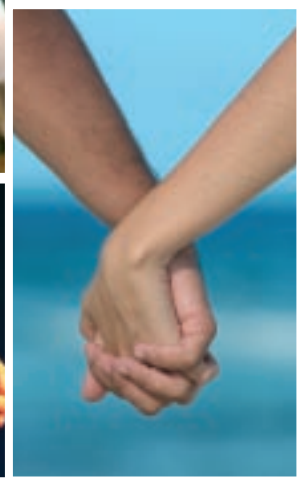
N. IRELAND Cancer Registry

Care of Patients with Malignant Melanoma of Skin in Northern Ireland 2006



Queen's University Belfast

2006 Melanoma Skin

Care of Patients with Malignant Melanoma of Skin in Northern Ireland 2006

Edited by **Ann Smith and Anna Gavin**

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Foreword

This report describes the characteristics of patients diagnosed in N. Ireland with malignant melanoma of skin and their care. This process is supported by local clinicians and the recommendations will be taken forward through the NICaN tumour specific group on melanoma.

We are on a journey of continuous improvement in cancer care and this report provides valuable information which will be essential in helping us to track our progress and highlight areas where change is needed. This second report in a new series highlights the importance of the Cancer Registry as a valuable public health tool. I look forward to future reports.

Dr Michael McBride
Chief Medical Officer

Acknowledgements

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The quality of data in this project is a result of the work of the Registry Tumour Verification Officers especially Bernadette Anderson and Jackie Kelly who meticulously extracted detailed information from clinical records for analysis and presentation in this report. The analysis of data was undertaken by Dr Ann Smith. A special word of gratitude to the Medical Records staff of all the hospitals in Northern Ireland who have facilitated the Registry in this work.

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

A Gavin
Director, NICR
2008

SECTION I – Introduction, Background and Methods

This report is the second in a new series of Cancer Audit reports examining in detail the pathway of care for cancer patients in Northern Ireland. It is the first such report on Malignant Melanoma.

BACKGROUND – Malignant Melanoma

Melanoma is a malignant tumour of melanocytes which are found predominantly in skin. It is one of the rarer types of skin cancer but causes the majority of skin cancer related deaths[1]. Despite many years of intensive laboratory and clinical research, the sole effective cure currently is surgical resection of the primary tumour before it achieves a thickness greater than 1 mm[2].

Around 160,000 new cases of melanoma are diagnosed worldwide each year[3]. The pattern of malignant melanoma in a population varies; in some populations more males develop it than females, but generally in a Caucasian population more females than males develop the condition. This is the case in Northern Ireland, Scotland, England and Wales where there is a record of higher levels in females. Melanoma is more common in Caucasian populations living in sunny climates than other groups[4]. According to a WHO Report about 48,000 melanoma related deaths occur worldwide annually[5].

In Caucasian populations the recognised risk factors for the condition are fair skin, a large number of moles, sunbathing and the use of sunbeds. There is a reported trend in increasing melanoma due to increasing frequency of holidays in the sun.

There are four main types of melanoma:

(a) **Superficial Spreading Melanoma** that spreads superficially, is by far the most common type. (About 70 % of all cases).

(b) **Lentigo Maligna** usually appears as a flat or mildly elevated mottled tan, brown or dark brown skin discolouration. This type arises on chronically sun-exposed, damaged skin.

(c) **Nodular Melanoma** is the most aggressive of the melanomas, and is found in 10 to 15 percent of cases. It is usually invasive at the time it is first diagnosed.

(d) **Acral Lentiginous Melanoma**, spreads superficially before penetrating the skin more deeply. Unlike the other forms of melanoma it usually appears as a black or brown discoloration under the nails or on the soles of the feet or palms of the hands.

Others include the very rare:

Spindle Cell Melanoma – this is characterised by the epitheloid cell (spindle cell shape) naevus, and is most common in elderly male patients, but women are at risk as well.

Desmoplastic Melanoma – A rare form of melanoma with nonpigmented lesions, mostly found on head and neck.

People with melanoma will usually be treated, and in many cases cured, by having surgery to remove the lesion. If necessary, secondary surgery, and plastic surgery, such as skin grafts are carried out. The thickness of the melanoma and how deeply it has invaded the layers of the skin determines the extent of the surgery. Lymph nodes near the tumour may be removed because cancer can spread through the lymphatic system to other parts of the body. For more advanced disease, chemotherapy agents, such as Dacarbazine are utilised, or high doses of Interferon and Temozolomide may sometimes be used in specific cases.

Similarly, biological therapy/immunotherapy using substances called cytokines can be utilised. Radiation

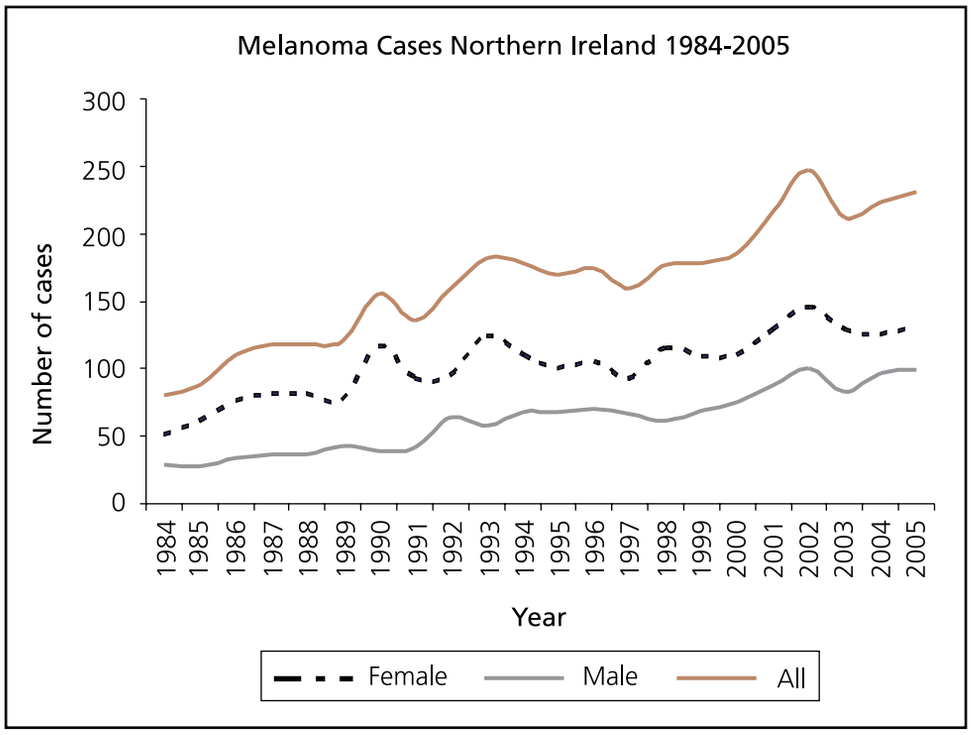
therapy may be used to help control melanoma that has spread to the brain, bones, and other parts of the body. It may shrink the tumour and relieve symptoms[6].

A trial was instigated in 2000 for malignant melanoma (the Middleton trial[7]) in an effort to gain curative therapy for malignant melanoma. Patients with stages III and IV are being randomly assigned to receive Temozolomide or Lomeguatrib, or a combination of these.

The incidence of invasive malignant melanomas in the UK has doubled over the past 20 years[8] and it now claims about 1,700 lives a year in the UK.

In Northern Ireland, the number of new cases diagnosed has trebled[9] (Figure 1 below).

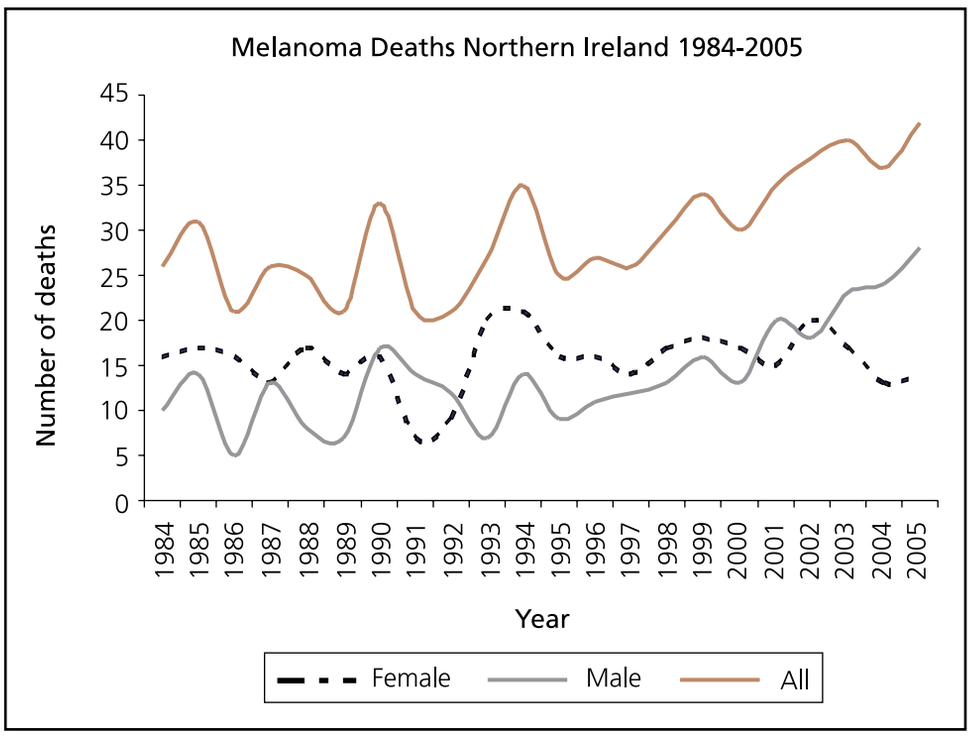
Figure 1



In Northern Ireland melanoma cases have increased from 80 cases in 1984 to 230 cases in 2005 (see Appendix A), an increase of 288% overall in 21 years. The patterns for males and females however, are different. While females have more cases than males, the rate of increase for males is higher at 340% compared with 260% for females. This overall rise may be attributable to cultural changes, including increased sunbathing and using sunbeds.

In Northern Ireland, mortality from melanoma has risen overall, reflecting the rise in incidence (Figure 2).

Figure 2



The number of deaths in males from melanoma rose from 26 in the year 1984 to 42 in year 2005, an increase of 162%. Deaths from melanoma in females has remained stable with no significant change throughout this time period.

Melanoma occurs more commonly in affluent populations. Socioeconomic analysis for Northern Ireland[10] show that there were statistically significant higher rates in EASRs (European Age Standardised Rates) of malignant melanoma for new cases with increasing affluence ($p<0.01$). Males living in the most affluent areas had an EASR of 13.9 compared with 6.8 per 100,000 for males living in the most deprived areas. Similarly, females living in the most affluent areas had higher EASR incidence of malignant melanoma than those living in the most deprived areas (18.3 vs 8.4 per 100,000 respectively). Mortality rates from malignant melanoma were considerably lower than incidence, with no statistically significant patterns detectable with deprivation for either males, females or both combined.

The Campbell report of 1996[11] set the standards required in Northern Ireland for the care of cancer patients. (Summary in Appendix B.)

The proposed management of patients with cancer was outlined, proposing multidisciplinary, multiprofessional specialist cancer teams and the setting up of a major cancer centre at the City Hospital and Cancer Units for each Health Board in Northern Ireland. While there was no special recommendation for the control of malignant melanoma or other skin cancers, the Department produced strategies for the control of malignant melanoma and other skin cancers in 1999[12] and a Working Group produced a report on Skin Cancer in 2004[13]. Both had a section on cancer treatment. The most recent document recommends the formation of a multidisciplinary melanoma audit team at each of the Cancer Units to review cases with a view to directing patients along agreed pathways of treatment.

Guidelines

Guidelines have been produced for the management of melanomas[14], by a multidisciplinary working party related to the British Association of Dermatologists. These recommendations include the procedure for biopsy and excision of suspected melanomas, the histopathology reporting in detail and the recording of patient and family histories. Rapid referral, diagnosis and treatment are the key to successful management.

- Targets include the patient being seen by a clinician specialising in the area, within two weeks of a referral letter from the G.P.
- Treatment of the primary lesion depends on the type (e.g. whether in situ or not) of melanoma and the depth. Margins for excision range from 0.5 cm for lesions of less than 0.75 mm depth to 3 cm for lesions of greater than 4 mm depth.
- Imaging investigations are not considered necessary for stages I and IIA patients, but patients with stage IIB and over should have chest X-rays, ultrasound, CT scans, full blood counts and liver function tests.
- Ideally patients with stage IIB or over should be managed in a Cancer Centre by a multidisciplinary team. If clinical trails are available then these patients should be considered for their suitability to participate.
- If there is any evidence of lymph node spread then the lymph node region should be excised radically.
- Patients with further spread should be referred to oncologists, but current therapies are mostly palliative, apart from further surgical resections.
- All patients with invasive melanoma should be followed up every 3 months for 3 years. Where the melanoma thickness was less than 1 mm the patient may be discharged; others should be followed up for a further two years at 6 monthly intervals.
- At risk individuals should be encouraged to practice sun care and examine their moles on a regular basis.

