Patient Models

Once the Course has been completed the next block will be the Patient Model. The Patient Model contains a single CT image set and all contour variants (targets and organs at risk) associated with these images.

About Patient Models

- ***Patient Model***: captures the state (anatomy) of a patient at a certain point in time. Each Patient Models contains a single Image Set (typically CT) and all contour (structure) variants associated with these images. Each unique Image Set imported into the patient should produce a new Patient Model. Each unique structure set imported into the Patient Models should produce new contour variants for each unique contour. Each contour may have only a single “active” variant and the plan will automatically update based on the selection of the active variant.
- ***Variant***: A specific model of a target, OAR, or other structure. A physician may provide an initial target contour and a treatment plan might be generated using this information. The physician may later (using the same CT image set) provide a revised target contour. Rather than import this revision as a new structure or override the original, you may specify this new contour as a variant of the original and the plan will automatically update based on the selection of this new active variant (note each contour/structure may have one or many variants, but only a single variant can be designated as “active”).

Structure Data Model

There are multiple levels that various structures can live at. Each level will effect how the structure will relate to the plan.

Note:

- The assignment of structure type will determine the types of constraints or objectives you can put on the structure.
- Only structures with a Type of Target can be used as Beam Targets
- Site level, Course level and Custom structures can be shared within plans on the same patient

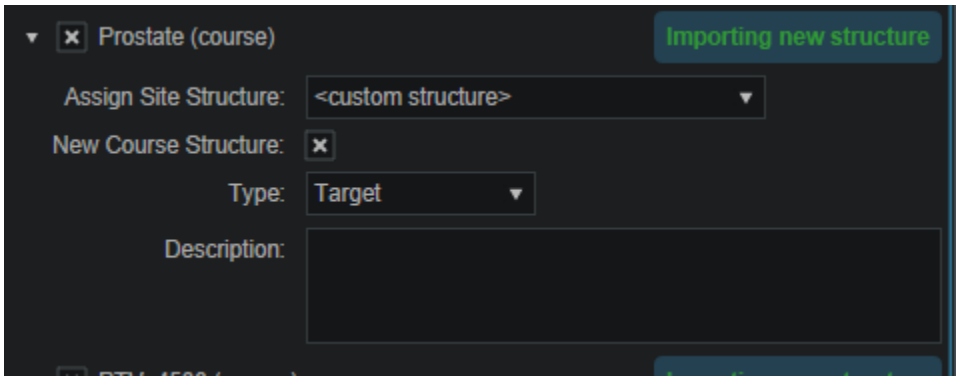
Site Level Structures

Site level structures are predefined templated structures. The user is not allowed to edit any aspect of a Site Level structure. Site level structures may be used for prescriptions as long as they have been

designated as a Target.

Course Level Structures

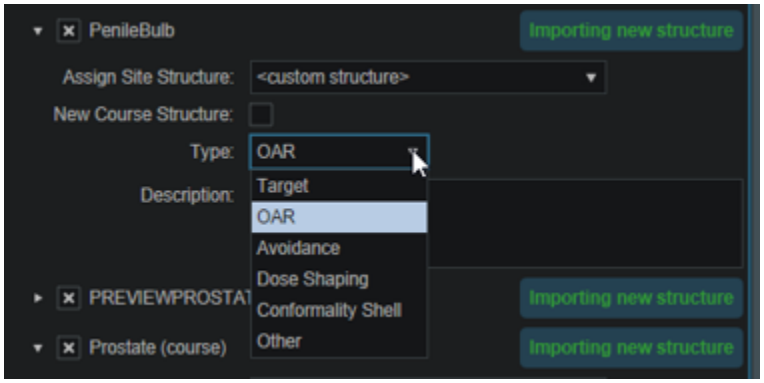
Course level structures are not predefined templated structures (Site Level Structures). Course level structures may have certain properties edited within the planning user interface (e.g.: their type). A structure may be assigned as a Course level structure by choosing the box “New Course Structure” option at the time of import for any structure that does not automatically match a Site Level Structure.



