

## Poster abstracts - RIP5/AP2

### **MRI-guided High Dose Rate Brachytherapy for Prostate Cancer – The responsibilities and educational requirements of a radiation therapist within this novel and complex clinical process. Jessie Abed - Princess Royal Hospital, Toronto, Canada.**

#### Abstract: Introduction:

The guidance of high dose rate prostate brachytherapy (HDRpb) with interventional MRI (iMRI) improves treatment quality, but necessitates the creation of many supporting processes. Radiation therapists (RT) are ideally suited to develop and implement these processes, and this may provide an opportunity for role expansion. This poster presentation outlines the MRI-guided HDRpb process, and describes the responsibilities and educational requirements of a RT working in that environment.

#### Methods:

This research is a retrospective case study. The research environment was a large Canadian teaching hospital, which has a permanent implant program for prostate cancer and an MRI scanner dedicated to RT. There was no prior institutional experience with either HDRpb or iMRI. The researcher documenting and interpreting the findings for this case study was a BSc-prepared RT, with 2-years experience and was employed as a research therapist dedicated to this project.

#### Results:

The iMRI-HDRpb procedure involves same-day catheter insertion, planning and treatment. Various inter-professional teams are necessary to make this process work. RT responsibilities included tasks beyond the normal scope of RT practice, such as project skills management, data collection and MRI safety. The RT educational requirements include on the job training in brachytherapy and MRI, and courses in research methodology.

#### Conclusions:

The iMRI-HDRpb procedure is still experimental, yet early results are promising. The clinical procedure itself is novel and complex, and has created an interesting opportunity for RT role expansion. This opportunity provides a new avenue for RT career diversity and must be supported by significant professional development efforts.

### **The development of an advanced practice radiographer role during the clinical implementation of image guided radiotherapy (IGRT) at The James Cook University Hospital, Middlesbrough. Helen Bayles - Radiotherapy Department, James Cook University Hospital, Middlesbrough, UK.**

Abstract: The development of an advanced practice role in image guided radiotherapy (IGRT) ran hand in hand with the installation of an Elekta Synergy with cone beam imaging into the radiotherapy department at The James Cook University Hospital, Middlesbrough. Early in 2008 it became apparent that to effectively implement and develop a radiographer led IGRT service, which would include autonomous assessment of prostate, lung, bladder and oesophagus imaging a dedicated team of advanced practice radiographers was required.

The level of advanced practitioner was achieved through formal study, mentorship of clinical practice and the professional development of the radiographers involved. A job description was formulated, resulting in the successful appointing of three advanced practitioners within the radiotherapy department and has allowed for the expansion of current imaging services, having a positive impact on both service and practice development.

This poster will explain in brief the development of the advance practice role in IGRT at the James Cook University Hospital. Benners continuum and the Society of Radiographers (SOR) strategy for professional development will be utilised to exemplify the therapy radiographers' journey.

**Radiographer applied on-shell markers versus integrated board markers - a comparison of efficacy in whole brain palliative radiotherapy. Jeanette Bowes-Cavanagh - Radiotherapy Department, the Beacon Centre, Taunton, UK.**

**Introduction:**

The ability to accurately reproduce a patient's position on a daily basis is a fundamental requirement of radiotherapy and this is particularly important in the Head and Neck or Brain area. Standard practice for whole brain treatments (WBRT) involves the use of masks to limit movement; in order to ensure treatment is given in the correct place; marks are made by the radiographers on the mask to show reference points and field edges. This has problems and a more accurate method is necessary. The QFix headboard has inset fiducial markers which could prove more accurate. A randomised trial was conducted to assess this.

**Method:**

A total of 20 patients receiving WBRT using thermoplastic shells were randomised to one of the two field positioning methods – the use of the fiducial marker within the QFix board or marks applied to the shell. Each patient was imaged daily and the images reviewed by the R+D Radiographer offline, with the randomisation only being known on the completion of the trial. Feedback was sought from the radiographers.

**Results:**

Results will be presented, comparing the 2 methods, using the displacement errors from the image review. Radiographer feedback with regard to ease of set-up and patient comment is reported.

**Conclusion:**

It is hoped that one method will prove more accurate than the other from the displacement data, allowing for a definitive protocol. If this is not the case, then the feedback from the radiographers will play an important role in the method that is applied.

