An assessment of the impact of Virtual Environment for Radiotherapy Training in UK clinical radiotherapy centres

Responsible person: Spencer Goodman
Published: Sunday, April 1, 2012
ISBN: 9781-871101-85-9

Summary

This document reports on the utilisation of VERT systems in clinical radiotherapy departments across the UK in September 2011, approximately 18 months after the completion of the initial DH VERT project funded by the Department of Health for England and the Cancer Action Team; and Managed by the Society and College of Radiographers (SCoR).

1. Background

The National Radiotherapy Advisory Group Report to Ministers in 20071 recommended the introduction of Hybrid Virtual Environment skills training facilities in the 10 education centres and 51 associated clinical sites delivering pre-registration radiotherapy programmes in England to address the issue of high student attrition.

The Department of Health (DH) and National Cancer Action Team (NCAT) funded the installation of the Virtual Environment for Radiotherapy Training (VERT) in both treatment and education centres across England as well as funding an 18-month project2 between April 2009 and October 2010 to manage the implementation of VERT and conduct an initial evaluation of its impact . The report from this project2 was published in June 2010. It highlighted the under-utilisation of VERT systems installed in clinical radiotherapy centres due to a variety of reasons and made specific recommendations to improve their utilisation and encourage wider use whilst ensuring availability to radiotherapy staff and students.

The aim of this project is to evaluate the utilisation of VERT systems in clinical radiotherapy departments across the UK in September 2011, approximately 18 months after the completion of the initial DH VERT project. 2

A further reading list has been provided for additional background information.

2. Methodology

A quantitative methodology was adopted using a questionnaire survey. The questionnaire (see Appendix 1 comprised 46 questions including those requiring yes/no responses, multiple choice responses and the submission of numerical data. The questionnaire was tested prior to distribution by two clinical practice educators for understandability, accessibility and ease of use, and by the Society and College of Radiographers' (SCoR) Knowledge Officer for Data Protection Act (1998) 3 compliance.

A link to the on-line survey , using the Survey Monkey™ tool, was emailed to all Radiotherapy Service Managers (RTSMs) in the United Kingdom (n = sixty seven). They were requested to submit one response per centre. All respondents were requested to provide their centre's name and contact details to enable effective monitoring of responses and assist with maximizing the response rate. All published data was to be anonymous.

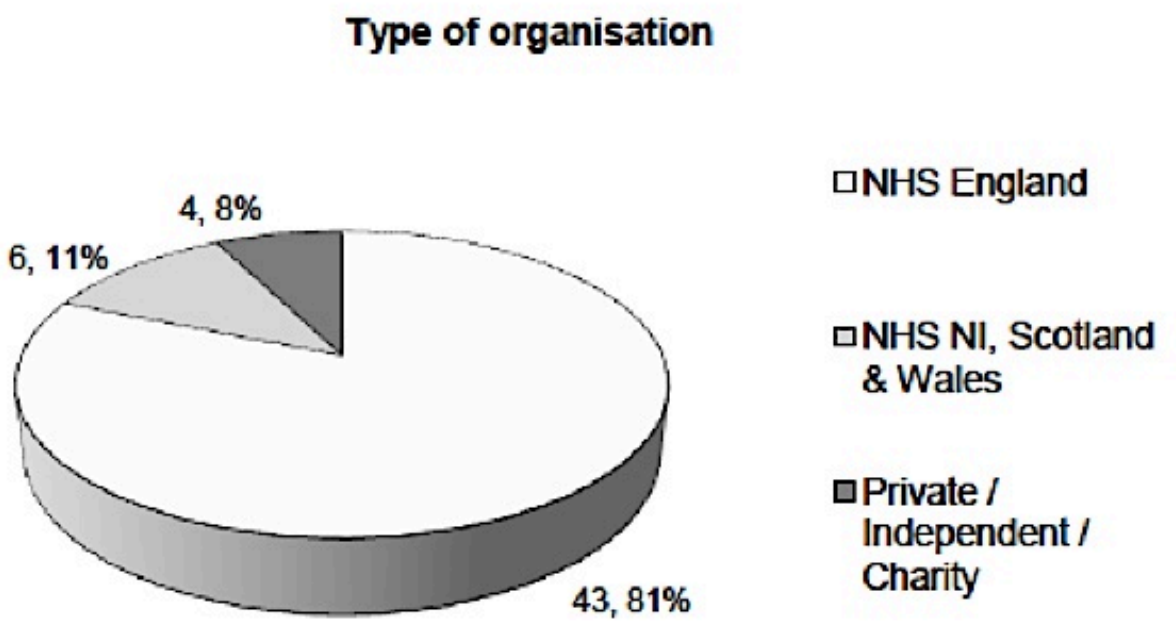
The questionnaire was distributed on 9th September 2011 with covering information to encourage responses by the submission deadline of 30th September 2011. Follow up emails were sent to the RTSMs of outstanding centres one week prior to the submission deadline to encourage their response. Direct targeting by emails enabled a final response rate of 82.8% (fifty-three) by 10th October 2011.
The findings from these questionnaires have been supplemented with qualitative data from a number of radiotherapy centres. This was acquired by email correspondence and telephone interviews.

3.1. Results

Overview of results

Response rate of type of organisation
53 responses (82.8%) n = 64. One independent provider replied on behalf of their 4 clinical sites.

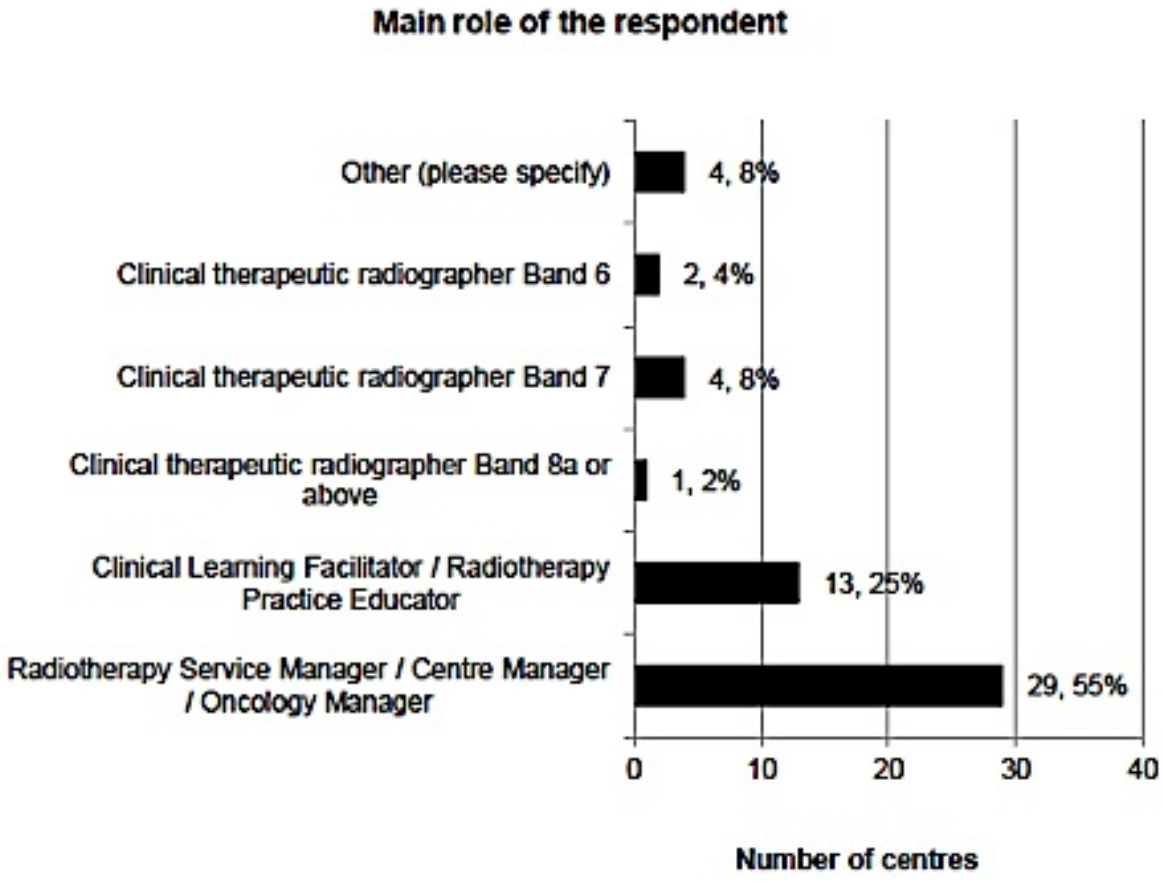
Figure 1



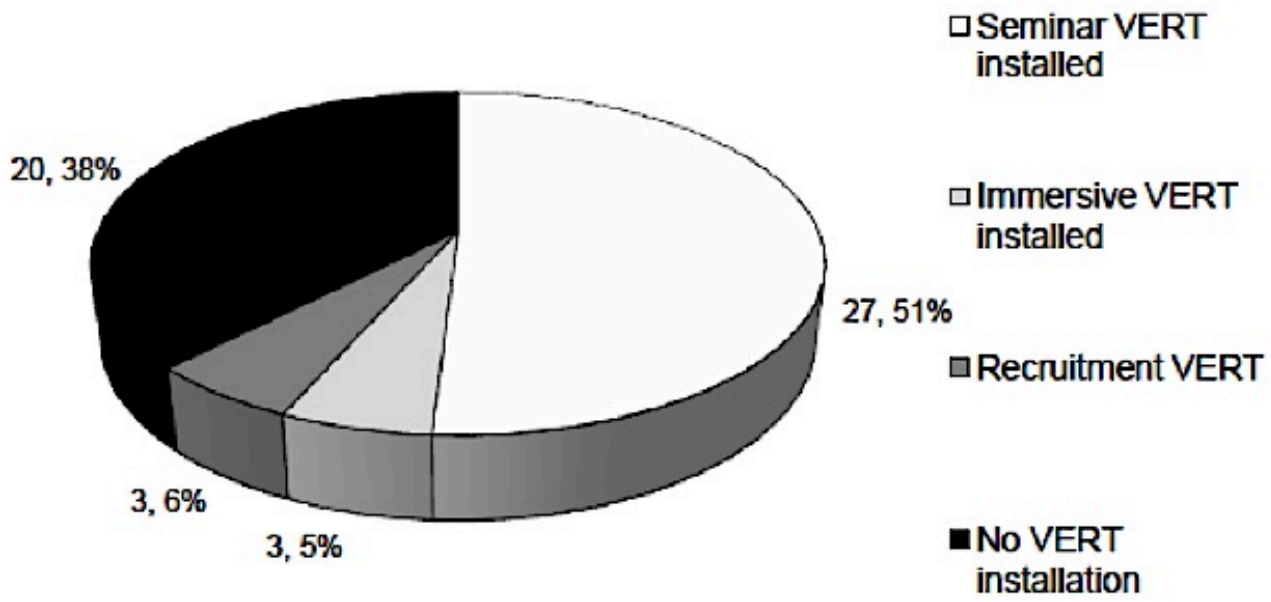
There were 11 non-responders across the UK.
There were 27 Centres that provided contact details confirming they were willing to be contacted for further discussion about this project.

Main role of the respondent
The majority of responses were completed by RTSMs as shown in figure 2.

Figure 2



Type of VERT system installed
27 (51%) centres have seminar VERT whilst 20 (38%) of centres across the UK have no VERT installation.
Figure 3



In England, the number of centres without any VERT installation was 14 (including NHS and private, independent sector, charity) and in the rest of the UK it was 6.

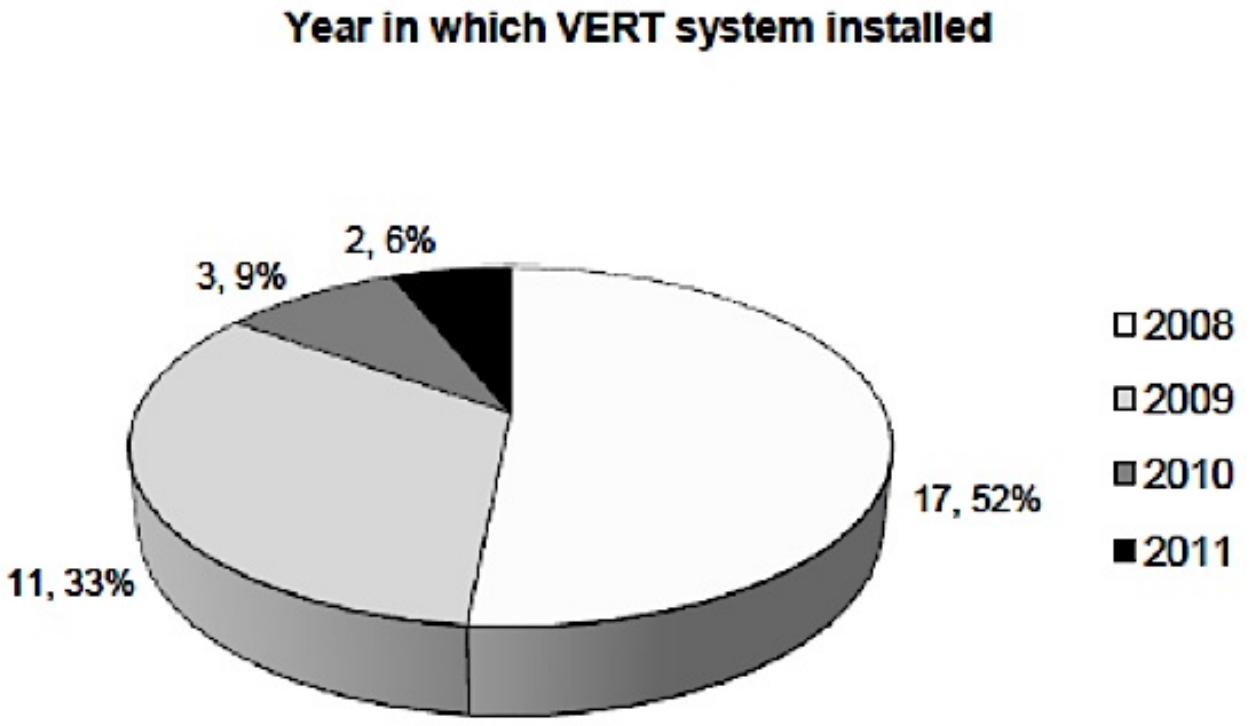
Centres without VERT installations
Of the 20 (38%) centres without VERT, only 1 centre confirmed that they have agreed plans to install seminar VERT. This is to be installed in an allocated room in new building project due for completion July 2012 which was originally due to finish by 2008. Prior to this new building there has been no suitable room. A second centre stated they would consider a laptop /mobile VERT.

