



**MID-WESTERN**  
HEALTH BOARD

09 January, 2003

**To:** Chairman & Each Member of  
Mid-Western Health Board

Report No: 3/03  
Item No on Agenda

**For Meeting of the Board to be held on 17<sup>th</sup> January, 2003**

**Proposal for Radiotherapy Services in the Mid-West Region**

Dear Member,

**1. Introduction**

The National Health Strategy, Quality and Fairness is guided by four key principles of equity, people centredness, quality and accountability.

The proposal to provide radiotherapy services in the Mid West region is based on those principles and the public private partnership proposals put forward in the strategy as an alternate means of financing and operating services.

The National Spatial Strategy has designated the Mid West as one of the key areas for future regional development. Limerick-Shannon is the designated "Gateway" with Ennis as a "Hub". A key issue is to "lever additional investment for the region through its critical mass, strategic location, capacity for innovation and development and connections within the national transport framework".

A comprehensive health services in the region will be one of the key factor in attracting such inward investment.

The Boards Acute Services Strategy aims to make the region as self sufficient as possible in terms of health care services.

**2. Background**

The need for Radiotherapy services in the Mid-Western Health Board (MWHB) region is set out in the Boards submission to the Expert Review Group on Radiotherapy Services in July 2000 (See Appendix 1) and a subsequent oral presentation to the group in February 2002 (See Appendix 2).

The continued hardship imposed on the population of this region in accessing radiotherapy and travelling long distances for services is contrary to the principles in the National Health Strategy. This is the primary motivating factor in the funding drive by the Mid Western Hospitals Development Trust (MWHDT) to develop Radiotherapy services locally, particularly to facilitate public patients.

A unit in the Mid West would also be convenient for patients from some of the midland and south eastern counties.

The Mater Private Hospital (MPH), which has a significant track record in providing a high quality Radiotherapy service in Dublin (See Appendix 3) has agreed to become a partner with MWHB and MWHDT to develop and operate a Radiotherapy service in Limerick to serve the population of the Mid West region.

### 3. Demography

Since 1971 the population of the Mid West region has increase by 25%. Based on current figures the population is set to increase by a further 20% in the next 30 years.

The number of elderly persons is set to double during this period.

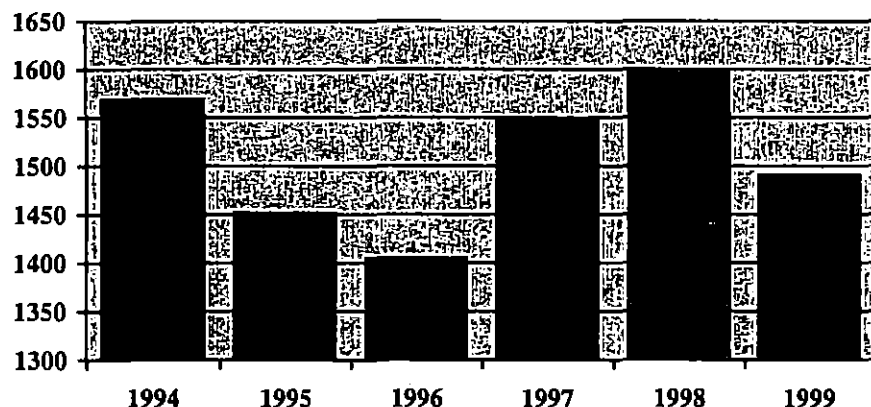
The report on Cancer in Ireland 1994-1998 highlights the fact that Cancer becomes more common with increasing age.

### 4. Demand for Radiotherapy in MWHB

#### Cancer in the Mid-Western Health Board Region

Cancer is a major cause of morbidity and mortality in the Mid-Western Health Board region. It is the second commonest cause of death after circulatory disease. Data for the Mid-Western Health Board Region were obtained from the National Cancer Registry. The incidence of cancer is about 1,500 cases on average per annum as the data between 1994 and 1999 demonstrates.

Figure 1 Incidence of cancer in MWHB, 1994-9



With regard to mortality the most recent figures available from the National Cancer Registry for 2001 showed that there were 657 cancer deaths in the region.

These figures do not take account of the number of repeat visits of people with recurrent disease.

#### Radiotherapy Treatment rates

The Mid West region has an excellent team of surgeons, which will be further enhanced with the forthcoming appointment of a Specialist Breast Surgeon and a first class oncology service.

The report *Cancer in Ireland 1994-1998* states that "with one or two notable exceptions, differences in treatment patterns between the various health boards were not statistically

*significant....The most notable exception is the lower percentage of lung, breast and colorectal patients receiving radiotherapy in the Mid Western Health Board"*

The charts in Appendix 4 illustrate this point.

### **Radiotherapy service requirements**

For those patients diagnosed with cancer, the proportion that receive radiotherapy varies. Some cancer centres treat only 24% of cases in the area while others treat up to 64%. It is generally accepted that 50-60% of patients with cancer are considered to require radiotherapy at some point in their illness.

In the UK a 50% take-up rate implies that 2,250 patients per million head of population receive radiotherapy annually in the UK. When this figure is applied to the Mid-Western Health Board region with an average annual incidence of cancer of 1,500, a total of 765 patients would require radiotherapy at some point in their illness.

A Radiotherapy Unit located in Limerick would be able to treat more than 95% of those patients requiring radiotherapy while the remainder would need to travel for highly specialised treatment elsewhere e.g. patients requiring Stereotactic treatment or Brachytherapy.

### **5. Proposal to Develop Radiotherapy Services at Limerick**

The MWHB, MWHDT and MPH propose to develop the Radiotherapy services at Limerick as follows:

- MWHB to provide an appropriate site adjacent to the existing Oncology Centre at Limerick Regional Hospital. Full planning permission already exists for a Radiotherapy unit and does not contravene the proposed Development Control Plan for the campus.
- MWHDT to provide the capital funding for the building and equipment for the Radiotherapy Centre. MPH to participate in the planning of the building, and the equipping and commissioning of it.
- On completion of the building and commissioning the ownership of the building and equipment transfers to the MWHB who negotiate an exclusive long-term operating agreement with the MPH to provide a Consultant led service to treat all patients who present for treatment based on the health care needs of the individual patients. The operating agreement will include a specific provision to this effect. The fee for the treatment of public patients will be borne by the MWHB.
- The MPH will bear all the operating costs of the Radiotherapy Centre including the recruitment, training and management of all staff required for the service and the replacement of all equipment at the end of the normal lifecycle for the duration of the operating agreement. The operating agreement will also cover the provision of diagnostic and other shared services to support the Radiotherapy Centre
- The MPH will enter into agreement with other health boards where appropriate and private medical insurers to provide Radiotherapy services.

### **Linear Accelerators**

Linear Accelerators deliver 90% of radiotherapy in the UK and 70-80% of Linear Accelerators capacity is devoted to curative treatment and the remainder to palliative radiation. Linear Accelerator provision in the UK varies from less than 1.5 to more than four Linear Accelerators per million head of population. In Ireland the service is predominantly centralised in Dublin where there are currently nine Linear Accelerators including three in private hospitals.

Using an algorithm published in the UK in 1999, and based on historical CSO population statistics for the MWHB region and cancer incidence from the National Cancer Registry Report (1994-1998), the number of linear accelerators required for the MWHB is 1.6.

The Mater Private Hospital proposes to commence the service in the Mid West region with one Linear Accelerator initially with backup provided by the Mater Private Hospital if necessary. This is only likely in very exceptional circumstances. The proposal is to progress to two Linear Accelerators as the service expands and increases.

## 6. Cost estimates

The MPH estimates that approx. €6m (at 2002 prices) would be required to build and equip the initial Radiotherapy Centre (subject to detail design and detailed costing).

