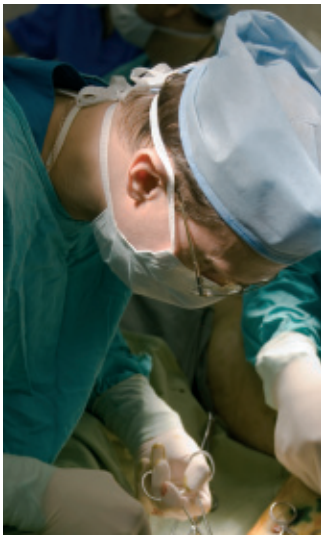
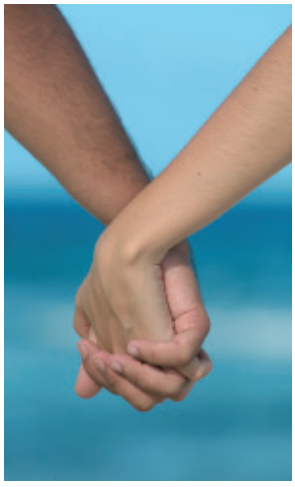
N. IRELAND Cancer Registry

Care of ovarian and cervical cancer patients diagnosed in Northern Ireland 2010 (with comparisons to 1996 and 2001)






Ovarian and Cervical 2010

Queen's University Belfast

GAIN Guidelines and Audit Implementation Network

HSC Public Health Agency

Care of ovarian and cervical cancer patients diagnosed in Northern Ireland 2010

(with comparisons to 1996 and 2001)

Lisa Ranaghan and Anna Gavin

CONTENTS

FOREWORD

This report describes the characteristics of patients with ovarian or cervical cancer and their care in 2010 making valuable comparisons with the care received by patients with these cancers in 1996 and 2001. Almost 160 women each year are diagnosed with ovarian cancer and 80-100 with cervical cancer. Compared to 1996 those diagnosed now are more likely to have their treatment discussed at a regional multidisciplinary meeting, and their survival after surgery has improved. This report provides valuable information which is essential in helping us to track progress and identify those areas where change is needed. The data from this exercise will also be used for investigation of the reasons for documented international differences in cancer survival under the framework of the International Cancer Benchmarking Partnership. These series of audits, led by the Cancer Registry and supported by local clinicians are valuable public health tools which have grown and developed significantly over the last few years and now play a leading role in monitoring cancer care within Northern Ireland.

Dr. Michael McBride
Chief Medical Officer
January 2013

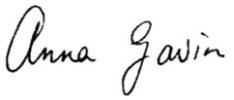
ACKNOWLEDGEMENTS

This report has been compiled in collaboration with the Northern Ireland Cancer Network (NICaN) Gynaecological Cancer Group. I am grateful to the clinicians who helped with determining the data items to collect, their interpretation and final presentation.

The Northern Ireland Cancer Registry is funded by the Public Health Agency. This audit was funded by the Guidelines and Audit Implementation Network (GAIN) following a successful submission by the Northern Ireland Cancer Registry (NICR) that it should be included in the GAIN programme of audits for the 2011/12 year.

The quality of data in this project is the result of the clinical guidance and analysis provided by Dr Lisa Ranaghan. The report would not have been possible but for the work of the Registry Tumour Verification Officers, Bernadette Anderson, Jackie Kelly and Julie McConnell, who meticulously extracted detailed information from clinical records for analysis and presentation in this report. Data abstraction was facilitated by Colin Fox of the Registry's IT group with A special word of gratitude is due to the Medical Records staff of all the hospitals in Northern Ireland who have facilitated the Registry in this work.

The work of the Northern Ireland Cancer Registry, including production of this report, is the result of the work of the Registry team. I also wish to record my thanks to the Steering Group and Council of the Registry who guide that work.



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January 2013

INTRODUCTION

The last fifteen years has seen considerable change in the services provided to cancer patients Northern Ireland. While change is a necessity due to increasing patient volumes, the development of new treatments and better understanding of the effectiveness of current procedures, there are occasionally reviews and recommendations that result in important changes to the structures within the NHS. The last such major review occurred in 1996 with the release of the Campbell report [1] which resulted from the input of many clinicians, service planners and patients who worked together with the aim of improving cancer services.

The Campbell report resulted in several broad recommendations, including the:

- Management of patients by multidisciplinary teams;
- Appropriate training of staff;
- Establishment of a single Cancer Centre and four other Cancer Units;
- Movement of radiotherapy services to the Cancer Centre, with chemotherapy to be made available in each Cancer Unit;
- Review of palliative services;
- Investment in oncology services.

In addition to these broad changes a further working group developed recommendations specific to gynaecological cancers [2] which addressed issues regarding where gynaecological cancer patients should be managed, the pathway for referral and the availablility of staff to manage these patients. Since then further guidelines and recommendations have been produced both from a national and regional perspective [3-5]. In the past these have been written by a wide range of public bodies, such as the NHS Centre for Reviews and Dissemination and the Department of Health and Social Services and Public Safety in Northern Ireland (DHSSPSNI) respectively. More recently general national guidance has been issued by the National Institute for Clinical Excellence (NICE), which has covered diverse topics such as the referral of suspected gynaecological cancer patients by a GP to hospital [6] and best initial management practice for ovarian cancer [7]. Regional guidance however is provided by the Northern Ireland Cancer Network (NICaN) which has developed guidelines on the management of gynaecological cancer [8,9].

The role of the Northern Ireland Cancer Registry

In order to monitor the changes in cancer care as a result of the Campbell report and subsequent recommendations and changes to clinical guidelines the Northern Ireland Cancer Registry (NICR) undertook a series of audits to document the change in cancer services over time and provide snapshots of activity levels within cancer services in particular years. The first phase of these audits looked at changes between 1996 and 2001, while the second phase also examined the situation

in 2006 (2005 for upper GI cancers and 2007 for pancreatic cancer) while also extending the number of cancers investigated to include melanoma (diagnosed 2006) and leukaemia and lymphoma (diagnosed 2008) [10-17].

The first phase of audits included one on ovarian and cervical cancer [18]. The key findings from this audit were:

- Evidence of centralisation in ovarian cancer;
- Increased use of investigations;
- Shorter delay from referral to first seen for ovarian cancer patients;
- Increased surgical specialisation for ovarian cancer patients;
- Increased use of chemoradiation for cervical cancer patients;
- Increased delay from diagnosis to first treatment for cervical cancer patients;
- Improved survival for Stage III ovarian cancer patients.

This report revisits ovarian and cervical cancers, although unlike the other cancers included in the first audit phase it examines data from 2010 and includes many data items not included in the previous audit (particularly for cervical cancer). In addition a modified approach to data collection has been applied. Previously all data were collected by manual examination of clinical notes. This audit however has for the first time used several electronic sources including the regional Cancer Patient Pathway System (CaPPS), with manual examination of notes undertaken to fill in data items that were not available from these sources. Despite these changes the objective of this audit remains to document the presentation, treatment, care and outcomes for patients diagnosed with ovarian or cervical cancer in Northern Ireland in 2010 and compare that with similar data from 1996 and 2001. In addition this report will form the basis of the Northern Ireland component of module five of the International Benchmarking Partnership [19] which aims to investigate the reasons for international variations in cancer survival.

Epidemiology and rates

Ovarian cancer is the leading cause of death from gynaecological malignancy with around 6,700 new cases per year in the UK (159 in N. Ireland) and accounts for 4,254 deaths annually in the UK (121 in N.Ireland). It is primarily a disease of postmenopausal women, with the large majority of cases occurring between age 50 and 79 years.

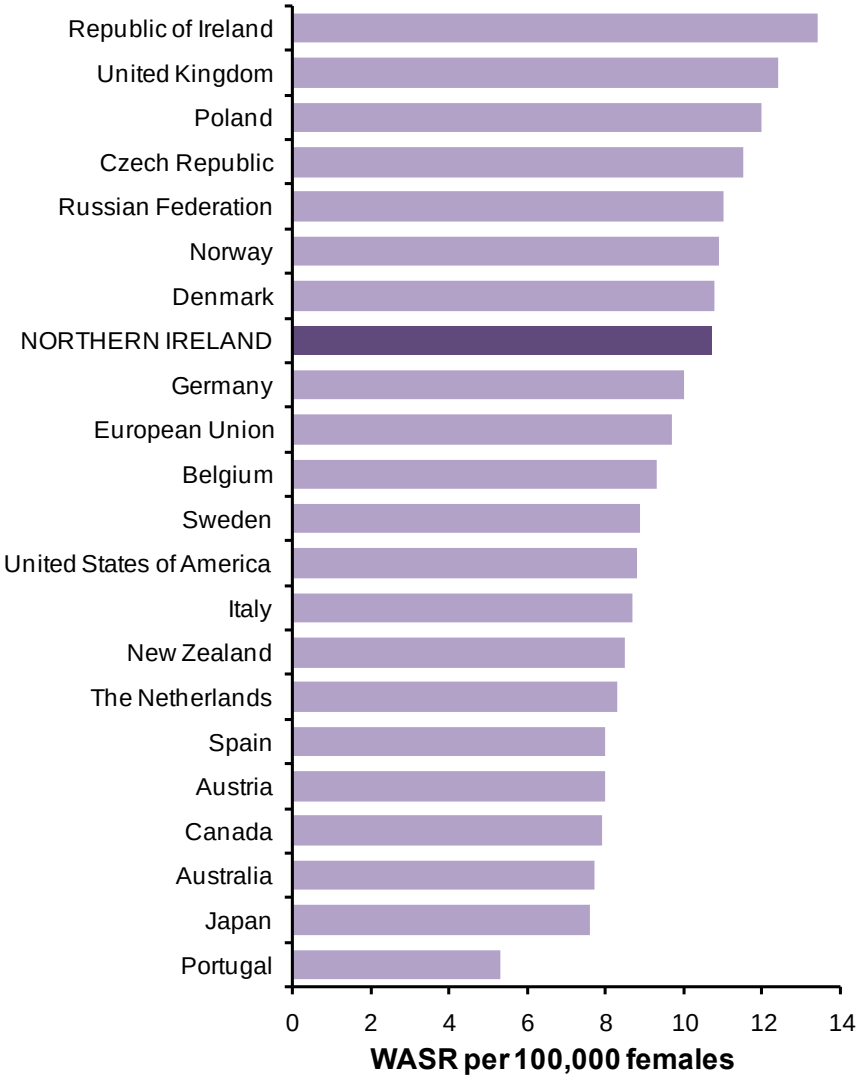
International comparisons of incidence

The incidence varies internationally with, in general, a higher incidence in more developed countries 9.3 cases per 100,100 compared to 4.9 per 100,000 in the less well developed [20]. In 2008, estimated rates of ovarian cancer were higher than average in the Republic of Ireland, United Kingdom, Poland and the Czech Republic. Rates in NI were lower than in these countries but were slightly above the European average and above USA, Canada and Australia. Rates of the disease were lowest in Portugal, followed by Japan, Australia and Canada.

Note: Differences in the coding of borderline ovarian cancers by cancer registries may account for some of the international differences in incidence rates.

Figure 1: International comparisons of ovarian cancer incidence during 2008

(World age-standardised incidence rates for selected countries)



WASR: World age-standardised rate
Source: GLOBOCAN, except for NI data which is from NICR data for the 2006-2010 period

SECTION I - OVARIAN CANCER OVERVIEW

Risk factors

Increasing age and a family history of ovarian cancer are the most important risk factors. Women with at least one affected first degree relative have a three-fold increased risk of developing ovarian cancer themselves [21]. The cause of ovarian cancer however in most cases is unknown but certain genetic factors are associated with increased risk for ovarian cancer. The inherited Lynch Syndrome [22] also known as Hereditary Nonpolyposis Colorectal Cancer (HNPCC) is associated with early onset of cancers of the colon and rectum, endometrium, and ovary with a 10% to 12% lifetime risk of developing ovarian cancer. Genetic mutations of the BRCA1 or BRCA2 genes are associated with an increased risk of breast and ovarian cancer. The risk of developing ovarian cancer in women with BRCA1 mutation by age 70 is 46% [23]. Women deemed to be genetically high risk can be offered screening and if found to be BRCA positive may be offered prophylactic surgery (removal of both ovaries and fallopian tubes) or surveillance with repeated monitoring of the ovarian cancer tumour marker CA125 and regular ultrasound scans.

Clear associations have been drawn between hormonal and reproductive factors and the risk of developing ovarian cancer. Increased risk is associated with multiple ovulations without pregnancy-induced breaks in ovulation , early menarche and /or late menopause, low parity or nulliparity and use of fertility drugs [24]. Risk is reduced in women who have had tubal ligation [25] or hysterectomy with ovarian conservation. Reduced risk is associated with increasing number of pregnancies and the use of oral contraceptives. The results of case control and prospective studies have shown that women who used oral contraceptives for 10 years or more had about a 60% reduction in risk of ovarian cancer [26]. Protection increases with increased duration of use, and the reduction in risk persists for more than 30 years after use has ceased [27]. Hormone replacement therapy, particularly oestrogen-only formulations, is related to increased risk, although formulations which include progestin are associated with only a modest risk [28]. Women who have used combined oestrogen-progestogen oral contraceptives have decreased risk. Smoking is causally linked to mucinous ovarian tumours, but not to other types of ovarian cancer [29]. Evidence that other lifestyle factors raise the risk of ovarian cancer is weaker. However higher intake of non-starchy vegetables [30] and high levels of physical activity [31] may be associated with reduced risk, while high percentage body fat and/or obesity may be related to an increased risk [32].

Clinical presentation

Women present with a range of vague symptoms which include abdominal pain and/or distension, urinary symptoms, change in bowel habit and abnormal vaginal bleeding. These symptoms may be misinterpreted as other conditions such as irritable bowel syndrome or ‘middle-aged spread’ which can contribute to late presentation and advanced stage in a high proportion of patients with this cancer. In some cases a pelvic mass may be detected incidentally by clinical examination or radiologically. Borderline ovarian tumours can occur in pre-menopausal women and also in girls and teenagers. They are often confined to the ovary but can spread within the pelvis. Patients with borderline tumours have a much better survival than ovarian cancers and most require surgical resection only. In younger women conservative surgery to preserve fertility may be appropriate.

Clinical examination, blood tests and radiological investigations

A common finding on clinical examination at presentation is a pelvic mass and this is then further investigated by an abdominal or vaginal ultrasound or CT scan. The radiological appearance of the mass gives some indication of whether or not it is likely to benign or malignant, however this is only confirmed pathologically at the time of surgery or by cytology of peritoneal or pleural fluid. The CT scan may also identify any evidence of spread within and beyond the pelvis with ascites*, tumour deposits in the peritoneum** and omentum*** being detected.

*[*Ascites (accumulation of fluid in the abdomen), *peritoneum (lining of abdominal cavity), *omentum (a large fatty structure that drapes over the intestines in the abdominal cavity)]*

The CT scan can also detect evidence of spread to lymph nodes and liver. Chest X-ray may be performed in the pre-operative work up to exclude pleural effusion or lung metastases.

Risk of malignancy index (RMI)

As not all pelvic masses turn out to be malignant, an ovarian tumour Risk of Malignancy Index (RMI) has been developed to assist in identifying the likelihood of malignancy based on the radiological appearance, the CA125 tumour marker level and whether or not the woman is postmenopausal. Risk is defined as low, moderate and high. This allows patients to be triaged so that women with high risk of malignancy are operated on by a specialist gynaecological surgeon in a cancer centre, women with moderate risk are operated on by a lead gynaecologist in a cancer unit, with general gynaecologists operating on low risk women. For women in the moderate risk category, if malignancy is confirmed, full surgical staging should be performed [33]. Patients in moderate and severe risk categories should be discussed at the specialist gynae-oncology multidisciplinary meeting prior to and after surgery [34].

Treatment

Surgery

Surgery plays a crucial role in the management of ovarian cancer. In the majority of cases it confirms the diagnosis pathologically and facilitates the assignment of stage. Comprehensive full surgical staging should be performed in a cancer centre by a specialist gynae-oncologist as this has been shown to improve prognosis [33]. For patients with early stage disease (FIGO Stage I-II) full surgical staging includes removal and pathological examination of the ovaries, uterus, fallopian tubes and omentum with biopsy of peritoneum, sampling of pelvic lymph nodes and cytolological examination of pelvic washings. In younger women with disease limited to one ovary who wish to preserve fertility it may be possible to leave the uterus and opposite fallopian tube and ovary intact. In patients with advanced disease (FIGO Stage III) the primary function of surgery is to remove as much tumour as possible (full surgical staging with tumour debulking). If all visible tumour is removed this is categorized as 'Complete debulking', when less than 1cm of residual tumour is left this is known as 'Optimum debulking', and 'suboptimal' is when more than 1cm of residual tumour remains. Achievement of optimum debulking improves survival. The amount of residual disease left after surgery correlates with poorer survival. Patients who have more than 2cm disease after their initial surgery have a poor prognosis with only 20% surviving 3 years. Median survival times for patients with suboptimally debulked disease (more than 1cm) range from 16 to 29 months and from 26 to 96 months for patients with optimally debulked disease (35).

Chemotherapy (Adjuvant and Primary)

Primary chemotherapy may be given to patients who are not fit for surgery or with advanced Stage IIIC disease or Stage IV patients with positive pleural effusions only and where optimum debulking cannot be achieved. Debulking surgery may then be performed after 3 cycles of chemotherapy (Interval debulking surgery). Adjuvant chemotherapy (following surgery) is recommended for all patients other than those with early stage low risk disease (FIGO IA or IB, low grade), [34]. Typically patients receive 6 cycles of carboplatin with or without paclitaxel every three weeks. NICE guidance recommends that the decision to treat with platinum-based chemotherapy alone or paclitaxel in combination with platinum-based chemotherapy should be made after discussion between the oncologist and patient regarding the increased side-effects of the combined therapy, the stage of disease, the extent of residual disease following surgery and patients's general fitness etc.

Chemotherapy for relapsed disease

The length of time between end of 1st line chemotherapy and relapse is important in determining likely response to subsequent treatment. Patients who relapse during initial treatment or within 6 months of completing initial treatment may be treated with non-platinum based drugs such as paclitaxel, topoisomerase I inhibitors (irinotecan/topotecan) or liposomal doxorubicin. Patients who relapse after 12 months may well respond to repeated platinum based chemotherapy.

Follow-up

Monitoring of CA125 levels in the blood following 1st line chemotherapy is routine practice. The decision to commence 2nd line therapy based on a rising CA125 level only in the absence of clinical evidence of relapse has been questioned. The recent results of the MRC OV05/EORTC 55955 trial (36) have shown no evidence of a survival benefit with early treatment of relapse on the basis of a raised CA125 concentration alone.

Prognosis

The key factors that determine outcome in ovarian cancer are the FIGO stage at diagnosis, tumour histology, tumour grade, the amount of residual tumour following debulking surgery and response to 1st line chemotherapy. For patients with early FIGO stage I disease the 5 year relative survival rate is 90% while for patients with advanced stage IV disease this falls to under 10%.

Histological type and pathological FIGO stage

Following surgery the pathologist determines the histological type of the ovarian tumour and the extent of the disease. There are three main histological types of ovarian tumours; epithelial tumors, sex cord-stromal tumours and germ cell tumours. The World Health Organisation (WHO) classification is shown in table 1. Epithelial carcinoma accounts for approximately 80% of all ovarian cancers. Histology and grade are important prognostic factors. Women with borderline tumours (low malignant potential) have excellent survival even when disease has spread beyond the ovary. In invasive carcinoma grade is very important as patients with well differentiated tumours have a better survival than those with poorly differentiated tumours. Histolological type is also extremely important. While sex cord-stromal tumours have an excellent prognosis, epithelial tumours (the most common) have a less favourable outcome. Germ cell tumours most commonly occur in young women and account for 70% of ovarian tumours in the under twenties with benign dermoid cysts being the more common of the benign ovarian tumours. Dysgerminoma is the commonest malignant germ cell tumour and 80% are stage I and can be treated by surgery alone. Sex cord-stromal tumours are often hormone producing such as the granulosa cell and Sertoli-Leydig tumours and can present with hormone-related effects such as excess hair growth (hirsutism).

Table 1: WHO Classification of Ovarian Tumours

Histological type
Malignant Epithelial tumours
Serous cystadenocarcinoma
Mucinous cystadenocarcinoma
Endometrioid adenocarcinoma
Clear cell adenocarcinoma
Adenosarcoma
Undifferentiated carcinoma
Adenocarcinoma, unspecified
Borderline Epithelial tumours
Borderline mucinous cystadenoma
Borderline serous cystadenoma
Borderline endometrioid cystadenoma
Non-Epithelial malignant tumours
Mixed Mullerian (carcinosarcoma)
Sex cord- stromal tumour [Granulosa cell, Sertoli-Leydig]
Germ cell neoplasm

FIGO Stage

The staging system for ovarian cancer developed by the International Federation of Gynaecology and Obstetrics (FIGO) is widely used throughout the world. The TNM also have a staging classification in which the definition for the T categories correspond to that of FIGO. The FIGO classification is shown in table 2 below.

Table 2: FIGO Stage

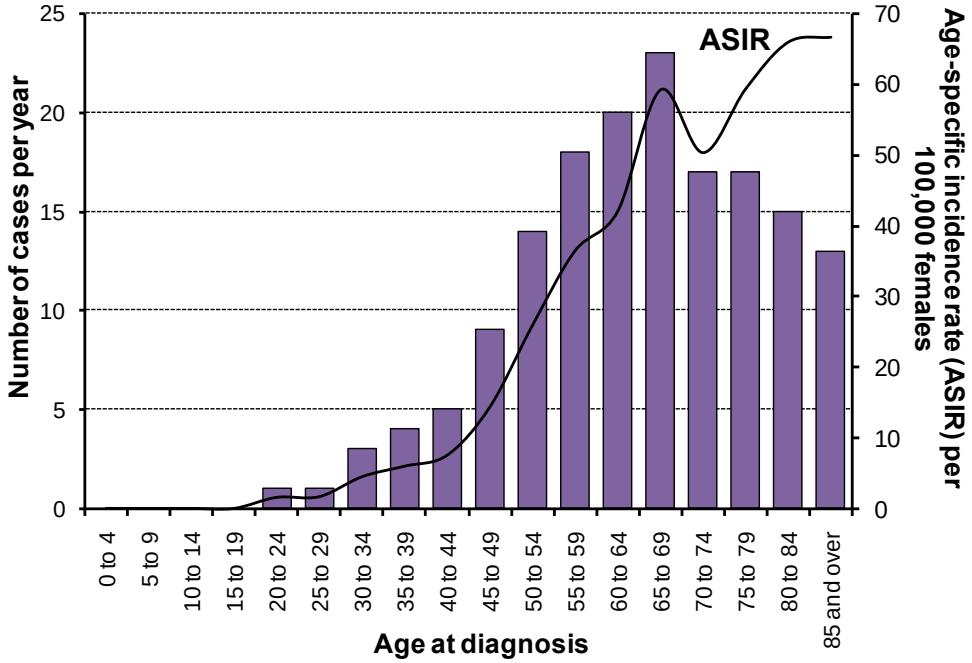
FIGO Stage	Extent of disease	5-year observed survival*
FIGO I	Limited to ovaries (one or both)	
IA	Tumour limited to one ovary	87.6%
IB	Tumour limited to both ovaries	84.5%
IC	Tumour in one or both ovaries with: capsule ruptured, tumour on ovarian surface, malignant cells in ascites or peritoneal washings	81.7%
FIGO II	Tumour involves one or both ovaries with extension to the pelvis	
IIA	Extension or implants on uterus or tubes	69.3%
IIB	Extension or implants on other pelvic tissues	70.2%
IIC	IIa or IIb with positive peritoneal washings/ascites	64.1%
FIGO III	Tumour involves one or both ovaries with peritoneal metastases	
IIIA	Microscopic peritoneal metastases beyond the pelvis	52.0%
IIIB	Macroscopic peritoneal metasases beyond the pelvis < 2cm	45.3%
IIIC	Macroscopic peritoneal metasases beyond the pelvis > 2cm and or regional lymph node metastases	32.1%
FIGO IV	Distant metastases	15.3%

**Observed 5-year survival for 11,738 cases of epithelial ovarian cancer diagnosed 1998-2002: Source: American National Cancer database*

During 2006-2010 there were on average 159 cases of ovarian cancer[a] diagnosed each year in NI. It was the sixth most common female cancer, making up 3.0% of all cancers (or 4.0% excluding non-melanoma skin cancer). The probability of developing the disease before the age of 75 during this period was 1 in 81. Ovarian cancer occurs primarily in older people with a median age at diagnosis of 66 years (Figure 2). The number of cases during 2006-2010 peaked in the 65-69 age group with 23 cases diagnosed per year in this age group (14% of cases). However age-specific incidence rates were highest among those aged 85 and over with 67 out of 100,000 women aged 85 and over diagnosed with the disease each year.