For the 19 centres with no plans to install VERT, the reasons given included:

1. No funding (6 centres)
2. Lack of space (8 centres)
3. Already have access at HEI (4 centres)
4. No students (2 centres)
5. Students already have sufficient access to clinical equipment (2 centres),
6. Do not see the need (1 centre)
7. Lack of staff (1 centre)
8. Not seen as useful for qualified staff (1 centre).

Centres with VERT installations
Four of the responding centres are multi-site radiotherapy providers although only one uses VERT at more than one site (on 2 sites).

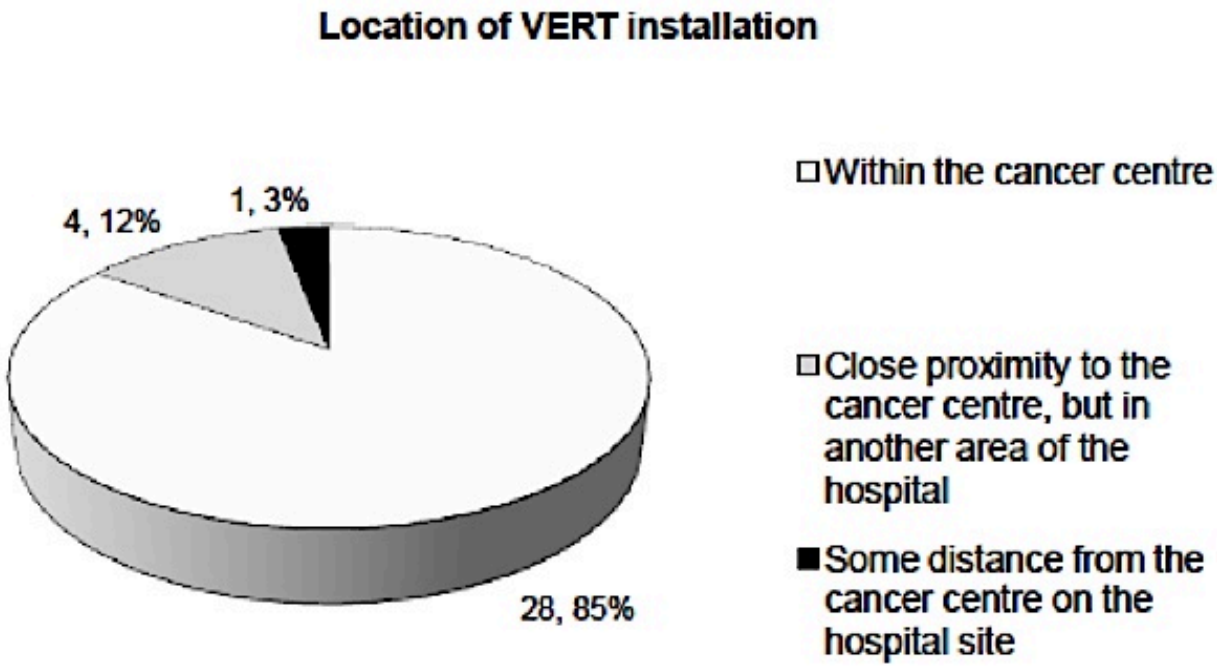
Year of installation
17 (52%) of VERT systems were installed in 2008 and 11 in 2009
Figure 4



Manufacturer of linear accelerators
23 (69.7%) centres have Varian, 12 (36.4%) have Elekta and 3 (9.1%) have Siemens linear accelerators.

Location of the seminar VERT system (or other system if not seminar VERT)
28 (84.8%) centres have their VERT within the cancer centre.
In 4 (12.1%) centres, VERT is in close proximity to the cancer centre but in another area of the hospital with only 1 (3%) centre having its VERT some distance from the cancer centre although still on the hospital site.

Figure 5



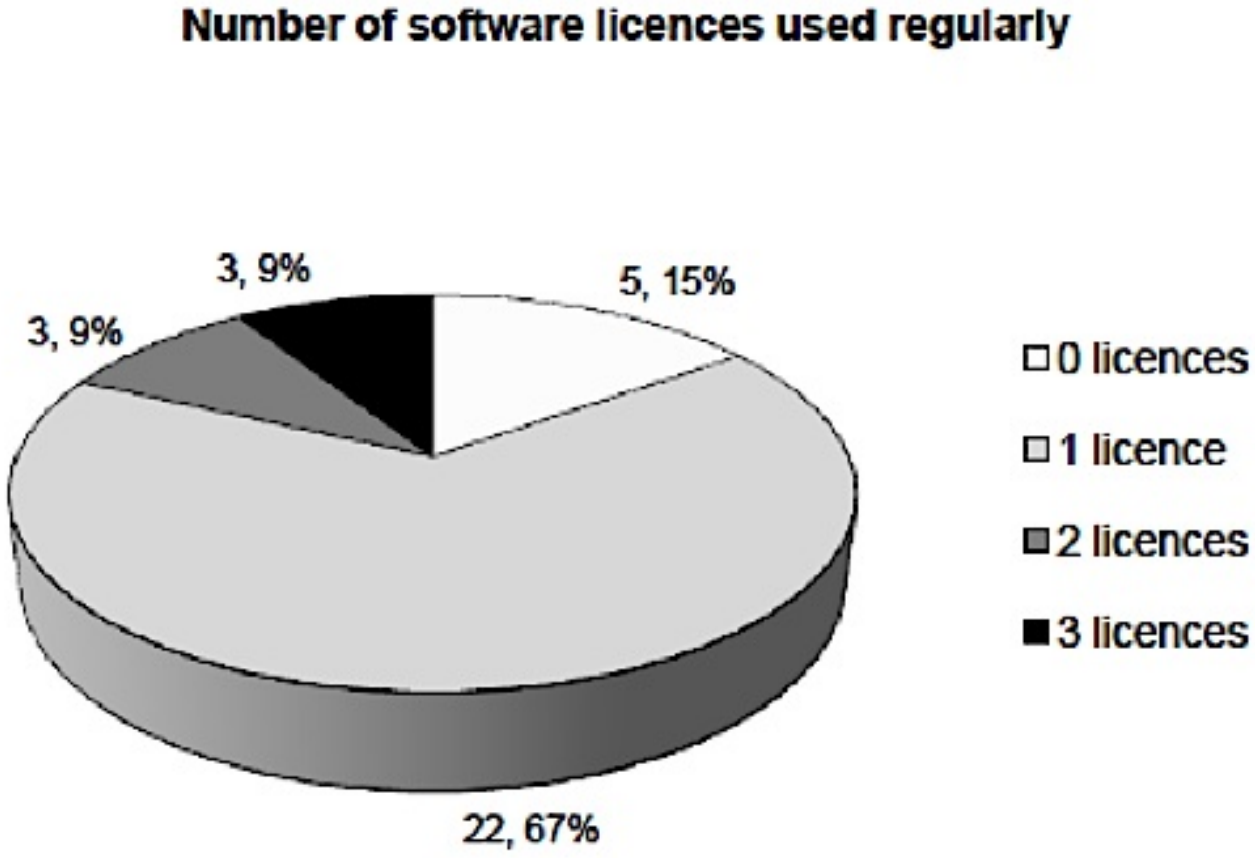
Software licences

Number of software licences

22 (66.7%) centres indicated they use 1 licence regularly. 3 (9.1%) centres used 2 and 3 licences regularly. No centres used more than 3 licences regularly.

5 (15.2%) centres indicated that did not use any licences, with the implication that they are not using their VERT systems at all. This is a higher number of centres than expected and it may be that some of these respondents misunderstood the question.

Figure 6



There were a variety of reasons given for not using more licences, these included:

1. Room not available (1 centre)
2. Students not in every week (1 centre)
3. Only need to use VERT room licence as can use HEI VERT for events (1 centre)
4. Didn’t know there was more than one
5. Laptop graphics card not good enough
6. Not had time to use more yet (2 centres)
7. Not using system at all (1 centre).

Figure 7

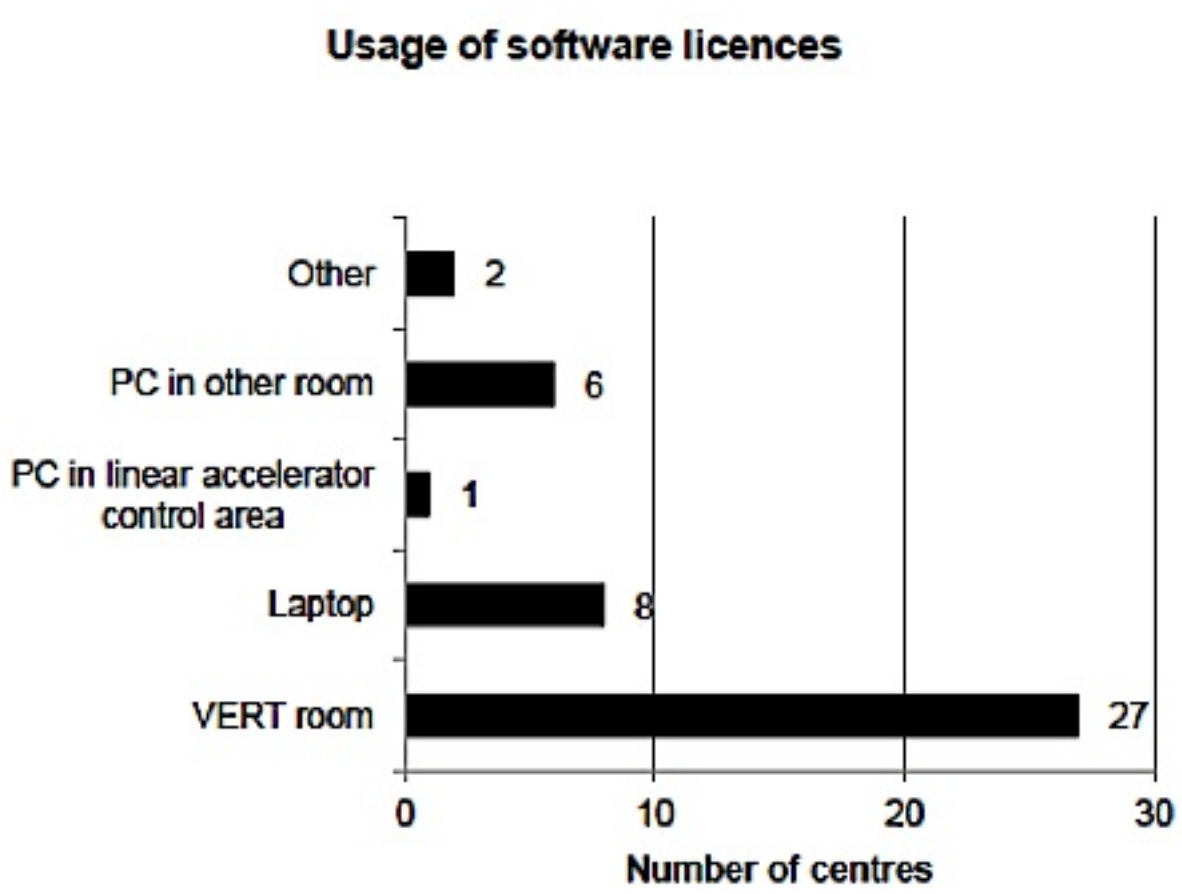


Figure 7 illustrates the location of where centres are using VERT. The majority of centres (81.8%) are using their licences in the VERT room.

Software version in use:
19 (57.6%) centres indicated that they were using V2.7 which was the latest version available at the time of this survey. 5 (15.2%) centres were using V2.6 and 4 (12.1%) centres were still using V2.2, the first version of software available for clinical use.