Patient referrals are likely to take some time to build up, as doctors and patients become accustomed to the alternative of local treatment and as awareness of Radiotherapy increases in the region. The estimated patient numbers is as follows:

	Year			
	1	2	3	4
<b><i>Patients</i></b>	294	450	602	707

The following financial projections have been prepared, with accompanying key assumptions:

	Year			
<b><i>€000's (@ 2002 Prices)</i></b>	1	2	3	4
<b><i>Revenue</i></b>	1,099	1,682	2,250	2,642
<b><i>Operating Costs</i></b>	1,029	1,582	1,825	2,009
<b><i>Interest / Depreciation</i></b>	156	135	113	105
<b><i>Profit/(Loss) Before Tax</i></b>	(86)	(35)	312	528

## Key Assumptions

- The projected distribution of patients will be about 50% public and 50% private and is based on existing referral patterns and the current level of private health insurance in the region.
- The cost of treatment, planning and simulation is based on current rates;
- Staff numbers will be approx. 14 in Year 1, rising to approx. 24 in Year 4;
- The equipment has one year of full warranty from the manufacturer;

## 7.Recommendation

There are a number of advantages to proceeding with the development of radiotherapy services in the Mid West region on the basis of the proposals contained in the document including;

- A least cost option to the exchequer
- The benefits of the experience and track record of Mater Private Hospital in radiotherapy and the backup which they will be in a position to provide.

- A speedy introduction of the service (Timeframe is 2 years from the date of formal agreement to proceed)
- The elimination of the existing hardship on patients including access, particularly patients in palliative care who require radiotherapy, travel and overnight stays and a significant reduction in waiting time for Radiotherapy
- Enhanced integration and delivery of cancer care with all the relevant healthcare professionals working as a team located on the same site.

I recommend that the Board approve the proposal as set out and that the matter be referred for formal approval to the Department of Health and Children. This will then allow for the detailed discussions to commence on the Memorandum of Agreement, the terms of the operating arrangements and planning.

**Yours sincerely,**



**JOHN O'BRIEN**  
**ASSISTANT CHIEF EXECUTIVE OFFICER**

## **APPENDIX 1**

# The need for radiotherapy services for patients of the Mid-Western Health Board Region

Department of Public Health  
Mid-Western Health Board

July 2000

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## Summary

- Radiotherapy is used for both curative and palliative care purposes. Radiotherapy services are currently provided in four centres in Ireland: St Luke's Hospital in Dublin, Cork University Hospital, St Vincent's Private Hospital, Dublin and the Mater Private Hospital, Dublin.

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- It is generally estimated that 40-60% of cancer patients may require radiotherapy at some time in their illness.
- Approximately 70% of patients who come to radiotherapy departments in the UK receive treatment with curative intent. In the US this percentage is 50%.
- Cancer incidence is an indirect measure of the need for curative radiotherapy. Cancer mortality may be used as an indirect measure of the need for palliative treatment for recurring cancer.
- The largest single group of cancer patients who receive radiotherapy are those with bone metastases (25% of the total). The size of this group is largely unknown since no statistics show the prevalence of metastases in the population.
- In the Mid-Western Health Board region an average of 1,475 new cases of cancer were diagnosed per year between 1994 and 1996. In 1996, 901 residents of the MWHB region died of cancer. International evidence shows that 40-60% of patients with cancer will require radiotherapy at some point during their illness. This would mean that, on average, 700 of the new cases diagnosed each year in the region would require radiotherapy.
- Population projections for the Mid-Western Health Board predict a significant rise in the population by the year 2011, particularly in the elderly population. This will have obvious implications for the delivery of services such as cancer services which are often used by the elderly.
- In 1999 patients from the Mid-Western Health Board region accounted for 182 admissions to St Luke's Hospital, 371 outpatient visits and 36 day cases. 272 new patients from the region were seen in the peripheral clinic in Limerick which is provided by St Luke's Hospital. There were 2,299 return visits during the year for patients from the region.
- The number of patients from the region who currently avail of radiotherapy services is limited by the fact that Cork University Hospital do not collect or collate demographic statistics for the patients attending their service.
- The recommendation in the UK, where cancer incidence is similar to our own, is that there should be four Linear Accelerators per million of the population. This would mean that there should be 14 in Ireland and one or two serving a population the size of the Mid-Western Health Board.
- The National Cancer Strategy document, however, states that, to be viable, a tertiary service incorporating radiotherapy facilities should serve a minimum population of 650,000. The UK Calman-Hine Report recommended that cancer centres, which provide radiotherapy services, should serve a population of more than one million people. However, it is also considered acceptable for some cancer units, with a smaller catchment population, to provide radiotherapy services, if the travel time to a more remote cancer centre would

be unduly onerous for patients. This limit is generally accepted as greater than sixty minutes by road.

- The population of the Mid-Western Health Board is similar to that of the Western Health Board where plans are currently underway to provide a local radiotherapy centre. Patients from the Mid-Western Health Board region currently have to travel to Dublin or Cork for radiotherapy. Both of these journeys exceed the 60 minutes by road limit proposed by the Calman-Hine report.
- A national analysis of radiotherapy rates for the common site cancers showed that fewer cases in Ireland are receiving radiotherapy across all anatomical sites than would be expected.
- It is recommended that two linear accelerators should be provided in the Mid-Western Health Board region and links developed with one of the existing radiotherapy services (Dublin or Cork) where specialised radiotherapy could continue to be carried out for patients of the Mid-Western Health Board region. The evidence from the literature would suggest that at least one LinAc is needed in this region. The evidence would also suggest that two LinAcs should be provided rather than one to compensate for machine breakdown and maintenance.

## **Introduction**

Radiotherapy is used for both curative and palliative care purposes. Radiotherapy requires the use of relatively expensive equipment and specially trained staff. It is therefore generally concentrated within a small number of facilities<sup>1</sup>. Radiotherapy services are currently provided in four centres in Ireland: St Luke's Hospital in Dublin which is the national centre for radiation oncology, Cork University Hospital, St Vincent's Private Hospital, Dublin and the Mater Private Hospital, Dublin. The National Cancer Strategy document of 1996 indicated that there may be scope for developing further radiotherapy services in Galway and discussions are underway regarding the introduction of a unit to Galway in the future.

Not all patients who are diagnosed with cancer require radiotherapy. It is generally estimated that 40-60% may require treatment at some time in their illness. After surgery, radiotherapy is the most effective treatment in the management and cure of cancer. Approximately 70% of patients who come to radiotherapy departments in the UK receive treatment with curative intent, either by radiotherapy alone or in conjunction with surgery and chemotherapy<sup>2</sup>. In the US approximately 50% of patients receive radiotherapy with curative intent while the other 50% receive palliative radiotherapy<sup>3</sup>.

Data from a number of UK radiotherapy units indicate that the demand for radiotherapy over the past 10 years has grown by 3% per annum. This annual growth is probably due to the increasing incidence of cancer due to the ageing population, an increased awareness amongst clinicians of the role and benefit of radiotherapy leading to an increase in referral rates and an increase in the availability of radiotherapy facilities and services<sup>1</sup>.

## **Literature review**

### ***General introduction***

Radiation therapy is one of the oldest treatments available for cancer management. Since the discovery of x-rays and radioactivity in the 1890s, patients have been treated with radiation. Advances in equipment and in the understanding of radiobiology permit delivery of effective doses of radiation to tumours while minimizing normal tissue damage. Recent advances in radiation have expanded the scope of treatment. Large-field, large-dose radiation, such as half-body treatment, permits treatment of metastatic disease in an effective and well-tolerated manner in patients too ill to travel for therapy. Total skin electron therapy has been successful in managing extensive skin disease. Hyper-fractionated treatment is an experimental approach that attempts to achieve better tumour control by treating with two fractions per day. Intra-operative radiation is a conceptually sound but logistically cumbersome plan in which treatment is given in a single fraction at the time of surgery. Brachytherapy is the use of radioactive sources implanted directly into the tumour or in a cavity in proximity to the tumour. Hyperthermia is the use of heat in conjunction with radiation. Heat has been found to enhance the effect of radiation and limit the repair of radiation damage<sup>4</sup>.