Figure 2: Age distribution of patients diagnosed with ovarian cancer during 2006-2010: N. Ireland

(Number of cases and incidence rates by five-year age group)



ASIR: Age-specific incidence rate

Incidence trends

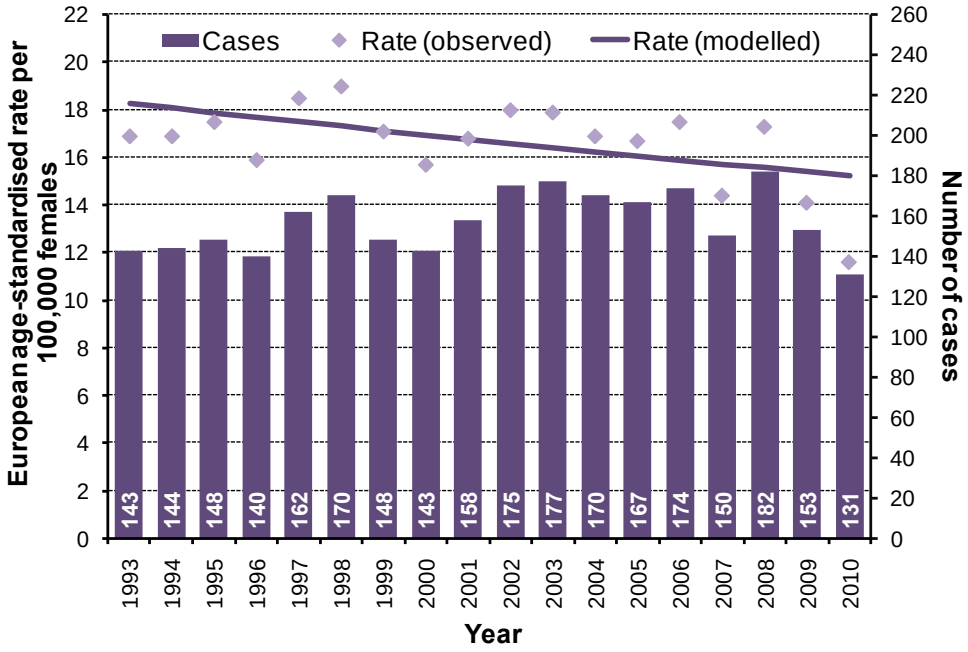
Between 1993 and 2010 (Figure 3) the number of cases of ovarian cancer diagnosed each year increased by an average of 0.8 cases per year from 145 cases /year (1993-95) to 155 cases/year (2008-10). The maximum number of cases in any given year occurred in 2008, when there were 182 cases diagnosed, while the minimum number of cases diagnosed in a given year was 132 cases in 2010.

The increase in cases is partially due to the increase in the overall population and the increasing proportion of this population aged 65 and over. In order to remove the influence of these factors we investigate trends using European age-standardised incidence rates (EASIR). Examination of these rates indicates a fall of 1.0% per year (p=0.034) suggesting an underlying reduction in the causes of this cancer.

[a] Includes ovarian cancer (C56) only and excludes cancer of fallopian tubes, primary peritoneal cancer and borderline ovarian tumours. Borderline ovarian tumours that were classified as malignant prior to 2007 are also excluded but analysed separately, ensuring consistency in the definition of ovarian cancer between 1993 and 2010.

Figure 3: Trends in cases and rates of ovarian cancer: N. Ireland

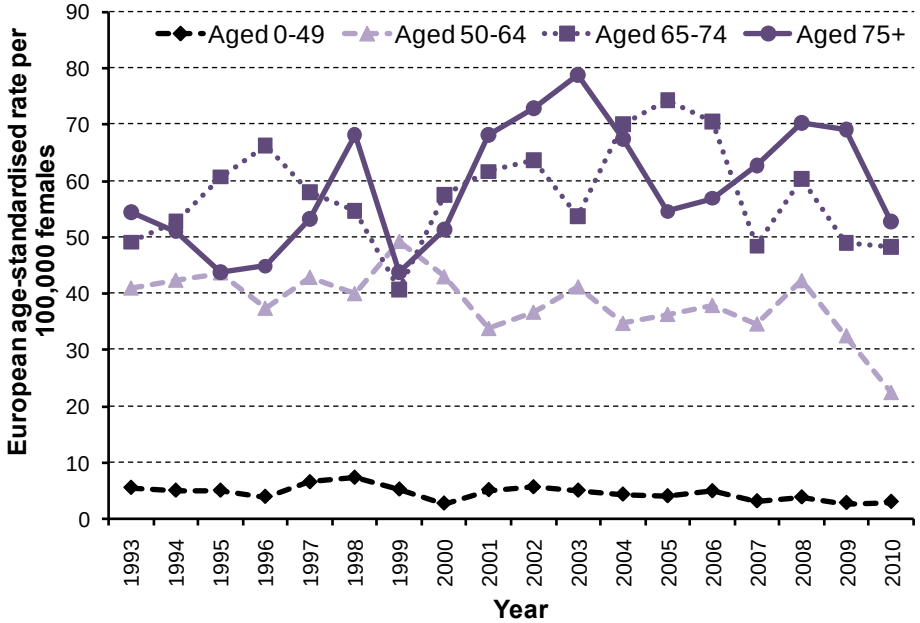
(Number of cases and European age-standardised incidence rates by year of diagnosis)



This trend is not consistent for all age groups. Among those aged 0-49 rates of ovarian cancer decreased by 3.2% (p=0.008) per year, however a small number of cases (19 in 2010) means that the overall impact is small. Among those aged 50-64 the decrease was 1.7% (p=0.012) per year (Figure 4) representing a fall from 49 cases in 1993 to 35 cases in 2010 cases. Among those aged 65-74 there was no significant change, while there was an annual percentage increase among those aged 75 and over of 1.6%, although this did not reach statistical significance (p=0.065).

Figure 4: Trends in rates of ovarian cancer by age: N. Ireland

(European age-specific incidence rates by age and year of diagnosis)



Mortality

During 2006-2010 there were on average 121 deaths from ovarian cancer each year in NI (Figure 5). It was the fourth most common cause of cancer death among women, accounting for 6.5% of female cancer deaths. The probability of dying from the disease before the age of 75 during this period was 1 in 115. The median age at death was 70 years of age. The number of deaths each year attributed to ovarian cancer increased by an average of 2.4 deaths per year during 1993-2010. The maximum number of deaths in any given year was 131 deaths which occurred in 2005. However European age-standardised mortality rates of ovarian cancer were static during this period, with an annual percentage change of 0.37% which was not statistically significant (p=0.461).

Figure 5: Trends in number and rates of ovarian cancer deaths: N. Ireland

(Number of deaths and European age-standardised mortality rates by year of death)

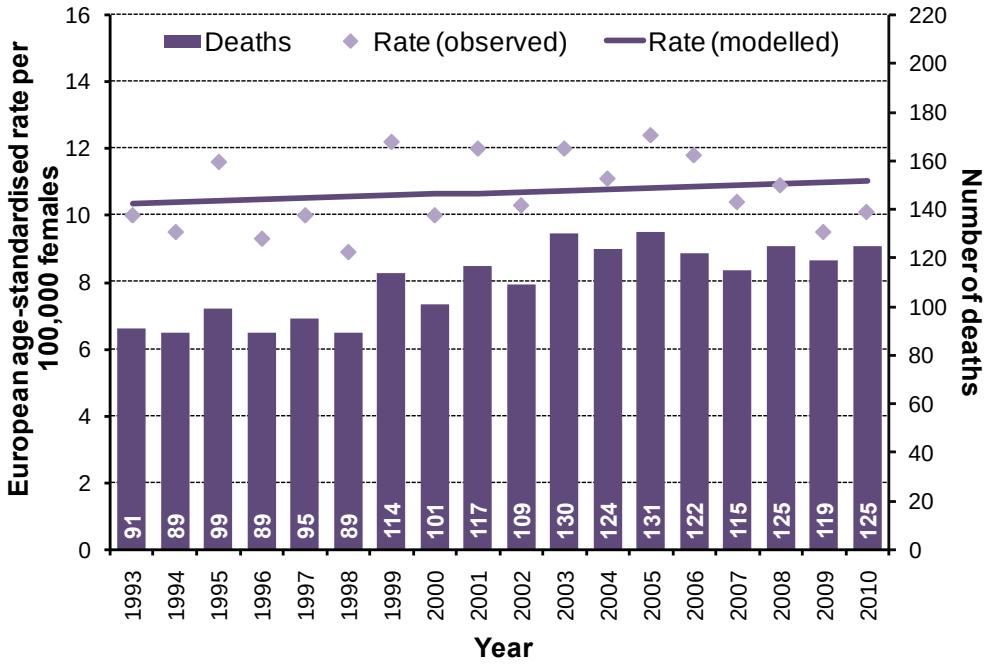


Figure 6: Trends in number and rates of ovarian cancer deaths by age

(Number of deaths and European age-standardised mortality rates by year of death)

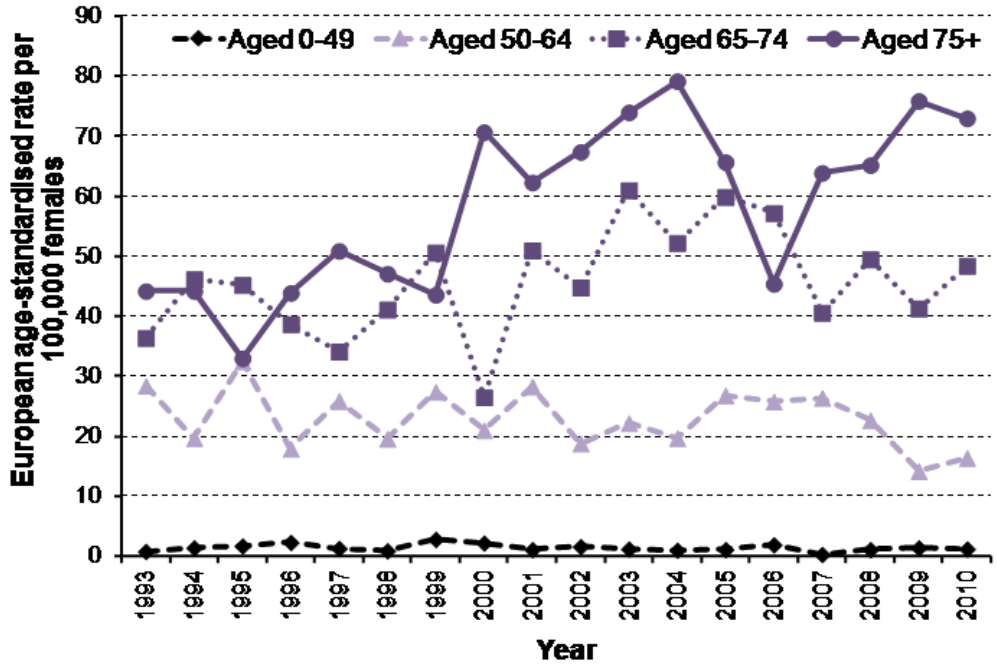


Figure 5 and 6 show the trend in ovarian cancer deaths since 1993 which over all have remained stable however in the age 75 and over there has been a significant increase (P=0.001).

Ovarian Cancer prevalence

At the end of 2010 there were 886 women living in NI who had had a diagnosis of ovarian cancer since 1993 (i.e. diagnosed in 1993-2010). 625 of these women were diagnosed within the last ten years (2001-2010). Over half (59%) of these women were aged 60 or over, with 12% aged 80 and over. Prevalence was greatest among those aged 60-69. Only 2% of those living with a diagnosis of ovarian cancer were aged 29 or less (Figure 6 and Table 3).

Figure 7: Prevalence of ovarian cancer by age at the end of 2010

(Percentage of people diagnosed during 1993-2010 who were alive at the end of 2010)

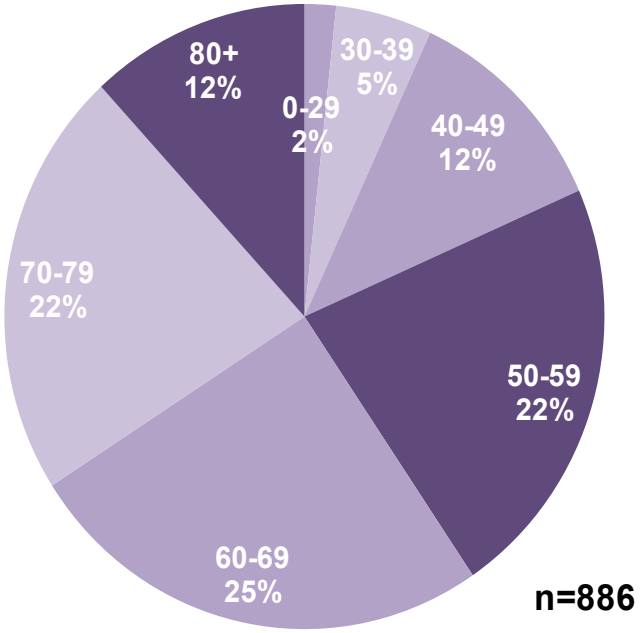


Table 3: Prevalent cases: Time from diagnosis

Time since diagnosis	Number	%
0-6 months	49	5.5%
6-12 months	44	5.0%
1-2 years	78	8.8%
2-5 years	218	24.6%
5-10 years	236	26.6%
10 + years	261	29.5%
Total	886	

SECTION III – METHODOLOGY: OVARIAN & CERVICAL CANCER AUDITS

The N. Ireland Cancer Registry (NICR) was established in 1994 and uses an automated computer system with multiple information sources to collate information on new diagnoses of cancer. Information on cancer incidence has been collected from 1993 onwards. The main sources for registration are histopathology reports from all the Hospital Trusts and the Trust Patient Administration Systems (PAS). Information on cancer site is coded using the tenth revision of the International Classification of Diseases (ICD-10) [37], while information on cancer morphology has been coded using the International Classification of Diseases for Oncology, with the second version (ICD-O-2) [38] used from 1993 to 2006 and the third version (ICD-O-3) [39] used from 2007 onwards. For the purposes of the current audit the ICD10 and ICD-O codes are used to identify patients registered with NICR as having been diagnosed with ovarian or cervical cancer in 2010. These patients then form the basis for the audit.

Definitions

Ovarian cancer

Ovarian cancer patients were identified using the ICD-10 code C56. However the change between ICD-O-2 and ICD-O-3 classifications in 2007 results in the re-definition of some ovarian cancers.

- Under the ICD-O-2 classification used during 1996/2001 some borderline ovarian tumours (Morphology codes: M/8442-3, M/8451-3, M/8462-3, M/8472-3 and M/8473-3) were coded as malignant (i.e. C56) and were thus collected in the 1996/2001 audits. Any borderline ovarian tumours coded as non-malignant (i.e. D39.1) under ICD-O-2 rules were not included.
- Under ICD-O-3 rules in place during 2010 all borderline ovarian tumours are classified as being non-malignant. However since interest in these tumours exists information on all non-malignant ovarian tumours coded as D39.1 were also included in this audit but identified separately. In addition, based on clinical advice, cancers of the fallopian tubes (C57.0) and primary peritoneum (C48.2) were included in the 2010 audit as these tumours present, are investigated and treated similarly to ovarian cancer.

Consequently, in order to ensure consistency over time, whenever comparisons between years are made only the non-borderline ovarian cancers (C56) are used.

However, unless otherwise stated the definition of ovarian cancer in this report includes malignant ovary, fallopian tube and primary peritoneal cancer (females only). The inclusion of cancer of the fallopian tubes and primary peritoneal cancer was based on clinical advice as the investigation and treatment is similar to that of ovarian cancer. These are not usually included in the definition of ovarian cancer however the results in this report are detailed for ovarian cancer alone to ensure compatibility with international data. Borderline ovarian tumours are considered separately.

Cervical cancer

Cervical cancer was identified using the ICD10 code C53. The 1996/2001 and 2010 audits do not include in-situ cervical cancer and there are no issues with regard to changes in classification between 1996 and 2010.

Audit data collection

The data items collected in the audit were agreed following consultation with NICaN gynaecology clinicians from the Health and Social Care Trusts. An electronic proforma, developed in Microsoft Access, was used to enable collection. It was populated electronically with patient details extracted from the NICR database in August 2011. However the majority of the data required for the audit is not available through the NICR database, thus other electronic datasets such as the Cancer Patient Pathway System (CaPPS) were used to populate as many of these items as possible. For those items that were still absent Registry Tumour Verification Officers (TVO's) collected data by extracting information on patients initially using the Clinical Oncology Information System (COIS) and then by reviewing clinical notes. Any inconsistencies between the four different datasets were then resolved, and after validation checks were complete, a detailed dataset of ovarian and cervical cancer patients was imported to the SPSS statistical software for analysis purposes. Data available from the previous audits were then recoded, if possible, to the same classifications as used in 2010 and was combined with the 2010 dataset to allow comparisons over time to be made. Data collection was completed in January 2012, with final data cleaning finished in April 2012.

In order to provide geographic and socio-economic information, the 2011 central postcode directory [40] was used to assign patients to a census output area (COA) based upon their postcode of usual residence. The COA was then used to assign a Health and Social Care Trust of residence and a deprivation quintile from the income domain of the 2010 multiple deprivation measure [41] with the latter used to provide an approximate socio-economic classification for each patient.

Limitations

While every effort has been made to obtain all the required information on each patient, there were several limitations imposed upon the collection of data:

- Outpatient records of private patients (N=18) were not examined resulting in some missing information on presentation dates and follow up.
- The MDT data download from CaPPS was not complete for all patients at the time of data extraction.
- Discharge letters from the Belfast City Hospital (where surgery was performed) were not always available in the patient notes held in peripheral hospitals.

In each of the above scenarios alternative sources of information were explored (e.g. COIS instead of patient charts).

Exclusions

Patients were excluded from the audit if their records lacked sufficient information or if information was available only from a death certificate (DCO) or post mortem.

Data analysis

The majority of analysis is through the derivation of the number of patients falling into particular categories relating to their demographics and process of care, with these numbers frequently presented as a percentage of all patients or a particular sub group of patients (e.g. surgery patients). While this is fairly straightforward, random fluctuations in values mean that caution needs to be exercised when comparing either two proportions or the overall distribution of factors between two sets of patients. Statistical tests exist for both scenarios and are utilised in this report to identify those differences that are statistically significant. Statistical decisions with regard to differences in proportions are based upon the assumption that any differences are normally distributed about zero, while the chi-square test is used to test for differences between the distribution of patient or tumour characteristics of two different cohorts. In both cases a 95% confidence level is applied.

In this report the Kaplan-Meier method has been used to calculate the observed survival with the Mantel-Cox log-rank test used to test for differences in survival between patient groups. All patients have been followed up until the end of 2011.

Study population

In 2010, 195 patients were included in the audit, 128 with malignant ovarian cancer (C56), 52 with borderline ovarian tumours (D39.1), 6 with cancer of the fallopian tube (C57.0) and 9 with primary peritoneal cancer (C48.2). As only 5 patients were excluded from the 2010 audit case ascertainment was very good (97.5%). While the number of cases of ovarian cancer annually has remained steady over the audit years the number of borderline ovarian tumours has increased since 1996 which may in part be due to change in the classification of these tumours over this time. Fallopian tube cancers (n=6) and primary peritoneal cancers (n=9) were included in the 2010 audit but not in the 1996 and 2001 audits (Table 4).

Table 4: Study patients: Tumour type by audit year

Audit year	1996	2001	2010
Total Patients	n=136	n=146	n=195
Ovarian cancer (C56)	121	122	128
Cancer of the fallopian tubes (C57.0)	-	-	6
Primary peritoneal cancer (C48.2)	-	-	9
Borderline ovarian tumours (D39.1)	15	24	52
Exclusions	9	34	5

The age distribution of patients with ovarian cancer and borderline ovarian tumours is shown in Table 5 below. The median age for ovarian cancer was 68 years and 20% of patients were aged 80 years or over. As expected the median age for the borderline ovarian tumours was younger (53 years) and one third of patients were under 50 years.

Table 5: Study patients: Age at diagnosis - 2010

Age at diagnosis	2010	
	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
Under 50	19 (13.3%)	18 (34.6%)
50 to 69	61 (42.7%)	27 (51.9%)
70 to 79	35 (24.5%)	4 (7.7%)
80 and over	28 (19.6%)	3 (5.8%)
Mean age	66	54
Median age	68	53

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

Hormone and reproductive factors

Information on use of hormone replacement therapy (HRT) was poorly recorded (Table 6). For the 29% of patients age 50 and over for whom this information was available 41.7% had never used HRT while the other 58.3% had used or were taking hormone replacement therapy at the time of diagnosis.

Table 6: Hormone replacement therapy

Hormone replacement therapy history	Age 50-69	Age > 70
Never received	8 (13.1%)	7 (11.1%)
Previously received	13 (21.3%)	3 (4.8%)
Currently receiving	3 (4.9%)	2 (3.2%)
Not recorded	37 (60.6%)	51 (81.1%)

Parity

Parity was well recorded (86.7% of patients). There was no pattern with parity, with 16.8% of ovarian cancer patients having no children and 19.6% having four or more children. Just under one third of borderline ovarian tumour patients were nulliparous.

Table 7: Parity

Parity	2010	
	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
No children	24 (16.8%)	17 (32.7%)
1 child	16 (11.2%)	2 (3.8%)
2 children	34 (23.8%)	10 (19.2%)
3 children	22 (15.4%)	7 (13.5%)
4 or more children	28 (19.6%)	9 (17.3%)
Not recorded	19 (13.3%)	7 (13.5%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

Body mass index (BMI)

Just over one third of ovarian cancer patients diagnosed in 2010 (35.0%) were recorded as being overweight or obese (Table 8). However this lifestyle factor was not recorded in patient notes for 42.7% of ovarian cancer patients.

Table 8: Body mass index (BMI)

Body mass index	2010	
	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
Underweight / Normal	32 (22.4%)	10 (19.2%)
Overweight	34 (23.8%)	13 (25.0%)
Obese	16 (11.2%)	13 (25.0%)
Not recorded	61 (42.7%)	16 (30.8%)

Family history of ovarian and other cancers

Recording of family history improved considerably over the audit years (Table 9). In 2010 this information was available for 75% of patients compared to 60.7% and 33.1% in 2001 and 1996 (not shown).

Table 9: Family history of cancer - 2010

Family history	2010			
	Family history of ovarian cancer (first or second degree relative)		Family history of other cancer (first relative only)	
	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
Yes	13 (9.1%)	2 (3.8%)	58 (40.6%)	6 (11.5%)
No	92 (64.3%)	19 (36.5%)	52 (36.4%)	18 (34.6%)
Not recorded	38 (26.6%)	31 (59.6%)	33 (23.1%)	28 (53.8%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

Information on history of ovarian cancer in a 1st or 2nd degree relative was recorded for almost three quarters of patients. Where this information was available 9% of women had a positive family history. A positive family history of other cancer was recorded in 58/143 (41%) of women and of these 22/58 (38%) were breast cancers.

Comorbidities

Approximately two thirds of patients with ovarian cancer had a least one comorbidity recorded (Table 10). Hypertension was the most frequently recorded comorbidity (46%) followed by psychiatric disorder (14%). A history of previous breast cancer was recorded in 4.9% of women.

Table 10: Comorbidities - 2010

Comorbidities	2010	
	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
COPD	2 (1.4%)	1 (1.9%)
Cardiovascular disease	13 (9.1%)	4 (7.7%)
Cerebrovascular disease	8 (5.6%)	0 (0.0%)
Diabetes	11 (7.7%)	6 (11.5%)
Hypertension	66 (46.2%)	17 (32.7%)
Dementia / Alzheimer's	9 (6.3%)	0 (0.0%)
Psychiatric disorder**	20 (14.0%)	7 (13.5%)
Learning difficulties	0 (0.0%)	1 (1.9%)
History of breast cancer	7 (4.9%)	1 (1.9%)
History of other malignancy	5 (3.5%)	1 (1.9%)
Polycystic ovaries	0 (0.0%)	0 (0.0%)
Renal disease	13 (9.1%)	1 (1.9%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*
*** Includes depression and anxiety*

As expected comorbidities increased with age with 78.9% of those aged 50 and under having no comorbidities compared to 10.7% of those aged 80 and over (Table 11).