**Into Another Dimension: CT Anatomy Training using VERT.**

**Pete Bridge - Sheffield Hallam University, UK**

**Abstract: Introduction**

The introduction of new image-guided radiotherapy (IGRT) technology and the increasing role played by radiographers in previously specialised areas such as planning have led to an increased emphasis on CT image interpretation in pre-registration radiotherapy education programmes. At Sheffield Hallam University, a newly developed 3D immersive visualisation application has been used to enhance student understanding of 3D relational and CT anatomy.

**Results**

Over 200 highly detailed structure outlines were created on 2.5mm CT slices within pelvis, thorax, head and neck and intracranial regions. This comprised all major organs, ducts, bones, cardiovascular structures and selected muscles. These outlines were imported into the 3D VERT immersive visualisation environment for use as a teaching resource. Evaluation of this resource showed that 75% students scored the effectiveness of this VERT resource as "good" or "very good" and 25% as "average". Feedback also suggested that students found the resource to be fun and that they desired more time with it. The existing VERT application is not the ideal interface for this resource and considerable lecturer input is needed to demonstrate structures to students.

**Conclusion**

Highly detailed structure outlines have been used successfully in VERT to aid student understanding of 3D relational and CT anatomy. Student feedback indicates the high value of the application and student demand for more time with the resource is clear. Work is being undertaken to develop a dedicated 3D VERT Anatomy educational software application that will empower students to learn independently.

**Radiotherapy Careers Open Day; An innovative approach to improving local recruitment. Melanie Clarkson - Radiotherapy Department, James Cook University Hospital, Middlesbrough, UK**

**Abstract:** The Radiotherapy Department at The James Cook University Hospital in Middlesbrough is currently undergoing a major expansion project resulting in the department doubling in size across the current centre and the new ambulatory centre. Amongst the many practical issues that need addressing with such a development, one is staffing the new size department. The department in Middlesbrough has historically had problems attracting staff to work to the area. The long term objective of the day is to relieve staff shortages by showcase the careers of Therapy Radiographers, Medical Physicists and Medical Technologists. Anyone interested in any of the careers are encouraged to attend the day from GCSE students to mature students, science and career teachers. The day begins with information gathering in the waiting room where the staff supplies written and verbal information to the potential students and their families. Small groups are then escorted around the department starting in pre-treatment, dosimetry, a linac with the covers removed, and a linac with cone beam and finally ending with an interactive session on VERT. By highlighting these careers to the local population, it is hoped, that they will embark on the appropriate degree course in the local area and/or seek to gain employment in Middlesbrough because of links they have with the area. The events have been very successful and the day is continually evolving. The poster will highlight the evolution of this day and the potential for improving local recruitment.

**Positioning of Prostate Cancer Patients: Combi-Fix vs Vacuum Cushion**

**Presenting Author: Ana Cravo de Sá - Higher School of Health Technology of Lisbon, Portugal.**

**Abstract:**

**Purpose:** During the radiotherapy treatments it's important to maintain the position reproducibility. It is common to use positioning devices in order to guarantee this reproducibility. Patients with prostate cancer who undergo radiotherapy treatment are usually positioned with a knee and feet support or Combi-fix® and a vacuum cushion or Blue Bag®. To evaluate which of the positioning and immobilization devices, Combi-fix® or Blue Bag®, guarantees the best immobilization and gives less deviations.

**Materials and Methods:** The deviations produced by the positioning and immobilization devices were analyzed with a sample of 52 patients, divided in two classes, according with their weight and with the positioning device. Statistics were made using the software named Predictive Analytics SoftWare (PASW).

**Results:** In both classes the vacuum cushion presents the higher deviations in all directions.

**Conclusion:** For both weight classes, Combi-fix® represents a more effective and reproducible positioning system. In the other hand, the vacuum cushion is less reproducible in thinner patients.