To arrive at a reasonable estimate of the total need for radiotherapy in a population, the various descriptions of population trends and measures of cancer trends must be studied concurrently. Incidence and mortality are well documented by official

statistics. Incidence, mortality, and prevalence may be considered either individually or together as indirect measures of the need for radiotherapy at different stages for different types of cancer<sup>5</sup>.

Incidence, i.e., the number of cases of disease onset during a given period, shows the indirect need for curative radiotherapy, e.g. for breast cancer, laryngeal cancer, gynaecological tumour types and head and neck cancer. The projected average annual mean increase in total incidence is 1.0%<sup>5</sup>.

Mortality may be used as an indirect measure of the need for palliative treatment for recurring cancer, e.g., for bone metastases, prostate cancer, lung cancer, or breast cancer. The mean increase is estimated at 0.9% per year. Likewise, prevalence can be an indirect measure of the need for palliative treatment for cancer diseases of a chronic nature, e.g., prostate cancer and multiple myeloma. The total mean increase per year has been estimated at 2.0%<sup>5</sup>.

The total need for radiotherapy in the future should be viewed against the background of all these descriptive measures. Assessment must also consider numerous other factors that directly influence need. A change in the indications for treatment can quickly increase the need for radiotherapy; e.g., the benefits of radiotherapy for non-invasive breast cancer are currently being studied. Even a change in the indications for surgical intervention for small tumours in the breast influence the need for primary curative radiotherapy in this large group of patients. Likewise, a shift in staging the primary diagnosis, e.g., in head and neck cancer, may substantially influence need<sup>5</sup>.

The largest single group of cancer patients who receive radiotherapy are those with bone metastases (25% of the total). The size of this group, and thereby the potential unsatisfied need, is largely unknown since no statistics show the prevalence of metastases in the population. This group is comprised mainly of patients that were primarily diagnosed with prostate cancer, breast cancer, and lung cancer. Concerning lung cancer, incidence trends probably provide the best measure of changes in the number of bone metastases over time. For breast cancer and prostate cancer, mortality trends provide more information about trends in the number of bone metastases. Projected trends show that the majority of cancer diagnoses, except lung cancer in men and cervical cancer in women, are expected to increase in number until the year 2010. Prevalence is expected to increase even more, particularly cancer in the rectum, breast, and prostate. Also, the number of cases of non-Hodgkin's lymphoma is expected to nearly double by 2010<sup>5</sup>.

### Equipment

Two kinds of machines have been developed which are still in widespread use: *linear accelerators*, which generate high energy x-rays and electrons using electricity, and *cobalt units* which use a radioactive source of high-energy gamma rays. Linear accelerators are more expensive (approximately £1M) and require specialist support to keep them running in a safe and effective manner. Cobalt units are less expensive, more reliable and easier to maintain than linear accelerators. However, cobalt units produce a radiation beam of a lower energy than a modern linear accelerator and also have inferior beam geometry. In addition, cobalt units are associated with the risks of accidental radiation exposure, which could result from a mechanical failure or fire, and the problems associated with the disposal of a spent radioactive source<sup>1</sup>.

Radiotherapy is prescribed in the same way as drugs: however the prescription includes details of the radiation dose and type and precise information about the area to be treated and the distribution of the radiation dose. The calculation of such a prescription for a complex treatment may take several man-hours. A course of radiotherapy may be given over a period extending from only one day to six or seven weeks. Each attendance for radiotherapy is referred to as a fraction. Normal tissue damage is reduced if a dose of radiation is spread over more than one fraction, as the tissues have the opportunity to recover between fractions. Tumours may also be more effectively damaged by fractionated radiotherapy. However it is important not to leave long gaps between fractions of radiotherapy as the tumour may also have the opportunity to recover<sup>1</sup>. When a patient attends for a fraction of radiotherapy this will be given by precisely positioning the patient and treatment machine as indicated in the treatment prescription, generally the radiation dose will be given by re-positioning the treatment machine several times. Each time the machine is switched on during the fraction is referred to as an exposure. A fraction may consist of anything from one to eight exposures. The treatment is given by a minimum of two radiotherapy radiographers<sup>1</sup>.

Linear accelerators, by nature of their complexity, are subject to frequent breakdowns. The majority of facilities have in-house teams of maintenance experts who are able to service equipment, and carry out emergency repairs. Facilities must be able to arrange alternative treatment for patients if prolonged breakdowns occur. This is generally done by extending the working day on another machine within the facility or by sending patients to another facility. Radiotherapy facilities try to keep waiting times to a minimum. However, when the majority of treatment machines are working to their maximum capacity, any increase in the number of patients being referred will result in a waiting list emerging. The tumours of patients awaiting radical treatment may progress during prolonged waits, and palliative patients will be left with unpleasant symptoms while they wait for treatment. Thus extended waits are unacceptable in either group<sup>1</sup>.

The monthly workload undertaken by each linear accelerator varies considerably. These variations may be associated with one or more of the following factors:

1. Unplanned downtime associated with elderly equipment, which usually becomes increasingly unreliable as it ages.
2. The increasing sophistication of modern linear accelerators, which contain a number of new technical developments designed to improve the accuracy of treatment that reduce the number of patients that can be treated per machine hour.
3. The lack of adequate numbers of radiotherapy radiographers to operate existing equipment to maximum capacity.
4. Different lengths of the normal working day on each machine<sup>1</sup>.

### ***Curative uses of radiotherapy***

#### **Rectal cancer**

Over 10,000 new cases of rectal cancer are reported in the UK each year and adjuvant treatments, such as preoperative radiotherapy, are now being used almost routinely. Following preoperative radiotherapy, rectal cancer may be down staged or,

occasionally, eradicated histologically. There is no evidence to suggest that preoperative radiotherapy adversely affects anastomotic integrity. It appears that preoperative radiotherapy has some adverse effects on long-term anorectal dysfunction, but this must not distract from its main objectives in rectal cancer, namely reduced local recurrence rates and improved overall survival<sup>6</sup>.

### **Bladder cancer**

One review which aimed to evaluate the outcome of radiotherapy in patients with bladder cancer concluded that the exact value of radical radiotherapy is difficult to establish because changes in treatment techniques and selection of patients have biased the results. The 5-year survival rates are reported to be 35-71% in T1 tumours, 27-59% in T2 tumours, 10-38% in T3 tumours and 0-16% in T4 tumours. Morbidity of radical radiotherapy depends on several treatment and patient related factors, but 50-75% experience acute intestinal or urological symptoms and 10-20% may develop severe late toxicity, depending on the kind of registration. New treatment possibilities with advanced techniques of radiotherapy, hyperfractionation and dose escalation and/or the addition of systemic chemotherapy may improve outcome. These options should be further explored in clinical trials<sup>7</sup>.

### **Cervical cancer**

Radiotherapy is standard treatment for women with locally advanced cervical cancer (stage IIB-IVA). Radiotherapy fails to control disease progression within the irradiated field in more than 40% of patients. The disease bulk is a major factor limiting the curative probability of pelvic radiotherapy. Chemotherapy has been integrated with pelvic radiotherapy with the goal of improving local tumour control and treating microscopic metastases outside the radiotherapy field. In one large trial, neoadjuvant chemotherapy was inferior to standard pelvic radiotherapy in terms of local control and survival. Adjuvant chemotherapy after radiotherapy has been little studied, and no randomised trials have been reported<sup>8</sup>.

A French cooperative study followed up 1383 cases with invasive carcinoma of the intact uterine cervix who were treated with radiation therapy alone. The 5-year survival rate obtained in advanced stages were among the highest in the literature at 76% in Stage IIB, 62% in Stage IIIa and 50% in Stage IIIB<sup>9</sup>.

