi-urgent new patients are reviewed in the Triple Assessment Breast Clinic within 6 weeks of receipt of referral.
- 100% of non-urgent patients are reviewed in a routine review breast clinic within 12 weeks of receipt of referral.
- 100% of patients diagnosed with breast cancer in SJH are discussed at a MDT meeting.

Gender and Age Analysis

Gender analysis of our patients revealed the breast cancer incidence to be 99.3% female (0.7% male). The mean patient age at diagnosis was 59 years. The age at diagnosis ranged from 19 to 99 years. 36% of patients diagnosed in SJH were younger than 50.

Table 10.1 Age breakdown of breast cancer patients

Age range	Occurrences	Percent
Younger than 50	712	36
50-65	542	27.4
Older than 65	724	36.4

Surgery

Table 10.2 shows the changing trend in breast cancer surgery over the 10 year period, with a move toward breast conserving surgery and sentinel node biopsy as primary surgical therapy. We can also see an increase in immediate reconstruction and neoadjuvant therapy prior to surgery.

Table 10.2 Age breakdown of breast cancer patients

Year	Surgery	Primary Breast Conserving Surgery[1,2]	Primary Mastectomy	Mastectomy with Immediate reconstruction	Primary Axillary Clearance[3]	Primary Sentinel Node Biopsy	Neoadjuvant treatment prior to surgery
2003	176	39.7%	60.30%	0.0%	92.6%	0.0%	4.5%
2004	116	35.3%	64.6%	0.0%	98.3%	0.0%	9.5%
2005	114	45.6%	54.4%	0.0%	92.1%	7.9%	1.8%
2006	107	54.2%	45.8%	0.0%	54.2%	36.4%	5.6%
2007	135	63.0%	37.0%	0.0%	34.1%	62.2%	1.5%
2008	124	56.5%	40.3%	3.2%	28.2%	67.0%	4.8%
2009	168	59.0%	38.7%	2.3%	32.1%	61.3%	14.3%
2010	228	60.1%	35.5%	4.4%	28.5%	66.2%	11.0%
2011	233	65.2%	29.2%	4.3%	26.2%	70.8%	19.3%
2012	207	62.8%	31.4%	5.8%	27.1%	68.6%	25.6%

1. 3 patients over the 10 years had bilateral surgery, both breast conserving and mastectomy. 2. 6 patients had surgical therapy other than breast conserving and mastectomy such as breast reduction surgery, excision of node in previous mastectomy scar, etc. 3. Not all surgical patients receive axillary dissection.

Tumour Site and Morphology

The most common tumour site occurrence was the upper outer quadrant of the breast, accounting for 44% of breast cancer sites. Invasive ductal carcinoma is the most common morphology, accounting for 72% of all breast cancers.

Pathological Staging

Table 10.3 illustrates the breakdown by pathological stage for all breast cancers.

Table 10.3 Breast cancer pathology stage

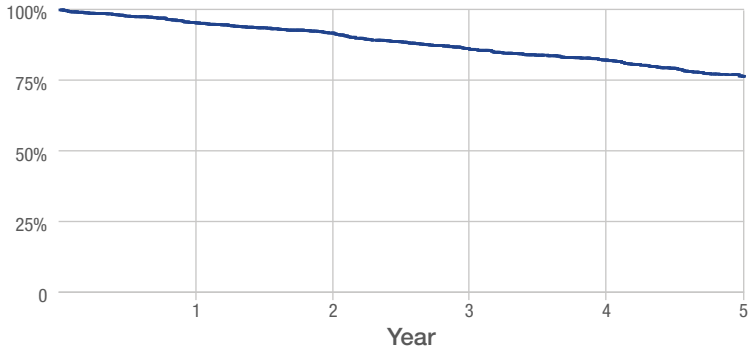
T stage		N stage		M stage	
T0	1.60%	N0	54.8%	M0	91%
Tis	7.80%	N1	26.2%	M1	9%
T1	41.15%	N2	10.6%		
T2	41.15%	N3	8.4%		
T3	6.30%				
T4	2.00%				