Of the 14 centres not using V2.7, 6 (42.9%) centres confirmed they have plans to upgrade their software in the future. Of the 8 (57%) of centres with no such plans, 5 centres identified cost as the reason. One centre also stated that their current version is sufficient for their needs.

Software renewal contract
17 (51.5%) centres confirmed they currently have a software renewal contract with Vertual. 16 (94.1%) of these confirmed they will be renewing their contract.

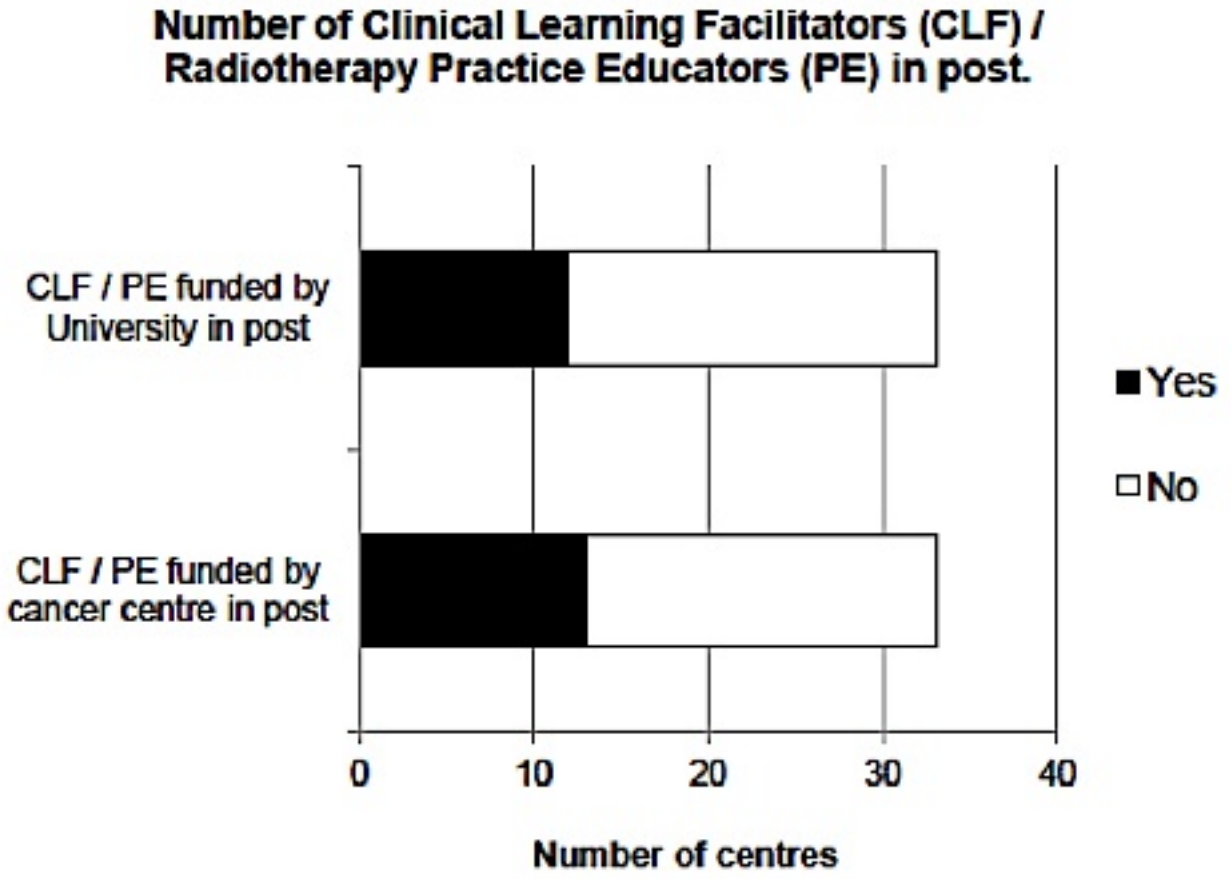
A variety of reasons were given for having not a software renewal contract, these included:

1. Lack of funding (4 centres)
2. Current software is sufficient (1 centre)
3. Not used enough to justify cost (1 centre)

2 centres confirmed they hope to have such a contract in place soon.

Clinical learning facilitators/radiotherapy practice educators in post

Figure 8



There are 25 funded clinical learning facilitator / practice educator posts across the 33 centres with VERT systems. Figure 7 shows that 12 of these posts are university funded and 13 are funded by the cancer centre.

VERT lead

29 (87.9%) centres confirmed they have an appointed VERT lead however only 6 of these VERT leads have dedicated time to develop the use of VERT in their centres.
In 28 centres the VERT lead is a therapeutic radiographer and in the remaining centre, VERT lead responsibility is held jointly by a therapeutic radiographer and a physicist.

Main role of therapeutic radiographers who undertake VERT lead responsibilities

Figure 9

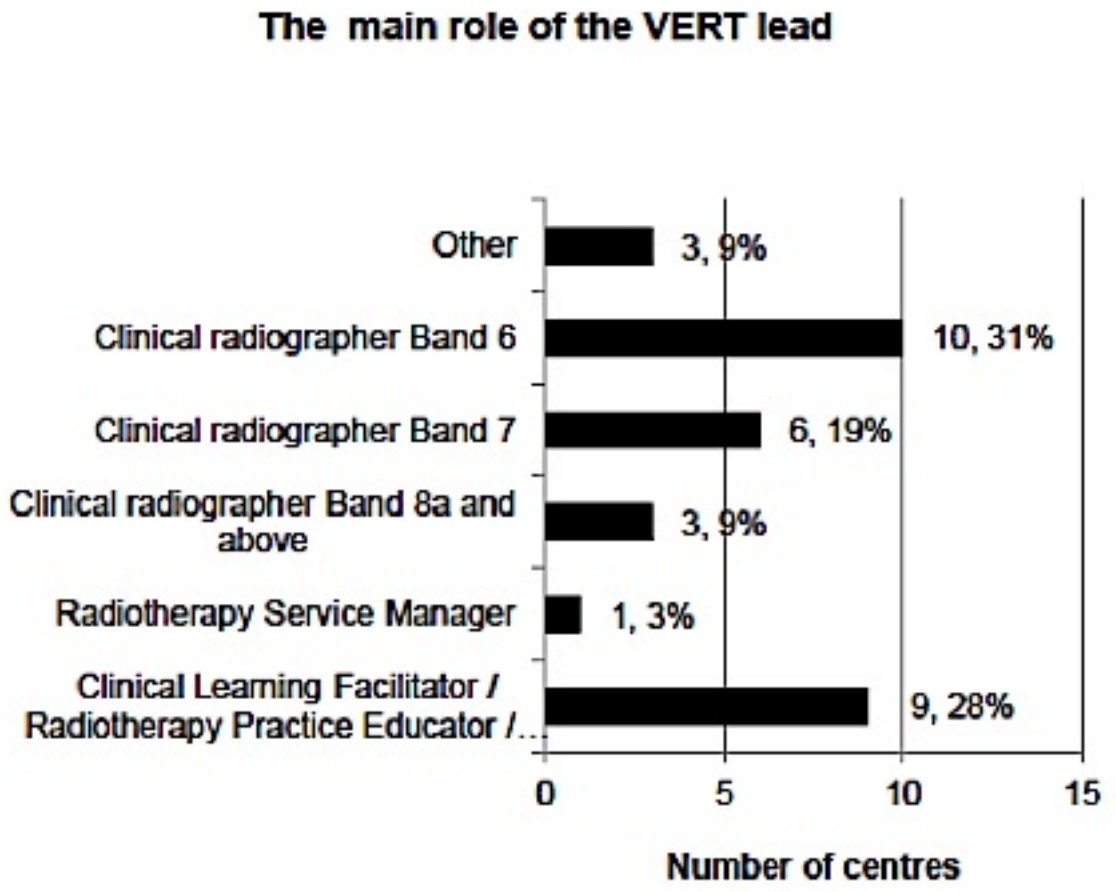
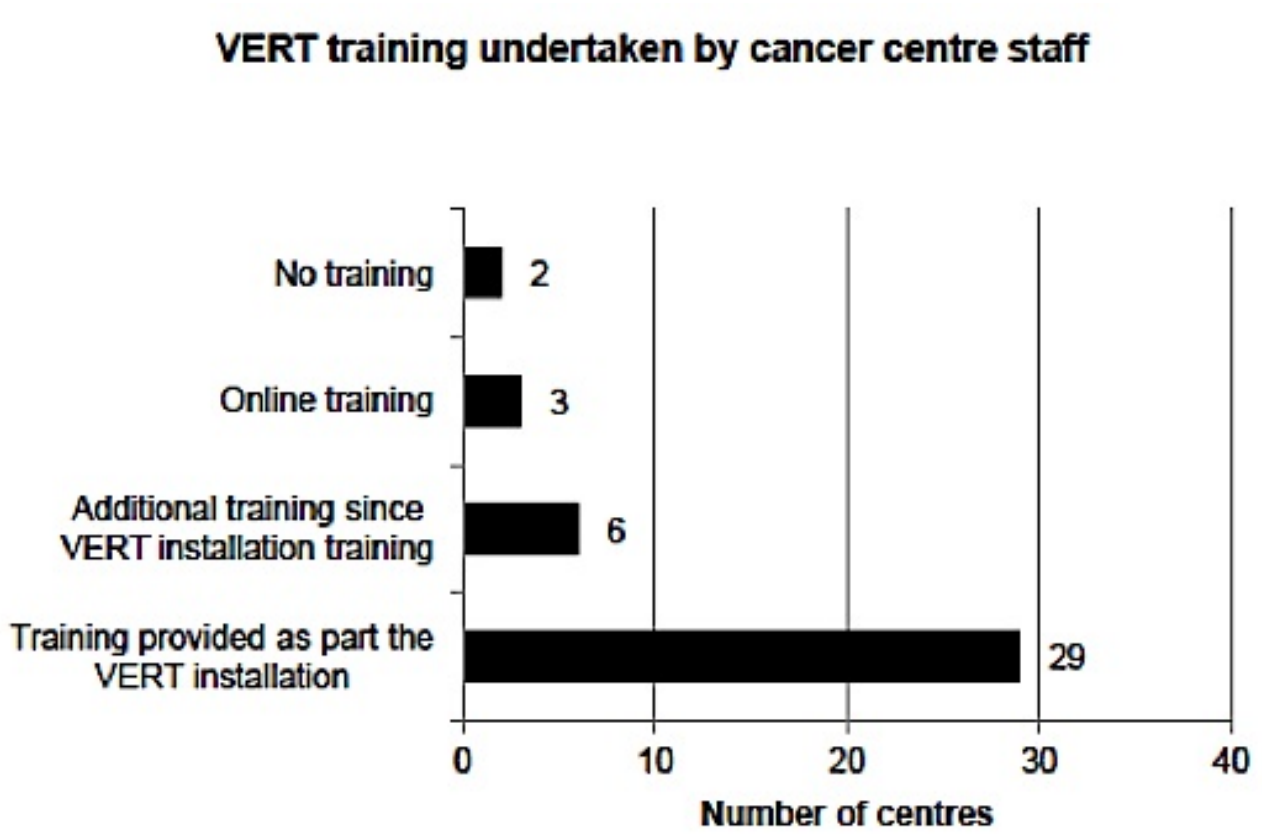


Figure 9 indicates the main roles undertaken by the therapeutic radiographers who are the dedicated VERT lead. There are 32 responses to this question as respondents were able to select more than one response if they have two roles within their centre.