### **Primary breast cancer**

Radiation therapy for breast cancer has gone through two revolutions in the last two decades: the routine use of radiation therapy in conjunction with breast-conserving surgery as an equivalent treatment to mastectomy, and the use of radiation therapy following mastectomy in advanced or node-positive disease. The perception of post-mastectomy radiation has changed from having no benefit when used for all cases, to being detrimental because of cardiac irradiation, to the present in which the selective use of irradiation in high-risk patients provides both an improvement in local control and an improvement of 8% to 10% in the survival rate<sup>10</sup>. A recent meta-analysis has demonstrated a decrease in breast cancer mortality of approximately 10% with post-mastectomy radiation, which is similar to the effect of adjuvant systemic therapy in axillary node-positive patients. Future studies are needed to further define the subset of patients who will benefit from post mastectomy radiation and to more precisely quantify this benefit<sup>11</sup>. Improvements in radiation technique have reduced complications, in particular late cardiac deaths. At present, most patients approach

radiation therapy for breast cancer with the knowledge that it has a very high probability of being successful<sup>10</sup>.

### **Head and neck cancer**

Radiotherapy plays a key role with surgery in the treatment of head and neck cancer. Encouraging results have been published indicating new ways to improve loco-regional control by tailoring the radiation treatment to individual tumours. Increasing the radiation dose to the tumour together with a better shielding of normal tissues has become possible by technical developments in radiotherapy<sup>12</sup>.

### ***Palliative uses of radiotherapy***

In the United States approximately one half of prescribed radiotherapy is given for palliation of symptoms due to incurable cancer. Distressing symptoms including pain, bleeding, and obstruction can often be relieved with minimal toxic effects. The most common presentation is the patient with bone metastasis<sup>3, 13</sup>. Ninety percent of patients with symptomatic bone metastases obtain some pain relief with a low dose, brief course of palliative radiotherapy. One half of the responding patients may experience complete pain relief. Radiotherapy relieves clinical symptoms in 70% to 90% of patients with brain metastases. Brief treatment schedules are as effective as more prolonged therapy. Chest symptoms are common in patients with locally advanced lung cancer and are effectively palliated with one or two doses of radiation to the thoracic inlet and mediastinum. In patients with stage III cancer there is no compelling evidence that radiotherapy confers a survival advantage, and it may be reasonable to administer thoracic radiotherapy only when the patient has significant symptoms and the goal is to achieve control of these symptoms. Eighty percent of the patients with vena cava syndrome due to malignant disease achieve symptom relief with a brief, fractionated, palliative course of radiation<sup>14</sup>.

Radiotherapy is an indispensable modality in the palliation of cancer. All palliative care programs should be acquainted with its indications and have a close working relationship with a radiation oncology department. The main indications are: pain relief (particularly bone pain), control of haemorrhage, fungation and ulceration, dyspnoea, blockage of hollow viscera, and the shrinkage of any tumours causing problems by virtue of space occupancy. In addition, it has an important role in the palliation of three oncological emergencies: superior vena caval obstruction, spinal cord compression, and raised intracranial pressure due to cerebral metastases. More clinical research and evaluation of palliative radiotherapy are required<sup>15</sup>.

### ***Acceptability of radiotherapy***

Although there is a substantial body of research into the impact of cancer therapies such as surgery and chemotherapy, little is known about the experiences of cancer patients receiving radiotherapy. Serial interviews with 39 patients undergoing radical radiotherapy to the oral cavity revealed that misunderstandings and groundless fears about this form of treatment were widespread. A majority were unprepared for the severity and duration of their side effects. These results suggest that written information for patients about radiotherapy and its side effects should be made available routinely. There is also scope for nutritional support. Finally, as a supplement to outpatient attendance, informal contact with the hospital in the immediate post-treatment phase would provide invaluable reassurance to patients<sup>16</sup>.

Another study assessed the physical and psychosocial sequelae of radical radiotherapy among patients with bladder or prostate cancer and investigated the support received from community health services. When interviewed two months after treatment, over half reported that they had experienced several physical side effects as well as curtailment of social and everyday activities. Such side effects were still being experienced by up to half the patients at the time of interview. Seventy-one per cent were unprepared for the duration and type of such effects. Most had seen their general practitioner in connection with their side effects and 76% felt that this contact had been helpful. Patients appreciated the willingness to spend time listening to their concerns and explaining side effects, as well as accessibility and flexibility which made it easy to obtain advice and support. Patients who expressed dissatisfaction with their general practitioner all felt that they should have been visited at home. The study suggests that general practitioners can play a valuable role in meeting patients' needs after radiotherapy<sup>17</sup>.

Although a substantial number of randomised clinical trials (RCTs) with a radiotherapy component have been conducted over time, it turns out that many of the trials have serious methodological flaws. What is even more frustrating is the circumstance that many RCTs, in radiotherapy as well as in other medical fields, are so heterogeneous in their reporting, that it is virtually impossible to judge their quality and thereby to judge the reliability of their conclusions<sup>18</sup>.

### ***Study of radiotherapy services in England***

This report, which was recently produced, contains an algorithm, which is designed to enable Trusts, PCGs, Health Authorities and regions to determine how their current level of resources, workload and efficiency compare with other radiotherapy units elsewhere in the UK. The aim of the report was to analyse variations in staff, equipment and its utilisation in radiotherapy units. The report did not aim to recommend "normal values" for staff, equipment or its utilisation in radiotherapy units and additional work would be required to produce evidence-based recommendations for radiotherapy staff and equipment levels<sup>1</sup>.

The algorithm calculates the number of fractions of radiotherapy, which will be required for a particular population. The following factors are used to calculate the number of fractions required:

1. The size of the population served.
2. The number of cancer registrations within the population served.
3. The intended treatment practice of the unit.
4. The number of courses of radiotherapy per head of population.
5. The number of fractions per course.
6. The number of additional fractions required to provide a complex or specialist service for an extended population living outside the Unit's main catchment area.

Having calculated the number of fractions required for the specified population, the algorithm will then calculate the number of linear accelerator hours required to deliver this number of fractions. In order to do this a number of additional factors are required:

7. The average number of fractions being treated per hour.



8. The number of days that the linear accelerators will be used for treatment per year.
9. 'Normal' use of a linear accelerator is based on a five-day working week, normal Bank Holidays, 3% or 4% unplanned downtime, with pre-planned maintenance being carried out during the normal working day or outside the normal working day.

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After the above variables have been entered into the equation, the algorithm can then calculate the number of linear accelerator hours per working week that will be required to provide a specified level of service. The algorithm can also calculate the number of linear accelerators, which would be required to provide a specified level of service based on an 8-hour working day, a 10-hour working day, or a 12-hour working day.

### ***Fractionation Policies.***

The term "Fractionation Policy" is used to describe the number of fractions per course and the number of exposures per fraction used to treat patients in a particular radiotherapy unit. A UK survey of radiotherapy services has demonstrated considerable variations in local fractionation policies between radiotherapy units within the UK.

Local fractionation policies are determined by a number of factors, which include:

1. The evidence base within the literature.
2. Local clinical traditions and working practices within a particular Unit.
3. Waiting times. When waiting times increase, clinicians come under pressure to reduce the number of fractions per course in order to increase patient throughput.
4. Data from the UK survey shows a correlation between fractions per million population and machines per million population. In other words, the availability of treatment machines appears to influence clinicians' choice of fractionation.

In recent years there has been a gradual change in the complexity of radiotherapy practice in the UK. Clinicians are adopting longer fractionation policies (more fractions per course). This change will require additional resources if access rates and waiting times are to be maintained or improved. Step changes in radiotherapy practice are also seen following the publication of research in the delivery of radiotherapy for particular tumours (e.g.: pre-operative radiotherapy for rectal cancer)<sup>1</sup>.

### ***Catchment Populations.***

The National Cancer Strategy document states that, to be viable, a tertiary service incorporating radiotherapy facilities should serve a minimum population of 650,000. . The Calman-Hine Report recommended that cancer centres, which provide radiotherapy services, should serve a population of more than one million people. However, it is also considered acceptable for some cancer units, with a smaller catchment population, to provide radiotherapy services, if the travel time to a more remote cancer centre would be unduly onerous for patients. This limit is generally accepted as greater than sixty minutes by road. In this situation a cancer unit may provide radiotherapy services but its staff should have close professional and functional links with a parent cancer centre. A number of facilities which serve smaller populations in urban areas (e.g. in London) have already developed alliances to establish Joint Centres, on more than one hospital site, which serve a population greater than one million<sup>1</sup>.

