

From TPS to Radiomics, Expanse Imaging Use in RT

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Radiation Oncology needs to combine a very large body of data to decide, plan, survey and follow-up a radiotherapy (RT). Moreover, as RT is tidily linked to the specific anatomy of the patient and the topology, size and shape of the tumor very accurate imaging documents are necessary. Even more, modern RT is defined at the scale of the mm, making positioning and repositioning a critical step totally devoted to imaging.

Thus, imaging is everywhere in RT and should be very well mastered by the different professionals involved in RT: MD, medical-physicists, technologists.

This course will review the different types of imaging used in RT, there requirement, quality level, availability, ergonomic, technical uses as organ and target segmentation, medicolegal issues, etc.

However, beyond this medico-technical use of imaging in RT, clinicians are demanding more and more information about the biological characteristics of the tumors, their internal heterogeneity, the presence of neoangiogenesis, hypoxia, molecular characteristics, evolutive potential, radioresistance or sensitivity, etc. Such a level of integration, in particular in a 3D space is only possible for the human brain by producing integrated images. Whatever the type of imaging the data mining in a panel of different imaging processes to decipher characteristics and prognostic of the tumors is now called Radiomics. This concept and examples will be explained.
