Optimization Constraints

About Constraints

Constraints can be set in multiple levels (*Plan, Fraction Group, Target List*) and they will function differently in each level. Note all constraints are considered “hard limits”- constraints that must be achieved. *Constraints* are what drive the feasibility calculation- whether the plan is achievable. *Constraints* at the *Plan* level are applied to the total dose across all beams. *Constraints* at the *Fraction Group* level apply to the total dose across all beams in the Fraction Group. Constraints at the *Target List* level are split evenly and applied individually to each Beam Set. In other words, the *Constraint* dose is divided by the *Beam Sets* in the *Target List*, so that both SFO and IMPT can be achieved (see Fraction Groups). The following will provide a walk through of the different levels and how constraints work at each one.

The following constraint types are available. Note certain constraints are available only for *Target* type structures.

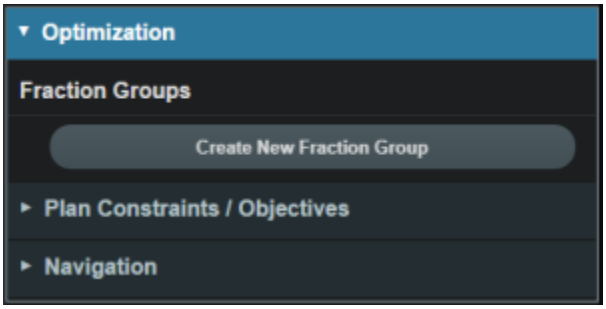
- **Min**: The minimum dose the structure must receive
- **Max**: The maximum dose the structure must receive
- **Min Mean**: The minimum mean dose a structure must receive
  - This will drive the dose up across the structure
- **Max Mean**: The maximum mean dose a structure must receive
  - This will limit the mean dose across the structure
- The user can choose to apply one of these constraints or multiple constraints to the structure

Working with Constraints

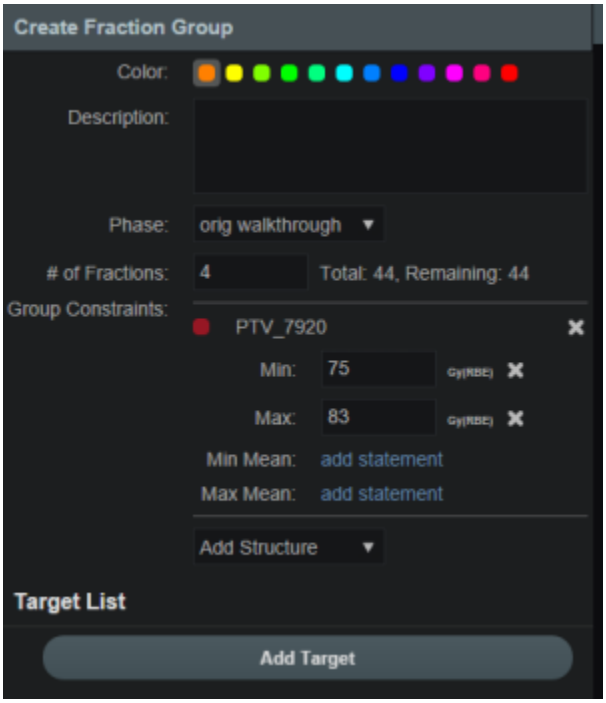
Working with Fraction Group Constraints

Constraints at the *Fraction Group* level apply to the total dose across all beams in the *Fraction Group*

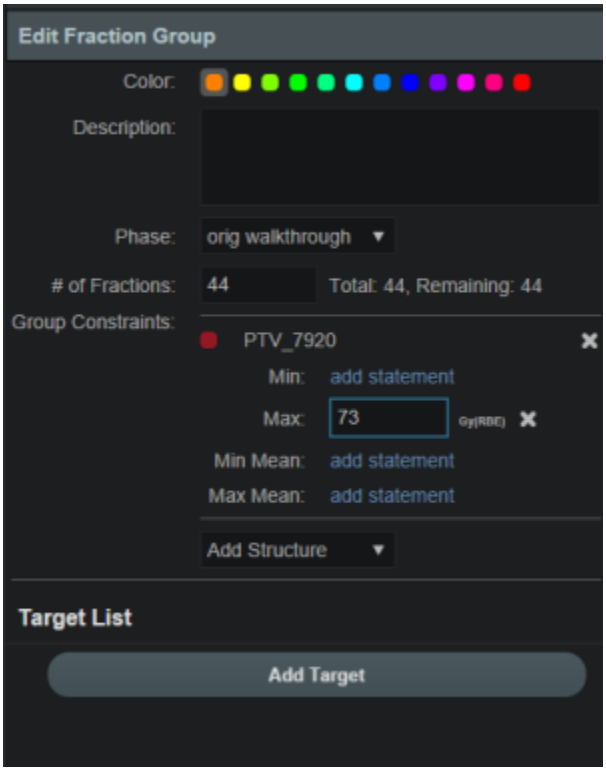
1. Select the *Fraction Group* if it has been created or create a new by selecting *Create New Fraction Group*