Breast Cancer Research

The department of surgery breast cancer research group is headed by Ms. Elizabeth Connolly (Consultant Breast Surgeon and Associate Professor) and comprises a multidisciplinary group of surgeons, scientists, radiologists, pathologists, research physiotherapists and data managers. Research strands in the group include investigating the molecular events involved in driving the development and progression of breast cancer in the context of obesity and the metabolic syndrome. Of particular interest is the role of mammary adipose tissue in the initiation and progression of this disease. In addition, members of the group are prospectively investigating predictive and modifiable risk factors for the development of breast cancer in a cohort of BRCA mutation carriers. This ongoing study aims to prospectively evaluate how lifestyle factors such as body composition physical activity and diet can impact breast cancer susceptibility in unaffected BRCA mutation carriers. This project will also examine the effect of these lifestyle factors on telomere length and DNA damage in this patient cohort. Further research themes in the group include pre-clinical evaluation of novel drugs, with a particular emphasis on testing the efficacy of novel anti-angiogenic agents using cell line, tumour explant and in vivo models of breast cancer. Central to our research, we maintain a breast cancer blood and tissue biobank of high quality samples linked to up to date clinical information. This biobank provides us with the patient material necessary to meet our research objectives.

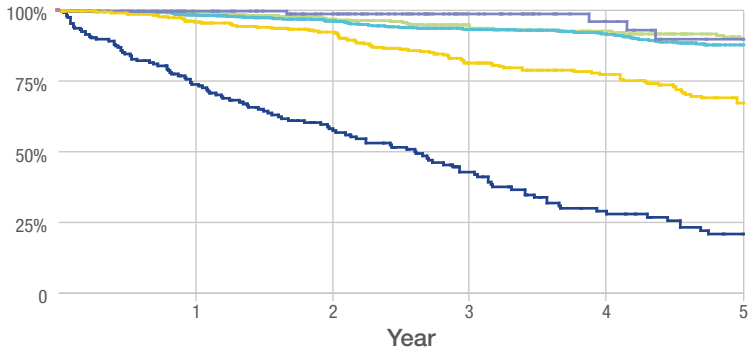
Survival Analysis

Figure 10.4 Overall Breast cancer survival



1 year	3 years	5 years
95%	86%	77%

Figure 10.5 Breast Cancer survival by Pathological Stage



	1 year	3 years	5 years
Stage 0	100%	100%	100%
Stage I	99%	94%	90%
Stage II	98%	93%	88%
Stage III	96%	81%	67%
Stage IV	71%	42%	20%

Appendix 1 Methods

Sources of Data

All information is actively obtained and audited by the cancer data managers with the clinicians and nursing staff ongoing input on all patients diagnosed and treated with cancer in SJH.

Data acquisition is obtained from the following sources:

- SJH Patient Administration System (PAS)
- SJH Pathology system
- SJH theatre management system
- SJH EPR system
- HIPE Data from www.esri.ie HIPE data was provided by staff from the HIPE coding department in SJH. Patient with ICD 9 codes between 140 and 239.9 were included until December 2005. From January 2006, ICD 10 codes between C00-D48 replaced ICD9 codes. ICD codes D10-D36 are excluded.
- MDT meetings.
- SJH Endoscopy system
- Services for death registration information. www.groireland.ie
- GP
- Chemotherapy recording system SJH
- NCRI
- Radiotherapy information from SLRON

Recording of Data

The cancer audit programme has been in place in SJH for over 10 years. Since 2001, an electronic cancer information system has replaced a paper system. The information system (PATS – software by Dendrite Clinical Systems) is divided into 16 cancer registries that are managed and audited by a data manager. There are other small registries that complement these include rapid access clinic registries.

Each registry has a core set of data items that captures key SJH cancer information requirements, the NCRI minimum dataset and incorporates site-specific national and international cancer and clinical datasets. Modifications have included capture of KPI data from the NCCP.

Patient information is captured from time of referral through follow-up and to time of death or last follow-up. The data managers ensure that follow-up is as up to date as possible to facilitate accurate survival analysis.

Data Analysis

All basic calculations have been completed by PATS, i.e. tabulation of the data. All survival curves were generated by a statistical software package, Stata (version 10.1). Survival analysis was generated using the Kaplein Meier method. Overall survival was used in the calculation of survival, unless otherwise stated and cancer free survival was used. A chi-square analysis test was used to investigate the comparisons of demographical factors in section one.

Data Quality

One of our constant key priorities of the cancer audit team has been the continuous improvement of QA initiatives to ensure the accurate and timely information is available to clinicians and management to measure the quality of care received by cancer patients in SJH.

There are two mechanisms for quality control and validation of our data. Continuous data quality checks at the time of data capture and periodical reviews of the accuracy and validity of our data.

