CT is currently routinely combined with MRI in the planning of radiotherapy (RT) at many centers in Europe. MRI is mainly introduced into the RT workflow due to a superior delineation precision of target volume and organs at risks compared to CT. This procedure, however, introduces a systematic error arising from the registration between the two modalities. Removing the CT scan and basing the entire treatment workflow, i.e. simulation, planning and delivery on MRI as the sole modality, so-called MRI-only RT, would eliminate this registration error. Electron densities, however, need to be assigned to the MRI images for dose calculation and patient setup based on digitally reconstructed radiographs (DRRs). Further, recent inventions such as the integrated MRI/PET and MRI/Linac systems have increased this need for attenuation map correction and plan adaptation based on the MRI. This presentation will present examples of the rationale behind MRI-only RT and review the past and current developments within this area. Further, the different strategies for assigning electron densities to the MR images in different parts of the body will be discussed.

SP-0511
MR linac, continuous IGRT during radiotherapy

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In the current radiotherapy clinic MRI is used to support tumour and organ at risk delineations as well as tumour characterisation because of its good soft tissue contrast. Moreover, with MRI, soft-tissue structures can be visualised at high temporal resolution. Future integrated MRI/radiotherapy systems promise to visualise soft-tissue structures in real-time during radiation delivery. This opens possibilities to better tailor the treatment to the momentary patient anatomy. In this presentation, we will take a look at MRI-linac hardware and explore therapy delivery prospects that arise from several dedicated MR sequences.

SP-0512
A physicist’s perspective

K. Tanderup

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A dream career in medical physics must be actively shaped by being pro-active, making good choices and exploiting opportunities. You need to know your field: A good career is based on the development of expertise in a multidisciplinary setting involving physics, oncology, and radiobiology. Regardless whether you are foreseeing a career in the direction of e.g. clinics, research, product development or administration: broad clinical medical physics training will always give you a sound insight in clinical workflows as well as importance/relevance/potential of new developments. Research training as accomplished during a PhD study will complement your clinical training. Explore opportunities at you University and at other Universities. Basic and advanced education within radiation therapy is available through ESTRO. This is an excellent opportunity to receive education of high quality and relevance. In particular: look out for the Physics Master Course which is taking place for the first time in autumn 2015. At ESTRO courses you will meet faculty and peers who may become professional partners and good friends.

You need to do choose your field: When choosing a field, you need to take into account the relevance over the next decades. What has potential in your own department? Do your interests fit with current activities in your department? What has interest and potential on the international scene? Think in terms of the impact your research and developments would have: 1) How many patients are treated? 2) What are the prospects over the next years? 3) How can your research change clinical practice? Finally, choose your field with passion! You need to know people: Networking inside and outside your institution is of immense importance for your development. Most of us are working in highly specialized fields, and you will have benefit from finding peers who have the same interests across departments and countries. Long or short term exchanges increases your network, and broadens your view. Look out for job opportunities abroad. Do not hesitate to write emails to colleagues with your CV and your interests. Furthermore, ESTRO has multiple activities where enthusiastic young people are highly appreciated for contributing to projects. You need to exploit and create opportunities: A great CV is not only a bunch of publications. Collaborative and organisational talents and experience is of high value in modern departments of Medical Physics. Your active contribution to your department and internationally creates the best opportunities. Such contributions may be in terms of e.g. coordination of projects/meetings, doing measurements, support of your mentors, and helping peers. Knock the door of the Professor and ask "What can I do to contribute?". The best investments for your career are often on the long term and will not readily show up on your CV.

SP-0513
A clinician’s perspective

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When finishing medical school and starting to work as a physician, there are many paths you can follow: Besides pure research work or movement into industry, clinical work is probably the most classical road to take after completing medical studies. However, although it can be the most rewarding, becoming a (successful) clinician can be the most demanding task. For every beginner in medicine and/or research, it is essential to evaluate the different perspectives, and to define your personal goals. During residency, a main priority is to become an excellent clinician, to acquire the knowledge, to treat every patient in the best way. Keeping „up to date” and integrating novel data and results into daily practice is essential. Moreover, especially in the University setting, clinical but perhaps also preclinical projects are a main part of daily tasks.

After defining your personal goals and objectives, it is necessary to re-define your perspective, re-evaluate your personal achievements, and re-adjust your focus regularly along the road. In this context, it is equally important to keep to your personal budget in terms of Quality of Life (QOL), Work-Life-Balance as well as other personal interests. In spite of all personal planning and organization, an effective work surrounding as well as a mentor, teacher, supporter… are not only helpful, but vital.