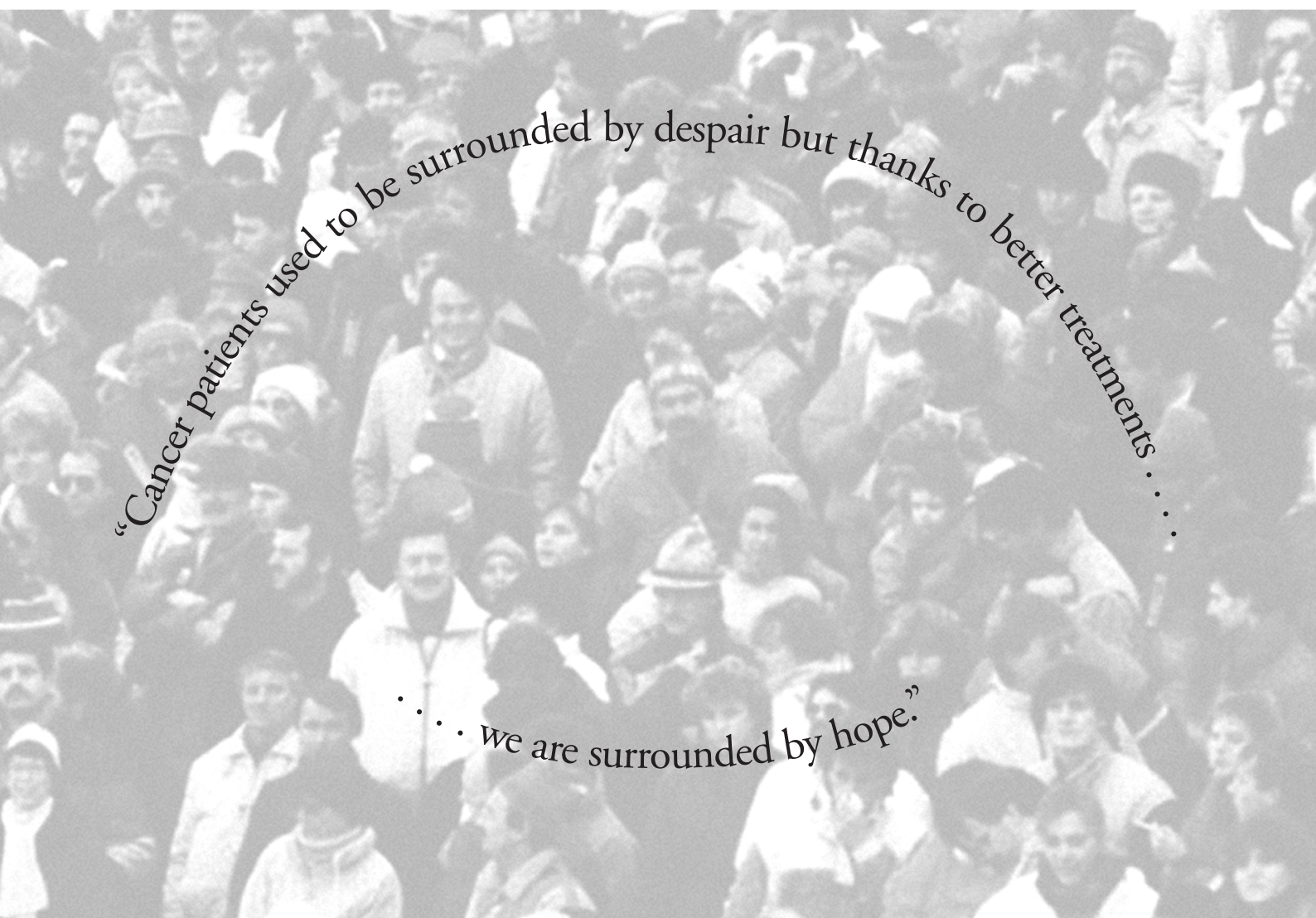




Cancer Services Audit 1996 & 2001
Colorectal



“Cancer patients used to be surrounded by despair but thanks to better treatments

. . . . we are surrounded by hope.”



Queen's University
Belfast



Cancer Services Audit 1996 & 2001
COLORECTAL

Edited by: **Heather Kinnear, Anna Gavin and Lisa Ranaghan**

This report should be cited as; Kinnear H, Gavin A, Ranaghan L, 2005.
Cancer Services Audit 1996 & 2001, Colorectal.
N. Ireland Cancer Registry
available at www.qub.ac.uk/nicr/racc.htm

CONTENTS

Foreword	I
Acknowledgements	II
Patient Stories	III
Introduction, Background and Methods	1
Results	6
Summary	37
Conclusion, Key Issues and Recommendations	43
References	44
Appendices	45
A Campbell Report: Recommendations regarding Cancer Services in Northern Ireland	
B NHS Improving Outcomes in Colorectal Cancer (recommendations in specific topic areas)	
C Guidelines for the Management of Colorectal Cancer (summary)	
D Staging of Colorectal Cancer	

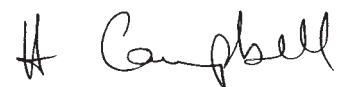
FOREWORD

Cancer services in Northern Ireland have improved in recent years. Developments have spanned prevention, early detection and screening, diagnosis, management and palliative care. The N. Ireland Cancer Registry has played an important role and made a vital contribution in monitoring this progress.

Since 1996, we have seen the establishment of five Cancer Units at Altnagelvin, Antrim, Belfast City, Craigavon, and Ulster hospitals and a regional Cancer Centre at the Belfast City Hospital working closely with the Royal Group of Hospitals. The Cancer Units are now the main focus for the delivery of services for people with the more common cancers. In addition, some services for other less common cancers are provided from Cancer Units, in conjunction with the Cancer Centre, on a shared care basis. These organisational changes have already made an impact on care.

This report on colorectal cancer is very welcome. It is the fifth in a series which examines in detail the pathways of care for patients with cancer here. The reports provide a fascinating insight into how care has changed over the period. They will also facilitate the ongoing work of improving services and patient care.

This work marks a significant step in the evaluation of cancer care and confirms the great value of the Registry as a public health tool. I look forward to future reports in this series and regular five yearly snapshots of the changing process of cancer care.



Dr Henrietta Campbell
Chief Medical Officer

ACKNOWLEDGEMENTS

The N. Ireland Cancer Registry is funded by the Department of Health, Social Services & Public Safety Northern Ireland (DHSSPSNI).

The work of this project would not have been possible without the additional funding received from the various sources outlined below:

- Department of Health, Social Services & Public Safety (DHSSPS)
- Eastern Health and Social Services Board
- Northern Health and Social Services Board
- Regional Medical Audit Group
- Research and Development Office
- Southern Health and Social Services Board
- Western Health and Social Services Board

The quality of data in this project is a result of the work of the present and past Registry Tumour Verification Officers especially Patricia Donnelly, Helen Hanlon, Dr Carmel Corr, Elinor Johnston, Mary McCartney and Eileen Sheppard who meticulously extracted detailed information from clinical records for analysis and presentation in this report. The analysis of data was largely undertaken by Heather Kinnear. A special word of gratitude to the Medical Records staff from all the hospitals in Northern Ireland who, in the course of the audit for all sites, pulled an estimated 10,000 charts.

We are grateful to the clinicians who commented on the detail of data to be collected, its interpretation and final presentation.

The work of the N. Ireland Cancer Registry including the production of this report is the result of the work of the team listed below:

Bernadette Anderson	Dr Lesley Anderson	Carmel Canning	Dr Denise Catney
Kate Donnelly	Patricia Donnelly	Deirdre Fitzpatrick	Colin Fox
Wendy Hamill	Helen Hanlon	Anita Jones	Jackie Kelly
Heather Kinnear	Julie McConnell	Susan McGookin	Dr Richard Middleton
Pauline Monaghan	Emma Montgomery	Dr Liam Murray	Giulio Napolitano
Dr Lisa Ranaghan	Dr Jeffrey Robertson	Breige Torrans	Rosemary Ward

I wish also to record my thanks to the Management Group and Council of the Registry who guide that work.

This presentation, I feel, has been enhanced by the stories from patients who have walked the patient journey. A journey we have attempted to analyse and quantify with a view to identifying current practice so clinicians may be facilitated in improving care.



A Gavin
Director, NICR
2005

PATIENT STORIES

“I am a 72 year old female who was diagnosed with bowel cancer in 1999.

My first symptom was an ache low down in the groin area. Over time the ache got worse. Then I noticed I was unusually tired and out of breath going uphill.

I went to my GP who took blood tests and immediately referred me as I was very anaemic. I had a colonoscopy which was clear. My symptoms persisted and I had two more colonoscopies. I was then diagnosed and I had an operation. The hospital has an excellent “joined up” system. When I was told of the diagnosis, the specialist bowel cancer nurse was called and she explained exactly what would be done and gave me leaflets. She visited me daily in hospital as did my surgeon. She also came with the oncologist on his first visit to discuss chemotherapy. She assured me that she was available at any time. I became aware of the Ulster Cancer Foundation and became a member of their Patient Action Group.

On a practical level – if you have an unexplained ache or any of the recognised symptoms go immediately to your doctor and if the symptoms persist after having been given the “all clear” seek a second opinion.

People need to know that help is available on an on-going basis. Most of us will experience cancer personally or through family or friends.

It is important to know at the time of diagnosis what help is available – constant publicity is necessary. Also medical schools should be more aware of the necessity of sensitivity on the part of doctors and surgeons when imparting bad news.

Cancer patients used to be surrounded by despair but thanks to better treatments and the support of voluntary organisations we are surrounded by hope”.


~

“I had been loosing blood for almost twelve months. I had various tests but nothing showed up. I knew something was wrong, then I had a special X-ray. They found I had bowel cancer. Although I knew something was wrong I was shocked as it wasn’t in my family.

After a short course of radiotherapy I didn’t have to wait long for my operation. The doctor was a real gentleman, he came to see me every day. I have a colostomy bag. I complained plenty about it, unfortunately it is not reversible. I had a great nurse who came to talk to me about the bag and how to use it.

I got all the usual leaflets etc. but the one that gave me best hope was the story about a mountain climber who also had a colostomy bag. I am on the road to recovery now”.

~



Cancer Services Audit 1996 & 2001
Colorectal

“I was diagnosed with bowel cancer a year ago. I had been constipated for 3-4 months but I had always been a bit constipated. I had piles and was told it could be due to the piles.

I was sent to the hospital to get my piles treated and was put on a waiting list for a barium enema examination. This showed a large tumour. I had radiotherapy for one week before the surgery and then I had an operation. This was followed up by a course of chemotherapy for about 7 months when I felt sick and tired. I also had a colostomy bag for about 7 months.

The consultants always kept me in the picture. I was given very good information about the bag and how to operate it. I am very grateful I didn't have to have the bag permanently. I feel great now two months after my chemotherapy.”

INTRODUCTION

This Report is the fifth in a series which examines in detail the pathway of care for cancer patients in Northern Ireland. Colorectal cancer is a major cause of cancer incidence and death, and the years 1996 and 2001 represent two points in time either side of the publication of the Campbell Report **“Cancer Services-Investing for the Future”**¹.

The Campbell Report resulted from the work of many clinicians, service planners and patients who worked together with the aim of improving cancer services in Northern Ireland. The Campbell Report made 14 recommendations (see Appendix A).

Subsequent to the publication of the Campbell Report, a Cancer Working Group in Northern Ireland produced a sub-group report on Colorectal Cancer² in 1996, which made specific comments and recommendations on the future of colorectal cancer services in Northern Ireland (see below):

Comments (N. Ireland Colorectal Cancer Subgroup report)

1. Rationalisation of clinical services for colorectal cancer between a Cancer Centre and Cancer Units may be difficult, while 18 acute hospitals continue to provide general medical and surgical services. Implementation of the Northern Ireland Regional Strategy for Acute Hospital Services, the Acute Hospitals Reorganisation Project and the Report of the Cancer Working Group will hasten a process that has already started voluntarily with greater sub-specialisation in general surgery and general medicine.
2. Physicians and surgeons dealing with colorectal cancer are likely to be responsible for the management of a broad spectrum of benign and malignant diseases of the colon and rectum. Malignant disease will represent only a small portion of the total practice for the majority of physicians and surgeons.
3. The Senate of the Surgical Royal Colleges, on the advice of specialist associations and the British Society of Gastroenterology, have outlined the curricula and training experience necessary for future specialist registration in digestive diseases. Some future trainees will have tertiary level training in colorectal diseases and will be expected to devote a substantial part of their clinical commitment to this speciality.
4. A “volume effect” cannot be demonstrated in the overall management of colon cancer but new evidence is emerging that, in the surgical treatment of sigmoid and rectal cancers, better results are achieved by colorectal and gastrointestinal surgeons than by general surgeons. These data refer to both disease-related and procedure-related mortality and morbidity and include lower recurrence rates, fewer stomas and more use of chemotherapy and radiation therapy. As a result of these practices, quality of life issues such as continence, influence of support groups and availability of enterostomal therapy nurses are now being evaluated.
5. The provision of a multidisciplinary service for the management of colorectal cancer will, of necessity, be limited to a small number of sites due to the limited availability of qualified gastroenterologists and medical oncologists with a special interest in colorectal diseases. There is also limited availability of specialist support services e.g. specialist gastrointestinal radiology, pathology and endoscopy services in the Province. Other essential services e.g. enterostomal therapy, nutritional support, intensive care, palliative care and acute pain services, will also, of necessity, be concentrated on a limited number of sites.

Cancer Services Audit 1996 & 2001

Colorectal

6. Colorectal cancer will continue to present as medical and surgical emergencies (approximately 20% of all colorectal cancers).

Recommendations (N. Ireland Colorectal Cancer Subgroup report)

1. There should be a multidisciplinary approach to the investigation and management of colorectal cancer.
2. Physicians and surgeons with a primary interest in colorectal diseases should be identified to general practitioners, the medical community, Purchasers and the public.
3. Designation as a specialist in colorectal and gastrointestinal diseases should be based on clinical expertise, experience, education and training.
4. The future management of colorectal cancer should be carried out mainly by a multidisciplinary group of enthusiasts with training in colorectal diseases, rather than by occasional practitioners.
5. There should be agreed protocols of management generated by the multidisciplinary group and the results of treatment should be audited regularly.
6. Details of all new cases of colorectal cancer should be submitted to the Northern Ireland Colorectal Cancer Registry (subsequently subsumed into the N. Ireland Cancer Registry) and data from the first five years of the Registry should be disseminated widely.
7. Information about current standards of practice in colorectal diseases in the United Kingdom should be widely disseminated to primary care physicians and Purchasers.
8. Clinical practice in colorectal cancer should be complemented by a commitment to basic, clinical and applied research into the epidemiology, treatment and prevention of colorectal cancer.

In 1997, the NHS produced a document outlining Guidance on Commissioning Cancer Services: **“Improving Outcomes in Colorectal Cancer”**³. Key recommendations in relation to colorectal cancer are as follows:

- Colorectal cancer should be managed by multidisciplinary teams working to agreed protocols.
- Patients should be offered full information about their condition and treatment and have continuing access to a member of the team.
- There should be adequate endoscopy facilities: colonoscopy completion and complication rates should be monitored.
- Surgeons who treat rectal cancer should be able to demonstrate good results, particularly in terms of low recurrence rates.
- Pathologists should give comprehensive feedback on adequacy of surgery.
- Pre-operative radiotherapy should be available to treat rectal cancer.
- Adjuvant chemotherapy should be offered to suitable patients and multi-centre randomised controlled trials should be supported.

This guidance also provided a summary of recommendations in specific topic areas (see Appendix B).

We would expect that when investigating the 2001 data, the above 1997 recommendations would have been implemented. The Association of Coloproctology of Great Britain and Ireland in 2001 produced a report **“Guidelines for the Management of Colorectal Cancer”**⁴ a summary of which is included in Appendix C for completeness.

PROJECT AIM

This Report aims to measure changes to care for patients with Colorectal (colon, rectum, rectosigmoid junction and anus) cancer from a baseline in 1996 and to determine whether they are in keeping with the recommendations of the Campbell Report¹.

BACKGROUND

The levels of colorectal cancer are similar in both sexes. The risk increases with age and is rare before 40 years. It is more common in the developed countries (USA, Canada, Northern and Western Europe etc) than in Asia, Africa and South America. In the UK, colorectal cancer is the second most common cause of cancer death after lung cancer and the overall 5-year relative survival is less than 40%⁵. In Northern Ireland each year 479 men and 451 women are diagnosed with this cancer while 218 men and 213 women die from it. The high incidence of this disease, together with the fact that improvement in mortality in recent years has been modest, highlight the need for research into prevention, earlier diagnosis and better treatment.

Aetiology and risk factors

Environmental, nutritional, genetic/familial factors and pre-existing diseases of the colon are all associated with this cancer.