The National Institute for Health and Clinical Excellence (NICE) have also issued guidelines for health care management for people with skin cancer[15]. With respect to melanomas, they recommend the involvement of specialist skin cancer multidisciplinary teams, attached to Cancer Centres. Nationally agreed protocols should be adhered to and appropriate follow up care agreed. Because of the steady rise in incidence of melanomas, information on skin cancers should be collected and studied, in adequately funded cancer registries.

Study Aim

The aim of the report is to review the process of care for malignant melanoma patients diagnosed in Northern Ireland during 2006. This is the first population based audit on this condition here.

Study Methods

Data collection

Registry tumour verification officers (TVOs) collected data by reviewing clinical notes on patients diagnosed in the calendar year 2006 with malignant melanoma (ICD C43). The data included presenting symptoms, co-existing illnesses, investigations, treatment, staging, onward referral and survival. The data are not incidences because sufficient information was not available on all cases, but should reflect the patterns of occurrence of malignant melanoma and its treatment in Northern Ireland.

Data were entered into an electronic proforma, devised with the help of local clinicians; copy available at www.qub.ac.uk/nicr.

Exclusions

Patients were excluded if they resided outside Northern Ireland, if their records lacked sufficient information, or if the diagnosis was not primary melanoma diagnosed in 2006.

Method of data analysis

The data was imported into EXCEL for cleaning, sorting and validation and then analysis was carried out in SPSS v15[16]. Comparisons between groups were tested by ANOVA.

SECTION II – Results

Whilst 254 patients were registered with invasive malignant melanoma in Northern Ireland in 2006, this report has recorded details of 248 cases which have sufficient information to be included. Of these 145 were females and 103 were males. In addition to the 254 patients with invasive malignant melanoma there were, in 2006, 85 female and 63 male in situ melanomas which are not included in this audit.

Study patients

Patients	Number of patients (%)
Total patients	254
Exclusions – lack of information	6
Total males	103 (41.5%)
Total females	145 (58.5%)
Total	**248 (100%)**
Average age at diagnosis – male	61 years
Average age at diagnosis – female	57 years

- Melanoma is more common in females than males (3:2).
- Males diagnosed with malignant melanoma are on average slightly older than females ($p<0.001$).
- Nine patients (3.6%) were aged less than 25 years, 76 (30.6%) were aged between 25 and 50 years and 163 (65.7%) were aged over 50 years.

Pattern with Deprivation

Deprivation quintile	Number of patients (%)
Quintile 5 (most deprived)	35 (14.1%)
Quintile 4	32 (12.9%)
Quintile 3	57 (23.0%)
Quintile 2	49 (19.8%)
Quintile 1 (least deprived)	75 (30.2%)
Total	**248 (100%)**

Note: In the general population, if the disease is not linked with deprivation then it would be expected that 20% of all cases of disease would fall in each quintile.

- In this group, more melanomas than expected occurred in the less deprived, more affluent, sectors of the population, with more than twice as many in the least deprived quintile (Q1) compared with the most deprived (Q5). This is a significant finding ($p<0.001$).

Family History

	Number of patients (% total)
Family history of melanoma	7 (2.8%)
Family history of skin cancer	5 (2.0%)
Family history of other cancer	39 (15.7%)
No family history of cancer	29 (11.7%)
Family history not recorded	174 (70.2%)

Note: Patients could record more than one family history, of more than one cancer.

- Family history was poorly recorded.
- A positive family history of malignant melanoma was recorded in 7 cases and indicates that this is not a major risk factor (2.8%) in this group. This does not concur with research carried out in the USA that has tried to quantify the risk posed by a family history of melanoma. Clinical records of family members were searched and they found higher levels (17%) had a family history of melanoma, when searching records rather than that reported by asking the patient[17].

Source of referral to specialist care

Source of referral	Number of patients (%)
G.P.	208 (83.9%)
Dermatology clinics	17 (6.8%)
Physician	9 (3.6%)
A&E/self referral	1 (0.4%)
Private sector	2 (0.8%)
Not recorded	9 (3.6%)
Other	2 (0.8%)
Total	**248 (100%)**

Note: "Physician" included in-patient referrals for patients admitted to hospital for other conditions, "Other" includes referrals from podiatry and nurse practitioners

- Most patients (84%) were referred by their G.P., while 7% were already under review by Dermatology clinics that they had been attending for other skin conditions. About 8% were referred from other sources.
- One hundred and thirty one patients (52.8%) were urgent referrals, whilst 15 (6.0%) were recorded as semi-urgent referrals.

Patients presenting within their own Health Board

Board of residence	Number of patients (% of patients in that board) presenting within own Board
NHSSB	39 (69.0%)
EHSSB	104 (97.8%)
SHSSB	48 (85.2%)
WHSSB	28 (92.9%)

- Most patients presented in their own Health Board of residence, however, this was less so for the Northern Board residents, many of whom presented to the Eastern Board.

Symptoms/signs at patients' first presentation

Symptom/sign	Number of patients (% total patients)	Number of patients with recorded duration of symptom (% of patients with symptom)	Average length of time (min, max, months)
Increasing size	135 (54.4%)	80 (60.6%)	7.9 (0.5, greater than 24)
Change in colour	88 (35.5%)	43 (49.4%)	7.7 (0.5, greater than 24)
Itching	39 (15.7%)	15 (38.5%)	4.3 (1, greater than 24)
Change in shape	34 (13.7%)	19 (57.6%)	9.7 (1, 24)
Nodule	60 (26.7%)	18 (30.0%)	4.2 (1,12)
Bleeding	44 (17.7%)	15 (34.1%)	2.2 (0.5, 6)
Ulceration	28 (11.3%)	5 (17.9%)	3.6 (0.5, 12)
Pain	9 (3.6%)	5 (55.6%)	1.2 (0.5, 3)
Lump in groin, neck or armpits	6 (2.4%)	0	0
No symptoms recorded other than lesion present	2 (0.8%)	–	–

Note: patients may present with more than one symptom.

- The most frequent symptom was increasing size of the lesion (over half of patients), followed by change in colour (one third). The presence of a nodule was reported by a quarter of patients, whilst approximately a fifth had bleeding. Itching was present in a sixth of patients. Less common symptoms were a change in shape or ulceration of the lesion.
- Two patients were asymptomatic. These patients were originally referred from a G.P., one had primary surgery at the G.P. clinic and the other at RVH.

Duration of symptoms/signs

Symptom/sign	1 month or less	2 – 5 months	6 – 11 months	12 months or greater	Proportion of patients with time recorded (% of patients with this symptom)
Increasing size	9 (11.3%)	29 (36.2%)	15 (18.8%)	27 (33.8%)	80/135 (59.3%)
Change in colour	3 (7.0%)	19 (44.2%)	7 (16.3%)	14 (32.6%)	43/88 (48.9%)
Itching	5 (33.3%)	6 (40.0%)	3 (20.0%)	1 (6.7%)	15/39 (38.5%)
Change in shape	3 (15.8%)	6 (31.6%)	2 (10.5%)	8 (42.1%)	19/34 (55.9%)
Nodule	5 (27.8%)	7 (39.9%)	4 (22.2%)	2 (11.1%)	18/60 (30.0%)
Bleeding	7 (46.7%)	6 (40.0%)	2 (13.3%)	0	15/44 (34.1%)
Ulceration	4 (80.0%)	0	0	1 (20.0%)	5/28 (17.9%)
Pain	3 (60.0%)	2 (40.0%)	0	0	5/9 (55.6%)

- Duration of symptoms was moderately well recorded.
- Bleeding, ulceration and pain, although not the most common symptoms, tended to be endured by the patient for less time than changes in size, shape or colour.
- The majority (n=18) of the 27 patients who had noticed increasing size of their lesion for over 12 months had stages I – II disease at diagnosis (Breslow thickness 0.2 mm to 3.5 mm, with 10 of these with Breslow depth greater than 1 mm). One patient had a IIIB staged lesion (Breslow thickness 9.4 mm). All others (n=8) had insufficient information for staging, but had Breslow thicknesses of between 0.2 mm and 3.5 mm, with three of these having thicknesses of greater than 1 mm.
- All patients who noticed change of lesion colour over at least 12 months (n=14), and with recorded staging of the lesion had stages I – II. One of these patients with stage IB, Breslow depth 1.15 mm, died in the first year after diagnosis of malignant melanoma.
- All patients who had noticed a change of shape for at least 12 months (n=8), and with recorded staging of the lesion had final stages I – II (Breslow depth 0.4 mm to 1.4 mm). All patients in this category were alive at 1 year after diagnosis.

Duration of any symptoms by gender

	1 month or less	2 – 5 months	6 – 11 months	12 months or more	Not recorded	No symptoms
Male	21 (20.4%)	22 (21.4%)	9 (8.7%)	7 (7.0%)	43 (42.2%)	1 (0.7%)
Female	18 (12.4%)	53 (36.6%)	24 (16.7%)	46 (31.7%)	3 (2.1%)	1 (1.0%)
All	39 (15.7%)	75 (30.2%)	33 (13.3%)	53 (21.4%)	46 (18.5%)	2 (0.8%)

Note: these are symptoms, not cases, as patients had more than one symptom. Two patients, one male, one female had no symptoms recorded.

- Recording of symptom duration was better for women than men.
- Of those recorded, women tended to have symptoms longer than men.

Co-morbidities – Existing illness

Co-morbidity	Number of patients (%)
Chronic Obstructive Pulmonary Disease	5 (2.1%)
Dementia	3 (1.2%)
Cerebrovascular disease	10 (4.1%)
Psychiatric condition	3 (1.2%)
Previous Basal Cell Carcinoma	21 (8.7%)
Previous melanoma	3 (1.2%)
Previous naevus	35 (14.5%)
Ischaemic heart disease	21 (8.7%)
Epilepsy/neurological disease	3 (1.2%)
Other malignancies	18 (7.4%)
No other morbidity reported	123 (50.8%)

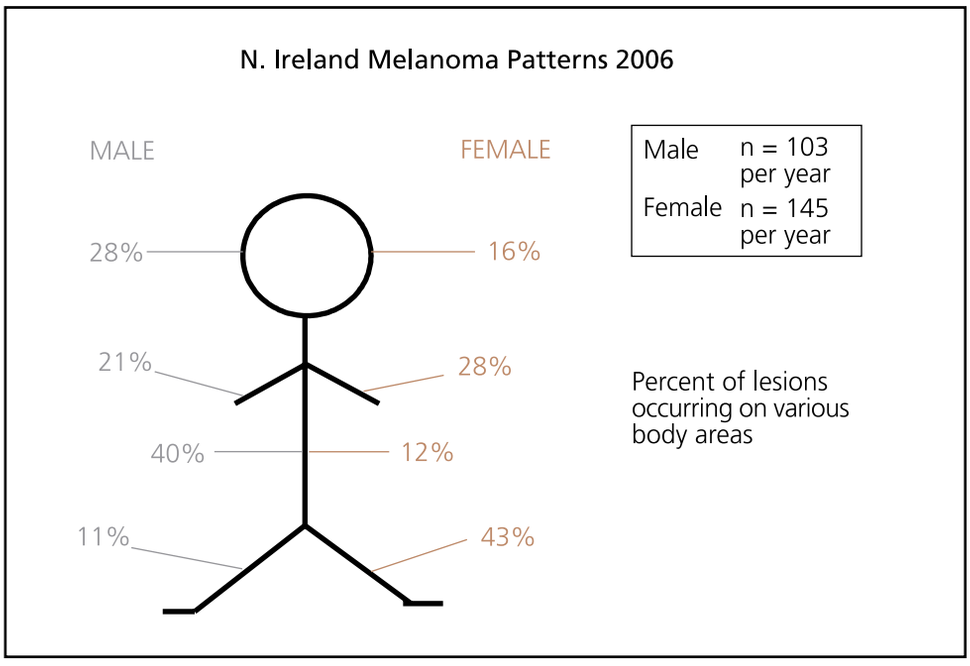
Note: patients may have had more than one co-morbidity.

- Melanoma patients had few co-morbidities overall compared with other cancer patients (see previous Audit Reports from NICR).
- Three patients had a previous melanoma on a completely different site.
- Fourteen percent had previous naevus (non-malignant) recorded.
- Of the "Other malignancies", 5 were breast cancer.