Table 11: Comorbidities by age - 2010

Number of comorbidities	2010 - Ovarian cancer*				
	Aged Under 50 (n=19)	Aged 50 to 69 (n=61)	Aged 70 to 79 (n=35)	Aged 80+ (n=28)	All ages (n=143)
No comorbidities	15 (78.9%)	25 (41.0%)	8 (22.9%)	3 (10.7%)	51 (35.7%)
1 comorbidity	3 (15.8%)	20 (32.8%)	14 (40.0%)	11 (39.3%)	48 (33.6%)
2 comorbidities	1 (5.3%)	12 (19.7%)	10 (28.6%)	9 (32.1%)	32 (22.4%)
3 or more comorbidities	0 (0.0%)	4 (6.6%)	3 (8.6%)	5 (17.9%)	12 (8.4%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

Ovarian Cancer Pathway: Referral and presentation

Route to diagnosis

- In 2010 two thirds (65.7%) of patients with ovarian cancer and almost three quarters of patients with borderline ovarian tumours (73%) were referred by their GP's. For ovarian cancer patients 25/94 (26.6%) of GP referrals were to A&E and the remainder to outpatients.
- Data completeness on referral source improved between 1996 and 2001. Otherwise there were no significant changes over time.

Table 12: Referral source

Referral source	1996	2001	2010		
	Ovarian cancer (n=121)	Ovarian cancer (n=122)	Ovarian cancer (n=128)	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
GP referral to outpatients/A&E	77 (63.6%)	89 (73.0%)	84 (65.6%)	94 (65.7%)	38 (73%)
Self referral to A&E	2 (1.7%)	10 (8.2%)	15 (11.7%)	15 (10.5%)	3(5.8%)
Screening	0 (0.0%)	0 (0.0%)	3 (2.3%)	3 (2.1%)	2 (3.8%)
Other Consultant	13 (10.7%)	11 (9.0%)	11 (8.6%)	12 (8.4%)	4 (7.7%)
Private sector	1 (0.8%)	3 (2.5%)	12 (9.4%)	16 (11.2%)	3 (5.8%)
Unknown	28 (23.1%)	9 (7.4%)	3 (2.3%)	4 (2.8%)	2 (3.8%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

Route to diagnosis

Table 13: Referral source by type

Referral source by type	2010 - Ovarian cancer*
GP – Red Flag to outpatients	35 (24.5%)
GP – Routine	8 (5.6%)
GP – Urgent	18 (12.6%)
GP – Other	7 (0.5%)
GP – Referral to A&E	26 (18.2%)
GP –TOTAL	**94 (65.7%)**
A&E – Self referrals	14 (9.8%)
A&E –total	**40 (28%)**
Screening	3 (2%)
Other Consultant	12 (8.4%)
Private sector	16 (11.2%)
Unknown	4 (2.8%)
Total patients	143

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

- In 2010 two thirds (65.7%) of patients with ovarian cancer were referred by their GP's (Table 13).
- One quarter (24.5%) of women were referred to hospital using the red flag system accounting for over one third (37.2%) of all GP referrals. Four patients were upgraded to red flag status by consultants prior to or at the time of presentation to hospital.
- A considerable proportion of patients (28%) were referred to A&E (GP or self referral).
- In 2010, 11.2% of patients first presented in the private sector (GP or self referral).

Trust and Hospital of 1st presentation

- In 2010 ovarian cancer patients presented to 16 different hospitals in NI (13 NHS hospitals, 3 private hospitals). This compares to 17 (16 NHS hospitals, 1 private hospital) in 2001 and 25 (22 NHS hospitals, 3 private hospitals) in 1996 (Table 14).
- Just over half (56.2%) of patients first presented to one of the five cancer units; Belfast City Hospital (13.3%), The Ulster Hospital (13.3%), Craigavon Area Hospital (11.2%), Antrim Hospital (11.2%) and Altnagelvin Hospital (7.7%).
- The proportion of patients that presented to Daisy Hill and Causeway Hospitals (8.4% and 6.3% respectively) was similar to Altnagelvin Hospital (7.7%).
- Apart from an increase between 1996 and 2001 in the proportion of patients presenting at Ulster Hospital (5.8% to 14.8%, p= 0.02) and an increase between 1996 and 2010 at Daisy Hill Hospital (2.5% to 8.6%, p=0.037) there were no significant changes over time in the proportion of patients presenting at each hospital.
- At Trust level however there was an increase between 1996 and 2010 in the proportion of patients presenting at hospitals in the Southern Trust (9.9% vs. 19.5%, p=0.033).
- There were more presentations to the private sector in 2010 (8.6%) compared to 1.6% in 2001.

Table 14: Trust and hospital of first presentation by year

Trust & hospital of 1st presentation	1996	2001	2010		
	Ovarian cancer (n=121)	Ovarian cancer (n=122)	Ovarian cancer (n=128)	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
Belfast HSCT	**34 (28.1%)**	**36 (29.5%)**	**30 (23.4%)**	**35 (24.5%)**	**11 (21.2%)**
Belfast City	15 (12.4%)	18 (14.8%)	16 (12.5%)	19 (13.3%)	4 (7.7%)
Royal Victoria	9 (7.4%)	13 (10.7%)	7 (5.5%)	7 (4.9%)	3 (5.8%)
Mater Infirmorum	10 (8.3%)	5 (4.1%)	7 (5.5%)	9 (6.3%)	4 (7.7%)
Northern HSCT	**26 (21.5%)**	**22 (18.0%)**	**27 (21.1%)**	**29 (20.3%)**	**5 (9.6%)**
Antrim	13 (10.7%)	8 (6.6%)	14 (10.9%)	16 (11.2%)	1 (1.9%)
Causeway (Coleraine)	5 (4.1%)	7 (5.7%)	9 (7.0%)	9 (6.3%)	3 (5.8%)
Whiteabbey	2 (1.7%)	6 (4.9%)	4 (3.1%)	4 (2.8%)	1 (1.9%)
Other**	6 (5.0%)	1 (0.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
South-Eastern HSCT	**16 (13.2%)**	**26 (21.3%)**	**21 (16.4%)**	**22 (15.4%)**	**9 (17.3%)**
Ulster	7 (5.8%)	18 (14.8%)	18 (14.1%)	19 (13.3%)	7 (13.5%)
Lagan Valley	1 (0.8%)	5 (4.1%)	3 (2.3%)	3 (2.1%)	2 (3.8%)
Downe	5 (4.1%)	3 (2.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Ards	3 (2.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Southern HSCT	**12 (9.9%)**	**17 (13.9%)**	**25 (19.5%)**	**28 (19.6%)**	**13 (25.0%)**
Craigavon Area	7 (5.8%)	9 (7.4%)	14 (10.9%)	16 (11.2%)	8 (15.4%)
Daisy Hill	3 (2.5%)	7 (5.7%)	11 (8.6%)	12 (8.4%)	5 (9.6%)
South Tyrone	2 (1.7%)	1 (0.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Western HSCT	**14 (11.6%)**	**18 (14.8%)**	**13 (10.2%)**	**14 (9.8%)**	**10 (19.2%)**
Altnagelvin	3 (2.5%)	9 (7.4%)	10 (7.8%)	11 (7.7%)	4 (7.7%)
Erne	5 (4.1%)	4 (3.3%)	2 (1.6%)	2 (1.4%)	3 (5.8%)
Tyrone County	4 (3.3%)	5 (4.1%)	1 (0.8%)	1 (0.7%)	2 (3.8%)
Roe Valley	2 (1.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (1.9%)
Private sector	5 (4.1%)	2 (1.6%)	11 (8.6%)	13 (9.1%)	1 (1.9%)
Not recorded	14 (11.6%)	1 (0.8%)	1 (0.8%)	2 (1.4%)	3 (5.8%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*
*** Other includes Mid Ulster, Moyle, Route, Waveney and Dalriada*
Note: In April 2007 the five integrated Health and Social Care (HSC) Trusts shown above were established. Prior to this the hospitals listed above were part of one of the 4 Health Boards.

Location first seen

- Recording of location first seen was good (90.9%).
- Almost half of ovarian cancer patients (45.4%) presented via outpatients, with 28% presenting via Accident and Emergency and 11.2 % via the private sector (Table 15).
- Of the 40 ovarian cancer patients first presenting at A&E, 11 were admitted to general medicine, 18 to general surgery and 10 to gynaecology inpatients and one patient was referred urgently to gynaecology outpatients.
- Over two thirds of women with borderline ovarian tumours (71.1%) presented via outpatients.

Table 15: Location 1st seen

Location first seen	2010	
	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
Accident & Emergency	40 (28.0%)	2 (3.8%)
Inpatient - Medicine	8 (5.6%)	0 (0.0%)
Inpatient - Surgery	8 (5.6%)	3(5.8%)
Inpatient - Other	4(2.8%)	5 (9.6%)
Outpatients (NHS)	65 (45.4%)	37 (71.1%)
Private sector	16 (11.2%)	3 (5.8%)
Unknown	2 (1.4%)	2 (3.8%)
Total	143	52

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

Table 16: Specialty first seen - 2010

Specialty first seen	2010	
	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
Gynaecology	76 (53.1%)	40 (77.0%)
General Medicine	22 (15.4%)	1 (1.9%)
General Surgery	36 (25.2%)	4 (7.7%)
Urology	1 (0.7%)	1 (1.9%)
Gastroenterology	3 (2.0%)	0 (0.0%)
Other	5 (3.5%)	5 (9.6%)
Not recorded		1 (2.0%)
Total	143	52

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

Over half (53.1%) of ovarian cancer patients and 77% of borderline tumour patients were first seen by gynaecology while just over one quarter (25.2%) of ovarian cancer patients were first seen by general surgery and 15.4% by general medicine. Half of the patients first seen by general medicine and general surgery were admitted via A&E.

Access to Gynaecology and Specialist Gynae-oncology 2010

Following discussion at the Regional Gynae-Oncology MDM, patients for whom surgical resection was considered a first treatment option, were referred to a specialist gynae-oncology surgeon (if they had not already been seen by one), with 86 patients in total (60.1%) being assessed by a gynae-oncology surgeon in 2010. A small proportion of patients with low risk of malignancy index were managed by cancer unit gynaecologists following discussion at the regional MDM.

Patients considered not suitable for surgery were referred by the MDM directly to medical oncology for assessment.

Table 17: Access to Gynaecology and specialist Gynae-oncology 2010

Seen by gynaecologist or gynae-oncologist	2010	
	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
Seen by gynae-oncology surgeon**	86 (60.1%)	13 (25.0%)
Seen by another gynaecologist only	47 (32.9%)	39 (75.0%)
Seen by any gynaecologist	133 (93.0%)	52 (100.0%)
No record of being seen by a gynaecologist	10 (7.0%)	0 (0.0%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*
*** May have already been seen by a gynaecologist*

- All patients with borderline ovarian tumours were seen by a gynaecologist.
- In 2010, ten (7%) of ovarian cancer patients had no record of having been seen by a gynaecologist or gynae-oncologist. Seven of these patients were aged 80 and over, 4 were first seen at Belfast HSCT and 3 were first seen at Southern HSCT. The specialty first seen by 6 of these patients was general medicine.

Symptoms at presentation

Table 18: Presenting symptoms 2010

Symptom	2010	
	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
Abdominal Pain	78 (54.5%)	26 (50.0%)
Abdominal distension	77 (53.8%)	24 (46.2%)
Anorexia	50 (35.0%)	5 (9.6%)
Altered bowel habit	46 (32.2%)	11 (21.2%)
Weight loss	46 (32.2%)	7 (13.5%)
Shortness of breath	30 (21.0%)	0 (0.0%)
Post menopausal bleeding	18 (12.6%)	6 (11.5%)
Urinary symptoms	17 (11.9%)	6 (11.5%)
Dyspepsia	9 (6.3%)	1 (1.9%)
Weight gain	4 (2.8%)	1 (1.9%)
Asymptomatic	5 (3.5%)	5 (9.6%)
Incidental finding	15 (10.5%)	7 (13.5%)

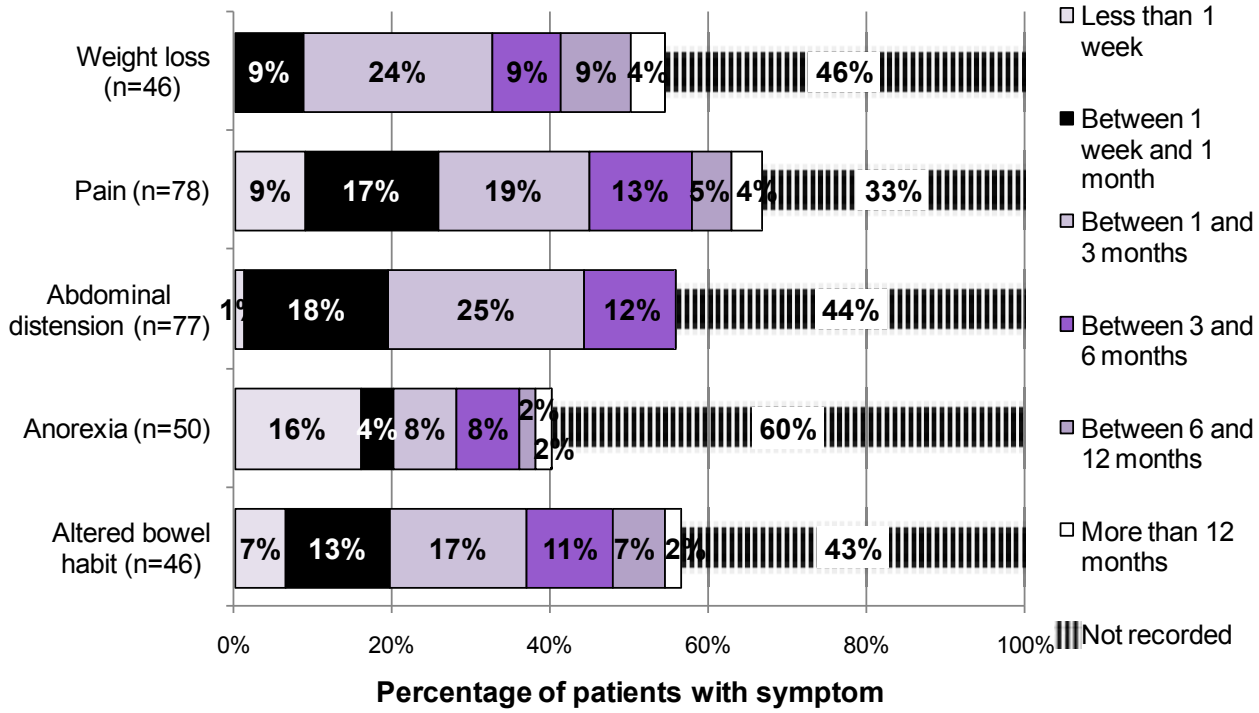
** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer.*
Note: Patients may have had more than 1 symptom.

- Only 3.5% of ovarian cancer patients were asymptomatic, as were 10% of patients with borderline ovarian tumours.
- Ovarian cancers and borderline ovarian tumours were detected incidentally in 10.5% and 13.5% of women respectively either during surgery for other conditions such as hysterectomy for post-menopausal bleeding or during radiological examinations where ovarian cancer was not suspected.
- The most common symptoms were abdominal pain and abdominal distension in both malignant and borderline tumours. Anorexia, altered bowel habit and weight loss were recorded in 35% and 32% of ovarian cancer patients. Post-menopausal bleeding occurred in 12.6% of women with ovarian cancer and in 11.5% of women with borderline ovarian tumours.
- Between 2001 and 2010 the proportion of patients presenting with pain as a symptom increased from 33.6% to 53.9% (p=0.001) while the proportion with anorexia increased from 22.1% to 34.4% (p=0.031), (Not shown) – comparison does not include cancer of the fallopian tubes and primary peritoneal cancer. This likely represents better recording of symptoms in the clinical notes in 2010.

Symptom duration

- Recording of symptom duration was generally poor. Where information was available 45% of women complained of abdominal pain and abdominal distension (43%) for less than 3 months (Figure 7). Abdominal distension for more than 6 months was not reported.
- For women complaining of abdominal pain (the most common symptom), 9.0% had it for less than one week, 16.7% had it between one week and one month, while 3.8% had it more than 12 months.
- As recording of symptom duration was much poorer than in previous audit years comparisons over time would be unreliable.

Figure 8: Symptom duration – 2010 – Ovarian cancer



Diagnosis: Investigations

Table 19: Investigations by year of diagnosis

Investigations	1996	2001	2010		
	Ovarian cancer (n=121)	Ovarian cancer (n=122)	Ovarian cancer (n=128)	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
CA125 level	51 (42.1%)	109 (89.3%)	123 (96.1%)	137 (95.8%)	49 (94.2%)
CEA level	-	-	90 (70.3%)	99 (69.2%)	37 (71.2%)
C19.9 level	-	-	91 (71.1%)	99 (69.2%)	34 (65.4%)
AFP level	-	-	18 (14.1%)	18 (12.6%)	8 (15.4%)
HCG level	-	-	6 (4.7%)	6 (4.2%)	0 (0.0%)
Ultrasound of abdomen	84 (69.4%)	78 (63.9%)	82 (64.1%)	92 (64.3%)	30 (57.7%)
Vaginal ultrasound	4 (3.3%)	3 (2.5%)	41 (32.0%)	46 (32.2%)	25 (48.1%)
CT scan	32 (26.4%)	91 (74.6%)	123 (96.1%)	137 (95.8%)	43 (82.7%)
Cytology of Ascites	48 (39.7%)	85 (69.7%)	56 (43.8%)	68 (47.6%)	13 (25.0%)
Cytology Pleural Fluid	-	-	19 (14.8%)	19 (13.3%)	1 (1.9%)
Other	17 (14.0%)	17 (13.9%)	49 (38.3%)	56 (39.2%)	14 (26.9%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*
Tumour markers: CA125 = Cancer antigen 125, CEA = carcinoembryonic antigen, CA19.9 = Cancer antigen 19.9, AFP= Alpha fetoprotein, HCH = Human chorionic gonadotrophin
Note: patients can have multiple tests.

Blood tests

- Recording of the ovarian cancer tumour marker CA125 level improved from 42.1% to 89.3% between 1996 and 2001 ($p<0.001$) and increased again to 96.1% in 2010 ($p=0.038$).
- Over two thirds of patients had CEA and C19.9 levels recorded. A smaller proportion had AFP & HCG levels measured as these tumour markers are more likely to be raised in the small proportion of germ cell tumours that occur in younger women.

Radiology

- Ultrasound of abdomen was performed in 64.3% of patients while 32.2% of patients had a vaginal ultrasound which was significantly higher ($p<0.001$) than in the 2001 audit (2.5%).
- CT scan was performed in 96% of patients, significantly higher than 26.4% in 1996 and 74.6%% in 2001 ($p<0.001$).

Other investigations

- Cytology of ascitic and pleural fluid was analysed in 47.6% and 13.3% of patients respectively. Increased use of investigations was observed over time and there was no significant variation noted in investigations by patient age.

Basis of diagnosis

Table 20: Basis of diagnosis by year of diagnosis

Basis of diagnosis	1996	2001	2010		
	Ovarian cancer (n=121)	Ovarian cancer (n=122)	Ovarian cancer (n=128)	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
Histopathology	97 (80.2%)	95 (77.9%)	108 (84.4%)	122 (85.3%)	50 (96.2%)
Cytology	13 (10.7%)	16 (13.1%)	9 (7.0%)	10 (7.0%)	0 (0.0%)
Radiology	7 (5.9%)	9 (7.4%)	4 (3.1%)	4 (2.8%)	1 (1.9%)
Clinical opinion	4 (3.3%)	2 (1.6%)	7 (5.5%)	7 (4.9%)	1 (1.9%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

- In 2010 the majority of patients had pathological (histopathology or cytopathology) confirmation of ovarian cancer (92.3%) or borderline ovarian tumours (96.2%) with the diagnosis being confirmed at the time of surgery in most cases (Table 20).
- 12 of the 13 patients having a diagnosis made on radiology or clinical opinion alone were aged 70 or over (8 patients were aged 80 or over).

Histological type

Table 21: Histological type

Histological type	2010
Malignant Epithelial tumours	
Serous cystadenocarcinoma	95 (73.0%)
Mucinous cystadenocarcinoma	6 (4.6%)
Endometrioid adenocarcinoma	8 (6.1%)
Clear cell adenocarcinoma	6 (4.6%)
Mixed Mullerian (carcinosarcoma)	4 (3.0%)
Adenosarcoma	1 (<1.0%)
Undifferentiated carcinoma	3 (2.3%)
Adenocarcinoma, unspecified*	7 (5.4%)
Malignant epithelial total	**130**
Borderline Epithelial tumours	
Borderline mucinous cystadenoma	34
Borderline serous cystadenoma	11
Borderline endometrioid cystadenoma	2
Non-epithelial malignant tumours	
Granulosa cell tumor/ Sex-cord stromal tumour/Germ cell tumours	5
Not histologically or cytologically verified	13
All ovarian tumours (Malignant and borderline)	**195**

Note: The 2 granulosa cell tumours and the sex-cord stromal tumour were registered as borderline and have been analysed as such in this report.

As expected epithelial tumours were the most common accounting for 88.1% of the malignant and 90% of the borderline tumours.

Histological grade

Table 22: Histological grade by year of diagnosis

Histological grade	1996	2001	2010	
	Ovarian cancer (n=121)	Ovarian cancer (n=122)	Ovarian cancer (n=128)	Ovarian cancer* (n=143)
Well differentiated	14 (11.6%)	6 (4.9%)	7 (5.5%)	8 (5.6%)
Moderately differentiated	11 (9.1%)	24 (19.7%)	10 (7.8%)	11 (7.7%)
Poorly differentiated	30 (24.8%)	35 (28.7%)	84 (65.6%)	94 (65.7)
Undifferentiated	1 (0.8%)	4 (3.3%)		
Not applicable*			20 (15.6%)	21 (14.7)
Not recorded	65 (53.7%)	53 (43.4%)	7 (5.4%)	9 (6.3%)

** Grade not assessable as cytology sample only*

Recording of histological grade improved over the audit years. In 2010 (92.6%) of tumours that were histologically verified had a grade assigned.

FIGO stage

- FIGO stage was very well recorded in 2010 with 91.6% of patients having a stage assigned an improvement from the earlier audits. The proportion of staged patients increased from just under 80% in 2001 to 91.6% in 2010 (p=0.007).
- The proportion of patients presenting with Stage I, II and III disease has remained constant over the audit years. The proportion of patients recorded with Stage IV disease increased from 9.8% in 2001 to 25.0% in 2010 however, this is most likely artefactual as there were considerably more unstaged patients in 1996 and 2001 whose survival is suggestive of late stage disease.

Table 23: FIGO Stage by year of diagnosis

FIGO Stage at diagnosis	1996	2001	2010		
	Ovarian cancer (n=121)	Ovarian cancer (n=122)	Ovarian cancer (n=128)	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
Stage I	29 (24.0%)	35 (28.7%)	24 (18.8%)	24 (16.8%)	45 (86.5%)
Stage II	11 (9.1%)	11 (9.0%)	11 (8.6%)	11 (7.7%)	1 (1.9%)
Stage III	48 (39.7%)	39 (32.0%)	50 (39.1%)	63 (44.1%)	3 (5.8%)
Stage IV	14 (11.6%)	12 (9.8%)	32 (25.0%)	33 (23.0%)	0 (0.0%)
Not recorded	19 (15.7%)	25 (20.5%)	11 (8.6%)	12 (8.4%)	3 (5.8%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

FIGO Stage by age

- Age was a factor in the stage at presentation for ovarian cancer patients. Among those aged under 50 in 2010, almost two thirds (63.2%) were diagnosed at Stage I compared to 5.7% of those aged 70 to 79 and 3.6% of those aged 80 and over. Conversely only 15.8% of those aged under 50 were diagnosed at Stage IV compared to 21.3% of those aged 50 to 59, 22.9% of those aged 70 to 79 and 32.1% of those aged 80 and over.