**Key-words:** prostate tumour, positioning, reproducibility, Combi-fix®, vacuum cushion

**A Case of Recurrent Adrenocortical Carcinoma treated using IMRT.**

**Rosaleen Crouch, Amy Taylor - Weston Park Hospital, Sheffield, UK.**

Abstract: Radiotherapy is seldom advocated or recognized as a valuable treatment option for Adrenocortical Carcinoma (ACC). The evidence base to support it is small with limited publications, therefore it is perceived as ineffective in the treatment of these malignancies (1). Those completed studies however provide evidence to the contrary with patients showing tumour response rates of up to 42% (2).

This poster reports on the case of a 34 year old female who presented with recurrent ACC in mid 2009. After surgical intervention the possibility of adjuvant radiotherapy was raised as the surgical resection margins were very close (<1mm in some cases). Discussions between the patient and her consultant encouraged examination of the various treatment options and their limitations due to the difficulties posed by the lack of evidence based literature. The decision was made to give Radiotherapy using Intensity Modulated Radiotherapy (IMRT) because of the difficulties posed by the volume to be treated. Conventional radiotherapy was never considered due to the proximity of the organs at risk (spinal cord, liver, and kidneys) to the target volume, and therefore IMRT was considered as the only feasible treatment option.

Weston Park Hospital has been treating patients with IMRT since 2003 and has experience of inverse planning IMRT for a variety of sites. The knowledge and expertise gained has enabled IMRT to be considered as a viable treatment option for those areas which are particularly problematic, as demonstrated with this case study.

#### References:

1. Fassnacht M, Hahner S, Polat B, et al. Efficacy of adjuvant radiotherapy of the tumour bed on local recurrence of Adrenocortical Carcinoma. *J.Clin.Endocrinol.Metab.* 2006; 91: 4501-4504.
2. Allolio B, Fassnacht M. Adrenocortical Carcinoma: clinical update. *J Clin Endocrinol Metab.* 2006; 91: 2027-2037.

#### **Putting on the goggles: Adapting to a new “view” in undergraduate radiation therapy methodology labs using VERT**

**Terri Flood, MRT(T), BSc1,4, Amanda Bolderston, MRT (T), MSc1,2,4 Krista Dawdy, MRT (T), BSc1,3 Niusha Nowbahari, MRT (T) BSc 1, Fiona Cherryman, MRT(T), MEd.1,4 (1. The Michener Institute for Applied Health Sciences, Toronto, Canada 2. Radiation Medicine Program, Princess Margaret Hospital, UHN, Toronto, Canada 3. Odette Cancer Centre, Toronto, Canada 4. Department of Radiation Oncology, University of Toronto).**

#### Introduction:

The joint Michener Institute/University of Toronto Medical Radiation Sciences program in Toronto, Canada has incorporated a Virtual Environment for Radiotherapy Training (VERT) system into its radiation therapy curriculum. This presentation describes the process of adapting a second year methodology lab course over 13 weeks to optimize student learning using this new technology.

#### Pre-VERT:

Hands-on labs were completed with conventional simulators where students replicated conventional simulations and LINAC treatments. Anthropomorphic phantoms were verified with fluoroscopy for simulations and treatment set-up labs utilized both phantoms and student models.

#### Post-VERT:

Conventional simulation labs were replaced with VERT lab activities. Sites incorporated were similar to the pre-VERT course, including skin, breast, lung, GI, GU and palliative cases.

#### Lessons learned:

Faculty needed to shift from emphasizing patient positioning and manipulation to spatial and visual actualization. Challenges included the lack of patient “handling”, visualization of accessories, and the limited availability of diverse datasets. Advantages included the ability to identify the implication of errors in setup and justification of clinical SOPs. VERT enabled students to devise treatments integrating sectional anatomy, oncologic principles and methodology concepts. VERT supported visualization of established PTVs, OARs and dose distributions in relation to patient anatomy.

Conclusion:

Although VERT is a useful and innovative tool, there is little published information on its use across the undergraduate curriculum. Recommendations include increasing collaboration between VERTUAL and other educational institutions to share examples of lesson plans for various levels of student experience and course objectives. Long-term advantages of VERT for advanced level undergraduate students are relatively unknown.

### **The influence of the Virtual Learning Environment for Radiotherapy Training Characteristics on the Development of Skills in Skin Apposition Techniques.**

**David Green – Sheffield Hallam University, UK.**

Abstract

The introduction of the Virtual Environment for Radiotherapy Training (VERT™) has meant that pre-registration radiotherapy students are exposed to the virtual clinical environment in preparation for the real clinical environment experience. The novelty of this resource means that its impact upon human performance in certain radiotherapy techniques has yet to be tested.