VERT training undertaken by cancer centre staff

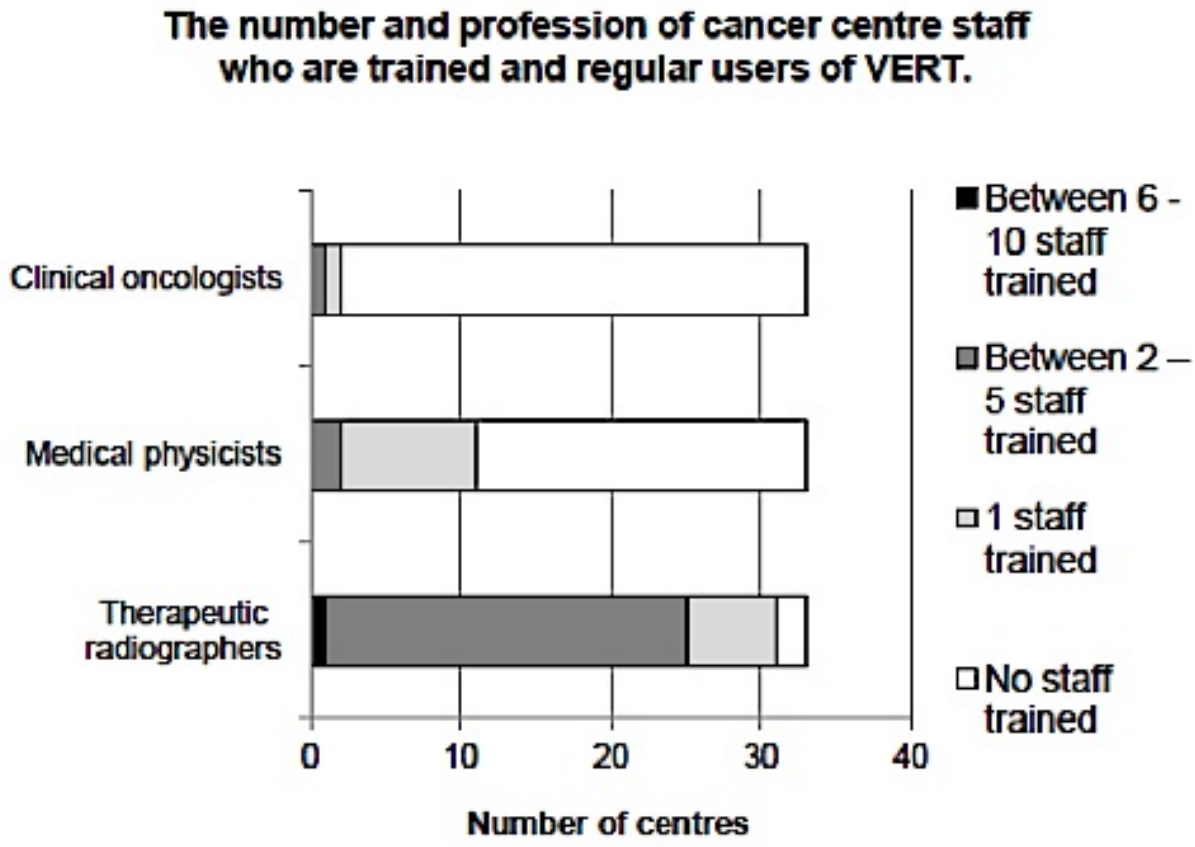
Figure 10



Of the 33 centres with VERT installations, the majority confirmed that they had received training as part of the VERT installation as shown in figure 10.

The number and profession of cancer centre staff who are trained and regular users of VERT.

Figure 11



The majority of staff trained in VERT are therapeutic radiographers as shown in figure 11, with 24 centres having between 2-5 trained therapeutic radiographers.
Only 11 centres have any physics staff trained in VERT and only 2 centres have any clinical oncologists trained.

Utilisation of VERT for the induction of staff

Figure 12

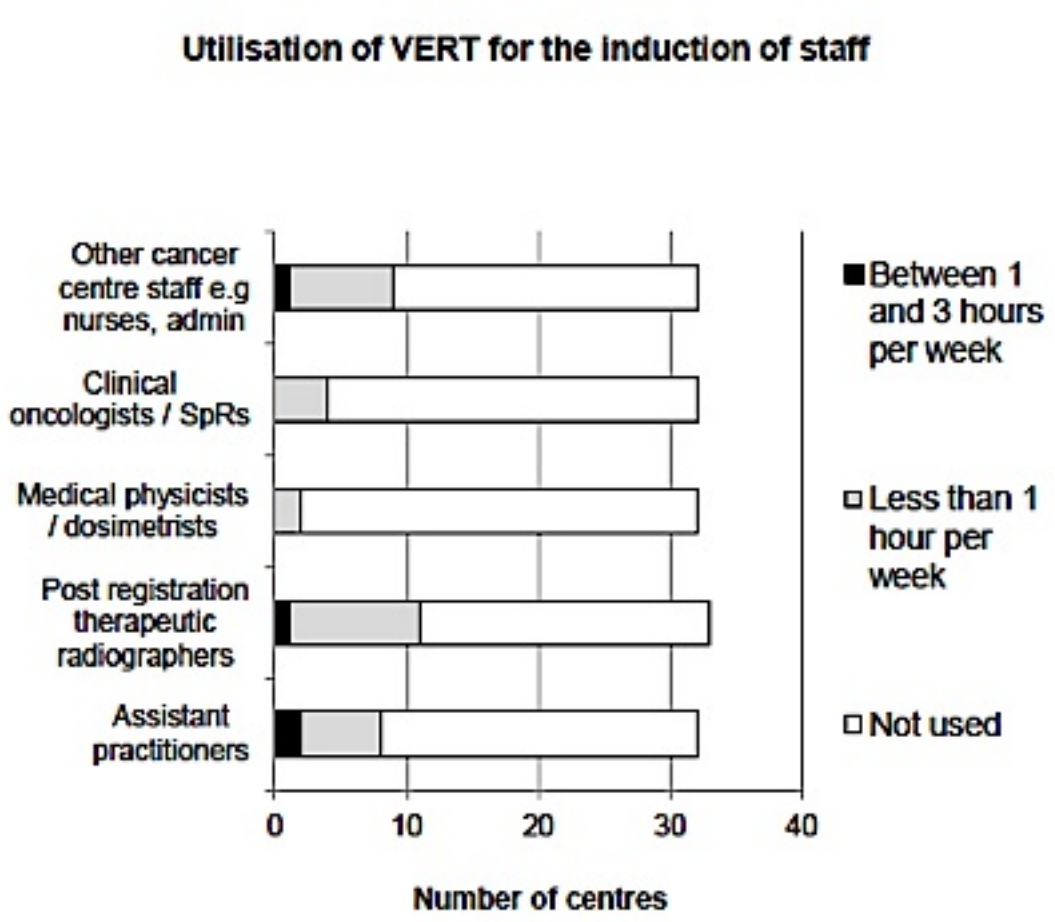
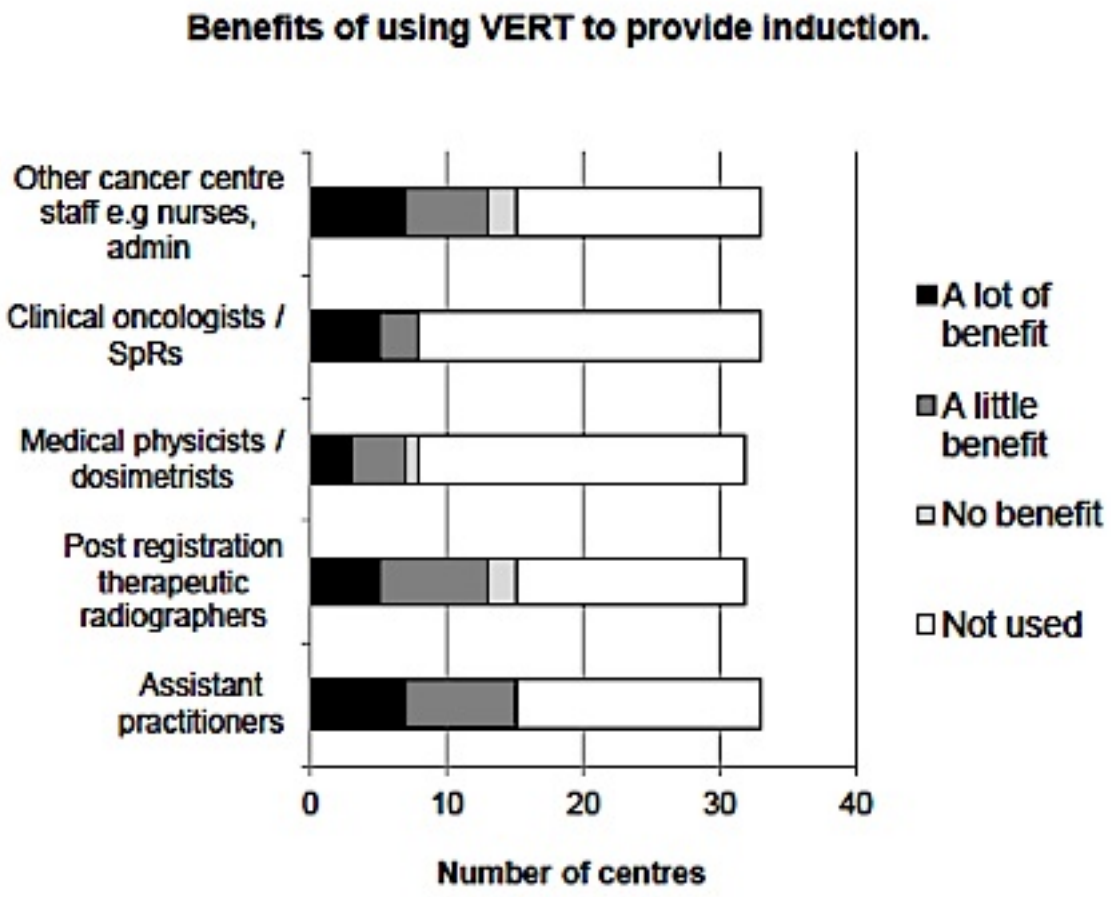


Figure 12 illustrates the limited use of VERT for induction of staff. The most frequent use of VERT for this purpose was for the induction of post registration therapeutic radiographers, other cancer centre staff and assistant practitioners.

Benefits of using VERT to provide induction

Figure 13



In the centres using VERT for the induction of staff, the majority of these centres felt there was benefit from this activity with only a small number of centres indicating no benefits as shown in figure 13.

Utilisation of VERT for the training of staff

Figure 14

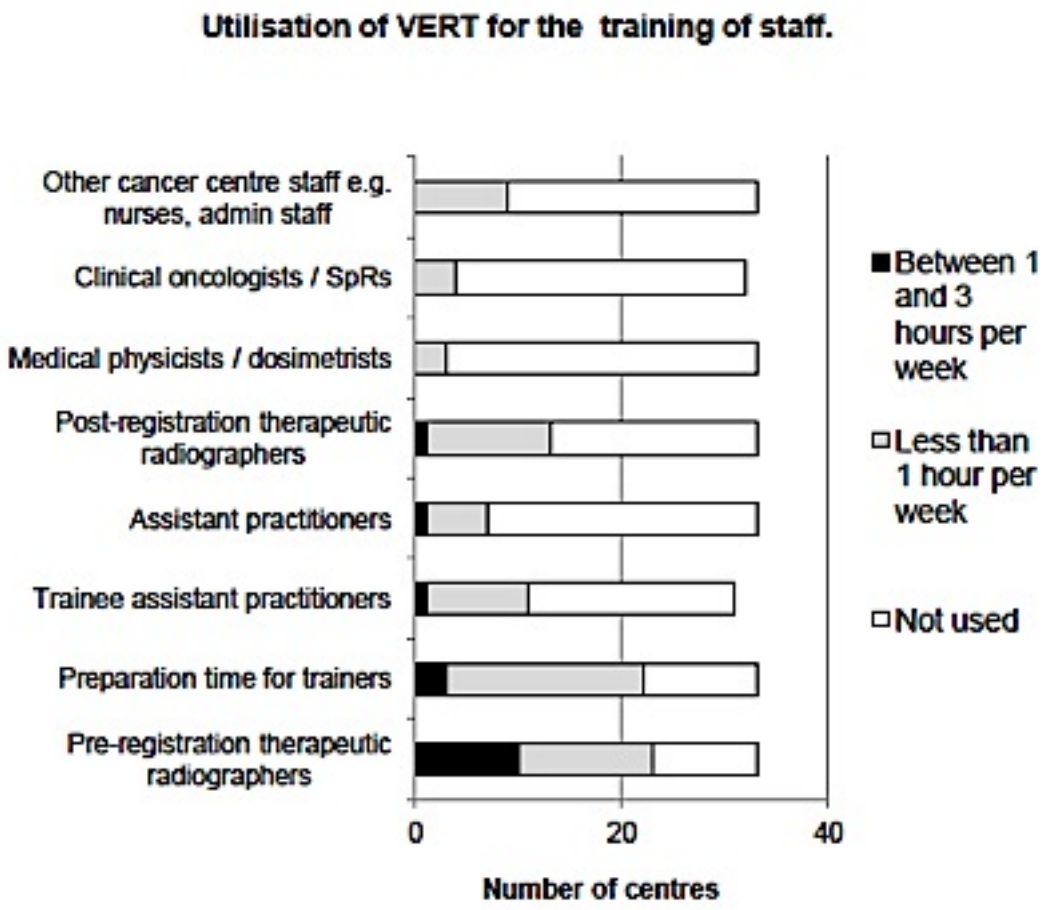
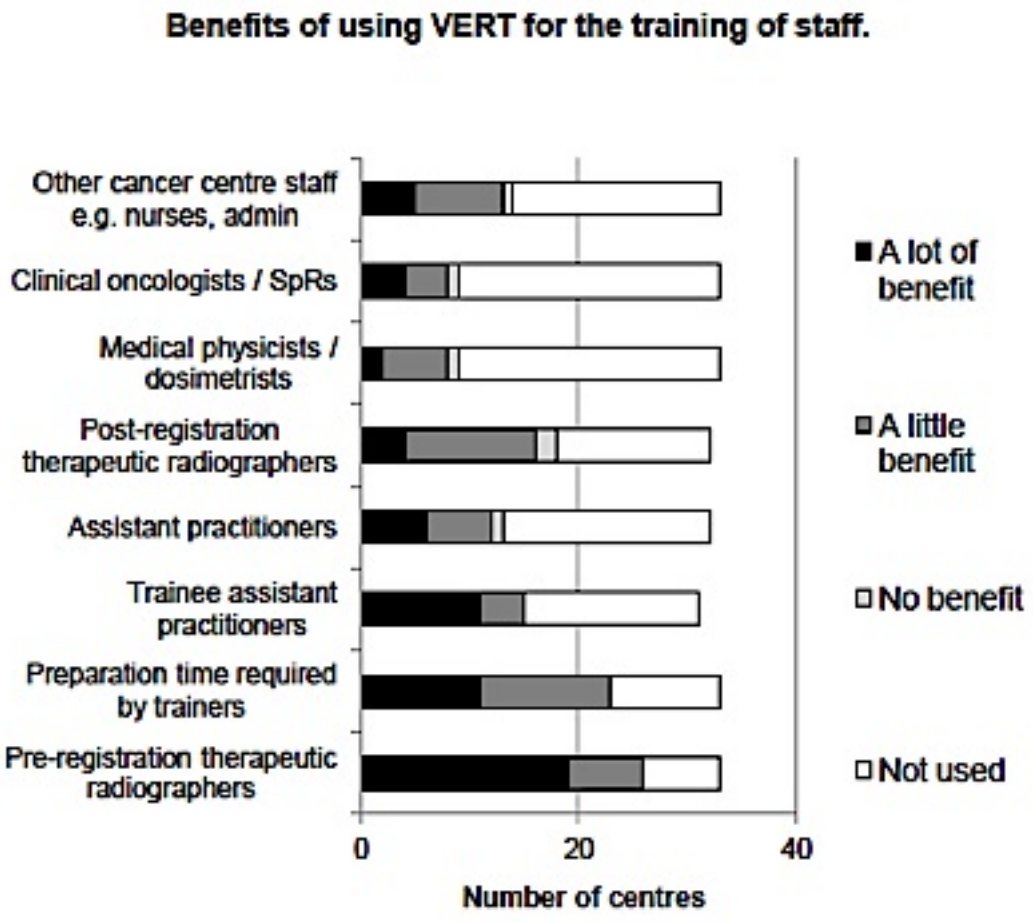