Table 24: FIGO Stage by age at diagnosis

FIGO Stage at diagnosis	2010 - Ovarian cancer*				
	Aged Under 50 (n=19)	Aged 50 to 69 (n=61)	Aged 70 to 79 (n=35)	Aged 80+ (n=28)	All ages (n=143)
Stage I	12 (63.2%)	9 (14.8%)	2 (5.7%)	1 (3.6%)	24 (16.8%)
Stage II	1 (5.3%)	3 (4.9%)	4 (11.4%)	3 (10.7%)	11 (7.7%)
Stage III	3 (15.8%)	36 (59.0%)	17 (48.6%)	7 (25.0%)	63 (44.1%)
Stage IV	3 (15.8%)	13 (21.3%)	8 (22.9%)	9 (32.1%)	32 (22.4%)
Not recorded	0 (0.0%)	0 (0.0%)	4 (11.4%)	8 (28.6%)	12 (8.4%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

Multidisciplinary team discussion

In 2010 the majority (90%) of ovarian cancer patients were discussed at the Specialist Regional Multidisciplinary Team Meeting (MDM) with 24% of patients having a first discussion at the local cancer unit MDM. Ten ovarian cancer patients were not discussed at either a local or regional MDM. Six of these patients were stage IV and 4 were unstaged. All of these patients died shortly after diagnosis (range 1-19 days). All were aged 70 years or over with 7 aged 80 or over.

- A lower proportion (78.8%) of patients with borderline tumours were discussed at the regional MDM meeting.

Table 25: Multidisciplinary team meetings (MDM) – 2010

MDM meetings	2010	
	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
Discussed at Regional MDM	129 (90.2%)	41 (78.8%)
Trust of 1st MDM discussion		
- Belfast Trust	97 (67.8%)	24 (46.2%)
- Southern Trust	25 (17.5%)	9 (17.3%)
- Western Trust	10 (7.0%)	8 (15.4%)
Not discussed at local or regional MDM	10 (7.0%)	11 (21.2%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*
Note: All Trusts participate in the Regional MDT in Belfast. Southern and Western Trusts have in addition a local MDT where patients are first discussed prior to discussion at the Regional MDT in Belfast.

Treatment

Table 26: Treatment by audit year

Treatment type	1996	2001	2010		
	Ovarian cancer (n=121)	Ovarian cancer (n=122)	Ovarian cancer (n=128)	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
Surgical resection**	95 (78.5%)	94 (77.0%)	77 (60.1%)	86 (60.1%)	50 (96.2%)
Chemotherapy	68 (56.2%)	74 (60.7%)	81 (63.3%)	91 (63.6%)	0 (0.0%)
Radiotherapy	5 (4.1%)	5 (4.1%)	1 (0.8%)	1 (0.7%)	0 (0.0%)
No active treatment	19 (15.7%)	23 (18.8%)	27 (21.1%)	31 (21.7%)	2 (3.8%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*
"" Excludes diagnostic procedures
Note: Patients may have more than one treatment type

- In 2010, the majority of patients 117/143 (81.8%) had a surgical procedure performed (including diagnostic/staging procedures) with 60% of ovarian cancer patients undergoing surgical resection, a lower proportion than previous audit years most likely due to the high proportion of Stage IV disease (25%) in 2010.
- In contrast, a higher proportion (63.3%) of patients received chemotherapy in 2010 compared to 56% in 1996.
- Almost all (96.2%) of patients with borderline ovarian tumours had surgery while two patients did not have any active treatment for clinical reasons.

Treatment modalities

The treatment modalities in each audit year are shown in Table 27.

- In 2010, surgery followed by adjuvant chemotherapy was the most common treatment modality (36.3%).
- A higher proportion of patients received primary chemotherapy alone (18%) in 2010 compared to just 5.8% in 1996.
- In 2010, 9.0% (n=13) of patients had primary chemotherapy followed by adjuvant de-bulking surgery.
- In total 31 patients (21.6%) did not have any active cancer treatment and received best palliative supportive care. This proportion was similar to previous audit years.

Table 27: Treatment modality by audit year

Treatment modality	1996	2001	2010		
	Ovarian cancer (n=121)	Ovarian cancer (n=122)	Ovarian cancer (n=128)	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
Surgery only	33 (27.3%)	25 (20.5%)	20 (15.6%)	21 (14.6%)	50 (96.2%)
Surgery and adjuvant chemotherapy	56 (46.3%)	64 (52.5%)	46 (36.0%)	52 (36.3%)	0 (0.0%)
Primary chemotherapy only	7 (5.8%)	5 (4.1%)	23 (18.0%)	25 (17.5%)	0 (0.0%)
Primary chemotherapy and adjuvant surgery	1 (0.8%)	0 (0.0%)	11 (8.6%)	13 (9.1%)	0 (0.0%)
Surgery and radiotherapy	1 (0.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Chemotherapy and radiotherapy	0 (0.0%)	0 (0.0%)	1 (0.8%)	1 (0.7%)	0 (0.0%)
Surgery, chemotherapy & radiotherapy	4 (3.3%)	5 (4.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Palliative supportive care/ no active treatment	19 (15.7%)	23 (18.9%)	27 (21.1%)	31 (21.6%)	2 (3.8%)
Total	**121**	**122**	**128**	**143**	**52**

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

Treatment by age

In 2010 approximately 20% of ovarian cancer patients were aged 80 years or over. Patients aged 80 or over were considerably less likely to undergo surgical resection (21.4%) or chemotherapy (14.3%) compared to younger patients and this is likely due to the comorbidities that accompany advanced age. In 2010, eighteen patients (64.3%) aged 80 years or older received palliative supportive care alone.

Table 28: Treatment by age of patient

Treatment type	2010 - Ovarian cancer*				
	Aged Under 50 (n=19)	Aged 50 to 69 (n=61)	Aged 70 to 79 (n=35)	Aged 80+ (n=28)	All ages (n=143)
Surgery	18 (95.0%)	45 (73.8%)	17 (48.6%)	6(21.4%)	86 (60.1%)
Chemotherapy	11 (57.9%)	54 (88.5%)	21 (60.0%)	4 (14.3%)	91 (63.6%)
Radiotherapy	0 (0.0%)	1 (1.6%)	0 (0.0%)	0 (0.0%)	1 (0.7%)
Palliative supportive care	0 (0.0%)	3 (4.9%)	10 (28.6%)	18 (64.3%)	31(21.7%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*
Note: Patients may have more than one treatment type

Treatment modality by FIGO stage

- Treatment modality was also strongly related to FIGO stage at diagnosis. All patients with Stage I or II disease received active treatment compared to two thirds (66.6%) of Stage IV patients. Just over half of patients with Stage I disease had surgery alone.
- In keeping with the regional clinical management guidelines [9] none of the patients with FIGO Stage IA or IB well differentiated tumours received adjuvant chemotherapy and 2 patients (one with moderate grade IA and one with high grade IB) received adjuvant chemotherapy also in compliance with the regional clinical management guidelines [9].
- 85.7% of patients with Stage III disease had active anticancer treatment with just over half having surgery and adjuvant chemotherapy. The majority (91.6%) of the unstaged patients had palliative supportive care only.

Table 29: Treatment by FIGO stage

Treatment type	2010 - Ovarian cancer*					
	FIGO I	FIGO II	FIGO III	FIGO IV	Unstaged	Total
Surgery alone	13 (54%)	5 (45.4%)	3 (4.8%)	0 (0.0%)		21 (14.6%)
Surgery and adjuvant chemotherapy	10 (41.7%)	6 (54.5%)	30 (47.6%)	6 (18.2%)		52 (36.4%)
Primary chemotherapy	1 (<1%)	0 (0.0%)	12 (19%)	11 (33.3%)	1 (<1%)	25 (17.5%)
Primary chemotherapy and adjuvant surgery			9 (14.3%)	4 (12.0%)		13 (9.1%)
Chemotherapy and radiotherapy				1 (3.0%)		1 (<1.0%)
Palliative supportive care	0 (0.0%)	0 (0.0%)	9 (14.3%)	11 (33.3%)	11 (91.6)	31 (21.7%)
Total	**24**	**11**	**63**	**33**	**12**	**143**

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

Surgical procedures

In 2010, 86/143 (60%) of patients underwent surgical resection. The type of surgical resection procedure by FIGO stage is shown in Table 30.

FIGO Stage I: The majority 16/23 (69.6%) of patients with Stage I epithelial ovarian cancers had a full surgical staging procedure performed as per regional guidelines (Hysterectomy, bilateral salphingo-oophorectomy and omentectomy). Of the remaining 7 patients who did not have full surgical staging, two had germ cell tumours and were referred to oncology, 2 declined full staging or adjuvant chemotherapy, 1 was deemed unfit for further treatment and two patients with low grade tumours on the advice of the regional MDM did not require full surgical staging.

FIGO Stage II: The majority of Stage II patients had a full surgical staging procedure performed as per regional guidelines. The two patients who did not have full surgical staging were aged over 85.

FIGO Stage III: Just under two thirds of patients with advanced Stage III disease had surgical resection, with 40/42 of these patients having full surgical staging and debulking surgery (93%). The 2 patients who did not have full surgical staging had inoperable disease at the time of surgery.

FIGO Stage IV: 30% of patients with Stage IV disease had surgical resection with 5/10 patients having full surgical staging and debulking surgery before or after chemotherapy. The remaining patients had more limited surgery.

Borderline ovarian tumours: 58% of patients had surgical staging +/- debulking.

Table 30: Surgery type by stage

Surgery type	Stage I (n=23)*	Stage II (n=11)	Stage III (n=42)	Stage IV (n=10)	Total (n=86)	Borderline ovarian tumours (n=50)**
Hysterectomy and bilateral salphingo-oophorectomy	2 (8.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (2.3%)	9 (18.0%)
Bilateral salphingo-oophorectomy	1 (4.3%)	0 (0.0%)	1(2.4%)	0 (0.0%)	2 (2.3%)	2 (4.0%)
Salphingo-oophorectomy	4 (17.4%)	2 (18.2%)	1 (2.3%)	3 (30.0%)	10 (11.6%)	10 (20%)
Surgical staging and debulking	1 (4.3%)	9 (81.8%)	40 (93.0%)	4 (40.0%)	54 (62.8%)	2 (4.0%)
Surgical Staging	15 (65.2%)	0 (0.0%)	0 (0.0%)	1 (10.0%)	16 (18.6%)	27 (54.0%)
Omentectomy only	0 (0.0%)	0 (0.0%)	0(0.0%)	2 (20.0%)	2 (2.3%)	
Total					**86**	**50**

**One Stage I patient did not have a surgical resection, ** 2 patients with borderline ovarian tumours did not undergo surgical resection*

Surgical specialisation

Table 31: Surgeon grade - First surgery performed 2010

Grade of surgeon	2010	
	Ovarian cancer* (n=86)	Borderline ovarian tumours (n=50)
Specialist gynae-oncologist	67 (78%)	12 (24.0%)
Gynaecologist [cancer unit]	15 (17.4%)	29 (58.0%)
Other surgeon	4 (4.6%)	9 (18.0%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

Over three quarters (78%) of ovarian cancer patients had their surgery performed or supervised by a specialist gynae-oncology surgeon. The regional guidelines [8,9] recommend that all ovarian cancer patients should have comprehensive full surgical staging performed by a specialist gynae-oncology surgeon. However various clinical scenarios (detailed below) resulted in a proportion of patients having their surgery performed by a cancer unit gynaecologist. The reasons for surgery not being performed by specialist gynae-oncology surgeon were: diagnosis of ovarian cancer was discovered during surgery for other conditions (Incidental cancers, 3 patients); diagnosis was made during emergency surgery (2 patients); patient choice not to have surgery in Specialist centre in Belfast City Hospital (2 patients); Low risk of malignancy (6 patients, 3 on advise of the specialist MDM, 3 decision made at cancer unit), multiple comorbidities (1 patient), reason unknown (1 patient).

- The remaining 4.6% were found to have ovarian cancer during surgery performed by non-gynaecological surgeons for other conditions where cancer was not suspected.
- Almost a quarter (24.0%) of patients with borderline ovarian tumour had a specialist gynae-oncologist conduct or supervise their surgery.
- A further 58.0% of patients with borderline tumours had a gynaecologist conduct or supervise their first operation. The remaining nine patients had a non-gynaecological surgeon perform their operation and these cases were incidental tumours identified either during surgery for another cause or emergency surgery cases.

Trust and hospital of surgery

Table 32: Trust and hospital of surgery - 2010 diagnosed patients

Trust and hospital of surgery	2010	
	Ovarian cancer* (n=86)	Borderline ovarian tumours (n=50)
Belfast HSCT	66 (74.2%)	13 (26.0%)
Belfast City	64 (71.9%)	8 (16.0%)
Royal Victoria	1 (1.1%)	1 (2.0%)
Mater Infirmorum	1 (1.1%)	4 (8.0%)
Northern HSCT	4 (4.5%)	5 (10.0%)
Antrim**	3 (3.4%)	3 (6.0%)
Causeway (Coleraine)	1 (1.1%)	2 (4.0%)
South-Eastern HSCT	5 (5.6%)	9 (18.0%)
Ulster**	5 (5.6%)	8 (16.0%)
Lagan Valley	0 (0.0%)	1 (2.0%)
Southern HSCT	4 (4.5%)	11 (22.0%)
Craigavon Area**	2 (2.2%)	8 (16.0%)
Daisy Hill	2 (2.2%)	3 (6.0%)
Western HSCT	3 (3.4%)	9 (18.0%)
Altnagelvin**	3 (3.4%)	8 (16.0%)
Erne	0 (0.0%)	1 (2.0%)
Private sector	4 (4.5%)	3 (6.0%)
Total	**86**	**50**

**Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer, ** Cancer Unit*

- Over seventy percent (71.9%) of ovarian cancer patients had their surgery performed in the specialist centre in Belfast City Hospital by a specialist gynae-oncology surgeon with 2 additional patients having surgery performed by a specialist gynae-oncology surgeon in the private sector.

- The remaining surgeries were performed in several other hospitals. The reasons for surgery being performed outside the specialist centre were: diagnosis of ovarian cancer was discovered during surgery for other conditions (Incidental cancers, 3 patients); diagnosis was made during emergency surgery (2 patients); patient choice not to have surgery in specialist centre in Belfast City Hospital (2 patients); Low risk of malignancy (6 patients, 3 on advise of the specialist MDM, 3 decision made at cancer unit), multiple comorbidities (1 patient), reason unknown (1 patient).
- The majority of surgery for borderline ovarian tumours (84%) was carried out in the cancer units.

Communication with primary care

Table 33: Contents of letter to GP

Contents of letter to GP	2010	
	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
Management plan	140 (97.9%)	48 (92.3%)
Patient prognosis	24 (16.8%)	9 (17.3%)
Diagnosis discussed with patient	99 (69.2%)	32 (61.5%)
Diagnosis discussed with patients family	60 (42.0%)	7 (13.5%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

- Communication with patients's GP's was generally good, with improvements noted between 1996 and 2010.
- 97.9% of ovarian cancer patients had a record of letter sent to their GP.
- The management plan was well documented in the GP letter (97.9%) and patient awareness of diagnosis was noted in over 2 thirds (69.2%) of cases. The GP letter provided information on prognosis in less than one fifth of cases.

Patient Information

- Discussion of the diagnosis and treatment plan with patients was well recorded (90%) in the clinical notes and CaPPS.
- Discussion of prognosis with patients was documented in less than one third of cases (30.8%).
- One third of patients (34.3%) were recorded as having been seen by the gynaecology clinical nurse specialist.
- The clinical notes documented that information leaflets had been given to the patients in just under half of cases (44.8%).
- Only one ovarian cancer patient was included in a clinical trial in 2010, a considerable reduction compared with 1996 and 2001 when 18 and 15 patients respectively were enrolled in trials. This reduction was due to a clinical trial closing in 2010 with a new trial not opening until 2011.

Table 34: Information provided to patient - 2010

Information provided to patient	2010	
	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
Diagnosis discussed with patient	130 (90.9%)	37 (71.2%)
Treatment plan discussed with patient	128 (89.5%)	46 (88.5%)
Prognosis discussed with patient	44 (30.8%)	6 (11.5%)
Information leaflets given	64 (44.8%)	9 (17.3%)
Other patient-related activity		
Treatment plan recorded	141 (98.6%)	48 (92.3%)
Seen by Gynaecological Clinical Nurse Specialist	49 (34.3%)	12 (23.1%)
Included in clinical trial	1 (0.7%)	0 (0.0%)

Onward referrals to other health care professionals

- In 2010 the most common referrals for ovarian cancer patients were to Macmillan Cancer Support (32.9%), a social worker (26.6%) and a specialist palliative care consultant (18.2%).
- The proportion of patients with a record of referral to Macmillan Cancer Support ($p<0.001$), hospice ($p=0.012$) and district nurse ($p<0.001$) all increased significantly between 2001 and 2010.

Table 35: Onward referrals

Referral to	1996	2001	2010		
	Ovarian cancer (n=121)	Ovarian cancer (n=122)	Ovarian cancer (n=128)	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
Macmillan Cancer Support	4 (3.3%)	13 (10.7%)	42 (32.8%)	47 (32.9%)	4 (7.7%)
Specialist palliative care consultant	1 (0.8%)	25 (20.5%)	22 (17.2%)	26 (18.2%)	0 (0.0%)
Hospice	8 (6.6%)	4 (3.3%)	15 (11.7%)	17 (11.9%)	0 (0.0%)
District Nurse	0 (0.0%)	1 (0.8%)	20 (15.6%)	23 (16.1%)	3 (5.8%)
Psychologist	-	-	4 (3.1%)	4 (2.8%)	0 (0.0%)
Dietician	-	-	16 (12.5%)	19 (13.3%)	3 (5.8%)
Social worker	-	-	32 (25.0%)	38 (26.6%)	7 (13.5%)
Community palliative care	-	-	16 (12.5%)	18 (12.6%)	0 (0.0%)

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*
Details on psychologist, dietician, social worker and community palliative care referrals only collected in 2010.
Note that patients may be referred to more than one group.

Ovarian cancer pathway: Timelines

This analysis excludes patients who first presented via the private sector.

Table 36: Time from 1st referral to first seen in secondary care by year (Excluding patients 1st seen in the private sector, 2010 patients only)

Time from referral to first seen	1996	2001	2010		
	Ovarian cancer (n=121)	Ovarian cancer (n=122)	Ovarian cancer (n=115)**	Ovarian cancer* (n=127)**	Borderline ovarian tumours (n=49)**
Same day	57 (47.1%)	74 (60.7%)	47 (40.9%)	51 (40.1%)	12 (24.5%)
1-14 days	20 (16.5%)	28 (23.0%)	39 (33.9%)	48 (37.0%)	21 (42.8%)
15-28 days	8 (6.6%)	7 (5.7%)	15 (13.0%)	15(11.8%)	6 (12.2%)
29-42 days	5 (4.1%)	6 (4.9%)	4 (3.5%)	4(3.1%)	1 (2.0%)
43 or more days	5 (4.1%)	6 (4.9%)	8 (7.0%)	8 (6.3%)	8 (16.3%)
Not recorded	26 (21.5%)	1 (0.8%)	2 (1.7%)	2 (1.6%)	1 (2.0%)
Total	**121**	**122**	**115**	**127**	**49**
Mean (days)	7	7	14	13	10
Median (days)	0	0	3	3	9

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer. ** In 2010 patients first seen in the private sector were excluded from this analysis.*

- In 2010, the median time from referral to first seen for ovarian cancer patients was 3 days with 40% of patients being seen on the same day as referral reflecting a considerable proportion of A&E presentations. The proportion of patients seen on the same day as referral however was lower than in 2001(60.7%) in keeping with fewer presentations via A&E in 2010 compared to 2001.
- Information on timelines has improved markedly since 1996.
- The proportion of patients seen between 1-14 days (37%) was considerably higher in 2010 than in previous audit years most likely due to the introduction of the cancer access targets in 2007.
- 6.3% of patients waited more than 43 days between referral and first being seen, 62.5% of whom were GP routine referrals.

Time from referral to first seen by referral type

This analysis (n=87) excludes patients who first presented via the private sector and via A&E.

Table 37: Time from referral to first seen by referral type – 2010 (Excluding patients 1st seen in the private sector and patients presenting via A&E)

Time from referral to first seen	2010 - Ovarian cancer*						
	Red Flag – GP suspect cancer (n=35)	Red Flag – Consultant upgrade (n=4)	GP Urgent– (n=17)	GP, Routine/ Unspecified (n=12)	Other (n=15)	Unknown (n=4)	All (n=87)
Same day	1 (2.8%)	0 (0.0%)	8 (47.0%)	1 (8.3%)	3 (20.0%)	2 (50.0%)	15
1-14 days	28 (80.0%)	3 (75.0%)	4 (23.5%)	3 (25.0%)	4 (26.7%)	1 (25.0%)	43
15-28 days	5 (13.9%)	1 (25.0%)	1 (5.9%)	1 (8.3%)	7 (46.7%)		15
29-42 days	1 (2.8%)	0 (0.0%)	2 (11.8%)	1 (8.3%)	0 (0.0%)		4
43 or more days	0 (0.0%)	0 (0.0%)	2 (11.8%)	5 (41.7%)	1 (6.7%)		8
Not recorded	0 (0.0%)	0 (0.0%)		1 (8.3%)		1 (25.0%)	2
Median (days)	10	12	0	33	15		10

Note: GP Red flag is when a GP refers a patient to hospital as a suspect cancer. These patients should be seen within 14 days of referral and if cancer is confirmed they should be treated within 62 days of referral.

- In 2010 there were 39 ovarian cancer patients on a red flag pathway with 82.1% being seen within the 14 day cancer access target.
- The remaining 48 patients were on a non-red flag pathway (GP urgent, GP routine and other). For patients referred as 'GP urgent' 70.5% were seen between 1-14 days of referral with 47% being seen on the same day as referral.
- 50% of patients referred as 'GP routine' waited over 28 days from referral to first being seen compared to 2.8% on a red flag pathway.

Access to Specialist Gynae-oncology

This analysis excludes patients who first presented via the private sector.

Table 38: Time from referral to hospital to first seen by a gynae-oncologist (Tertiary care) for patients undergoing surgery as 1st treatment only – 2010 (Excluding patients 1st seen in the private sector)

Time from referral to first seen by gynae-oncologist	2010	
	Ovarian cancer* (n=50)	Borderline ovarian tumours (n=11)
Same day	1 (2.0%)	0 (0.0%)
1-14 days	12 (24.0%)	3(27.3%)
15-28 days	12 (24.0%)	4 (36.4%)
29-42 days	12 (24.0%)	1 (9.1%)
43 or more days	11 (22.0%)	3 (27.3%)
Unknown (missing dates)	2	
Total	**50**	**11**
Median (days)	28	20

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

- 63% of all ovarian cancer patients (90/143) were seen by a specialist gynae-oncologist during their pathway.
- For the 50/90 patients (56.0%) who had surgery as first treatment, one quarter of these patients were seen by a gynae-oncology surgeon within 14 days of initial referral to secondary care, just under one quarter between 14 and 28 days (24.0%) while one fifth were seen 6 weeks or more from 1st referral to secondary care.

Referral to treatment

This analysis excludes patients who first presented via the private sector.

Table 39: Time between hospital referral and first active cancer treatment by year (Excluding patients 1st seen in the private sector, 2010 patients only)

Time from 1st referral to hospital to treatment	Patients receiving treatment				
	1996	2001	2010		
	Ovarian cancer (n=102)	Ovarian cancer (n=99)	Ovarian cancer (n=88)	Ovarian cancer* (n=96)	Borderline ovarian tumours (n=47)
Same day	2 (2.1%)	2 (2.1%)	0	0	0
1-14 days	29 (28.4%)	21(21.2%)	4 (4.5%)	4 (4.2%)	4 (8.5%)
15-30 days	14 (13.7%)	33 (34.0%)	16 (18.2%)	16 (16.7%)	5 (10.6%)
31-62 days	11 (11.3%)	23 (23.7%)	31 (35.2%)	38 (39.6%)	22 (46.8%)
63 or more days	28 (27.4%)	20 (20.6%)	36 (40.9%)	37 (38.5%)	16 (34.0%)
Not recorded	18 (17.6%)	0 (0.0%)	1 (1.1 %)	1 (<1.0%)	0
Total patients	**102**	**99**	**88**	**96**	**47**
Median (days)	**27**	**28**	**55**	**54**	**50**

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

- In 2010 the median time between referral and first treatment for ovarian cancer patients treated in the health service (excluding private patients) was 55 days. The increase from 2001 can be explained by the inclusion of private patients in the 1996 and 2001 data.
- 37 patients were treated 63 days or more from hospital referral. 14 patients (37.8%) were on a red flag pathway, 6 presented as emergencies via A&E, 11 were GP urgent & routine referrals and 6 were referred from other sources. Trust of 1st presentation was Northern (12), Belfast (9), Southern (7), South Eastern (6), Western (2) and private sector (1). In total 20/37 (54%) of these patients were intertrust transferred to the Belfast Trust for treatment from Northern Trust (10) Southern Trust (6) and South Eastern Trust (3), Private sector (1). Just over half (19/37) had surgery as 1st treatment with the remainder having chemotherapy.