## Cancer in the Mid-Western Health Board Region

Cancer is a major cause of morbidity and mortality in the Mid-Western Health Board region. It is the second commonest cause of death after circulatory disease. Data for the Mid-Western Health Board Region were obtained from the National Cancer Registry. It can be seen that the incidence of cancer remained fairly constant over 1994, 1995 and 1996 with an average of 1,475 new cases diagnosed per year.

**Figure 1** Incidence of cancer in MWHB, 1994-6

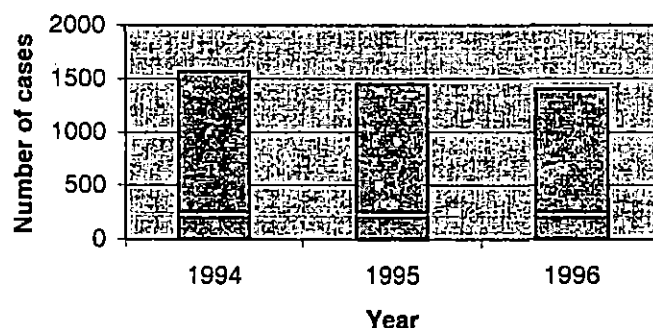


Table 1 shows the number of new cases diagnosed of some of the cancers for which radiotherapy is widely used.

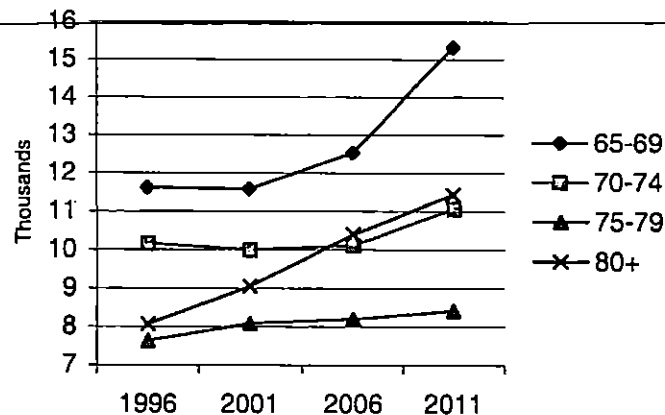
**Table 1** Number of cases of specific cancers in MWHB, 1994-6

	1994	1995	1996
<i>Breast</i>	121	141	126
<i>Lung</i>	110	105	80
<i>Ano-rectal</i>	65	38	30
<i>Prostate</i>	85	95	92
<i>Bladder</i>	48	26	39

With regard to mortality the most recent figures available from the National Cancer Registry for 1996 showed that in that year there were 901 cancer deaths in the region.

Population projections for the Mid-Western Health Board predict a significant rise in the population by the year 2011, particularly in the elderly population. This will have obvious implications for the delivery of services in the future, particularly for services such as cancer services which are used predominantly by the elderly.

**Figure 2** Population projections for those aged over 64 in the Mid-Western Health Board 1996-2011  
(Source: National Council for the Elderly, Report 42, 1995)



### Current and Planned Radiotherapy Services in Ireland

Radiotherapy services are currently provided in four centres in Ireland: St Luke's Hospital in Dublin which is the national centre for radiation oncology, Cork University Hospital, St Vincent's Private Hospital, Dublin and the Mater Private Hospital in Dublin. Outpatient services are also provided in a number of peripheral clinics around the country.

#### *Linear Accelerators*

With regard to the current national provision of Linear Accelerators there are

- 6 in St Luke's Hospital in Dublin
- 1 in St Vincent's Private Hospital
- 1 in Mater Private Hospital with plans underway to provide another one
- 1 in Cork University Hospital with plans to provide another two. Building commenced in May 2000 and the unit should be operational within 12-18 months.

### Radiotherapy for MWHB patients

#### *St Luke's Hospital*

Data were obtained from St Luke's Hospital about the number of patients from the Mid-Western Health Board who attended the various services that they provide in 1999.

**Table 2: Patients from Mid-Western Health Board attending outpatients in St Luke's, 1999**

	New	Return	Total
<i>Limerick city</i>	6	70	76
<i>Limerick county</i>	5	71	76
<i>Tipperary NR</i>	10	137	147
<i>Clare</i>	10	62	72
<b>Total</b>	<b>31</b>	<b>340</b>	<b>371</b>

- There were 182 admissions to St Luke's Hospital from the Mid-Western Health Board region in 1999.

- 36 day cases from the Mid-Western Health Board region were seen in St Luke's Hospital in 1999
  - 272 new patients from the Mid-Western Health Board region were seen in the peripheral clinic provided by St Luke's Hospital in Limerick. There were 2,299 review appointments for the clinic. Many patients may have attended the clinic for review more than once during the year.
- 

### ***Cork University Hospital***

The radiotherapy service in Cork University Hospital does not record which Health Board the patients come from when registering them. For this reason although anecdotally many patients do attend from the Mid-Western Health Board region, the service has no means of identifying or counting them.

### **Need for radiotherapy services**

For those patients diagnosed with cancer, the proportion who receive radiotherapy varies. Some cancer centres treat only 24% of cases in the area while others treat up to 64%. It is generally accepted that 40-60% of patients with cancer are considered to require radiotherapy at some point in their illness. A 50% take-up rate implies that 2,250 patients per million head of population receive radiotherapy annually in the UK. When this figure is applied to the Mid-Western Health Board region with an average annual incidence of cancer of 1,475 between 1994 and 1996, this would imply that 736 (590-885) patients might require radiotherapy at some point in their illness.

Linear Accelerators deliver 90% of radiotherapy in the UK and 70-80% of LinAc capacity is devoted to curative treatment as opposed to palliative radiation. Linear Accelerator provision in the UK varies from less than 1.5 to more than four Linear Accelerators per million head of population. In Ireland the service is predominantly centralised in Dublin where there are currently eight LinAcs including two in private hospitals. The recognised minimum to be aimed for is four per million head of population. This would mean that there should be 14 LinAcs in Ireland and one serving the population of the Mid-Western Health Board.

Access to radiotherapy in the UK is severely limited by lack of LinAcs and staffing and there is a marked inequality of provision in different parts of the country. For potentially curative treatment of head and neck and cervix cancers each week of interruption reduces the chance of cure by 12-15%.

### ***Beds***

Patients being treated with radiotherapy will sometimes require admission to hospital. This may be for a variety of reasons.

1. The patient may be unwell (related or unrelated to their underlying cancer) and need nursing care.
2. The patient may become unwell during treatment due to the side effects of radiotherapy and require nursing care.
3. The patient may be relatively fit, but live too far from the radiotherapy facility to travel for treatment on a daily basis and may, therefore, require accommodation during their course of radiotherapy.

Thus the number of beds required by a facility will vary, depending on: -

1. The distance that patients normally have to travel to reach the facility.
2. The severity of acute radiation reactions generated by the fractionation patterns utilised by a particular facility.
3. The local "traditional" working practice of the facility to treat patients as in-patients, or outpatients.
4. The availability of hostel or 'step-down' beds (as an alternative to admission to a fully nursed inpatient ward)<sup>1</sup>.

Facilities serving rural populations, and providing treatment regimes associated with severe acute radiation reactions will require a larger numbers of beds. Therefore, it is difficult to specify an optimum number of beds per head of population<sup>1</sup>.

### **Staff**

The staffing of a radiotherapy unit generally consists of consultant clinical oncologists, therapy radiographers of varying grades and medical physicists of varying grades. Other staff involved in the treatment of patients with radiotherapy can include non-consultant hospital doctors and medical technical officers<sup>1</sup>.

A number of documents have been published which have made recommendations about staffing levels within radiotherapy facilities. The Royal College of Radiologists has published two reports that address the issue of consultant clinical oncologists' workload. The first published in 1991 made a recommendation that each consultant clinical oncologist should see no more than 350 new patients per annum. The second document, published during 1998, revised this recommendation down to 315 per annum. When attempting to estimate the number of consultant oncologists required to serve a specified catchment population, it is important to bear in mind the following points.

