Advancements and Integration: Exploring the Evolution of Automation in Radiotherapy Treatment Planning
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Purpose/Objective(s):

This presentation explores the historical progression and current state of automation in Radiotherapy (RT) treatment planning. We will examine the evolution of RT technology, the motivations behind seeking automations, potential challenges, and the possibilities for the future.

Materials/Methods:

Drawing from personal experience and industry insights, we will discuss the role of automation in RT planning. We will delve into the meaning of automation in the context of modern RT planning, including the emergence of Software-as-a-Service (SaaS) modular solutions and automation features within Treatment Planning Systems (TPS). Additionally, we will address the integration challenges faced by vendors and healthcare institutions including scalability, standardisation, and the importance of seamless integration in healthcare settings to enhance accuracy and efficiency.

Results:

Through historical analysis, we will showcase the progressive integration of computerised automations in RT. We will highlight how software vendors, including Linac manufacturers, are increasingly aware of the automation requirements in treatment planning. The collaboration between software development experts and healthcare professionals has paved the way for rapid advancements and large-scale innovation in the field. We will showcase specific TPS automations and a system of integrated components and software-enabled collaboration between clinical physics experts and software developers, enabling scale, rapid development, and the creation, testing and release of optimisation templates. This approach acts as a force for standardisation and establishes a direct connection to the clinician requirements.

Conclusion:

To achieve safe and rapid developments in RT planning automation, digital integration across all system components/services and a scaled approach to collaboration between clinicians and software development experts are crucial. This includes digitising and integrating constraints and objectives for each component of the treatment planning process. By leveraging the power of automation and seamless integration, we can enhance the accuracy, efficiency, and overall effectiveness of the treatment planning process.