Environmental factors

The fact that Asians, Africans and South Americans assume the colon cancer risk of their adopted country within a few generations gives evidence to the role of environmental factors in its development⁶.

Nutritional

Results from a large international study investigating the links between cancer and nutrition has confirmed that colorectal cancer risk is associated with high consumption of red and processed meat, while a diet high in fish is protective⁷. Dietary fibre in this study is also shown to be protective⁸. The combination of these dietary factors plays a major role in colorectal cancer as do lifestyle factors - alcohol and smoking, obesity and low physical activity⁹. Post menopausal hormone use (combined oestrogen and progesterone)¹⁰ and prolonged use of non-steroidal anti-inflammatory drugs has been shown to protect against colorectal cancer¹¹.

Pre-existing conditions

Patients with pre-existing inflammatory bowel disease (e.g. ulcerative colitis) have a higher than average risk of colorectal cancer. The risk increases with the duration of the condition to 30% by the third decade of colitis. Colorectal tumours develop more often in patients with adenomatous (benign) polyps than those without such polyps. The risk of polyps undergoing cancerous change is related to their size and the histological type, with polyps larger than 2cm having a 40% chance of malignant transformation¹².

Genetic factors

The risk of developing colorectal cancer is significantly increased in several forms of inherited susceptibility, which accounts for 5% of all colorectal cancers. Familial Adenomatous Polyposis (FAP) is inherited in an autosomal dominant fashion. These patients develop colonic and rectal polyps from an early age and if left untreated, all will develop colorectal cancer by the third or fourth decade. For this reason these high risk patients usually have a prophylactic total colectomy. Hereditary Non-Polyposis Colorectal Cancer (HNPCC) is also inherited as an autosomal dominant genetic defect. FAP and HNPCC families are offered genetic testing to identify whether or not individuals are gene carriers so that they can be offered colorectal cancer screening

Cancer Services Audit 1996 & 2001

Colorectal

from an early age. A third group of patients are at risk of colorectal cancer due to a strong family history of colorectal cancer, the exact genetic transmission of which has yet to be determined.

COLON CANCER - N. IRELAND

Rates of colon cancer in Northern Ireland have consistently been higher than the rest of the UK. Cancer of the colon accounts for 7% of cancer cases in men, 6% in women and 8% of cancer deaths in men and women. In 2001 colon cancer was the fourth most common cancer in males and females. On average, 301 males and 312 females were diagnosed as having colon cancer each year (1993-2001). The median age at diagnosis was 71 for males and 73 for females. Each year on average 155 males and 162 females die from colon cancer. In 2001, it was the third most common cause of cancer death in males and females¹³.

Five-year relative survival rates were similar for males and females at 55%, showing an improvement in survival in the more recent diagnostic period (1996-99) compared with 1993-96. Survival is very dependent on the stage of disease at presentation. Patients presenting with early Stage I disease had a 5-year relative survival rate of 97%, compared with 14% for patients with late Stage IV disease¹³.

Between 1993 and 2001, rates of colon cancer in males and females decreased significantly by an average of 6 and 8 cases per year respectively. In the same period, deaths also fell for males and females.

RECTUM, RECTOSIGMOID (RS) JUNCTION & ANUS - N. IRELAND

In Northern Ireland cancers of the rectum, rectosigmoid junction and anus account for 4% of cancer cases and deaths in men and 3% of cancer cases and deaths in women. In 2001, rectal cancer was the fifth most common cancer in males and sixth most common in females. On average, 178 males and 139 females were diagnosed with this cancer each year between 1993-2001. The median age at diagnosis was 69 years for males and 72 years for females. Each year on average 63 males and 51 females die from rectal cancer. In 2001, it was the eighth and tenth most common cause of cancer mortality in males and females respectively¹³.

The 5-year survival rates were similar for males and females, and for both periods (1993-96, 1996-99), at over 50%. Survival is very dependent on the stage of disease at presentation. Patients presenting with early Stage I disease had a 5-year relative survival rate of 90%, compared to 16% for patients with late Stage IV disease¹³.

Between 1993 and 2001, there was no change in the rate of new cases or deaths from rectal cancer in either males or females¹³.

METHODS

DATA COLLECTION

Registry Tumour Verification Officers (TVOs) collected data by reviewing clinical notes of patients with a new primary colorectal cancer already registered with the N. Ireland Cancer Registry in 1996 and 2001. This, in many cases, involved review of notes from several hospitals. Data were then entered into an electronic proforma, which had been developed with the guidance of relevant clinicians; copy available at www.qub.ac.uk/nicr/racc.htm

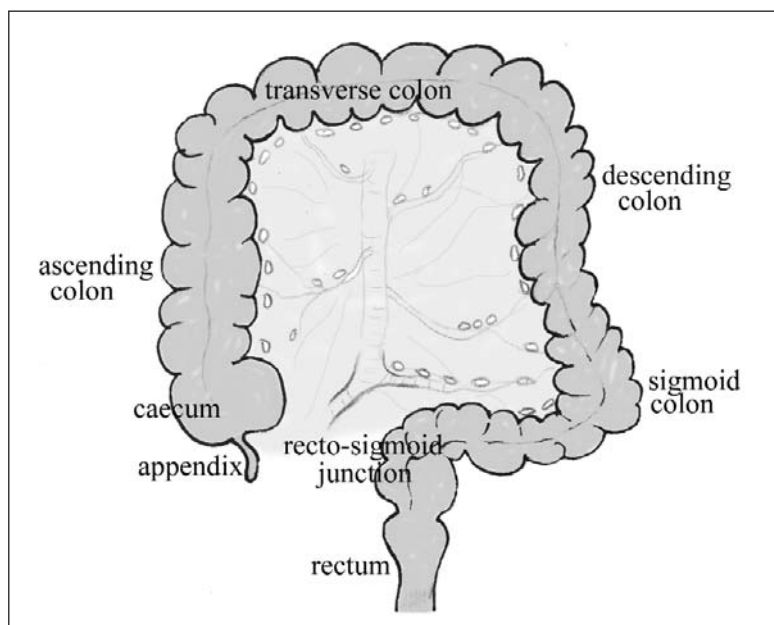
EXCLUSIONS & ANALYSES

Patients were excluded if their records lacked sufficient information or if information was available only from a death certificate (DCO). It was also decided to remove histological types such as lymphomas, sarcomas and carcinoids because their natural history and management are different from those of other colorectal cancers. After cleaning and validation, data analysis was carried out using SPSS. Chi-square was used to test for significance, where appropriate, throughout the report. The Kaplan-Meier method was used for survival analysis.

CLASSIFICATION

It is difficult to meaningfully group tumours of the colon, rectum, rectosigmoid (RS) junction and anus in a report such as this. Following consultation with the clinicians it was agreed that for the purposes of this audit report, tumours in each of the four areas would be considered individually for some analyses, but for the majority of analyses, colon and RS junction tumours would be grouped together and rectal tumours would be dealt with separately. Numbers for anal tumours are small and so these are not reported separately in analyses but are included in 'colorectal totals' where applicable.

Anatomical divisions of colon and rectum



Cancer Services Audit 1996 & 2001

Colorectal

RESULTS

Study patients

Patients	Colon		RS Junction		Rectum	
	1996	2001	1996	2001	1996	2001
Total patients	490	515	47	102	193	203
Exclusions – Death certificate only	1	1	0	0	0	0
Exclusions – Lack of information/comments	9	13	3	1	3	0
Total exclusions	10	14	3	1	3	0
Total reported on – male	238 (50%)	260 (52%)	24 (55%)	59 (58%)	113 (59%)	121 (60%)
Total reported on – female	242 (50%)	241 (48%)	20 (45%)	42 (42%)	77 (41%)	82 (40%)
Total reported on	480	501	44	101	190	203

Patients	Anus		All cases combined	
	1996	2001	1996	2001
Total patients	11	10	741	830
Exclusions – Death certificate only	0	0	1	1
Exclusions – Lack of information/comments	0	0	15	14
Total exclusions	0	0	16	15
Total reported on – male	5 (45%)	5 (50%)	380 (52%)	445 (55%)
Total reported on – female	6 (55%)	5 (50%)	345 (48%)	370 (45%)
Total reported on	11	10	725	815

- Data were available on 741 individuals in 1996 and 830 individuals in 2001. After all exclusions 725 remained in 1996 and 815 in 2001.
- Rectal cancers were more common in males than females (60:40).
- Colon cancers occurred with similar frequencies in both sexes.
- The median age at diagnosis for colon cancer was 72 years, RS junction was 67 years, rectum was 70 years and anus was 74 years. There was no variation between the years 1996 and 2001.
- The increased number of RS junction cancers in 2001 reflects more precise use of coding classification.

Socio-economic status of study patients

Deprivation Quintile	Number of Patients (%)	
	1996 (n=725)	2001 (n=815)
Quintile 1 (most affluent)	148 (20%)	192 (24%)
Quintile 2	144 (20%)	146 (18%)
Quintile 3	138 (19%)	135 (17%)
Quintile 4	150 (21%)	174 (21%)
Quintile 5 (least affluent)	145 (20%)	168 (21%)

- If a disease is not related to deprivation in the general population, it is expected that 20% of all cases of disease would fall in each quintile. Our data show that there is no difference in the levels of colorectal cancer with deprivation in these populations ($\chi^2 = 0.572, p>0.05$).

Source of referral to specialist care

Source	Number of Patients (%)	
	1996 (n=725)	2001 (n=815)
General Practitioner (GP)	600 (83%)	709 (87%)
Surgeon	15 (2%)	27 (3%)
Physician	25 (3%)	35 (4%)
Radiology	0	3 (<1%)
Other*	41 (6%)	29 (4%)
Not recorded	44 (6%)	12 (1%)

- In both years over 80% of colorectal cancer patients were referred by their GPs.

**These included referrals from nursing homes, geriatrics, cardiology, urology, psychiatry and neurology.*

Cancer Services Audit 1996 & 2001 Colorectal

Details of GP Referrals

Referrals	Number of Patients (%)					
	Colon & RS Junction		Rectum		Anus	
	1996 (n=434)	2001 (n=530)	1996 (n=158)	2001 (n=171)	1996 (n=8)	2001 (n=8)
Surgical emergency	116 (27%)	150 (28%)	17 (11%)	18 (11%)	1 (12%)	1 (12%)
Medical emergency	49 (11%)	55 (11%)	6 (4%)	9 (5%)	0	0
Consultant *	1 (<1%)	5 (1%)	0	1 (<1%)	0	0
Outpatients	231 (53%)	271 (51%)	122 (77%)	126 (74%)	7 (88%)	7 (88%)
Other **	28 (6%)	39 (7%)	9 (6%)	15 (9%)	0	0
Not recorded	9 (2%)	10 (2%)	4 (3%)	2 (1%)	0	0

Referrals	Number of Patients (%)	
	All cases combined	
	1996 (n=600)	2001 (n=709)
Surgical Emergency	134 (22%)	169 (24%)
Medical Emergency	55 (9%)	64 (9%)
Consultant *	1 (<1%)	6 (<1%)
Outpatients	360 (60%)	404 (57%)
Other **	37 (6%)	54 (8%)
Not recorded	13 (2%)	12 (2%)

* A consultant referral is a referral between consultants, where the initial consultant visit was not related to cancer

** 'Other' comprised patients who presented as domiciliary visits, private patients, self referrals or those who presented to A&E

- The majority of patients presented via outpatients in both years with over one third of colon and RS junction cancers presenting as surgical or medical emergencies (39% colon & RS Junction and 16% rectum).

Family history of colorectal and other cancers recorded in notes

Family History	Number of Patients (%)	
	1996 (n=725)	2001 (n=815)
Colorectal cancer recorded	59 (8%)	103 (13%)
Not recorded	513 (71%)	385 (47%)
Other cancer recorded	40 (6%)	93 (11%)
Not recorded	559 (77%)	431 (53%)

- There was better recording of family history of colorectal and other cancers by 2001.

Co-morbidities (NOTE: Each patient may have had more than one co-morbidity except for colitis/ulcerative colitis)

Co-morbidity	Number of Patients (%)	
	1996 (n=725)	2001 (n=815)
Ulcerative colitis	3 (<1%)	6 (<1%)
Colitis (non infective)	2 (<1%)	2 (<1%)
Crohns disease	5 (<1%)	7 (<1%)
Familial adenomatous polyposis	0	7 (<1%)
Irritable bowel	3 (<1%)	6 (<1%)
Diverticular disease	32 (4%)	42 (5%)
Other malignancy (excluding NMS*)	44 (6%)	68 (8%)

* NMS = Non Melanoma Skin

- 9% of patients had a record in their hospital notes of some chronic, non malignant bowel disease (2001 data).
- 11% of patients had a personal history of other malignancy (8% if non melanoma skin cancers are excluded).

The figures, particularly for Irritable Bowel Syndrome and Diverticular Disease appear to be underestimated compared to reported levels in a general population of about 15% for Irritable Bowel Syndrome and about 40% for Diverticular Disease¹⁴. This may represent under-recording of this data in the notes of our study patients and/or inclusion of asymptomatic patients in the general population survey¹⁴.

Cancer Services Audit 1996 & 2001

Colorectal

Symptoms

The symptoms of colorectal cancer vary according to the site. Cancers of the right side of the colon often present with symptoms such as anaemia, abdominal mass or intestinal obstruction.

Cancers occurring in the left side of the colon generally cause a change in bowel habit, colicky abdominal pain and/or obstructive symptoms.

Rectal cancers more often present with bleeding, change in bowel habit and/or rectal fullness and tenesmus*.

Symptoms/signs at presentation (NOTE: Patients may present with more than one symptom)

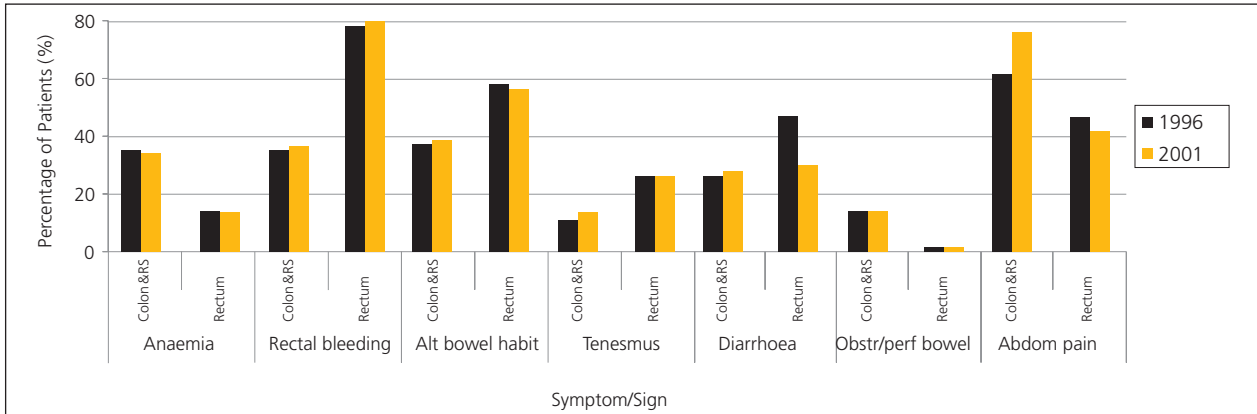
Symptom/sign	Percentage of Patients			
	Colon & RS Junction		Rectum	
	1996 (n=524)	2001 (n=602)	1996 (n=190)	2001 (n=203)
Weight loss	34%	42%	30%	35%
Anaemia	26%	32%	14%	12%
Rectal bleeding	34%	37%	77%	80%
Altered bowel habit	37%	39%	57%	53%
Lethargy	19%	30%	10%	16%
Constipation	27%	38%	25%	26%
Tenesmus*	6%	10%	26%	26%
Diarrhoea	26%	27%	47%	33%
Obstructed/perforated bowel	13%	13%	2%	2%
Abdominal pain	41%	55%	29%	26%

Symptom/sign	Percentage of Patients			
	Anus		All cases combined	
	1996 (n=11)	2001 (n=10)	1996 (n=725)	2001 (n=815)
Weight loss	27%	30%	34%	40%
Anaemia	0	0	28%	27%
Rectal bleeding	64%	50%	46%	48%
Altered bowel habit	55%	40%	43%	42%
Lethargy	27%	20%	17%	26%
Constipation	45%	30%	26%	35%
Tenesmus*	45%	30%	12%	14%
Diarrhoea	9%	10%	31%	28%
Obstructed/perforated bowel	0	0	10%	10%
Abdominal pain	18%	0	35%	47%

* Tenesmus is the sensation of incomplete rectal emptying

Cancer Services Audit 1996 & 2001 Colorectal

Symptoms/signs for patients in 1996 and 2001 (excludes patients with anal cancer)



- Symptoms recorded were generally similar in both years.
- Over one third (37%) of colon and RS junction cancer patients and 80% of rectal cancer patients had rectal bleeding.
- About one in eight (13%) of colon and RS junction cancer patients were recorded as presenting with obstructed/perforated bowel.
- The proportion of rectal cancer patients recorded as presenting with diarrhoea fell from 47% in 1996 to 33% in 2001.