Figure 14 illustrates the use of VERT for training staff. The most frequent use of VERT for this purpose was for pre and post registration therapeutic radiographers and assistant practitioners. Infrequent use for training of medical physicists and clinical oncologists was reported.

Benefits of using VERT for the training of staff

Figure 15



In the centres using VERT for training staff, the majority of these centres felt there were benefits from this activity, with only 6 centres indicating ‘no benefits’ as shown in figure 15.

Utilisation of VERT for the introduction of new treatment techniques

Figure 16

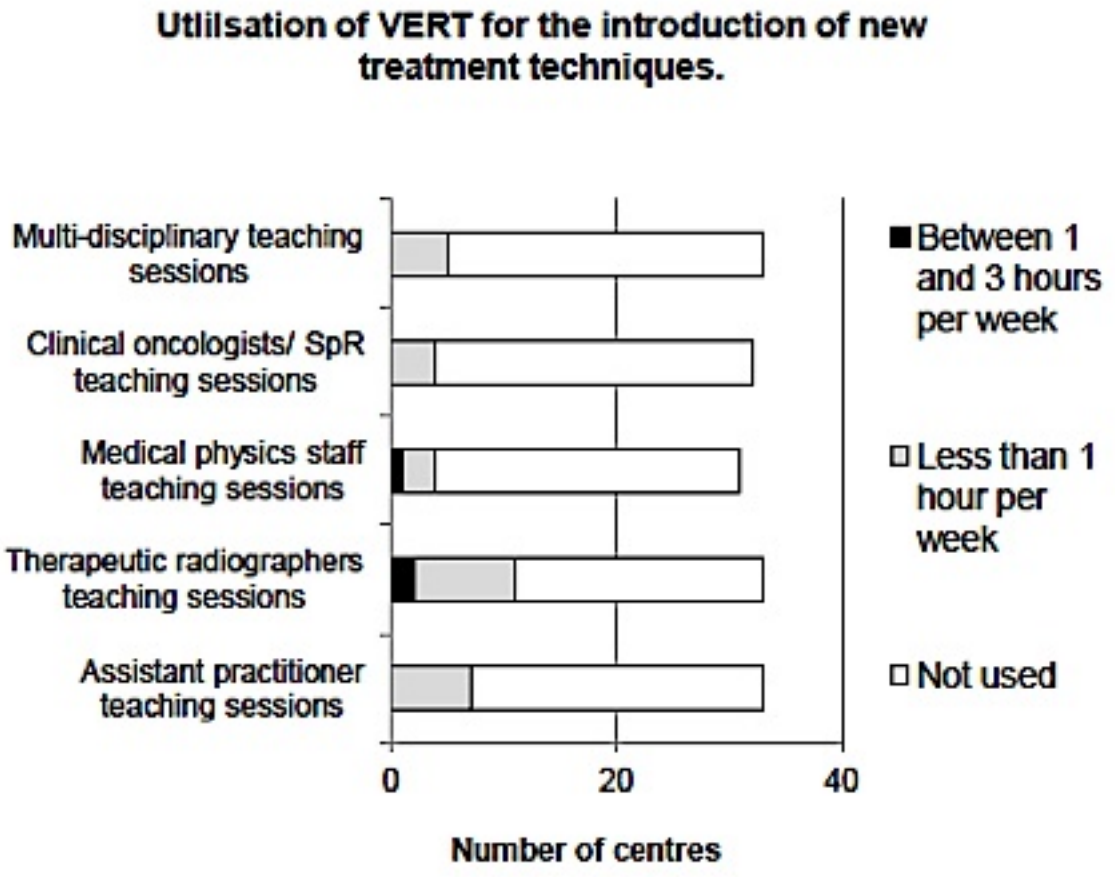
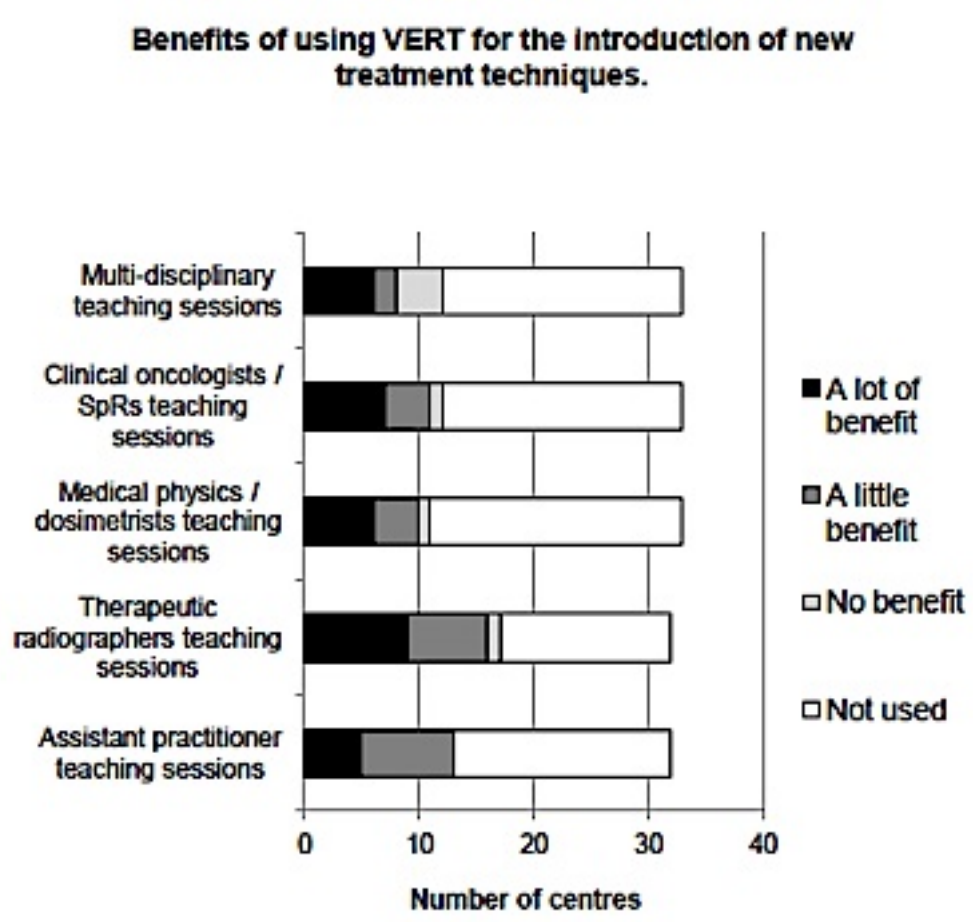


Figure 16 illustrates the limited use of VERT for the introduction of new treatment techniques. The most frequent use of VERT for this purpose was for post registration therapeutic radiographer teaching sessions. Only a small number of centres use it for the other professionals' teaching sessions .

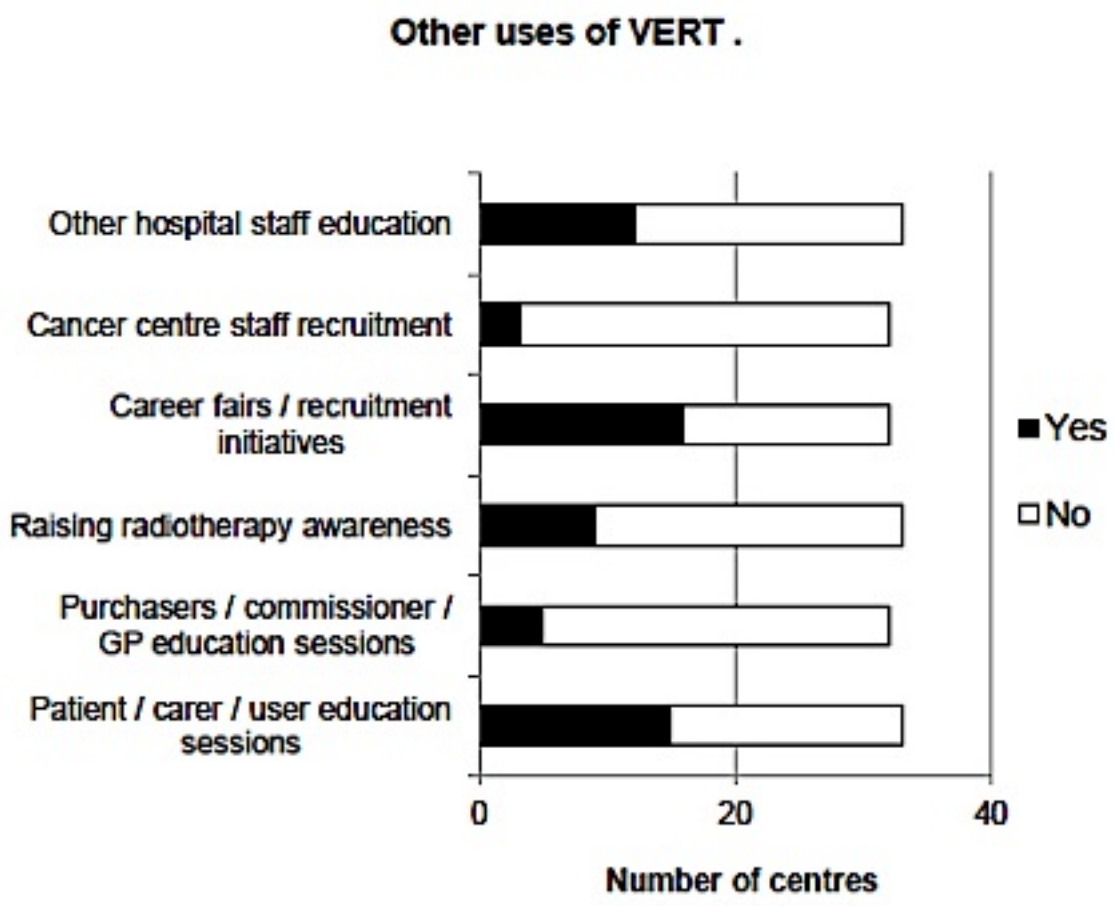
Benefits of using VERT for the introduction of new treatment techniques

Figure 17



In the centres using VERT for the introduction of new treatment techniques, the majority of these centres felt there was benefit from this activity.

