a/β which might also reflect more uniformity in response perhaps more characteristic of lower proliferative or early-stage disease. This has resulted in new efforts to test hypofractionation which have also been enabled by better dose localization achievable with image-guided Volumetric Modulated Arc Therapy.

There is evidence that the LQ model becomes less reliable at doses per fraction < 1 Gy, due to possible low-dose hyper-radiosensitivity, and also at > 6 Gy per fraction for reasons not yet understood though increasing vascular damage and immunological/inflammatory effects occur at higher doses per fraction. It is axiomatic that LQ must indeed overestimate effect at very high doses per fraction because the effective D0 would become unrealistically low. This makes the outcome of hypofractionated regimes less predictable: using LQ at high doses per fraction would be playing safe in predicting toxicity of hypofractionation, while overestimating the effect on the target malignancy, noting that possible hypoxia in a tumor could also limit the effectiveness of large dose fractions.

Debate: Have we reached the technology edge in radiation therapy?

SP-0507
In radiotherapy, technology without radiobiology is like driving a Porsche at 40 kilometres per hour
A. Nahum

Today’s external-beam radiotherapy (EBRT) is technologically sophisticated but radiobiologically primitive. Since the late 1980s ‘Hi-tech’ has dominated EBRT at the expense of ‘radiobiological intelligence’. Furthermore we have become slaves to the mantra ‘evidence-based medicine’, with evidence as phase-3 clinical trials: this ties our hands behind our backs. We prostrate ourselves before the ‘Collective Dose-Escalation Deity’ e.g. via advances such as MLCs, IMRT, even protons but largely reject individual dose-escalation based on (normal-tissue) patient DVHs - this is illogical and does patients a disservice. We have become ‘hostages to commercial fortune’ - if the companies say ‘oh we cannot give you TCP or NTCP in our planning system in case someone sues us’ we meekly accept this! This lamentable ‘worship of commercial interests’ is a negation of our dignity as scientists and our responsibility as medical practitioners. Today’s EBRT is ‘North Korean’ - instead it should be ‘South Korean’ i.e. based on enterprise and intelligence. Evolution equipped us with creative brains, which can do so much more than follow ‘safety first’ protocols developed by committees. The ‘Hi-tech’ gadgets of today are impressive but our use of them will remain largely pedestrian without the application of ‘radiobiological intelligence’ - our patients expect no less.

SP-0508
Against the motion: No, new technological developments will always appear
P. Munck af Rosenschöld

The debate revolves around the impact of technology in radiotherapy (RT). RT as a field has a long tradition of high technology involvement, and practitioners are used to frequent technology advances. Recent technology advances include advanced imaging for planning and treatment verification, as well as rotational intensity modulation RT delivery. The ability to deliver the correct dose efficiently and with millimeter precision is now feasible at most modern RT departments. The question whether we have reached “the edge in radiotherapy” is therefore warranted. Even though the technology for planning and delivery has evolved, RT clinics rely much on manual procedures for tumor delineation, treatment planning, quality control test and treatment adaptation. Simultaneously, many RT clinics face the challenge of rising patient numbers to treat using the same equipment and with less staff. Further, most RT clinics lack systematic follow-up of treatment outcomes. I argue in this talk that new technology can improve RT cost-effectiveness and patient outcomes. In addition, improved technology is warranted for safe personalized dose prescription and adapted radiation therapy. Technology advances can allow for automated procedures in the preparation of treatments, including delineation and planning of the treatment anatomy and treatment target localization. For instance, information technology solutions could automate the follow-up procedures, including evaluation of quality of life, local control, patterns of relapse and survival.

Symposium: MRI throughout the treatment chain

SP-0509
MR Imaging in Radiotherapy: The evolving role of the RTT
G. Perkins

There is increasing interest and application of Magnetic Resonance Imaging simulation (MRI-SIM) into the radiotherapy localization and planning process. However, the knowledge base within the context of Radiation Therapy practice is still in development. Further, workforce development and the training plans for RTTs working in this developing area of practice has been not yet been standardized. This session targeted at RTTs, aims to provide an overview of the issues involved in developing a service where MRI scans are acquired in the treatment position, for RT planning (MRI-SIM). The session will review the basic principles of MR imaging, the rationale for its use in radiotherapy and typical pulse sequences and scan protocols used for radiotherapy localization (MR-SIM). The session will also provide an overview of MR scanner modifications and accessories utilized for MR-SIM. The typical clinical workflow for MR-SIM including patient preparation, safety issues, scan optimization and CT-MR image registration using clinical examples will be presented. An overview of common staffing models and training plans for RTT’s working in MR-SIM will be reviewed

SP-0510
Dose planning based on MRI as the sole modality: Why, how and when?
J. M. Edmund, D. Andreasen, H. M. Kjer, K. Van Leemput

The debate revolves around the impact of technology in radiotherapy (RT). RT as a field has a long tradition of high technology involvement, and practitioners are used to