Duration of symptoms for Colon and RS Junction patients in 1996 and 2001 (NOTE: Not all patients with symptoms had duration recorded)

Symptom/Sign		1 month or less	2-5 months	6-11 months	12 or more months	Duration not recorded	Total Symptomatic Patients (% of total patients)
Weight loss	1996	10%	31%	10%	15%	37%	176 (34%)
	2001	8%	34%	12%	15%	30%	254 (42%)
Anaemia	1996	9%	17%	9%	7%	58%	138 (26%)
	2001	2%	14%	7%	13%	64%	195 (32%)
Rectal bleeding	1996	26%	23%	12%	13%	26%	178 (34%)
	2001	15%	29%	12%	13%	31%	226 (37%)
Altered bowel habit	1996	22%	29%	11%	9%	29%	194 (37%)
	2001	20%	25%	7%	10%	38%	236 (39%)
Lethargy	1996	14%	34%	6%	7%	39%	100 (19%)
	2001	16%	24%	4%	8%	49%	182 (30%)
Constipation	1996	29%	21%	9%	7%	34%	142 (27%)
	2001	25%	21%	5%	9%	40%	229 (38%)
Tenesmus	1996	16%	33%	8%	9%	34%	31 (6%)
	2001	19%	3%	0	7%	71%	59 (10%)
Diarrhoea	1996	24%	29%	11%	15%	21%	136 (26%)
	2001	22%	24%	4%	10%	40%	163 (27%)
Abdominal pain	1996	34%	18%	6%	6%	36%	215 (41%)
	2001	34%	21%	7%	7%	31%	333 (55%)

Cancer Services Audit 1996 & 2001 Colorectal

Duration of symptoms for Rectum patients in 1996 and 2001 (NOTE: Not all patients with symptoms had duration recorded)

Symptom/Sign		1 month or less	2-5 months	6-11 months	12 or more months	Duration not recorded	Total Symptomatic Patients (% of total patients)
Weight loss	1996	8%	39%	6%	15%	32%	57 (30%)
	2001	7%	35%	13%	11%	34%	71 (35%)
Anaemia	1996	11%	18%	0	0	71%	27 (14%)
	2001	0	4%	0	0	96%	25 (12%)
Rectal bleeding	1996	22%	29%	11%	10%	28%	146 (77%)
	2001	20%	31%	12%	10%	27%	162 (80%)
Altered bowel habit	1996	25%	25%	9%	7%	34%	108 (57%)
	2001	12%	35%	17%	8%	28%	108 (53%)
Lethargy	1996	26%	35%	6%	0	32%	19 (10%)
	2001	19%	19%	9%	0	53%	32 (16%)
Constipation	1996	20%	28%	4%	2%	46%	48 (25%)
	2001	11%	28%	8%	17%	36%	53 (26%)
Tenesmus	1996	16%	40%	16%	0	28%	49 (26%)
	2001	17%	28%	9%	8%	38%	53 (26%)
Diarrhoea	1996	31%	29%	8%	7%	25%	89 (47%)
	2001	18%	37%	13%	7%	25%	68 (33%)
Abdominal pain	1996	32%	20%	4%	7%	38%	56 (29%)
	2001	17%	44%	4%	4%	31%	52 (26%)

- Recording of symptom duration was poor in both years.
- Of those who had rectal bleeding, at least 21% of rectal patients and 25% of colon and RS junction patients had this symptom for over 6 months. This was similar in both years.
- Of those who had altered bowel habit, at least 25% of rectal patients and 17% of colon and RS junction patients had this symptom for over 6 months. This was similar in both years.
- 11% of symptomatic colorectal cancer patients had abdominal pain for over 6 months.

Cancer Services Audit 1996 & 2001 Colorectal

Hospital of presentation (Colon and RS Junction)

Hospital	Number of Patients (%)			
	Including Emergencies		Excluding Emergencies	
	1996 (n=524)	2001 (n=602)	1996 (n=343)	2001 (n=385)
Royal Victoria (RVH)*	49 (9%)	56 (9%)	31 (9%)	29 (8%)
Belfast City (BCH)*	39 (7%)	30 (5%)	28 (8%)	16 (4%)
Ulster (UH)**	57 (11%)	85 (14%)	27 (8%)	50 (13%)
Altnagelvin (AH)**	55 (10%)	64 (11%)	37 (11%)	40 (10%)
Craigavon Area (CAH)**	25 (5%)	55 (9%)	14 (4%)	36 (9%)
Antrim (ANT)**	46 (9%)	71 (12%)	30 (9%)	39 (10%)
Mater (MIH)	32 (6%)	25 (4%)	18 (5%)	23 (6%)
Coleraine/Causeway (COL/CAU)	32 (6%)	28 (5%)	16 (5%)	19 (5%)
Mid Ulster (MUH)	14 (3%)	20 (3%)	10 (3%)	13 (3%)
Tyrone County (TCH)	13 (2%)	22 (4%)	10 (3%)	9 (2%)
Whiteabbey (WHA)	27 (5%)	18 (3%)	16 (5%)	12 (3%)
Daisy Hill (DHH)	32 (6%)	32 (5%)	23 (7%)	24 (6%)
Erne (ERN)	15 (3%)	22 (4%)	9 (3%)	16 (4%)
Downe (DH)	21 (4%)	18 (3%)	11 (3%)	11 (3%)
Lagan Valley (LVH)	20 (4%)	27 (4%)	16 (5%)	19 (5%)
Ulster Independent Clinic (UIC)***	1 (<1%)	8 (1%)	1 (<1%)	8 (2%)
South Tyrone (STH)	15 (3%)	10 (2%)	10 (3%)	10 (3%)
Armagh Community (ACH)****	0	1 (<1%)	0	1 (<1%)
Ards (AR)****	8 (2%)	0	7 (2%)	0
Banbridge (BBH)****	1 (<1%)	0	1 (<1%)	0
Moyle (MLE)	3 (<1%)	0	2 (<1%)	0
Belvoir Park (BPR)	1 (<1%)	0	1 (<1%)	0
Waveney (WAV)****	1 (<1%)	0	1 (<1%)	0
Bangor Community (BGR)****	0	1 (<1%)	0	1 (<1%)
Lurgan (LGH)	1 (<1%)	0	1 (<1%)	0
Masserene (MAS)	1 (<1%)	0	1 (<1%)	0
Not Recorded	15 (3%)	9 (1%)	22 (6%)	9 (2%)

* Cancer Centre ** Cancer Unit *** The Ulster Independent Clinic is a private hospital **** Changed to community health facility with no inpatient facilities by 2001

- 524 patients with cancer of the colon or RS junction presented to 24 hospitals in 1996 and 602 patients presented to 19 hospitals in 2001. Excluding emergencies, the pattern was the same.
- By 2001, 60% of patients presented to a Cancer Unit/Centre.
- In both years approximately one third of colon and RS junction patients were recorded as presenting as emergencies.

Cancer Services Audit 1996 & 2001 Colorectal

Hospital of Presentation (Rectum)

Hospital	Number of Patients (%)			
	Including Emergencies		Excluding Emergencies	
	1996 (n=190)	2001 (n=203)	1996 (n=163)	2001 (n=172)
Royal Victoria (RVH)*	18 (9%)	28 (14%)	17 (10%)	22 (13%)
Belfast City (BCH)*	23 (12%)	5 (2%)	20 (12%)	4 (2%)
Ulster (UH)**	18 (9%)	19 (9%)	15 (9%)	17 (10%)
Altnagelvin (AH)**	9 (5%)	25 (12%)	7 (4%)	22 (13%)
Craigavon Area (CAH)**	20 (10%)	14 (7%)	16 (10%)	13 (8%)
Antrim (ANT)**	14 (7%)	13 (6%)	14 (9%)	9 (5%)
Mater (MIH)	12 (6%)	15 (7%)	10 (6%)	12 (7%)
Coleraine/Causeway (COL/CAU)	12 (6%)	12 (6%)	11 (7%)	11 (7%)
Mid Ulster (MUH)	7 (4%)	4 (2%)	8 (5%)	3 (2%)
Tyrone County (TCH)	9 (5%)	6 (3%)	7 (4%)	4 (2%)
Whiteabbey (WHA)	5 (3%)	2 (1%)	5 (3%)	2 (1%)
Daisy Hill (DHH)	6 (3%)	8 (4%)	4 (2%)	8 (5%)
Erne (ERN)	8 (4%)	7 (3%)	7 (4%)	5 (3%)
Downe (DH)	5 (3%)	7 (3%)	4 (2%)	7 (4%)
Lagan Valley (LVH)	8 (4%)	14 (7%)	5 (3%)	11 (6%)
Ulster Independent Clinic (UIC)***	1 (<1%)	6 (3%)	1 (<1%)	6 (3%)
South Tyrone (STH)	5 (3%)	6 (3%)	3 (2%)	6 (3%)
Armagh Community (ACH)****	0	1 (<1%)	0	1 (<1%)
Ards (AR)****	1 (<1%)	1 (<1%)	1 (<1%)	1 (<1%)
Banbridge (BBH)****	1 (<1%)	1 (<1%)	1 (<1%)	1 (<1%)
Moyle (MLE)	1 (<1%)	3 (1%)	1 (<1%)	3 (2%)
North West Independent (NWC)***	0	1 (<1%)	0	1 (<1%)
Waveney (WAV)****	3 (2%)	0	3 (2%)	0
Masserene (MAS)	1 (<1%)	0	1 (<1%)	0
Belvoir Park (BPR)	1 (<1%)	0	1 (<1%)	0
Not Recorded	2 (1%)	5 (2%)	2 (1%)	3 (2%)

* Cancer Centre ** Cancer Unit *** The Ulster Independent Clinic and the North West Independent Clinic are private hospitals
**** Changed to community health facility with no inpatient facilities by 2001

- 190 patients with cancer of the rectum presented to 23 hospitals in 1996 and 203 patients presented to 22 hospitals in 2001. Excluding emergencies, the pattern was the same.
- Just over 50% presented to a Cancer Unit/Centre in both years.
- In both years, 15% of rectal cancer patients were recorded as presenting as emergencies.
- 11 patients with cancer of the anus presented to 9 hospitals in 1996 and 10 patients presented to 5 hospitals in 2001 (not shown).
- In 2001, 70% of patients with cancer of the anus presented to a Cancer Unit/Centre.

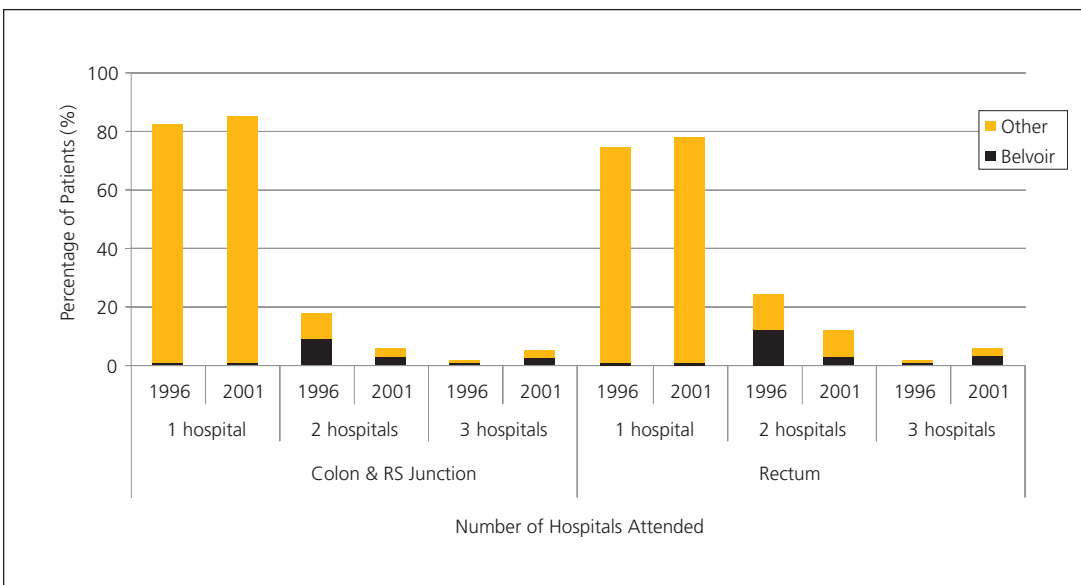
Patients presenting within their own Board (Colon, RS Junction and Rectum)

Board of Residence	Number of Patients			
	Colon and RS Junction		Rectum	
	1996 (n=524)	2001 (n=602)	1996 (n=190)	2001 (n=203)
NHSSB	122 (79%)	138 (83%)	39 (80%)	31 (79%)
EHSSB	196 (97%)	221 (97%)	82 (96%)	81 (93%)
SHSSB	69 (83%)	86 (81%)	31 (97%)	30 (83%)
WHSSB	79 (94%)	104 (96%)	22 (92%)	39 (95%)

- For patients with colorectal cancer, the majority presented to a hospital within their own Board of residence. This pattern changed little between 1996 and 2001.
- All of the anal cancer patients presented to a hospital in their own Board of residence in both 1996 and 2001 (not shown).

HOSPITALS ATTENDED

Percentage of patients attending one, two or three hospitals (excludes patients with anal cancer)



- 25% of all colorectal patients in 1996 and 13% in 2001 attended Belvoir Park Hospital (Northern Ireland Radiotherapy Centre). This reduction likely reflects the transfer of chemotherapy services to the Cancer Centre at Belfast City Hospital and the Cancer Units.

Cancer Services Audit 1996 & 2001

Colorectal

Investigations (NOTE: Patients may have received more than one type of investigation)

Investigation	Number of Patients (%)			
	Colon & RS Junction		Rectum	
	1996 (n=524)	2001 (n=602)	1996 (n=190)	2001 (n=203)
Sigmoidoscopy	218 (42%)	224 (37%)	150 (79%)	151 (74%)
Barium enema	382 (73%)	389 (65%)	105 (55%)	99 (49%)
Barium meal	27 (5%)	9 (1%)	5 (3%)	1 (<1%)
USS abdomen	293 (56%)	311 (52%)	105 (55%)	70 (34%)
Endorectal USS	2 (<1%)	7 (<1%)	3 (2%)	22 (11%)
CT abdomen	83 (16%)	215 (36%)	40 (21%)	134 (66%)
Colonoscopy	135 (26%)	207 (34%)	33 (17%)	61 (30%)
MRI scan	1 (<1%)	3 (<1%)	1 (<1%)	9 (4%)
Abdominal X-ray	150 (29%)	162 (27%)	29 (15%)	32 (16%)
Chest X-ray	338 (65%)	305 (51%)	108 (57%)	103 (51%)

- By 2001, patients with colorectal cancer were more likely to have a colonoscopy and/or a CT scan of the abdomen.
- By 2001, use of endorectal ultrasound had increased for rectal cancer patients to 11%.

Investigations by age (Number of patients in each age category and percentage undergoing procedures)

		79 years and under		80 years and over	
		1996	2001	1996	2001
Colon & RS Junction	Barium Enema	415 (75%)	462 (68%)	109 (66%)	140 (53%)
	CT abdomen	415 (16%)	462 (37%)	109 (14%)	140 (33%)
	Colonoscopy	415 (26%)	462 (37%)	109 (24%)	140 (26%)
Rectum	Barium Enema	158 (54%)	171 (50%)	32 (63%)	32 (44%)
	CT abdomen	158 (22%)	171 (68%)	32 (19%)	32 (56%)
	Colonoscopy	158 (17%)	171 (32%)	32 (19%)	32 (22%)

- In 1996 and 2001, patients 80 years and over with colon and RS junction or rectal cancer had similar investigations to those 79 years and under ($p>0.05$).

HISTOPATHOLOGY

Histopathological type

Sub-Type	Number of Patients (%)					
	Colon & RS Junction		Rectum		Anus	
	1996 (n=524)	2001 (n=602)	1996 (n=190)	2001 (n=203)	1996 (n=11)	2001 (n=10)
Adenocarcinoma	436 (83%)	522 (87%)	168 (88%)	185 (91%)	6 (55%)	2 (20%)
Mucinous carcinoma*	14 (3%)	22 (4%)	4 (2%)	4 (2%)	0	0
Signet ring cell carcinoma*	3 (<1%)	4 (<1%)	1 (<1%)	1 (<1%)	0	0
Squamous cell carcinoma	0	0	1 (<1%)	1 (<1%)	3 (27%)	6 (60%)
Adenosquamous carcinoma	0	0	1 (<1%)	1 (<1%)	0	0
Small cell carcinoma	0	1 (<1%)	0	0	0	0
Carcinoma, NOS**	0	1 (<1%)	1 (<1%)	0	0	0
Not available (NR)	71 (14%)	52 (9%)	14 (7%)	11 (5%)	2 (18%)	2 (20%)

* Subtypes of Adenocarcinoma with different prognosis ** NOS = Not Otherwise Specified

- A high percentage of colorectal cancer included in this study had a histological diagnosis in both 1996 and 2001 (88% and 92% respectively).
- As expected, the majority of colorectal cancers in both years were adenocarcinomas.

