Clinical Oncology
The Royal College of Radiologists

A National Audit of Waiting Times for Radiotherapy

Foreword

Earlier this year the Faculty of Clinical Oncology published its updated guidance on medical manpower and workload in the United Kingdom[1]. This document clearly defined the increasing pressures on clinical time in recent years and recommended that a maximum number of 315 new patients each year should be seen by any one consultant. Many clinical oncologists, however, are seeing far in excess of this number, yet because they work excessive hours under great pressure, waiting times for consultations are minimal. But if radiotherapy is then recommended no amount of extra effort by the doctor can overcome shortages of equipment or lack of specialised staff needed for its operation. This audit was therefore carried out to see whether delays exist between the time a consultant recommends radiotherapy and the time treatment can begin.

In parallel with this audit of waiting times for radiotherapy, the Faculty has published the results of its survey of workload, equipment and manpower[2]. This reveals a depressing picture of a growing workload outstripping the resources available to meet this demand. Our audit documents the inevitable consequence of such a deficit: an unacceptable delay in treatment in many parts of the United Kingdom.

This report provides a precise baseline of the present position and restates previously agreed national targets[3] which should be met.

In order to remedy this situation the shortfalls identified in the report on workload, equipment and manpower should be addressed as a matter of urgency. If this does not happen then the twin objectives of the Government's White Paper[4] on the New NHS, pledging a reduction in waiting times for cancer patients and its Green Paper, *A Healthier Nation*[5], seeking a reduction in cancer mortality in the under-65s by the year 2010 are both likely to be frustrated.

I am very grateful to Sue Mackintosh and Alex Hinks for their help in producing this audit and also to all the coordinators at radiotherapy centres across Britain who gathered the original data: M Abraham, J Archer, A Atkins, N Bowl, L Bracher, M Burns, C Bradley, G Bratt, J Briggs, H Cartwright, J Chrich, T Cooper, J Cox, J Crane, V Cutting, S D'Arcy, J Dewhurst, J Faulkner, P Gavin, S Griffiths, S Harron, B Hercliffe, R Hobbs, E Hughes, D Hurman, L Huthart, A Hutchinson, M Illingworth, M Irving , M Jackson, J Johnson, L Joyce, W Kelly, S Kinnes, K Mehta, F Milne, M Noonan, P Pimm, H O'Connell, E Ogle, P Topps, C Richard, S Richardson, J Roper, P Shields, D Shillam, P Skinner, A Smith, J Smith, S Stamp, W Steele, J Sweeney, S Tatlow, Z Tippett, C Thorne, M Tomkinson, T Vincent and J Yusuf.

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Summary

In 1993 the Joint Council for Clinical Oncology (JCCO) defined targets for waiting times for radiotherapy[3]. These defined four categories of patient: urgent cases, those requiring radical (curative) radiotherapy, those requiring palliative treatment (for symptom control), and a special subgroup identifying women having adjuvant radiotherapy after surgery for breast cancer. The Faculty of Clinical Oncology has audited current waiting times for treatment in the UK to see how closely they meet the JCCO's recommendation for good practice and maximum acceptable delays. Figure 1 summarises the findings.

Overall 28% of patients were waiting longer than the maximum times advised by the JCCO. There was considerable regional variation in waiting times and there is evidence to suggest that the presence of inequalities in provision of resources is a major factor in these geographical differences.

Introduction

Stimulated by the publication of *The Patient's Charter*[6] the previous year, in 1993 the JCCO published recommendations regarding waiting times for radiotherapy to treat cancer[3]. These divided the patient population into four groups: those who were considered urgent, those whose treatment was given with curative intent and was therefore deemed radical, those for whom irradiation was purely palliative and those women with early breast cancer who were referred for treatment following surgery. For the first three categories a standard for good practice and a maximum acceptable waiting time was defined (Table 1).

Table 1. Summary of 1993 standards on waiting times

Patient group	**Waiting times for radiotherapy**	
	Good practice	**Maximum acceptable delay**
A Urgent	24 h	48 h
B Radical	14 days	28 days
C Palliative	2 days	14 days
D Post-operative	-	28 days

These were 24 and 48 hours respectively for urgent cases, 2 weeks and 4 weeks for radical treatments and 48 hours and 2 weeks for palliative therapy. For those with operable breast cancer the advice was that radiotherapy should begin within 4 weeks of surgery unless treatment was electively delayed for clinical reasons (such as the integration of chemotherapy into the treatment programme or waiting for resolution of post-operative complications).