1. Not all patients who are diagnosed with cancer require radiotherapy.
2. The English survey showed that the average number of courses of radiotherapy per cancer registration is 0.54.
3. That survey also showed that each patient receiving radiotherapy will undergo an average of 1.4 courses of radiotherapy during the course of their disease. These courses of treatment may be given at intervals, which vary from a few weeks to many years, depending on the course of an individual patient's illness.

The Royal College of Radiologists and the College of Radiographers, have also published documents recommending minimum staffing levels for therapy radiographer. These reports recommended a minimum of four whole time equivalent radiographers to staff a linear accelerator working an 8-hour day, with additional staff required on a pro-rata basis for machines working an extended day.

The IPEM have published recommendations regarding the number of physicists required in radiotherapy facilities, which are based on an algorithm using the number and type of treatment machines, and the throughput of radiotherapy patients per annum.

There is a considerable overhead in staff numbers associated with small facilities. Thus, it is only reasonable to make comparisons between facilities of a similar size, when assessing staffing levels.

A number of facilities have experienced difficulties with recruiting therapy radiographers within recent years, and this problem is getting worse. If additional linear accelerators were to be installed within radiotherapy facilities within the UK, units would be likely to encounter difficulties in recruiting sufficient therapy radiographers to staff these machines. It takes at least three years, on a university degree course, to train a Therapy Radiographer. Therefore, even if undergraduate numbers were increased in the immediate future, there would still be a significant delay before there was a corresponding increase in the number of qualified radiographers, available to staff additional machines or extend the working day on existing machines<sup>1</sup>.

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### ***The Optimum Radiotherapy Facility***

Theoretically, the optimum radiotherapy facility would have the following features: -

- The size and location of the facility would be determined by a strategic planning process, which took into account, the size of the catchment area, the population to be served, the incidence of cancer in the population and the size and location of adjacent radiotherapy facilities.
- All clinically eligible cancer patients within the facilities catchment area would have access to radiotherapy.
- All patients requiring radiotherapy would be planned and treated without delay
- Treatment and planning machines would be utilized at maximum efficiency.
- Staff would have sufficient time to deliver a quality service.
- The effectiveness of the service would be monitored by prospectively measuring clinical outcomes<sup>1</sup>.

## Conclusions

Radiotherapy has an important curative and palliative role in the management of cancer. Estimates are that between 40 and 60% of all cancer patients will require radiotherapy at some point during their illness. This means that between 600 and 900 patients in the Mid-Western Health Board region would require radiotherapy at some point during their illness. A national analysis of radiotherapy rates for the common site cancers showed that fewer cases in Ireland are receiving radiotherapy across all anatomical sites than would be expected. The need for radiotherapy services will increase in Ireland in the future with projected increases in cancer numbers due to demographic changes.

Assessment of the current demand for services for patients from the Mid-Western Health Board region is limited by the fact that Cork University Hospital does not compile demographic statistics on patients which would allow estimation of patients from the region who availed of the radiotherapy services in the past year. Figures are available for patients from the region who availed of the services provided by St Luke's Hospital in 1999. It must be pointed out, however, that the use of present services may be a function of the limited supply of those services rather than the actual need for radiotherapy services. The demand for these services would possibly increase if a local centre were established. Population projections, advances in technology and constant cancer rates would imply that the need for radiotherapy services will increase in the future.

In 1993 the report of an independent review of specialist services in London stated that a radiotherapy centre servicing a population of a million requires 4 LinAcs. This would imply that 14 LinAcs are required in Ireland and at least one LinAc is required to serve a population the size of the Mid-Western Health Board region. The National Cancer Strategy document, however, states that, to be viable, a tertiary service incorporating radiotherapy facilities should serve a minimum population of 650,000. This is to ensure that the volume of patients is sufficient to maintain the high level of medical and technical expertise needed for such a high technology unit. The Calman-Hines report in the UK, however, stated that in general patients should not have to travel for more than 60 minutes by road to a cancer centre for radiotherapy.

The population of the Mid-Western Health Board is similar to that of the Western Health Board where plans are currently underway to provide a local radiotherapy centre. Patients from the Mid-Western Health Board region currently have to travel to Dublin or Cork for radiotherapy. Both of these journeys exceed the 60 minutes by road limit proposed by the Calman-Hines report. Many of the treatment modalities which are recommended as best practice for various forms of cancer today include radiotherapy regimes (e.g. preoperative radiotherapy for rectal cancer; concurrent chemotherapy and radiotherapy for oesophageal and cervical cancer; post operative radiotherapy after breast conserving surgery). Inequity of access to radiotherapy services may mean that best practice is not carried out at all times in all health board regions.

It is recommended that two linear accelerators should be provided in the Mid-Western Health Board region and links developed with one of the existing radiotherapy services (Dublin or Cork) where specialised radiotherapy could continue to be carried out for patients of the Mid-Western Health Board region. The evidence from the

literature would suggest that at least one LinAc is needed in the region. The evidence would also suggest that two LinAcs should be provided rather than one to compensate for machine breakdown and maintenance. The provision of a local radiotherapy service would reduce travel time for patients availing of the service and their relatives. Patients would also be able to access the local service more readily for follow-up than a geographically removed centre. Any expansion of local radiotherapy services should be accompanied by an increase in the involvement of GPs in after care. GPs may need specific training in this regard to equip them for the questions that they may be asked by patients.

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


## References

1. Department of Health. A Survey of Radiotherapy Services in England. London: 1999.
2. Royal College of Radiologists. Equipment, Workload and Staffing for radiotherapy in the UK 1992-1997. Royal College of Radiologists, London: 1998.
3. Rose CM, Kagan AR. The final report of the expert panel for the radiation oncology bone metastasis work group of the American College of Radiology. *Int J Radiat Oncol Biol Phys*, 40(5):1117-24 1998.
4. Strohl RA. Radiation therapy. Recent advances and nursing implications. *Nurs Clin North Am*, 25(2):309-29 1990.
5. Anon. Cancer trends in Sweden until 2010. *Acta Oncol* 35 Suppl 6(-HD-):37-45 1996.
6. Wheeler JM; Warren BF; Jones AC; Mortensen NJ. Preoperative radiotherapy for rectal cancer: Implications for surgeons, pathologists and radiologists. *Br J Surg*, 86(9): 1108-20 1999.
7. Sengeløv L; von der Maase H. Radiotherapy in bladder cancer. *Radiother Oncol* 52(1): 1-14 1999.
8. Tattersall MH Concomitant and neoadjuvant chemotherapy in conjunction with radiotherapy in the management of locally advanced cervical cancer. *J Natl Cancer Inst Monog*, -HD-(21):101-3 1996.
9. Horiot JC; Pigneux J; Pourquier H; Schraub S; Achille E; Keiling R et al. Radiotherapy alone in carcinoma of the intact uterine cervix: a French cooperative study of 1383 cases. *Int J Radiat Oncol Biol Phys*, 14(4): 605-11 1988.
10. Taghian AG, Powell SN. The role of radiation therapy for primary breast cancer. *Surg Clin North Am*. 79(5): 1091-115 1999.
11. Fowble B. Postmastectomy radiation: then and now. *Oncology (Huntingt)*, 11(2): 213-34, 239; discussion 239-40, 243 1997.
12. Bartelink H; Keus RB. Progress in radiotherapy by treatment tailoring in head and neck cancer. *Curr Opin Oncol*, 3(3):523-8 1991.
13. Dawson R, Currow D, Stevens G, Morgan G, Barton MB. Radiotherapy for bone metastases: a critical appraisal of outcome measures. *J Pain Symptom Manage*, 17(3): 208-18 1999.
14. Hoegler D. Radiotherapy for palliation of symptoms in incurable cancer. *Curr Probl Cancer* 21(3): 129-83 1997.
15. Ashby M. The role of radiotherapy in palliative care. *J Pain Symptom Manage*, 6(6): 380-8 1991.
16. Eardley A. Radiotherapy: what are patients' needs? *Eur J Surg Oncol*, 11(4): 353-5 1985.
17. Eardley A. Patients' needs after radiotherapy, the role of the general practitioner. *Fam Pract*, 7(1): 39-42 1990.