STAGING (see also Appendix D)

Colorectal cancers are usually staged after surgical exploration of the abdomen and pathological examination of the resected specimen. Dukes stage was generally preferred by surgeons, while TNM stage group was rarely recorded. TNM variables were recorded in many patients without allocation to a stage group and in only 5% of surgery patients (n=4) was TNM stage group alone recorded (2001).

- By 2001, recording of Dukes stage in clinical notes had increased to 77% for colon and RS junction (59% in 1996) and to 62% for rectal cancers (58% in 1996).
- By 2001, recording of TNM stage in the clinical notes had increased to 14% for colon and RS junction (1% in 1996) and 7% for rectal cancers (1% in 1996).
- For colon and RS junction patients, 10% in 1996 and 8% in 2001 had neither TNM nor Dukes stage recorded in the notes.
- For rectal patients, 17% in 1996 and 16% in 2001 had neither TNM nor Dukes stage recorded in the notes.

When stage was not recorded and there was sufficient information available in the clinical notes, Registry TVOs were able to assign a stage group (Registry-assigned stage). The AJCC Cancer Staging Manual was utilised¹⁵.

Cancer Services Audit 1996 & 2001 Colorectal

Colon & RS Junction - Stage (recorded in notes or Registry-assigned)

Dukes A and B tumours are confined to the bowel wall, while Dukes C tumours have metastasised to the regional lymph nodes. Dukes D indicates a tumour that has spread to other organs.

Stage	Number of Patients (%)			
	All Patients		Surgery Patients	
	1996 (n=524)	2001 (n=602)	1996 (n=463)	2001 (n=546)
Dukes A/TNM I	36 (7%)	57 (9%)	34 (7%)	50 (9%)
Dukes B/TNM IIA-IIB	187 (36%)	177 (29%)	185 (40%)	170 (31%)
Dukes C/TNM IIIA-IIIC	108 (20%)	190 (32%)	107 (23%)	188 (34%)
Dukes D*/TNM IV	142 (27%)	130 (22%)	109 (24%)	104 (19%)
TNM only staging recorded	2 (<1%)	4 (<1%)	2 (<1%)	4 (<1%)
Staging not possible**	51 (10%)	48 (8%)	28 (6%)	34 (6%)

* Modified Dukes stage ** Staging for these patients was not possible due to a lack of information recorded in the notes

Rectum - Stage (recorded in notes or Registry-assigned)

Stage	Number of Patients (%)			
	All Patients		Surgery Patients	
	1996 (n=190)	2001 (n=203)	1996 (n=164)	2001 (n=171)
Dukes A/TNM I	24 (13%)	39 (19%)	23 (14%)	36 (21%)
Dukes B/TNM IIA-IIB	52 (27%)	41 (20%)	51 (31%)	41 (24%)
Dukes C/TNM IIIA-IIIC	40 (21%)	48 (24%)	40 (24%)	46 (27%)
Dukes D*/TNM IV	42 (22%)	42 (21%)	36 (22%)	27 (16%)
TNM only staging recorded	1 (<1%)	1 (<1%)	1 (<1%)	1 (<1%)
Staging not possible**	32 (17%)	33 (16%)	14 (9%)	21 (12%)

* Modified Dukes stage ** Staging for these patients was not possible due to a lack of information recorded in the notes

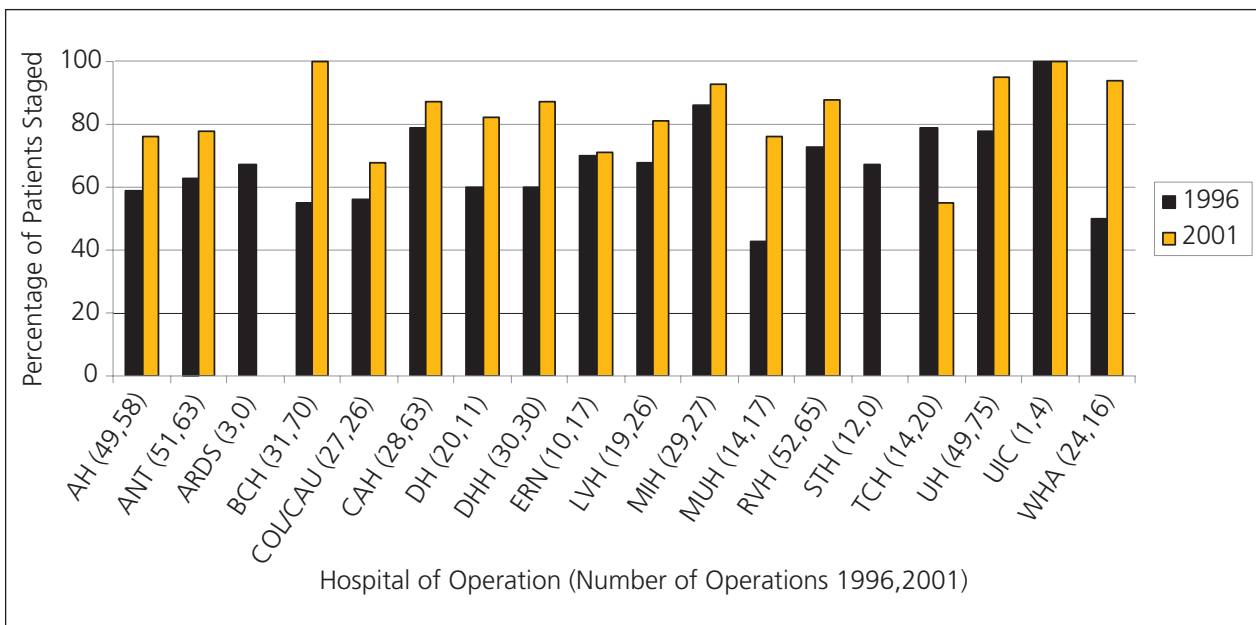
- Using information available in the notes it was possible to assign a Dukes stage to about 90% of colon and RS junction cancers and 84% of rectal cancers in both years.
- The increase in percentage of node positive cancers (Dukes C) reflects improved lymph node resection.

Patients with insufficient data for Staging

Area of Residence	Number of Patients			
	Colon and RS Junction		Rectum	
	1996	2001	1996	2001
NHSSB	11 (22%)	20 (12%)	5 (16%)	5 (13%)
EHSSB	28 (14%)	14 (6%)	17 (20%)	18 (21%)
SHSSB	4 (8%)	5 (5%)	7 (22%)	5 (14%)
WHSSB	8 (16%)	9 (8%)	3 (9%)	5 (12%)
N. Ireland	51 (10%)	48 (8%)	32 (17%)	33 (16%)

- The percentage of patients with colorectal cancer for whom it was possible to determine stage increased between 1996 and 2001 in all Boards (except EHSSB and WHSSB for rectum only), with the most marked improvement evident for residents of the Northern Board area.
- Staging in the Western Board for rectal cancers was the best in both years.

Colon & RS Junction - Patients staged in each year as a percentage of patients having surgery in each hospital (Dukes stage as recorded in the clinical notes)

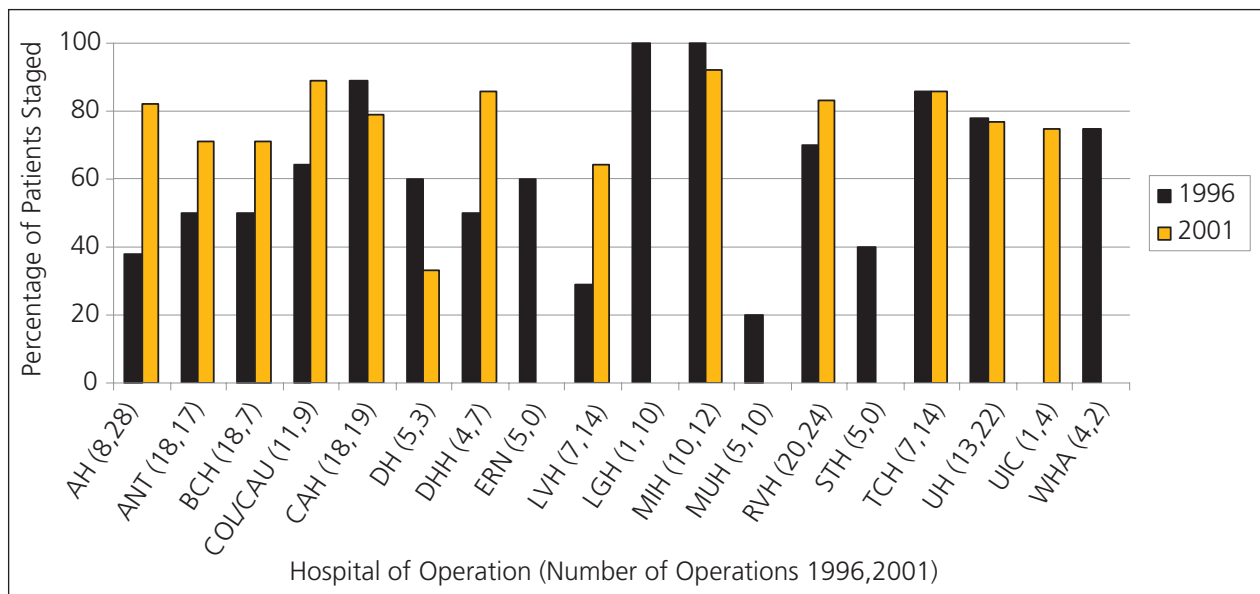


Cancer Services Audit 1996 & 2001

Colorectal

Rectum - Patients staged in each year as a percentage of patients having surgery in each hospital

(Dukes stage as recorded in the clinical notes)



- Recording of Dukes stage in colorectal cancer patients was good and improved in the majority of hospitals between 1996 and 2001.
- In 2001, a level of 70% Dukes stage allocation was achieved in 14 hospitals for colon and RS junction and 11 hospitals for rectal cancer patients.

Nodal Assessment

The AJCC Cancer Staging Manual¹⁵ recommends that 7-14 nodes are examined in a resection specimen. As the number of nodes examined for staging of colon cancers is itself a prognostic variable¹⁶ we analysed the percentage of patients having no nodes examined, 1-10, 11-20 and more than 20 nodes respectively.

Number of lymph nodes examined

Nodes	Number of Resection Patients (%)			
	Colon & RS Junction		Rectum	
	1996 (n=433)	2001 (n=522)	1996 (n=146)	2001 (n=150)
None*	8 (2%)	14 (3%)	6 (4%)	10 (7%)
1 – 10	264 (61%)	203 (39%)	69 (47%)	71 (47%)
11 – 20	96 (22%)	221 (42%)	43 (29%)	57 (38%)
More than 20	6 (1%)	64 (12%)	1 (<1%)	6 (4%)
Not recorded**	59 (14%)	20 (4%)	27 (18%)	6 (4%)

* The majority of these patients had Dukes Stage D cancer, three quarters had a barium enema and over half had a USS abdomen

** Over one third of these patients had Dukes Stage D cancer, half had a sigmoidoscopy and three quarters had a barium enema

- The percentage of colorectal resection patients with nodes examined increased (83% in 1996, 93% in 2001 not shown).
- By 2001, lymphadenectomy practice improved with the percentage of patients having over 11 nodes examined increasing substantially for colon and RS junction tumours with a smaller percentage increase for rectal tumours.
- In 1996, only 1% of colon and RS junction patients had more than 20 nodes examined, while in 2001, this had risen to 12%.
- For colon and RS junction tumours the median number of nodes examined was 10 in 1996 and 12 in 2001, similar to that reported recently in the literature¹⁶.

MULTIDISCIPLINARY TEAM MEETINGS

The effective management of colorectal cancer patients requires input from a range of experts. Multidisciplinary team meetings (MDMs) involve a group of healthcare professionals meeting to discuss the diagnosis and treatment of patients. As there are a range of potential treatments that could be performed, multidisciplinary discussions are of great importance. With respect to MDMs it should be noted that discussions among healthcare professionals, regarding the diagnosis and treatment of patients, may have taken place but may not have been in recognised MDM format.

Multidisciplinary team meetings recorded in the notes

MDM	Number of Patients (%)			
	Colon & RS Junction		Rectum	
	1996 (n=524)	2001 (n=602)	1996 (n=190)	2001 (n=203)
Yes	1 (<1%)	107 (18%)	1 (<1%)	62 (31%)
No/Not Recorded	523 (99%)	495 (82%)	189 (99%)	141 (69%)

- Recording in the clinical notes that discussion at a MDM had taken place improved from less than 1% for all patients in 1996 to 18% for colon and RS junction and 31% for rectal patients in 2001.
- In 1996, a record of MDMs having taken place was found in the clinical notes from only two hospitals (Coleraine/Causeway and Daisy Hill). By 2001, this had improved with the notes from 9 additional hospitals (Altnagelvin, Antrim, Belfast City, Lagan Valley, Mater, Royal Victoria, Tyrone County, Ulster and Whiteabbey hospitals) containing evidence of MDMs taking place.
- In one Cancer Unit, Craigavon, there were no records of MDMs having taken place in either year.

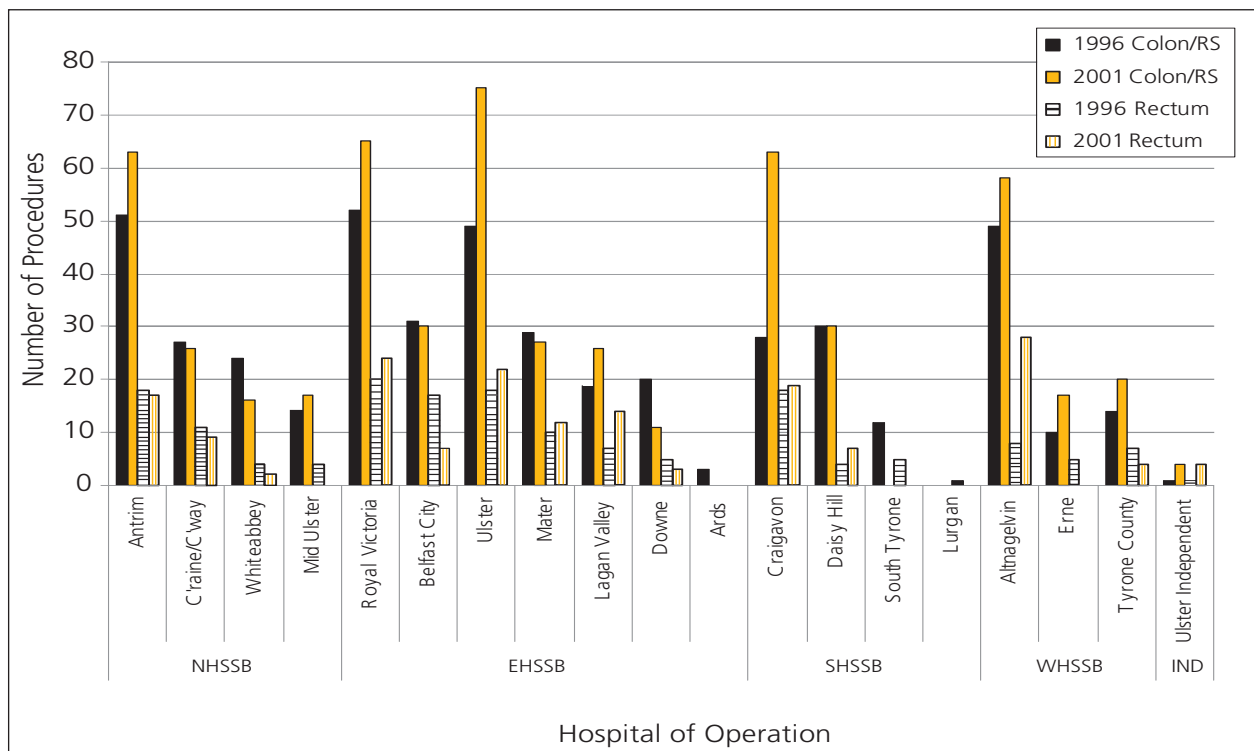
Cancer Services Audit 1996 & 2001

Colorectal

SURGICAL PROCEDURES

- For Colon and RS junction cancers: In 1996, 463 surgical procedures were carried out in 18 hospitals, while in 2001, 546 operations were performed in 16 hospitals.
- For Rectal cancers: In 1996, 164 surgical procedures were carried out in 18 hospitals, while in 2001, 171 operations were performed in 14 hospitals.
- Seven operations in 1996 and three in 2001 were carried out on patients with cancer of the anus (71% in 1996 and 100% in 2001 were performed in Cancer Units or Cancer Centre). All anal surgery patients also received chemotherapy.
- By 2001, 65% of colon and RS junction cancer surgery and 68% of rectal cancer surgery was performed in the Cancer Centre or Cancer Units.
- For residents of the Northern Board there was a shift in the main hospital of treatment from the Royal Victoria to Antrim.
- For patients residing in the Eastern Board, fewer main hospitals performed surgery for colorectal cancer in 2001. The Royal Victoria, Ulster and Lagan Valley hospitals all saw an increase in surgery by 2001, while levels of surgery for rectal cancer in Belfast City Hospital had decreased.

