In 82.8% of 319 patients investigated with 68Ga-PSMAHBED- and treat metastatic castration resistant prostate cancer. PSMA-targeting molecules are under development to detect frequently over-expressed in prostate cancer (PCa) several Since the prostate-specific membrane antigen (PSMA) is PET/CT at least one lesion in dicative for PCa was detected. androgen deprivation therapy. Amongst lesions investigated by histology, 30 were false-negative in 68Ga-PSMAHBED-PET/CT scan location and body size. from imaging procedures are only modestly dependent upon values based on scan procedure and site because organ doses to significantly reduce the image doses. It is feasible to portal imagers. There are a variety of approaches available much lower imaging doses compared to the conventional MV compared to 18F-fluoromethylcholine-PET/CT. In 68Ga-PSMA-PET/CT concerning PC-suspicious lesions was significant (p=0.04). All lesions detected by 18F-fluoromethylcholine-PET/CT were also seen by 68Ga-PSMA-PET/CT. In 68Ga-PSMA-PET/CT SUVmax was clearly (>10%) higher in 62 of 78 lesions (79.1%) and tumor-to-background ratio was clearly (>10%) higher in 73 of 78 lesions (93.6%) when compared to 18F-fluoromethylcholine-PET/CT. Since the ligand bound to PSMA is internalized, the target may also be used for endoradiotherapy. We used a small molecule inhibitor of PSMA ((S)-2-(3-(1-carboxy-5-(3-4-(↑1I))-iodophenyl)ureido)-pentyl)ureido)-pentanedioic-acid; MIP-1095) for therapy in men with mCRPC. Dosimetry estimates for I-131-MIP-1095 revealed that the highest absorbed doses were delivered to the salivary glands (3.8 mSv/MBq, liver (1.7 mSv/MBq) and kidneys (1.4 mSv/MBq). The absorbed dose calculated for the red marrow was 0.37 mSv/MBq. PSA values decreased by >50% in 60.7% of the men treated. 84.6 % of men with bone pain showed complete or moderate reduction in pain. Hematological toxicities were mild. 25% of men treated had a transient slight to moderate dry mouth. No adverse effects on renal function were observed.

In order to increase the therapeutic flexibility we designed a novel theranostic PSMA ligand coupled to DOTA which allows coupling to Ga-68 for diagnostic use or to Lu-177 or Ac-225 for therapy. Especially for alpha therapy with Ac-225 promising results were found in the first 10 patients.

Conclusions: The excellent agreement between Monte Carlo and measurements demonstrate that Monte Carlo simulations against measurements of the beam’s half-value layers and dose distributions. Patient dose calculations showed that the imaging doses to the eyes for representative head images are 0.05-0.2 cGy and 0.1 cGy; doses to the bladder for representative pelvis images are 1.6 cGy and 0.07 cGy; while doses to the heart for representative thorax images are 0.4 cGy and 0.07 cGy; when using kV-CBCT scans and kV radiographs, respectively. In contrast, organ doses increase by a factor of 2-4 if bow-tie filters are not used during kV-CBCT acquisitions.

Conclusion: The excellent agreement between Monte Carlo calculations and measurements demonstrates that Monte Carlo techniques yield accurate results for kV dose calculations. Current on-board kV imaging devices result in much lower imaging doses compared to the conventional MV portal imagers. There are a variety of approaches available to significantly reduce the image doses. It is feasible to estimate and account for organ dose by using tabulated values based on scan procedure and site because organ doses from imaging procedures are only modestly dependent upon scan location and body size.

Symposium: Innovations in functional imaging for radiotherapy

SP-0602
PSMA ligands for diagnosis and therapy
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Since the prostate-specific membrane antigen (PSMA) is frequently over-expressed in prostate cancer (PCa) several PSMA-targeting molecules are under development to detect and treat metastatic castration resistant prostate cancer. In 82.8% of 319 patients investigated with 68Ga-PSMAPET/CT at least one lesion indicative for PCa was detected. Tumor detection was positively associated with PSA level and androgen deprivation therapy. Amongst lesions investigated by histology, 30 were false-negative in 68Ga-PSMA-PET/CT (one local relapse in one patient and 29 lymph nodes in another patient), all other lesions (n=416) were diagnosed true-positive or -negative. Fifty of 116 patients available for follow-up received local therapy after 68Ga-PSMA-PET/CT. A comparison of 68Ga-PSMA-ligand with 18F-fluoromethylcholine PET/CT revealed 78 PC-suspicious lesions in 32 patients using 68Ga-PSMA-PET/CT and 56 lesions in 26 patients using Choline-PET/CT. The higher detection rate in 68Ga-PSMA-PET/CT concerning PC-suspicious lesions was significant (p=0.04). All lesions detected by 68Ga-PSMA-PET/CT were also seen by 18F-fluoromethylcholine-PET/CT. In 68Ga-PSMA-PET/CT SUVmax was clearly (>10%) higher in 62 of 78 lesions (79.1%) and tumor-to-background ratio was clearly (>10%) higher in 73 of 78 lesions (93.6%) when compared to 18F-fluoromethylcholine-PET/CT. Since the ligand bound to PSMA is internalized, the target may also be used for endoradiotherapy. We used a small molecule inhibitor of PSMA ((S)-2-(3-(1-carboxy-5-(3-4-(↑1I))-iodophenyl)ureido)-pentyl)ureido)-pentanedioic-acid; MIP-1095) for therapy in men with mCRPC. Dosimetry estimates for I-131-MIP-1095 revealed that the highest absorbed doses were delivered to the salivary glands (3.8 mSv/MBq, liver (1.7 mSv/MBq) and kidneys (1.4 mSv/MBq). The absorbed dose calculated for the red marrow was 0.37 mSv/MBq. PSA values decreased by >50% in 60.7% of the men treated. 84.6 % of men with bone pain showed complete or moderate reduction in pain. Hematological toxicities were mild. 25% of men treated had a transient slight to moderate dry mouth. No adverse effects on renal function were observed.