This study investigates the influence of virtual environment characteristics on the development of skills previously honed exclusively in the clinical environment. Specifically the development of the electron treatment skin apposition technique. A specific treatment site was selected on the virtual patient and student performance, in terms of set-up to the treatment site, was determined by dataset software indicators.

44 year 1 and 2 pre-registration radiotherapy students were involved in the study. Their perceptions with regard to confidence and skills development in terms of electron skin apposition were analysed with questionnaires and in some cases interviews. Respondents found the resource intrinsically motivating and perceived enhanced skin apposition skills (80%) and confidence levels (89%) as a consequence of using VERT™. Further study of this resource is on-going to examine its influence on student performance within the clinical environment.

### **Administration of IV Contrast Media: Extended Role or a Core Competency for Pre Treatment Therapy Radiographers? Helen Holme - Radiotherapy Department, James Cook University Hospital, Middlesbrough, UK.**

Abstract:

Following implementation in 2007, administration of IV contrast media has become routine for CT localisation of lung, oesophagus, stomach, head and neck, gynaecological, colorectal and lymphoma sites for radiotherapy planning at the James Cook University Hospital. The administration of contrast has facilitated improved definition of gross tumour volume and the development of a radiographer-led IV contrast service in pre-treatment.

Incorporating new competencies in administration of IV contrast into everyday practice has resulted in the pre treatment radiographers extending their roles incorporating additional professional accountability. With further development of the service expected, involving training of more radiographers and including more treatment sites, there is a sense that this extended part of the pre-treatment role is becoming accepted as normal practice. However, the administration of IV contrast requires additional responsibility and competency beyond those required for professional registration.

The question arises as to whether such extension of the radiographer role could be deemed common practice and as such require core competencies in IV administration of contrast to be developed for all senior radiographers in pre-treatment. With increasing demands from the department to further improve the service by maximising the number of pre treatment radiographers who carry out such a task, and the need to adopt the culture of life long learning, it could be argued that such core competencies could be adopted within the Key Skills Framework.

**The Specialist Paediatric Radiotherapy Radiographer: Meeting the needs of the patient, their carers and the radiotherapy service. Lucy Hume - Leeds Teaching Hospitals, UK.**

Introduction

Paediatric radiotherapy is a complex pathway for the patient and their family. In order to ensure their needs are met, it is now recommended that radiotherapy centres treating children in the UK appoint a lead paediatric radiographer.

Aim

Through a review of current literature and personal reflections on the development of a specialist paediatric radiographer post, our aim was to identify the important aspects of such a role and discuss how these serve to address the needs of the patient, their family/carers and the radiotherapy service.

Main Discussion

Several themes were identified as being important and integral to the role of a specialist paediatric radiographer. These focused on continuity in care; the provision of effective, age appropriate communication and information; and the need to be an integral member of the paediatric multi disciplinary team.

Key Conclusions

The need for information and support, throughout the radiotherapy process, provided by an individual that the child and family can trust and build a connection with, is clear. The paediatric radiographer is able to provide this continuity of care and act as a liaison and advocate for the patient and their family both within the radiotherapy department and the wider multi-disciplinary team. This enables a better assessment of individual circumstance and has been shown to offer clear benefits to both the patient and the department. In conjunction with the play therapist, the need for general anaesthetic or sedation can be reduced and advice can be provided on radiotherapy procedure and complex treatment cases.

**Building and implementing a lung stereotactic body radiotherapy (SBRT) programme in a non academic radiotherapy centre: The Middlesbrough Experience.**

**Claire Huntley - Radiotherapy Department, James Cook University Hospital, Middlesbrough, UK**

**Abstract:** Building and implementing a lung stereotactic body radiotherapy (SBRT) programme in a non-academic radiotherapy centre The Middlesbrough experience C. Huntley, H. Bayles, C. Peedell, J. Green, D. Shakespeare, N. Richmond, E. Thompson, K. Pilling, P. Summers, , C. Walker. South Tees NHS Trust, Middlesbrough, United Kingdom Stereotactic body radiotherapy (SBRT) is increasingly being accepted by the international radiation oncology community as a new treatment option for patients with medically inoperable, peripherally located, early stage NSCLC. We describe the experience of building and implementing a Stereotactic Body Radiotherapy programme at our institution. After a number of “dummy runs” the first SBRT patient was treated in September 2009, receiving a dose of 55 Gy in 5 fractions over 14 days, prescribed at the 80% isodose line. So far, 4 patients have been treated and although follow up is too short and numbers are too small to assess outcomes at this stage, we present our initial findings on the practical aspects and considerations of implementing SBRT at a non-academic institution.