Site of malignant melanoma

Site	Males N (%)	Females N (%)	Number of patients N (%)
C43.1 (Eyelid)	1 (1.0%)	1 (0.7%)	2 (0.8%)
C43.2 (Ear and aural canal)	6 (5.8%)	2 (1.4%)	8 (3.2%)
C43.3 (Face)	15 (14.6%)	19 (13.1%)	34 (13.7%)
C43.4 (Scalp and neck)	7 (5.8%)	1 (0.7%)	8 (3.2%)
C43.5 ((Main torso)	41 (39.8%)	17 (11.7%)	58 (23.4%)
C43.6 (Upper limb, shoulder)	21 (20.4%)	41 (28.3%)	62 (25.0%)
C43.7 (lower Limb, hip)	12 (11.7%)	64 (43.4%)	76 (30.6%)
ALL SITES	**103**	**145**	**248**

- All patients had site of melanoma recorded.
- The most frequent site for melanoma in male was the main torso, with more than two times as many males presenting with melanoma on this part of the body than females.
- The greatest difference between the sexes was for the lower limb, with over five times as many females as males presenting with melanoma at this location. Males had almost twice the percentage of lesions on the head and neck. These differences are all highly significant ($p<0.001$).
- These patterns are similar to previous melanoma results for Northern Ireland and reflect patterns of skin sun exposure.



History of Sun Exposure

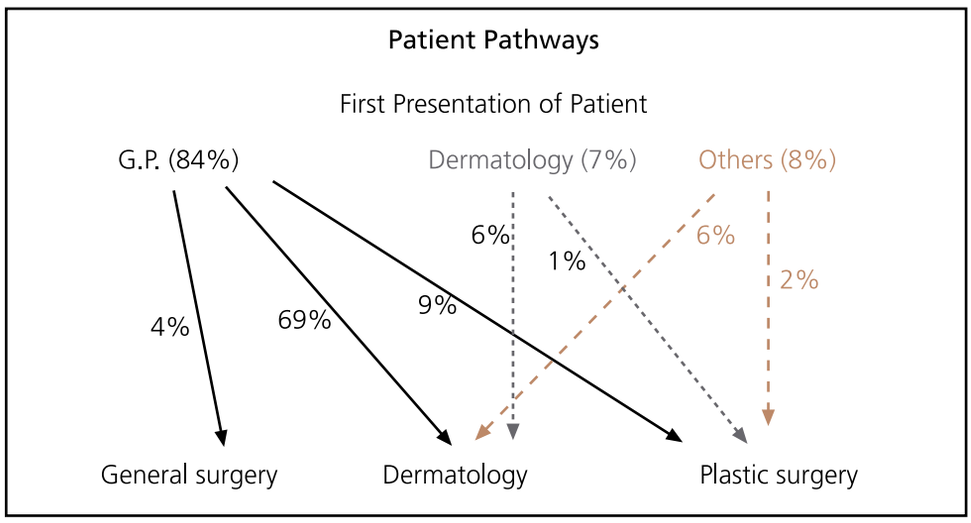
- Fifty eight patients (24.0%) had significant sun exposure recorded in the notes.
- Durations for living abroad were recorded of greater than 2 years for six patients and six months for one patient.
- Comments recorded were:
  - "Sunny holidays" (2).
  - "Multiple sunburn over the years".
  - "Sunburn in the past".
  - "Sunburn and sun beds" (2).
  - "Sun worshipper".
  - "Sun exposure in youth".
  - "Prolonged sun exposure" (2).

Patient Pathways

This diagram illustrates the patient pathways from referral.

Patients either attended their G.P. first (84%), were already attending dermatology clinics (7%), or presented from diverse sources, such as private clinics or other hospital clinic (Others, 8%).

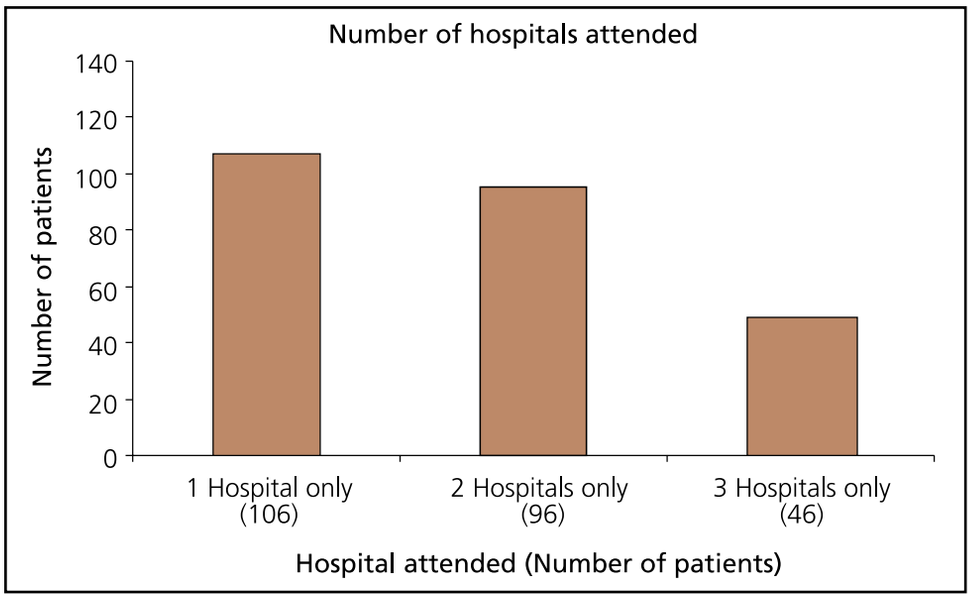
The majority of patients (69%) were referred directly to a dermatology clinic by a General Practitioner. Patients could be referred to an oncologist after these initial pathways. Three percent of patients had initial removal of their lesion at their G.P. clinic, and were then referred to secondary care.



Note: Patient pathways for 'others' are diverse, can include many sources. Some patients did not have the pathway recorded.

- 157 patients (63% of total) were referred to a plastic surgeon, 9% from G.P. directly. Ninety seven patients (41%) had further surgery performed in plastic surgery.
- Eighty nine patients (36% of total) were referred to oncology after these initial pathways.

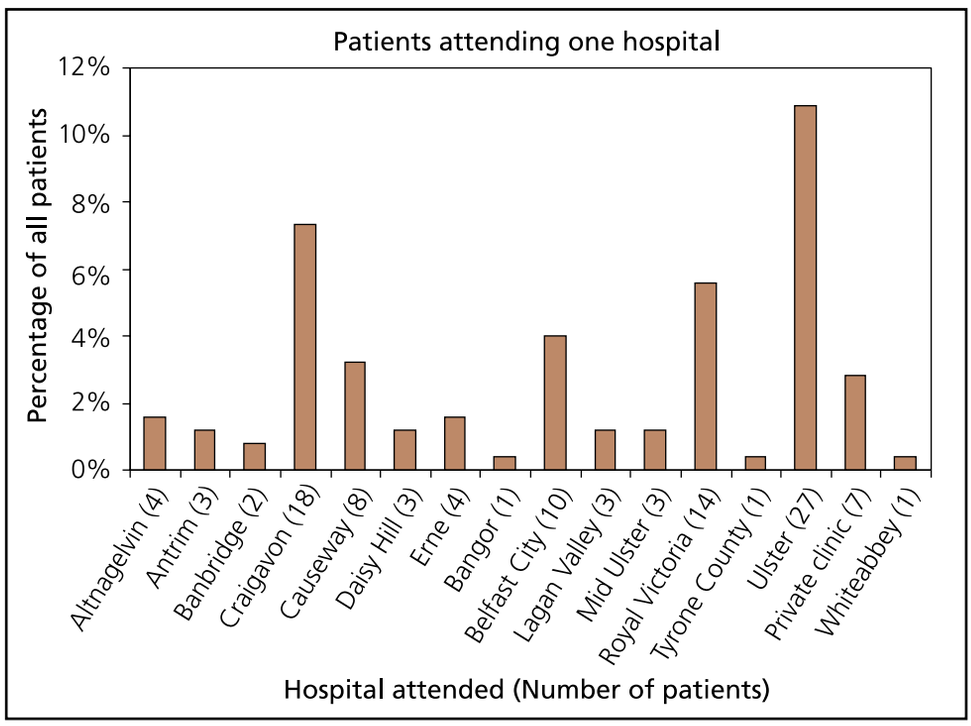
Number of hospitals attended



- Of the 248 patients in the final dataset, 106 attended one hospital for treatment, 96 attended two hospitals and 46 attended three hospitals.

Number of hospitals attended

One hospital



Note: Belvoir Park closed in March 2006, so numbers for the Belfast City Hospital and this are combined for this year. The figures are for the one hospital attended.

- The greatest number of patients who went to one hospital only (n=27, 10.9% of all patients) were referred to the Ulster Hospital, where there is a specialist plastic surgery unit.
- Many patients who attended only one hospital (n=18, 7.3%) were referred to Craigavon Hospital, the Royal Victoria Hospital (n=14, 5.6%) or went to private clinics (n=7, 2.8%).
- Most patients who attended two hospitals and had attended another hospital initially, were referred to the Ulster Hospital's plastic surgery unit as their second hospital (n=36). Numbers attending two hospitals were 96 (38.7% of all patients).
- Some patients attending just two hospitals were referred on to the Cancer Centre at Belfast City/Belvoir Park (n=11, 4.4%).
- Most patients who attended at least three hospitals (17 patients) were referred on to the Ulster Hospital, after having attended two other hospitals.

Total new melanoma patients ever attending each hospital for treatment 2006

Hospital	Total numbers of attendances (% of total patients)	Numbers attending this hospital if only one hospital attended (n=106)
Altnagelvin	12 (4.8%)	4 (3.8%)
Roe Valley	2 (0.8%)	0 (0%)
Erne	8 (3.2%)	4 (3.8%)
Tyrone County	5 (2.0%)	1 (0.9%)
Antrim	17 (6.9%)	3 (2.8%)
Causeway	15 (6.0%)	8 (7.5%)
Mid Ulster	7 (2.8%)	3 (2.8%)
Whiteabbey	6 (2.4%)	1 (0.9%)
Belfast City/Belvoir Park	46 (18.5%)	10 (9.4%)
Lagan Valley	11 (4.4%)	3 (2.8%)
Royal Victoria	37 (14.9%)	14 (13.2%)
Downe	4 (1.6%)	2 (1.9%)
Ulster	138 (55.6%)	27 (25.5%)
Daisy Hill	13 (5.2%)	1 (0.9%)
Craigavon	41 (16.5%)	18 (17.0%)
South Tyrone	3 (1.2%)	0 (0%)
Private Clinics	17 (6.9%)	7 (6.6%)

Note: Patients could have attended more than one hospital, but percentages are of total patients (248).

- 56% of patients attended the Ulster Hospital, at some stage of their treatment.
- 4.8% of patients had some or all of their treatment in the private sector.
- 76.5% of patients were seen at a cancer unit at some stage of their treatment.

Hospital/Clinic of diagnosis/primary surgery and secondary surgery

Hospital	Primary surgery for diagnosis. Number of patients (%)	Location of secondary surgery. Number of patients (%)
Altnagelvin	9 (3.6%)	4 (1.6%)
Roe Valley	2 (0.8%)	0
Erne	7 (2.8%)	4 (1.6%)
Tyrone County	3 (1.2%)	2 (0.8%)
Mid Ulster	5 (2.0%)	1 (0.4%)
Moyle	1 (0.4%)	0
Causeway	10 (4.1%)	9 (3.6%)
Coleraine	1 (0.4%)	1 (0.4%)
Antrim	6 (2.4%)	3 (1.2%)
Whiteabbey	2 (0.8%)	2 (0.8%)
Ards	5 (2.0%)	2 (0.8%)
Downe	4 (1.6%)	2 (0.8%)
Bangor	3 (1.2%)	2 (0.8%)
Belfast City/Belvoir Park	26 (10.6%)	11 (4.4%)
Lagan Valley	5 (2.0%)	3 (1.2%)
Royal Victoria	23 (9.3%)	19 (7.7%)
Ulster	56 (22.6%)	100 (40.3%)
Daisy Hill	3 (1.2%)	0
Armagh Community	1 (0.4%)	0
Craigavon	25 (10.2%)	19 (7.8%)
Banbridge	2 (0.8%)	2 (0.8%)
South Tyrone	5 (2.0%)	1 (0.4%)
G.P. clinics	32 (13.2%)	0 (0%)
Private Clinics	12 (4.8%)	12 (4.8%)
No further surgery		49 (19.8%)
Total	**248 (100 %)**	**248 (100%)**

- Thirteen percent of patients had their lesions removed by G.P.s, who have minor surgery clinics, and who carried out punch biopsies or simple excision of lesions. These were usually diagnostic procedures.
- The Ulster Hospital carried out the highest rate (40%) of the secondary surgery for wider excisions after histology indicated malignant melanoma.
- Others were referred to several different places for secondary surgery, including Craigavon Hospital dermatology clinic (7.8%), the Royal Victoria Hospital (7.7%) or the Cancer Centre at City/Belvoir Hospitals (4.4%).

