energy deposition and particle fluence. The software package, written in Matlab, incorporates interaction sampling methods employed in general-purpose Monte Carlo codes. Users select the incident particle type, energy, target material and (optionally) particle cut-off energies. Modes of operation include; 3D views of particle tracks from a broad beam incident on selected media, views of interaction probabilities and outgoing particle energy and direction, or energy deposition and charged particle fluence scored as a function of depth for a user-defined number of incident particles.

In addition, the ‘physics’ underlying radiation transport can be modified, by ‘switching off’ multiple Coulomb scattering, delta-ray production and radiative energy losses, in order to observe the effect this has on energy deposition and so gain a greater understanding of the physics involved.

Results: The MC teaching software, ‘VisualMC’, has been packaged as a stand-alone application and made available to university students via citrix. Practical sessions are used to introduce students to the software, after which the software can be accessed remotely by students to perform their own radiation transport ‘experiments’ to gather results for assessed assignments.

Conclusion: A MC-based software package has been developed to support the teaching of radiation interactions and radiotherapy dosimetry. The software has been incorporated into academic programmes at undergraduate and postgraduate levels, providing practical exercises for students of radiotherapy and medical physics.

EP-1956
Twitter as a tool for radiotherapy medical education: The #radonc Journal Club
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Purpose or Objective: Radiation technology is expanding at an exponential rate. Accompanying discoveries in molecular and radiation biology there are multiple developments in both hardware and software solutions. This expansion in information presents huge challenges to radiotherapy professionals to maintain adequately appraised in new data. Continuing Professional Development (CPD) is threatened by the huge volume of information and lack of financial and physical (workforce) resources to support study. Social media (SoMe) provides a new tool for medical education which is free and open access (FOAM, foameducation.org). Twitter presents a tool for CPD which can usefully connect multidisciplinary professionals in radiation oncology.

Material and Methods: The hashtag #radonc denotes information on twitter that is pertinent to radiation oncology. A similar #medphys tag is used for specific medical physics subjects. On a monthly basis a #radonc journal club is held on the twitter platform. A paper is discussed in an open dialogue. The paper under discussion is introduced on twitter and via the www.radiationnation.com website. At the end of a week of asynchronous comment a hosted discussion is held for one hour with the paper’s author. Participation is free and open to all.

Results: The #radonc journal club has been in place since 2014 and grown in participant numbers. In July 2015 the journal club had 86 participants from the USA, Canada, Australia, UK, Spain, Philippines, and Saudi Arabia. Over 600 tweets were sent which created over 1.5 million page impressions (symplr.com). Participants have mainly identified themselves as Radiation/Clinical Oncologists although there have been strong contributions from medical physicists, RTTs and patients and their advocates. The journal club continues with plans to host multiple timed chats to cope with demand from users in separate time zones. Further effort is being spent on using contributors to #radonc to provide SoME sourced FOAM to be hosted on the Radiation Nation website.

Conclusion: The #radonc twitter club is a successful, free, International initiative to use social media to promote discussion and interaction in radiotherapy education.

Electronic Poster: Brachytherapy track: Breast

EP-1957
Partial breast irradiation with brachy- and teletherapy: comparative dosimetry of treatment plans
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Purpose or Objective: To compare the dose distributions of partial breast irradiations in treatment plans of high dose rate multicatheter brachytherapy and intensity modulated radiotherapy with special respect to dose to organs at risk.

Material and Methods: 15 patients with early-stage breast cancer treated with interstitial partial breast brachytherapy (BT) irradiation were selected for the study. The total dose was 30.1 Gy given by 7 x 4.3 Gy fractionation. Target volume and organs at risk (non-target breast, contralateral breast, both lungs, skin, ribs and heart for left sided lesion) were outlined and treatment plans were made using geometrical and graphical optimization with Oncentra brachy (Elekta) planning system. The PTV was created around the resection cavity with a margin of 20 mm minus tumor-free surgical margin in each direction limited to skin and chest wall. Skin was delineated as a 5 mm shell inside the body contour. Then, the CT data with the contours were transferred to an external beam treatment planning system (Eclipse, Varian),
and using the same patient anatomy and fractionation schedule virtual plans for intensity modulated radiotherapy (IMRT) were made. The PTV in IMRT plans was created by 5 mm volumetric extension around the PTV used in BT plans. PTVenval was formed from PTV with geometrical limitation to the skin. Detailed dose-volume histogram analysis was carried out for the PTVs, breasts, lungs, skin, ribs and heart. Means, standard deviations were calculated and the corresponding parameters were statistically compared. Wilcoxon matched pairs analysis was performed for test of significance.