In 1998 it was decided to carry out a national audit to see how closely these standards were being met.

Methods

For the working week beginning 2 February 1998, all radiotherapy departments in the United Kingdom were asked to record details of every patient starting treatment noting the date that their course of irradiation actually began and the date that it had first been advised by a clinical oncologist. The intervening interval, measured in calendar days, would then constitute the waiting time. In addition the diagnosis and category of treatment (i.e. urgent, radical, palliative or operable breast cancer) was noted. Respondents were also asked to record if there had been any elective delays in starting treatment and if so to give the reason for this.

For the present audit the definition of waiting time for the operable breast cancer patients differed from that given in the original targets of 1993 in that the latter measured the interval from the date of surgery whilst the audit monitored the time from when the decision was made by the clinical oncologist to advise radiotherapy. This difference was primarily because the audit wished to determine how effectively clinical oncologists and the resources they had at their command were able to meet the original targets. The original 1993 standard based on the time of surgery introduced factors over which the clinical oncologist had no control, such as delay in referral by the surgeon.

Also, in considering patients receiving radical (curative) radiotherapy the 1993 document did not identify that a proportion of these cases would be skin cancers. These lesions are almost always treated on special low energy (superficial) x ray machines and there is no significant waiting time for such treatment. For this reason in the present audit those patients recorded as receiving radical treatment for basal and squamous cell carcinomas of the skin were classified as a separate subgroup.

Results

Questionnaires were sent to all 57 radiotherapy departments in the United Kingdom. One centre was unable to participate as at the time of the audit the department was closed during a move to new premises. The remaining centres all complied yielding a total of 2,631 patients starting new courses of radiotherapy during the week in question.

The overall results are summarised in Table 2.

Table 2. UK waiting times in days for radiotherapy for patients commencing treatment between 2 February 1998 and 9 February 1998

Category	**Overall**		**No elective delay**		**With elective delay**	
	Number of patients	**Waiting time (average/range)**	**Number of patients**	**Waiting time (average/range)**	**Number of patients**	**Waiting time (average/range)**
Urgent	107	1 (0-13)	105	1 (0-13)	2	1 (1-2)
Radical						
-Skin	206	11 (0-87)	178	15 (0-81)	28	44 (2-87)
-Other	670	31 (0-189)	507	25 (0-83)	163	47 (5-189)
-Total	876	28 (0-189)	685	23 (0-83)	191	46 (2-189)
Palliative	1193	11 (0-126)	1103	10 (0-62)	90	25 (3-126)
Adjuvant breast	455	43 (2-379)	273	27 (2-65)	182	68 (2-379)
Total	2631	22 (0-379)	2166	16 (0-83)	465	51 (1-379)

By definition elective delays are not of concern when considering waiting times for treatment since the delay is the result of a clinical decision judged to be in the best interests of the patient. Also, as already explained, skin malignancies form a special category. Consequently these two subgroups of patients have been excluded from the remainder of this analysis. Table 3 gives the number of patients in each category in the UK regions.

Table 3. The proportion of patients with skin cancers and elective delays in treatment in each region

Region	**Total number of patients**	**Total number with skin cancer (%)**	**Total number with elective delays (%)***
Northern & Yorkshire	238	20 (8%)	34 (16%)
Trent	173	24 (14%)	30 (20%)
Anglia & Oxford	223	12 (5%)	35 (17%)
South West	357	36 (10%)	52 (16%)
West Midlands	247	24 (10%)	35 (16%)
North West	286	20 (7%)	24 (8%)
North Thames	477	29 (6%)	107 (22%)
South Thames	250	23 (9%)	51 (20%)
Wales	107	10 (9%)	31 (30%)
Scotland	211	2 (1%)	25 (12%)
Northern Ireland	62	6 (10%)	13 (21%)
Total	2631	206 (8%)	437 (17%)

Excluding skin malignancies and elective delays leaves a total of 1,988 patients in the audit. Table 4 gives the overall picture for waiting times in each region.