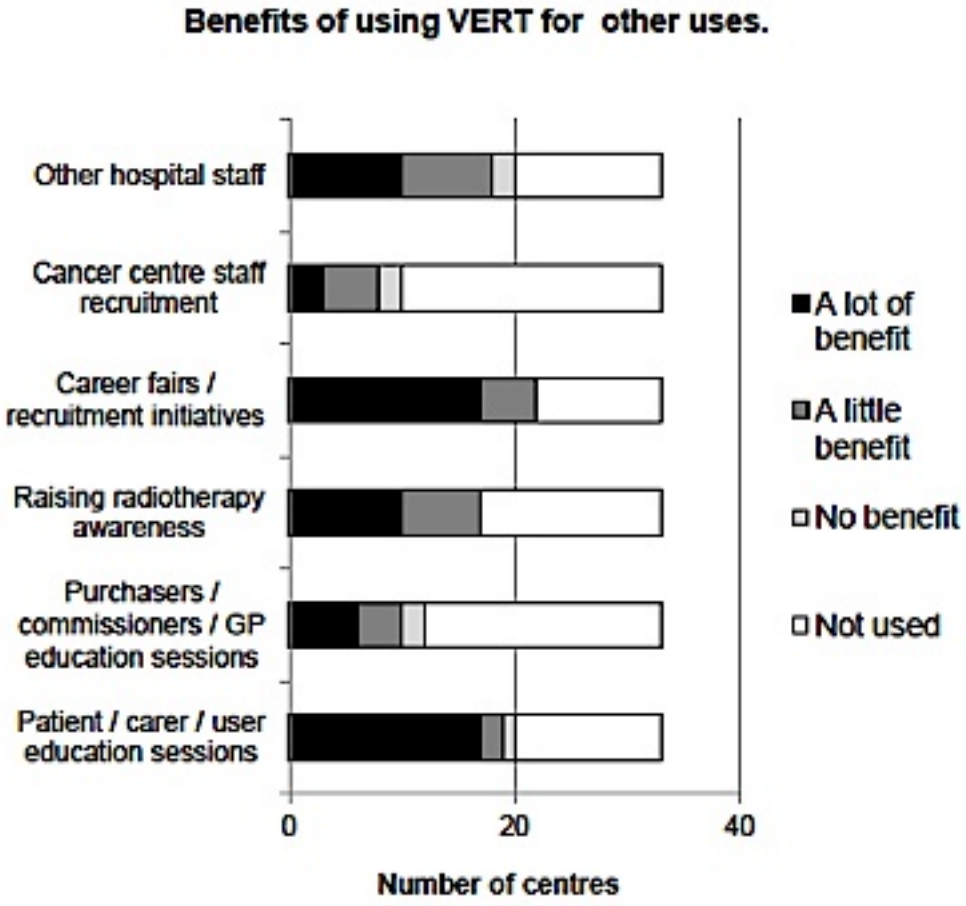
Other uses of VERT
Figure 18



The most frequent other uses were patient/carer/user education sessions; careers fair/recruitment initiatives and other hospital staff education sessions, as shown in figure 18.

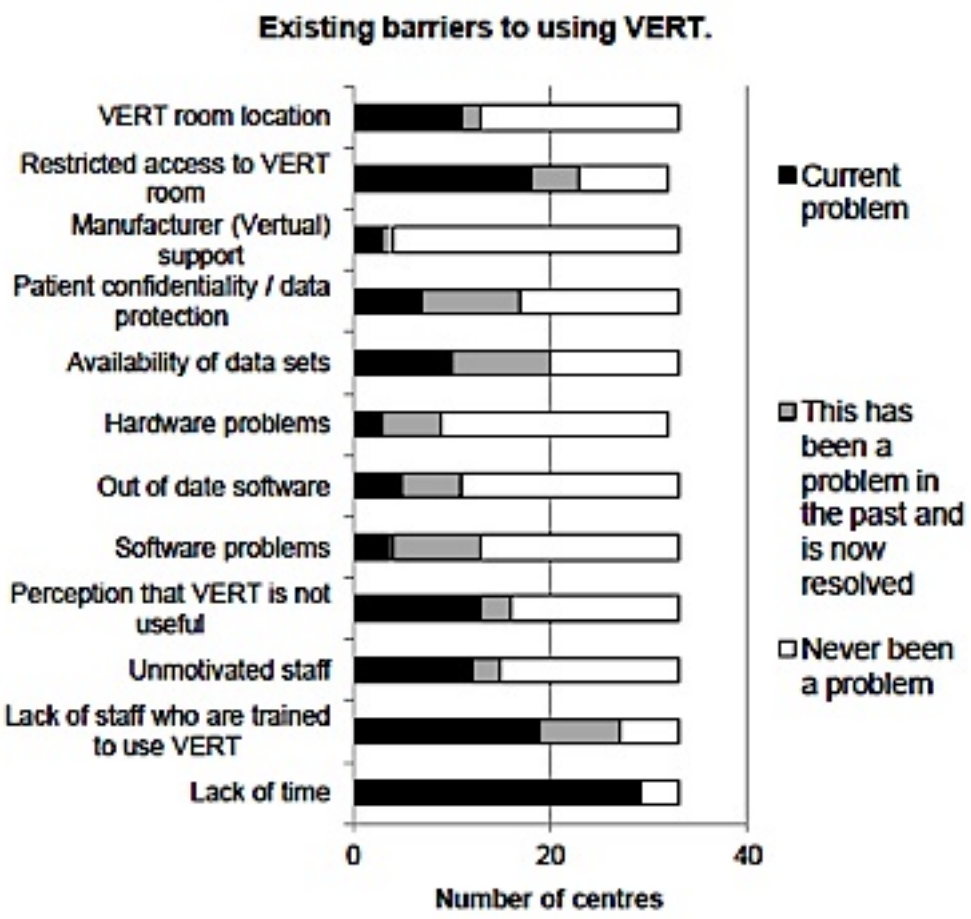
Benefits of using VERT for 'other uses'

Figure 19



In the centres using VERT for 'other uses' the majority felt there was benefit from this activity, with only a small number of centres indicating no benefits, as shown in figure 19.

Existing barriers to using VERT
Figure 20



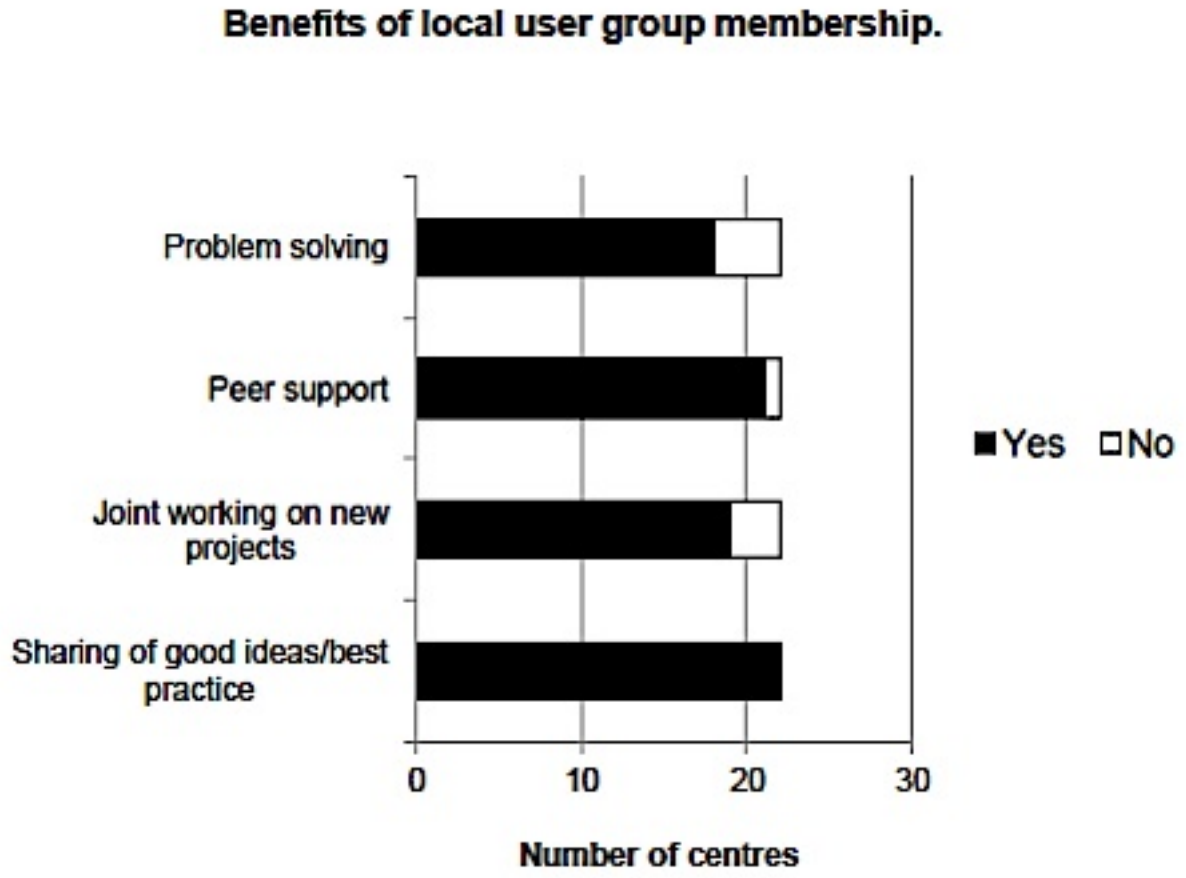
There are a range of barriers to using VERT as shown in figure 20. Lack of time is confirmed as a current barrier by 29 (87.8%) of centres with VERT systems. Restricted access to the VERT room and lack of trained staff are also confirmed as frequent barriers.

Staff attendances at the 1st VERT international user meeting
13 (39.4%) centres with VERT systems supported staff to attend the first international VERT user conference.

VERT local user group involvement
22 (66.7%) centres have staff who are members of their local VERT user group.

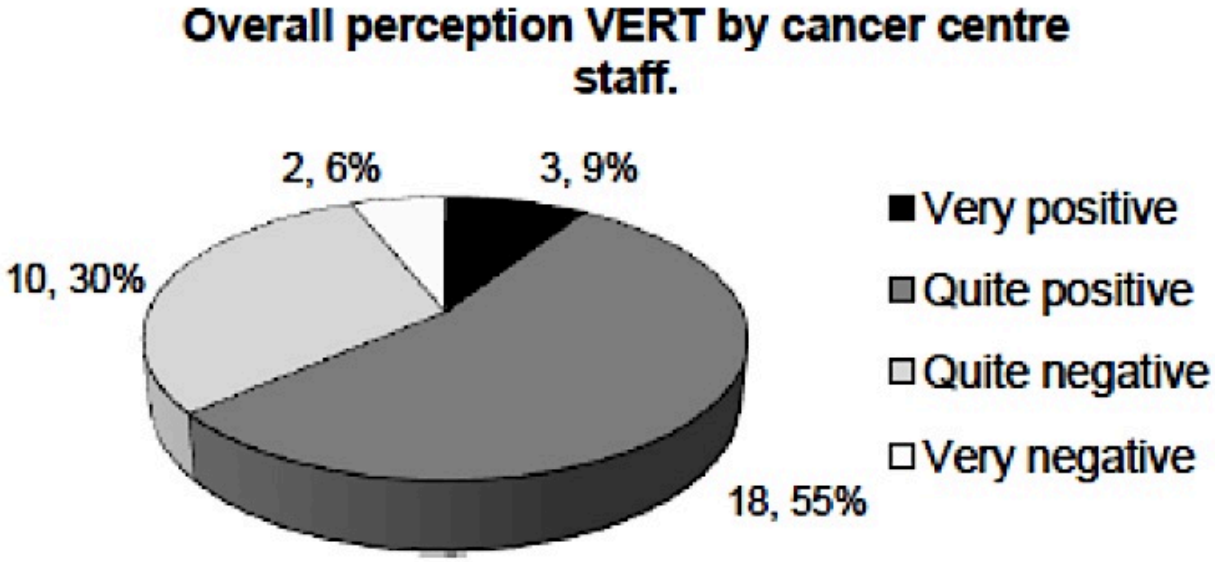
Benefits of local user group membership

Figure 21



Of the 22 (66.7%) centres that have staff participating in local user groups, the vast majority agreed that there are a range of benefits as shown in figure 21.
An additional benefit identified “Ensures parity and continuity of experience for pre-reg students accessing different placements from the same academic program”.

Overall perception of VERT by cancer centre staff
Figure 22



Results from the survey indicate a variety of perceptions about VERT as shown in figure 22, with 21 (63.6%) centres indicating very or quite positive’ perceptions. It will be seen that over a third of

centres indicated quite or very negative perceptions (12 or 36%)

Future additional plans
Respondents were asked to identify future additional plans for the use of VERT. There was a variety of comments in response, as follows:

- Improve liaison with Higher Education Institutions (HEIs) (2 centres)
- Introduce it into their patient education sessions (7 centres)
- CT anatomy teaching sessions (1 centre)
- Careers fairs (1 centre)
- Enhance existing student training (1 centre)
- Improve data sets (1 centre)
- Establish internal user group (1 centre)
- Widen use to include other staff groups (5 centres)
- Appoint another VERT lead (1 centre)
- Training for new techniques such as adaptive RT, IGRT (2 centres)
- Continual Professional Development (2 centres)
- Provide GP education sessions
- Provide health promotion sessions

Further comments
The final question asked for any other comments about VERT. The key themes from these comments were as follows:

1. **Room location issues.** Inaccessibility of the room in which VERT is installed is a major problem. In one radiotherapy department, moving the system into the department from the post graduate education centre has increased availability and flexibility.
2. **Staffing issues.**The time/ staff resource required to utilise VERT is demanding, especially when centres have budgets squeezed and staffing levels further reduced. Potentially, VERT will become less widely utilised unless staff can be assigned to using it. But it is difficult to build a business case for dedicated staff. VERT can have a very positive effect on the student experience and in turn the future workforce supply - but the dichotomy arrives when patient throughput has to take priority in departments which are understaffed.
3. **Practical issues.** It is difficult to show breast techniques with the various immobilisation devices, like knee rolls and footrests. The projection system and IT access and support is problematic; for example no IT access available, and frequent image misalignment resulting from non VERT use of the projection system.
4. **Development of new techniques.** VERT is a very useful remedial tool, however it will need to adapt in the advent of new techniques

3.2. Further analysis

Introduction

It was not possible to test for significant differences in the data summarised and described in section 3.1. This was because statistical testing is unreliable when small numbers are analysed.

