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## Creating Structures

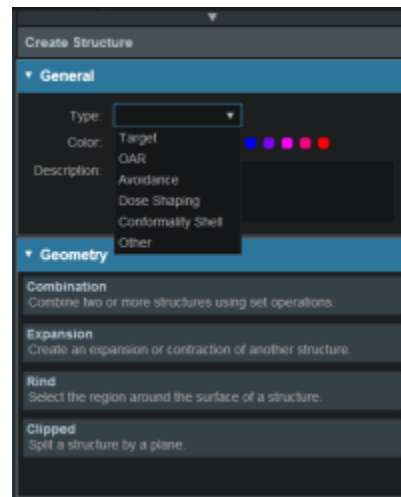
Within Astroid the planner has the ability to create additional structures that may be needed to perform the plan.



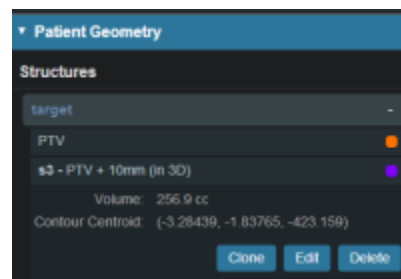
1. Open the Patient Geometry block This will open the patient structure list.
2. Choose the Create New Structure list at the bottom of the list



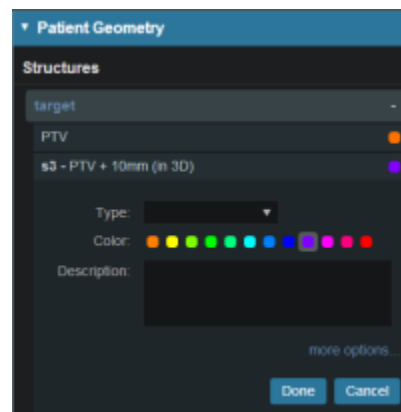
3. The planner must then choose what type of structure they would like to create from the drop down menu at the top as well as the geometry to create the structure- Combination, Expansion, Rind or Clipped.



4. Once an additional structure has been created the planner may edit, clone or delete the structure by clicking on the structure.



5. If the planner desires to clone (duplicate) or delete the structure they may choose to do so. If they need to further edit the structure they may click on the edit button then choose more options. This will take the planner to the structure Geometry block and they may proceed with the necessary edits.

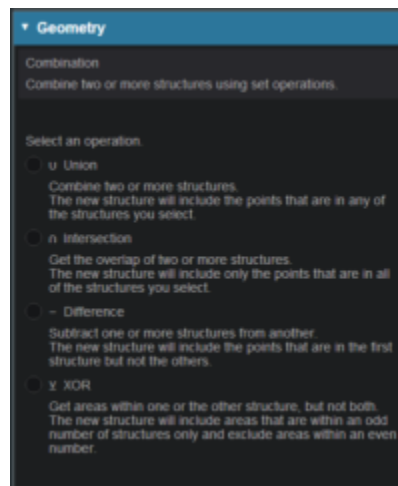


## Explanation of Structure Geometry Functions

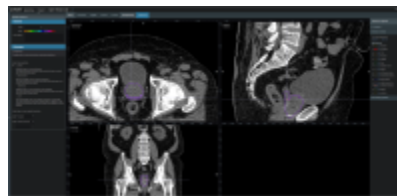
The following is a detailed explanation of each of the structure geometry functions that a user may use to create or edit a structure once it is in Astroid

- **\*Combination** -Combination of two ore more structures using set operations

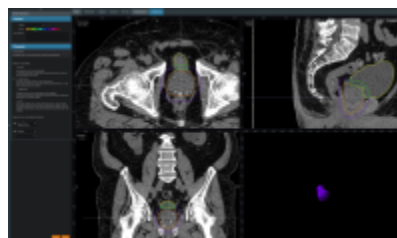
1. The planner must choose which set operation they desire to create the structure



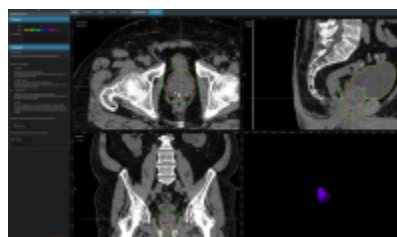
2. *Union*- Combine two or more structures. The union will contain the points that are in any of the structures the planner selects. From the drop down the planner chooses which structures the would like in the union



3. *Intersection*-This will get the overlap of two or more structures. The intersection will include only the points that are in all of the structures the planner selects from the drop down.

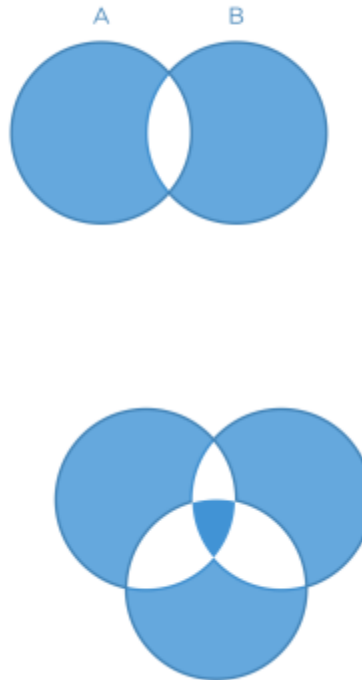


4. *Difference* -Allows the planner to subtract one structure from another. The new structure will include the points that are in the first structure but not the others. The first drop down is the structure to be subtracted from. The second drop down is the structure the planner wishes subtracted.



5. *XOR* -Combines two or more structures. The new structure will include areas that are within an odd number of structures only but will exclude areas that are within an even number of

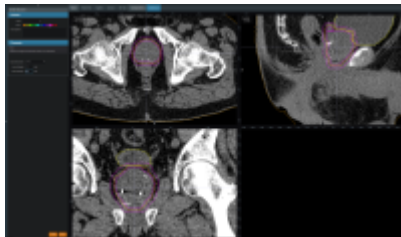
structures. Two or more structures need to be chosen from the drop down to create the new structure. The shaded areas in the examples show the new structure. The non-shaded areas would be excluded.



- **\*Expansion\*** The planner may create an expansion or contraction of a chosen structure. An expansion is done by entering a positive number in the expansion amount. A negative number will cause a contraction to be created. They also may choose to expand the structure in two dimensions (structure will only expand/contract in the slice that the chosen structure is on) or three dimensions (structure will expand onto other slices).



- **\*Ring\*** Creates an outer ring around the outside of a structure. The planner needs to choose the structure from the drop down as well as enter the inner margin and outer margin. Negative margins are not permitted.



- **\*Clipped\*** Splits a structure in either the transverse, coronal or sagittal plane. The user must choose the structure, plane and the point at which the structure should be clipped. The following

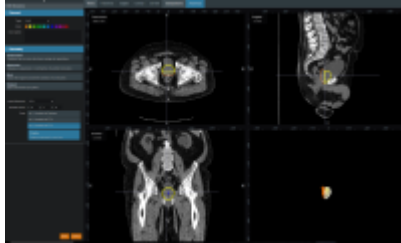
walk through demonstrates clipping a structure

1. 

2. 

3. 

4. 



5.

6. 

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