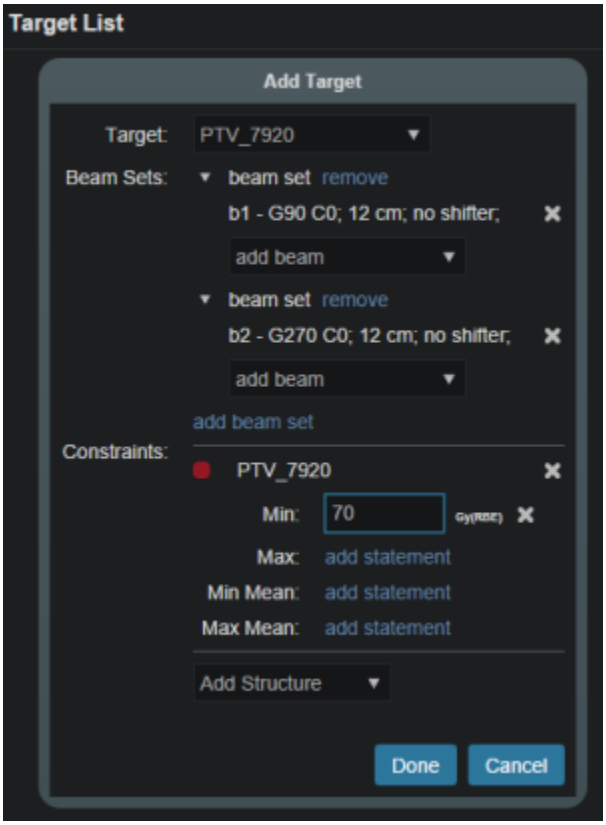
2. Choose the target, the phase and number of fractions to be treated within this Fraction Group



3. Choose from the drop down the structure or structures to which constraints should be added
4. Define what constraint(s) should be applied to each structure by choosing the constraint and entering the dose



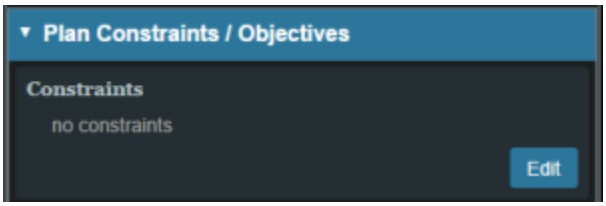
5. Once the constraints are set in the *Fraction Group* the user will create *Target Lists* and assign *Constraints*
6. The assigned constraint doses will be divided evenly among the *Beam Sets* in the *Target List*



Working with Plan Constraints

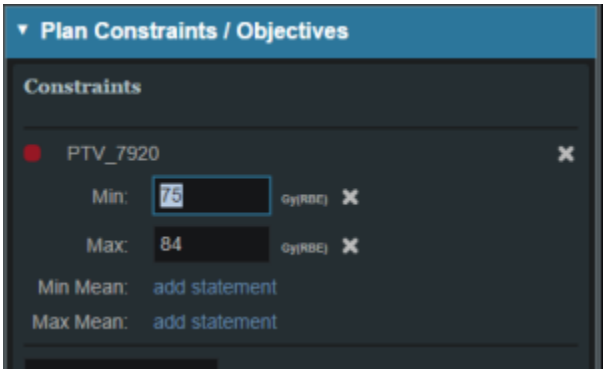
Constraints at the *Plan* level are applied to the total dose across all beams.

1. Open the *Constraint* sub block contained in the *Plan Constraints/Objectives* block and choose the *Edit* button.

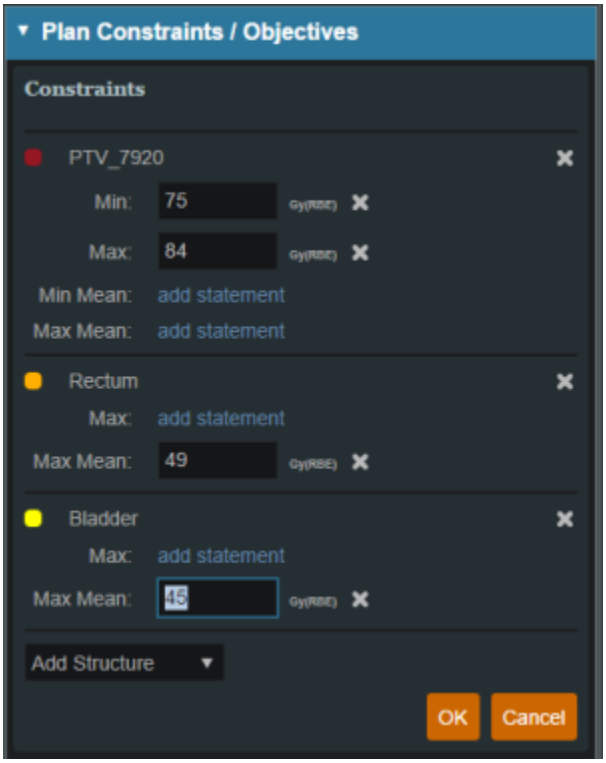


2. Choose from the drop down the structure or structures to which constraints should be added

3. Define what constraint(s) should be applied to each structure by choosing the constraint and entering the dose



4. Follow this and enter the constraints for all applicable structures.



5. When finished click the *OK* button.
6. Once all the Constraints have been set the user can either start the Feasibility or move on to defining the Objectives