All data managers complete regular QA, error and completeness checks across all registries across the entire data collection process. The PATS software system allows the facility to control user access and privilege. There is an audit trail facility to track data entry by all users. The system restricts users to a range of predetermined values for each data item, and checks for internal consistency.

Monthly and annual audits of all information are routinely done and presented to clinicians to review. Lead clinicians are ultimately responsible for data produced.

The introduction of collaborative quality improvement programmes (QIP) in each of the individual tumour sites has been significant in improving the validation and quality control of our data. These QIP groups meet regularly and data is can be prospectively measured, assessed, and benchmarked against national and international performance indicators.

Appendix 2 Cancer Audit Programme Team

Professor John Reynolds	Cancer Audit Lead	reynoldspa@stjames.ie
Ms. Suzanne Rowley	Cancer Audit Manager	srowley@stjames.ie
Ms. Charlotte Stuart	Colorectal Cancer Data Manager	cstuart@stjames.ie
Ms. Kerena Sutcliffe	Lung Cancer Data Manager	ksutcliffe@stjames.ie
Ms. Sinead King	Upper GI & Hepatobilary Data Manager	sking@stjames.ie
Ms. Lorraine Quinn	Breast Cancer Data Manager	lquinn@stjames.ie
Mr. Richard Lawson	Haematology Data Manager	rlawson@stjames.ie
Ms. Mary Devlin	Head & Neck Cancer Data Manager	mdevlin@stjames.ie
Ms. Therese Brown	Gynaecological Cancer Data Manager	tbrown@stjames.ie
Ms. Avril Nolan	Breast Data Clerk	anolan@stjames.ie

Left to right. Lorraine Quinn, Sinead King, Suzanne Rowley, Prof. John Reynolds, Charlotte Stuart, Mary Devlin, Richard Lawson, Kerena Sutcliffe.

Appendix 3 References

1. AJCC Cancer Staging Handbook (6th & 7th Edition). American Joint Staging on Cancer
2. A Strategy for Cancer Control in Ireland 2006. National Cancer Forum. Department of Health & Children. Ireland
3. Report and Recommendations on Patient Referrals from General Practice to Outpatient and Radiology Services including the National Standard for Patient Referral Information 2011; HIQA
4. Cancer in Ireland 2013, annual report of the National Cancer Registry of Ireland www.ncri.ie
5. Guidance on Developing Key Performance Indicators (KPI) and Minimum Data Sets to Monitor Healthcare Quality Version 1.1, HIQA 2013
6. http://www.ic.nhs.uk/services/national-clinical-audit-support-programme-ncasp/audit-reports/oesophago-gastric-cancer. 'National Oesophago-gastric Cancer Audit'. (2012) The Royal College of Surgeons of England
7. HSE National Clinical Programme for Palliative Care http://www.hse.ie/eng/about/Who/clinical/natclinprog/palliativecareprogramme
8. National Bowel Cancer Audit Annual Report 2013, prepared by the HSCIC in partnership with the Association of Coloproctology of Great Britain and Ireland (ACPBGI) and the Royal College of Surgeons (RCS).
9. ECOG Performace Status, Eastern Co-operative Onchology Group
10. American Society of Anaesthesiologists Score within Saklad M. Grading of patients for surgical procedures. Anesthesiology 1941; 2:281-4.
11. Prognostic Gleason grade grouping: data - based on the modified Gleason scoring system – Epstein, JI. BJU Int. May 2013.
12. HIPE Unit - Hospital Inpatient Enquiry System, Economic Social Research Institute. www.esri.ie
13. International association for the study of lung cancer 7th edition stage grouping
14. Quality Assurance Standards for Symptomatic Breast Disease Services. (2007) Department of Health & Children.
15. National Standards for Safer Better Healthcare, HIQA 2012
16. Tekkis P, Smith J, Constantinides V., Thomson M, Stamatakis J, (2005). Report of The National Bowel Cancer Audit Project. "Knowing your Results". The Association of Coloproctology of Great Britain and Ireland.
17. Risk Assessment and Management in Cancer Genetics. Edited by Fiona Lalloo, Bronwyn Kerr, Jan Friedman & Gareth Evans (2005), Oxford University Press.
18. Six –year Cancer Audit Report, St James's Hospital
19. Tekkis P, Smith J, Constantinides V., Thomson M, Stamatakis J, (2005). Report of The National Bowel Cancer Audit Project. "Knowing your Results". The Association of Coloproctology of Great Britain and Ireland.
20. The Lourdes Hospital Inquiry. (2006) Report of Judge Maureen Harding Clark S.C.
21. World Health Organisation WHO http://www.who.int/cancer/
22. World Health Organisation Classification of Tumours of Haematopoietic and Lymphoid Tissues, Fourth Edition;
23. The 2012 revised edition of the EBMT-ESH Handbook on Haemopoietic Stem Cell Transplantation;
24. Essential Haematology, 6th Edition;
25. Victor Hoffbrand; Paul Moss
26. Data Protection Act 1988, 2003