We discuss patient selection and the SBRT patient pathway, equipment requirements, our SBRT techniques, team building and training, clinical governance issues, quality assurance processes, data collection and the use of national and international guidance. The departmental demands of implementing SBRT, such as physics time, planning and scheduling of radiotherapy are also discussed.

### **Planning for Future Care: Advanced Care Plans – Information for Health care Professionals. Anne Jessop - Sheffield Hallam University UK.**

#### **Abstract**

The Department of Health "End of Life Care Strategy" for England (2008) defines Advanced Care Planning (ACP) as; “A voluntary process of discussion between an individual, their care providers irrespective of discipline and often those close to them, about future care”.

ACP requires total commitment from all MDT members to achieve effective cohesive working. Although not legally binding, ACP can offer some suggestions of an individuals wishes where they are no longer in a position to make those wishes known in any other communicative manner. ACP can give support to families and carers who may find that the decisions to be made are a difficult task at what can be a very distressing time in ones life. Research has shown that for patients who have had ACP in place during their terminal illness when death occurs, stress and anxiety is significantly reduced for family and carers.

### **Radiotherapy in the quality of life of palliative patients and emergencies. Carina Marques - Higher School of Health Technology of Lisbon, Portugal.**

**Abstract:** Presenting Author: Carina Marques **Background and Purpose:** Radiotherapy has benefits in the treatment of oncological emergencies and palliative patients, witch leads to the need to assess the impact of this treatment in the quality of life of these patients. The purpose of this study is to evaluate the quality of life of palliative patients and oncological emergencies indicated for radiotherapy.

**Materials and Methods:** It was applied the questionnaire FACT-PAL version 4 to 14 palliative and oncological emergencies patients undergoing radiotherapy in four moments: before, during, last day of the treatment and three weeks after the end of radiotherapy treatment. The sample was statistically characterized through the application of the statistical test of Friedman and Wilcoxon to the obtained data.

**Results:** The statistical tests showed significant changes in all dimensions of quality of life, except in the social-family welfare scale. The differences are greater between the period before radiotherapy and three weeks after the end of the treatment.

Conclusions: Radiotherapy in palliative patients and oncological emergencies leads to an improved quality of life in the dimensions of physical well-being, emotional well-being and functional well-being three weeks after treatment.

**Developing and conducting a Patient Satisfaction Survey within a new Radiotherapy Department.  
Karen Morgan - Radiotherapy Department, the Beacon Centre, Taunton, UK.**

Introduction:

Patient Satisfaction Surveys are an essential part of service development. The Beacon Radiotherapy Department (BRD) treated its first patient in June 2009. A patient satisfaction survey was conducted to assess how the service was received. The survey aimed to identify problems or negative experiences.

Method and Materials:

A questionnaire survey of 36 patients within the Radiotherapy Department was conducted. The questionnaire was based on the RCR's patient liaison group publication [1]. The questionnaires were distributed over a one week period to all patients attending for Radiotherapy treatment.

Results:

36 questionnaires were returned from 58 distributed (62%). 20 respondents were female (56%). Results identified that 78% were treated within 30 minutes of their appointment time; 97% felt they were treated with courtesy and respect and as an individual all the time; 14% felt not enough time was taken to deal with problems.

Conclusion and Discussion:

Many positive comments were received and patients were happy with the department. However, a number of issues were highlighted. Patients experiencing delays were not always informed of the reasons for these - radiographers need to communicate with patients to explain delays, particularly as many patients require bladder preparation. Occasionally, conflicting advice has been given to patients causing confusion. As a result of this, patients requiring bowel and bladder preparation will carry a "prep card" in future, detailing their individual requirements. The survey has highlighted areas for improvement and given positive feedback, essential for development of a new service.