Structures that have been changed to Course level will have be designated as such by the word “course” appearing in parentheses beside the structure name during import. This is useful when a structure was misnamed during the contouring process. Course level structures that have been designated as Target structures can also be used for prescriptions. Ant structure with TV as part of its name will automatically be designated as a Course Level structure.

Custom Structures

Custom structures show up at the Patient Model level. These are structures that were not part of the templated structures nor assigned as a Course Level structure. The user has the option to edit the properties of a custom structure from within the Patient Model task.



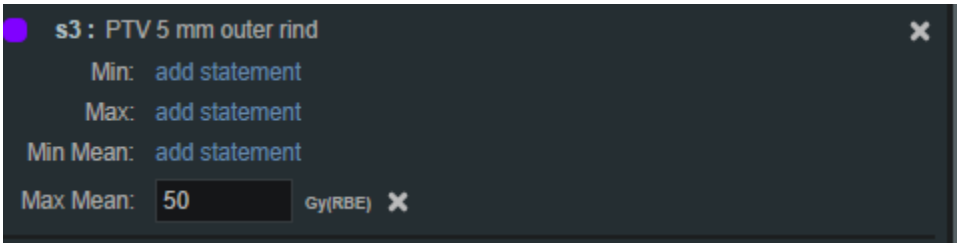
Plan Level Structures

Plan level structures are structures created with the Astroid TPS. These structures are derived from existing structures (e.g.: expansions, combinations). See Patient Geometry on how these are created.

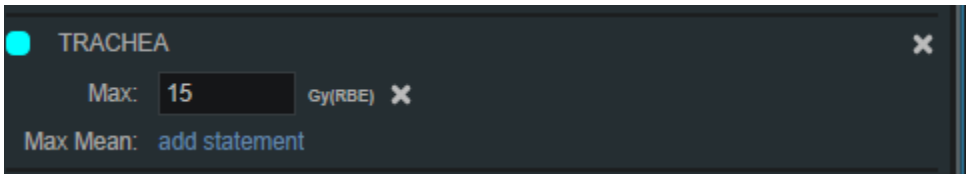
Structure Types When Used in Plan Constraints and Objectives

See Optimization Constraints and Optimization Objectives for definitions of Constraints and Objectives.

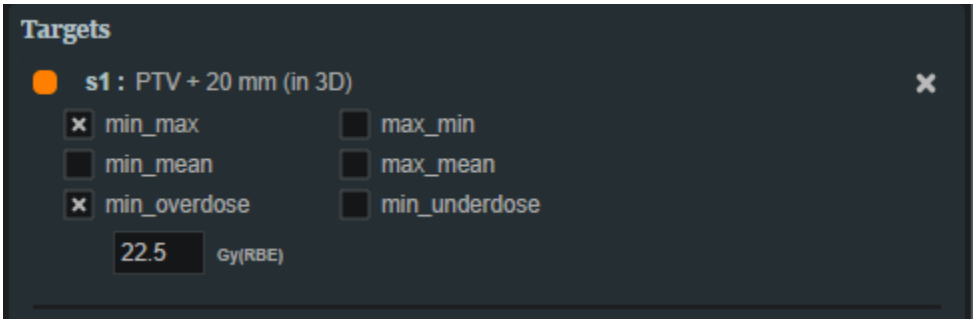
When the user is setting up their Constraints only on Targets will they have the ability to set minimum doses to be achieved for the minimum dose and the minimum mean dose. The user can also set the maximum dose they want to be achieved along with the maximum mean dose.