Appendix 4 Audit Publications

1. Abu Saadeh F, Norris L, O'Toole S, Gleeson N. Venous thromboembolism in ovarian cancer: Incidence, risk factors and impact on survival. Eur J Obstet Gynecol Reprod Biol. 2013 Sep;170(1):214-8.
2. Abu Saadeh F, Norris L, O'Toole S, Mohamed BM. Langhe R, O'Leary J, Gleeson N. The role of tumour derived tissue factor and tissue factor inhibitor in ovarian cancer – relationship with venous thrombosis risk. Journal of Thrombosis Research. 09/2013. doi 10.1016
3. Bright SA, McElligott AM, O'Connell JW, O'Connor L, Carroll P, Campiani G, Deininger MW, Conneally E, Lawler M, Williams DC, Zisterer DM. Novel pyrrolo-1,5-benzoxazepine compounds display significant activity against resistant chronic myeloid leukaemia cells in vitro, in ex vivo patient samples and in vivo. Br J Cancer. 2010; 102(10):1474-82.
4. Doyle SL, Donohoe CL, Finn SP, Howard JM, Lithander FE, Reynolds JV, Pidgeon GP, Lysaght J. IGF-1 and its receptor in esophageal cancer: association with adenocarcinoma and visceral obesity. Am J Gastroenterol. 2012 Feb;107(2):196-204. doi: 10.1038/ajg.2011.417. Epub 2011 Dec 6.
5. Foley C, Moran B, McMenamin M, McDermott R, Ormond P, Irvine AD. Spontaneous regression of cutaneous metastases of squamous cell carcinoma. QJM. 2013 Aug 16. [Epub ahead of print].
6. Finn S, Smyth P, O'Regan E, Cahill S, Toner M, Timon C, Flavin R, O'Leary J, Sheils O. Low-level genomic instability is a feature of papillary thyroid carcinoma: an array comparative genomic hybridization study of laser capture microdissected papillary thyroid carcinoma tumors and clonal cell lines. Arch Pathol Lab Med. 2007 Jan;131(1):65-73.
7. Fleming M, Knox M, Kennedy MJ. Incidental detection of colorectal malignancies using FDG PET-CT. Ir Med J. 2013 May;106(5):151-3.
8. Glynn RW, Cashman EC, Doody J, Phelan E, Russell JD, Timon C. Prophylactic total thyroidectomy using the minimally invasive video assisted (MIVAT) approach in children with multiple endocrine neoplasia (MEN) type 2. Head Neck. 2013 Apr 22. doi: 10.1002/hed.23358. [Epub ahead of print]
9. Guinan EM, Hussey J, McGarrigle SA, Healy LA, O'Sullivan JN, Bennett K, Connolly EM. A prospective investigation of predictive and modifiable risk factors for breast cancer in unaffected BRCA1 and BRCA2 gene carriers. BMC Cancer. 2013 Mar 21;13:138.
10. Guinan E, Hussey J, Broderick JM, Lithander FE, O'Donnell D, Kennedy MJ, Connolly EM. The effect of aerobic exercise on metabolic and inflammatory markers in breast cancer survivors-a pilot study. Support Care Cancer. 2013 Feb 22.
11. Hanson RP, Chow TK, Feehan E, Eadie PA, Timon CT, Keogh S. Analysis of functional results and quality of life following free jejunal flaps for reconstruction after upper aerodigestive neoplastic resection: the St James's experience. J Plast Reconstr Aesthet Surg. 2007;60(6):577-82. Epub 2007 Jan 24.
12. Kamran MW, Vaughan D, Crosby D, Wahab NA, Saadeh FA, Gleeson N. Opportunistic and interventional salpingectomy in women at risk – a strategy for preventing pelvic serous cancer (PSC). European Journal of Obstetrics, Gynecology & Reproductive Biology 2013; 170:251-4.
13. Langabeer SE, Quinn F, O'Brien D, McElligott AM, Kelly J, Browne PV, Vandenberghe E. Incidence of the BRAF V600E mutation in chronic lymphocytic leukaemia and prolymphocytic leukaemia. Leuk Res. 2012; 36(4):483-4.

