# **Electron Block Creation**

Here the user can create and edit Electron Blocks for the selected beam as well as edit values for an existing block.

▼	Beams					
Т	eatment Machine				Varia	nTrueBeam
=	Electron Beams					
	b1: G341 C285 CL0	; 6x6 iso: (-0.4, -34.2, 8.0				
	Beam Energy: Beam Normalization: Normalization Type: Applicator: Block: Bolus: Bolus Type: Intensity Modulator: Skin Collimator:	341 deg 285 deg 0 deg 100 cm 9 MeV 54 Gy Structure: nose; Type: N 6x6 1-G341C285-eIM-C5550 1-G341C285-EB-C5550 Structure as Bolus yes	05	%	Edi	Delete
				Create Ne	w Flect	on Ream
				Create Ive	W LICU	on beam

Fig. 1: Block size selection

## **Block Size**

• **Size:** Select the block size. The list of available block sizes is derived from the list of applicator (cone) sizes available for the selected machine. Applicator sizes can be enabled and disabled from editing the machine data in the site configuration.

**Note:** When first creating a beam the eRT app will auto calculate the smallest block that will fit the current aperture shape.

▼ Collimatio	on and a second s
Use Skin C	collimation
Block Size	
Size:	6x6 🔻
Description:	6x6
	10x10
	15x15
📃 Use Primiti	20x20
Target Margin	25x25
Margin:	- 1 + cm
Avoidance St	ructures
Add Structure	•
Manual Edits Draw on the be	Enable eam's eye view to manually add or remove material.
Shape Smoot	hing
Level:	- 10 +

Fig. 2: Block size options

**Note** Selecting a block size that is too small for the aperture shape will cause an error that will not allow the creation/saving of the beam until an appropriate size is selected.

▼ Collimation	
A Invalid block size for selected target	
Use Skin Collimation	
Block Size	

Fig. 3: Block size too small

• **Description:** An optional description for this block used to identify it.

### **Target Margin**

• **Margin:** The value (in cm) of the margin around the target structure as projected to isocenter. A negative margin can be used to specify a contraction around the beam target while positive values will cause an expansion.

Note: The app will automatically recalculate and display changes to the block as the margin is edited.



Fig. 4: Block target margin

## **Avoidance Structures**

The user may select one or more structures in the structure list here to add as an avoidance structure. Avoidance structures will decrease the block opening to remove all areas within the projection of the structure.

Fig.	6:	Avoidance	structure	selection

Once the structure is selected you will be able to set the values for how it should be avoided. Including:

• Avoidance Margin: required, sets the margin of avoidance around the selected structure's projection to the isocenter plane.

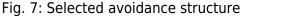
-

Occlude by Target

cm

cm

0.1



Avoidance Structures

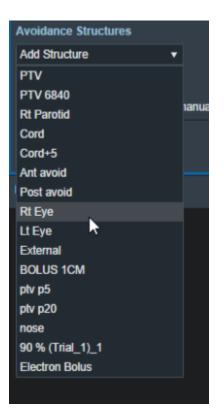
Avoidance Margin:

Force Min Target Margin:

Ant avoid

• Force min target margin: disabled by default, when enabled it will force a minimum margin around the target taking priority over the settings of the avoidance structure.

**For example:** As shown below, there is an overlap between the margin set for the avoidance structure and our target structure. Since "force min target margin" is disabled, the avoidance margin has priority



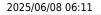
#### over the target.

decimal Electron RT																- 0
Section View																
.decimal err + ECT Nose (Nose) + 3																Daniel Patenaude (*
	Vires	Saultai	Coronal	Transverse	30 BEV	DVH 3	Statistics D	ineline	Compositions	Ontro + BEV	Othe + 3D	3D + REV	Ortho + DVH	DVH + Stats	Ortho + Dose Line	
													0.000		Controls / Options	
<ul> <li>General target nose</li> </ul>	ч <u>с</u>								$\rightarrow$						General Display Option	
<ul> <li>Approach</li> <li>C356 deg, C0 deg, C1 deg</li> </ul>															CT Controls	
► Energy Selection energy: 9 MeV															Structure Controls	
▼ Block	*			- T											× Show structures	
Diock Size							Avo	idance	Margin						× Highlight Slice Post	ion .
Size: Goli + Description			10				∕∼.								Show All Hide All	
Construction (	2				1	/-	<u>-</u> ,		+				-		• • • • PTV	
Target Margin								1					;			
Margin: - 1.25 + on	1	- '						1		Targe	t Margin				<ul> <li>■</li></ul>	
Avoidance Structures	2			10. T	111	ίπ.		1							+ 🔲 🗘 Cord+5	
Rt Eye + x Occlude by Target +						-									<ul> <li></li></ul>	
Avsidance Margin: - 1 + cm				. T	<b>NAMES</b>	1		1							• 🗖 💠 Rt Eye	
Force Min Target Margin: - 1 + cm	-			1	- I	1		ļ		_					<ul> <li>• • • • • Etternal</li> </ul>	
Add Bruchare +													:		• • • • • • • • • • • • • • • • • • •	м
Manual Edits Disable	-						Overt	ap 💧			_ (				<ul> <li>● ◆ ptvp5</li> <li>● ◆ ptvp20</li> </ul>	
Draw on the beam's eye view to manually add or remove material. Reduct = 0.5 + cm	0		×.	_		4									• • • • • nose	
Brack Ure × Snapping Chur Edit				`		- 7	(								• • • • • 50% (Trial)	
Shape Smoothing	1												/ .		Point Controls	<b>4</b> .6
Level - 0 +	π						Į								Dose Controls	
► Bolus nons															Beam Cantrols	
	-														Deart Care do	
	2															
	2												_!			
	1															
Dow Canal																
			La C C	· 4	. (	a '	4	կ	6	· 4		12 '	' d	- la - '		

Fig. 8: Force min target margin is off

If the user decides that the target should have priority over the avoidance structure we can enable the "force min target margin" and set a min margin for our target. As you can see below the min margin set takes priority over our avoidance margin and there is no more overlap.

