AXrEM

AXrEM – RADIOTHERAPY Specialist Focus Group

Position statement of radiotherapy provision in the English oncology community 2007.

- **NOF/CIP central funding a great success**
- **NOF/CIP terminated prematurely**
- **Radiotherapy provision still well below E.U. norm**
- **Cancer survival some of the lowest in E.U.**
- **Market for replacement equipment collapsed**
- **Replacement cycle 3 years to first clinical treatment**
- **IGRT now standard in 1st world countries**
- **Internationally recognised effective low cost treatment compared with surgery & chemo**

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Radiotherapy Overview

Cancer is usually treated with surgery, radiation therapy and drugs. In recent decades we have gained increasing knowledge on the manner in which growth is regulated in normal cells and cancer cells and the genetic changes that cause malignant transformation. In the future this can lead to entirely new and it is hoped, improved methods of treatment, not least if they are used in combination with present-day methods.

The importance of radiation therapy as a curative treatment has not diminished. A further SBU study of radiation treatment is currently in progress. A group of experts within the European Society for Therapeutic Radiology and Oncology (ESTRO), headed by Dr Walter van den Bogaert, Brussels, has recently estimated that 50% of those who are cured of their tumours receive radiation therapy.

About 60% of these receive radiation therapy only, while the remainder are given radiation therapy combined with surgery and/or medical tumour treatment. Between 50% and 60% of cancer patients undergo radiation therapy at some point during the clinical course. Half of all radiation treatments are said to be given for curative purposes. Similar estimates have been made in the USA and Canada.

In the United Kingdom, healthcare to the population is predominantly provided by the National Health Services (NHS). The NHS has made extensive investments for additional capacity for radiation therapy, thanks to funds made available from the National Lottery. In total, 157 linacs have been ordered for UK hospitals during the last 6 years. Radiation therapy is highly important for both curative and palliative treatment of tumours.

Radiotherapy is involved in the treatment of an estimated 40% of all patients who are cured of cancer. As well as being effective, it is less expensive than both surgery and chemotherapy. However, the latest linear accelerators (linacs) can require a large capital investment and require skilled staff to operate them, so countries need to plan ahead if they are to acquire and maintain sufficient capacity to meet demand.

European figures from the 1990s show the average cost of a course of radiotherapy among EU Member States to be 3,000 euros, compared with 7,000 euros for cancer surgery and 17,000 euros for chemotherapy. Whilst many have perceived radiotherapy to have high capital and staff costs, due to the huge activity and throughput for each linac radiotherapy represents a highly cost effective treatment modality. Even in Sweden, which has the highest capacity and investment in radiotherapy, it only represents 6% of the total cost of oncology.

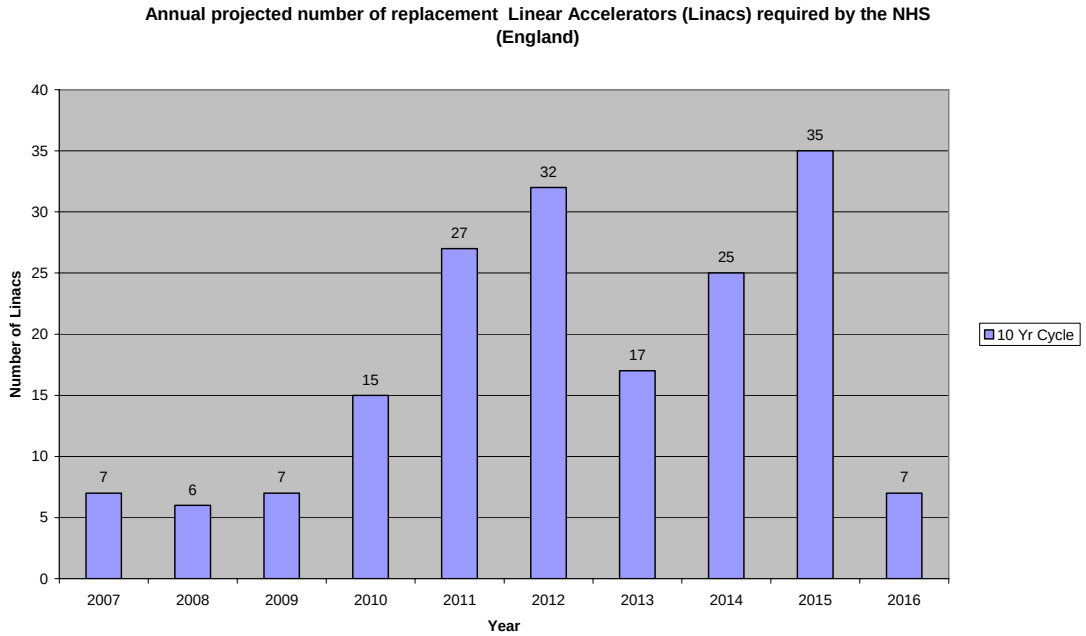
Review of NRAG report from AXrEM – RADIOTHERAPY Specialist Focus Group

As a group we have reviewed this comprehensive report and have concentrated on certain numbered paragraphs (18,69,73,74,79,80,83) where we believe we can add the most constructive additional material on a point-by-point basis with *our response in bold italics*.

18. In 1998 the Royal College of Radiologists (RCR) recommended that 4 linear accelerators (linacs – the machines used to give radiotherapy) per million population would be needed to meet growing demand for radiotherapy. In 2000 the Cancer Plan acknowledged the uneven distribution of radiotherapy facilities across the country and committed to replace linacs over 11 years old and purchase additional machines with the aim of meeting the RCR's recommendation. As a result, over the past 6 years central procurement programmes have invested substantially in radiotherapy equipment particularly in areas with the Replacement Linacs.