14. Larkin JO, Moriarity AR, Cooke F, McCormick PH, Mehigan BJ. Self-expanding metal stent insertion by colorectal surgeons in the management of obstructing colorectal cancers: a 6-year experience. Tech Coloproctol. 2013 Oct 10. [Epub ahead of print]

15. Lyons and O Connell, Lung Cancer in Non Smokers. Respiratory Medicine Series.

16. Lysaght J, Verma NK, Maginn EN, Ryan JM, Campiani G, Zisterer DM, Williams DC, Browne PV, Lawler MP, McElligott AM, The microtubule targeting agent PBOX-15 inhibits integrin-mediated cell adhesion and induces apoptosis in acute lymphoblastic leukaemia cells. International journal of oncology, 42, (1), 2013, p239-46.

17. Maher SG, Gillham CM, Duggan SP, Smyth PC, Miller N, Muldoon C, O'Byrne KJ, Sheils OM, Hollywood D, Reynolds JV. Gene expression analysis of diagnostic biopsies predicts pathological response to neoadjuvant chemoradiotherapy of esophageal cancer. Ann Surg. 2009 Nov;250(5):729-37. doi: 10.1097/SLA.0b013e3181bce7e1.

18. Mee C, Carroll P, Donatello S, Connolly EM, Griffin M, Dunne B, Burke L, Flavin R, Rizkalla H, Ryan C, Hayes B, D'Adhemar C, Banville N, Faheem N, Muldoon C, Gaffney EF. Maintaining Breast Cancer Specimen Integrity and Individual or Simultaneous Extraction of Quality DNA, RNA, and Proteins from Allprotect-Stabilized and Nonstabilized Tissue Samples. Biopreservation and biobanking Volume 9, number 4, 2011 :1-10.

19. Oon SF, Cullen IM, Moran D, Bolton EM, McDermott T, Grainger R, Lynch TH. The effect of a Rapid Access Prostate Cancer Clinic on prostate cancer patient and disease characteristics, primary treatment and surgical workload. Ir J Med Sci. 2013 Aug 8.

20. O'Riordan JM, Larkin JO, Mehigan BJ, McCormick PH. Re-laparoscopy in the diagnosis and treatment of postoperative complications following laparoscopic colorectal surgery. Surgeon. 2013 Aug;11(4):183-6. doi: 10.1016/j.surge.2013.01.002. Epub 2013 Apr 10.

21. Ryan AM, Healy LA, Power DG, Byrne M, Murphy S, Byrne PJ, Kelleher D, Reynolds JV. Barrett esophagus: prevalence of central adiposity, metabolic syndrome, and a proinflammatory state. Ann Surg. 2008 Jun;247(6):909-15.

Appendix 5 Abbreviations

ACPGBI	Association of Coloproctology of Great Britain & Ireland
ALL	Acute Lymphocytic Leukemia
AML	Acute Myelogenous Leukemia
AMNCH	Adelaide & Meath Hospital, Incorporating the National's Children's Hospital Tallaght)
APER	Abdomino-Perineal Excision of the rectum
ASCO	American Society of Clinical Oncology
NCMG	National Centre for Medical Genetics
NM	Nuclear Medicine
BCC	Basal Cell Carcinoma
BMT	Bone Barrow Transplant
BRAF	Proto-oncogene B-Raf
BTOG	British Thoracic Oncology Group
CACT	Centre for Advances in Clinical Therapeutics
CAMI	Centre of Advanced Medical Imaging
CAP	Cancer Audit Programme
CCTO	Cancer Clinical Trials Office
CEO	Chief Executive Officer
CGMP	Current Good Manufacturing Practice
CIRG	Cancer International Research Group
CLD	Centre for Learning & Development
CLL	Chronic Lymphocytic Leukaemia
CMD	Cancer Molecular Diagnostics
CNM	Clinical Nurse Manager
CRC	Colorectal Cancer
CNS	Clinical Nurse Specialist
CRANN	Centre for Research on Adaptive Nanostructures and Nano Devices
CRC	Colorectal cancer
CT	Computed Topography
CWIUH	Coombe Women's & Infant's University Hospital
DCU	Dublin City University
DCCR	Dublin Centre for Clinical Research
DDH	Dublin Dental Hospital
DDS	Dublin Dental School
DLBCL	Diffuse Large B-Cell Lymphoma
DNA	Deoxyribonucleic Acid
EBMT	European Bone Marrow Transplant