18. Bentzen SM. Towards evidence based radiation oncology: improving the design, analysis, and reporting of clinical outcome studies in radiotherapy. *Radiother Oncol*, 46(1): 5-18 1998.

## **APPENDIX 2**



## The need for Radiotherapy Service for Patients in the Mid-Western Health Board

Presented by John O'Brien, Deputy Chief Executive Officer  
Mid-Western Health Board

26 Feb 2002

1



## Quality and Fairness A Health System for you

- "Key concerns identified by the analysis of the health system are centred around:
  - Eligibility
  - Access
  - Equity"
- Guiding principles
  - Equity: Health status across social system and equitable access based on need
  - Patient centredness: Patient empowerment
  - Quality: Standards set in partnership with the consumer
  - Accountability

3



## Contents

- Demography and Geography
- Incidence of Cancer
- Uptake of Radiotherapy
- Palliative Uses of Radiotherapy
- The need for Radiotherapy in the Mid-Western Health Board
- Current Service
- Mid-Western Health Board position
- Costs

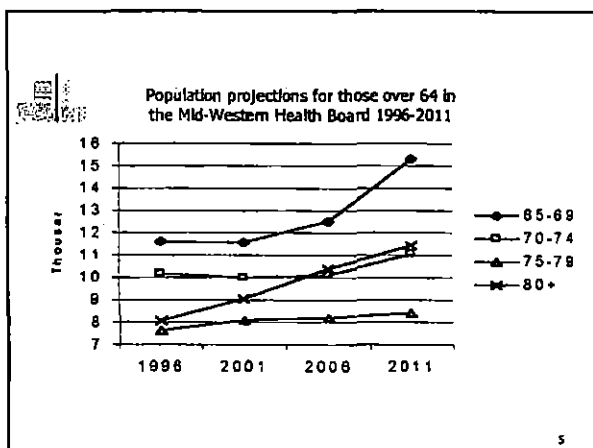
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## Demography

- Since 1971 there has been an increase in population in the MWHB of over 17.5%
- M.W.H.B. Population projection in year
  - 1996 = 317
  - 2011 = 356 (+ 12.3%)
  - 2031 = 375 (+18.3%)

4



**Geography**

The MWHB is 3,000 sq miles which represents 11.07% of Ireland

Distance from	To	Miles (return)	Duration of round trip
Limerick	Dublin	240	7 hrs
Limerick	Cork	130	4 hrs
Limerick	Galway	130	4 hrs
Limerick	Ennis	50	1.5 - 2 hrs
Limerick	Kilrush	106	3 hrs
Limerick	Roscrea	90	2.5 - 3 hrs
Limerick	Abbeyfeale	80	2 - 2.5

- Elderly population**
- 4 out of 5 deaths in 1996 were to persons aged 65 years and over
  - At national level the period 1996-2031 will see the population aged 65 years and over more than doubling
  - "Cancer becomes more common with increasing age, by age group the largest number of cases (deaths) was in those aged 70-74 years "
- (Cancer in Ireland 1994-1998)

**Cancer Incidence Rates by Health Board.  
% of National Incidence Rate**

AREA	FEMALE	MALE
EHB	107	114
MHB	104	95
MWHB	93	89
NEHB	94	96
NWHB	98	97
SEHB	94	95
SHB	101	99
WHB	90	89

## Treatment of Cancer in Ireland

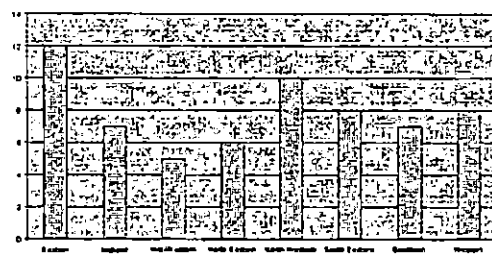
"With one or two notable exceptions, differences in treatment patterns between the various health boards were not statistically significant... The most notable exception is the lower percentage of lung, breast and lymphoma patients receiving radiotherapy in the Western and Mid-Western Health Boards"

(Cancer in Ireland, 1994 to 1998)

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## Uptake of Radiotherapy by Patients with Colorectal Cancer, *Cancer in Ireland 1994-1998*

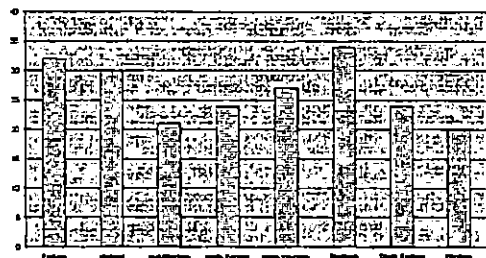
% of cases receiving Radiotherapy by selected patient and tumour characteristics 1994-1998  
Colorectal Cancer



11

## Uptake of Radiotherapy by Patients with Lung Cancer, *Cancer in Ireland 1994-1998*

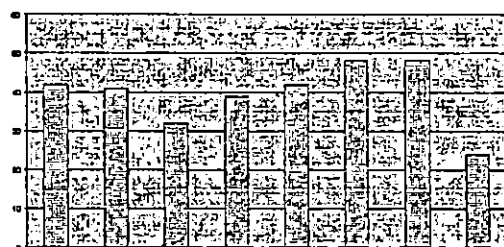
% of cases receiving Radiotherapy by selected patient and tumour characteristics 1994-1998  
Lung Cancer



10

## Uptake of Radiotherapy by Patients with Breast Cancer, *Cancer in Ireland 1994-1998*

% of cases receiving Radiotherapy by selected patient and tumour characteristics 1994-1998  
Breast Cancer



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## Palliative Uses of Radiotherapy

- Patients having to travel out of the M.W.H.B. for radiotherapy is against the philosophy of Palliative Medicine as patients have to leave their families and sometimes die away from familiar surroundings
- Radiotherapy is an indispensable modality in the palliation of cancer. In the United States approximately one half of prescribed radiotherapy is given for the palliation of symptoms due to incurable cancer.
- Distressing symptoms can often be relieved with minimal toxic effects however having to travel long distances by ambulance may exacerbate these symptoms and may rule this treatment option out.

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## The Need for Radiotherapy

- Current capacity
  - St. Luke's (6 machines) = 2,800
  - Mater/St. Vincent's Private x 3 = 1,200
  - Cork (1 + 3 planned machines) = 1,600
- Total = 5,600

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## The Need for Radiotherapy

- Nationally 20,000 patients are diagnosed with cancer per year
- 50% of these patients will require radiotherapy treatment i.e 10,000 Patients
- Currently it is estimated by Cancer Specialists that only 16% of patients with cancer receive radiotherapy
- In the MWHB 1,500 patients are diagnosed with cancer each year, at least 750 of whom will require radiotherapy
- Major developments have taken place in Breast, Colorectal and Urology services in the Mid-West region. These services cannot fully develop without ready access to radiotherapy

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## The Need for Radiotherapy

- 2 machines planned for Galway = 1,200
  - Shortfall in 2001 = 3,200
  - Shortfall in 2011 = 5,347\*
  - Shortfall in 2031 = 6,273\*
- \*based on current predictions

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## Current radiotherapy service

- Service Arrangements
- Referral to St. Luke's for treatment- Current average waiting time for access to St. Luke's Hospital is 7 weeks
- A significant number of patients every day receive their radiotherapy treatment at St. Luke's between 5 p.m. and 9 p.m.
- Approx. 50% of those requiring radiotherapy actually receive it
- Consultant led clinic at the Mid-Western Regional Hospital has ceased. No indication of resolution. Issue: The services outside the main centre tend to be marginalised.