We would like to acknowledge that investment by the Government, Department of Health and PASA for the NOF/CIP for the central procurement programmes have radically changed Radiotherapy Linacs portfolio in the last 6 years in the most positive way. This was an excellent way to procure high value capital equipment giving an efficient, transparent, competitive tender process that gives real value for money and end user choice.

69. The recommended working life of a linac is 10 years – after this time they become technically out of date and there is mechanical wear so that they are less accurate and less reliable. In addition, manufacturer support is usually withdrawn after about 10 years**.** Figure b below shows the projected number of linacs in the current stock that will require replacement from 2007 to 2016 – this is in addition to the new linacs required set out in Table 6.



We fully concur with the statement above with regard to working lifetime, and would like it recorded that since the end of the important NOF/CIP programmes the replacement of Linacs has virtually stopped with just one replacement Linacs being purchased by the NHS in England in the last 12 months.

We would like to highlight the timeframe for replacement equipment from the initial enquiry to full clinical use is typically 3 years. Therefore immediate action is required to address this alarming position given the fact that within this time span 35 Linacs should be replaced and in the 4th year a further 27 will be due for replacement (in 2011).
We would like to point out that the industry has greatly reduced installation times and with the cooperation of our clinical colleagues, we believe we can greatly improve commissioning times.

An interesting fact that we would like to share, is before NOF/CIP, equipment purchases through charity funding accounted for a significant proportion of radiotherapy service provision. This fell away to virtually zero during the lifetime of the above programme. However, now the programme has ceased, charity funding has once again become a main source of purchasing high-tech equipment in Radiotherapy.

New Technology

73. A 3D based environment for imaging, planning and radiotherapy delivery is the current baseline for linacs. However, 4D radiotherapy takes into account tumour volume in three dimensions but also takes into account changes with time (the 4th dimension). Adaptive therapy also allows the treatment set-up and dose delivered to be verified and then changed as necessary during a course of treatment. NRAG advises that image guided four-dimensional (4D) adaptive radiotherapy is the future standard of care for radical radiotherapy treatment that the NHS should aspire to. NRAG therefore recommends that all replacement and newly installed machines are capable of image guided four-dimensional (4D) adaptive radiotherapy**.** There is evidence (set out in the technology report) that these processes will become more time-efficient as the technology becomes standard practice.

Since the publication of the NRAG report this point has been confirmed at National and International meetings that image guided four-dimensional (4D) adaptive radiotherapy is today's standard of care. We can also confirm from our own data that >80% of our first world Linacs delivered are capable of image guided four-dimensional (4D) adaptive radiotherapy.

74. Lack of resources, in particular staffing, has limited some departments' ability to exploit fully the capabilities of some equipment leading to variable use of optimal treatment. It will be important to ensure that the introduction of further new technology is properly planned with sufficient training for all appropriate staff – the recommendation set out at para 68 will support this.

We can confirm from recent experience that Image Guided treatments are very intuitive and small departments in England are already exploiting this advance routinely.

79. Intensity modulated radiotherapy (IMRT), which conforms the dose more closely to the shape of the tumour target, is likely to be used in conjunction with 4D adaptive radiotherapy. This, and other new technologies, is discussed further in the technology sub-group report.

We would like to state that Image Guided Linacs have greatly increased the adoption of IMRT by giving the clinical confidence to fully implement the technology already purchased.

Particle (proton) Therapy

80. Proton therapy is a form of radiotherapy that has the ability to focus precisely on the tumour even if it is very close to critical structures. It is used in the UK for patients with tumours of the eye. However, the UK has no modern high energy proton treatment facility for other patients with deeply situated tumours who would benefit from this technology. This contrasts with most European countries where such centres are either already available or are being commissioned or planned.

We feel that, while there is growing interest in particle therapy, the current priority in the UK must be to increase the number of - and replace ageing - linear accelerators, thereby ensuring patients have access to the most advanced treatments and waiting times are kept under control. A move towards the establishment of a Proton treatment Centre in the UK for a highly defined small number of patients for whom there is a clear indication should be seen as a complementary policy. It should not distract from the main necessity, which is high quality and modern Linear Accelerator capacity throughout England.

Implementation

83. Current service provision varies considerably between cancer networks. NRAG recommends that the Cancer Action Team carries out a formal benchmarking exercise involving all networks/ radiotherapy centres and that individual cancer networks should then set out trajectories, with associated actions, to achieve the recommended interim and long term activity levels (40,000 by 2010/11 and up to 54,000 fractions by 2016 per million population respectively) and to reduce waiting times. These trajectories and associated actions should be approved by the relevant SHA in association with the Cancer Action Team.

We would welcome as a group an invitation to work with the Department of Health and the associated professional clinical bodies to create a process for the speedy implementation of new technology and a new initiative for the expansion and replacement of existing equipment when it reaches 'end of life' as per the guidelines of 10 years.

<u>Conclusion</u>

Earlier investments have stopped and there is no clear viable alternative as a replacement and as such investment has stopped, resulting in a collapse in critical radiotherapy investment. Time is of the essence given the protracted timeframe from initial enquiry to first clinical treatment would be 3 years plus.

Since NOF/CIP ended, only two Linear Accelerators to our best knowledge have been ordered for replacement by the NHS in England. Current activity is at an all time low, with just a few PFI projects and Satellite centres in the pipeline.

It is important to note that the only recent effective and timely expansion of radiotherapy capital equipment was undertaken when commissioning was funded and managed centrally. This was efficient and allowed major benefits in terms of collaboration with multiple manufacturers to balance cost advantages and technology standards, particularly important when matching equipment within existing departments.

From the data provided in the NRAG report, there should be significantly more activity than at present in the replacement of Linear Accelerators.

Radiotherapy is the most cost effective treatment, without compromise to patient outcomes, currently available to the medical community.