This analysis excludes patients who first presented via the private sector.

Table 40: Time between hospital referral and first treatment by presentation type (Excluding patients 1st seen in the private sector)

Time between hospital referral & first treatment	2010 – Ovarian cancer patients receiving active treatment				
	A&E (22)	Gynaecology (n=49)	General Medicine / General surgery (n=18)	Other (n=7)	All patients (n=96)
Same day	0	0	0 (0.0%)		
1-14 days	2 (9.0%)	1 (2.1%)	1 (5.5%)		4 (4.2%)
15-30 days	6 (27.3%)	7(8.3%)	3 (16.7%)		16 (16.7%)
31-62 days	8 (36.4%)	24 (49.0%)	6 (33.3%)		38 (39.6%)
63 or more days	6 (27.3%)	17 (34.7%)	8 (44.4%)	6 (85.6%)	37 (38.5%)
Not recorded			0 (0.0%)	1 (14.3%)	1 (1.0%)
Total	22	49	18	7	96
Median (days)	**39**	**55**	**58**	**155**	**54**

Other = Urology,Gastroenterology

- Median time between referral and first treatment was shorter for those initially being admitted via A&E (39 days) compared to 55 days for outpatient gynaecology and 58 days for general medicine/general surgery.

Table 41: Time between hospital referral and first treatment by 1st treatment type (Excluding patients 1st seen in the private sector)

Time from referral to first treatment by 1st treatment type	2010	
	Surgery	Chemotherapy
Same day	0	0
1-14 days	4 (6.5%)	0
15-30 days	12 (19.7%)	4 (11.4%)
31-62 days	25 (41%)	13 (28.3%)
63 or more days	19 (41.0)	18 (51.4%)
Unknown	1 (1.6%)	
Total	**61**	**35**
Median (days)	46	64

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

- Median time between referral and first treatment was shorter for those initially having surgery as first treatment (46 days) compared to 64 days for patients undergoing chemotherapy as first treatment.

Survival

Survival by tumour type

- Observed survival one year from diagnosis of ovarian cancer was 59.4%. Including cancer of the fallopian tubes and primary peritoneal cancer it was 58.7%. Survival from borderline ovarian tumours was excellent at 100.0% after six months and 98.1% after one year.

Figure 9: Survival by ovarian tumour type

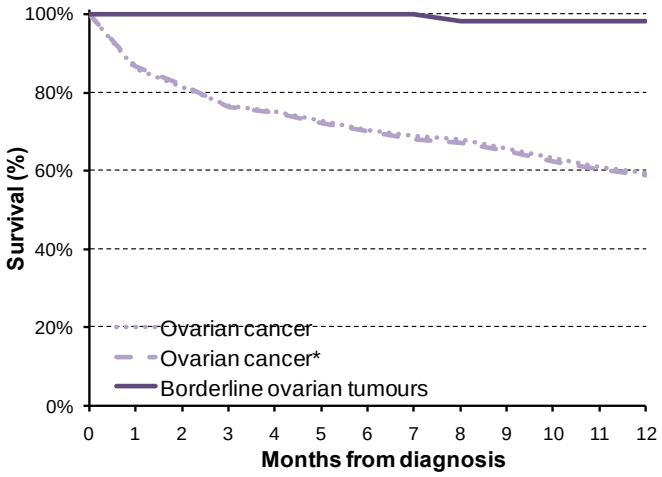


Table 42: Survival by tumour type

Time from diagnosis	Observed Survival 2010		
	Ovarian cancer (n=128)	Ovarian cancer* (n=143)	Borderline ovarian tumours (n=52)
3 months	76.6%	76.2%	100.0%
6 months	70.3%	69.9%	100.0%
9 months	65.6%	65.0%	98.1%
12 months	59.4%	58.7%	98.1%

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

Survival of patients treated surgically

- In 2010, survival for ovarian cancer patients treated surgically (excluding cancer of the fallopian tubes and primary peritoneal cancer) was good at 90.0% after six months and 83.8% after one year.
- Survival for ovarian cancer patients who had surgery improved between 1996 and 2010 (p=0.007). For example one-year survival increased from 75.8% in 1996 to 81.9% in 2001 and 83.8% in 2010.

Figure 10: Survival of surgery patients

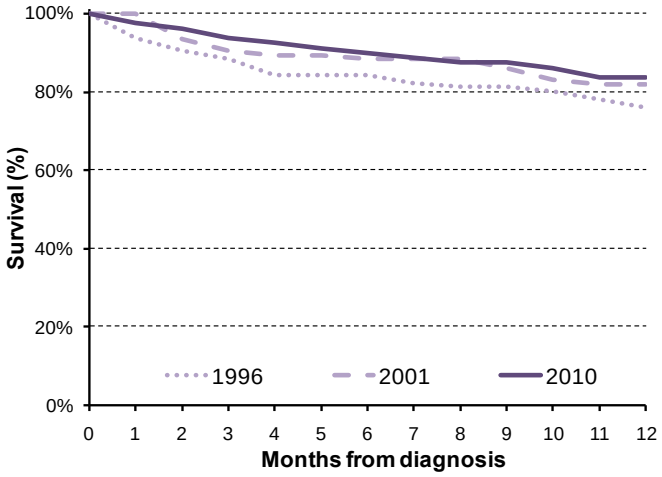


Table 43: Survival: patients treated surgically

Time from diagnosis	1996	2001	2010
	Ovarian cancer (n=95)	Ovarian cancer (n=94)	Ovarian cancer (n=80)
3 months	88.4%	90.4%	93.8%
6 months	84.2%	88.3%	90.0%
9 months	81.1%	86.2%	87.5%
12 months	75.8%	81.9%	83.8%

Survival by stage

- Survival from ovarian cancer was strongly related to stage at diagnosis ranging from 100.0% for Stage I to 62.5% for Stage IV after 3 months and from 91.7% for Stage I to 31.3% for Stage IV after one year. Only 15% of the 13 unstaged patients were alive after 3 months.

Figure 11: Survival by FIGO stage

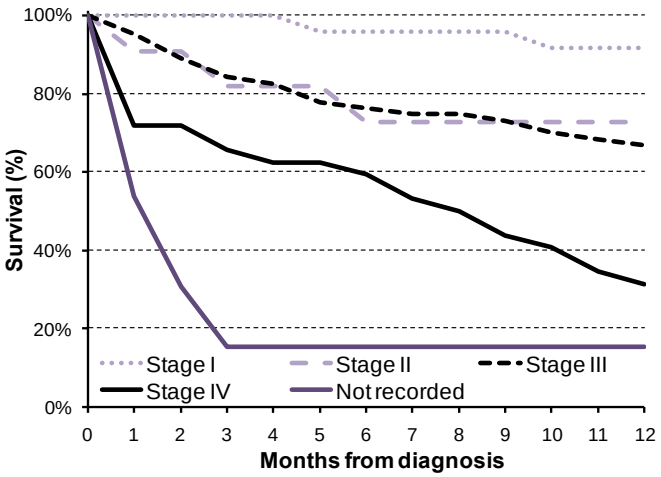


Table 44: Survival by FIGO stage

Time from diagnosis	2010 - Ovarian cancer*				
	Stage I (n=24)	Stage II (n=11)	Stage III (n=50)	Stage IV (n=32)	Unstaged (n=13)
3 months	100.0%	81.8%	82.5%	62.5%	15.4%
6 months	95.8%	81.8%	77.8%	62.5%	15.4%
9 months	95.8%	72.7%	73.0%	43.8%	15.4%
12 months	91.7%	72.7%	66.7%	31.3%	15.4%

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

Survival by age

- Observed survival for ovarian cancer patients was also strongly related to age at diagnosis ranging from 94.7% for those aged under 50 to 21.4% for those aged 80 and over after one year. This observed survival is affected by the existence of or not of comorbidities which are more common with increasing age.

Figure 12: Survival by age

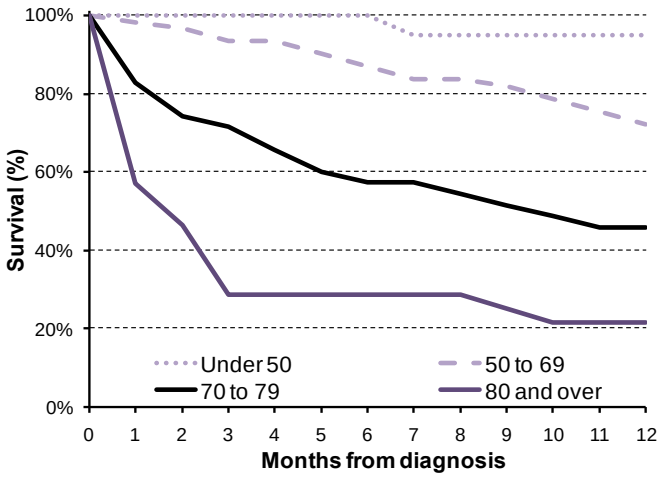


Table 45: Survival by age

Time from diagnosis	2010 - Ovarian cancer*			
	Aged Under 50 (n=19)	Aged 50 to 69 (n=61)	Aged 70 to 79 (n=35)	Aged 80+ (n=28)
3 months	100.0%	93.4%	71.4%	28.6%
6 months	100.0%	86.9%	57.1%	28.6%
9 months	94.7%	78.7%	48.6%	21.4%
12 months	94.7%	72.1%	45.7%	21.4%

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

Survival by number of comorbidities (additional diseases which the patient has in addition to their cancer)

- Survival from ovarian cancer varied by the number of comorbidities a patient had ranging from 82.4% for those with no comorbidities to 41.7% for those with three or more comorbidities after one year. This variation is linked to patient age. In addition older patients were more likely to present with advanced stage disease.

Figure 13: Survival by number of comorbidities

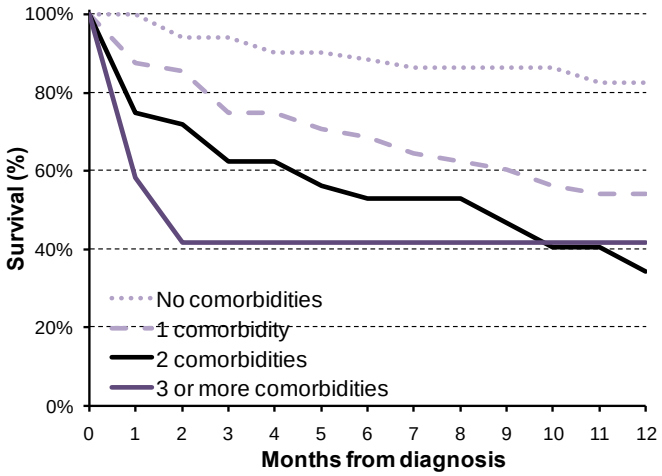


Table 46: Survival by comorbidities

Time from diagnosis	2010 - Ovarian cancer*			
	None (n=51)	One (n=48)	Two (n=32)	3 or more (n=12)
3 months	94.1%	75.0%	62.5%	41.7%
6 months	88.2%	68.8%	53.1%	41.7%
9 months	86.3%	60.4%	46.9%	41.7%
12 months	82.4%	54.2%	34.4%	41.7%

** Includes ovarian cancer, cancer of the fallopian tubes and primary peritoneal cancer*

Survival trends

- One year survival from ovarian cancer (excluding cancer of the fallopian tubes and primary peritoneal cancer) remained unchanged. Although it was lower in 2010 than in 1996 (66.1%) and 2001 (65.6%), this variation was not statistically significant.

Figure 14: Survival trends over time

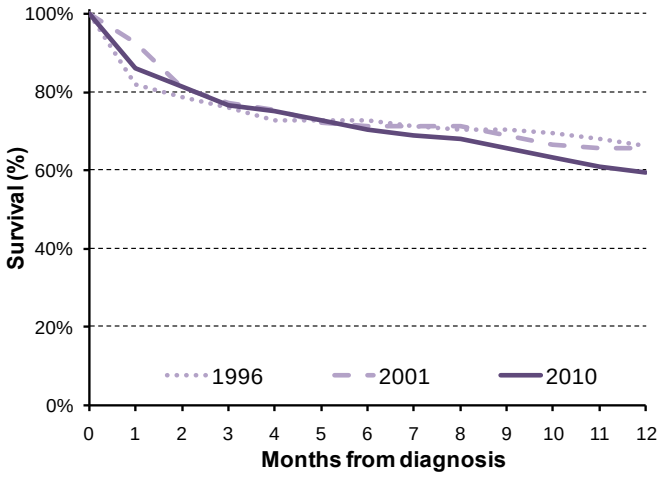


Table 47: Survival by audit year

Time from diagnosis	1996 Ovarian cancer (n=121)	2001 Ovarian cancer (n=122)	2010 Ovarian cancer (n=128)
3 months	76.0%	77.0%	76.6%
6 months	72.7%	71.3%	70.3%
9 months	70.2%	68.9%	65.6%
12 months	66.1%	65.6%	59.4%

One-year survival trends by age and stage

The lack of improvement in survival over time is not explained by changes in disease stage but could possibly be due to the higher number of patients aged 80 and over.

Table 48: Observed survival trends by age and stage

Age/Stage	1996	2001	2010
Under 50	76.5%	88.2%	94.4%
50-69	79.0%	79.7%	74.5%
70-79	53.6%	48.5%	45.5%
Age 70 and over	42.9%	39.1%	35.6%
Age less than 80	72.0%	71.6%	68.6%
Age 80 and over	21.4%	15.4%	23.1%
Stage I	86.2%	97.1%	91.7%
Stage II	90.9%	81.8%	72.7%
Stage III	66.7%	69.2%	68.0%
Stage IV	42.9%	33.3%	31.3%
Not recorded	36.8%	24.0%	18.2%
All patients	66.1%	65.6%	59.4%

Survival trends 1993-2009

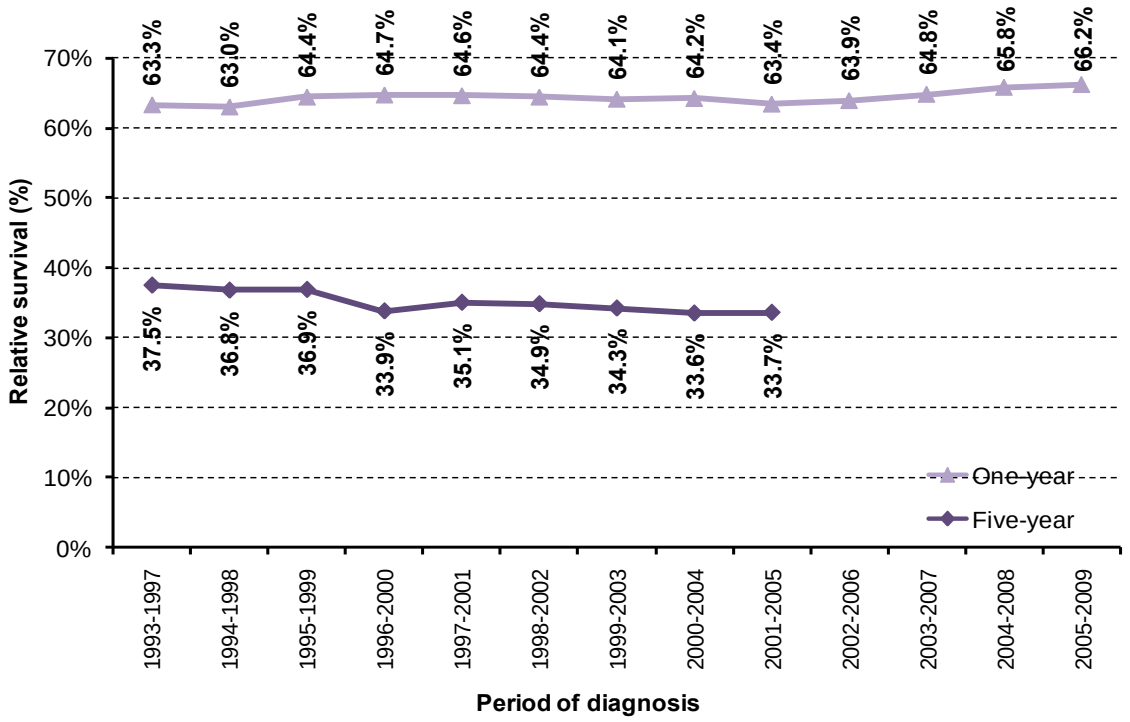
(Results from NICR database)

One-year relative survival from ovarian cancer increased slightly, but not significantly between 1993-1997 and 1996-2000 and remained virtually static up until 2002-2006. Since then survival has improved rising from 63.9% after one year in 2002-2006 to 66.2% in 2005-2009. Examination of the trend in this short period illustrates that each year an additional 0.7% (p=0.006) of patients survived one year from diagnosis.

Five-year relative survival from ovarian cancer has however deteriorated between 1993 and 2005, with 37.5% of patients surviving five years from diagnosis in 1993-1997 compared to 33.7% in 2001-2005. The trend during this period was significantly downwards with 0.5% fewer (p=0.002) patients surviving five years from diagnosis each year. The aforementioned improvements in one-year survival occurred after this period and the impact of that improvement is not seen in this downward trend. Estimates[1] of five-year relative survival for patients diagnosed in 2006-2010 indicate a slight recovery to 35.1%. It should be noted that it is possible that less robust classification in early years has resulted in some borderline tumours (which have excellent survival) being classified as malignant cancer, thereby inflating the earlier survival figures.

Figure 15: Trends in survival from ovarian cancer

(Relative survival from diagnosis, followed up until the end of 2010)



Note: Relative survival takes into account and adjusts for deaths from other causes which are more common with increasing age. It is also higher than observed survival.

[1] *Derived using the period analysis technique*

SECTION V – CERVICAL CANCER - OVERVIEW

Cervical cancer is the second most common cancer in women worldwide. There is however a wide range in incidence levels in different areas with much higher rates in developing countries [20]. High-risk regions are Eastern and Western Africa (age-standarised rate) greater than 30 per 100,000),Southern Africa (26.8 per 100,000), South-Central Asia (24.6 per 100,000), South America and Middle Africa (ASRs 23.9 and 23.0 per 100,000 respectively). Within the more developed regions of the world there is considerable variation in incidence (Figure 16 below) with lowest incidence in Australia (4.9 per 100,000) compared to N. Ireland (10 per 100,000).

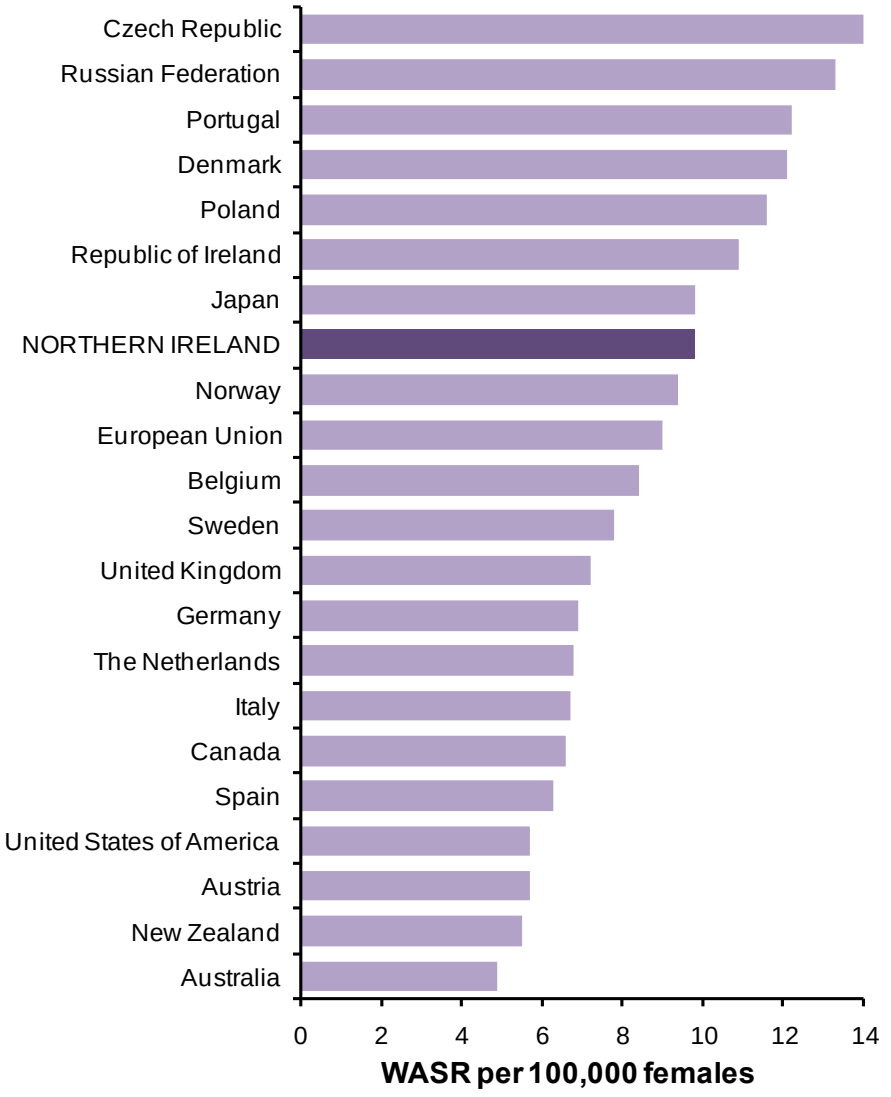
International comparisons of incidence

Cervical cancer incidence rates in 2008 were highest in the Czech Republic and Russia and lowest in Australia and New Zealand. The incidence rate of the disease in NI was slightly higher than the European Union average, the USA and the United Kingdom but was lower than in the Republic of Ireland.

Variation between countries in the percentage of cases assigned to "uterus, part unspecified" (which are not included in the NI data) may account for some of the international variation.

Figure 16: International comparisons of cervical cancer incidence during 2008

(World age-standardised incidence rates for selected countries)



WASR: World age-standardised rate
Source: GLOBOCAN [20], except for NI data which is from NICR data for the 2006-2010 period

SECTION V – CERVICAL CANCER - OVERVIEW

Risk factors

The overwhelming majority of cases are associated with persistent infection with Human Papilloma Virus (HPV) mainly with subtypes HPV 16 and 18 [42]. Increased risk is therefore associated with unprotected sexual intercourse, early first sexual intercourse and non-barrier contraception. Social deprivation, cigarette smoking and multiparity are also associated with increased risk [43]. Conditions that weaken the immune system such as HIV and use of immunosuppressant drugs following transplant are also known to increase risk. The incidence of malignant disease is reduced in countries with a cervical cancer screening programme as is mortality. There are two peaks in incidence occurring in the 30-39 age group and in the over seventy age group.

Presentation

HPV infection can result in a spectrum of changes in the epithelium of the cervix. These changes can range from mild dysplasia (abnormal cell appearance) with or without evidence of viral infection to a condition known as cervical intraepithelial neoplasia (CIN). CIN is classified as Mild (CIN 1), moderate (CIN 2) and severe (CIN 3). CIN 3 can progress, if left untreated, to the development of micro-invasive carcinoma, and finally invasive carcinoma. These conditions can be detected by a cervical smear test and/or a cervical biopsy. If CIN is detected on a smear test then a colposcopy procedure (examination of the cervix at high magnification) is often performed to accurately assess the cervical epithelium. CIN 1 & 2 is common in sexually active females using non-barrier contraception. It can revert to normal without treatment and be monitored by regular smears.