EBUS	Endo Bronchial Ultrasound
ECOG	Eastern Cooperative Oncology Group
EGFR	Epidermal Growth Factor Receptor
EMBRACE	Epidemiology Study of Familial Breast Cancer
EMR	Endo Mucosal Resection
EORTC	European Organisation for Research & Treatment of Cancer
EPR	Electronic Patient Record
ERAS	Enhanced recovery After Surgery
ERHA	Eastern region health Authority
ENT	Ear, Nose and Throat
ESTRO	European Society for Therapeutic Radiology and Oncology
EU	European Union
EUS	Endoscopic Ultrasound
FDA	Food and Drug Administration
FEES	Fiberoptic Endoscopic Examination of Swallowing
GCP	Good Clinical Practice
GEMS	Directorate: GI Medicine & Surgery, General Medicine Inc Hepatology & Urology
GCIG	Gynaecologic Cancer Intergroup
GP	General Practitioner
HDU	High Dependency Unit
HIPE	Hospital Inpatient Enquiry
HIQA	Health Information and Quality Authority
HL	Hodgkin's Lymphoma
HNPCC	Hereditary Non Polyposis Colorectal Cancer
HODC	Haematology Oncology Day Care
HOPE	Haematology Oncology, Medical & Radiation Oncology & Palliative Care
HRB	Health Research Board
HSCT	Haematopoietic Stem Cell Transplantation
HSE	Health Service Executive
IBMTR	International Bone Marrow Transplant Registry
IASW	Irish Association of Social Workers
IBTS	Irish Blood Transfusion Service
ICD	International Classification of Disease
ICU	Intensive Care Unit
ICORG	Irish Clinical Oncology Research Group
ICS	Irish Cancer Society
KRAS V-Ki-ras2	Kirsten rat sarcoma viral oncogene
IMB	Irish Medicines Board
IMRT	Intensity Modulated Radiation Therapy
IMS	Information Management Services

JACIE	The Joint Accreditation Committee-ISCT (Europe)
KPI	Key Performance Indicator
LA	Linear Accelerator
LTFU	Long Term Follow Up
MDT	Multidisciplinary Team
MIRA	Mercers Institute for Research on Ageing
MPBE	Medical Physics and Bioengineering
MMS	Moh's Microsurgical Unit
MRI	Magnetic Resonance Imaging
NBMTU	National Cancer Bone Marrow Transplant Unit
NCCP	National cancer Control Programme
NMSC	Non Melanoma Skin Cancer
NCHCD	National Centre for Coagulation and Haemostasis Disorders
NCI	National Cancer Institute, Washington
NCRI	National Cancer Registry of Ireland
NHS	National Health Service
NIMIS	National Integrated Medical Imaging System
NICE	National Institute for Health & Clinical Excellence
NMSC	Non Melanoma Skin Cancer
NSAPB	National Surgery Adjuvant Breast & Bowel Group
OLH	Our Lady's Hospice
OLH&CS	Our Lady's Hospice and Care Services
OLHSC	Our Lady's Hospital for Sick Children
OP	Occupational Therapy
QIP	Quality Improvement Programme
PACS	Picture Archiving and Communication System
PATS	Patient Analysis & Tracking System
PAS	Patient Administration System
PET	Positron Emission Tomography
PI	Principal Investigator
QAQT	Quality Assurance Quality Control
RAPC	Rapid Access Prostate Clinic
RCOG	Royal Society of Gynaecologists
RCSI	Royal College of Surgeons in Ireland
RFMA	Radiofrequency and Microwave Ablation
RNA	Ribonucleic acid
SaMS	Dermatology, Endocrinology, GUIDE, Gynaecology, Neurology, Opthamology % Rheumatology
SCOPe	Speech & Language Therapy, Medical Socia Work, Clinical Nutririon, Occupational Therapy & Physiotherapy
SJH	St James's Hospital