Source of primary removal of those requiring secondary surgery

Source of primary removal	N (%) requiring secondary surgery
G.P. n=32	32 (100%)
Dermatology clinic n=201	155 (62.5%)
Hospital physicians n=4	3 (75.0%)
Private clinic n=12	9 (75.0%)

Hospital of primary surgery for those not requiring secondary surgery

Primary Surgery Hospital	Those not requiring secondary surgery (% total at that hospital)
Altnagelvin	2/9 (22.2%)
Erne	1/7 (14.3%)
Mid Ulster	2/5 (40.0%)
Causeway	1/10 (10.0%)
Royal Victoria	2/23 (8.7%)
Downe	1/3 (33.3%)
Belfast City	1/26 (3.8%)
Ulster	27/56 (48.2%)
Bangor	2/3 (66.7%)
Craigavon	7/25 (28.0%)
Private Clinic	3/12 (25.0%)

- Of those who had no secondary surgery, some had wide excisions at primary surgery and did not require further operation.
- Most patients who did not require secondary surgery had their primary surgery at the Ulster Hospital (48%). This compares favourably with an average of 20%.

Staging of those not referred for secondary surgery

Stage	Those not referred for secondary surgery N (%)
Stage IA	4 (8.3%)
Stage IB	15 (31.3%)
Stage IIA	2 (4.2%)
Stage IIB	0 (0%)
Stage IIC	4 (8.3%)
Stage IIIA	0 (0%)
Stage IIIB	1 (2.1%)
Stage IV	1 (2.1%)
Stage not recorded	22 (43.8%)

- Almost half (43.8%) of patients who did not have secondary surgery did not have a stage recorded in their notes.

Investigations

Frequency of investigations carried out on patients with malignant melanoma by hospital of primary diagnostic surgery

Hospital of primary diagnostic surgery	CT scans Number of patients (%)	PET scans Number of patients (%)	Ultrasound Number of patients (%)
Erne	4/7 (57.1%)	0/7 (0%)	0/7 (0%)
Altnagelvin	3/9 (33.3%)	4/9 (44.4%)	0/9 (0%)
Roe Valley	1/2 (50.0%)	0/2 (0%)	1/2 (50%)
Tyrone County	1/3 (33.3%)	1/3 (33.3%)	1/3 (33.3%)
Antrim	1/6 (16.7%)	1/6 (16.7%)	0/6 (0%)
Moyle	1/1 (100%)	0/1 (0%)	0/1 (0%)
Causeway	1/10 (10.0%)	2/10 (20.0%)	2/10 (20.0%)
Coleraine	1/1 (100%)	0/1 (0%)	0/1 (0%)
Mid Ulster	0/5 (0%)	0/5 (0%)	1/5 (20.0%)
Whiteabbey	0/2 (0%)	0/2 (0%)	0/2 (0%)
Ards	1/5 (20.0%)	2/5 (40.0%)	0 (0%)
Bangor	0/3 (0%)	0/3 (0%)	0 (0%)
Belfast City/Belvoir Park	3/26 (11.5%)	1/26 (3.8%)	2/8 (25%)
Armagh Community	0/1 (0%)	0/1 (0%)	0/1 (0%)
Downe	0/3 (0%)	1/3 (33.3%)	1/3 (33.3%)
Royal Victoria	4/23 (17.4%)	5/23 (21.7%)	0/23 (0%)
Ulster	22/56 (39.3%)	6/56 (10.7%)	4/56 (7.1%)
Lagan Valley	0/5 (0%)	0/5 (0%)	0/5 (0%)
Craigavon	4/25 (16.0%)	3/25 (12.0%)	4/25 (16.0%)
Banbridge	2/2 (100%)	1/2 (50.0%)	0 (0%)
Daisy Hill	0/4 (0%)	0/4 (0%)	0/4 (0%)
South Tyrone	0/5 (0%)	1/5 (20.0%)	0/5 (0%)
G.P. clinics	5/32 (15.6%)	3/32 (9.4%)	0/32 (0%)
Private Clinics	3/12 (25.0%)	1/12 (8.3%)	1/12 (8.3%)
Total of all patients	**57 (23.0%)**	**32 (12.9%)**	**17 (6.9%)**

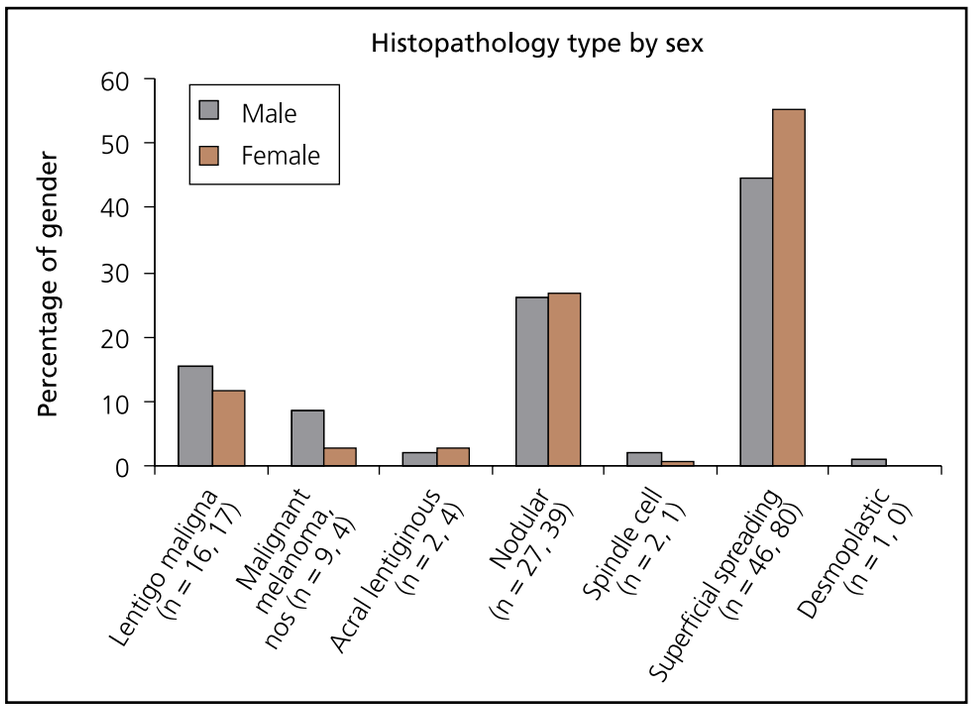
- The percentage of patients having various investigations varied by hospital of primary diagnosis. These investigations may have been ordered subsequent to primary diagnosis.
- Four patients had MRI scans, they had primary surgery at a G.P. clinic, Altnagelvin Hospital, Ulster Hospital or the Ulster Independent Clinic.
- Of the 33 patients who had lesions of stage IIB or greater, 30 (90.9%) had Full Blood Counts carried out, 28 (84.8%) had Liver Function Tests carried out and 27 (81.8%) had both investigations carried out. This means that most patients had these investigations, in accordance with the recommendations given in the guidelines.

Imaging scans by Health Board of residence

Board of residence	Number of patients (% patients residing in each Board)		
	CT scan	PET scan	Ultrasound
EHSSB	22 (20.8%)	10 (9.4%)	7 (6.6%)
NHSSB	13 (19.6%)	10 (17.9%)	3 (5.4%)
SHSSB	12 (24.8%)	6 (10.9%)	6 (10.9%)
WHSSB	10 (36.0%)	6 (21.4%)	1 (3.6%)
Total	**57 (23.0%)**	**32 (12.9%)**	**17 (6.9%)**

- There was no significant difference in the rate of PET/CT/Ultrasound scans, carried out on patients, by area of residence.
- Those who resided in the WHSSB had an apparent higher percentage of CT scans but this figure is not significantly different (p= 0.39) compared with Northern Ireland as a whole.
- Similarly, when all scans were totalled there were no significant differences between all types of scans carried out for each Board, compared with Northern Ireland as a whole.

Histopathology



Note: percentages are of gender.

- All cases had histopathology.
- The most common type (51.2% of total patients) was superficial spreading followed by nodular (26.9%) and lentigo maligna (13.2%).
- The difference between males and females presenting with superficial spreading melanoma was not significant.
- The ages of spindle cell patients were 52, 58 and 87 years.
- Nineteen patients (23.3%) with nodular melanoma were aged less than 50 years, whilst 47 (28.8%) were older than 50 years. The difference is not significant.

Staging

TNM staging

(See Appendix C for further information on staging.)

Stage	Male N (%)	Female N (%)	All patients N (%)	Without secondary surgery N (%)	With secondary surgery N (%)
IA	19 (19.4%)	30 (20.8%)	49 (20.2%)	4 (8.3%)	45 (23.2%)
IB	33 (33.7%)	46 (31.9%)	79 (32.2%)	15 (31.3%)	64 (33.0%)
IIA	8 (8.2%)	7 (4.9%)	15 (6.1%)	2 (4.2%)	13 (6.7%)
IIB	5 (5.1%)	8 (5.6%)	13 (5.3%)	0 (0%)	13 (6.7%)
IIC	5 (5.1%)	6 (4.2%)	11 (4.5%)	1 (2.1%)	10 (3.6%)
IIIA	0 (0%)	3 (2.1%)	3 (1.2%)	0 (0%)	3 (1.5%)
IIIB	1 (1.0%)	1 (0.7%)	2 (0.8%)	0 (0%)	2 (0.5%)
IV	1 (1.0%)	3 (2.1%)	4 (1.6%)	1 (0%)	3 (1.5%)
Insufficient data	31 (30.1%)	41 (28.3%)	72 (29.0%)	26 (53.1%)	46 (23.1%)
Total	**103 (100%)**	**145 (100%)**	**248 (100%)**	**49 (100%)**	**199 (100%)**

- A total of 176 (71%) patients had sufficient information recorded for staging by the Registry staff who examined the notes.
- The most common stage at presentation was stage 1B malignancy (32.2%). Overall, 68.3% of patients had stages I – II, whereas 3.6% had stages III and IV recorded.
- There was no difference in stage by gender.

Patients with insufficient data for staging

Area of residence	Number of patients (% unstaged of total patients in each area)
NHSSB	16 (27.9%)
EHSSB	24 (23.8%)
SHSSB	22 (39.2%)
WHSSB	10 (31.6%)
Northern Ireland	72 (29.0%)

- Overall 29.0% had insufficient information in the notes to allow staging to be recorded by the Registry staff. The figures for each Health Board were similar in this respect.

Those patients with tumour staging by hospital/clinic of first (diagnostic) surgery

Hospital/clinic	N (%) staged from this hospital/clinic
Altnagelvin	5 (62.5%)
Roe Valley	2 (100.0%)
Erne	5 (71.4%)
Tyrone County	3 (100.0%)
Causeway	9 (90.0%)
Mid Ulster	4 (80.0%)
Whiteabbey	2 (100.0%)
Antrim	4 (66.7%)
Ards	3 (60.0%)
Lagan Valley	5 (100.0%)
Ulster	45 (83.3%)
City/Belvoir	18 (69.2%)
Downe	2 (66.7%)
Royal Victoria	19 (86.4%)
Daisy Hill	1 (33.3%)
Craigavon	17 (68.0%)
South Tyrone	2 (40.0%)
Armagh Community	1 (100.0%)
G.P. clinics	23 (71.9%)
Private Clinics	6 (66.7%)

Note: Note: Staging here means complete Breslow depth and Clark level, along with TNM classification (see Appendix C).

- Of these hospitals/clinics, with total number patients of 10 or over, Craigavon had 68.0% of patients staged, Causeway had 90.0%, the Royal Victoria had 86.4%, the Ulster had 83.3%, the City / Belvoir had 69.2% and G.P. clinics had 71.9% staged.

Symptoms at presentation by recorded TNM stage

Symptom	TNM stage								
	IA	IB	IIA	IIB	IIC	IIIA	IIIB	IV	NR
Change in shape	10	15	3		1	1			4
Change in colour	23	24	7	5	2	2	2		23
Increasing size	27	42	10	10	8	2	2	2	32
Bleeding	2	8	4	7	7		1	3	12
Nodule	1	14	8	10	7	2	1	3	14
Ulceration	1	4	2	4	7	2	1	2	5
Itching	9	12	2	1	2				13
Pain	1	1		2	3	1			1
Lump in groin, neck or armpits	1		2			1	1		1
No recorded symptoms	1	1							

Note: NR is not recorded. Patients may be recorded more than once.

- Stage IV patients presented with increasing size, bleeding, nodule or ulceration. These symptoms were however, also recorded commonly for earlier stage disease.

Diagnostic scans by TNM stage

Scan	TNM stage									
	IA	IB	IIA	IIB	IIC	IIIA	IIIB	IV	NR	Total
CT scan	3	21	7	3	7	2	2	4	8	57
PET scan		3	5	7	4	2	1	1	9	32
Ultrasound	1	3	2	4	1	2		1	3	17

Note: NR is not recorded.

