

RAVES - Contouring Guidelines

Revised July 2011

CTV Delineation

The following guidelines for CTV contouring are generic and may need to be changed on an individual basis according to clinical and histopathologic findings. In this circumstance please outline reasons for variations from guidelines on the submission form to ensure reviewer is aware of reasoning.

The CTV structure will be named “**CTV**” at the planning computer. Delineation of the CTV surgical bed (recommendations are based on CT slice thickness of 2.5-3.0 mm) shall be:

Inferior border: The inferior border of the CTV will be 5-6mm inferior to the vesicourethral anastomosis (depending on CT slice thickness), but should be extended inferiorly if necessary to include all tumour bed clips (i.e. non-vascular).

- i. The anastomosis can be identified on axial, coronal and sagittal reconstructions as the slice inferior to the last slice where urine is visible. To assist with the treatment plan review process, the CT slice containing the anastomosis shall contain a contour or some other identifier indicating the position of the anastomosis. This contour (or appropriate identifier) shall be labelled “**anastomosis**”.
- ii. When the anastomosis is not clearly defined, the inferior border will be the first slice superior to the penile bulb.

Anterior border:

- i. From the inferior border of the CTV to 3cm superior, the anterior border of the CTV is the posterior aspect of the symphysis pubis. In certain circumstances (eg positive margins at bladder neck) it may be necessary to extend this height up to the level of the superior pubic symphysis.
- ii. More superiorly, the anterior border of the CTV should encompass at least the posterior 1.5cm of the bladder.

Posterior border: The space delineated by the levator ani and anterior rectal wall is at risk for recurrence and should be encompassed in the CTV if rectal dose constraints allow. As a minimum, the lateral posterior border must approximate the anterior rectal wall in the inferior portion. Ensure a minimum 2cm margin from the posterior extent of the CTV to the posterior rectal wall to prevent the entire circumference of rectum receiving the full radiation dose. In defining the CTV be aware that the PTV expansion and the 95% isodose should not encompass the full circumference of the rectal wall. More superiorly, the posterior border of the CTV is the anterior mesorectal fascia. This is often delineated by the posterior border of the residual seminal vesicles/seminal vesicle bed.

Lateral border: The medial border of the levator ani muscle inferiorly or obturator internus muscle (pelvic side wall) superiorly.

Superior border:

- i. If the seminal vesicles are not involved, the superior border should encompass all of the seminal vesicle bed as defined by post surgical changes and non vascular clips. The tips of the residual SV's do not need to be included.
- ii. If the seminal vesicles are pathologically involved by tumour, ensure any residual seminal vesicles are also included in CTV.

Planning target volume (PTV)

The PTV is created by adding 10mm to the CTV in all directions to create the PTV, in order to account for day-to-day variation in patient positioning/set-up and patient and organ motion.

Planning target volume delineation:

A uniform margin of 10mm from CTV to PTV for the entire dose. The PTV shall be named “**PTV**” at the treatment planning computer. Ensure the PTV expansion and the 95% isodose does not encompass the full circumference of the rectal wall.

If the V40Gy rectal DVH constraint cannot be met (i.e. more than 60% of the rectum is receiving >40Gy), then we recommend reducing the posterior margin to a minimum of 0.5cm keeping other margins to 1cm using the auto expansion tool in the planning software. If the V40 is still cannot be met, please submit case to the reviewing team who will then be in contact to discuss case.

If the V60Gy constraint cannot be met (i.e. more than 40% of the rectum is receiving >60Gy) then consider the following:

Option 1: Reduce the posterior expansion of CTV to PTV to 5mm for the entire course of treatment.

Option 2: Maintain the 10mm CTV to PTV expansion in all planes and treat using IMRT. Centres must be credentialed to plan with IMRT prior to considering this option.

Note that for IMRT treatments a 10 mm uniform expansion is mandatory due to the increased potential for geographic miss.

Centres should consult with QA Tech committee if the rectal DVH constraints cannot be met.

Normal tissue contouring and dose constraints:

Rectum: The external surface of the rectum shall be named “**Rectum**” at the treatment planning computer and should be contoured as a solid organ superiorly from the recto-sigmoid junction (where the rectum turns horizontally into the sigmoid, usually at the inferior border of the sacro-iliac joint) to 15mm inferior to the inferior border of the CTV. The rectal contours should extend at least 15mm superior and inferior to the CTV. It is recommended that patients be encouraged to maintain an empty rectum at simulation and during treatment. As a guide, it is expected that the rectal diameter shall be <5cm.

The left femur shall be named “**LF**” at the treatment planning computer and will be contoured from the acetabulum to the inferior edge of the treatment field.

The whole external wall of the bladder shall be named “**Bladder**” at the treatment planning computer and should be contoured to the slice superior to the anastomosis. Note, during treatment planning, if the bladder has been filled with contrast then a pixel by pixel density correction is inappropriate and a “bulk” correction, using typical values for normal tissue, should be applied.

Whilst it is not a protocol requirement to delineate the anal canal, if it is delineated, shall be named “**AC**”.