Table 4. Number of patients waiting longer than maximum acceptable time for radiotherapy

Region	Total number of patients*	Total number waiting beyond acceptable time (%)
Northern & Yorkshire	184	67 (36%)
Trent	119	44 (37%)
Anglia & Oxford	176	49 (28%)
South West	269	83 (31%)
West Midlands	188	14 (7%)
North West	242	98 (40%)
North Thames	341	76 (22%)
South Thames	176	53 (30%)
Wales	66	9 (14%)
Scotland	184	52 (28%)
Northern Ireland	43	11 (26%)
Total	1988	556 (28%)

*Excludes elective delays and skin cancers

There were a total of 105 patients who were classified as urgent. Of these, 96 (92%) were treated within the 2-day 'maximum acceptable' limit set by the JCCO's 1993 document, and of these 96, 62 (59%) received radiotherapy within the 24-hour limit for 'good practice'. Of the remaining nine, six were treated within 5 days, the other three waited 8 days (two patients) and 13 days. The JCCO criteria did not define precisely the term urgent and these delays may owe more to variations in interpretation of 'urgency' rather than anything else.

The details of waiting times for patients in the other three categories (palliative treatment, radical treatment excluding skin cancers and operable breast cancer) are given in Tables 5, 6 and 7.

Table 5. Waiting times for palliative radiotherapy with no elective delay

Region	Total number	Number of patients waiting (%)		
	of patients	0-2 days	0-14 days	Over 14 days
Northern & Yorkshire	111	21 (19%)	85 (77%)	26 (23%)
Trent	64	11 (17%)	37 (58%)	27 (42%)
Anglia & Oxford	102	12 (13%)	78 (76%)	24 (24%)
South West	173	31 (18%)	123 (71%)	50 (29%)
West Midlands	92	36 (39%)	84 (91%)	8 (9%)
North West	129	13 (10%)	68 (53%)	61 (47%)
North Thames	186	34 (18%)	149 (80%)	37 (20%)
South Thames	95	18 (19%)	70 (74%)	25 (26%)
Wales	49	20 (41%)	46 (94%)	3 (6%)
Scotland	81	22 (27%)	66 (81%)	15 (19%)
Northern Ireland	21	6 (29%)	18 (86%)	3 (14%)
Total	1103	224 (20%)	824 (74%)	279 (25%)

Table 6. Waiting times for radical radiotherapy for non-skin cancers with no elective delay

Region	Total number	Number of patients waiting (%)			
	of patients	0-2 weeks	0-4 weeks	Over 4 weeks	Over 6 weeks
Northern & Yorkshire	50	10 (20%)	22 (44%)	28 (56%)	22 (44%)
Trent	27	5 (19%)	19 (70%)	8 (30%)	3 (11%)
Anglia &	37	9 (24%)	23 (62%)	14 (38%)	11 (30%)

Oxford					
South West	38	10 (26%)	25 (66%)	13 (34%)	3 (8%)
West Midlands	60	27 (45%)	56 (93%)	4 (6%)	0
North West	70	14 (20%)	53 (76%)	17 (24%)	11 (16%)
North Thames	93	30 (32%)	64 (69%)	29 (31%)	18 (19%)
South Thames	37	11 (30%)	28 (76%)	9 (24%)	1 (3%)
Wales	12	4 (33%)	7 (58%)	5 (42%)	3 (25%)
Scotland	68	12 (18%)	40 (59%)	28 (41%)	18 (26%)
Northern Ireland	15	2 (13%)	9 (60%)	6 (40%)	5 (33%)
Total	507	134 (26%)	346 (68%)	161 (32%)	95 (19%)

Table 7. Waiting times for post-operative radiotherapy for operable breast cancer with no elective delay

Region	**Total number**	**Number of patients waiting (%)**		
	of patients	**0-4 weeks**	**Over 4 weeks**	**Over 6 weeks**
Northern & Yorkshire	19	6 (32%)	13 (68%)	10 (53%)
Trent	19	10 (53%)	9 (47%)	0
Anglia & Oxford	29	18 (62%)	11 (38%)	7 (24%)
South West	41	25 (61%)	16 (39%)	5 (12%)
West Midlands	32	31 (97%)	1 (3%)	0
North West	33	16 (48%)	17 (52%)	5 (15%)
North Thames	40	30 (75%)	10 (25%)	5 (15%)
South Thames	31	12 (39%)	19 (61%)	7 (23%)
Wales	5	4 (80%)	1 (20%)	0
Scotland	18	10 (55%)	8 (45%)	2 (11%)
Northern Ireland	6	4 (66%)	2 (33%)	1 (17%)
Total	273	166 (61%)	107 (39%)	42 (15%)

