which translate into biases and variance in the uptake measurement. Moreover, the tracer has typically a source-to-background ratio that decreases during treatment (e.g. after 3 weeks for FBG). This intrinsically limits the number of interpretable images that can be acquired during treatment.

ii) Dose blurring due to treatment fractionation. Daily setup introduces geometrical errors. Random errors blur the planned dose, while systematic ones shift it. A systematic drift can also be caused by patient evolution (tumor regression, weight loss), thus making adaptive radiotherapy a desirable prerequisite for DP. All this shows that DP must cope with limited information about the real uptake heterogeneities. If directly converted into a dose prescription, these blurred heterogeneities are likely to be further smoothed or even shifted by random and systematic errors if the delivered dose is considered. While dose blurring is beneficial to uniformity within the targets in usual treatment plans, it is actually detrimental to any form of intended heterogeneity. Dose blurring cannot be compensated for with usual safety margins, since they rely on a model that implicitly assumes dose uniformity and further reinforces it to guarantee coverage. Instead, robust plan optimization must be used, either by modeling the setup errors in the optimizer or by providing a modified prescription, dilated for systematic errors and deconvolved for random errors. It is however noteworthy that ensuring coverage might sound paradoxical in DP: it widens the dose peaks and increases the mean dose, whereas DP precisely aims at a selective and parsimonious escalation.

Conclusions: Advanced treatment techniques such as intensity-modulated radiotherapy make DP technically feasible: a non-uniform dose prescription, with rather sharp intensity-modulated radiotherapy make DP technically feasible: a non-uniform dose prescription, with rather sharp

draft target delineation guidelines on glioblastoma. This talk will summarize the different steps that were taken to pull together all relevant information and will highlight the most relevant issues having been included within this guideline. In brief, treatment preparation, imaging prerequisites, delineation guidelines and pitfalls, planning objectives and normal tissue constraints will be discussed. The panel members have ensured to update this guideline within a 2-year’s time frame and updates will be given as amendments if there are scientific breakthroughs.

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Brachytherapy and physics guidelines, update and introduction of recent guidelines
C. Tanderup
Aarhus University Hospital, Department of Oncology, Aarhus C, Denmark

GEC ESTRO has a long term tradition for development and publication of guidelines within brachytherapy. These initiatives have grown out of working groups, which have a structure for joint multicenter research and development projects. The working groups have facilitated substantial progress within e.g. imaging, target definition and treatment planning, and this has become the basis of novel guidelines such as the GEC ESTRO recommendations for cervix, prostate, breast, as well as head & neck brachytherapy. The most recent example is the guideline on target definition for accelerated partial breast irradiation (APBI) which was published by the GEC ESTRO breast working group (Strnad et al) in June 2015 in Radiotherapy & Oncology. In parallel, the GEC ESTRO breast working group has been carrying out a randomized study on APBI, and this has further strengthened the impact of the guidelines. The clinical outcome of the study was published in Lancet in October 2015, and this is an excellent example of possible synergy between development of guidelines and related research activities. Other initiatives from GEC ESTRO include the current development of guidelines on bladder brachytherapy (Bradley Pieters), quality assurance of ultrasound in brachytherapy (Frank André-Siebert), as well as an update on head & neck brachytherapy (György Kovács). During the last decade there has been extensive collaboration between ESTRO (in particular the BRAPHYS working group and AAPM therapy group) on joint physics recommendations and guidelines. The underlying idea is that the gathering of experts from different continents improves quality and that geographically broader views improve the global applicability of guidelines. Examples of recently published joint GEC ESTRO/AAPM guidelines are guidelines for uncertainty analysis (Christian Kirisits), robotic brachytherapy (Taran Podder), and the report on High Energy Brachytherapy Dosimetry (Jose Perez-Calatayud). Uncertainty analysis (Kirisits) showed therefore big impact on the field, and there is altogether now an increasing attention towards quantification of uncertainties in brachytherapy and considerations about how to improve clinical outcome by decreasing uncertainties. Joint GEC ESTRO/AAPM recommendations currently in progress are: TG - 167 (Non-brachytherapy physics guidelines in progress are Quality Management in RT: The use of industry Quality Tools (Crister Cebeg), QA guidelines for CBCT developed together with EFOMP (Alberto Torressin), and also guidelines on Technology for Precision Small Animal Radiotherapy Research (Frank Verhaegen and Dietmar Georg). ESTRO physics committee and AAPM are currently working on a memorandum of understanding (MOU) with the aim of increasing scientific