**The Educational Theory Underpinning a Clinical Workbook for VERT.  
Heather Nisbet - Churchill Hospital, Oxford, UK.**

Abstract: The introduction of VERT (Virtual Environments for Radiotherapy Training) into radiotherapy departments across the UK was in response to NRAG's recommendation to the Department of Health that it may assist in improving the clinical experience of student radiotherapy radiographers. It was suggested that this may help to reduce the high attrition rate of students currently experienced, particularly in the first year of training. This poster investigates the clinical educator's role in ensuring that VERT is used to its maximum potential for developing students, in order to meet this vision. We argue that using an epistemological approach, i.e. using the theory of knowledge, to support the design of the learning resources is key to enabling the educator to fulfil these expectations. We look at the design of a generic VERT workbook for use in the clinical departments that train students for the University of Hertfordshire. We examine how we have used educational theory to underpin the aims of the workbook and inform its development. We then



discuss how we have aligned the workbook with the curriculum to enhance the students' learning experience and nurture their clinical competence. Finally, we also consider the teaching methods used during the delivered sessions and demonstrate how they allow us to achieve these aims.

### **Simulated Radiation Therapy: Low fidelity, High impact!**

**Cathryne Palmer, Fiona Cherryman, Susan Weltz, Robert Craig - University of Toronto, Canada.**

**Background:** In 2005 the Medical Radiation Sciences (MRS) Program enhanced the curriculum with the addition of simulation-based education. Using Standardized Patients (SPs), simulation addressed concerns that radiation therapy (RT) students were underprepared for the clinical environment, particularly 'interpersonal' skills with patient care and communication. Development of these skills is critical, as Salas, et al. (2008) cite that communication is the root cause for nearly 70% of medical errors in clinical practice.

**Method:** With ethics approval, a mixed-methods approach was used, collecting rich qualitative feedback and quantitative data from stakeholders through online surveys and semi-structured focus groups. Transcripts were independently analyzed and themed.

**Results:** Faculty noted students' improved patient care and communication given simulations' ability to target these areas more effectively than didactic methods. Students rated interactions with SPs valuable to their learning, though suggested that some interactions were unrealistic, their expectations being that simulation would more closely resemble the clinical environment. Given their opportunity to observe and compare students across old and new curriculum, the clinical faculty rated new curriculum students better prepared in patient care and communication skills upon their entry into clinical.

**Conclusion:** The new simulation-enhanced curriculum has provided students their first opportunity to practice previously-unrefined patient care and communication skills safely before progressing to the clinical environment. This presentation will share data which demonstrates the unique advantages of simulation. Radiation therapy students are provided with positive experiential learning opportunities that help improve critical interpersonal skill development in addition to integrating didactic knowledge in clinical practice.

### **Development of an M-level Module on Radiation Treatment for Breast Cancer: A Delphi Consensus Method. Heidi Probst - Sheffield Hallam University, UK.**

**Background:**

In 2007 the UK National Radiotherapy Advisory Group (NRAG) report to ministers identified that in order to meet the government objective set out in the NHS Cancer plan of providing services which are among the best in Europe a dramatic revision of equipment and workforce provision needed to be considered; including the development of new roles within the radiographers 4-tier structure. It is apparent that where advanced roles have been employed there has been demonstrated efficiency, reduced waiting times, and a more patient focussed service<sup>1</sup>. Development of professionals into advanced roles cannot happen without concurrent knowledge development to support the practitioner into the new role; these skills and knowledge are beyond those required for registration<sup>2</sup>. Research shows that formal education increases the confidence of those moving into specialist roles<sup>3</sup>; hence we have developed a master's module on breast cancer radiotherapy. To identify the knowledge and skills required by this specialist workforce a consensus methodology was employed.

**Method**

Fifteen experts from 7 disciplines and 3 Continents were asked to complete an online survey to identify key skills and knowledge required to specialise in breast cancer radiotherapy and then rate these knowledge and skills in terms of importance, desirability and feasibility of delivering within an e-learning environment.