4/8



5/8

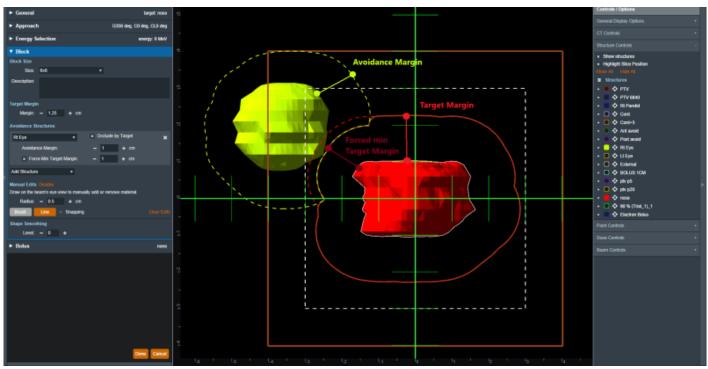
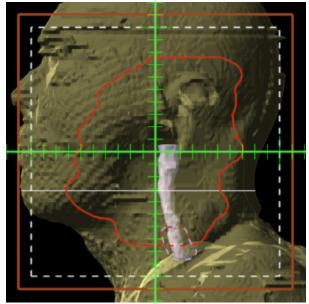


Fig. 9: Force min target margin is on

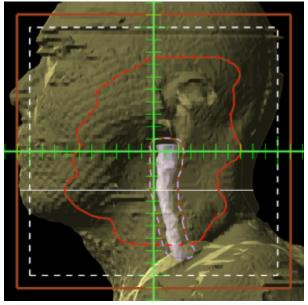
 Occlude by target: The user may also choose to occlude the structure by the target or not by using the "Occlude by Target" option. For the following examples we will use the Spinal Cord as it shows a dramatic example of differences of using or not using the "Occlude by Target" option. A 5mm margin was applied to the Cord for the following examples.

		-		
▼ Collimatio	on			
🔲 Use Skin C	Collimation			
Block Size				
Size:	20x20	•		
Description:				
Target Margin				
Margin:	- 1 + cm			
Avoidance St	ructures			
Cord	•	Occlude by	y Target	×
Avoidan	ce Margin:	- 0.5	+ cm	
Ford	e Min Target Margin:		+ cm	
Add Structure	•			

Checking the "Occlude by Target" option makes the calculations account for the relative depth positions of the target and avoidance structure when determining the area to avoid. More specifically, the visible portion of the target (target volume that is in front of the avoidance structure) will not be blocked by the aperture. Note that just the inferior edge of the Cord is blocked by the aperture as this is the only portion that is visible (not behind the target) and the part of the Cord that is behind the PTV is not blocked.



 Unchecking the "Occlude by Target" option makes the calculations ignore the depth order. This means the entire avoidance structure will be blocked, regardless of whether it is behind or in front of the target. In this example, the aperture now blocks out all of the Cord.



### **Manual Edits**

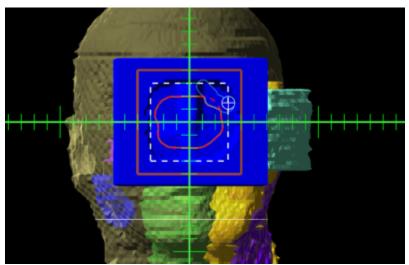
By default manual editing of the block shape it disabled, but a user can elect to enable the ability to manually change the block shape.

Manual Cali	Disable			
Manual Edit				2
Draw on the	beam's ey	e view to manually add	d or remove material.	
Radius	: - 0.5	+ cm		
Brush	Line	× Snapping	Clear Edits	
Channe Carro	- 41-1			

Fig. 10: Enabling manual edits

Once manual editing has been enabled you will see the cursor update to reflect the editing tool. You can choose to edit with the Brush cursor or by drawing straight lines using the Line tool. Both take in the radius that can also be set by the user to alter the size of the editing tool.

**Note:** Drawing on the "Exterior" of the aperture shape will shrink the shape of the block as can be seen below.



#### Fig. 11: Shrinking the block shape

**Note:** Drawing from the "Interior" of the aperture shape will expand the shape of the block as can be seen below.

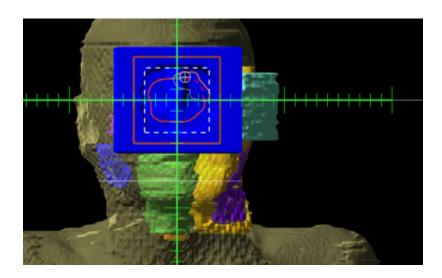


Fig. 12: Expanding the block shape

## Shape Smoothing

• Level: Sets the level of smoothing applied to the block shape.

**Note:** The app will automatically recalculate and display changes to the block based on the set smoothing level.

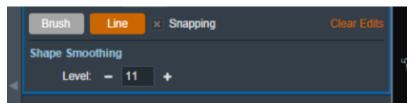


Fig. 13: Setting the smoothing level for the block

From: https://apps.dotdecimal.com/ - decimal App Documentation
Permanent link: https://apps.dotdecimal.com/doku.php?id=electronrt:userguide:tutorials:electron_blocks&rev=1607317386
Last update: 2021/07/29 18:24