The above figures show that across the UK only 24% (420/1715) of eligible patients met the critieria for 'good practice' defined by the JCCO. Of patients requiring palliative radiotherapy, 25% (279/1103) had to wait longer than the maximum 14 days recommended. For radical treatment 32% (161/507) of patients waited more than 28 days for potentially curative therapy and 19% (95/507) waited more than 6 weeks. Similarly for adjuvant irradiation after removal of a breast cancer 39% (107/273) of women waited more than the maximum target of 28 days and 15% (42/273) waited more than 6 weeks.

Discussion

This study demonstrates that the defined maximum waiting times for radiotherapy are not being met; 28% (556/1988) of eligible patients are falling outside the target limits (Table 8). It is also apparent that the problem is more acute in some regions than others. The reasons for this geographical variation are probably multifactorial, but one element that may be considered is the provision of equipment. For radiotherapy, other than for skin cancer, the megavoltage machines, linear accelerators (LinAcs) and cobalt units form the cornerstone of treatment. In 1997 The Royal College of Radiologists surveyed the distribution of megavoltage equipment in the UK[2] and from these data it is possible to rank the Health Regions according to the number of megavoltage machines per million head of population served. Table 9 compares these figures to the ranking according to the percentage of patients who fail to be treated within the target times (based on the data given in Table 4).

Table 8. Summary of 1998 audit findings based on the 1993 guidelines

Patient group	**Number of patients**	**Waiting times for radiotherapy**		
		Good practice	**Maximum acceptable delay**	**Outside of standard**
A Urgent	105	62 (59%)	34 (33%)	9 (8%)
B Radical	507	134 (26%)	212 (42%)	161 (32%)
C Palliative	1103	224 (20%)	600 (55%)	279 (25%)
D Post-operative	273	-	166 (61%)	107 (39%)
Total	1988	420 (21%)	1012 (51%)	556 (28%)

Table 9. Comparison of waiting times and megavoltage equipment provision

Region	**Waiting time ranking**	**Megavoltage ranking**	**Megavoltage, units per million head of population***
Northern & Yorkshire	9	9	2.65
Trent	10	10	2.42
Anglia & Oxford	4=	4	2.88
South West	8	5	2.87
West Midlands	1	6	2.80
North West	11	11	1.88
North Thames	3	2	3.06
South Thames	7	3	2.96
Wales	2	1	3.08
Scotland	6	7	2.78
Northern Ireland	4=	8	2.76

**This calculation is based a cobalt unit being the equivalent of 70% of a LinAc in terms of the number of treatments it is able to deliver*

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These figures show a relationship between the level of megavoltage equipment availability and the waiting time for radiotherapy treatment in the UK (Spearman rank correlation test $p < 0.05$) (see Figure 2). It could be argued that by increasing the hours of operation of the existing equipment the delay in treatment might be reduced. Approximately one third of UK centres are currently working in excess of 8 hours per day2, but a detailed logistic and economic analysis has concluded that such extended day operation is, at best, only a short term solution7.

Figure 2. Ranking by '% Treated within Target' vs Ranking by 'Equipment Provision'

The number of patients referred for radiotherapy is increasing as is the number of exposures needed for each course of treatment3. These pressures will only make the waiting time problem worse unless additional megavoltage equipment is provided. The aim in the first instance should be to achieve four LinAcs per million head of population, and this means that there should be 48 new machines, 22 of which should replace old cobalt units. There is also a need to replace a further 44 LinAcs which are currently more than 10 years old2. Although this capital investment may seem very considerable it should be remembered that in overall terms radiotherapy not only offers a cure for many cancer patients but is also a very cost-effective approach to treatment8.

The recent White Papers on the NHS4 have placed specific emphasis on the times patients with cancer have to wait for consultations. Even if these times are reduced, however, there will be little improvement in outcome unless definitive treatment is also rapidly available and the government's other target of reducing cancer deaths in those under 65 by 20% by the year 20105 is unlikely to be achieved.

Approved by the Board of the Faculty of Clinical Oncology: 1 May 1998
Approved by Council: 29 May 1998 BFCO(98)3

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