SLH	St. Luke's Hospital
SLROC	St Luke's Radiation Oncology Centre
SLRON	St Luke's Radiation Oncology Network
SLT	Speech & Language Therapy
SNB	Sentinel Node Biopsy
SPD	Sir Patrick Duns
SPECT	Single-Photon Emission Computed Tomography
TBI	Total Body Irradiation
TBNA	Trans Bronchial Needle Aspirate
TCBE	Trinity Centre for Bioengineering
TCD	Trinity College Dublin
TBSI	Trinity Biomedical Sciences Institute
TCIN	Trinity College Institute of Neurosciences
THI	Trinity Health Ireland
TTMI	Trinity Translational Medicine Institute
TURP	Transurethral Resection of Prostate
US	Ultrasound
WTE	Whole Time Equivalent

Appendix 6
Acknowledgements

Mr. Dhafir Alazawi	Consultant Breast Surgeon
Dr. Lucy Balding	Palliative Care Consultant
Dr. Rupert Barry	Consultant Dermatologist
Mr. Frank Bell	IMS, SJH
Prof. Kathleen Bennett	Associate Professor, TCD
Mr. Terry Boyle	Consultant Surgeon
Ms. Sandra Brady	Clinical Nutrition Head
Ms. Marie Byrne	Physiotherapy
Ms. Margaret Codd	Nurse Manager, HOPE
Dr. Sonya Collier	Psychological Medicine
Dr. Harry Comber	NCRI
Dr. Eibhlin Conneally	Consultant Haematologist
Prof. Elizabeth Connolly	Consultant Breast Surgeon
Ms. Hilary Craig	Regional Oncology Communications & Health Promotions Officer, SJH
Dr. Moya Cunningham	Consultant Radiation Oncologist
Ms. Ann Dalton	Chief Operations Officer, SJH
Ms. Sandra Deady	Data Analyst, NRRI
Ms. Elaine Dunne	HIPE Manager, SJH
Ms. Fiona Dwane	Data Manager, NCRI
Mr. Anthony Edwards	Clinical Photographer, SJH
Mr. Barry Fanning	IMS, SJH
Mr. David Farrell	MDT Co-ordinator
Dr. David Gallagher	Genetics Consultant
Dr. Noreen Gleeson	Consultant Gyanecologist
HIPE Unit	www.esri.ie
Ms. Elaine Jackson	HIPE Unit, SJH
Prof John Kennedy	Consultant Medical Oncologist
Ms. Ingrid Kiernan	CCTO
Dr. Niamh Leonard	Consultant Histopathologist

Prof Thomas Lynch	Urology Surgeon
Mr. Rustom Manecksha	Urology Surgeon
Mr. Paul McCormick	Colorectal Surgeon
Ms. Sarah McGarrigle	Biobank Manager, TCD
Mr. Brian Mehigan	Colorectal Surgeon
Ms. Niamh Murphy	SCOPe Manager
Ms. Deirdre Murray	NCCP
Ms. Carmel Nolan	Genetics Nurse
Ms. Siobhan Nunn	Principal Medical Social Worker, SJH
Dr. Finbarr O'Connell	Clinical Director and Respiratory Consultant
Dr. Hugh O'Connor	Consultant Gynaecologist
Dr. Dearbhaile O'Donnell	Consultant Medical Oncologist
Dr. Rory O'Donnell	Respiratory Consultant
Ms. Gina O'Donoghue	Speech and Language Therapy Head
Dr. Ann Marie O'Dwyer	Psychological Medicine
Ms. Aoife O'Gorman	Occupational Therapy Manager
Dr. Norma O'Leary	Palliative Care Consultant
Ms. Jacinta O'Sullivan	Senior Lecturer, TCD
Dr. Patrick Ormond	Consultant Dermatologist
Mr. Ronan Ryan	Consultant Cardiothoracic Surgeon
Mr. Narayanasamy Ravi	Upper GI Surgeon
Ms. Shona Schneeman	HOPE Business Manager
Dr. Niall Sheehy	Consultant Radiologist
Prof Leo Stassen	Maxillo Facial Surgeon
Ms. Ann Tierney	MDT Co-ordinator
Prof Conrad Timon	Consultant Head and Neck Surgeon
Dr. Elizabeth Vandenberghe	Consultant Haematologist
Mr. Vincent Young	Consultant Cardiothoracic Surgeon

The Hospital's fundamental purpose is the delivery of health treatment, care and diagnosis as well as health promotion and preventative services at catchment, regional, supra-regional and national levels.