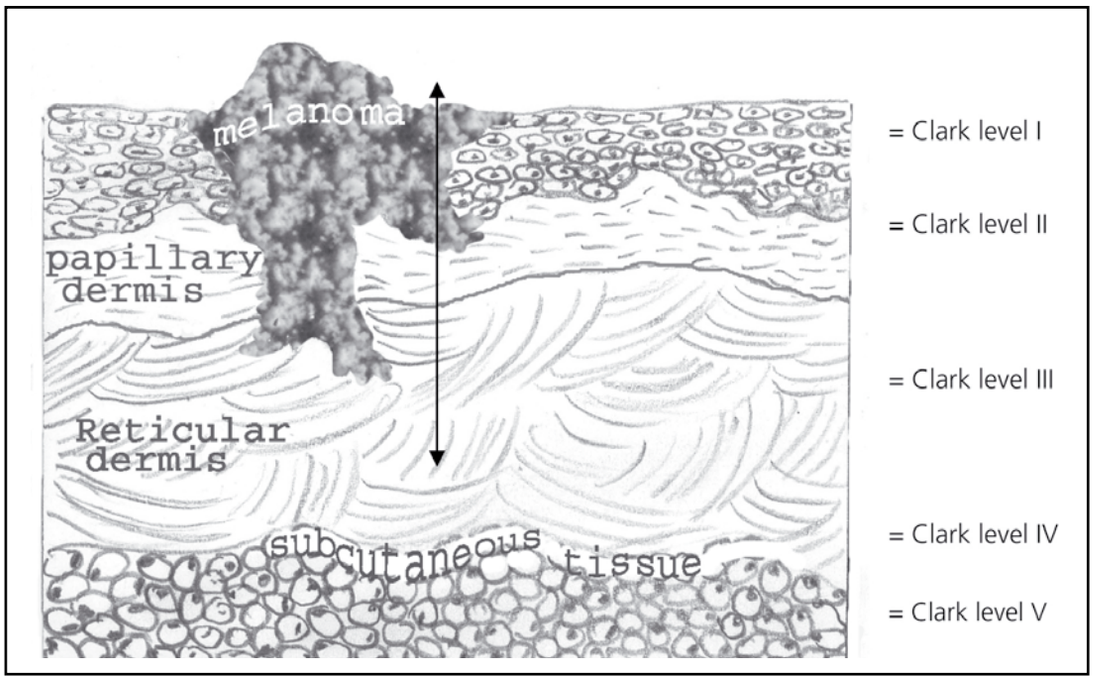
- Despite having scans, stage remained unrecorded in some patients.

There are five Clark levels of invasion in melanoma[18], defined as:

- Level I: Melanomas confined to the outermost layer of the skin, the epidermis. Also called "melanoma in-situ."
- Level II: Penetration by melanomas into the second layer of the skin, the dermis.
- Levels III – IV: Melanomas invade deeper through the dermis, but are still contained completely within the skin.
- Level V: Penetration of melanoma into the fat of the skin beneath the dermis, penetration into the third layer of the skin, the subcutis.

Staging of melanoma: Example pT1a melanoma

(Breslow thickness 0.9 mm, invasion to Clark level III).



Clark level of lesion

Clark level	Male		Female		All patients	
II	7	(6.8%)	25	(17.4%)	32	(12.9%)
III	22	(21.4%)	28	(19.3%)	50	(20.2%)
IV	66	(64.1%)	79	(54.9%)	145	(58.5%)
V	4	(3.9%)	12	(8.3%)	16	(6.6%)
Not recorded	4	(3.9%)	1	(0.7%)	5	(2.0%)
Total	**103**	**(100%)**	**145**	**(100%)**	**248**	**(100%)**

- Clark level IV was the most commonly recorded.

Breslow depth of lesion

Breslow depth (mm)	Male		Female		All patients	
Less than 0.75	47	(45.6%)	62	(42.7%)	109	(44.0%)
0.75 – 1.50	19	(18.4%)	36	(24.8%)	55	(22.2%)
1.51 – 3.00	15	(14.6%)	26	(17.9%)	41	(16.5%)
3.01 or greater	21	(20.4%)	20	(13.8%)	41	(16.5%)
Not recorded	1	(1.0%)	1	(0.7%)	2	(0.8%)
Total	**103**	**(100%)**	**145**	**(100%)**	**248**	**(100%)**

- Breslow depth less than 0.75 mm was the most commonly recorded.
- There was no variation in Breslow depth/Clark level by gender.
- Lesions on the torso were the same average Breslow depth as those elsewhere, with the same average depths of 1.84 mm (range 0.2 mm, 6.5 mm) compared with 1.84 mm (range 0.03 mm, 9.6 mm) on other sites.
- When the deprivation levels were categorised into two groups, 1 – 3 and 4 – 5, there was no detectable variation in Breslow depth or Clark level with deprivation.

Clark level of lesion and Breslow depth by broad age category

Clark level	n (%) patients with age less than or equal to 50 years		n (%) patients with age greater than 50 years	
II	11	(12.9%)	21	(12.9%)
III	25	(29.4%)	25	(15.3%)
IV	47	(55.3%)	98	(60.1%)
V	0	(0%)	16	(9.8%)
NR	2	(2.4%)	3	(1.8%)
Total	**85**	**(100%)**	**163**	**(100%)**

Note: NR is not recorded.

Breslow depth (mm)	n (%) patients with age less than or equal to 50 years		n (%) patients with age greater than 50 years	
less than 0.75	32	(37.6%)	77	(47.2%)
0.75 – 1.50	27	(31.8%)	28	(17.2%)
1.51 – 3.00	14	(16.4%)	27	(16.6%)
3.01+	10	(11.8%)	31	(19.0%)
NR	2	(2.4%)	0	(0%)
Total	**85**	**(100%)**	**163**	**(100%)**

Note: NR is not recorded.

- All patients with the deeper level V Clark lesions were over 50 years.

Involvement of pathologist in TNM staging, Breslow depth and Clark staging, where these have been recorded

	Regional pathologist involved N (%)	Regional pathologist not involved N (%)	Involvement of regional pathologist not recorded N (%)
TNM stage recorded	93 (52.0%)	61 (34.1%)	25 (14.0%)
Breslow depth recorded	125 (50.4%)	79 (32.1%)	33 (13.4%)
Clark level recorded	124 (51.0%)	77 (31.7%)	32 (13.2%)

- In cases where the regional pathologist was involved, TNM and Breslow depth were more likely to be recorded.

Hospital/clinic	Number of patients with lateral margins free (%)	Number of patients with deep margins free (%)	Number of patients with regional pathologist involved (%)
Altnagelvin	7/9 (77.8%)	7 (77.8%)	0 (0%)
Roe Valley	2/2 (100%)	2 (100%)	1 (50.0%)
Erne	6/7 (85.7%)	6 (85.7%)	2 (33.3%)
Tyrone County	2/3 (66.7%)	2 (66.7%)	1 (33.3%)
Mid Ulster	4/5 (80.0%)	4 (80.0%)	1 (20.0%)
Moyle	1/1 (100%)	1 (100%)	1 (100%)
Causeway	10/10 (100%)	8 (80.0%)	2 (20.0%)
Coleraine	1/1 (100%)	1 (100%)	0 (0%)
Antrim	4/6 (66.7%)	3 (50.0%)	3 (50.0%)
Whiteabbey	2/2 (100%)	1 (50.0%)	1 (50.0%)
Ards	5/5 (100%)	5 (100%)	4 (80.0%)
Downe	3/3 (100%)	2 (66.7%)	0 (0%)
Bangor	3/3 (100%)	3 (100%)	2 (66.7%)
Belfast City/Belvoir Park	24/26 (92.3%)	25 (96.2%)	11 (42.3%)
Lagan Valley	5/5 (100%)	5 (100%)	3 (60.0%)
Royal Victoria	17/23 (73.9%)	21 (91.3%)	19 (82.6%)
Ulster	51/56 (91.1%)	51 (91.1%)	46 (82.1%)
Daisy Hill	4/4 (100%)	4 (100%)	3 (75.0%)
Armagh Community	1/1 (100%)	1 (100%)	0 (0%)
Craigavon	21/25 (84.0%)	19 (76.0%)	6 (24.0%)
Banbridge	2/2 (100%)	2 (100%)	0 (0%)
South Tyrone	5/5 (100%)	5 (100%)	2 (40.0%)
G.P. clinics	20/32 (62.5%)	22 (68.8%)	13 (40.6%)
Private Clinics	9/12 (75.0%)	10 (83.3%)	5 (41.7%)
Total (n=248)	**209 (84.3%)**	**210 (84.7%)**	**126 (50.8%)**

Note: other patients either did not have their margins free or this was not recorded in the notes.

- The regional pathologist was involved in assessing about half of the lesions.
- Most patients had their lateral margins and deep margins tumour free at primary surgery (84.3% and 84.7% respectively).

Patients with margins recorded as being not free at primary surgery plus involvement of regional pathologist

Hospital/clinic	Number of patients with lateral margins not free (%)	Number of patients with deep margins not free (%)	Number of affected lesions with regional pathologist involved (%)
Roe Valley	1/2 (50%)	0 (0%)	0 (0%)
Erne	1/7 (14.3%)	1 (14.3%)	1 (50%)
Tyrone County	1/3 (33.3%)	1 (33.3%)	1 (50%)
Mid Ulster	0/5 (0%)	1 (0%)	0 (0%)
Antrim	1/6 (16.7%)	2 (33.3%)	1 (33.3%)
Belfast City/Belvoir Park	2/26 (7.7%)	1 (3.8%)	0 (0%)
Royal Victoria	2/23 (8.7%)	0 (0%)	2 (100%)
Ulster	2/56 (3.6%)	2 (3.6%)	2 (50%)
Craigavon	1/25 (4.0%)	0 (0%)	1 (100%)
G.P. clinics	8/32 (25.0%)	3 (9.4%)	4 (36.4%)
Private Clinics	1/12 (8.3%)	0 (0%)	0 (0%)
Total (n=248)	**20 (8.1%)**	**11 (4.4%)**	**12 (38.7%)**

Note: some patients did not have a record as to whether their margins were free or not.

- The lateral margins were not free at surgery for 8.1% of patients. The deep margins were not free at surgery for 4.4% of patients. These patients usually have wider excision later.
- The regional pathologist was involved in assessing 12 (38.7%) of the 31 lesions where either the lateral or deep margins were not free at surgery. Seven patients had both types of margins not free at surgery, five of which were assessed by the regional pathologist.
- Eight patients out of a total of 20, whose lateral margins were not free, had primary surgery at G.P. clinics.
- Similarly, for those 11 patients whose deep margins were not clear, primary surgery was performed on 3 patients at G.P. surgeries.
- Of the seven patients who had both margins not clear, 3 were treated at G.P. clinics.

Numbers of surgeons carrying out secondary operations

Number of procedures per year	Number of surgeons	N (% of patients)
20+	1	28 (14.1%)
15-20	3	52 (21.0%)
10-14	1	10 (4.0%)
5-9	5	35 (17.6%)
2-4	18	52 (26.1%)
Single	18	18 (9.0%)
Not recorded	-	4 (1.6%)
Total	**46**	**199**

Note: Surgeons = Consultant in charge and includes dermatologists, general surgeons and plastic surgeons.

- Including dermatology, general surgery and plastic surgery there were 59 listed operators for primary diagnostic surgery on 248 patients.
- There were 46 operators recorded for secondary surgery on 199 patients with 18 single operators and 36 operators performing procedures on less than 5 patients in that year.

Multidisciplinary Team Meetings

There was no formal melanoma Multidisciplinary Team (MDT) meetings in place at the time of this audit. Discussion at MDT was, however, recorded for 7 patients. For the hospital of presentation, these were: 3 at Craigavon Area Hospital, 1 at Altnagelvin Hospital, 1 at Causeway Hospital, 1 at Ards Hospital, and 1 at Lagan Valley Hospital. Secondary surgery on these patients were recorded as 2 being referred to the Ulster Hospital, 1 to the Royal Victoria Hospital, 1 to Altnagelvin, 1 to Causeway hospital and 1 to a Private Clinic. One patient did not have secondary surgery. MDTs were recorded for 4 patients who had plastic surgery.

The site of lesion was not a factor in whether the patients were discussed at an MDT meeting: two patients had lesions in each site category of torso, upper limb or face, whilst one patient had a lesion on the lower limb.

Procedures

Those referred to a plastic surgeon by hospital of 1st (diagnostic) surgery

Hospital/clinic of primary diagnostic surgery	N (% referred to plastic surgery by hospital)
Altnagelvin	4 (50.0%)
Roe Valley	2 (100.0%)
Erne	2 (28.6%)
Tyrone County	1 (33.3%)
Mid Ulster	2 (40.0%)
Causeway	3 (30.0%)
Antrim	3 (50.0%)
Whiteabbey	1 (50.0%)
Ulster	56 (100.0%)
Downe	1 (33.3%)
Lagan Valley	2 (40.0%)
Belfast City/Belvoir	20 (76.9%)
Banbridge	1 (50%)
Ards	5 (100.0%)
Royal Victoria	14 (52.2%)
South Tyrone	4 (80.0%)
Craigavon	6 (24.0%)
Daisy Hill	2 (66.7%)
G.P. clinics	25 (71.9%)
Private clinics	3 (27.3%)
Total	**157**

- A total of 157 patients (62.3%) were referred to a plastic surgeon and 97 (63%) of these had further surgery.
- Final stage was recorded for 115 (74%) of these referred patients (not shown).
- The average wait to be seen by a plastic surgeon from referral, for those 144 patients who had both dates recorded, was 24 days (median time 11 days). The minimum time was 0 days when a patient had plastic surgery the same day as referral and the maximum was 495 days. This patient was lost in the system because of address change. Of those 4 patients who waited for plastic surgery of more than 100 days, referral was to the Ulster Hospital. These patients were either non-attendees at clinics or had changed address.
- Delays in treatment by plastic surgery were also noted due to waits for complete staging, which would require scans, etc.

