AbstractID: 9735 Title: Integrating Research into the Clinic: Experiences from Implementing Monte Carlo, IMRT, and …

Clinical implementation of in-house developed research-based treatment planning software poses challenges for both the code developer and clinical user. This presentation will examine several important aspects of the implementation and integration processes, using in-house IMRT and Monte Carlo dose calculation programs as examples. For the developer, challenges include the creation of fail-safe strategies to ensure patient safety; procedures for upgrades, including updates to address clinically urgent issues; and separation of clinically implemented code from research-based code which is under continual development. Jointly, the developer and clinical user are challenged to create commissioning and quality assurance procedures which not only meet AAPM TG guidelines, but which also test pre-identified failure modes that are specific to the software implementation. They are further challenged to develop per-patient quality assurance methods to ensure patient plan quality. A useful strategy in this regard is to utilize a vendor-supplied FDA approved product for cross-comparison of the deliverable treatment plan. Finally, the implementation and integration processes should include procedures for dealing with non-compliant cases, including identifying error sources and implementing remedies. Examples of how these challenges were addressed in our clinic will be presented.

Learning Objectives
1. To appreciate the challenges inherent in safe clinical implementation of in-house developed software
2. To understand strategies for overcoming the challenges of clinical implementation of in-house developed software
3. To understand the role of QA in safe clinical implementation of research

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