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## Mid-Western Health Board position

- Partnership approach with other Boards i.e. Satellite unit linked to a main centre - Treatment planning at the main centre, actual treatment locally e.g. MW., S., SE
- A site has been identified adjacent to the Oncology Centre
- Planning permission has been received
- The Mid-Western Hospitals Development Trust have agreed to fund the Capital costs approx. €1.9m
- Revenue costs = €1.027m and 6 in-patient beds €1.108m i.e. increase of 0.4% of the annual budget
- Totally opposed to any notion of a split in the population

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## Case histories

- Mrs. P. Mc D. is a 69 year old housewife. Following a right sided mastectomy on 18 04 01 she was referred for Radiotherapy. She received her first treatment on 13 08 01
- Mr. J.H. is a 21 year old student at U.C.G. with a diagnosis of Hodgkins Disease. On completion of chemotherapy in April 01 he was referred for radiotherapy which commenced at the end of August 01
- Many ladies with Breast Cancer are given the option of a lumpectomy and radiotherapy or a mastectomy. Many opt for a mastectomy rather than travelling to Dublin for radiotherapy treatment.

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## Costings - Capital

Linear Accelerator	900.000
Treatment planning centre	250.000
Record and verify computer	100.000
Mould room and Patient fixation devices	100.000
Dosimetry and QA equipment	250.000
Bunker	300.000
Total	€1,900.000

20



## Costings - Revenue

▪ Consultant Radiation Oncologist	€ 218,000
▪ Radiographers x 4	€ 216,000
▪ Medical Physicists x 2	€ 143,000
▪ NCHD's x 2	€ 169,000
▪ Dosimetrists x 2	€ 150,000
▪ Clinic Nurses x 2	€ 97,000
▪ Clerical Support	€ 34,000
▪ Total	€ 1,027,000

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## Recent Medical Journal/ Press comments

- "It is considered acceptable for some cancer units, with a smaller catchment population to provide radiotherapy services, if the travel time to a more remote Cancer Centre would be unduly onerous on the patient. This limit is generally accepted as greater than sixty minutes by road." Calman Hine Report 1995
- "A population of 280,000 to 300,000 justifies a two machine radiotherapy centre" The Royal Australia and New Zealand College of Radiology Policies 1999
- Europa Donna Ireland "would like to see better geographical provision of radiotherapy services and easier access for those who have to travel" 2002
- "Cancer Treatments depends on where you live" The Irish Times, 2002

23

## Costings - In-patient beds

C.N.M. II	€ 55,000
Staff Nurses x 10	€ 460,000
Attendant x 3	€ 81,000
Porter	€ 27,000
Total	€ 623,000
Locum	€ 124,600
Pay total	€ 747,600
Non-pay	€ 360,000
Overall Total	€ 1,108,216

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## Conclusion

- Current arrangements are totally unsatisfactory
- Principles of the NH Strategy
- Partnership approach
- Community willing to help itself
- Strong evidence to support our position

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## **APPENDIX 3**

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## **Overview of Radiotherapy Services, Mater Private Hospital**

### **Initial Development**

- (a) Siemens Linear Accelerator + Simulator + Planning Software, installed by MPH and patient treatment initiated in March 1995.
- (b) 1995 - Director of Radiotherapy, Dr. Michael Maher, appointed and staff complement: 4 radiographers, 1 physicist, 1 clerical and 0.5 nurse.
- (c) Structures put in place for efficient operation of Radiotherapy Department + clinical guidelines of international standard + comprehensive quality assurance programme.
- (d) Incremental increase year on year in the number of new patients attending and number of radiotherapy treatments delivered.
- (e) Low dose rate brachytherapy facility introduced in 1998.

### **Departmental Expansion**

- (a) Second Siemens Linear Accelerator with MLC acquired, installed and commissioned July 2001.
- (b) Second radiotherapy treatment planning system integrated into existing technological structure, September 2001.
- (c) Virtual simulation brought into clinical use in September 2001.
- (d) Radio-active seed implants for early stage prostate cancer initiated March 2002.

### **Further Development**

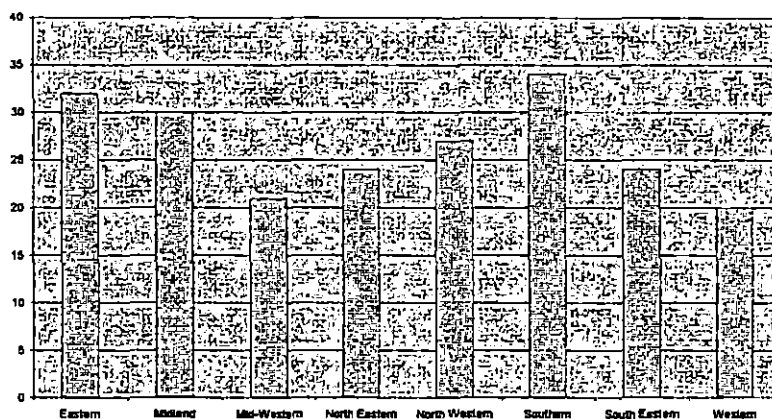
- (a) High dose rate brachytherapy to be acquired and brought into clinical use in 2003.
- (b) Further expansion of the external beam radiotherapy service off campus.

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## **APPENDIX 4**

## Uptake of Radiotherapy by Patients with Lung Cancer, *Cancer in Ireland 1994-1998*

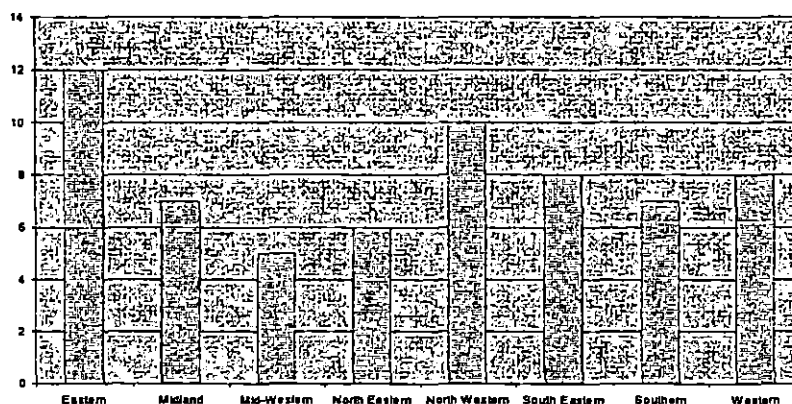
% of cases receiving Radiotherapy by selected patient and tumour characteristics 1994-1998  
Lung Cancer.



10

## Uptake of Radiotherapy by Patients with Colorectal Cancer, *Cancer in Ireland 1994-1998*

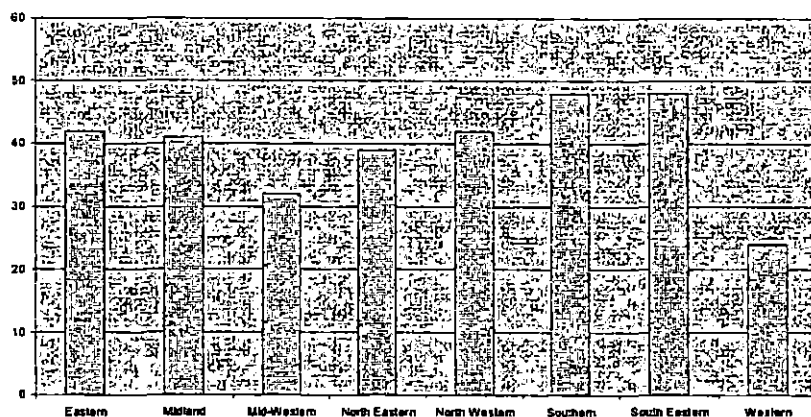
% of cases receiving Radiotherapy by selected patient and tumour characteristics 1994-1998  
Colorectal Cancer.



11

# Uptake of Radiotherapy by Patients with Breast Cancer, *Cancer In Ireland 1994-1998*

% of cases receiving Radiotherapy by selected patient and tumour characteristics 1994-1998  
Breast Cancer



12