

Imaging technologies have proven to be of great value in medicine. The capacity to detect, characterize, and locate anatomical structures within the body by non-invasive methods has had a profound effect on the diagnosis, prognostic accuracy, and toxicity associated with an intervention. The availability of computed tomography (CT) in the '80s opened the gates to localization and targeting of radiation therapy for cancer and has been a key enabling technology for the past two decades of innovation in RT. Similar efforts are now underway to bring the power of ultrasound and magnetic resonance (MR) imaging to the simulation and treatment process. Taken together, these modalities offer a remarkable level of resolution and sensitivity that describe the underlying anatomical structure and they continue to bring forward additional anatomical information that can play a role in target and normal tissue delineation. The role of anatomical measures in the assessment of overall treatment response is long standing, however, the development of peri-therapeutic imaging activities (e.g. daily CT-based image guidance, weekly MR imaging) are raising the potential for these technologies to be used for both treatment adaptation and potentially prediction of outcome. In this presentation, anatomical imaging is framed and briefly described in relation to the underlying signal generating processes (CT, MR, US) and a review of efforts to employ anatomical imaging methods to assess response in radiation therapy is presented.