Tumour staging of 157 patients referred to a plastic surgeon, compared with secondary surgery

Stage of tumour	No secondary surgery N (%)	Any secondary surgery N (%)	Total tumours	Number (%) of patients referred to plastic surgery
IA	4 (8.2%)	45 (45.9%)	49 (100%)	23 (46.9%)
IB	15 (19.0%)	64 (81.0%)	79 "	53 (67.0%)
IIA	2 (13.3%)	13 (86.7%)	15 "	12 (80.0%)
IIB	0 (0%)	13 (100%)	13 "	12 (92.3%)
IIC	4 (36.4%)	7 (63.6%)	11 "	9 (81.8%)
IIIA	0 (0%)	3 (100%)	3 "	3 (100%)
IIIB	1 (50%)	1 (33.3%)	2 "	1 (50.0%)
IV	1 (25.0%)	3 (75.0%)	4 "	3 (75.0%)
Not Recorded	22 (30.6%)	50 (69.4%)	72 "	41 (56.9%)
Total	**49 (19.8%)**	**199 (80.2%)**	**248 (100%)**	**157 (63.3%)**

- There were no differences in the staging level between those referred to a plastic surgeon compared with those who had secondary surgery.

Clark level of those referred to a plastic surgeon

Clark level (Total patients with this level)	Number of patients referred to plastic surgeon (%)	Number of patients not referred to a plastic surgeon (%)	Number (%) of patients with no record of being referred to a plastic surgeon
II	17 (53.1%)	12 (37.5%)	3 (9.4%)
III	28 (56.0%)	14 (28.0%)	8 (16.0%)
IV	94 (64.8%)	32 (22.0%)	19 (13.1%)
V	14 (87.5%)	1 (6.3%)	1 (6.3%)
Not Recorded	4 80.0%)	0 (0%)	1 (20.0%)
Total	**157**	**59**	**32**

- A higher percentage of those with Clark level IV and V were referred to a plastic surgeon than levels II and III.
- Four patients who were referred to a plastic surgeon had no record of Clark level in their notes.

Breslow depth recorded for those referred to a plastic surgeon

Breslow depth (mm)	Number (%) of patients referred to a plastic surgeon	Number (%) of patients not referred to a plastic surgeon	Number (%) of patients with no record of being referred to a plastic surgeon
less than 0.75	67 (61.5%)	26 (23.9%)	16 (14.7%)
0.75 – 1.50	35 (63.6%)	15 (27.3%)	5 (9.1%)
1.51 – 3.00	22 (53.7%)	11 (26.8%)	8 (19.5%)
3.01+	32 (78.0%)	6 (14.6%)	3 (7.3%)
Not recorded	1 (50.0%)	1 (50.0%)	0 (0%)
Total	157 (63.3%)	59 (23.0%)	32 (12.9%)
Mean depth	2.20 mm	1.26 mm	0.97 mm
Min depth	0.03 mm	0.17 mm	0.25 mm
Max depth	15.60 mm	7.00 mm	5.00 mm

Note: These Breslow depth subsets allow comparison of our data with standard American Joint Committee on Cancer (AJCC) categories and with classification schemes used in other publications and institutions. The depth relates to the thickness of the tumour penetrating into the skin and can be related to the prognosis of the patient.

- Only one patient who was referred to a plastic surgeon did not have their Breslow depth recorded.
- Those with Breslow depth greater than 3 mm were more likely to be referred to a plastic surgeon (78.0% of patients compared with 14.6% who were not referred).
- The mean depth of lesion of those sent to a plastic surgeon (2.20 mm) was greater than that of those patients not referred to a plastic surgeon (1.26 mm). Those with no record of referral to a plastic surgeon had mean depth of 0.97 mm.
- The minimum depth of lesion was 0.03 mm of those referred to a plastic surgeon compared with 0.17 mm for those not referred. Those with no record of referral had a minimum depth of 0.25 mm.
- The maximum depth of lesion was greater for those referred to a plastic surgeon (15.60 mm) compared with those who were not referred to a surgeon (7.00 mm). Those with no record of referral had a maximum depth of 5.0 mm
- In general, those with deeper lesions were referred to a plastic surgeon, because they required more radical or wider surgery.

Referral to plastic surgeon by site of lesion

Site	Number referred (%)	Not referred	Not recorded
C43.1 (Eyelid)	1 (50.0%)	1 (50.0%)	0 (0%)
C43.2 (Ear and aural canal)	7 (87.5%%)	0 (0%)	1 (12.5%)
C43.3 (Face)	24 (70.6%)	6 (17.6%)	4 (11.8%)
C43.4 (Scalp and neck)	5 (62.5%)	1 (12.5%)	2 (25.0%)
C43.5 ((Main torso)	33 (56.9%)	19 (32.8%)	6 (10.3%)
C43.6 (Upper limb, shoulder)	31 (50.0%)	20 (32.3%)	11 (16.1%)
C43.7 (lower Limb, hip)	56 (74.6%)	12 (16.0%)	8 (10.7%)
ALL SITES	**157 (63.3%)**	**59 (24.4%)**	**32 (12.9%)**

- A higher percentage of patients were referred to a plastic surgeon if they had a lesion on their head (average of 67.7%) or lower limb (74.6%) compared with those with lesions on their main torso or upper limb (average 53.1%). This is significantly different (p=0.02).

Referral to Oncology

Tumour staging of patients who were referred to an oncologist

TNM stage of tumour	Total tumours	Number of patients referred to an oncologist
IA	49	2 (4.1%)
IB	79	28 (35.4%)
IIA	15	13 (86.7%)
IIB	13	9 (69.2%)
IIC	11	9 (81.8%)
IIIA	3	3 (100%)
IIIB	2	2 (100%)
IV	4	3 (75.0%)
NR	72	20 (27.8%)
Total	**248**	**89 (35.9%)**

- Eighty nine patients were referred to an oncologist.
- All patients of stages III and IV were referred to an oncologist, apart from one patient who declined.
- Most patients with stage II were also referred to an oncologist
- Stage I patients tended not to be referred.
- Twenty patients referred to an oncologist did not have the stage recorded (27.8%).

Clark level of patients referred to an oncologist

Clark level	Number of patients (%) referred to an oncologist	Number of patients (%) not referred to an oncologist	Number of patients (%) with no record of being referred to an oncologist
II	1 (3.1%)	17 (53.1%)	14 (43.8%)
III	15 (30.0%)	23 (46.0%)	12 (24.0%)
IV	63 (43.4%)	51 (35.2%)	31 (21.4%)
V	9 (56.3%)	5 (31.3%)	2 (12.5%)
NR	1 (20.0%)	2 (40.0%)	2 (40.0%)
Total	**89**	**98**	**61**

- Referral to oncology was more likely for patients with Clark level IV and V than other levels.

Breslow depth of patients referred to an oncologist

Breslow depth (mm)	Number of patients (%) referred to an oncologist	Number of patients (%) not referred to an oncologist	Number of patients (%) with no record of being referred to an oncologist
less than 0.75	32 (29.4%)	41 (37.6%)	36 (33.0%)
0.75 – 1.50	26 (50.0%)	23 (41.8%)	6 (10.9%)
1.51 – 3.00	13 (31.7%)	18 (43.9%)	10 (24.4%)
3.01+	17 (41.5%)	15 (36.6%)	9 (22.0%)
NR	1 (50.0%)	1 (50.0%)	0 (0%)
Total	**89**	**98**	**61**
Mean depth	2.98 mm	1.25 mm	1.11 mm
Min depth	0.20 mm	0.03 mm	0.17 mm
Max depth	15.60 mm	8.50 mm	13.0 mm

Note: One patient referred to an oncologist did not have the Breslow depth recorded because of sample difficulties.

- There was little variation in referral to oncology by Breslow depth.

Treatment

Surgery, radiotherapy or chemotherapy actually carried out (not total referrals)

Treatment	N of procedures (% of patients)
Secondary surgery and plastic surgery	216 (80.2%)
Chemotherapy	8 (3.2%)
Radiotherapy	5 (2.0%)

- Follow up surgery was recorded for 80% of patients. Ninety seven (39.1%) of all patients had plastic surgery. All patients (100%) had primary surgery.
- For surgery, 32% were recorded as being curative while 1% were recorded as being palliative, with 67% not recorded.
- Five patients received Radiotherapy (2%), and these patients had stage level IB, IIC, IV while two did not have stage recorded. The patient with initial recorded stage IB returned with metastasis at 14 months after diagnosis.
- Eight patients received chemotherapy, and these patients had stage levels IB, IIB, IIC (2 patients), and IV (2 patients) while 2 patients did not have stage recorded.

Timelines

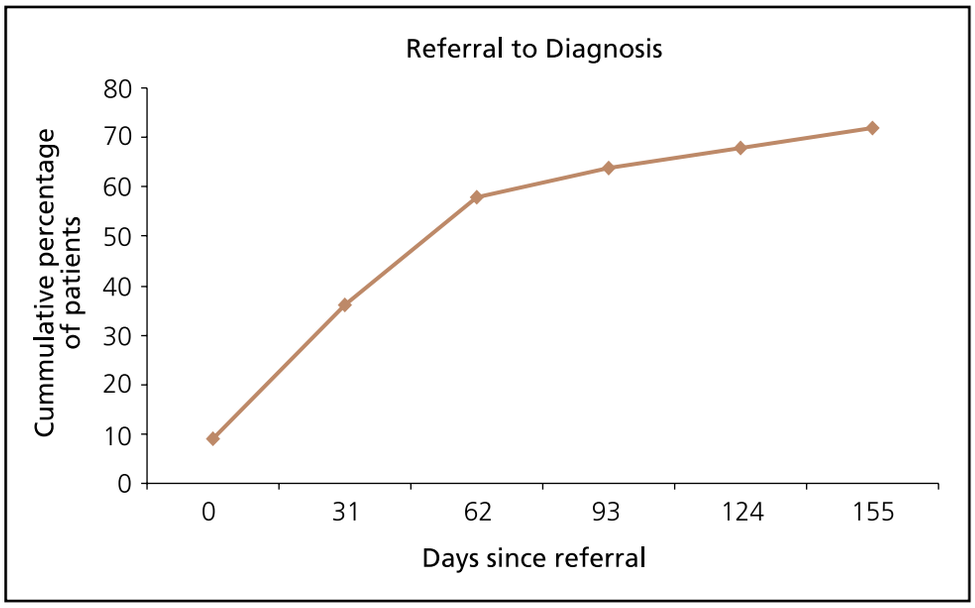
Timelines were examined in line with the current standards regarding waiting times. The two targets examined are that of the times between diagnosis and the date of the first treatment (secondary surgery) (31 days) and the date of referral to 1st treatment (62 days). Additionally, the time between referral and diagnosis was also examined.

Summary timelines

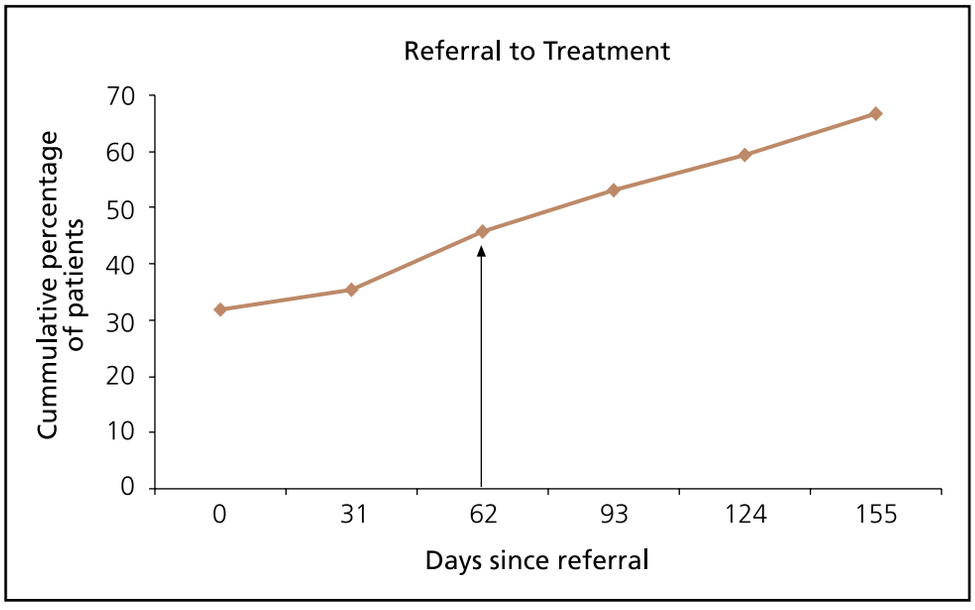
Time	Referral to diagnosis. Number (%) of patients	Referral to 1st treatment Number (%) of patients	Diagnosis to 1st treatment Number (%) of patients
Diagnosis made by G.P. (zero time)	22 (8.9%)	78 (39.2%)	90 (45.2%)
1 day – 31 days	65 (26.2%)	9 (4.5%)	16 (8.0%)
32 days – 62 days	53 (21.4%)	25 (12.6%)	15 (7.5%)
63 days – 93 days	35 (14.1%)	18 (9.0%)	23 (11.6%)
94 days – 124 days	15 (6.0%)	15 (7.5%)	17 (8.5%)
125 days – 155 days	15 (6.0%)	16 (8.0%)	14 (7.0%)
More than 155 days	23 (9.3%)	20 (10.1%)	23 (11.6%)
Dates of referral to diagnosis or treatment not recorded	20 (8.1%)	18 (9.0%)	1 (0.5%)
Total	**248 (100%)**	**199 (100%)**	**199 (100%)**

