men will respond to androgen deprivation therapy for a finite time before ultimately progressing and succumbing to their disease. Bone targeted therapy has included bone-seeking radionuclides for nearly 30 years. The beta-emitting bone-seeking radionuclides Strontium-89 and Samarium-153 EDTMP as well as Rhenium-186 HEDP and Rhenium-188 HEDP have been used to palliate pain in advanced cancer metastatic to bone for many years [2]. Despite clear evidence of benefit in palliation, these agents have never been shown to result in a survival benefit for patients. Radium-223 is the first in class alpha-emitting radionuclide which began clinical testing almost 10 years ago and has recently become licenced for the treatment of castration resistant prostate cancer (CRPC) metastatic to bone. In an international prospective randomised clinical trial, Radium-223 (50kBq/kg, for 6 cycles at 4 weekly intervals) + best standard of care (BOS) was shown to improve overall survival compared to placebo + BOS in men with symptomatic, metastatic CRPC. Radium-223 also resulted in significant improvement in time to symptomatic pro-gression [3]. The rationale for combining External Beam Radiotherapy (EBRT) with Radium-223 in the treatment of metastatic prostate cancer will be discussed. In particular the potential for using Radium-223 along with advanced EBRT with "curative" intent in hormone naïve de novo metastatic prostate cancer will be described.

References:

SP-0369
Radiobiology of combined therapies
L. Strigari, M. D’Andrea
Regina Elena Cancer Institute, Laboratory of Medical Physics and Expert Systems, Roma, Italy

Throughout the past two decades the efforts to improve treatment efficacy for locally advanced head and neck squamous cell carcinoma (LA-HNSCC) have led to increased use of multimodality approaches combining surgery, radiotherapy (RT), and chemotherapy (CT). In fact, conventional RT was associated with unsatisfactory patients’ outcomes, thereby a greater understanding of radiobiology led to the development of altered irradiation schedules, such as hyperfractionation (HF) and accelerated fractionation (AF), in the management of advanced HNSCC. Randomized controlled trials and meta-analyses demonstrated that for patients with locally advanced HNSCC, major improvements in loco-regional control and overall survival rates may be obtained by AF and HF with increased total radiation dose. CT represents an important component of multimodality treatment approach for locally advanced HNSCC. The combination of concurrent CT and RT (CCRT) provides a substantial and statistically significant improvement in survival and loco-regional control, as compared to RT alone. CCRT has been also shown to preserve healthy tissue in almost two thirds of patients, without affecting survival. However, despite hundreds of clinical trials in patients with advanced disease, there is no widespread consensus about patient selection for altered fractionation regimens, type of chemo-radiotherapy association, radiation/ chemotherapy dose schedule in LA-HNSCC. The state of the art of radiobiological models for tumor control and toxicity after CCRT will be presented together with methods of BED calculation. Model parameters will be introduced to be applicable to different chemotherapy schedules. The aim is to highlight the potential convenience of using radiobiology in the selection more effective treatment strategies. As secondary aim BED for combined CCRT with/without hyperthermia (HT) will be introduced to further stress the versatility of radiobiological concepts in predicting patient’s outcome and improving the efficacy of treatment strategies.

Symposium: Proton therapy, from rationale to planning and delivery

SP-0370
Clinical rationale
S.E. Combs
Klinikum Rechts der Isar, Department of Radiation Oncology, Munich, Germany

Particle therapy offers distinct physical properties leading to reduction of integral dose. For low-LET particles, biology is relatively comparable to photons, however, if this often cited sentence is correct in detail, is a matter of discussion. Albeit known heterogeneities and differences, in particular the potential for using Radium-223 along with advanced EBRT with “curative” intent in hormone naïve de novo metastatic prostate cancer will be described.

References:

SP-0371
Treatment planning for proton therapy ñ a challenge for the whole team
C. Vallhagen Dahlgren
Skandionkliniken, Skandionkliniken, Uppsala, Sweden

The first Scandinavian Proton Centre, Skandionkliniken, is planned to treat its first patient in June 2015; a facility owned by the seven regions with university hospitals. Patients will be referred to Skandionkliniken through these hospitals utilising “distributed competence” [1]. The patients will be prepared for treatment at their “home centre” - immobilisation, CT-scanning and treatment planning will be performed at the university hospital. All treatment plans will be reviewed at joint teleconference meetings [2] prior to the treatment start. The patient and any individual immobilisation device will be sent to Skandionkliniken for treatment. Skandionkliniken will be a “spot scanning only” facility.