Number of operations by hospital – 1996 & 2001 (Colon, RS Junction and Rectum)



- The most marked evidence of service reorganisation within a Board was for rectal cancer operations in the Western Board where there was a four fold increase in the number of procedures performed in Altnagelvin Hospital with a reduction in operations performed in other Western Board hospitals.
- In 1996, more colorectal cancer (excludes anus) operations were performed in the Royal Victoria Hospital than any other hospital, while by 2001, more operations were carried out in the Ulster Hospital.

Health Board of surgery (Colon & RS Junction)

Board of residence	Board of Operation					Total
	NHSSB	EHSSB	SHSSB	WHSSB		
NHSSB	1996	114 (84%)	18 (13%)	2 (1%)	2 (1%)	136
	2001	120 (80%)	25 (17%)	4 (3%)	1 (1%)	150
EHSSB	1996	1 (<1%)	172 (99%)	0	0	173
	2001	0	201 (100%)	0	0	201
SHSSB	1996	0	11 (14%)	68 (86%)	0	79
	2001	0	5 (5%)	91 (93%)	2 (2%)	98
WHSSB	1996	1 (1%)	3 (4%)	0	71 (95%)	75
	2001	0	4 (4%)	1 (1%)	92 (95%)	97

Health Board of surgery (Rectum)

Board of residence	Board of Operation				Total	
	NHSSB	EHSSB	SHSSB	WHSSB		
NHSSB	1996	35 (80%)	5 (11%)	1 (2%)	3 (7%)	44
	2001	25 (74%)	9 (26%)	0	0	34
EHSSB	1996	0	70 (99%)	1 (1%)	0	71
	2001	2 (3%)	68 (97%)	0	0	70
SHSSB	1996	0	1 (4%)	27 (96%)	0	28
	2001	1 (3%)	5 (16%)	26 (81%)	0	32
WHSSB	1996	2 (10%)	2 (10%)	0	17 (80%)	21
	2001	0	2 (6%)	0	33 (94%)	35

- The majority of patients with cancer of the colon and RS junction or rectum were operated on within their own Board of residence in both years.
- If a patient was not operated on in their own Board of residence, the operation most likely took place in the Eastern Board.
- All anal cancer patients who had surgery were operated on within their own Board of residence in both years (not shown).
- For residents of the Southern Board there was a major shift in hospital of operation from Belfast City Hospital to Craigavon Hospital by 2001 (not shown).

Cancer Services Audit 1996 & 2001

Colorectal

Surgery

Patients had three main types of surgery (resection, stoma formation, open and close procedures). Resection includes abdomino-perineal resection, anterior resection, right hemicolectomy, left hemicolectomy, excision of the sigmoid colon and excision of the transverse colon. There were three main types of stoma formation – colostomy, caecostomy and ileostomy. Colostomy can be a temporary or permanent procedure. Open and close surgery was not specified in detail and was recorded simply as “yes” or “no”.

Surgery (NOTE: A patient may have received more than one type of surgery)

Surgery	Number of Patients (% of total patients)			
	Colon & RS Junction		Rectum	
	1996	2001	1996	2001
Resection only	390 (74%)	422 (70%)	67 (35%)	48 (24%)
Resection with stoma	43 (8%)	100 (17%)	79 (42%)	102 (50%)
Stoma formation only	9 (2%)	19 (3%)	9 (5%)	15 (7%)
Open and close	4 (<1%)	20 (3%)	0	0
Other surgery *	14 (3%)	14 (2%)	12 (6%)	5 (2%)

* Includes gynae operations at which colorectal cancer was discovered. NOTE: Stoma may be temporary or permanent

- By 2001, 82% of colorectal cancer patients had a resection (87% of colon & RS junction and 74% rectal). This was similar to 1996 (80%) but represented 93 more patients.
- There were 69% more stomas (temporary or permanent) in 2001 than 1996 with 29% of colorectal cancer patients having a stoma as part of their treatment by 2001 (19% in 1996).
- The number of open and close procedures increased for colon and RS junction patients.

Large bowel surgery

Surgery	Number of Patients (%)			
	Colon & RS Junction		Rectum	
	1996 (n=451)	2001 (n=539)	1996 (n=159)	2001 (n=156)
Abdomino-perineal resection (APER)	4 (<1%)	13 (2%)	51 (32%)	42 (27%)
Anterior resection	54 (12%)	82 (15%)	77 (48%)	95 (61%)
Right hemicolectomy	210 (47%)	215 (40%)	0	0
Left hemicolectomy	51 (11%)	73 (14%)	2 (1%)	0
Sigmoid colectomy	82 (18%)	104 (19%)	3 (2%)	2 (1%)
Transverse colectomy	9 (2%)	13 (2%)	0	0
Endoscopic excision	4 (<1%)	3 (<1%)	10 (6%)	9 (6%)
Rectosigmoidectomy/Hartmanns	11 (2%)	5 (1%)	9 (6%)	1 (<1%)
Other large bowel surgery *	26 (6%)	31 (6%)	7 (4%)	7 (4%)

*Other includes colectomy, bypass procedures and other procedures not specified.

- Anterior resection for rectal carcinomas was more commonly performed in 2001 with a corresponding decrease in Abdomino-perineal resections, with the percentage of APER being comfortably less than 40% in both years, in keeping with current guidelines⁴.
- 86% of patients with cancer of the anus had a stoma formation in 1996 compared with 100% in 2001 (not shown).

Total Mesenteric Excision (TME) confirmed in operative specimen

TME involves careful dissection of the node-bearing mesorectum, and it is recommended for tumours in the lower two thirds of the rectum. Patients who have had TME have been shown to have lower recurrence rates than non-TME patients¹⁷.

Total mesenteric excision (TME)

TME Confirmed in notes	Number of Patients (%)			
	Rectum		RS Junction	
	1996 (n=159)	2001 (n=127)	1996 (n=34)	2001 (n=90)
Yes	29 (18%)	24 (19%)	1 (3%)	18 (20%)
No	25 (16%)	50 (39%)	8 (24%)	31 (34%)
Not Recorded	105 (66%)	53 (42%)	25 (73%)	41 (46%)

- Recording that TME had been performed was similar in both years for patients with cancer of the rectum, but had increased for patients with cancer of the RS junction by 2001. However, as 89% of rectal patients had nodes examined and 38% had between 11-20 nodes examined, it is likely that TME was performed but not recorded in some cases.

Treatment modalities as recorded in notes

'Neo-adjuvant' chemotherapy refers to a preliminary cancer treatment that precedes a necessary second modality of treatment e.g. pre-operative chemotherapy. Adjuvant chemotherapy refers to a cancer treatment following another treatment type e.g. post-operative chemotherapy.

Treatment	Number of Patients (%)			
	Colon & RS Junction		Rectum	
	1996 (n=480)	2001 (n=501)	1996 (n=234)	2001 (n=304)
Surgery alone	265 (55%)	334 (67%)	118 (50%)	126 (41%)
Chemotherapy (adjuvant and neo-adjuvant)	125 (26%)	126 (25%)	54 (23%)	103 (34%)
Radiotherapy* (adjuvant and neo-adjuvant)	*	*	57 (24%)	87 (29%)
Chemotherapy plus Radiotherapy*	*	*	26 (11%)	43 (14%)
No treatment	51 (11%)	26 (5%)	26 (11%)	23 (8%)

Radiotherapy is not generally used for colon cancer.

- Only 11% of patients in 1996 and 6% in 2001 did not have a record of having surgery, chemotherapy or radiotherapy.
- Two thirds of colon cancer patients and 40% of rectal patients had surgery alone in 2001.
- A third of rectal cancer patients had chemotherapy in 2001, an increase from 23% in 1996, while a quarter of colon and RS Junction patients had chemotherapy in both years.
- 33% of all rectal cancer patients had radiotherapy in 2001, showing a very small increase since 1996 (28% (not shown)).
- There was a slight increase in the number of patients with rectal cancer who had a combination of radiotherapy and surgery (10% vs 14%) (not shown).

Cancer Services Audit 1996 & 2001 Colorectal

Chemotherapy (Colon, RS Junction, Rectum & Anus)

Therapy	Number of Patients (%)	
	1996 (n=179)	2001 (n=229)
Adjuvant	76 (42%)	141 (62%)
Neo-adjuvant	3 (2%)	25 (11%)
Not recorded	100 (56%)	63 (28%)

- In 1996, one quarter of patients had chemotherapy which was recorded in 2% of cases as neo-adjuvant. In 2001, almost one third of patients had chemotherapy which was recorded in 11% of cases as neo-adjuvant.
- The number of patients recorded as having adjuvant chemotherapy doubled by 2001.

Patients who did not receive any treatment - TVO assigned stage

(excludes patients with anal cancer)

Dukes stage assigned by TVOs	Number of Patients (%)	
	1996	2001
Dukes A	2 (6%)	4 (6%)
Dukes D*	18 (53%)	35 (49%)
Dukes Stage not recorded	14 (41%)	32 (45%)
Total	34 (5%)	71 (9%)

* Modified Dukes stage

- The patients with Dukes stage A disease who did not have any record of treatment were all over 70 years at the time of diagnosis. Some of these patients refused treatment while others were too ill with co-morbidities for further treatment. Three quarters of patients recorded as Dukes stage A who did not receive treatment were deceased within one month of diagnosis. Some of stage A recorded patients may have been understaged.
- Approximately 50% of patients who did not receive active treatment and for whom a stage was known were Dukes stage D. 83% of the Dukes stage D patients and 72% of those patients for whom a stage was not recorded were deceased within one month of diagnosis.

Frequency of operations

Operator grade	Number of operators (% of total procedures)			
	Colon & RS Junction		Rectum	
	1996	2001	1996	2001
Consultant surgeons *	62 (86%)	63 (86%)	46 (93%)	35 (94%)
Surgeons in training	25 (11%)	21 (12%)	6 (6%)	4 (5%)
Career grade surgeons	2 (<1%)	4 (1%)	0	0
Unknown	2 (2%)	1 (<1%)	1 (<1%)	0
Total operators	91	89	53	39

* Includes Locums

Consultant surgeon workload

Number of Procedures	Number of Surgical Procedures (% of total procedures)			
	Colon & RS junction		Rectum	
	1996	2001	1996	2001
20 or more	1 (6%)	4 (20%)	0	1 (13%)
10 – 19	12 (36%)	13 (36%)	1 (8%)	2 (16%)
5 – 9	24 (42%)	22 (34%)	9 (39%)	11 (46%)
Less than 5	26 (16%)	24 (10%)	37 (53%)	22 (25%)
Total Consultant surgeons	62	63	46	35
Total surgeons in training	25	21	6	4
Total operators	91	89	53	39

- By 2001, there was evidence of specialisation in colorectal cancer surgery especially for rectal patients with 56% of colon & RS junction and 29% of rectal patients operated on by a surgeon undertaking at least 10 of these procedures annually. By 2001, 20% of all colon and RS junction surgery was performed by 4 Consultant surgeons who collectively performed one fifth of all operations carried out in that year. By 2001, one Consultant surgeon performed 13% of all rectal surgery.
- There was a reduction in the number of total operators for colorectal cancer (consultants, trainees and career grades) from 104 in 1996 to 90 in 2001. The number of consultant operators also fell from 77 in 1996 to 65 in 2001. This excludes gastroenterologists who would have removed cancerous polyps during colonoscopy etc.
- There were 48 consultant operators who operated in both years, 29 who operated in 1996 only and 17 who operated in 2001 only. There were 6 surgeons in training who operated in both years, 19 who operated in 1996 only and 15 who operated in 2001 only.
- About 85% of procedures for patients with cancer of the colon and RS junction were carried out by 63 Consultant surgeons in both years.
- Over 90% of procedures for patients with cancer of the rectum were carried out by 46 Consultant surgeons in 1996 and 35 in 2001.
- By 2001, 25% of rectal and 10% of colon & RS junction procedures were being undertaken by operators who performed fewer than 5 operations, a significant improvement from 1996 (53% rectal, 16% colon & RS junction).

Cancer Services Audit 1996 & 2001

Colorectal

TIMELINES/WAITING TIMES

Timelines were examined for the following categories:

- colon and RS junction patients,
- rectum patients,
- colon and RS junction patients excluding emergency presentations and those receiving neo-adjuvant chemotherapy,
- rectum patients excluding emergency presentations and those receiving neo-adjuvant chemotherapy,
- all patients aged under 60 years at the time of diagnosis.
- Colon and RS junction patients who received a sigmoidoscopy and/or CT abdomen.
- Rectum patients who received a sigmoidoscopy and/or CT abdomen.

Colon & RS Junction - Timelines

Time	Number of Patients (%)					
	Referral - First seen at hospital		First seen - Diagnosis		Diagnosis - Surgery	
	1996	2001	1996	2001	1996	2001
Same day	172 (33%)	233 (39%)	62 (12%)	19 (3%)	208 (45%)	371 (68%)
1 – 14 days	110 (21%)	116 (19%)	145 (28%)	196 (33%)	195 (42%)	80 (15%)
15 – 42 days	91 (17%)	139 (23%)	128 (24%)	168 (28%)	46 (10%)	75 (14%)
43 – 84 days	39 (7%)	65 (11%)	76 (15%)	103 (17%)	5 (1%)	16 (3%)
More than 84 days	25 (5%)	32 (5%)	60 (11%)	109 (18%)	6 (1%)	3 (<1%)
Minus values*	19 (4%)	1 (<1%)	27 (5%)	0	2 (<1%)	1 (<1%)
Not recorded	68 (13%)	16 (3%)	26 (5%)	7 (1%)	1 (<1%)	0
Total	524	602	524	602	463	546

* Diagnosis was made prior to hospital visit.

Colon and RS Junction (Including Emergencies)

- Between 1996 and 2001, the percentage of patients seen within two weeks of referral was similar but this represented more patients in 2001. The percentage of patients having their diagnosis confirmed within two weeks of presentation to hospital was similar.
- The percentage of patients having surgery within 42 days of diagnosis remained steady at 97% in both years. The percentage of patients having surgery within 4 weeks of diagnosis was around 85% in both years, in keeping with current guidelines⁴.
- The slight reduction in patients having surgery within two weeks of diagnosis likely reflects increased investigations and also use of neo-adjuvant treatment prior to surgery.

Colon and RS Junction - Timelines excluding emergencies and those who received neo-adjuvant chemotherapy which would delay surgery

Time	Number of Patients (%)					
	Referral - First seen at hospital		First seen - Diagnosis		Diagnosis - Surgery	
	1996	2001	1996	2001	1996	2001
Same day	4 (7%)	14 (8%)	6 (10%)	6 (4%)	21 (39%)	91 (57%)
1 – 14 days	18 (30%)	39 (23%)	17 (28%)	38 (22%)	25 (46%)	33 (20%)
15 – 42 days	17 (28%)	63 (37%)	16 (26%)	35 (21%)	4 (7%)	25 (15%)
43 – 84 days	3 (5%)	31 (18%)	12 (20%)	43 (25%)	0	6 (3%)
More than 84 days	5 (8%)	14 (8%)	3 (5%)	44 (26%)	0	0
Minus values*	0	1 (<1%)	2 (3%)	0	0	0
Not recorded	14 (23%)	7 (4%)	5 (8%)	3 (2%)	4 (7%)	7 (4%)
Total Patients	61	169	61	169	54	162

* *Diagnosis was made prior to hospital visit.*

Colon and RS Junction (Excluding Emergencies and patients receiving neo-adjuvant chemotherapy)

- Between 1996 and 2001, although the percentage decreased, the actual number of patients seen within two weeks of referral increased, reflecting increase in workload.
- Similarly, the actual number of patients having their diagnosis confirmed within two weeks of surgery increased as did the actual number having surgery within 42 days from diagnosis.
- The percentage of patients having surgery within four weeks remained steady at 80% in both years.