However it was possible to develop an objective scoring system to identified ‘high’ users of VERT. This was achieved by allocating points to every response of each question.

For example, questions requiring a yes or no response, 1 point was allocated to ‘yes’ response, and 0 points were given to a ‘no’ response.

For questions with a range of possible responses, the most positive response was given the highest score and the most negative response was given the lowest score. All questions were scored and the totals accumulated. The resultant scores ranged from 47 to 6. Out of a possible total score of 104.

From reviewing the range of scores, ‘high’ users were deemed to be those with scores above 30 points. From reviewing the activities and features of the high users, it was then possible to identify their key characteristics, as follows:

Characteristics of a ‘good VERT user centre’
Management commitment

- VERT located within cancer centre or in close proximity to centre for convenience of use and access
- Designated VERT lead identified by service manager and allocated work time for effective development and implementation of VERT
- Staff supported and encouraged to undertake VERT training opportunities
- Staff supported and encouraged to participation with User Groups; including establishing an ‘internal’ user group and attending both local and International user group meetings.
- Financial commitment to upgrade licence software with software renewal contract in place.

User commitment

- Multi-professional approach with therapeutic radiographers, physicists and clinical oncologists all VERT trained with at least two (or more, depending upon centre size) individuals from each profession trained to ensure there is support available when required. This approach also reduces the risk of losing an individual’s expertise if a sole trained user leaves employment within the centre.
- Use of VERT for variety of purposes: induction, training, introduction of new treatment technologies for radiotherapy staff, education of patients, users, GPs, commissions, other hospital staff; promoting radiotherapy within own hospital and in the community such as at careers fairs and staff recruitment events.
- Use of VERT in variety of locations including use of mobile (laptop) VERT
- Regular usage of more than one software licence
- Having a positive perception of VERT and eagerness to use VERT

3.3. Case studies

The survey identified several centres that have developed their use of VERT to meet specific local needs and effective involvement with VERT user groups.

In this section, a series of case studies are presented to outline different activities developed and implemented by these centres. They include a brief outline of why and how these activities were instigated and any benefits achieved. The case studies are offered as examples of good practice to encourage and inspire others to investigate and further develop the use of their VERT systems.

The case studies included relate to:

- pre-registration therapeutic radiographer training
- post-registration therapeutic radiographer training and CPD
- education and teaching of clinical oncologists, specialist registrars and medical students

- introduction of new technology and treatment techniques
- patient /carer/user education sessions
- raising radiotherapy awareness in the community
- careers fairs and staff recruitment events
- other hospital staff education
- involvement with regional user groups.

CASE STUDY ONE: Pre-registration therapeutic radiographer training - 1

Goal
Provision of a safe learning environment for pre-registration therapeutic radiographers.

Background
The National Radiotherapy Advisory Group (NRAG) report 1 identified the importance of providing a safe learning environment for pre-registration therapeutic radiographers, particularly in their first year of training.

VERT was recommended as a means of preparing students for a positive clinical experience to help address the high attrition levels in therapeutic radiography training programmes.

This approach is also supported in the Society of Radiographer's document Improving Student Retention: Guidelines and Good Practice. 4

Activity
The majority of UK radiotherapy education providers place pre-registration therapeutic radiographers in several different placement sites, with one provider using up to ten different placements sites.

This situation potentially creates the risk of differing experiences depending upon the clinical placement site. One regional VERT user group whose local education provider uses six clinical placements sites recognised the importance of parity of training across all their placement sites and, in order to achieve this, developed a generic clinical workbook. 5 By aligning this workbook to the curriculum, the students are able to develop their clinical competences in a safe learning environment as they progress through their undergraduate education programme.

An evaluation of the workbook has been undertaken using a questionnaire. The results from this indicate that the workbook approach is well received by the students. It is felt that it increases their confidence levels and enhances their understanding by bridging the gap between theory and practice, and developing their clinical reasoning skills which is where it is felt the emphasis lies.

Conclusion
The development and use of this clinical workbook has provided a valuable resource for the pre-registration therapeutic radiographers to ensure parity of training across the differing the clinical placements, enhancing their learning environment and increasing the use of VERT across the region.

CASE STUDY TWO: Pre-registration therapeutic radiographer training - 2

Goal
To use VERT to identify and address pre-registration therapeutic radiographers at risk of leaving their education programme due to their perception of their clinical experience.

Background
The NHS trust was provided with a mobile VERT system by the National Cancer Action Team (NCAT) as part of investigative research project6 to explore the use of VERT in improving the students' perception of their clinical experience.

Activity
Within the timeframe of this project, all 1st year students were offered time-tabled, one-to-one,

student directed tutorials using VERT at least once during their clinical placements. These sessions were designed to enable the use of VERT in a safe environment, and, when needed, to act as an enabler to allow any social and pastoral issues to be identified and discussed between the student and the facilitator who was always an experienced superintendent radiographer or practice educator.

The students were invited to sign up for sessions and were able to specify the practical content themselves and they were not time limited so that all the students' needs could be met . The majority of sessions were completed in 1 hour, but in some cases extra time was required and extended sessions to 1.5-2 hours.

A clinical perception tool was developed for students to provide feedback scores on 8 aspects of their clinical experience where the use of VERT was influential. The tool enabled the cancer centre staff to monitor the effectiveness of VERT in improving the students' perception of their clinical experience. Immediate action was taken if any students were identified 'at risk' of leaving their education programme and which aspect of their clinical experience was leading to their decision.

Conclusion
The results from this project6 demonstrated that VERT played a key role in lowering stress and improving the students' confidence levels and therefore reducing the individuals' likelihood of leaving the programme.

CASE STUDY THREE: Post-registration therapeutic radiographer training and CPD

Goal
Facilitation of post-registration therapeutic radiographer training sessions

Background
With the increasing computerisation of all aspects of radiotherapy planning and treatment, delivery of the knowledge and skills required of therapeutic radiographers has evolved as newer technologies have become available.

VERT is able to provide a safe learning environment for post-registration therapeutic radiographers to allow them to maintain and enhance their knowledge and skills as new equipment, planning and treatment techniques are introduced into clinical practice. 6 A greater understanding of CT anatomy in relation to the planning and delivery of radiotherapy treatments has been essential as the use of virtual simulators and treatment techniques such as cone beam CT requires therapeutic radiographers to be able to accurately interpret CT images.

Activity
A large radiotherapy centre realised the need to facilitate in-house CT anatomy training sessions for a reasonable proportion of its therapeutic radiography workforce. The duration of these sessions is approximately one hour and they are therefore accessible to a reasonable number of staff simultaneously, providing an opportunity to refresh and enhance existing knowledge and skills. Sessions have also been undertaken to teach radiographers how to resolve treatment set up problems for breast cancer patients.

The sessions are designed to be interactive, for example the participants are asked to label a transverse CT section on a print out and the identical slice is then displayed on VERT allowing participants to check their answers. Multiple choice questions are displayed using the virtual presenter function on VERT and the participants demonstrate their chosen answer by using an indicator card.

VERT has allowed the visualization of anatomy in terms of size, relationship to other organs and bony anatomy.

Future ideas
The intention is to develop sessions based on different tumour sites and provide demonstrations of

unusual treatment techniques by developing a series of case studies which relate radiotherapy side effects to anatomical structures.

Participant feedback from the evaluation of past sessions has highlighted requests for head and neck anatomy sessions and consequently a case study was recently developed presenting the treatment of a patient with ethmoid cancer.

This session demonstrated the organs at risk and the implications for their received doses when adjustments were made to the treatment set up.

Conclusion
The use of VERT has proven to be a useful tool to provide safe, effective, accessible and enjoyable learning sessions for the therapeutic radiography staff in a large radiotherapy centre.

These sessions have enhanced their knowledge and skills as new technologies and treatment techniques have been introduced, while also assisting with the individuals to comply with their mandatory professional CPD requirements as part of maintaining their professional registration.

CASE STUDY FOUR: Education and teaching of clinical oncologists, specialist registrars and medical students

Goal
To explain a range of radiotherapy principles and treatment techniques to a variety of staff groups and students which includes clinical oncologists, specialist registrars and medical students.

Background
The radiotherapy department in a large teaching hospital had received a high number of requests for in-depth explanations of radiotherapy techniques to a variety of staff groups.

The radiographers had experience in using VERT during anatomy tutorials and felt VERT would be an invaluable tool to teach radiotherapy techniques in response to requests from specialist registrars to explain the more complex techniques. These are much easier to demonstrate using a 'virtual' system rather than 'pen and paper'.

Activity
VERT is now used to train and educate clinical oncologists, specialist registrars and medical students and improve their understanding of radiotherapy in the following ways:

- by practical demonstrations of treatment techniques and principles as part of the specialist registrars' revision of theory in preparation for their FRCR examinations
- by weekly tutorials to the specialist registrars from the consultant oncology team
- in the induction of medical students during their radiotherapy placements.

All these sessions are carried out by one of the therapeutic radiographers with a small team of designated individuals.

Conclusion
VERT is regularly used to teach a variety of staff groups in the department including medical staff as described above. The department now has a good catalogue of complicated and difficult techniques as VERT tutorials which are used to provide these education sessions.

CASE STUDY FIVE: Introduction of new technology and treatment techniques

Goal
The introduction of new technology and treatment techniques into clinical practice.

Background
For many radiotherapy centres the introduction of new treatment techniques such as Intensity-Modulated Radiation Therapy (IMRT) and Image Guided Radiation Therapy (IGRT) can be challenging as centres are under pressure to continuously utlilise their radiotherapy capacity as efficiently as possible. Reducing the number of patients treated per linear accelerator while introducing new techniques may not be practicable and any ways of reducing pressure on the staff and the demands on the linear accelerator capacity when introducing new treatment techniques are welcomed.

Participating in clinical trials which require the implementation of a new technique to a given centre may provide some level of reassurance to the clinicians in that centre, as the introduction of a new technique as part of a clinical trial necessitates adhering to the framework and governance outlined within the trial and QA protocols.

The clinicians are thus supported to successfully implement a new technique to the patient group eligible for entry in the clinical trial. The experience and resultant expertise from this patient group then enables these clinicians and their colleagues to roll this technique out across a wider group of patients within the centre.

Activity
A multi-disciplinary approach to teaching the new technique was adopted. Presentations were given to oncologists, junior doctors, radiographers, physicists, management and anybody else who wanted to attend. This series of presentations included the clinical oncologist explaining the principles of IMRT and the aims of the trial; the physicist explaining the planning procedures for IMRT and quality control requirements of the trial and the radiographer from the Clinical Trial Unit outlining the trial recruitment, randomisation and trial endpoints.

The professional development co-ordinator used VERT to demonstrate the IMRT plan by demonstrating the treatment planning volume, the treatment volume and the outlined organs at risk in relation to the external surface of the patient. In dual display, VERT was also used to show the treatment segments changing thus demonstrating IMRT in a dynamic and graphic way and making it more understandable by a multi-disciplinary audience.

As a consequence of this approach this centre has included a VERT session into the training of staff for their individual IMRT competencies.

Conclusion
This experience gave the opportunity to educate a multi-disciplinary group of radiotherapy staff about IMRT and the relevant clinical trial as part of an approach to ensure the safe and efficient introduction of a new treatment technique into routine clinical service.

CASE STUDY SIX: Raising radiotherapy awareness in the community

Goal
Raising the profile of radiotherapy across a wider range of users and others such as other members of the directorate, school children and patients.

Background
The NHS trust was provided with a mobile VERT system by the National Cancer Action Team (NCAT) as part of an investigative research project7 to explore the use of VERT in advancing clinical practice and enhancing inter-professional working.

Initial Activity
The introduction of the mobile VERT in the oncology department warranted the establishment of a working group. This group included a physicist, the clinical lecturer and a radiographer with an interest in IT and new technologies. The initial plan was to examine and fulfill the research title before branching out to wider uses. However once mobile VERT was in use, a number of additional

opportunities to use VERT presented themselves so the working group moved these forward alongside the ongoing investigation into the research question.

Initially a fair amount of time was required to establish the systems and sessions. However as many of these initial sessions were able to be adapted to serve several purposes, the overall time required for the development of subsequent sessions was reduced.

Activity
The key activities undertaken within this project included:

1. Directorate education sessions on radiotherapy. VERT was used to demonstrate the patient pathway experiences of prostate, breast and head and neck patients.
2. Prospective undergraduate students were introduced to radiotherapy and the available careers. VERT mobile was used to demonstrate radiotherapy at local careers events.
3. High school education sessions. VERT was used to deliver GCSE Science lessons within the hospital environment to a range of students of differing abilities. These sessions were tailored to the area of the curriculum requested by the school such as the anatomy of the skin, and X-ray production. Students were given the opportunity to use VERT and ask any questions they had regarding oncology, and the various careers available in the radiotherapy department.
4. Patient education sessions. Sessions were advertised throughout the oncology department and in selected areas in the hospital. New patients were made aware of the sessions if it was considered that they would benefit from them. These sessions were informal drop-in sessions tailored to the questions arising from the participants. A number of staff including a physicist, radiographer and Macmillan support radiographer attended to answer any queries that were raised.