Symptoms

Patients with micro-invasive carcinoma usually have no symptoms. The earliest symptoms of invasive carcinoma are post-coital bleeding, vaginal discharge and intermenstrual bleeding. More advanced disease may present with heavy vaginal bleeding, back pain resulting from enlarged nodes causing pressure symptoms, weight loss and bowel disturbance.

Diagnosis

Investigations

Colposcopy and biopsy (Lletz, cone or punch biopsy) to confirm micro-invasive or invasive cancer is performed. If invasive carcinoma is confirmed patients should have an examination under anaesthetic to clinically stage the cancer. Patients may also have a cystoscopy to check for bladder involvement and a rectal examination to exclude rectal involvement.

An MRI scan is then performed to assess stage and evidence of nodal spread. Staging however is still based on clinical examination.

Histology

The majority of cervical carcinomas are squamous cell (85-90%) with adenocarcinoma accounting for 10-15%. Neuroendocrine tumours and clear cell carcinomas each account for less than 1%.

Staging

The FIGO staging system is preferred by gynae-oncologists and is based predominantly on the extent of the primary tumour. Alternatively the AJCC (American Joint Committee on Cancer) TNM staging system can be used which classifies cervical cancer on the basis of 3 factors: the extent of the tumor (T), whether the cancer has spread to lymph nodes (N) and whether it has spread to distant sites (M). The FIGO system uses the similar information.

Table 49: International Federation of Gynaecology and Obstetrics (FIGO) stage

FIGO Stage	Extent of disease
FIGO IA1	Micro-invasive disease: Invasion < 3mm deep & < 7mm wide
FIGO IA2	Micro-invasive disease: Invasion 3-5 mm deep & < 7mm wide
FIGO IB1	Visible tumour ≤ 4 cm
FIGO IB2	Visible tumour > 4cm
FIGO IIA1	Visible tumour ≤ 4cm with spread beyond the cervix or uterus with disease involving the upper 1/3 of the vagina but not parametrium
FIGO IIA2	Visible tumour > 4cm with spread beyond the cervix or uterus with disease involving the upper 1/3 of the vagina but not parametrium
FIGO IIB	Tumour involves the parametrium but not pelvic side wall
FIGO IIIA	Tumour involves the lower 2/3 of the vagina but not the pelvic side wall
FIGO IIIB	Tumour extends to pelvic side wall or hydronephrosis or non-functioning kidney or regional lymph node involvement
FIGO IVA	Spread of the tumour to adjacent pelvic organs (bladder, rectum)
FIGO IVB	Spread to distant organs

Treatment

Treatment largely depends on stage and age of patient and desire for fertility preservation.

- **FIGO Stage IA1:** local excision alone is adequate provided the excision margins are clear or total abdominal hysterectomy (TAH) is an alternative. In younger women radical trachelectomy (removal of cervix and paracervical tissue only) is an option if fertility preservation is desired.
- **FIGO Stage IA2-IB1:** Wertheim's hysterectomy (removal of uterus, parametrium and pelvic nodes). In women with positive pelvic lymph nodes, parametrial invasion or positive or close vaginal margins (less than 5mm) should receive adjuvant therapy. Patients with positive nodes following surgery will require adjuvant therapy. Adjuvant chemoradiotherapy results in improved overall survival compared to radiotherapy alone.
- **FIGO Stage > IB2:** Chemoradiotherapy with brachytherapy (insertion of radioactive applicators into uterus) is generally used to treat patients with FIGO Stage IB2 or higher if patients are suitable for radical treatment.

SECTION VI – CERVICAL CANCER AUDIT RESULTS

Study population

At the beginning of 2012 the number of cervical cancers registered with NICR was 93 diagnosed in 1996, 72 diagnosed in 2001 and 87 diagnosed in 2010 (Table 50). Some cervical cancers were registered with NICR after the data for the audit was originally extracted (7 from 1996, 3 from 2001 and 1 from 2010). Insufficient information thus existed on these patients for audit purposes and they are therefore excluded from this study. There were thus 86 patients diagnosed in 2010 included in the study with a further 86 diagnosed in 1996 and 69 diagnosed in 2001 from the previous audit.

Table 50: Study patients

Audit year	1996	2001	2010
Cases	86	69	86
Exclusions	7	3	1

Age at diagnosis

- The median age at diagnosis in 2010 was 40 years (Table 51 below), slightly lower than in 2001 however this was not significant (P<0.058) Just over two thirds of patients (67.4%) were aged under 50 at diagnosis. This was slightly, but not significantly higher than the 62.3% in 2001.
- None of the patients were aged less than 25 in 2010, while 12 patients were aged between 25 and 29.

Table 51: Age at diagnosis by year

Age at diagnosis	1996 (n=86)	2001 (n=69)	2010 (n=86)
Under 50	49 (57.0%)	43 (62.3%)	58 (67.4%)
50 to 69	25 (29.1%)	15 (21.7%)	16 (18.6%)
70 and over	12 (14.0%)	11 (15.9%)	12 (14.0%)
Mean age	49	47	46
Median age	47	42	40

Socio-economic status

Table 52: Socio-economic status by year

Socio-economic status (based on area of residence)	1996 (n=86)	2001 (n=69)	2010 (n=86)	1996, 2001 & 2010 combined (n=241)
Quintile 1 (least deprived)	9 (10.5%)	5 (7.2%)	15 (17.4%)	29 (12.0%)
Quintile 2	15 (17.4%)	12 (17.4%)	15 (17.4%)	42 (17.4%)
Quintile 3	11 (12.8%)	8 (11.6%)	13 (15.1%)	32 (13.3%)
Quintile 4	26 (30.2%)	16 (23.2%)	22 (25.6%)	64 (26.6%)
Quintile 5 (most deprived)	25 (29.1%)	28 (40.6%)	21 (24.4%)	74 (30.7%)

- There was no significant relationship between socio-economic status and the occurrence of cervical cancer demonstrated in the 2010 study patients. However this is likely due to the smaller number of cases available for analysis. When data from 1996, 2001 and 2010 were combined a significant relationship is identified ($\chi^2 = 32.88$, $p<0.001$) with cases higher in the most deprived areas.

Trust of residence

Table 53: Trust of residence - 2010

Trust of residence	2010 (n=86)	Rate per 100,000 females
Belfast	18 (20.9%)	11.0
Northern	17 (19.8%)	7.8
South Eastern	16 (18.6%)	9.7
Southern	20 (23.3%)	12.0
Western	15 (17.4%)	10.7

- The Southern Trust had the highest proportion of cervical cancer patients diagnosed in 2010 (23.3%), while the Western Trust had the lowest (17.4%). These differences are not significant. There was also no significant variation in the proportion of patients resident in each Trust over time (not shown).

Smoking status

Table 54: Smoking status by age - 2010

Smoking status	2010			
	Aged 25 to 49 (n=58)	Aged 50 to 69 (n=16)	Aged 70+ (n=12)	All ages (n=86)
Never smoked	22 (37.9%)	8 (50.0%)	6 (50.0%)	36 (41.9%)
Previously smoked	3 (5.2%)	5 (31.2%)	3 (25.0%)	11 (12.8%)
Current smoker	29 (50.0%)	3 (18.8%)	3 (25.0%)	35 (40.7%)
Not recorded	4 (6.9%)	0 (0.0%)	0 (0.0%)	4 (4.7%)

- Smoking status was well recorded in 2010.
- Two out of five (40.7%) patients diagnosed in 2010 were current smokers. This compares to 24% of those aged 16 and over in the general population. Another one in eight (12.8%) cervical cancer patients were previous smokers. This varied by age with 50% of cervical cancer patients aged under 50 being current smokers compared to 18.8% of those aged 50 to 59 and 25.0% of those aged 70 and over. Ex-smokers were more common among those aged 50 and over compared to those aged under 50. The high level of smoking may reflect the age structure and female population.

Family history of cancer

Table 55: Family history of another cancer - 2010

Family history of other cancer	2010 (n=86)
Positive	9 (10.5%)
Negative	27 (31.4%)
Not recorded	50 (58.1%)

- Family history of cancer was poorly recorded in 2010. 10.5% of patients had a history of another cancer in a first degree relative.
- Among these patients, the family member with a history of cancer was the mother in one third of cases and a sister in another one third of cases.
- Only one of these family members had a history of cervical cancer, while one had a history of ovarian cancer and one had a history of endometrial cancer.

Comorbidities

Table 56: Comorbidities - 2010

Comorbidities	2010 (n=86)
COPD	5 (5.8%)
Cardiovascular disease	7 (8.1%)
Cerebrovascular disease	1 (1.2%)
Diabetes	4 (4.7%)
Hypertension	13 (15.1%)
Dementia/Alzheimers	2 (2.3%)
Psychiatric disorder*	14 (16.3%)
History of breast cancer	1 (1.2%)
History of other malignancy	2 (2.3%)
Renal disease	8 (9.3%)

** Includes anxiety and depression*

- 40.7% of patients diagnosed in 2010 had one or more comorbidities. The most frequent of these were a psychiatric disorder (which includes depression and anxiety), (16.3%) and/or hypertension (15.1%).

Table 57: Comorbidities by age - 2010

Number of comorbidities	2010			
	Aged 25 to 49 (n=58)	Aged 50 to 69 (n=16)	Aged 70+ (n=12)	All ages (n=86)
No comorbidities	41 (70.7%)	9 (56.2%)	1 (8.3%)	51 (59.3%)
1 comorbidity	14 (24.1%)	3 (18.8%)	2 (16.7%)	19 (22.1%)
2 comorbidities	3 (5.2%)	4 (25.0%)	4 (33.3%)	11 (12.8%)
3 or more comorbidities	0 (0.0%)	0 (0.0%)	5 (41.7%)	5 (5.8%)

- As expected the number of comorbidities a patient had varied by their age at diagnosis, with 70.7% of those aged 50 and under having no comorbidities compared to 8.3% of those aged 70 and over.

Cervical screening history

Smear history by year

- The proportion of patients with no record of a smear test has fallen from 31% in 1996 to 21% in 2010.
- The proportion of patients with a record of 3 or more smears is steady at just under 6%.

Table 58: Screening history by audit year

Number of smear tests	1996 (n=86)	2001 (n=69)	2010 (n=86)
No test	27 (31.4%)	15 (21.7%)	18 (20.9%)
1 test	40 (46.5%)	33 (47.8%)	37 (43.0%)
2 tests	14 (16.3%)	14 (20.3%)	26 (30.2%)
3 or more tests	5 (5.8%)	7 (10.1%)	5 (5.8%)

Smear history by age – 2010

- The majority (92%) of older women had no record of a smear. This may be due to:

(i) Women being above the age of the screening programme in 1989 when it was reorganized;
(ii) Women not having been invited or not attending;
(iii) No record available of them having a smear.

Table 59: Screening history by age - 2010

Number of smear tests	2010			
	Aged 25 to 49 (n=58)	Aged 50 to 69 (n=16)	Aged 70+ (n=12)	All ages (n=86)
No test	4 (6.9%)	3 (18.8%)	11 (91.7%)	18 (20.9%)
1 test	30 (51.7%)	6 (37.5%)	1 (8.3%)	37 (43.0%)
2 tests	21 (36.2%)	5 (31.2%)	0 (0.0%)	26 (30.2%)
3 or more tests	3 (5.1%)	2 (12.5%)	0 (0.0%)	5 (5.8%)

Time between most recent smear test and diagnosis by smear history

Table 60: Screening history by age - 2010

Time between most recent smear test and diagnosis	History of one or more smear tests - 2010			
	1 smear test (n=37)	2 smear tests (n=26)	3 or more smear tests (n=5)	Total (n=68)
Up to 6 months before diagnosis	24* (64.9%)	23 (88.4%)	3 (60.0%)	50 (73.6%)
6 months to 1 year before diagnosis	4 (10.8%)	2 (7.7%)	1 (20.0%)	7 (10.3%)
1-5 years before diagnosis	5 (13.5%)	1 (3.8%)	1 (20.0%)	7 (10.3%)
More than 5 years before diagnosis	1 (2.7%)	0 (0.0%)	0 (0.0%)	1 (1.5%)
Not recorded	3 (8.1%)	0 (0.0%)	0 (0.0%)	3 (4.4%)

**Defined for further analysis as 'Symptomatic'*

- 24 women had a record of a single smear within six months or at diagnosis. These have been defined as symptomatic for the purposes of this report (i.e. not screening). The remaining cases could be taken to represent the screening history of women with cervical cancer. These have been analysed in table 60 above.

Table 61: Screening history by age – 2010 (excluding 24 symptomatic patients)

Number of smear tests	2010			
	Aged 25 to 49 (n=36)	Aged 50 to 69 (n=14)	Aged 70+ (n=12)	All ages (n=62)
No tests	4 (11.1%)	3 (21.4%)	11 (91.7%)	18 (29.0%)
1 test	8 (22.2%)	4 (28.6%)	1 (8.3%)	13 (21.0%)
2 tests	21 (58.3%)	5 (35.7%)	0 (0.0%)	26 (41.9%)
3 or more tests	3 (8.3%)	2 (14.3%)	0 (0.0%)	5 (8.1%)

- Excluding patients over 70 years and those who had symptomatic smears only, 14% had no previous smear, 24% had one previous test, 52% had 2 tests and 10% had 3 or more tests.

Figure 17: Time between most recent smear test and diagnosis by result of most recent smear – 2010 (excluding symptomatic smears)

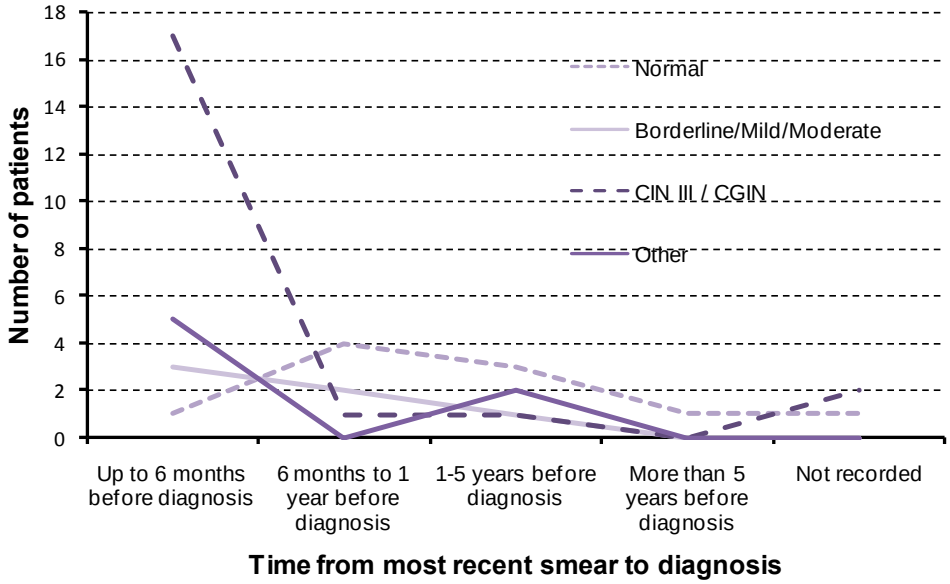


Table 62: Time between most recent smear test and diagnosis by result of most recent smear – 2010 (excluding symptomatic smears)

Number of smear tests	Time between most result smear test and diagnosis by result of most recent smear					
	Up to 6 months before diagnosis	6 months to 1 year before diagnosis	1-5 years before diagnosis	More than 5 years before diagnosis	Not recorded	Total
Normal	1	4	3	1	1	10
Borderline/ Mild/Moderate nuclear changes	3	2	1	0	0	6
CIN III / CGIN	17	1	1	0	2	21
Other	5	0	2	0	0	7

- 5 of the 10 patients who had a normal or borderline result on their last smear test (excluding symptomatic smears) had their last smear test within one year of being diagnosed with cervical cancer.
- Among the 8 patients whose last smear test was more than one year before diagnosis, 4 patients had had a normal result.

Cervical Cancer Pathway: Route to diagnosis

Table 63: Referral source - 2010

Referral source	2010 (n=86)
GP – Red Flag	17 (19.8%)
GP – Routine/Other	24 (27.9%)
GP – Semi-urgent / Urgent	21 (24.4%)
GP Total	**62**
Screening Programme	11 (11.6%)
Accident and Emergency	5 (5.8%)
Other Consultant	2 (2.3%)
Self referral to private sector	4 (4.6%)
Not recorded	2 (2.3%)
Total	86

- Just under three quarters (62/86) of patients diagnosed in 2010 were referred to hospital by their GP, including 24 asymptomatic patients following an abnormal smear.
- 34% of GP referrals were urgent/semi-urgent.
- 27.4% of GP referrals were red flagged accounting for 20% of cervical cancers in 2010.
- 11 patients (11.6%) were referred through the National Screening Programme.
- 5.8% of patients presented via Accident and Emergency. Of the five patients presenting at A&E, four had no history of smear tests, two of whom were aged 80 years or over.

Symptoms at presentation

Table 64: Symptoms at presentation - 2010

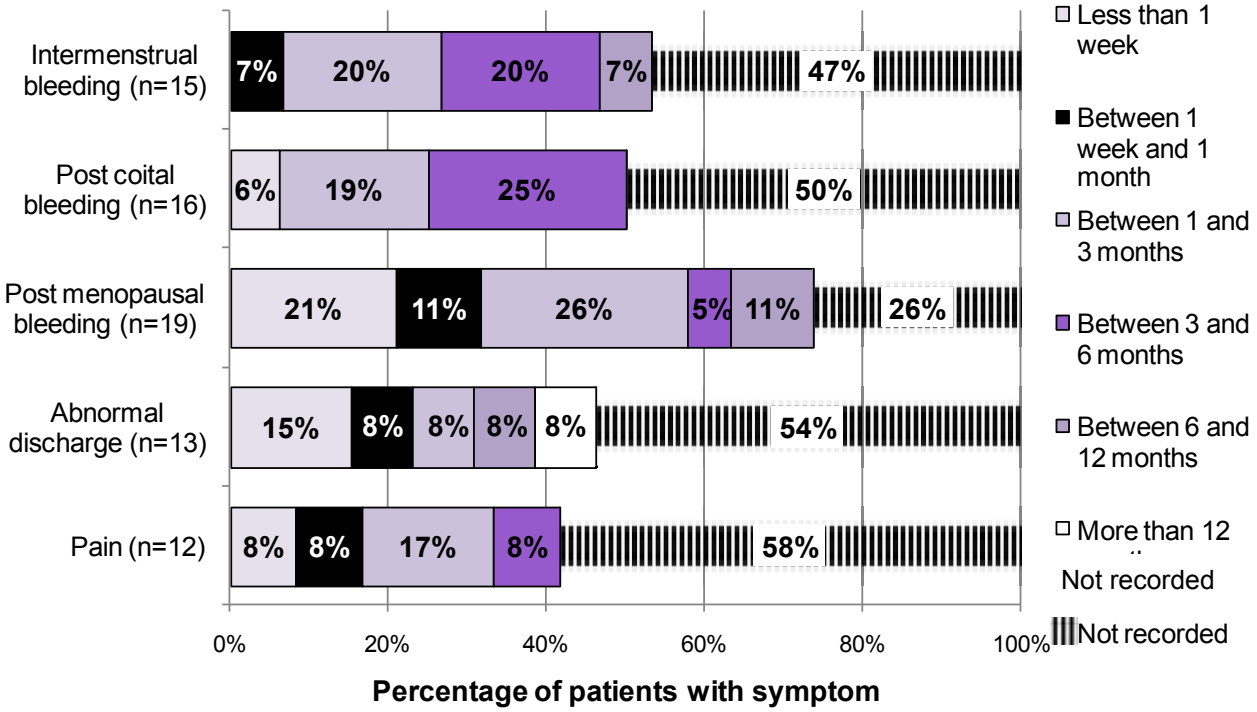
Symptom	2010 (n=86)
Intermenstrual bleeding	15 (17.4%)
Post coital bleeding	16 (18.6%)
Post menopausal bleeding	19 (22.1%)
Abnormal bleeding	8 (9.3%)
Abnormal discharge	13 (15.1%)
Pain	12 (14.0%)
Dyspareunia	2 (2.3%)
Urinary symptoms	8 (9.3%)
Anorexia	6 (7.0%)
Weight loss	4 (4.7%)
Other	17 (19.8%)
Asymptomatic	35 (40.7%)

Note: Patients may have more than 1 symptom

- The most common symptoms were post-menopausal bleeding (22.1%), post coital bleeding (18.6%) and intermenstrual bleeding (17.4%). Other significant symptoms included abnormal discharge (15.1%) and pain (14.0%).

Symptom duration

Figure 18: Symptom duration – 2010



- Symptom duration was poorly recorded. For the most common symptoms, duration was recorded for approximately half of patients, with the exception of post menopausal bleeding for which duration was recorded in three quarters of cases.
- 21.0 % of patients with post menopausal bleeding had the symptom for less than one week, although 10.5% had it for between 6 and 12 months.
- Between 3 and 6 months was the most common symptom duration for post coital and intermenstrual bleeding while between 1 and 3 months was the most common duration for pain. 15% of those experiencing abnormal discharge had it for less than one week.

Referral source (asymptomatic patients)

Table 65: Referral source for asymptomatic patients - 2010

Referral source	2010 (n=35)
GP – Red Flag	3 (8.6%)
GP – Urgent	3 (8.6%)
GP – Other	18 (51.4%)
Screening Programme	11 (31.4%)

- Among the 35 asymptomatic patients 31.4% were referred to hospital through the screening programme, with the remaining 68.6% being referred by the patients GP following an abnormal smear result, three of whom were referred as red flag.

Cervical cytology

Table 66: Result of most recent smear test for asymptomatic patients - 2010

Result of most recent smear test	2010 (n=35)
Borderline	3 (8.6%)
CIN II (Moderate)	5 (14.3%)
CIN III (Severe)	23 (65.7%)
CGIN (Glandular)	4 (11.4%)

- All 35 asymptomatic patients diagnosed in 2010 had a smear history. Of these two thirds (65.7%) had CIN III.
- 82.9% of asymptomatic patients had their most recent smear test within six months of being diagnosed with cervical cancer.

Trust and Hospital of 1st presentation

Table 67: Trust and hospital of presentation – 2010

Trust and hospital of presentation	2010 (n=86)
Belfast HSCT	**18 (20.9%)**
Belfast City	14 (16.3%)
Royal Victoria	2 (2.3%)
Mater Infirmorum	2 (2.3%)
Northern HSCT	**12 (14.0%)**
Antrim*	7 (8.1%)
Causeway (Coleraine)	1 (1.2%)
Whiteabbey	4 (4.7%)
South-Eastern HSCT	**18 (20.9%)**
Ulster*	12 (14.0%)
Lagan Valley	5 (5.8%)
Downe	1 (1.2%)

Trust and hospital of presentation	2010 (n=86)
Southern HSCT	**19 (22.1%)**
Craigavon Area*	9 (10.5%)
Daisy Hill	9 (10.5%)
South Tyrone	1 (1.2%)
Western HSCT	**15 (17.4%)**
Altnagelvin*	6 (7.0%)
Erne	7 (8.1%)
Tyrone County	2 (2.3%)
Private sector	3 (3.5%)
Not recorded	1 (1.2%)

** Cancer unit*

Note: In April 2007 the five integrated Health and Social Care (HSC) Trusts shown above were established. Prior to this the hospitals listed above were part of one of the 4 Health Boards.

- In 2010 cervical cancer patients presented to 17 different hospitals in N. Ireland (15 NHS hospitals, 2 private sector hospitals/clinics). Overall 3.5% of patients presented to the private sector.
- In 2010 the greatest volume of patients presented to the Belfast City Hospital (16.3%), followed by one of the cancer units: Ulster Hospital (14.0%), Craigavon Area Hospital (10.5%), Antrim Hospital (8.1%) and Altnagelvin Hospital (7.0%). Similar numbers of patients first presented to 2 of the non-cancer unit hospitals- Daisy Hill (10.5%) and the Erne Hospital (8.1%).

Specialty first seen

Table 68: Specialty first seen - 2010

Specialty first seen	2010 (n=86)
Gynaecology	81 (94.2%)
General Medicine	2 (2.3%)
Care of the Elderly	1 (1.2%)
Other	1 (1.2%)
Not recorded	1 (1.2%)

- The majority (94.2%) of patients diagnosed in 2010 were first seen by gynaecology. All patients were seen by a gynaecologist with the exception of one elderly lady diagnosed on clinical opinion only.