#### Results

In round 1, 7 themes were identified covering a total of 37 knowledge areas. In round 2 panel members identified theme 1 (background knowledge of cancer and radiotherapy) should be a pre-requisite to studying the module leaving 6 remaining themes to be covered in the content of the module. This digital poster will present these key themes and how we have used the data to inform the development of resources of the new module.

#### **VERT for post registration CT anatomy training**

**Urvina Shah and Angela Williams - Radiotherapy Department, Mount Vernon Hospital, Middlesex, UK.**

#### Background:

With the increasing use of CT anatomy in radiotherapy for treatment plans, virtual simulation and cone beam CT, we felt it would be a great CPD opportunity to refresh the existing knowledge of staff using VERT.

#### Method: preparation and planning

Existing consent forms were adapted with ethics approval and permission from the Caldicott guardian to enable us to use patients' data for VERT.

Patient data was anonymised and anatomical structures in the pelvis, thorax and head and neck regions were outlined individually and exported to VERT.

Staff were split into groups and asked to label a printed out transverse slice of the pelvis and thorax. Following this, the identical slice was brought up on VERT to show the same structures and scroll through the CT anatomy.

Screen grabs and multiple choice questions for structures in the head and neck region were devised and displayed using the virtual presenter function. Staff answered by showing cards labelled A, B, C or D.

#### Results and conclusion:

Evaluations by 29 staff indicated:

Seeing the size, location of structures and organs at risk within the treatment field was beneficial.

The relationship of organs to surface anatomy using CT slices was a useful refresher.

Head and neck anatomy was popular and raised interest for future sessions.

Preparing sessions for VERT is time consuming but has clearly demonstrated a benefit in meeting CPD needs for post registration training.

#### **The Management of Emergency Malignant Spinal Cord Compression.**

**Colette Sheehan – Guys and St Thomas's NHS Trust, London UK.**

Abstract: Malignant Spinal Cord Compression (MSCC) is a debilitating and common complication of cancer, occurring in 5-14% of cancer patients. It is the main oncological emergency we deal with in radiotherapy. At the end of 2008 GSTT took part in the Royal College of Radiologists (RCR) national audit on the use of Radiotherapy for MSCC. The aim of the audit was to create a baseline of management for MSCC throughout the UK, to ensure optimum quality of life for patients and to ensure an appropriate use of radiotherapy and hospital resources. Through the use of questionnaires it also aimed to ascertain if patients had prompt access to MRI, surgical assessment

and treatment and fractionated radiotherapy to optimize maintenance of mobility and continence. The results of this are still pending so we decided at GSTT to analyse our local data set and compare these with the NICE guidelines published on the management of MSCC in 2008. After all, it was this publication which prompted the revision of our Trust policy on the same matter. Analyses lead to criticism of the original RCR audit and highlighted the need for a more detailed audit to establish how efficiently we manage MSCC at GSTT. A more comprehensive audit has now been performed which has led to interesting conclusions and recommendations.

**A comparison between soft tissue and bone registration techniques for prostate radiotherapy.  
Richard Small, Paul Bartley, Audrey Ogilvie, Nick West, Karen Hawthorn and John Frew - Northern Centre for Cancer Treatment, Newcastle, UK.**

#### Purpose

Image-guided radiotherapy for prostate cancer is increasingly seen as the standard of care to maximise the chance of tumour control and minimise treatment related toxicity. The aim of this study was to assess the difference between image registration displacements based on bone and soft tissue registration.

#### Method

Twenty consecutive patients receiving radical radiotherapy to the prostate using a Siemens Primatom (CT on rails) machine were included in this study. Patients underwent verification CT imaging as per department protocol. Currently in the department bony matching to determine displacements is the accepted, trusted technique. This technique will be the standard benchmark when comparing new soft tissue matching technique. Bone and soft tissue image registration was performed on each verification scan and the differences in lateral, longitudinal and vertical displacements recorded. To eliminate operator bias, this procedure was performed by two independent operators with the average value used for data analysis. To assess the robustness and consistency of the technique Patient and population based systematic and random error were calculated.

#### Results

Patients received an average of 12.3 verification scans over the course of treatment with a range of 11 to 17. Results show a standard deviation magnitude of 0.11 for soft tissue compared to 0.13 for bone when looking at differences between users for each verification modality. The two matching procedures showed, for the majority, similar results. 623 of the 704 shifts made were within  $\pm 1$ mm. However, 18% of shifts made had a difference of more than 2mm between soft tissue and bony registration with a maximum difference of 8mm in the vertical direction.