Planned Activity
Future plans for VERT included the continuation of monthly patient drop in sessions and the GCSE educational sessions. Further schools within the area have been in contact with the oncology department and it is anticipated that a rolling programme of lessons will be developed.

It is also hoped that a session will be developed for GP practices in the near future; this will also raise the profile of radiotherapy and help to fill any knowledge gaps for health care staff outside the hospital setting.

Conclusion
Results from this project7 demonstrate that the mobile VERT system can be an effective tool for advancing clinical practice and enhancing inter-professional working and understanding both from within the health care setting and the wider community.

Activities (2), (3) and (4) above have improved the inter-professional relationships with people outside the hospital, helped to raise the profile of radiotherapy and promote the available careers in radiotherapy.

The feedback from the patient education sessions has demonstrated that these informal sessions are beneficial to the patients by improving their understanding of the processes involved in their treatment, ultimately helping to advance clinical practice.

CASE STUDY SEVEN: Involvement with regional VERT user groups - 1

Background
Following a VERT user meeting at the Society and College of Radiographers (SCoR), it was decided to organise a regional VERT meeting. The therapeutic radiographers at two radiotherapy centres who attended the SCoR meetings identified the need to meet and took the initiative forward. All clinical placement sites and the education provider were invited to send representatives.

User meetings
Membership: Therapeutic radiographers from all clinical placement sites and a VERT representative from the education provider.

Organisation: Meetings are held 2 – 3 times per year. The meetings are at one of the clinical sites which is centrally located and the representative from this centre organises the meetings.

Terms of reference: These are in development. None formally adopted as yet.

Objectives
The key objective of the group is to make sure that the pre-registration therapeutic radiographers in the differing radiotherapy centres are getting the same VERT opportunities and that all centres are optimising their use of VERT with regard to the training of pre-registration therapeutic radiographers. Although not formalised, all group members have chosen to take responsibility for specific tasks.

Achievements

1. The development of the clinical workbooks for manual dexterity and a series of tumour sites which are used in the training of pre-registration therapeutic radiographers. This is now a mandatory part of this training and was described in case study one.

The dissemination of this work through publications and presentations.

Future plans
The development of CPD packages for post-registration therapeutic radiographers has been undertaken by the clinical learning facilitators from one of the clinical placements within this group. It is hoped that this work will be utlilised by the other clinical sites in the future.

These packages have been designed to enhance and develop existing skills and knowledge of the post registration therapeutic radiographers, as described in case study three.

Conclusions and benefits
These achievements have been realised more efficiently and effectively as a result of being members of this user group. This is partly as a result of being able to resolve problems efficiently by sharing ideas and possible solutions, such as gaining patient consent.

The preparation of patient plans and teaching resources has also been shared which has reduced the workload for each centre, ensured parity for students in the different clinical departments and effectively promoted and enhanced the use of VERT for the benefit of pre-registration therapeutic radiographers.

CASE STUDY EIGHT: Involvement with regional VERT user groups - 2

Background
This group has had three meetings since November 2010 with the attendance level growing as more VERT systems have been installed in clinical radiotherapy centres across the region. The group’s membership now includes 6 out of the 8 radiotherapy centres in the region with VERT installations.

User meetings
Membership: Therapeutic radiographers from all clinical placement sites with the exception of the site currently without a VERT installation. A professional development facilitator from each of these clinical sites also attends; these post holders are employed by the education provider.

Organisation: Meetings are held three times per year rotating round the different clinical placements to encourage attendance from a variety of centres.

All meetings are recorded and minutes are available to all members as a resource for practical peer

support purposes and to aid the efficiency of future meetings by reducing the need for repeated discussion about reoccurring problems/ themes.

Terms of reference: None formally adopted as yet.

Objectives
The group's primary objective has been to provide practical peer support to clinical radiotherapy centre VERT users, and to assist them with developing the use of VERT as part of the training programme for pre-registration therapeutic radiographers.

At least two of the clinical radiotherapy centres are in the process of customising the Breast CPD package for use by their post-registration therapeutic radiographers.

A longer term objective is to implement the use of VERT as part of oncology registrar training programme and exam revision sessions.

Achievements
The focus of the group has been to provide peer support by learning from each other's experiences, to help with resolving problems and trouble shooting. As this experience builds a wealth of knowledge across the group, membership expands and the potential to assist each other improves.

Conclusions and benefits
One radiotherapy centre representative "felt that her membership of this group had been instrumental in enabling her to get the use of their VERT system off the ground".

4. Discussion

The high response rate (82.8%) provided a good perspective of how VERT installations are being used in different radiotherapy centres across the UK at the time of this survey.
The results indicate that just over half (51%) of UK radiotherapy centres have VERT installed. However of the 20 centres currently without a VERT installation, only 1 centre is intending to install in the near future. This is presumably due to the ending of the DH funded VERT project. 2

Utilisation of VERT
These results indicate that the use of VERT varies considerably in differing radiotherapy centres. This ranges from centres declaring they are not using the system at all (figure 5) to the usage described in the series of case studies provided. The majority of centres only use VERT in its designated room. However the funding of mobile VERT (case studies two and six) demonstrate the value of this mobile VERT system and the benefits of VERT being used at additional locations other than the designated VERT room.

The most frequent use of VERT is for the training of staff; specifically for the training of pre-registration therapeutic radiographers and preparation time for trainers. This is unsurprising as the DH funding was provided as part of a strategy to improve the retention rates of pre-registration therapeutic radiographers during their training programmes. 1 It is a concern that just under a third of centres are not using their VERT systems for this training purpose.

VERT is infrequently used for induction purposes. In some centres it is being used to assist with the introduction of new treatment techniques mainly for the teaching of therapeutic radiographers. The most frequent 'other uses' are: careers fairs, patient/user sessions and education of other hospital staff.

Benefits of using VERT
Overall when questioned, the majority of centres using VERT for any of the specified purposes felt

that it provides benefits. It is very positive that very few centres indicated ‘No benefit’ with regard to using VERT for any of the purposes questioned.

VERT lead
A high proportion of radiotherapy centres have appointed a VERT lead, and this is predominantly a therapeutic radiographer who is either the clinical learning facilitator/practice educator or a band 6 radiographer.

Number and professional background of VERT trained staff and regular VERT users
The majority of VERT trained staff are therapeutic radiographers.
There are a reasonable number of centres (11) with a low number of physicists, but only 2 centres with VERT trained clinical oncologists. One of these latter centres discussed positive benefits from using VERT as part of their junior doctors’ induction programme. However this use has not been continued for unspecified reasons.

Barriers to using VERT
Lack of time, lack of trained staff, restricted access to VERT room and perception that VERT is not useful, are indicated as the most frequent current barriers. It is a concern that lack of data sets, patient confidentiality/data protection issues & perception of VERT remain as current barriers. Some of these barriers are management issues and need to be addressed to ensure that VERT is available for use, and given appropriate priority and resources.

Room location is indicated quite frequently as a barrier; however this does not match to the responses in figure 4 where the vast majority installations are in the cancer centre. Only 4 centres specify their VERT system to be in ‘close proximity to the cancer centre, but in another area of the hospital’ and only 1 centre indicated that their system is ‘some distance from the cancer centre’.
It is positive that Vertual support, hardware and software are indicated as infrequent barriers.

User group activities
It is encouraging that two thirds of centres with VERT have staff who are members of their local user groups. The establishment of local, regional and national users groups was one of the key recommendations on the VERT report2. The vast majority of responses on the benefits of being a member of a local user group were positive for all of the options specified in the questionnaire.

Perception of VERT
Two thirds of centres indicated that overall their cancer centre staffs have either a ‘very positive’ or ‘quite positive’ perception of VERT. Only 10 and 2 centres indicated their staff had a ‘quite negative’ and ‘very negative’ perception respectively.

Future plans
Many centres with VERT systems have plans to expand their own use of VERT.

Vertual is also encouraging VERT users to expand their use of VERT for CPD purposes. This was discussed at the 2011 User Group Meeting. There has been progress with supporting centres to develop outline CPD sessions on specific tumour sites or problem solving case studies. The aim is to provide a series of outline sessions which will be available to all VERT users.

These will require customisation by individual centres to allow for local differences in treatment techniques. However it is hoped this will encourage centres to use VERT for CPD sessions by reducing the time required of local staff to prepare and create such sessions.

5. Conclusions and recommendations

This comprehensive survey has highlighted the varied use of VERT in radiotherapy centres across the UK. The findings also indicate that, when used, a wide variety of benefits are experienced.

This suggests that all RTSMs should;

- commit adequate resources to develop and implement VERT fully and effectively so that its full potential is realised in all radiotherapy centres.

It is hoped that the availability of these case studies will inspire and encourage all RTSMs and radiotherapy staff to:

- review their current use of VERT
- increase the level and diversification of their VERT activities undertaken both within their centres and in their local communities.

This will result in a wider range of benefits being achieved in a higher number of radiotherapy centres across the UK.

There must also be greater promotion to encourage those centres currently without VERT to fund and install systems now that the DH funded VERT project2 has ceased.

6. Acknowledgements

The SCoR wishes to express its thanks to all the cancer centres who responded to the survey and to the individuals who provided additional information towards the content of this report.

The following individuals and their centres are thanked for their contributions:

Sarah Armstrong, Professional Development Lead, Radiotherapy, The Royal Marsden NHS Foundation Trust

Jan Antonis, Radiotherapy Product Specialist, Vertual Ltd

Louisa Alder, Trainee Clinical Scientist, Ipswich Hospital NHS Trust

Rob Appleyard, Senior Lecturer, Sheffield Hallam University

Gemma Bushby, Senior Radiographer, Weston Park Hospital, Sheffield

Louise Coleman, Lecturer, Oncology & Radiotherapy Technology, School of Science, Technology and Health, University Campus Suffolk

Dean Garnham, Treatment Area Specialist/Systems Administration, Ipswich Hospital NHS Trust

Sue Hilton, Professional Development Coordinator, Bristol Haematology and Oncology Centre.

Clare Hutton, Senior Radiographer, Queens Oncology & Haematology Centre, Castle Hill Hospital.

Alex Knights, Clinical Lecturer/ Senior Radiographer, Ipswich Hospital NHS Trust

Sara Matthews, Radiotherapy Practice Educator, Churchill Hospital, Oxford.

Heather Nisbet, Radiotherapy Practice Educator, Churchill Hospital, Oxford.

Mark Rose, Radiography Manager, Radiotherapy, Norfolk and Norwich University Hospitals NHS

Foundation Trust

Alex Thompson, Student Clinical Scientist, Ipswich Hospital NHS Trust

Jodie Pack, Radiographer, Radiotherapy, Norfolk and Norwich University Hospitals NHS Foundation Trust

Urvina Shah, Clinical Learning Facilitator, Mount Vernon Cancer Centre

Kevin Sullivan, Lead Planning Superintendent, Department of Radiotherapy, UCLH Foundation Trust

Angela Williams, Clinical Learning Facilitator, Mount Vernon Cancer Centre.

7. Further reading

Coleman L. The benefits of using virtual environment radiotherapy training. Health Service Journal Feb 2nd 2012.

Green D, Appleyard R. The influence of VERT™ characteristics on the development of skills in skin apposition techniques.

Radiography Vol. 17, Issue 3; 178-182, August 2011.

Green D. Climbing the learning curve. Synergy Imaging and Therapy Practice. August 2009.

Appleyard R, Coleman L. Implementation of an immersive virtual reality training system for radiotherapy. Imaging and Oncology, 2009

Beavis A, Philips R, Ward J. Radiotherapy training tools for yesterday’s future. Imaging and Oncology, 2007.

8. References

Department of Health, Radiotherapy: developing a world class service for England Report to Ministers from National Radiotherapy Advisory Group, DH, 2007.
http://webarchive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/publication...

Department of Health, Cancer Action Team and SCoR. Virtual Environment for Radiotherapy Training (VERT) Final Project Report (2008)

Data Protection Act 1998.

The Society and College of Radiographers. Improving Student Retention: Guidelines and Good Practice. London: SCoR, 2009.

Nisbet H, Matthews S.The educational theory underpinning a clinical workbook for VERT. Radiography Vol. 17, Issue 1, 72-75, Feb 2011.

Rose M. How can VERT be used to identify and address students who are at risk of leaving radiotherapy due to their perception of their clinical experience? 23rd May 2011. Mark Rose,

Radiographer Manager, NNUHFT.

Shah U, Williams A. How to use VERT for interactive CT anatomy for post registration training. Synergy Imaging and Therapy Practice. July 2010.

Bumstead L, Knights A, Garnham, D and Thompson, A. How VERT can be used to advance clinical practice and enhance interprofessional working. Project report, Sept 2011.

9. Appendix 1

Download questionnaire.