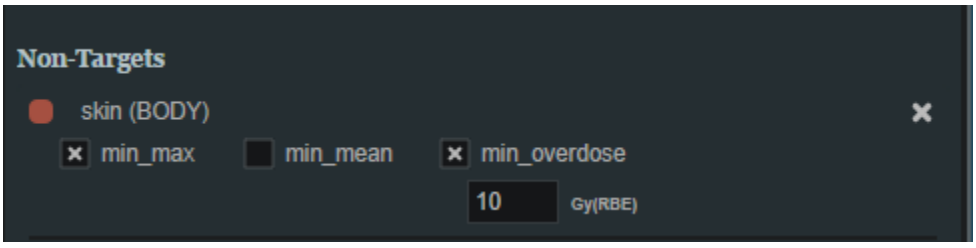
For all other structure types the user will only have the ability to set the maximum dose to be achieved along with the maximum mean dose.



Similarly when setting the Objectives the user can set objectives to both minimize and maximize the doses on Targets.



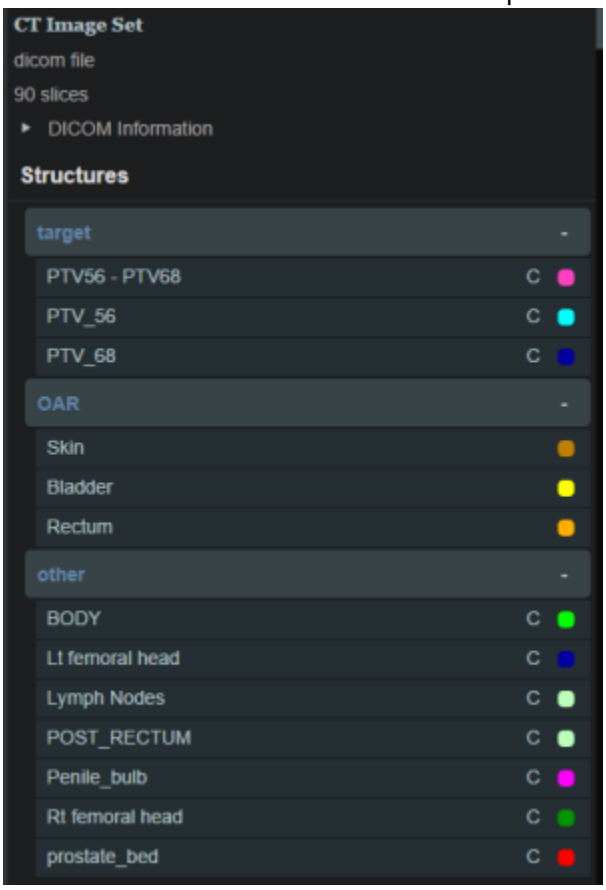
However on Non-Targets the user can only set objectives that will drive the dose down to these structures.



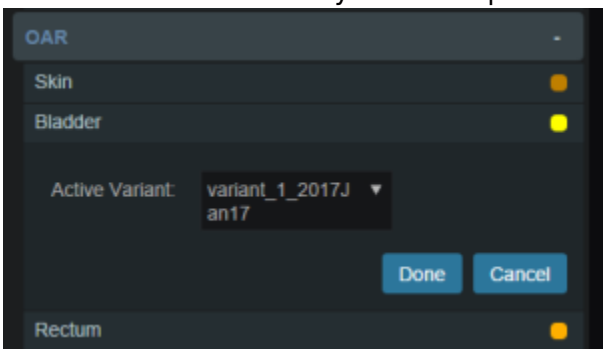
Working with Patient Models

Within Astroid the planner has the ability to view the Patient Model details and edit certain structures in a limited capacity.

1. A Patient Model contains data relating to the image set such as the number of slices, who imported the image set, the import date and the UID.
2. A Patient Model also contains a list of the structures that were imported.



3. The user may choose to set the active variant for any structure present in the snapshot.



4. Structures not defined in the site config (i.e. custom structures) are denoted with a “c” beside it. These structures have the ability to be edited in a limited capacity. The planner may choose to change the structure variant, color, and structure type. The planner may also choose to enter any notes that may be helpful at this point.