Rectal - Timelines

Time	Number of Patients (%)					
	Referral - First seen at hospital		First seen - Diagnosis		Diagnosis - Surgery	
	1996	2001	1996	2001	1996	2001
Same day	73 (38%)	34 (17%)	27 (14%)	16 (8%)	41 (25%)	40 (23%)
1 – 14 days	36 (19%)	49 (24%)	65 (34%)	94 (46%)	74 (45%)	27 (16%)
15 – 42 days	31 (16%)	65 (32%)	40 (21%)	52 (26%)	43 (26%)	61 (36%)
43 – 84 days	14 (7%)	29 (14%)	28 (15%)	26 (13%)	4 (2%)	27 (16%)
More than 84 days	8 (4%)	15 (7%)	17 (9%)	12 (6%)	2 (1%)	16 (9%)
Minus values*	2 (1%)	0	1 (2%)	0	0	0
Not recorded	26 (14%)	11 (5%)	12 (6%)	3 (1%)	0	0
Total Patients	190	203	190	203	164	171

* *Diagnosis was made prior to hospital visit.*

Cancer Services Audit 1996 & 2001 Colorectal

Rectum (Including Emergencies)

- Between 1996 and 2001, the percentage of patients seen within two weeks of referral decreased from 58% to 41%. This may reflect the lower proportion presenting as emergencies. The percentage of patients having their diagnosis confirmed within two weeks of presentation to hospital increased from 49% to 54%.
- In 2001, the percentage of patients having surgery within 42 days from diagnosis decreased from 96% in 1996 to 75% in 2001. This is likely to reflect increased use of newer diagnostic techniques and also neo-adjuvant therapy.

Rectal - Timelines excluding emergencies and those who received neo-adjuvant chemotherapy which would delay surgery

Time	Number of Patients (%)					
	Referral - First seen at hospital		First seen - Diagnosis		Diagnosis - Surgery	
	1996	2001	1996	2001	1996	2001
Same day	3 (10%)	3 (6%)	1 (3%)	2 (4%)	10 (37%)	14 (31%)
1 – 14 days	6 (21%)	13 (25%)	9 (31%)	21 (41%)	10 (37%)	10 (22%)
15 – 42 days	10 (34%)	21 (41%)	4 (14%)	12 (24%)	7 (26%)	18 (40%)
43 – 84 days	5 (17%)	8 (16%)	5 (17%)	13 (25%)	0	3 (8%)
More than 84 days	1 (3%)	3 (6%)	5 (17%)	3 (6%)	0	0
Minus values*	0	0	1 (3%)	0	0	0
Not recorded	4 (14%)	3 (6%)	4 (14%)	0	0	0
Total Patients	29	51	29	51	27	45

* *Diagnosis was made prior to hospital visit.*

Rectum (Excluding emergencies and patients receiving neo-adjuvant chemotherapy)

- Between 1996 and 2001, the percentage of patients seen within two weeks of referral remained steady at 31% over both years. The percentage having their diagnosis confirmed within two weeks of presentation to hospital increased (38% to 45%).
- The percentage of patients having their elective surgery within 42 days from diagnosis decreased slightly from 100% in 1996 to 89% in 2001.

Timelines for patients under 60 years do not differ significantly from those for all patients for colon and RS junction or rectal cancer patients (not shown).

Colon & RS Junction - Waiting times for patients who received a Sigmoidoscopy and/or a CT abdomen

Time	Number of Patients (%)			
	Referral – Sigmoidoscopy		Referral – CT abdomen	
	1996	2001	1996	2001
Same day	16 (7%)	6 (3%)	3 (4%)	6 (3%)
1 – 14 days	65 (30%)	63 (28%)	11 (13%)	57 (27%)
15 – 42 days	44 (21%)	60 (27%)	18 (22%)	49 (23%)
43 – 84 days	28 (13%)	34 (15%)	11 (13%)	39 (18%)
More than 84 days	19 (9%)	53 (24%)	20 (24%)	54 (25%)
Minus values*	14 (6%)	1 (<1%)	8 (10%)	0
Not recorded	32 (15%)	7 (3%)	12 (14%)	10 (5%)
Total	218	224	83	215

* Investigation was performed prior to referral for colorectal cancer

Rectum – Waiting times for patients who received a Sigmoidoscopy and/or a CT abdomen

Time	Number of Patients (%)			
	Referral – Sigmoidoscopy		Referral – CT abdomen	
	1996	2001	1996	2001
Same day	5 (3%)	3 (2%)	0	2 (1%)
1 – 14 days	44 (29%)	44 (29%)	8 (20%)	22 (16%)
15 – 42 days	47 (31%)	49 (32%)	14 (35%)	44 (33%)
43 – 84 days	20 (13%)	30 (20%)	7 (18%)	35 (26%)
More than 84 days	14 (9%)	18 (12%)	5 (13%)	22 (16%)
Minus values*	4 (3%)	0	4 (10%)	0
Not recorded	16 (11%)	7 (5%)	2 (5%)	9 (7%)
Total	150	151	40	134

* Investigation was performed prior to referral for colorectal cancer

- There was little difference in the numbers of colon and RS junction patients who received a sigmoidoscopy within two weeks of referral (37% in 1996, 31% in 2001).
- Despite a threefold increase in the number of patients having CT abdomen, more patients and a higher proportion (30%) of colon and RS Junction patients had a CT abdomen within two weeks of referral by 2001.
- There was no difference between 1996 and 2001 for rectal cancer patients in the time they waited for either a sigmoidoscopy and/or a CT abdomen.

Cancer Services Audit 1996 & 2001 Colorectal

Information recorded in notes

Information	Number of Patients (%)	
	1996 (n=725)	2001 (n=815)
Diagnosis discussed with patient	352 (49%)	599 (73%)
Treatment plan discussed with patient	350 (48%)	572 (70%)
Written information given	7 (<1%)	31 (4%)
Consultation taped	1 (<1%)	6 (<1%)
Referred to oncology centre	298 (41%)	482 (59%)
Management discussed with oncologist	364 (50%)	570 (70%)
Seen by stoma therapist	94 (13%)	193 (24%)
Psycho-social needs considered	289 (40%)	700 (86%)
Clinical trial discussed with patient	82 (11%)	9 (1%)
Clinical trial recorded in notes	82 (11%)	7 (<1%)
Multidisciplinary case conference	2 (<1%)	171 (21%)
Multidisciplinary treatment plan recorded	1 (<1%)	280 (34%)

- Almost three quarters of patients in 2001 had a record of discussion of diagnosis and treatment plans in the notes, an increase compared with 1996.
- By 2001, the number of patients referred to oncology increased to 59% (41% in 1996) and patient management was more likely to be discussed with oncologists (50% in 1996 to 70% in 2001).
- The discussion of patient cases at multidisciplinary meetings greatly improved, yet by 2001, only about a fifth of cases were recorded as having been discussed at these meetings.
- The recording of multidisciplinary treatment plans also greatly improved, yet was available for only a third of patients.
- The provision of written information or recording of interviews was rarely recorded in notes.
- The number of patients entered into clinical trials fell between 1996 (11%) and 2001 (less than 1%). This may reflect availability of suitable clinical trials. While most hospitals participated in trials in 1996, in contrast, by 2001 there were only 5 hospitals where patients were entered into clinical trials (Royal Victoria, Belfast City, Causeway, Lagan Valley and Whiteabbey).
- Referral to a stoma therapist increased. 67% of patients in 1996 and 82% in 2001 who underwent a stoma formation were referred to a stoma therapist (not shown).

FOLLOW-UP CARE DETAILS

This relates to information recorded in the discharge letter from hospital to GP.

After care (NOTE: Patients may have had more than one referral)

After Care	Number of Patients (%)	
	1996 (n=725)	2001 (n=815)
General Practitioner (GP)	49 (7%)	351 (43%)
Community nurse	21 (3%)	183 (22%)
Macmillan nurse	34 (5%)	78 (10%)
Hospice	25 (3%)	26 (3%)
Marie Curie nurse	15 (2%)	13 (2%)
Palliative care specialist	21 (3%)	372 (46%)
Psychologist referral	5 (<1%)	15 (2%)
Info on support groups/education supplied	1 (<1%)	5 (<1%)
Dietician referral	0	7 (<1%)
No onward referral recorded	91 (13%)	36 (4%)

- The most dramatic recorded increase was in referral to palliative care specialists (3% in 1996 to 46% in 2001) with a doubling in referrals to Macmillan nurses to 10%, reflecting increased availability of these services.
- Referrals to Hospices and Marie Curie nurses remained steady at around 3% and 2% respectively.

Information in GP letter

Information	Number of Patients (%)	
	1996 (n=725)	2001 (n=815)
Management plan	557 (77%)	730 (90%)
Prognosis	273 (38%)	675 (83%)
Diagnosis discussed with patient	187 (26%)	420 (52%)
Diagnosis discussed with family	127 (18%)	224 (27%)
Diagnosis not discussed with patient	66 (9%)	34 (4%)

- Overall, information to the GP greatly improved especially regarding the inclusion of information on prognosis which by 2001 was included in 83% of notes while 90% had a management plan.
- By 2001, only half of GP letters included information on whether the diagnosis had been discussed with the patient.

Cancer Services Audit 1996 & 2001

Colorectal

PATIENT OUTCOMES

Surgery outcomes

Outcomes	Number of Patients (%)			
	Colon & RS Junction		Rectum	
	1996 (n=463)	2001 (n=546)	1996 (n=164)	2001 (n=171)
Anastomatic leak	13 (3%)	20 (4%)	4 (2%)	9 (5%)
Significant wound complication	20 (4%)	48 (9%)	16 (10%)	18 (11%)

- Only small numbers of patients had anastomatic leaks or significant wound complications recorded in the clinical notes, with no significant difference between the years.

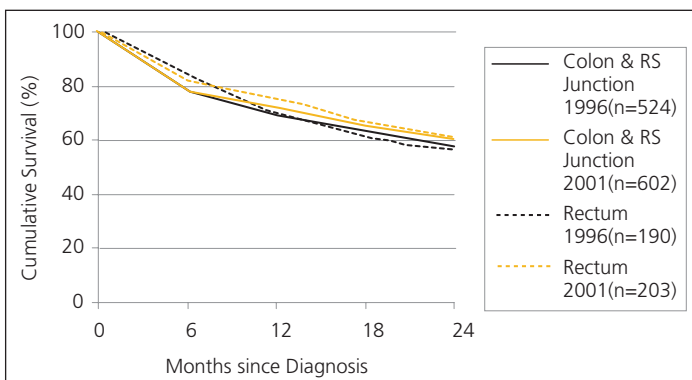
Survival

Survival analysis was performed on patients diagnosed in 1996 and 2001 with sub-group analysis for surgery and non surgery patients and for stage.

Percentage of patients alive at various times after diagnosis

Time since Diagnosis	Colon & RS Junction		Rectum		All Patients (Colon, RS Junction, Rectum & Anus)	
	1996	2001	1996	2001	1996	2001
30 days	90%	91%	95%	96%	92%	92%
60 days	87%	88%	91%	91%	88%	89%
6 months	78%	78%	83%	82%	80%	79%
1 year	69%	72%	69%	75%	70%	73%
2 years	58%	60%	56%	61%	58%	61%
Total Patients	524	602	190	203	725	815

Colon, RS Junction & Rectum cancer observed survival by year (1996 & 2001)



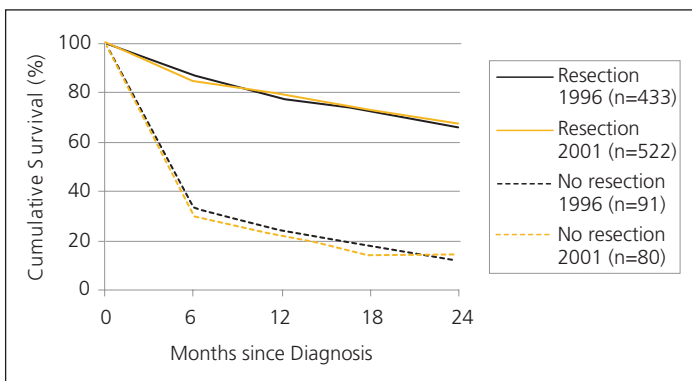
- There was no significant difference in the overall observed survival of patients with cancer of the colon or RS junction in each year ($p > 0.05$). The same was true for patients with cancer of the rectum ($p > 0.05$).

RESECTION VS NO RESECTION

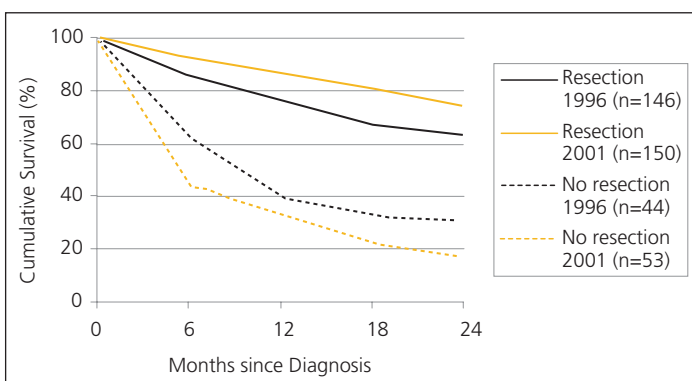
Percentage of patients alive at various times after diagnosis

Time since Diagnosis	Colon & RS Junction				Rectum			
	Resection patients		Non surgery patients		Resection patients		Non surgery patients	
	1996	2001	1996	2001	1996	2001	1996	2001
30 days	95%	94%	63%	69%	95%	98%	89%	87%
60 days	93%	92%	52%	55%	93%	96%	79%	73%
6 months	87%	85%	33%	30%	87%	93%	63%	44%
1 year	78%	79%	24%	22%	77%	87%	39%	34%
2 years	66%	67%	12%	14%	63%	74%	31%	17%
Total Patients	433	522	91	80	146	150	44	53

Colon & RS Junction cancer observed survival for resection vs no resection (1996 & 2001)



Rectal cancer observed survival for resection vs no resection (1996 & 2001)



- As expected survival for patients undergoing potentially curative resections was significantly better than non resection patients, reflecting appropriate patient selection.
- There was no difference in survival between 1996 and 2001 for resection patients and non resection patients alike.
- Rectal cancer patients with resections appear to have improved survival in 2001 compared with 1996. This however, did not reach statistical significance ($p > 0.05$).

Cancer Services Audit 1996 & 2001

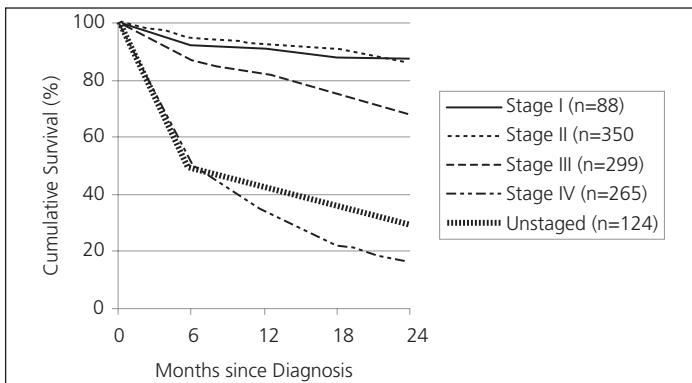
Colorectal

Colon and RS Junction - Percentage of patients alive at various times after diagnosis by disease stage (1996 & 2001)

Year	Time	Stage I	Stage II	Stage III	Stage IV	Unstaged	All Patients
1996	30 days	91%	97%	93%	84%	75%	90%
	60 days	90%	96%	92%	78%	65%	87%
	6 months	89%	95%	90%	51%	54%	78%
	1 year	88%	92%	86%	31%	44%	69%
	2 years	86%	83%	68%	15%	32%	58%
	Total Patients	36	180	108	133	67	524
2001	30 days	96%	97%	95%	85%	68%	91%
	60 days	95%	97%	91%	79%	57%	88%
	6 months	94%	95%	85%	51%	45%	78%
	1 year	91%	93%	80%	37%	40%	72%
	2 years	86%	88%	68%	17%	26%	60%
	Total Patients	52	170	191	132	57	602

- Overall observed 2-year survival was about 60% in both years with no change between 1996 and 2001 for any single stage.

Colon & RS Junction observed survival by stage (both years combined)

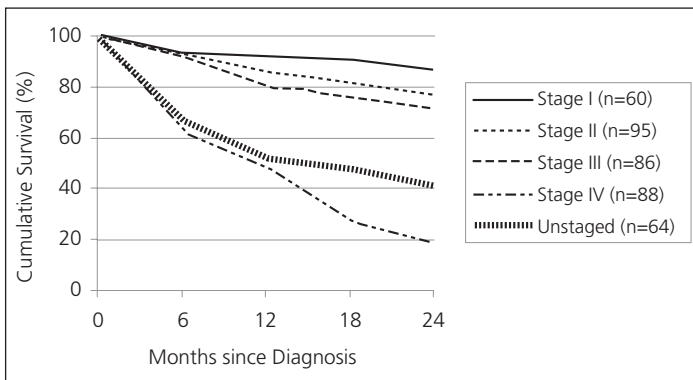


- As expected there was a highly significant difference in observed survival for stage at diagnosis ($p < 0.001$), with earlier stage generally having better survival.

