CONTOURING FOR EARLY PROSTATE CANCER

VOLUME DELINEATION BASED ON ICRU 50&62/RTOG 0126

THE GROSS TUMOR VOLUME (GTV)

GTV is defined by the physician as all known disease as defined by the planning CT, urethrogram, and clinical information.

If a urethrogram is used, the GTV will encompass a volume inferiorly 5mm superior to the tip of the dye and no less than the entire prostate.

Prostate dimensions should be defined as visualized on CT scan.

THE CLINICAL TARGET VOLUMES (CTV)

CTV is GTV plus areas considered to contain microscopic disease, delineated by the treating physician, and is defined as follows:

CTV is the GTV (prostate) plus the proximal bilateral seminal vesicles.

Only the first 1.0 cm of seminal vesicle tissue adjacent to the prostate shall be included in the CTV.

This 1.0 cm of seminal vesicles refers to both radial (in plane) and superior (out of plane) extent.

If both prostate and seminal vesicle are visualized in the same CT slice, this seminal vesicle tissue will contribute to the 1.0cm of tissue.

THE PLANNING TARGET VOLUME (PTV)

PTV is margin around the CTV to compensate for the variability of treatment set up and internal organ motion.

Minimum of 5 mm around the CTV is required to define each respective PTV.

Superior and inferior margins *should be 5-10 mm* depending on the thickness and spacing of the planning CT scan.

Careful consideration should be made when defining the 5-10 mm margin in three dimensions.

It is advised that extreme bladder or rectal filling not be present at the time of the planning CT scan.

A distended bladder or rectum can introduce a systematic error that may increase the probability of missing the CTV. An enema before the planning CT scan and use of a hollow *catheter to evacuate flatus* will empty the rectum, thereby allowing a narrow posterior PTV margin *(~5 mm) to account mainly for* set up errors.

CRITICAL NORMAL STRUCTURES

The normal tissue volume to be contoured will include bladder, rectum, bilateral femoral heads (to the level of ischial tuberosity), penile bulb, and skin. The normal tissues will be contoured and considered as solid organs.

The bladder should be contoured from its base to the dome, and the rectum from the anus (at the level of the ischial tuberosities) for a length of 15 cm or to the rectosigmoid flexure. This generally is below the bottom of the sacroiliac joints.

The tissue within the skin and outside all other critical normal structures and PTV's is designated as unspecified tissue.

VOLUMES TO BE CONTOURED - CA PROSTATE

Standard Name	Description
BLADDER	Bladder
CTV	Clinical Target Volume
FEMUR_LT	Left Femur
FEMUR_RT	Right Femur
GTV	Gross Tumor Volume (Prostate)
PENILE_BULB	Penile Bulb
PTV	Planning Target Volume
RECTUM	Rectum
SKIN	External patient contour
SEM_VES	Seminal Vesicles

DEMONSTRATION

TOLERANCE DOSE-OAR

Normal organ limit†	No more than 15% volume receives dose that exceeds	No more than 25% volume receives dose that exceeds	No more than 35% volume receives dose that exceeds	No more than 50% volume receives dose that exceeds
Bladder Constraint	80 Gy	75 Gy	70 Gy	65 Gy
Rectum Constraint	75 Gy	70 Gy	65 Gy	60 Gy
Penile Bulb	Mean dose less than or equal to 52.5 Gy			