

In tomotherapy the primary objective is to achieve local tumor control while minimizing dose to critical structures. Often, the tumor volume is not clearly delineated, so little rationale exists for tight conformance of dose. Thus, a complementary method, known as *conformal avoidance radiotherapy* (CARx), is suggested, whereby dose distributions are designed to treat regional fields while “conformally avoiding” sensitive structures.

Prime implementation opportunities for CARx exist in treatment of diseases such as breast cancer, hepatobiliary cancer, and Hodgkin’s disease, for they can involve nodal regions extending from the neck to the abdomen. Also, one challenge in head/neck cancer is preventing spinal cord and parotid gland doses from exceeding tolerance. With CARx implemented on a tomotherapy system, it would be possible to treat the entire neck, elevating dose to primary tumor regions, while sufficiently sparing critical structures. In such cases where disease is not well-confined, it does not make sense to conform radiation to the tumor. Instead, “conform to avoid” critical structures or structures not deemed critical but whose loss of function could cause the patient further degradation of quality of life.

To investigate the viability of “conformal avoidance”, CT data sets of a human male and female have been obtained via the “Visible Human Project” and imported into Pinnacle for use in comparative studies to be performed between conformal and CARx techniques. Results from a Pinnacle-planned head/neck case are presented.