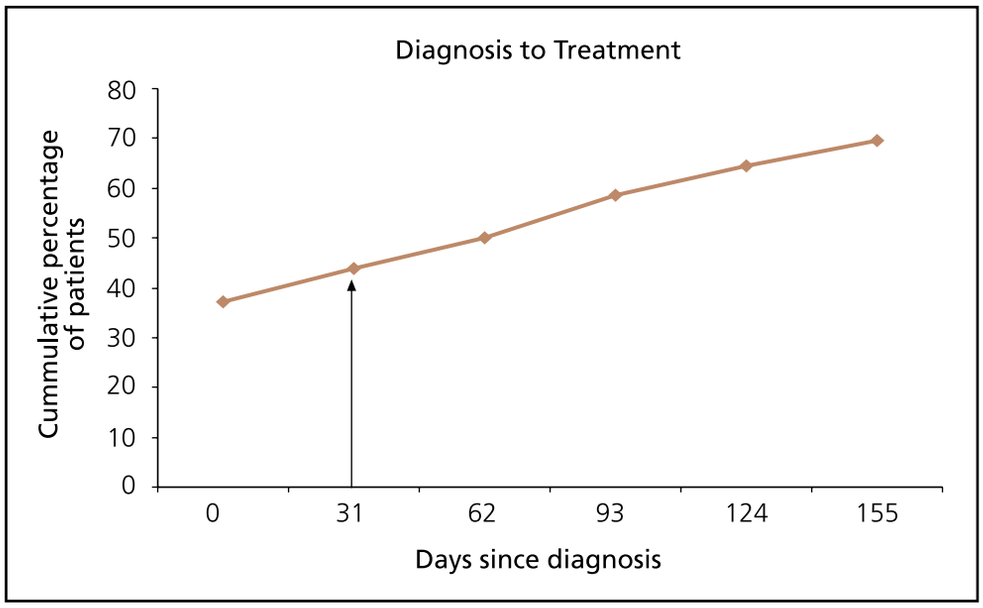
Note: referral to first treatment was decided to be wider excision. The primary excision or biopsy was regarded as being diagnosis rather than treatment.
Note: there may occasionally be clinical reasons for delay in secondary surgery.

- Fifty three percent of patients had their treatment within the 31 day target time from diagnosis to first treatment.
- Fifty six percent of patients had their treatment recorded within the 62 day target time from referral.
- Almost 12% of patients waited more than 155 days for treatment after diagnosis.
- Just over 10% of patients waited over 155 days for treatment following referral.
- Twenty three patients (9.3%) waited more than 155 days for their diagnosis from referral.
- The mean delay between referral and diagnosis was 69 days. (Median 38 days).



Note: Diagnosis was usually taken as first diagnosis incision.





Note: Diagnosis to 1st treatment was generally the time between 1st excision and the wider (or 2nd) excision.

- Some patients did not have both dates for referral and diagnosis/or first treatment recorded.

Information recorded in notes

Information	Number of patients (%)
Diagnosis discussed with patient	216 (87.0%)
Treatment plan discussed with patient	222 (89.5%)
Sun care advice given	100 (40.3%)
Referred to oncology centre	89 (35.9%)
Psychosocial needs considered	27 (10.9%)
Clinical trial discussed with patient	5 (2.0%)
Clinical trial entry recorded in notes	2 (0.8%)
Multidisciplinary team meeting	7 (2.8%)
Management plan recorded	239 (98.4%)
Prognosis recorded	81 (32.7%)
Total patients	**248**

Note: Patients may be recorded more than once.

- Most patients had a record of diagnosis being discussed with them (87.0%) and treatment plan was recorded for 89.5%.
- Sun care advice was recorded as given to 100 (40.3%) of patients.
- Eighty nine (35.9%) were referred to an oncologist.
- Records indicate that twenty seven patients (10.9%) had their psychosocial needs considered.
- Of the clinical trials discussed, three were informed regarding the possibility of the Middleton trial, one about an HDI trial and one DNA vaccine trial (in the USA).
- Two patients were entered into a clinical trial.

Follow up care details

After care	Number of patients
G.P. general practice	225 (93.0%)
Review planned at dermatology, plastic surgery, general surgery or oncology	238 (96.0%)
Planned review not recorded	10 (4.0%)
Total patients	**248**

Note: These figures relate to information recorded anywhere in the patients' notes, including the discharge letters to G.P.s.

- After treatment for malignant melanoma the patients were generally referred back to their G.P. with planned review with a specialist.
- Of those ten who had no follow up review planned, 2 were dead at one year after diagnosis; 1 was discharged by consultant who thought review unnecessary; 4 were private patients; 1 was considered to be too old and frail while one had emigrated and another had defaulted.

Patient Outcomes

- Survival from melanoma in the first year after diagnosis is good (98.8%). Figures for five year survival of this cohort are not currently available.
- Due to the good survival and short time of follow up, no difference in survival by patient age, stage, etc. could be detected.
- Five out of ten of the study patients who died within 465 days of diagnosis, died as a direct result of malignant melanoma, 3 males and 2 females.

  Of the five patients who died of malignant melanoma:
  - Two were recorded as stage IV, one as stage IB, one as stage IIC, whilst one was not recorded.
  - The average Breslow depth was 2.56mm (min 0.3mm, max 6.5mm).
  - Four were recorded as having Clark level IV and one had Clark level III.
  - Four of these patients had radiotherapy treatment and two patients had chemotherapy.
  - Three patients died in the first year after diagnosis.
  - The average age of these was 62 years.

Conclusions

- The number of cases of malignant melanoma is rising particularly in males, pointing to the need to increase efforts to encourage care in the sun and avoidance of sunbeds.
- Fifty one patients (21.1%) had significant symptoms for over a year, indicating the need to further increase awareness among the population.
- The recording of tumour stage is poor (73%) and should be improved.
- Only 7 patients were discussed at a multidisciplinary team meeting (MDT). A Northern Ireland regional melanoma MDT is about to commence and should lead to more standardised treatment.
- In 2006 only 56% of patients were treated within the 62 day referral to treatment target and only 53% of patients were treated within the 31 day diagnosis to treatment target. This, however, was before the waiting list initiative.
- It was difficult to access information for patients treated outside of the NHS.
- The service should actively review the number of operators (46) performing secondary surgery on (199) melanoma patients with the aim of reducing the number of low volume operators (36 less than 5 operations, including 18 single operations). This would ensure an equitable, high quality service for all patients.

SECTION III – Summary

Patients

- Almost sixty percent of patients with malignant melanoma were female and their average age at diagnosis was 4 years younger than males (57 years compared with 61 years).
- Melanoma was more common in groups from affluent areas compared with groups from deprived areas.
- 3.6% of patients were less than 25 years at diagnosis and a third (34%) were under 50 years.
- The level of co-morbidities was low, but a previous naevus was reported in 14% of cases.
- Three patients had a history of melanoma.
- Only 2.8% of patients reported having a family member with melanoma.
- 24% had a significant sun exposure recorded in their notes.

Presentation

- The majority of patients were referred by their G.P. (84%).
- 53% were referred urgently.
- Most patients presented within their Health Board of residence.
- The most common symptoms were an increase in size (54%) and/or a change in colour of their lesion (36%) while 18% had bleeding, 16% had itching and 27% the presence of a nodule.
- Bleeding, ulceration and pain, although not the most common symptoms, tended to be endured by the patient for less time than changes in size, shape or colour.
- Some patients had symptoms for over a year.
- Recording of symptom duration was better for women than men and of those recorded women tended to have symptoms longer than men.
- Melanoma was more common on the head and torso in males and legs in females, reflecting patterns of sun exposure.

Referral Patterns

- GPs referred 4% of patients to general surgery, 69% to dermatology and 9% directly to plastic surgery.
- 157 (63%) patients were then referred to plastic surgery.

Hospital of Treatment

- Of the 248 patients in the final dataset, 106 attended just one hospital for treatment, 96 attended just two hospitals and 46 attended 3 hospitals.
- 56% of patients attended the Ulster Hospital at some stage of their treatment.
- 4.8% of patients had some or all of their treatment in the private sector.
- 76.5% of patients were seen at a cancer unit at some stage of their treatment.

Primary Excision/Biopsy

- 59 operators performed primary surgery on 248 patients.
- 13% of patients had primary surgery in GP clinics, 5% in a private clinic and the remaining 204 patients had their primary surgery in one of 22 hospitals, with over two thirds 68.7% having surgery in a cancer unit, the majority, 22.6%, in the Ulster Hospital.
- Most patients had their lateral margins and deep margins tumour free at primary surgery (84.3% and 84.7% respectively).

- Of those who had their primary surgery at the Ulster Hospital (48%) did not require secondary surgery, compared with the average of 20%.
- The lateral margins were not free for 8.1% of lesions, with deep margins not free for 4.4% of lesions. Of the 7 patients who had both lateral and deep margins not free, 3 were treated at GP clinics and the regional pathologist was involved in assessing 5 of these.

Histology

- The regional pathologist was involved in the assessment of over half the lesions.
- All patients had a morphology diagnosis.
- The types of melanoma were: superficial spreading melanoma (51%); nodular melanoma (27%); while lentigo maligna was recorded for 13% of patients. Other morphologies present were malignant melanoma, not otherwise specified (5%); acral lentiginous (3%); spindle cell (1%); desmoplastic melanoma (0.4%).
- Types of melanoma were similar in males and females.

Investigations

- A total of 57 patients (23%) had CT scans. PET scans were performed on 32 patients (13%). Ultrasound scans were performed on 17 patients (7%), 4 MRI scans were carried out.
- The percentage of patients having scans varied by hospital of primary surgery, but was not significantly different between Health Boards of the patient's residence.
- The use of scans was not related to stage, Breslow depth or Clark level.

Multidisciplinary meetings

- Only 7 patients had a record of discussion at MDM, but there were no formal melanoma Multidisciplinary Team (MDT) meetings in place at the time of this audit.

Staging, Breslow and Clark

- A total of 176 patients (71%) had sufficient information for full staging of their tumours and most of these (n=128, 53% of all patients) were stage IA and IB.
- Where the regional pathologist was involved, almost all cases had Breslow depth and Clark level recorded and 74% had TNM stage recorded. This was significantly higher than where the regional pathologist was not involved.
- There was no variation in staging by Health Board of residence.
- Stages I and II were recorded for 67% of patients and 4% had stages III and IV. The remainder (29%) did not have stage recorded.
- Almost half (43.8%) of patients who did not have secondary surgery did not have a stage recorded in their notes.
- Twenty patients referred to an oncologist did not have the stage recorded (27.8%).
- There was no difference in stage, Breslow depth or Clark level, at presentation by gender.
- Forty four percent of patients had lesions with Breslow depth of less than 0.75 mm; 22% had depths of 0.75 mm – 1.50 mm; 17% had depths of 1.51 mm – 3.00 mm and 17% had depths of greater than 3.01 mm.
- Clark Level IV was most commonly recorded (59%) as was Breslow less than 0.75 mm (44%).
- Despite having scans, stage remained unrecorded in some patients.
- There was no detectable variation in Breslow depth or Clark level with deprivation.
- Stage IV patients presented with increasing size, bleeding, nodule or ulceration. These symptoms were however also recorded commonly for earlier stage disease.
- All patients with the deeper Clark Level V lesions were over 50 years of age.

Surgery

- After the initial surgery of diagnosis, secondary surgery was recorded for 199 (80.2%) of the patients. This meant that 49 patients (19.8%) had no further surgery beyond the initial biopsy/excision.
- Including dermatology, general surgery and plastic surgery there were 59 listed operators for primary diagnostic surgery on 248 patients.
- There were 46 operators recorded for secondary surgery on 199 patients with 18 single operators and 36 operators performing procedures on less than 5 patients in that year.
- Plastic surgery was performed on 97 patients out of 157 referred to a plastic surgeon.
- A higher percentage of patients were referred to a plastic surgeon if they had a lesion on their head (average of 67.7%) or lower limb (74.6%) compared with those with lesions on their main torso or upper limb (average 53.1%). This is significantly different (p=0.02).
- A higher percentage of those with Clark Level IV and V were referred to a plastic surgeon than Levels II and/or III.
- In general, those with deeper lesions were referred to plastic surgery. Those with Breslow depth greater than 3mm were more likely to attend plastic surgery (78.0% vs 14.6% not referred).