Diagnosis

Investigations

Table 69: Investigations by age - 2010

Investigations	2010			
	Aged 25 to 49 (n=58)	Aged 50 to 69 (n=16)	Aged 70+ (n=12)	All ages (n=86)
Colposcopy	57 (96.6%)	14 (93.3%)	8 (66.7%)	79 (91.9%)
Examination under anaesthetic (EUA)	19 (32.2%)	11 (73.3%)	10 (83.3%)	40 (46.5%)
Cystoscopy	14 (23.7%)	8 (53.3%)	9 (75.0%)	31 (36.0%)
MRI scan	36 (61.0%)	12 (80.0%)	7 (58.3%)	55 (64.0%)
CT scan	8 (13.6%)	5 (33.3%)	9 (75.0%)	22 (25.6%)
Other*	13 (22.0%)	8 (53.3%)	7 (58.3%)	28 (32.6%)

** Other includes ultrasound, PET scan and hysteroscopy*

- In 2010 the majority of patients had colposcopy (91.9%) which was more frequently performed in women under 70 years.
- Comparable data were available only for CT scan from 1996 (32.6%) and 2001 (31.9%). Its use in 2010 was lower at 25.6% (although this was not a significant change). However in 2010, 64.0% had an MRI scan which was an investigation not available in the earlier years.
  Examination under anaesthetic (EUA), cystoscopy and CT scan in contrast were more frequently performed in women aged 70 and over. This may in part be due to higher proportion of women in the screening age presenting with micro-invasive disease for which these investigations eg. EUA are not usually required.

Method of diagnosis

- In 2010 the majority (98.8%) of cervical cancer patients had a histopathology diagnosis (Table 70 below). One patient who died before investigations could be completed was diagnosed by clinical opinion only.
- The proportion diagnosed via histopathology in 2010 was similar to that in 1996 and 2001.

Table 70: Method of diagnosis

Method of diagnosis	1996 (n=86)	2001 (n=67)	2010 (n=86)
Histopathology	85 (98.8%)	67 (100.0%)	85 (98.8%)
Clinical opinion	1 (1.2%)	0 (0.0%)	1 (1.2%)

Histological type by year

- In 2010 seventy percent of cervical cancers were squamous cell carcinomas with 21% adenocarcinoma.
- Between 1996, 2001 and 2010 the distribution of histological type did not change significantly.

Table 71: Histological type by year

Histological type	1996 (n=86)	2001 (n=69)	2010 (n=86)
Squamous cell neoplasms	65 (75.6%)	51 (73.9%)	60 (70.0%)
Adenocarcinomas	13 (15.1%)	12 (17.4%)	18 (21.0%)
Adenosquamous carcinoma	3 (3.5%)	2 (2.9%)	3 (3.5%)
Neuroendocrine carcinoma			2 (2.3%)
Small cell carcinoma			1 (1.2%)
Other	4 (4.7%)	4 (5.8%)	1 (1.2%)
Not histologically verified	1 (1.2%)	0 (0.0%)	1 (1.2%)
Total	**86**	**69**	**86**

FIGO stage at diagnosis

Table 72: Stage at diagnosis by year

Stage at diagnosis	1996 (n=86)	2001 (n=69)	2010 (n=86)
Stage I	43 (50.0%)	40 (58.0%)	49 (57.0%)
Stage II	21 (24.4%)	16 (23.2%)	13 (15.1%)
Stage III	13 (15.1%)	9 (13.0%)	12 (14.0%)
Stage IV	5 (5.8%)	4 (5.8%)	10 (11.6%)
Not recorded	4 (4.7%)	0 (0.0%)	2 (2.3%)
Total	**86**	**69**	**86**

- Recording of stage in the CaPPS in 2010 was excellent with 97.7% of patients having a stage recorded. Over half (57%) of cervical cancer patients were diagnosed with Stage I disease while 11.6% were diagnosed with Stage IV disease.
- The stage distribution of patients did not change significantly between 1996 and 2010 (χ^2 =8.525, p=0.384). Although the numbers of Stage IV patients doubled in 2010 this was not significant (p=0.177).

Table 73: Stage at diagnosis by referral type

Stage at diagnosis	Screening programme & GP screening	GP Red Flag*	GP, Other	A&E	Private sector	Other	Total
Stage I	29 (90.6%)	8 (47.0%)	7 (29.2%)		3 (75.0%)	2	49
Stage II	2 (6.2%)	4 (23.5%)	6 (25.0%)	1 (20.0%)			13
Stage III	1 (3.1%)	3 (17.6%)	5 (20.8%)	1 (20.0%)	1 (25.0%)	1	12
Stage IV		2 (11.8%)	5 (20.8%)	3 (60.0%)			10
Not recorded			1 (4.2%)			1	2
Total	**32**	**17**	**24**	**5**	**4**	**4**	**86**

**3 patients from GP screening were referred as red flag*

- 91% of patients referred from the screening programme or GP screening had early FIGO Stage I disease with only a small proportion (9%) having more advanced Stage II or III disease.
- In contrast almost two thirds (65.8%) of symptomatic patients 25/38 referred by their GP had Stage II disease or higher with 18.4% having Stage IV disease.
- The small proportion of patients who presented via A&E all had Stage II disease or higher with 60% having advanced Stage IV disease.

Stage at diagnosis by age

Table 74: Stage at diagnosis by age - 2010

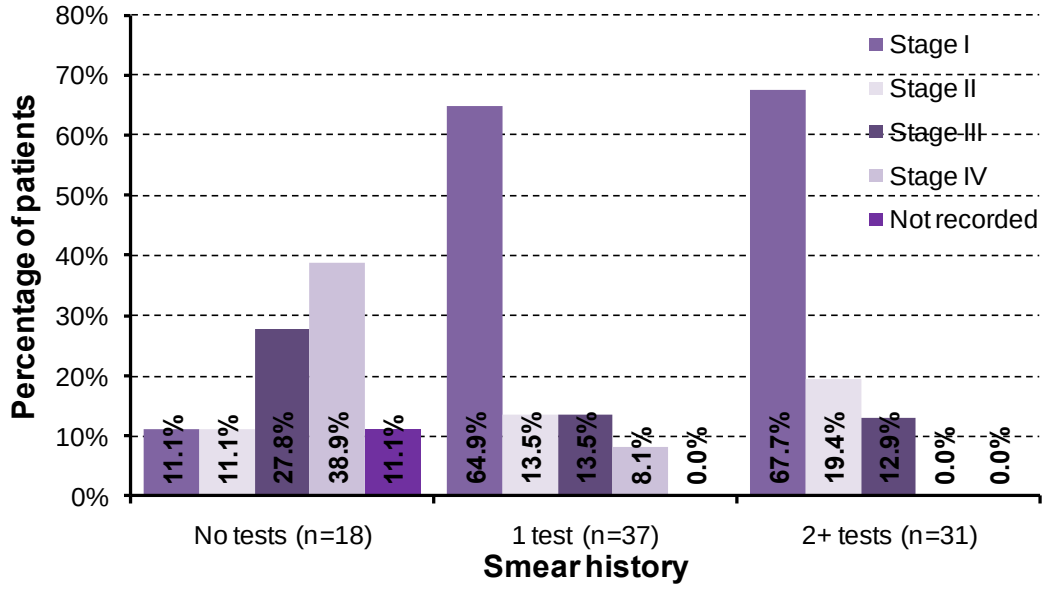
Stage at diagnosis	2010			
	Aged 25 to 49 (n=58)	Aged 50 to 69 (n=16)	Aged 70+ (n=12)	All ages (n=86)
Stage I	43 (74.0%)	6 (37.5%)	0 (0.0%)	49 (57.0%)
Stage II	4 (6.9%)	6 (37.5%)	3 (25.0%)	13 (15.1%)
Stage III	8 (13.8%)	1 (6.2%)	3 (25.0%)	12 (14.0%)
Stage IV	3 (5.2%)	2 (12.5%)	5 (41.7%)	10 (11.6%)
Not recorded	0 (0.0%)	1 (6.2%)	1 (8.3%)	2 (2.3%)

- Stage at diagnosis varied considerably with age. A higher proportion of women aged under 50 years (74%) had Stage I disease compared to 37.5% of those aged 50 to 69 and 0.0% of those aged 70 and over (p<0.001). Conversely only 5.2% of those aged under 50 had Stage IV disease compared to 12.5% of those aged 50 to 69 and 41.7% of those aged 70 and over.

Stage at diagnosis by smear history

- In 2010 women who had had a smear test were more likely to have Stage I disease and less likely to have Stage IV compared to those who did not have a record of a smear test (P<0.001). None of the women with a history of two or more smear tests were diagnosed with Stage IV disease. Of the three Stage IV patients who had had a smear test, one had it at diagnosis, one had it 6 months before diagnosis and one had it more than one year before diagnosis.

Figure 19: Stage at diagnosis by smear history (All patients)



Multidisciplinary team (MDT) meetings - 2010

Table 75: Discussion at Multidisciplinary team (MDT) meetings - 2010

MDM Discussion	Cervical cancer* (n=86)
Discussed at Regional MDM	78 (90.6%)
Trust of 1st MDM discussion	
- Belfast Trust	54 (62.7%)
- Southern Trust	13 (15.1%)
- Western Trust	12 (13.9%)
Not discussed at local or regional MDM	7 (8.1%)

Note: All Trusts participate in the Regional MDT in Belfast City Hospital. Southern and Western Trusts have in addition a local MDT where patients are first discussed prior to discussion at the Regional MDT in Belfast.

- In 2010 the majority (90.6%) of patients were discussed at the Specialist Regional Multidisciplinary Team Meeting (MDM) in Belfast City Hospital with 29% of patients having a 1st discussion at the local cancer unit MDM.
- Seven patients were not discussed at either a local or regional MDM. Their Trust of presentation was Northern (6), and Western (1). Six of these patients were under 50 years and had FIGO Stage I disease. The other 2 patients were over 80 years one with Stage IV disease the other unstaged.

Treatment

Table 76: Treatment received by audit year

Treatment received	1996 (n=86)	2001 (n=69)	2010 (n=86)
Surgery*	50 (58.1%)	46 (66.7%)	48 (55.8%)
Chemoradiotherpy/Chemotherapy/ radiotherapy	41(47.7%)	35 (50.7%)	41 (47.7%)
Supportive palliative care	10 (11.6%)	1 (1.4%)	3 (3.5%)

** Excludes diagnostic surgery and refers to surgery performed for curative or palliative reasons*
Note: Patients can have more than one type of treatment

- In 2010, 48 patients (55.8%) underwent surgical resection for cervical cancer. The proportion of patients receiving any oncological therapy (chemoradiotherapy/chemotherapy/radiotherapy) in 2010 was similar to previous audit years at approximately 50%.
- A small proportion of patients (3.5%) received supportive palliative care in 2010 similar to 2001 and lower than in 1996.

Treatment modalities by age

Table 77: Treatment modalities by age- 2010

Treatment combinations	Age 25-49	Age 50-69	Age 70+	All ages
Surgery alone	36 (62.0%)	6 (37.5%)	0	42 (48.8%)
Chemoradiotherapy + brachytherapy alone	18 (31.0%)	8 (50.0%)	1 (8.3%)	26 (30.2%)
Chemoradiotherapy + brachytherapy + Surgery	3 (5.2%)		1 (8.3%)	5 (5.8%)
Chemoradiotherapy + brachytherapy total	**21** (36.2%)	**8** (50.0%)	**2** (16.7%)	**31 (36%)**
Surgery + adjuvant radiotherapy	1 (1.7%)			1 (1.2%)
Chemoradiotherapy without brachytherapy		1 (6.2%)		1 (1.2%)
Radiotherapy + brachytherapy only			1 (8.3%)	1 (1.2%)
Palliative radiotherapy only		1 (6.2%)	6 (50%)	7 (8.1%)
Palliative supportive care			3	3 (3.5%)
Total patients	**58**	**16**	**12**	**86**

** 26 patients had chemoradiotherapy & brachytherapy only. Five patients had chemoradiotherapy & brachytherapy and surgery: prior to chemoradiotherapy & brachytherapy (3 patients) and after chemoradiotherapy & brachytherapy (2 patients)*

- Treatment type varied considerably with age most likely due to the combined effects of later stage at presentation and co-morbidities in older women.
- Just under half (48.8%) of patients had surgery alone. For patients aged under 50 years 62% had surgery alone while none of the patients age 70 years or more were suitable for this treatment as all had stage II disease or above.
- Chemoradiotherapy with brachytherapy alone 26/86 (30.2%) was the next most frequent treatment modality and was more likely in patients in the 50-69 age group, a reflection of the more advanced FIGO stage in these patients. As a further 5 patients had chemoradiotherapy with brachytherapy before or after surgery in total 31 patients (36%) received chemoradiotherapy with brachytherapy as part of their treatment.
- A small proportion of patients had palliative intent radiotherapy only, the majority of whom were aged 70 or over (85.7%).
- A small proportion of patients (3.5%) had palliative supportive care only.

Treatment by FIGO stage

Table 78: Treatment received by FIGO stage – 2010

In this analysis patients can have more than one type of treatment.

	Cervical resection (Cone /Lletz only)	Cervical resection as 1st treatment then completion hysterectomy	Trachelectomy +/- Pelvic / Para-aorttic node sampling	Radical Hysterectomy +/- Pelvic / Para-aorttic node sampling or Completion hysterectomy	Chemoradiotherapy +/- Brachytherapy* +/- Pelvic / Para-aorttic node sampling	External Beam radiotherapy only
FIGO IA1 & IA2 (n=28)	15 (53.5%)	7 (25.0%)		6 (21.4%)		
FIGO IB1 (n=18)			6 (33.3%)	10 (55.5%)	5* (27.8%)	
FIGO IB2 (n=3)				1 (33.3%)	2 (66.7%)	
FIGO IIA & IIB (n=13)				2 (15.4%)	11 (84.6%)	
FIGO IIIB (n=12**)				1 (8.3%)	9 (75.0%)	2 (16.7%)
FIGO IV (n=10**)					4 (40.0%)	4 (40.0%)
Unstaged (n=2**)						1 (50.0%)
Total	15	7	6	20	31	7

.Note: Patients may have more than one treatment type

** 3 of these patients had surgery & chemoradiotherapy, ** 1 patient with stage IV had brachytherapy & external beam radiotherapy, 1 patient with stage IIIB had supportive care only as did 1 patient with stage IV disease and 1 unstaged patient [not shown in table]*

- Treatment type varied considerably with stage at diagnosis with all patients with FIGO Stage IA1 & IA2 having either a radical hysterectomy (21.4%) or Lletz or cone cervical resection only (53.5%). One quarter of patients had Lletz or cone cervical resection as first definitive treatment followed by a completion hysterectomy.
- The majority (77.3%) of patients with FIGO IB-IIA disease had radical hysterectomy or trachelectomy with pelvic node dissection as first treatment (17/22) in keeping with clinical management guidelines [8]. One patient had a hysterectomy followed by radical chemoradiotherapy, while the remaining four patients had chemoradiotherapy as first treatment. Three of the patients who had surgical resection required adjuvant chemoradiotherapy.

- In keeping with the regional clinical management guidelines [8] the majority (75.7%) of patients with Stage IB2 or above had chemoradiotherapy (27/37), one patient who had surgery as first treatment declined adjuvant chemoradiotherapy. 96.3% of these chemoradiotherapy patients had brachytherapy as part of their definitive treatment.
- None of the patients with stage IV disease had surgical resection with 40% having chemoradiotherapy and brachytherapy and 40% palliative radiotherapy alone.

Oncology summary

Table 79: Oncology summary

Oncology details	2010 (n=86)
Seen by oncologist	43 (50.0%)
Chemoradiotherapy and brachytherapy	31 (36.0%)
Brachytherapy and external beam radiotherapy	1 (1.2%)
Palliative External beam radiotherapy only	7 (8.1%)
Other treatment combination	2 (4.6%)

Note: Patients can have more than one type of treatment;

- In 2010 fifty percent of patients were seen by oncology and all but 2 patients received oncological treatment.
- Over one third of patients (36%) had chemoradiotherapy and brachytherapy.

Hospital and Trust of first surgery

Table 80: Hospital/Trust of first surgery

Hospital / Trust of surgery	Lletz/cone cervical resection only	Radical or simple hysterectomy or Trachelectomy	Completion hysterectomy	Total Procedures
Belfast HSCT				**28 (58.3%)**
Belfast City Hospital	5 (33.3%)	22 (84.6%)	1 (14.3%)	
Northern HSCT				**7 (14.6%)**
Antrim*	2 (13.3%)	2 (7.7%)	2 (28.6%)	6
Causeway			1 (14.3%)	1
South-Eastern HSCT				**7 (14.6%)**
Ulster*	4 (26.7%)		1 (14.3%)	5
Lagan Valley	1 (6.7%)			1
Downe	1 (6.7%)			1
Southern HSCT				**3 (6.25%)**
Craigavon Area*	1 (6.7%)		1 (14.3%)	1
Daisy Hill	1 (6.7%)			1
Western HSCT				**1 (2.1%)**
Altnagelvin*			1 (14.3%)	
Ulster Independent Clinic		2 (7.7%)		**2 (4.2%)**
Total surgery patients	**15**	**26**	**7**	**48**

** Cancer Unit*

- In 2010 just under sixty percent of all cervical cancer surgery was performed in Belfast City Hospital. The majority of hysterectomies, and trachelectomies 22/26 (84.6%) were performed in BCH. Seven patients who had a Lletz/cone cervical resection as first definitive treatment subsequently had a completion hysterectomy performed, the majority of which were performed in one of the cancer units. Two radical hysterectomies were performed in the private sector (7.7%).

Surgeon type

Table 81: Hysterectomy/Trachelectomy as 1st definitive treatment: Surgeon type

Surgeon type	Radical hysterectomy, Simple Hysterectomy (for Stage IA1) or Trachelectomy as 1st definitive treatment
Specialist Gynae-oncology surgeon	24/26 (92.3%)
Cancer Unit Gynaecology surgeon	2/26 (4.0%)

In 2010 the majority of patients (92%) had their hysterectomy performed by a specialist gynae-oncology surgeon with 2 patients having simple hysterectomy for early micro-invasive carcinoma performed by a cancer unit gynaecologist, reflecting a high level of surgical specialization. An additional 7 patients had a completion hysterectomies, 6 of which were performed by a cancer unit gynaecologist following successful Lletz as first definitive treatment for early micro-invasive carcinoma.

Communication with Primary Care

Table 82: Contents of letter to GP - 2010

Contents of letter to GP	2010 (n=86)
Management plan	85 (98.8%)
Patient prognosis	11 (12.8%)
Diagnosis discussed with patient	68 (79.1%)
Diagnosis discussed with patients family	27 (31.4%)

- The letter to patient's GP's contained information of the patient's management plan in 98.8% of cases. Information was less well recorded on the patient's prognosis (12.8%) and on whether the diagnosis had been discussed with the patient's family (31.4%).

Patient Information

Table 83: Information provided to patient - 2010

Information provided to patient	2010 (n=86)
Diagnosis discussed with patient	78 (90.7%)
Prognosis discussed with patient	10 (11.6%)
Information leaflets given	34 (39.5%)
Treatment plan discussed with patient	84 (97.7%)
Other patient-related activity	
Treatment plan recorded	85 (98.8%)
Seen by specialist gynaecological nurse	32 (37.2%)
Included in clinical trial	0 (0.0%)

- In 2010 almost all cervical cancer patients had a record in CaPPS and or the clinical notes of a discussion with them of their diagnosis (90.7%), that a treatment plan had been recorded (98.8%) and that this had been discussed with them (97.7%). However a record that the prognosis had been discussed with the patient was only present in 11.6% of cases.
- No patients were included into clinical trials in 2010 as no trials were ongoing.

Follow-up

Table 84: Patient follow-up

Follow up conducted after treatment	2010 (n=86)
Follow up by GP	2 (2.3%)
Follow up by gynaecology	46 (53.5%)
Follow up by oncology	32 (37.2%)
Follow up by specialist palliative care	5 (5.8%)

Patients may be followed up by more than one group.

Just over half of patients were followed up by gynaecology while one third were under oncology review. A small proportion (2.3%) of patients were discharged to the care of their GP.

Onward referrals

Table 85: Onward referrals

Onward referrals	2010 (n=86)
Macmillan Cancer Support	8 (9.3%)
Specialist palliative care	9 (10.5%)
Hospice	5 (5.8%)
District nursing	5 (5.8%)
Clinical Psychology	2 (2.3%)
Dietetics	3 (3.5%)
Social Work Team	11 (12.8%)
Community palliative care	8 (9.3%)

Patients may be referred to more than one group.

In 2010 just over ten percent of patients were referred to a Specialist Palliative Care consultant while a similar proportion were referred to Macmillan Cancer Support and Community Palliative Care. Eleven patients (12.8%) were referred to the social work team.

Cervical cancer pathway: Timelines

This analysis (n=82 patients) excludes patients who first presented via the private sector.

Time from referral received to first seen

- In 2010 the median time from referral to first seen was 17 days.
- 17.1%, of patients were first seen on the same day with just under a quarter seen between 1-14 days. One third of patients (33.5%) waited more than 28 days.
- Of the 28 patients waiting more than 28 days, 14 were referred by screening, 8 were urgent/semi-urgent GP referrals and 6 were other/routine GP referrals.

Table 86: Time from referral to 1st seen- 2010 year (Excluding patients 1st seen in the private sector)

Time from referral received to first seen (days)	2010 (n=82)
Same day	14 (17.1%)
1-14 days	20 (24.4%)
15-28 days	18 (21.9%)
29-42 days	12 (14.0%)
43 or more days	16 (19.5%)
Unknown	5 (6.0%)
Total	**82**
Median (days)	17
Mean (days)	23

Time from first seen to diagnosis by year

- In 2010, 56% of patients were diagnosed on the date first seen in hospital. This was a significant improvement compared to 2001 (30.4%, p=0.014).

Table 87: Time from 1st seen to diagnosis (Excluding patients 1st seen in the private sector in 2010 only)

Time from first seen to diagnosis (days)	1996 (n=86)	2001 (n=69)	2010 (n=82)
Same day	14 (16.3%)	21 (30.4%)	46 (56.0%)
1-14 days	34 (39.5%)	15 (21.7%)	25 (30.5%)
15-28 days	11 (12.8%)	9 (13.0%)	4 (4.9%)
29-42 days	5 (5.8%)	7 (10.1%)	1 (1.2%)
43 or more days	10 (11.6%)	17 (24.6%)	4 (4.9%)
Not recorded	12 (14.0%)	0 (0.0%)	2 (2.4%)
Mean (days)	21	47	7
Median (days)	7	13	0

Time between first referral to secondary care and first treatment

This analysis of 79 patients includes only patients who had active cancer treatment (surgery, chemoradiotherapy or radiotherapy) and excludes patients first seen in the private sector.

- For all referral types, the median time between referral to first treatment in 2010 was 62 days with 46.8% of patients receiving 1st definitive treatment 62 days or more from first referral.
- For just under 20% of patients, diagnostic cervical resection (Lletz/cone) was also first treatment.
- Those waiting over 62 days between referral and first treatment were from all Trusts and from each age group.

Table 88: Time between referral received to first treatment

Timeline (days)	2010 – Active anticancer treatment (n=79)
	Time from referral to first treatment
Same day	0 (0.0%)
1-14 days	5 (6.3%)
15-30 days	6 (7.6%)
31-62 days	28 (35.4%)
62 or more days	37 (46.8%)
Not recorded	3
Total	**79**
Median (days)	62
Mean (days)	65

Table 89: Time between referral to first treatment by referral type (Excluding patients 1st seen in the private sector)

Timeline (days)	2010 – Active anticancer treatment (n=79)			
	Time from referral to first treatment			
	Red flag pathway*	GP Non-red flag/ other	Screening programme	A&E
Same day	0	0	0	0
1-14 days	3	1		1
15-30 days	1	2	1	2
31-62 days	11	11	4	1
62 or more days	11	19	6	1
Not recorded	1	2		
Total	**27**	**35**	**11**	**5**
Median (days)	58	70	64	22
Mean (days)	56	74	75	30

* 6/35 screening patients red flagged by GP's/consultants are included in red flag pathway

- The median time to treatment for patients on a red flag pathway was 58 days, considerably shorter than patients on non-red flag pathways with a median time to treatment for screening patients of 64 days and other non-red flag referral types 70 days. It is recognized that the pathway for patients referred with abnormal smears via the screening programme will be longer than the red flag pathway, as urgent referrals from screening to colposcopy are seen within 4 weeks and routine within 8 weeks, compared to 2 weeks in the red flag system.