#### Discussion

For the majority of patients the data suggests bony registration alone can act as a surrogate for the prostate. As shown in the results, however there can be 8mm difference between the two modalities. This is unacceptable when considering the use of IMRT for prostate patients. A variety of reasons including rectal filling account for the change between soft and bony matching. An important issue when considering changing imaging practice is inter-observer reliability between modalities. Results show the variability (precision) of soft tissue matching is in the order of the previous, accepted technique using the automated bony matching. The initial results from this study suggest patients with variable rectal filling would benefit from accurate image-guided radiotherapy with soft tissue registration. The difficulty in the future will be in trying to identify this cohort prospectively. In the era of intensity-modulated radiotherapy i.e. steep dose gradients providing the opportunity to potentially reduce margins we believe soft tissue image registration should be strongly considered.

## **A-Tale-of-Two Advanced Practice Radiation Therapy Positions at the Juravinski Cancer Centre in Hamilton, Ontario, Canada**

**Marcia Smoke, J. Blain, L. Doerwald-Munoz, N. Harnett, L. Zychla - Juravinski Cancer Centre, Ontario, Canada.**

### **BACKGROUND**

In 2009 two advanced practice radiation therapy roles were piloted at the Juravinski Cancer Centre in Hamilton, the Bone Metastases Clinical Specialist and the Head and Neck Clinical Specialist. These roles were part of the Clinical Specialist Radiation Therapist Demonstration Project of the Ministry Of Health and Long Term Care (MOHLTC) in Ontario implemented to address wait times, increase access to care, and improve health of Ontarians.

### **PURPOSE**

A toolkit was used to assist Managers in radiation therapy departments to develop advanced practice roles. This tool was used to assess the need for advanced radiation therapy practitioners, to design and implement the positions with a specific delivery model, and to evaluate the success and/or failure of the positions. This is an overview of the implementation of advanced practice using this toolkit.

### **METHOD**

The quality framework "Plan, Do, Study, Act" (PDSA) provided the basis for the implementation, assessment and evolution of the positions to meet the changing needs of the Centre and its patients. The initial Plan phase involved defining the patient population, identifying and engaging key stakeholders, and conducting a needs assessment to determine the issues and gaps in service delivery.

### **CONCLUSIONS**

The Bone Metastases Clinical Specialist position closely matched the "toolkit" role and was successfully integrated into the program. The Head and Neck Clinical Specialist position was implemented and required adaptations to meet the emerging technical challenges and incorporates emphasis on research and quality assurance.

## **Supporting mentors and developing mentoring skills in clinical practice.**

**Angela Williams, Elaine Parry-Jones Project team, Elaine Gannon - Mount Vernon Hospital, Middlesex, UK.**

### **Introduction.**

High student attrition rates exist in radiotherapy and many reasons are cited for this. One factor is student experience in the clinical environment. Mentoring students during clinical is a key component to provide support.

### **Method**

A project was completed over 12 months involving 13 therapeutic radiographers to increase support to mentors, thus enhance student experience. Staff members completed a questionnaire to ascertain confidence levels with different aspects of mentoring. They completed a SWOT analysis, following which action plans were developed to help participants improve their skills.

Workshops were held on the most prevalent issues and a follow up questionnaire completed.

## Results

The most difficult aspects of mentoring were: giving verbal or written feedback to underperforming students, dealing with challenging students, balancing more than one student with a busy patient workload and objective setting. Workshops focussed on these topics using scenario based group work.

All workshops were evaluated positively. Participants found learning from others experiences and techniques beneficial. Staff fulfilled their action plans and results of the follow up questionnaire show an increase in confidence in all areas of mentoring.

## Conclusion and discussion

All practitioners are expected to supervise students and need training to develop expertise. Staff completing this project have enhanced their skills and are more prepared as a mentor.

These results suggest mentor training should be mandatory, that time allocated for training is increased and a structured approach be employed. This needs to be introduced to support and enhance skills to ultimately improve student training and hopefully reduce attrition.