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SP-0603
MR spectroscopic imaging at high field for tumour characterisation
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Abstract not received.

SP-0604
A visual computing approach towards integration of multi-parametric imaging into radiation oncology workflows
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The integration of the full analytical power of today’s multi-modal and multi-parametric imaging techniques into workflows of radiation oncology has not yet reached daily clinical routine. Reasons for this are manifold and range from simple data integration problems to the question, how the relevant information distributed over different images or over several parameters can be fused in the best way to provide a more complete and comprehensive image of the current situation.

The EU project Software for the Use of Multi-Modality images in External Radiotherapy - SUMMER(*) is addressing these problems with the aim to extend the current set of imaging modalities integrated into radiotherapy planning. In this talk, I will give an overview over faced challenges and results achieved over the last 3 years from a Visual Computing perspective. I will show how visualization, data fusion, and alternative ways in data representation can be used to gain
new insights and significantly accelerate current workflows. Special emphasis will be given on use cases including 4D PET/CT and MR Spectroscopy data - work we have done in cooperation with the University Hospital Freiburg and the Institute Claudius Regaud in Toulouse.

(*) http://summer-project.eu/about-summer/

Symposium: How does the RTT world look in 2020? Different regions, different challenges

SP-0605
RTT perspective in Eastern Europe and region of Former Yugoslavia on basic of education an roles
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Objective: Basic on receive and available data of RTT education, position, roles and titles recognized in Eastern Europe situation is more and less is almost same, in field of basic education, titles recognized, individualism in work, research possibilities.

Materials and Methods: For improving and acceptable vision of RTT in 2020 must exist good project and cooperation between RTT in Eastern Europe. One of good project in educations of RTT is ESTRO/IAEA project TTT. Through this project the RTT from region of Former Yugoslavia establish excellent cooperation in field of continual education and position of RTT. The members of first TTT group from this country actively participate in creating of education of RTT on school, chambers and professional Societies. Also, through project was made excellent connection between participants.

Results: This cooperation through TTT project is get result in good position in international organization, possibilities to create one small part of education, and create documents about workflow and competenencies for RTT in some country.

Conclusions: In next period the goal is provide more time for Radiotherapy subject through studies.

In 2020 RTT in Eastern Europe will be technicians with professional or faculty degree, absolutely indepened in work with whole liability for own work with possibilities for research activities through its work. RTT will be RT Dosimetrist like new skills of RTT in field of contouring OAR and QA. Provide more individualism in RTT work. Provide possibility of research for RTT. Cooperation between professional Societies of Eastern Europe through board within ESTRO.

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Vision 2020: Challenges facing the RTT in Western Europe
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It is undoubtedly an exciting but challenging time to be an RTT in Western Europe. With the ever-expanding technological advancements in radiotherapy and the drive towards personalized radiotherapy for individual patients, RTTs in Western Europe must be equipped to meet these challenges.

One such challenge is in relation to the definition of roles and responsibilities of the RTT and there is a wide variety in this at present across Western Europe. In some countries, the profile of the RTT is well defined, particularly with respect to research, treatment planning and dosimetry, image-guidance, clinical decision-making, ongoing care and advice throughout the process and psychosocial support whereas in others, it is less so.

This discrepancy can be closely related to the inherent differences in RTT undergraduate education across Western Europe, with dedicated radiotherapy programmes in some countries and 'mixed' education programmes in others. Definition of and discrimination between standard roles, role expansion and advanced practice is also challenging in Western Europe as we approach 2020 and is somewhat ambiguous. The essential competences of any graduate should be addressed through the undergraduate programme and such progression in roles and responsibilities should be closely linked to postgraduate education level.

Personalised treatment is the future of radiotherapy within Western Europe in the next five years and this will challenge the RTT to examine their practice in a new fashion; moving from generic 'site-based' solutions to an individualised and holistic interpretation of the management and care of patients.

SP-0607
India How does the RTT world look in 2020? Different regions, different challenges
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Emerging country like India are the fastest growing with the greatest needs for fast and efficient technologies to treat growing cancer populations" We want to make sure that what we develop and produce meets their needs. Focused on learning about the clinical processes that are followed in