Results: The target coverage represented by V90 was better for IMRT (100% vs. 97%, p<0.05), but the D90 was higher for BT (103% vs. 100%, p<0.05). The conformity numbers were 0.73 for BT and 0.84 for IMRT (p<0.05). The V100, V90 and V50 for non-target breast were 1.7% vs. 0.2% (p<0.05), 2.8% vs. 4.3% (p<0.05) and 11.5% vs. 23.9% (p<0.05) for BT and IMRT plans, respectively. For ipsilateral lung the V5 was not significantly different in the two groups, but the V10 was lower for BT (11.7% vs. 20.5%, p<0.05). For contralateral breast and lung no significant differences in D0.1ccm were observed. For patients with left sided lesion the dose to heart was less with IMRT for D0.1ccm (15.3% vs. 22.7%, p<0.05). The most exposed skin volume (0.1 ccm) received significantly less dose with BT (64.4% vs. 92.4%). The same is true for ribs with values of 51.3% vs. 71.2%. With BT the ribs never received the prescribed dose, while with IMRT the D0.1ccm exceeded the prescribed dose in five cases.

Conclusion: With both BT and IMRT techniques acceptable target coverage can be obtained, but the conformity of dose distributions is better with IMRT. The dose to organs at risk is less with BT compared to IMRT, except for the heart. Generally, the BT and IMRT can be alternative techniques for partial breast irradiation, but in individual cases the recommended technique depends on the tumour location.

EP-1958  
Treatment results of Mammosite catheter in combination with whole breast irradiation
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Purpose or Objective: To report the initial outcomes of patients treated with the MammóSite brachytherapy device (MSBT) as a boost followed by whole breast irradiation (WBI).

Material and Methods: From June 2011 to March 2014, 107 patients (typically pT1-2, pN0-1, M0) were treated with breast-conserving therapy (BCT) and adjuvant radiotherapy with MSBT (15 Gy in 2.5 Gy fractions) followed by WBI (median 50.4 Gy). Toxicity was classified according to the Common Terminology Criteria for Adverse Events v3.0. The median follow-up was 21 months.

Results: So far no ipsilateral breast-tumor recurrences were observed, 102 patients (95%) were alive at last follow-up. Two patients (2%) developed distant metastasis. Five patients (5%) died during follow-up, only one as a result of breast cancer. The 2-year disease-free survival was 95 ± 3%. The incidence of asymptomatic and symptomatic seroma in 90 days after MSBT was 28% and 10%, respectively. Infectious mastitis was observed in 3 patients (3%), who were treated successfully with antibiotics. Only 3 patients (3%) developed a radiodermatitis > grade 2 after WBI.

Conclusion: The boost technique used in this study seems to provide excellent local control with acceptable toxicity, similar to the results observed with other forms of interstitial accelerated partial-breast irradiation as a boost. Long-term follow-up is necessary to refine the patient selection criteria and to assess efficacy and late toxicities.

EP-1959  
Dosimetric consequences from minimal displacements in APBI brachytherapy using the SAVI applicator
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Purpose or Objective: Evaluate the necessity of a complete CT scan before each treatment in the APBI and the use of additional immobilization devices

Material and Methods: A retrospective study was performed on 25 patients treated in the 2013-2015 period with APBI brachytherapy. The CT scans of each patient taken before each treatment were imported in to the planning system. Each CT scan was registered with the initial one. Dosimetric evaluations respective to the initial CT scan image series were performed. The deviation of dose received by the skin and ribs in each treatment were calculated and minimum, maximum and average dose received by skin and ribs were recorded and compared to the initial plan’s results.

Results: Small deviations in displacements were observed from the SAVI applicator to the ribs and the skin surface. Dosimetric evaluations revealed, very small changes in the inter-fractionation position make significant differences in the maximum dose to these critical organs. As a result, the maximum dose varied between 10% and 32% in ribs and skin surface.

Conclusion: The CT scan before each treatment is necessary to minimize the uncertainty in setup and any intervention if deemed necessary. This study indicates, in 30% of the cases needed re-planning between treatments to minimize the risk of critical organs to be overdosed. We conclude that the physicist should evaluate the position of the device by analyzing the CT images before each treatment and consider re-planning the deviations are high. Also this study reveals the urgent need of improving the immobilization methods when treating APBI with SAVI applicator. This type of treatment will benefit of deformable registration at each treatment and adaptive planning.

EP-1960  
Exclusive brachytherapy of vaginal cuff: ethical considerations on quality of life after treatment
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Purpose or Objective: To evaluate efficacy, clinical and psychological impact of chronic toxicity, of exclusive BRT of vaginal cuff in patients (pts) affected by endometrial cancer after hysterectomy (EC)

Material and Methods: From January 2010 to December 2014 we studied 108 pts with EC treated with exclusive BRT. Treatment was performed with cylinder in vagina to sterilize vaginal cuff, fractionation 6 · 30 Gy, prescription to 0.5 cm from surface of cylinder, active length almost 3 cm. We evaluated efficacy, quality of life and impact on sexual activity after BRT filling out a test designed to investigate following areas: 1) social relations and personal emotions, 2) couple intimacy and sexuality , 3) impact of treatment on sexuality and doctor-patient relationship before BRT.

Results: 96 evaluable pts median follow-up 24 months (range 9-60); median age 62 years (40-88); histology revealed 2 cr, squamous and 94 adenocarcinoma; grading G1 for 15%, G2 for 65% and G3 for 20% of cases; all pT1b stage; lymph node