Other treatment

- Eighty nine patients (36%) were referred to an oncologist.
- Chemotherapy was given to 3.3% of patients.
- Radiotherapy was given to 2.0% of patients.
- All patients of stages III and IV were referred to an oncologist, apart from one patient who declined.
- Most patients with stage II were also referred to an oncologist.
- Stage I patients tended not to be referred to oncology.
- Referral to oncology was more likely for patients with Clark Level IV and V than other levels.
- There was little variation in referral to oncology by Breslow depth.

Timelines

- The 62 day referral to treatment target was met for 56% of patients.
- The 31 day diagnosis to treatment target was met for 53% of patients.
- Nine percent of patients waited more than 155 days for treatment after diagnosis.

Information Recorded in the notes

- Most patients (87.0%) had a record of diagnosis discussion while (89.5%) had a treatment plan recorded.
- Sun care advice was recorded as given to 100 patients (40.3% of total).
- Records indicate that twenty seven patients (10.9%) had their psychosocial needs considered.
- Of the clinical trials discussed, three were informed regarding the possibility of the Middleton trial, one about an HDI trial and one DNA vaccine trial (in the USA).
- Two patients were entered into a clinical trial.

Onward referral

- Most patients (93%) were referred back to their G.P. and (96%) had a review with a specialist planned to assess the patient in the future. Four percent of patients had no review recorded.

Outcomes

- Survival from melanoma is good (98.4% in the first year).
- Ten of the cohort of 248 patients studied had died at 465 days after diagnosis but only five of these as a direct result of their melanoma.

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Appendices

Appendix A – Number of cases per year of malignant melanoma from 1984 to 2005

(EASR is the European Age Standardised Rate per 100,000 population, with upper and lower confidence intervals.)

Males

Year	No of cases	Percentage of Total	Crude Rate/100,000	EASR	EASR Lower	EASR Upper
1984	28	0.7%	3.7	4.4	2.7	6.0
1985	27	0.6%	3.5	4.1	2.5	5.6
1986	35	0.9%	4.6	5.1	3.4	6.7
1987	36	0.9%	4.7	5.3	3.5	7.0
1988	36	0.9%	4.7	5.2	3.5	6.9
1989	37	0.9%	4.8	5.3	3.6	7.0
1990	34	0.8%	4.4	5.2	3.4	7.0
1991	39	0.9%	5.0	5.7	3.9	7.6
1992	62	1.4%	7.8	8.8	6.6	11.0
1993	58	1.4%	7.3	8.3	6.2	10.5
1994	68	1.6%	8.5	9.2	7.0	11.5
1995	68	1.7%	8.5	9.3	7.1	11.6
1996	70	1.7%	8.6	9.5	7.3	11.8
1997	66	1.6%	8.1	8.8	6.6	10.9
1998	61	1.4%	7.5	8.0	6.0	10.0
1999	69	1.6%	8.4	8.7	6.6	10.8
2000	75	1.8%	9.1	9.7	7.5	12.0
2001	88	2.0%	10.7	11.0	8.7	13.3
2002	101	2.2%	12.2	12.5	10.0	14.9
2003	83	1.8%	10.0	10.3	8.1	12.5
2004	107	2.3%	12.8	12.7	10.3	15.1
2005	99	2.1%	11.7	11.7	9.4	14.0

(EASR is the European Age Standardised Rate per 100,000 population, with upper and lower confidence intervals.)

Females

Year	No of cases	Percentage of Total	Crude Rate/100,000	EASR	EASR lower	EASR upper
1984	51	1.2%	6.4	6.3	4.5	8.1
1985	60	1.4%	7.5	7.3	5.4	9.3
1986	76	1.8%	9.4	9.8	7.5	12.0
1987	80	1.8%	9.9	9.6	7.4	11.9
1988	81	1.9%	10.0	10.4	8.0	12.7
1989	65	1.5%	8.0	8.4	6.3	10.6
1990	107	2.4%	13.1	13.0	10.5	15.5
1991	90	2.0%	10.9	11.1	8.7	13.5
1992	93	2.2%	11.2	10.7	8.5	13.0
1993	124	2.9%	14.8	14.0	11.5	16.6
1994	111	2.7%	13.2	12.8	10.3	15.3
1995	101	2.4%	12.0	11.4	9.1	13.8
1996	105	2.4%	12.3	12.0	9.6	14.3
1997	93	2.1%	10.9	10.5	8.3	12.7
1998	116	2.7%	13.5	12.2	9.9	14.5
1999	109	2.5%	12.7	12.1	9.8	14.5
2000	111	2.5%	12.9	12.0	9.7	14.3
2001	129	3.0%	14.9	13.5	11.1	15.9
2002	146	3.2%	16.8	15.7	13.1	18.3
2003	129	2.7%	14.8	13.3	10.9	15.6
2004	140	3.0%	16.0	14.8	12.3	17.3
2005	131	2.8%	14.9	13.4	11.0	15.7

Deaths from malignant melanoma

(EASR is the European Age Standardised Rate per 100,000 population, with upper and lower confidence intervals.)

Male

Year	No of deaths	Percentage of Total	Crude Rate/100,000	EASR	EASR lower	EASR upper
1984	10	0.2%	1.3	1.5	0.6	2.4
1985	14	0.3%	1.8	2.1	1.0	3.2
1986	15	0.4%	2.0	2.2	1.1	3.3
1987	13	0.3%	1.7	1.8	0.8	2.7
1988	8	0.2%	1.0	1.3	0.4	2.1
1989	7	0.2%	0.9	1.0	0.2	1.7
1990	17	0.4%	2.2	2.7	1.4	4.0
1991	14	0.3%	1.8	1.9	0.9	3.0
1992	12	0.3%	1.5	1.7	0.7	2.7
1993	7	0.4%	0.9	1.0	0.2	1.7
1994	14	0.8%	1.7	2.0	0.9	3.1
1995	9	0.5%	1.1	1.2	0.4	2.0
1996	11	0.6%	1.4	1.6	0.7	2.6
1997	12	0.6%	1.5	1.6	0.7	2.5
1998	13	0.7%	1.6	1.7	0.8	2.6
1999	16	0.9%	2.0	2.0	1.0	3.0
2000	13	0.7%	1.6	1.8	0.8	2.7
2001	20	1.0%	2.4	2.5	1.4	3.6
2002	18	0.9%	2.2	2.4	1.3	3.5
2003	23	1.2%	2.8	2.8	1.6	4.0
2004	24	1.2%	2.9	2.9	1.7	4.0
2005	28	1.5%	3.3	3.2	2.0	4.4

(EASR is the European Age Standardised Rate per 100,000 population, with upper and lower confidence intervals.)

Female

Year	No of deaths	Percentage of Total	Crude Rate/100,000	EASR	EASR lower	EASR upper
1984	16	0.4%	2.0	2.1	1.0	3.1
1985	17	0.4%	2.1	2.1	1.1	3.2
1986	16	0.4%	2.0	1.8	0.9	2.7
1987	13	0.3%	1.6	1.3	0.6	2.0
1988	17	0.4%	2.1	2.1	1.0	3.1
1989	14	0.3%	1.7	1.6	0.7	2.4
1990	16	0.4%	2.0	1.8	0.9	2.7
1991	7	0.2%	0.8	0.7	0.2	1.2
1992	9	0.2%	1.1	0.8	0.2	1.4
1993	20	1.1%	2.5	2.6	1.5	3.8
1994	21	1.2%	2.6	3.0	1.7	4.3
1995	16	1.0%	2.0	2.2	1.1	3.3
1996	16	0.9%	2.0	2.1	1.1	3.2
1997	14	0.8%	1.7	1.8	0.8	2.7
1998	17	1.0%	2.1	2.2	1.1	3.2
1999	18	1.0%	2.2	2.4	1.3	3.5
2000	17	0.9%	2.1	2.1	1.1	3.1
2001	15	0.9%	1.8	1.8	0.9	2.8
2002	20	1.1%	2.4	2.5	1.4	3.6
2003	17	0.9%	2.0	2.1	1.1	3.1
2004	13	0.7%	1.6	1.5	0.6	2.3
2005	14	0.8%	1.7	1.6	0.8	2.5

Appendix B – Campbell report: Recommendations regarding Cancer Services in N. Ireland, 1996

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

13 There should be a comprehensive review of palliative care service in Northern Ireland.

14. The Northern Ireland Cancer registry should be adequately resourced.

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

Appendix C – Staging of Melanoma

Accurate staging is essential for the planning of appropriate treatment and for the comparison of the outcomes of such treatment (surgical and non-surgical). It is best achieved by a combination of techniques including physical examination, with careful inspection of the skin and regional lymph nodes. Adjuncts to staging such as CT scanning should be performed when clinically indicated.

Pathological staging adds significant information to this process. It involves histological examination of the surgically resected specimen including evaluation of the total number of regional nodes removed and the number containing metastatic tumour.

The TNM classification of Melanoma (6th Edition) is shown in table 1.

Determining the tumour size (T) factor

The T category is determined primarily by the thickness of the melanoma known as Breslow depth. The level of invasion (Clark Level) is used to subdivide T1 melanomas but not for T2 – T4. Melanoma ulceration (absence of an intact epidermis determined histopathologically) has a negative prognostic impact and is used to subdivide each T category.

Determining the (N) factor

Regional metastases include metastases to regional lymph nodes and also intralymphatic metastases which are either satellites around a primary melanoma or in-transit metastases between the primary melanoma and the regional nodes. When nodes are clinically and pathologically apparent this has a negative prognostic impact and this is used to futher subdivide the N categories.

Determining the (M) factor

Distant metastases are stage by the site or organ involved and also the presence of an elevated serum lactic dehydrogenase (LDH) has a negative prognostic impact and is used to further subdivide the M category.

Table 1: TNM classification of Melanoma

Tumour

Tumour		Classification
	TX	Primary tumour cannot be assessed
	Tis	Melanoma in situ
T1	**T1**	Melanoma ≤ 1.0 mm with or without ulceration
	T1a	Melanoma ≤ 1.0 mm in thickness and Clark level II or II, no ulceration
	T1b	Melanoma ≤ 1.0 mm in thickness and Clark level IV or V, or with ulceration
T2	**T2**	Melanoma 1.01 – 2.0 mm in thickness with or without ulceration
	T2a	Melanoma 1.01 – 2.0 mm in thickness, no ulceration
	T2b	Melanoma 1.01 – 2.0 mm in thickness, with ulceration
T3	**T3**	Melanoma 2.01 – 4.0 mm in thickness with or without ulceration
	T3a	Melanoma 2.01 – 4.0 mm in thickness, no ulceration
	T3b	Melanoma 2.01 – 4.0 mm in thickness, with ulceration
T4	**T4**	Melanoma >4.0 mm in thickness with or without ulceration
	T4a	Melanoma >4.0 mm in thickness, no ulceration
	T4b	Melanoma >4.0 mm in thickness, with ulceration

Nodes

Nodes		Classification
	NX	Regional lymph nodes cannot be assessed
	N0	No regional nodes involved
N1	**N1**	Metastases in 1 lymph node
	N1a	Clinically occult (microscopic metastases only)
	N1b	Clinically apparent (macroscopic metastases)
N2	**N2**	Metastases in 2 to 3 regional nodes or intralymphatic regional metastases
	N2a	Clinically occult (microscopic metastases only)
	N2b	Clinically apparent (macroscopic metastases)
	N2c	Satelite or in-transit metastases without nodal metastases
N3	**N3**	Metastases in 4 or more, or matted metastatic nodes, or intransit metastases or satellite(s) with metastases in regional node(s)

Metastases

Metastases	Classification
MX	Distant metastases cannot be assessed
M0	No distant metastases
M1	Distant metastases
M1a	Metastases to skin, subcutaneous tissues, or distant lymph nodes
M1b	Metastases to lung
M1c	Metastases to all other visceral sites or distant metastases to any site associated with an elevated LDH

In order to facilitate survival analysis the assigned TNM profile is condensed into a stage group category of which there are 9 (stages IA, IB, IIA, IIB, IIC, IIIA, IIIB, IIIC & IV, Table 2).

Table 2: Stage Group Melanoma

Stage	T	N	M
IA	T1a	N0	M0
IB	T1b	N0	M0
	T2a	N0	M0
IIA	T2b	N0	M0
	T3a	N0	M0
IIB	T3b	N0	M0
	T4a	N0	M0
IIC	T4b	N0	M0
IIIA	T1 – 4a	N1a	M0
	T1 – 4a	N2a	M0
IIIB	T1 – 4b	N1a	M0
	T1 – 4b	N2a	M0
	T1 – 4a	N1b	M0
	T1 – 4a	N2b	M0
	T1 – 4a/b	N2c	M0
IIIC	T1 – 4b	N1b	M0
	T1 – 4b	N2b	M0
	Ant T	N3	M0
IV	Any T	Any N	M1

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