Rectal - Percentage of patients alive at various times after diagnosis by disease stage (1996 & 2001)

Year	Time	Stage I	Stage II	Stage III	Stage IV	Unstaged	All Patients
1996	30 days	100%	95%	94%	91%	92%	95%
	60 days	99%	94%	93%	81%	85%	91%
	6 months	96%	92%	88%	63%	66%	83%
	1 year	95%	85%	72%	42%	51%	69%
	2 years	95%	74%	56%	21%	48%	56%
	Total Patients	24	54	39	46	27	190
2001	30 days	100%	97%	97%	91%	91%	97%
	60 days	94%	92%	96%	79%	86%	91%
	6 months	88%	91%	93%	61%	66%	82%
	1 year	87%	86%	86%	54%	52%	75%
	2 years	83%	81%	81%	16%	36%	61%
	Total Patients	36	41	47	42	37	203

Rectum observed survival by stage (both years combined)



- There was a significant improvement in survival for Stage III patients ($p < 0.05$) in 2001 compared to 1996. This may in part be due to a stage migration due to improved lymph node resection identifying a higher proportion of stage III patients.

COLORECTAL CANCER SUMMARY

Presentation

- Over 80% of all diagnosed colorectal cancer cases in both years came from GP referrals with 60% arriving via outpatients.
- For all patients with colorectal cancer, the majority presented to a hospital within their own Board of residence. This pattern changed little between 1996 and 2001.
- 39% of colon and RS junction cancers and 16% of rectal cancers presented as emergencies.

Colon & RS junction

- 524 patients with cancer of the colon or rectosigmoid (RS) junction presented to 24 hospitals in 1996 and 602 patients presented to 19 hospitals in 2001. Excluding emergencies the pattern was the same.
- By 2001, 60% of colon and RS junction patients presented to a Cancer Unit/Centre.

Rectum

- 190 patients with cancer of the rectum presented to 23 hospitals in 1996 and 203 patients presented to 22 hospitals in 2001. Excluding emergencies the pattern was the same.
- Just over 50% of rectal cancer patients presented to a Cancer Unit/Centre in 2001.

Anus

- 11 patients with cancer of the anus presented to 9 hospitals in 1996 and 10 patients presented to 5 hospitals in 2001.
- In 2001, 70% of patients with cancer of the anus presented to a Cancer Unit/Centre.
- All of the anal cancer patients presented to a hospital in their own Board of residence in both 1996 and 2001.

Co-morbidity/Risk factors

- 9% of patients had a record of a chronic non malignant bowel disease.
- 11% of patients had a personal history of other malignancy (8% if non melanoma skin cancers are excluded).
- 13% of patients had a recorded family history of colorectal cancer.

Symptoms and Signs

- Over one third (37%) of colon cancer patients and 80% of rectal cancer patients had rectal bleeding.
- About one in eight (13%) of colon and RS junction cancer patients and 2% of rectal patients were recorded as presenting with obstructed/perforated bowel.
- The proportion of rectal cancer patients recorded as presenting with diarrhoea fell from 47% in 1996 to 33% in 2001.
- Of those who had rectal bleeding, at least 21% of rectal patients and 25% of colon and RS junction patients had this symptom for over 6 months. This was similar in both years.
- Of those who had altered bowel habit, at least 25% of rectal patients and 17% of colon and RS junction patients had this symptom for over 6 months. This was similar in both years.

Investigations

- By 2001, patients with colorectal cancer were more likely to have a colonoscopy (34% colon and RS junction, 30% rectal) and/or a CT scan of the abdomen (36% colon and RS junction, 66% rectal).
- By 2001, use of Endorectal Ultrasound had increased for rectal cancer patients to 11%.
- In 1996 and 2001 patients 80 years and over with colon and RS Junction or rectal cancer had similar investigations to those 79 years and under ($p>0.05$).

Histopathology

- A high percentage of colorectal cancer included in this study had a histological diagnosis in both 1996 and 2001 with the majority adenocarcinomas.

Staging and Nodal Involvement

- By 2001, recording of Dukes stage in clinical notes had increased to 77% for colon and RS junction (59% in 1996) and to 62% for rectal cancers (58% in 1996).
- By 2001, recording of TNM stage in the clinical notes had increased to 14% for colon and RS junction (1% in 1996) and 7% for rectal cancers (1% in 1996).
- 6% of all colorectal patients in 1996 and 8% in 2001 had neither TNM or Dukes stage recorded in the notes.
- The increase in percentage of node positive cancers (Dukes C) reflects improved lymph node resection.
- Using information available in the notes it was possible to assign a Dukes stage to about 90% of colon and RS junction cancers and 84% of rectal cancers in both years.
- The percentage of patients with cancer of the colon, RS junction and rectum for whom it was possible to determine stage increased between 1996 and 2001 in all Boards (except EHSSB and WHSSB for rectum only), with the most marked improvement evident for residents of the Northern Board.
- Staging in the Western Board for rectal cancers was the best for all Boards in both years.
- The percentage of colorectal resection patients with nodes examined increased (83% in 1996, 93% in 2001).

Recording of Multidisciplinary Team Meetings

- Recording in the clinical notes that discussion at an MDM had taken place improved from less than 1% for all patients in 1996 to 18% for colon and RS junction and 31% for rectal patients in 2001.
- In 1996, a record of MDMs having taken place was found in the clinical notes from only two hospitals (Coleraine/Causeway and Daisy Hill). By 2001, this had improved with the notes from 9 additional hospitals (Altnagelvin, Antrim, Belfast City, Lagan Valley, Mater, Royal Victoria, Tyrone County, Ulster and Whiteabbey hospitals) containing evidence of MDMs taking place.
- In one Cancer Unit, Craigavon, there was no evidence of multidisciplinary team meetings having taken place in either year.

Surgery

- In 1996, 463 surgical procedures for colon and RS junction cancer were carried out in 18 hospitals, while in 2001, 546 operations were performed in 16 hospitals.
- In 1996, 164 surgical procedures for rectal cancer were carried out in 18 hospitals, while in 2001, 171 operations were performed in 14 hospitals.

Cancer Services Audit 1996 & 2001

Colorectal Summary

- Seven operations in 1996 and three in 2001 were carried out on patients with cancer of the anus.
- By 2001, 82% of colorectal cancer patients had a resection (87% colon & RS Junction and 74% rectal patients). This was similar to 1996 (80%) but represented 93 more patients.
- There were 69% more stomas in 2001 than 1996 with 29% having a stoma as part of their treatment by 2001 (19% in 1996).
- The number of open and close procedures increased for colon and RS Junction patients.
- Two thirds of colon and RS junction cancer patients had surgery alone in 2001.

Hospital of Surgery

- By 2001, 65% of colon and RS junction cancer surgery and 68% of rectal cancer surgery was performed in the Cancer Centre or Cancer Units.
- 25% of all colorectal patients in 1996 and 13% in 2001 attended Belvoir Park Hospital (Northern Ireland Radiotherapy Centre).
- For residents of the Northern Board there was a shift in the main hospital of treatment from the Royal Victoria to Antrim.
- For patients residing in the Eastern Board, fewer main hospitals performed surgery in 2001. The Royal Victoria, Ulster and Lagan Valley hospitals all saw an increase in surgery by 2001 while levels of surgery for colorectal cancer in Belfast City Hospital had decreased.
- For residents of the Southern Board there was a major shift from Belfast City Hospital to Craigavon Hospital by 2001.
- The most marked evidence of service reorganisation within a Board was for rectal cancer operations in the Western Board where there was a four fold increase in the number of procedures performed in Altnagelvin with a reduction in operations performed in other Western Board hospitals.

Surgeon Workload

- By 2001, there was evidence of specialisation in colorectal cancer surgery especially for rectal patients with 56% of colon & RS junction and 29% of rectal patients operated on by a surgeon undertaking at least 10 of these procedures annually. By 2001, 20% of all colon and RS junction surgery was performed by 4 Consultant surgeons who collectively performed one fifth of all operations carried out in that year. By 2001, one Consultant surgeon performed 13% of all rectal surgery.
- There was a reduction in the number of total operators for colorectal cancer (consultants, trainees and career grades) from 104 in 1996 to 90 in 2001. The number of consultant operators also fell from 77 in 1996 to 65 in 2001. This excludes gastroenterologists who would have removed cancerous polyps during colonoscopy etc.
- There were 48 consultant operators who operated in both years, 29 who operated in 1996 only and 17 who operated in 2001 only. There were 6 surgeons in training who operated in both years, 19 who operated in 1996 only and 15 who operated in 2001 only.
- About 85% of procedures for patients with cancer of the colon and RS junction were carried out by 63 Consultant surgeons in both years.
- Over 90% of procedures for patients with cancer of the rectum were carried out by 46 Consultant surgeons in 1996 and 35 in 2001.
- By 2001, 25% of rectal and 10% of colon & RS junction procedures were being undertaken by operators who performed fewer than 5 operations, a significant improvement from 1996 (53% rectal, 16% colon & RS junction).

Centre Workload

- In 1996, more colorectal cancer operations were performed in the Royal Victoria Hospital than any other hospital, while by 2001, more operations were carried out in the Ulster Hospital.
- The majority of patients with cancer of the colon and RS junction or rectum were operated on within their own Board of residence in both years.
- All anal cancer patients who had surgery were operated on within their own Board of residence in both years.

Oncology

- Only 11% of patients in 1996 and 6% in 2001 did not have a record of having surgery, chemotherapy or radiotherapy.
- One quarter of colon and RS junction cancer patients had chemotherapy in both years.
- 33% of all rectal cancer patients had radiotherapy in 2001, showing a very small increase since 1996 (28%).
- There was a slight increase in the number of patients with rectal cancer who had a combination of radiotherapy and surgery (10% vs 14%).
- Use of chemotherapy and/or radiotherapy for rectal and RS junction cancer patients increased by 2001.

Timelines

Colon and RS Junction patients

- Between 1996 and 2001, the percentage of patients seen within two weeks of referral was similar but this represented more patients in 2001.
- The percentage of all patients having their diagnosis confirmed within two weeks of presentation to hospital decreased from 47% to 36% although the number of patients were similar. Excluding emergencies, more patients had their diagnosis confirmed within two weeks of presentation.
- In 2001, the percentage of patients having surgery within 42 days from diagnosis remained steady at 97% in both years while a reduction in patients having surgery within two weeks of diagnosis likely reflects increased investigations and also use of neo-adjuvant treatment prior to surgery.

Rectal patients

- Between 1996 and 2001, the percentage of patients seen within two weeks of referral decreased from 58% to 41%. This may reflect the lower proportion presenting as emergencies.
- The percentage of patients having their diagnosis confirmed within two weeks of presentation to hospital increased from 49% to 54%.
- In 2001, the percentage of rectal cancer patients having surgery within 42 days from diagnosis decreased from 96% in 1996 to 75% in 2001. This is likely to reflect increased use of newer diagnostic facilities and also neo-adjuvant therapy.

Age and Investigations

- Timelines for patients under 60 years do not differ significantly from those for all patients for colon and RS junction or rectal cancer patients.
- There was no difference in the numbers of colon and RS junction or rectal patients who received sigmoidoscopies within two weeks of referral in both years.

Cancer Services Audit 1996 & 2001

Colorectal Summary

- Despite a threefold increase in the number of patients having CT abdomen, more patients and a higher proportion (30%) of colon and RS Junction patients had a CT abdomen within two weeks of referral by 2001.

Onward Referral

- The most dramatic recorded increase was in referral to Palliative care specialists (3% in 1996 to 46% in 2001) reflecting increased availability of these services.
- Referrals to Hospices and Marie Curie nurses remained steady at around 3% and 2% respectively.

Communication

- Almost three quarters of patients in 2001 had a record of discussion of diagnosis and treatment plans in the notes, an increase compared with 1996.
- By 2001, the number of patients referred to oncology increased to 59% (41% in 1996) and patient management was more likely to be discussed with oncologists (50% in 1996 to 70% in 2001).
- The discussion of patient cases at multidisciplinary meetings greatly improved, yet by 2001, only about a fifth of cases were recorded as having been discussed at these meetings.
- The recording of treatment plans also greatly improved, yet was available for only a third of patients.
- The provision of written information or recording of interviews was rarely recorded in notes.
- The number of patients entered into clinical trials fell between 1996 (11%) and 2001 (less than 1%). This may reflect availability of suitable clinical trials. While most hospitals participated in trials in 1996, in contrast, by 2001 there were only 5 hospitals where patients were entered into clinical trials (Royal Victoria, Belfast City, Causeway, Lagan Valley and Whiteabbey).
- Referral to a stoma therapist increased. 67% of patients in 1996 and 82% in 2001 who underwent a stoma formation were referred to a stoma therapist.
- Overall information to the GP greatly improved especially regarding the inclusion of information on prognosis which by 2001 was included in 83% of notes while 90% had a management plan.
- By 2001, only half of GP letters included information on whether the diagnosis had been discussed with the patient.

Outcomes

- Survival from colorectal cancer was similar in both years with approximately 60% observed survival at two years.
- There was no significant difference in the overall observed survival of patients with cancer of the colon or RS junction in each year ($p>0.05$). The same was true for patients with cancer of the rectum ($p>0.05$).
- As expected survival for patients undergoing potentially curative resections was significantly better than non resection patients, reflecting appropriate patient selection.
- There was no difference in survival between 1996 and 2001 for resection patients and non resection patients alike.
- Rectal cancer patients with resections appear to have improved survival in 2001 compared with 1996. This however, did not reach statistical significance ($p>0.05$).
- As expected there was a highly significant difference in observed survival for stage at diagnosis ($p<0.001$), with earlier stage generally having better survival.

CONCLUSION, KEY ISSUES & RECOMMENDATIONS

By 2001, the following improvements were apparent:

- Better initial and intra-operative staging for colorectal cancer.
- More patients were being operated on by surgeons with a workload of over 20 patients per year.
- Recording of MDM discussion, treatment plan, stage and discussion of diagnosis with the patient had improved, but further improvement is necessary in this area.
- Figures indicated that by 2001, the process of specialisation in colon cancer surgery had progressed slightly.
- Figures indicated that by 2001, there had been some specialisation of rectal cancer services.

Key Issues

- The high rate of emergency presentations poses challenges for service providers.
- There is a need to improve recording of stage related information.
- Discussion of patients and the recording of such at multidisciplinary team meetings needs to be improved. This will need additional resources.
- While there was evidence of specialisation, further work in this area needs to be done.
- Fewer patients were entered into clinical trials.
- While referrals to stoma therapists improved, a fifth of stoma patients in 2001 had no such referral.

Recommendations

- Some patients had serious symptoms for over one year. This points to the need to raise awareness of symptoms among the population.
- The number of operators and hospitals treating colorectal cancer is too high. There needs to be more specialisation.
- Retrospective note review is dependent on the completeness and accuracy of data in the notes. Efforts should be made to increase availability of data collected prospectively.