Table 90: Time between referral to first treatment by first treatment type (Excluding patients 1st seen in the private sector)

Timeline (days)	2010 – Active anticancer treatment (n=79)	
	Time from referral to first treatment	
	Surgery	Oncological therapy
Same day	0	0
1-13 days	3 (7%)	2 (5.5%)
14-31 days	5(11.6%)	2 (5.5%)
31-62 days	13 (30.2%)	14 (38.9%)
62 or more days	18 (41.9%)	18 (50%)
Not recorded	4 (9.3%)	0
Total	**43**	**36**
Median (days)	58	62.5
Mean (days)	63	66

For all referral types, the median time from first referral to treatment for patients first treated surgically was 58 days compared to 62.5 days for patients undergoing oncological therapy (chemoradiotherapy, radiotherapy or chemotherapy) as 1st treatment. A considerable proportion of patients (42%) had 1st surgery 62 days or more from referral to hospital and 50% of patients received oncological treatment 62 days or more from referral to hospital.

Table 91: Time between diagnosis to first treatment by first treatment type (Excluding patients 1st seen in the private sector)

Timeline (days)	2010 – Active anticancer treatment (n=79)	
	Time from referral to first treatment	
	Radical hysterectomy/trachelectomy*	Oncological therapy
Same day	0	0
1-13 days	0	2 (5.0%)
14-31 days	1 (4.8%)	9 (25.0%)
31-62 days	16 (76.2%)	20 (55.4%)
62 or more days	3 (14.3%)	5 (14.0%)
Not recorded	1 (4.8%)	0
Total	**21**	**36**
Median (days)	48	41
Mean (days)	50	41

** Patients undergoing Lletz/cone cervical resections as 1st treatment excluded from analysis as diagnosis & treatment happen on the same day.*

- For all referral types, the median time from diagnosis to commencing oncological therapy was 41 days while the median time to definitive surgery (hysterectomy/trachelectomy) was longer (48 days).

Survival trends

- One year observed survival for patients with cervical cancer in 2010 was 84.9% (Figure 20 and Table 92 below). This was lower than in 2001 (89.9%), but slightly higher than in 1996 (83.7%). However these variations were not statistically significant.

Figure 20: Survival trends

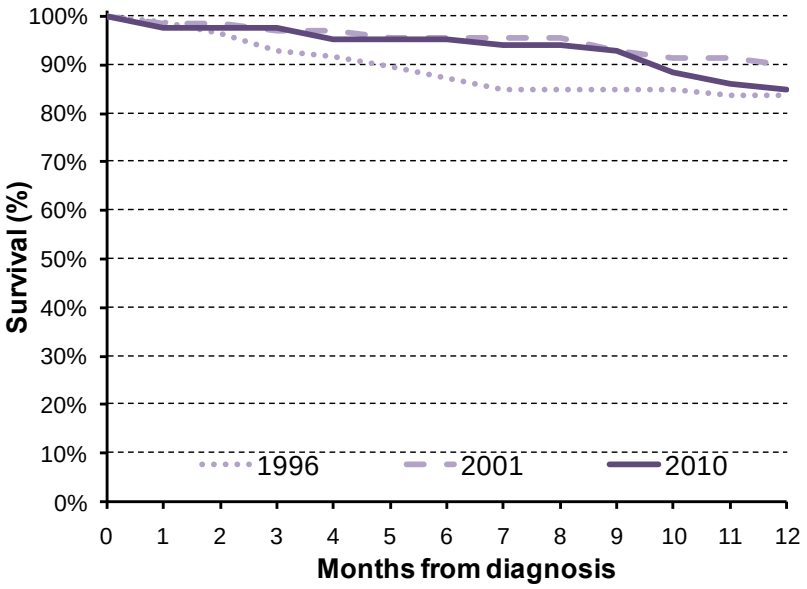
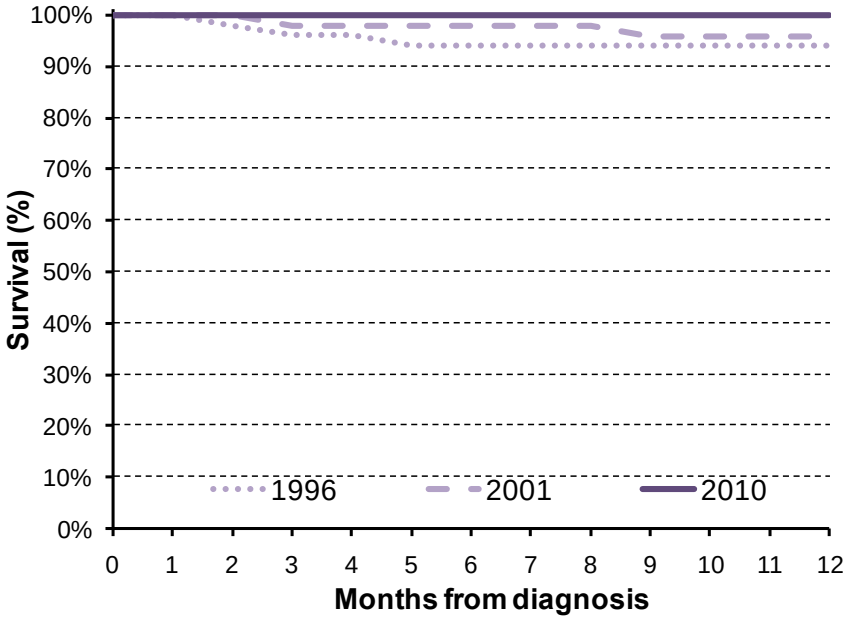


Table 92: Survival trends by audit year

Survival from diagnosis	1996 (n=86)	2001 (n=69)	2010 (n=86)
3 months	93.0%	97.1%	97.7%
6 months	87.2%	95.7%	95.3%
9 months	84.9%	92.8%	93.0%
12 months	83.7%	89.9%	84.9%

Survival (patients treated surgically)

Figure 21: Survival of surgery patients



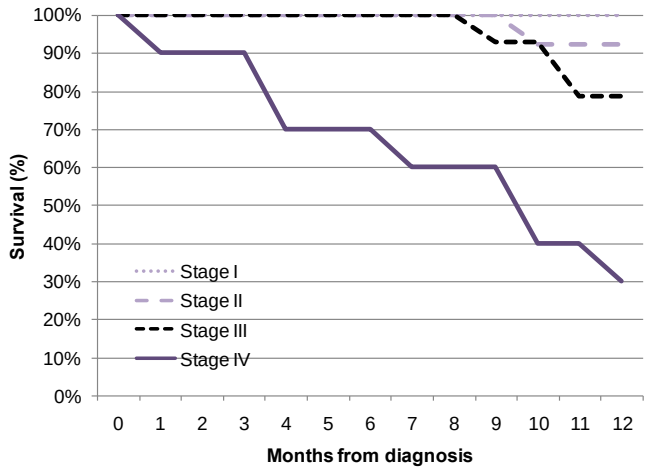
- In 2010 survival for patients treated surgically was excellent at 100.0% after one year reflecting the early FIGO Stage I of disease in patients who undergo surgery.
- Survival for patients treated improved between 1996 and 2010 (p=0.043) with one-year survival increasing from 94.0% in 1996 to 95.7% in 2001 to 100.0% in 2010.

Table 93: Survival of patients treated surgically by audit year

Survival from diagnosis	1996 (n=50)	2001 (n=46)	2010 (n=48)
3 months	96.0%	97.8%	100.0%
6 months	94.0%	97.8%	100.0%
9 months	94.0%	95.7%	100.0%
12 months	94.0%	95.7%	100.0%

Survival by stage

Figure 22: Survival by stage



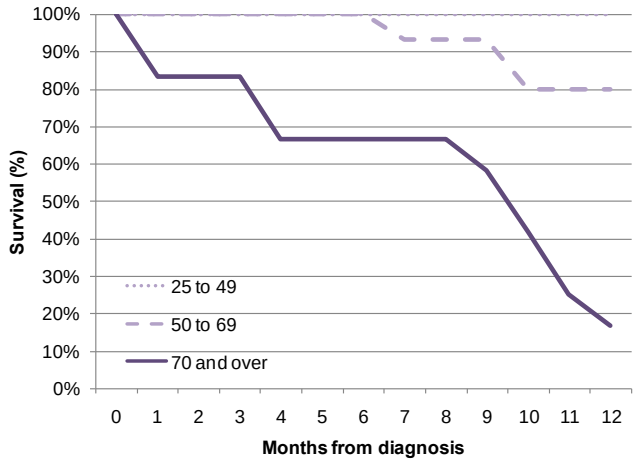
Survival from diagnosis	Stage I (n=47)	Stage II (n=13)	Stage III (n=14)	Stage IV (n=10)
3 months	100.0%	100.0%	100.0%	90.0%
6 months	100.0%	100.0%	100.0%	70.0%
9 months	100.0%	100.0%	92.9%	60.0%
12 months	100.0%	92.3%	78.6%	30.0%

Note: Excludes 2 patients with unknown stage.

- Observed survival from cervical cancer was strongly related to stage at diagnosis ranging from 100.0% for Stage I to 90.0% for Stage IV after 3 months and from 100.0% for Stage I to 30.0% for Stage IV after one year.

Survival by age

Figure 23: Survival by age



Survival from diagnosis	Aged 25 to 49 (n=58)	Aged 50 to 69 (n=16)	Aged 70+ (n=12)
3 months	100.0%	100.0%	83.3%
6 months	100.0%	100.0%	66.7%
9 months	100.0%	93.3%	66.7%
12 months	100.0%	80.0%	16.7%

- Survival from cervical cancer was also strongly related to age at diagnosis ranging from 100.0% for those aged 25 to 49 to 16.7% for those aged 70 and over after one year. Note however that many of the older patients presented with late stage disease.

SUMMARY – OVARIAN CANCER

Presentation, diagnosis and staging

- Data on 128 patients with malignant ovarian cancer (C56), 9 with primary peritoneal cancers (C48.2) 6 with cancers of the fallopian tubes (C57) and 52 patients with borderline ovarian tumours were examined representing 97.5% of eligible cases.
- The median age for ovarian cancer was 68 years with 20% of patients aged 80 years or over. Patients with borderline ovarian tumours were of younger average age. 89% of the over eighty's had comorbidities.
- Almost half of ovarian cancer patients (45.4%) presented via hospital outpatients with 24.5% of patients on a GP red flag suspect cancer pathway. A considerable proportion of patients (28%) presented via Accident and Emergency and 11.2 % via the private sector.
- 41% of patients were first seen by general surgery or general medicine with 60% of ovarian cancer patients subsequently being seen by a specialist gynae-oncology surgeon while just under one third of patients were managed by cancer unit gynaecologists following discussion at the Regional Specialist Gynae MDM in the majority of cases.
- The proportion of patients seen between 1-14 days (37%) was considerably higher in 2010 than in previous audit years most likely due to the introduction of the cancer access targets in 2007.
- In 2010 there were 39 ovarian cancer patients on a red flag pathway with 82% being seen within the 14 day cancer access target.
- All patients with borderline ovarian tumours were seen by a gynaecologist as were 93% of ovarian cancer patients.
- The commonest symptoms were abdominal pain, abdominal distension and altered bowel habit in both malignant and borderline tumours with 45% of women having abdominal pain and/or distension (43%) for less than 3 months.
- CA125 was measured in 96% of patients and 96% of patients had a CT scan performed.
- Diagnosis was confirmed pathologically in 92% of ovarian cancer patients and 96% of patients with borderline ovarian tumours. 62% of patients (8/13) without pathological confirmation were aged 80 or over.
- Epithelial tumours were the most common accounting for 88.1% of the malignant and 90% of the borderline tumours and two thirds of ovarian cancers were poorly differentiated.
- The proportion of patients staged improved from 80% in 2001 to 91.6% in 2010. Two thirds of ovarian cancer patients presented with advanced Stage III or IV disease and 43% of these patients were aged 70 or over.
- Age was a factor in the stage at presentation. Among those aged under 50 (excluding borderline tumours) 63% were stage I compared to only 5.7% of those aged 70 to 79 and only 3.6% of those aged 80 and over.

SUMMARY – OVARIAN CANCER

Treatment

- 90% of ovarian cancer patients were discussed and a treatment plan agreed by the Specialist Regional Multidisciplinary Team Meeting (MDM).
- Treatment modality was also strongly related to FIGO stage at diagnosis. All patients with Stage I or II disease received active treatment compared to two thirds (66.6%) of Stage IV patients.
- 60% of ovarian cancer patients had surgical resection and 78% of these patients had their surgery performed by a specialist gynae-oncology surgeon, reflecting improved surgical specialisation. Various clinical scenarios resulted in 15 ovarian cancer patients (17.4%) having their surgery performed by a cancer unit gynaecologist. The remaining 4.6% of patients were found to have ovarian cancer during surgery (performed by a non-gynaecological surgeon) for other conditions where cancer was not suspected.
- A high proportion, 81%, of patients underwent comprehensive surgical staging as per regional clinical management guidelines.
- Surgery followed by adjuvant chemotherapy was the most common treatment modality (36%) while 17.5% of patients received primary chemotherapy alone and 21.7% of patients received best palliative supportive care.
- In keeping with the regional clinical management guidelines none of the patients with early FIGO Stage IA or IB well differentiated tumours received adjuvant chemotherapy.
- In 2010, the median time between referral and first treatment was 54 days.
- Median time from 1st hospital referral to 1st treatment was considerably shorter for those initially being admitted via A&E (39 days) compared to 55 days for outpatient gynaecology and 58 days for general medicine/general surgery.
- Median time from 1st hospital referral to 1st treatment was considerably shorter for patients having surgery as first treatment (46 days) compared to chemotherapy (64 days).
- 37 patients were treated 63 days or more from hospital referral. 14 patients (37.8%) were on a red flag pathway, 6 presented as emergencies via A&E, 11 were GP urgent & routine referrals and 6 were referred from other sources.

SUMMARY – OVARIAN CANCER

Communication with patients and Primary Care

- Recording of discussion of the diagnosis and treatment plan with the patients was very good with more than 90% having this detailed in the clinical notes or CaPPS.
- Communication with primary care was excellent with 98% of patients having a letter forwarded to their GP indicating the diagnosis and treatment plan.

Survival

- Observed survival for ovarian cancer patients at one year was only 59%. However, 1-year survival for patients able to undergo surgical resection improved significantly in 2010 (83.8%) compared to 1996 (75.8%), P=0.007.
- One year survival was also strongly related to age at diagnosis ranging from 94.7% for those aged under 50 to 21.4% for those aged 80 and over after one year. It was also strongly related to stage at diagnosis ranging from 100.0% for stage I to 31.3% for stage IV patients. The presence of comorbidities also had, as expected, a considerable negative impact on survival.

SUMMARY – CERVICAL CANCER

Presentation, diagnosis and staging

- Data on 86 patients with cervical cancer (C53) were examined representing 98.8% of eligible cases.
- The median age at diagnosis was 40 years, two thirds of patients were aged under 50 and 14% were over 70.
- 41% of women were current smokers with 13% ex-smokers.
- 72% of patients were referred by their GP's to hospital outpatients with 27% of these patients on a GP red flag suspect cancer pathway. 11.6% of women were referred from the cervical screening programme.
- For all referral types, 40% of patients were first seen in secondary care within 14 days of referral. The median time from referral to first seen was 17 days however one third of patients waited more than I month to be seen.
- In 2010, 56% of patients were diagnosed on the date 1st first seen in hospital. This was a significant improvement compared to 2001 (30.4%, p=0.014).
- The most common symptoms were post-menopausal bleeding (22.1%), post-coital bleeding (18.6%) and inter-menstrual bleeding (17.4%).
- The proportion of 2010 cervical cancer patients with no record of a previous smear test was 21% compared to 31% in 1996 in keeping with increased uptake of screening over the audit years.
- 94.2 % of patients were first seen by gynaecology.
- 91% had management plan decided by the Regional Specialist Gynae MDT however 7 patients were not discussed at MDM (6 from Northern Trust, 1 from Western Trust).
- FIGO stage was very well recorded in CaPPS (98%) while stage at diagnosis varied considerably by age with two thirds of women under 70 having stage I disease while 42% of women age 70 and over had advanced stage IV disease.

Treatment

- All patients with early FIGO Stage IA1 and IA2 required surgery alone.
- The majority (77.3%) of patients with FIGO IB-2A disease had radical hysterectomy or trachelectomy with pelvic node dissection as first treatment (17/22) in keeping with clinical management guidelines.
- The majority of first treatment hysterectomies and trachelectomies (92%) were performed by a specialist gynae-oncology surgeon reflecting a high level of surgical specialisation.
- In keeping with the regional clinical management guidelines three quarters of patients with FIGO Stage IB2 disease or above (75.7%) had chemoradiotherapy and 96% of these patients had brachytherapy as part of their radical chemoradiotherapy.
- 50% of patients were referred to oncology and 95% of these patients received oncological therapy.
- The proportion of patients having oncological therapy was similar to previous audit years.

SUMMARY – CERVICAL CANCER

- For all referral types, the median time between referral to first treatment was 62 days with 46.8% of patients receiving 1st definitive treatment 62 days or more from first referral.
- For all referral types, the median time from diagnosis to commencing oncological therapy was 41 days while the median time to surgery (hysterectomy/trachelectomy) was longer (48 days).
- The median time from referral to treatment for patients on a red flag pathway was 58 days, considerably shorter than patients on non-red flag pathways (70 days).

Communication with patients and Primary Care

- Recording of discussion of the diagnosis and treatment plan with the patients was very good with more than 90% having this detailed in the clinical notes or CaPPS.
- Communication with primary care was excellent with 99% of patients having a letter forwarded to their GP indicating the diagnosis and treatment plan.

Survival

- Survival for all cervical cancer patients at one year was very good (84.9%) while survival for the early FIGO stage patients undergoing surgery was excellent (100%) and significantly better than in 1996 (94%), (p=0.043).
- Survival from cervical cancer was strongly related to age at diagnosis ranging from 100.0% for those aged 25 to 49 to 16.7% for those aged 70, however this was related to stage of disease and possibly comorbidities.
- Survival from cervical cancer was also strongly related to stage at diagnosis ranging from 100.0% for stage I to 30.0% for stage IV after one year.

CONCLUSIONS AND RECOMMENDATIONS

Patients with ovarian and cervical cancer in N. Ireland are managed by well functioning local and regional specialist multidisciplinary teams which record cancer stage and treatment plans and communicate very well with patients and secondary care. The majority of gynaecological cancer surgery in 2010 was performed by specialist gynae-oncology surgeons in the regional centre at Belfast City Hospital in keeping with regional clinical management guidelines. However as with any service, improvements may be made.

The considerable proportion (28%) of ovarian cancer patients had an emergency admission via A&E is in keeping with late presentation. Late stage at presentation was particularly evident in older patients.

Over a third of ovarian cancer patients and 46% of cervical cancer patients received their first treatment more than 62 days from initial hospital referral.

14% of cervical cancer patients were over age 70, the majority of whom presented with late stage disease and had no record of a cervical smear.

Recommendations

1. Reasons for late presentation especially in the elderly need further study.
2. A public awareness campaign highlighting the key symptoms of ovarian cancer in post-menopausal women should be considered.
3. The pathways for ovarian and cervical cancers should be explored to speed up this process.
4. There should be increased awareness among clinicians of cervical cancer as a possible diagnosis in older women.
5. The value of the current screening programme to detect early changes which may lead to cancer should continue to be highlighted.

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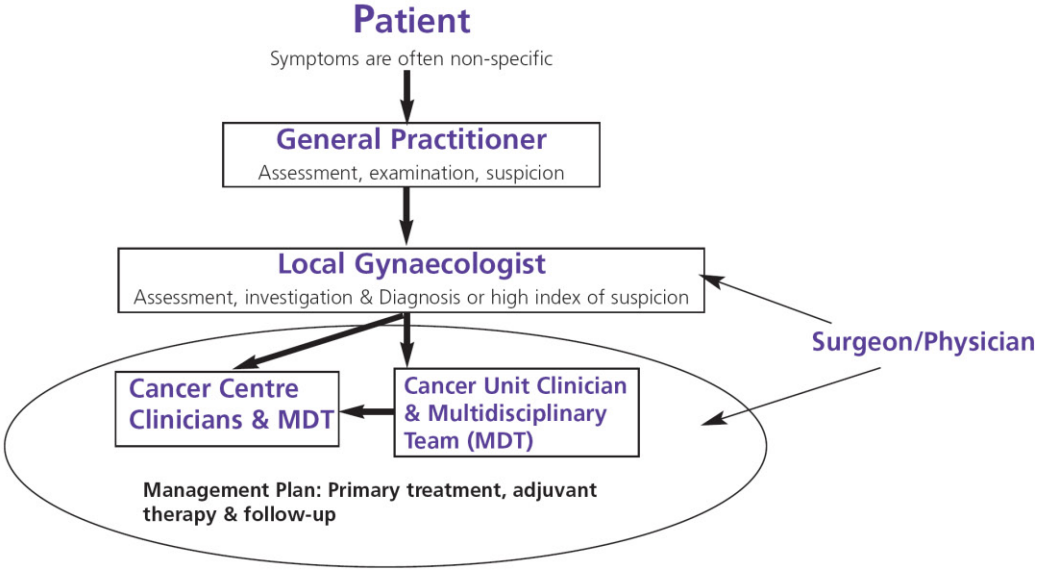
APPENDIX A - GYNAECOLOGICAL CANCER GUIDANCE PATIENT PATHWAY



- Management plans to be agreed by the MDT at the Cancer Centre/Cancer Unit and recorded in the patient's notes
- Treatment should only be conducted in the Cancer Centre or a Cancer Unit
- Protocol-based investigations should be completed locally to expedite management
- Each hospital should have arrangements, including rapid access facilities, for urgent assessment

TYPICAL PRESENTATION, DIAGNOSIS AND TREATMENT

	OVARY	CERVIX	VULVA/VAGINA	UTERUS
Symptoms	Abdominal distension or discomfort	Recurrent postcoital, latermenstrual, or post-menopausal bleeding	Vulval itch or discomfort especially in elderly	Post menopausal or intermenstrual bleeding. Abnormal bleeding for 4 weeks after stopping HRT
Signs	Suspicious pelvic mass Suspicious mass on USS	Suspicious lesion on cervix especially if hard, irregular or ulcerated	Suspicious lesion on vulva, especially if ulcerated.	
	REFER TO CONSULTANT GYNAECOLOGIST FOR INVESTIGATION/DIAGNOSIS			
Investigation and Diagnosis	USS/CTCs 125 Risk of Malignancy Index (RMI) calculated	Cervical Biopsy MRI	Biopsy CT	Hysteroscopy/Biopsy MRI
	REFER PATIENT TO THE CANCER CENTRE OF CANCER UNIT FOR AGREED MDT MANAGEMENT			
	MULTIDISCIPLINARY TEAM MANAGEMENT eg Staging of Disease, Nature & Location of Treatment, Adjuvant Therapy, Patient Registration, Follow-up			
Primary Treatment	CANCER UNIT Surgery CANCER CENTRE Radical/Surgery +/ Chemotherapy CANCER CENTRE ONLY	Radical Hysterectomy or Chemoradiation CANCER CENTRE ONLY	Radical vulvectomy CANCER UNIT	Hysterectomy - DSO CANCER CENTRE Hysterectomy - DSO +/Radiotherapy
	CONTINUING CARE AND FOLLOW-UP SHOULD BE AGREED BY THE CANCER CENTRE AND CANCER UNITS MDT.			
	SPECIALIST PALLIATIVE CARE		**PSYCHOSEXUAL COUNSELLING**	
Continuing Care	All patients should receive information and literature on community-based support. Most palliative care provided by primary care team. Refer as appropriate at any stage for psychosexual counselling or specialist palliative care.	• Physical uncontrolled pain, intestinal obstruction, lymphoedema, drug side effects • Psychological complex emotional issues • Rehabilitation	• Social complex family issues • Spiritual: loss of hope, cultural or religious issues • Respite Care • Terminal Care	• Severe adjustment reaction to the diagnosis of cancer or the effect of treatment • Physical complications affect normal sexual function • Psychosexual difficulties directly or indirectly related to disease

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