REFERENCES

1. Campbell Report. 'Cancer Services – Investing for the Future'. Department of Health and Social Services, 1996.
2. *Cancer Services – Investing for the Future – Cancer Working Group Sub-Group Reports*. Department of Health and Social Services, 1996.
3. NHS Improving Outcomes. 'Guidance on Commissioning Cancer Services – Improving Outcomes in Colorectal Cancer – The Research Evidence'. NHS Executive, 1997. Available at www.nice.org.uk/pdf/CSGCC_Research_evidence.pdf
4. *Guidelines for the Management of Colorectal Cancer*. Issued by the Association of Coloproctology of Great Britain and Ireland, 2001.
5. Cancer Research Campaign. *CancerStats: Large Bowel – UK*. November 1999.
6. Fernandez, E, Gallus, S, La Vecchia, C, Talamini, R, Negri, E, Franceschi, S. *Family History and Environmental Risk Factors for Colon Cancer*. *Cancer Epidemiology Biomarkers & Prevention* 2004; Vol 13: 658–661.
7. Riboli, E et al. *Meat, Fish and Colorectal Cancer Risk: The European Prospective Investigation into Cancer and Nutrition (EPIC)*. *Journal of the National Cancer Institute* 2005; Vol 97: No. 12, 906 – 916.
8. Bingham, S.A., Day, N.E., Luben, R., Ferrari, P., Slimani, N. et al. *Dietary fibre in food and protection against colorectal cancer in the European Prospective Investigation into Cancer and Nutrition (EPIC): an observational study*. *Lancet* 2003; 361 (9368): 1487-8.
9. Hou, L., Ji, B.T., Blair, A., Dal, Q., Gao, Y.T. & Chav, W.H. *Commuting physical activity and risk of colon cancer in Shanghai, China*. *American Journal of Epidemiology* 2004; 160: 860-867.
10. Chlebowski, R.T., Wactawski - Wiende, T., Ritenbaugh, C., Hubbell, F.A., Ascensao, T., Rodabaugh, R.J. *Estrogen plus progestin and Colorectal cancer in Post-menopausal women*. *The New England Journal of Medicine* 2004; 350: 10; 991-1004.
11. Peleg, I, Maibach, H.T, Brown, S.H et al. *Aspirin and Non-steroidal Anti-inflammatory Drug use and the Risk of Subsequent Colorectal Cancer*. *Archives of International Medicine* 1994; 154: 394-399.
12. Stryker, S.J, Wolff, B.G, Culp, C.E. *Natural History of Untreated Colonic Polyps*. *Gastroenterology* 1987; Nov 93 (5): 1009-13.
13. Fitzpatrick D, Gavin A, Middleton R, Catney D. 'Cancer in Northern Ireland 1993-2001: A Comprehensive Report'. N. Ireland Cancer Registry, Belfast, 2004. Available at www.qub.ac.uk/nicr
14. Thompson W.G, Heaton, K.W. *Functional Bowel Disorders in Apparently Healthy People*. Department of Medicine, Bristol Royal Infirmary, University of Bristol, England and Ottawa Civic Hospital, University of Ottawa, Ottawa, Canada. *Gastroenterology* 1980; 79: 283-288.
15. Greene, F.L, Page, D.L, Fleming, I.D, Fritz, A.G, Balch, C.M, Haller, D.G, Morrow, M. *AJCC Cancer Staging Handbook TNM Classification of Malignant Tumours*. 6th Edition, New York: Springer-Verlag, 2002.
16. Voyer, T.E., Sigurdson, E.R., Hanlon, A.L., Mayer, R.J., Macdonald, P.J. & Haller, D.G. *Colon Cancer Survival is associated with increasing number of lymph nodes analyzed: A Secondary Survey of Intergroup Trial INT - 0089*. *Journal of Clinical Oncology* 2003; Vol 21: No. 15: 2912-2919.
17. Brigham and Women's Hospital webpage. *The TME Procedure*. Available at www.slp3d2.com/brw_1065/broadcast_post.cfm

APPENDIX A

Campbell Report¹: Recommendations regarding Cancer Services in Northern Ireland, 1996

1. The management of patients with cancer should be undertaken by appropriately trained, organ and disease specific medical specialists.
2. All patients with cancer should be managed by multidisciplinary, multiprofessional specialist cancer teams.
3. A Cancer Forum should be established involving all key interests in the delivery of cancer services.
4. Cancer Units should, in conjunction with local GPs and other providers, develop an effective communication strategy.
5. Northern Ireland should have one Cancer Centre, which in addition to its regional role, should act as a Cancer Unit to its local catchment population of around half a million.
6. There should be four other Cancer Units, one in each Board area, each serving a population of around a quarter of a million.
7. Radiotherapy services, together with chemotherapy services, should be moved as soon as possible to the Belfast City Hospital and become an integral part of the regional Cancer Centre.
8. Each Cancer Unit should develop a chemotherapy service. This service should be staffed by designated specialist nurses and pharmacists, and should be overseen by the non-surgical oncologist attached to the unit, with back-up from a haematologist.
9. There should be a minimum target of 13 consultants in non-surgical oncology for Northern Ireland by 2005.
10. Any new appointments of trained cancer specialists should be to Cancer Units or to the Cancer Centre.
11. Guidelines should be drawn up and agreed for the appropriate investigation and management of patients presenting to non-Cancer Unit hospitals, who turn out to have cancer.
12. The Cancer Centre and Cancer Units should each develop a specialist multiprofessional palliative care team.
13. There should be a comprehensive review of palliative care services in Northern Ireland.
14. The Northern Ireland Cancer Registry should be adequately resourced.

The above recommendations outlined the change that was necessary to improve cancer care.

APPENDIX B

NHS Improving Outcomes in Colorectal Cancer³, 1997. (Summary recommendations in specific topic areas).

1. Patient-centred Care

- At every stage, patients and their carers should be offered prompt, full and clear information about their condition and about any treatment that may be offered in both verbal and written forms. Information given to family members should not be withheld from the patient.
- From the time of diagnosis, each patient should have access to a named nurse or other member of the core team who can provide guidance, information and support, and to offer continuity of care.

2. Access to appropriate services

- Older patients with symptoms that can be caused by colorectal cancer, should receive prompt and thorough evaluation.
- Rectal bleeding of recent onset in people over the age of 50 should not be attributed to haemorrhoids without first excluding colorectal cancer.

3. Multidisciplinary Team

- Patients with colorectal cancer should be managed by a coordinated team whose members have particular interest and expertise in this area.
- The team, operating over one or more hospitals, should include clinicians with specialised knowledge of each aspect of diagnosis and treatment and specialised nursing staff who support, advise and assist patients, and provide information.

4. Primary Diagnosis and Preoperative Evaluation

- Initial investigation of patients in whom colorectal cancer is suspected should involve either colonoscopy alone or flexible sigmoidoscopy followed by double contrast barium enema.
- If colorectal cancer is diagnosed, patients should have further investigations including an ultrasound or CT/MRI scan, unless the findings are unlikely to influence management.

5. Surgery and Histopathology

- Surgery should be undertaken by surgeons who can demonstrate skill in removing the tumour intact and minimise the risk that cancer cells are left at the site of origin.
- The histopathologist should complete a minimum data set including the size, stage, type, grade and appearance of the tumour, depth of invasion, number of lymph nodes excised and number affected, and the tumour involvement at all surgical margins, including the circumferential plane in rectal cancer.
- Surgeons should aim to conserve the anal sphincter whenever possible.

6. Radiotherapy in Primary Diagnosis

- Radiotherapy should be available for patients with rectal cancer.
- Preoperative radiotherapy, usually over a period of one week, should be used, unless the operating surgeon can demonstrate low baseline local recurrence rates ($\leq 1\%$).

7. Adjuvant Chemotherapy

- Chemotherapy should be considered for patients with Dukes Stage C cancer who are fit enough to tolerate it.
- Patients receiving chemotherapy should have access to emergency care and both patients and GPs should have access to information and advice from oncology trained staff on a 24 hour basis. They should be given written information on how to deal with side-effects of chemotherapy.

8. Follow Up

- Patients and their GPs should be given full information on symptoms which might signify cancer recurrence.
- Patients should be reassured that the risk of recurrence declines rapidly after the first two years after treatment, so that by year 5, recurrence is very unlikely.

9. Recurrent and Advanced Disease

- Treatment options for recurrent and advanced colorectal cancer should be clearly explained to patients. They should be given realistic information both about potential effectiveness and adverse effects and should be actively involved in decisions about treatment options, if they so wish.
- The use of chemotherapy – usually based on 5-fluorouracil and folinic acid (5FU) should be discussed with patients when a diagnosis of recurrent or advanced colorectal cancer is confirmed.
- Radiotherapy should be discussed with patients with locally recurrent/advanced rectal cancer who have not previously undergone radiotherapy. It should also be offered to patients with bone metastases.

10. Palliative Care

- A palliative approach which involves both symptom control and attention to the social and psychological wellbeing of patients and their carers should be provided throughout the course of the illness.
- The role of the palliative care specialist will primarily be to provide information, education and advice for other health professionals.
- Clear mechanisms should exist for referral to and communication between primary care, community and hospital services involved in the delivery of general and specialist palliative care.

APPENDIX C

Guidelines for the Management of Colorectal Cancer⁴, 2001 – Issued by the Association of Coloproctology of Great Britain and Ireland (Summary of guidelines)

1. Investigation

- Fast-tracking of patients with high risk symptoms with either flexible or rigid sigmoidoscopy plus a high quality double contrast barium enema or colonoscopy, when appropriate.
- Preoperative histology should be obtained from all rectal tumours.
- First degree relatives of patients who develop colorectal cancer before the age of 45 years and members of families in which multiple cancers have occurred should be seen by a specialist, preferably with experience in genetic counselling.

2. Access to Treatment

- Initial treatment within four weeks of diagnosis.
- Treatment by surgeons with appropriate training and experience and who work as part of a multidisciplinary team.

3. Preparation for Surgery

- The patient who may require a stoma should be seen by a stoma nurse prior to surgery and the referral should be made at the earliest opportunity to allow adequate time for preparation.
- Mechanical bowel preparation and antibiotic prophylaxis are recommended.

4. Elective Surgical Treatment

- Surgeons should expect to achieve an overall curative resection rate of at least 60%.
- Any cancer whose distal margin is seen at 15cm or less from the anal verge using a rigid sigmoidoscope should be classified as rectal.
- Total mesorectal excision should be performed for cancer in the lower two thirds of the rectum, either as part of a low anterior resection or an abdomino-perineal resection (APER).
- Cytocidal washout of the rectal stump should be undertaken prior to anastomosis.
- The proportion of rectal cancers treated by abdomino-perineal excision of the rectum (APER) should be less than 40%, and, if distal clearance of 1cm can be achieved, a low rectal cancer may be suitable for anterior resection. If a surgeon has any doubt regarding the choice between these two operations, an experienced second opinion should be sought.
- Laparoscopic surgery for colorectal cancer should only be performed by experienced laparoscopic surgeons who have been properly trained in colorectal surgery and who are entering their patients into one of the national trials.

5. Record Keeping

- All patients with colorectal cancer should be brought to the attention of the Colorectal Multidisciplinary Team. Records of these meetings, the cases discussed and the outcomes agreed must be recorded.

6. Emergency Treatment

- Emergency surgery should be carried out during daytime hours as far as possible, by experienced surgeons and anaesthetists.

7. Adjuvant Therapy

- Patients with Dukes C colon cancer should be considered for adjuvant chemotherapy.
- Patients with Dukes B colon cancer should be considered for entry into randomised trials of adjuvant chemotherapy.

- Patients with high risk Dukes B colon cancer should be individually counselled about their level of risk and possible benefits of chemotherapy.
- There is no evidence to support the use of adjuvant chemotherapy in Dukes A cancers of the colon or rectum.
- In patients with rectal cancer, pre-operative radiotherapy using short course (25 Gy in 5 fractions in one week) or longer course (40-45 Gy in 20-25 fractions over 4-5 weeks) are both acceptable.
- In patients with rectal cancer who have not had pre-operative radiotherapy, post-operative radiotherapy and chemotherapy should be offered to patients with well established predictors of risk.
- Patients with potentially operable rectal cancer should always be considered for entry into trials of adjuvant radiotherapy.

8. Treatment of Advanced Disease

- For patients with inoperable rectal carcinoma without evidence of metastatic disease, primary radiotherapy alone or in combination with chemotherapy should be considered.
- Patients with metastatic disease who are fit for active therapy should be accurately staged with CT scans of abdomen and thorax.
- Patients with evidence of unresectable metastatic disease should be referred to an oncologist for consideration of palliative chemotherapy as soon as the diagnosis of metastatic disease is made, but this may not be appropriate for elderly patients.
- Palliative treatment should be 5FU given by infusion, combined with the use of irinotecan in the first instance or on 5FU failure, if the patient remains fit for chemotherapy.
- Hepatic arterial infusional chemotherapy remains of unproven benefit.

9. Outcome

- An operative mortality of not more than 15-25% for emergency surgery and not more than 4-7% for elective surgery with colorectal cancer should be achieved.
- Intensive care and high dependency care are an essential part of peri-operative colorectal cancer care and should be available in hospitals undertaking colorectal cancer surgery.
- Wound infection rates after surgery for colorectal cancer should be not greater than around 10%.
- Local recurrence rates after curative resection for rectal cancers should be not greater than around 10% within two years of follow up.

10. Follow Up

- Although there is no evidence that intensive follow up for the detection of recurrent disease improves survival, it is reasonable to offer liver imaging to asymptomatic patients during the first two postoperative years for the purpose of detecting operable liver metastases.

11 Histopathology

- All resected polyps and cancers should be submitted for histopathological examination.
- Pathology laboratories should store stained histology slides for a minimum of 10 years, and tissue blocks from specimens indefinitely, in order to facilitate future case review, clinical audit, and research.

APPENDIX D

Staging of Colorectal Cancer

Accurate staging is essential for the planning of appropriate treatment and for the comparison of the outcomes of such treatment (surgical and non-surgical).

Clinical staging

This involves physical examination, endoscopic examination (sigmoidoscopy/colonoscopy) and imaging using barium enema and endorectal MRI (rectal tumours only). Additional investigations to detect metastatic disease include chest X-ray, CT scanning and newer imaging techniques such as PET scanning.

Pathological staging

Pathological staging adds significant information to this process. It is only possible following surgical exploration of the abdomen and pathological examination of the surgically resected specimen. This will include the section of bowel containing the tumour with its lymph node-bearing mesentery. This gives more exact information on the depth of the tumour invasion in the intestinal wall (T) and detects the presence of metastatic tumour within the examined lymph nodes (N). It may also provide histological evidence of distant metastases (M) by sampling suspect areas in the liver (see Table 1).

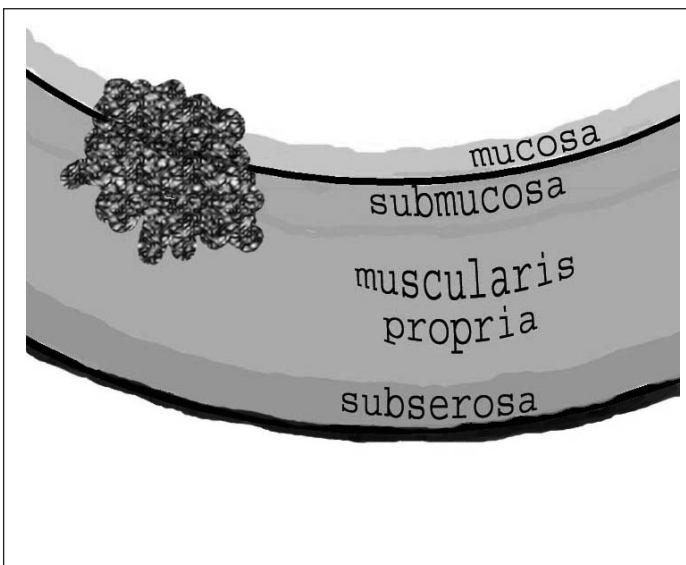
The Dukes classification system, which places patients into one of three categories (Stages A, B, C) was first introduced in 1932 and was subsequently modified by Astler-Coller to include a fourth stage (Stage D). Dukes A and B tumours are confined to the bowel wall, while Dukes C tumours have metastasized to the regional lymph nodes and Dukes D tumours have spread to distant sites. More recently, the American Joint Committee on Cancer (AJCC) and UICC (International Union Against Cancer) have introduced the TNM staging system, which places patients into one of four stages (Stage I-IV). The TNM classification provides more detail and more precision in identifying prognostic groups than the Dukes staging system. Both systems are shown in Table 2.

Table 1 TNM classification of colorectal cancer¹³

Tumour

T0	no evidence of primary tumour
T1	tumour invades submucosa
T2	tumour invades muscularis propria
T3	tumour invades through the muscularis propria into the subserosa, or into the non-peritonealized pericolic or perirectal tissue
T4	tumour directly invades other organs or structures, and/or perforates visceral peritoneum (serosa)
T4a*	tumour directly invades other organs or structures without perforating the visceral peritoneum
T4b*	tumour directly invades other organs or structures with perforation of the visceral peritoneum

*Optional subdivision



Nodes

NX	regional nodes not assessed
N0	no regional lymph node metastases
N1	metastases in 1 to 3 regional nodes
N2	metastases in 4 or more regional nodes

Metastases

MX	distant metastases cannot be assessed
M0	no distant metastases
M1	distant metastases

In order to facilitate survival analysis the assigned TNM profile is condensed into a stage group category of which there are 7 (I, IIA, IIB, IIIA, IIIB, IIIC and IV, see Table 2).

Cancer Services Audit 1996 & 2001 Colorectal

Table 2 Stage Group Colorectal Cancer

<i>Stage</i>	<i>T</i>	<i>N</i>	<i>M</i>	<i>Dukes</i>
I	T1	N0	M0	A
	T2	N0	M0	A
IIA	T3	N0	M0	B
IIB	T4	N0	M0	B
IIIA	T1-T2	N1	M0	C
IIIB	T3-T4	N1	M0	C
IIIC	any T	N2	M0	C
IV	any T	any N	M1	D*

* Modified Dukes

Example:

- Examination of the resected tumour shows penetration into but not beyond the muscle layer of the bowel therefore **T** = T2
- Regional nodes sampled and are negative for metastases, therefore **N** = N0.
- Clinically/radiologically there is no evidence of distant metastases and is therefore **M** = M0.

TNM profile is **pT2 pN0 cM0** (p = determined pathologically, c = clinically determined).
This TNM profile is assigned to stage group I or Dukes A.