ACNS0331 Medulloblastoma Target Volumes and Organ at Risk Atlas

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Patient positioning and treatment planning

- Treatments may be delivered prone or supine
- 3DCRT, IMRT or Proton therapy is required
- Submission of *Individual* (CSI and Boost) **AND** *Composite* isodose distributions is **required**
  - Sum of CSI and boost(s) dose distribution
  - Isodose display in 3 planes
  - Dose volume histograms
Some institutions choose to treat CSI in a prone position then use the supine position for the boost.

This requires two plans to be created.

A composite plan must be created that assumes the cranial dose is equivalent, irrespective of position.
CSI and boost positioning 2/2

- Submission of **Composite** isodose distributions is required
- What do you do if the patient was treated in 2 positions?
  - While a “true” composite plan cannot easily be created, simulating the cranial portion of the CSI on the boost plan will allow a reasonable estimate of the total dose.
Digital Data Submission

• Strongly consider digital data submission!
• QARC can accept data in the same format as the RTOG or other ITC (Image-guided Therapy QA Center) trials.
• Digital data submission not only can save on hardcopy costs (color prints) it has the potential to reduce data management time and effort.
• Information on digital data submission can be found at QARC website.
Limited Target Volume Boost

Organs at Risk (OARs) not displayed for illustration purpose
(see below)
Cyan = PTV (CTV + 0.3 to 0.5 cm)
Pink = CTV (GTV + 1.5 cm within posterior fossa)
Red = GTV (tumor resection bed and residual) Above target

Above target
Limited Target Volume Boost

Cyan = PTV
Pink = CTV
Red = GTV
Limited Target Volume Boost

Cyan = PTV
Pink = CTV
Red = GTV
Limited Target Volume Boost

Cyan = PTV
Pink = CTV
Red = GTV
Limited Target Volume Boost

Cyan = PTV
Pink = CTV
Red = GTV

SLICE: 0.50 CM
ZOOM: 2
Target5
Limited Target Volume Boost

Cyan = PTV
Pink = CTV
Red = GTV
Limited Target Volume Boost

Cyan = PTV
Pink = CTV
Red = GTV
Limited Target Volume Boost

Cyan = PTV
Pink = CTV
Red = GTV
Limited Target Volume Boost

Cyan = PTV
Pink = CTV
Red = GTV
Limited Target Volume Boost

Cyan = PTV
Pink = CTV
Red = GTV
Limited Target Volume Boost

Cyan = PTV
Pink = CTV
Red = GTV
Limited Target Volume Boost

Cyan = PTV
Pink = CTV
Red = GTV
Limited Target Volume Boost

Cyan = PTV
Pink = CTV
Red = GTV
Limited Target Volume Boost

Cyan = PTV
Pink = CTV
Red = GTV
Limited Target Volume Boost

Cyan = PTV
Pink = CTV
Red = GTV

SLICE: -4.50 CM
ZOOM: 2

Target15
Whole Posterior Fossa Target Volume
Above $PTV_{PF}$

Right Supratentorial Brain (RSB)

Left Supratentorial Brain (LSB)
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn

RSB  LSB

PTV  CTV

TargetPF5
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn

Right Eye
Left Eye
RSB LSB
PTV CTV
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn

Right Eye
Left Eye
Chiasm
CTV
PTV
RSB
LSB
RON
LON
SLICE: 20.35 CM
TargetPF8
ZOOM: 2
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn

Hypothalamus/Pituitary

Right Eye
Left Eye

RSB LSB

RON LON

R Lens

CTV

PTV

SLICE: 20.05 CM
TargetPF9

ZOOM: 2
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn

Hypothalamus/Pituitary
Right Eye Left Eye
RSB LSB
RON LON
R Lens L Lens
PTV CTV
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn

Right Eye
Left Eye

Hypothalamus/Pituitary

RSB  LSB

SLICE: 19.45 CM  TargetPF11
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn

Right Eye  Left Eye
RSB  LSB

PTV  CTV
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn

PTV
CTV
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn

Right Cochlea
(best seen on bone window)

Left Cochlea
(best seen on bone window)
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn

Level of Foramen Magnum
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn

C-1

PTV

Cervical Spinal Cord
Whole Posterior Fossa Target

Cyan = PTV
Pink = CTV
GTV not drawn
Below $PTV_{PF}$

Cervical Spinal Cord

C-2
Organs at Risk

Targets not displayed for illustration purpose
Organs at Risk

- The following organs must be defined for 3-D conformal radiation therapy or IMRT planning:
  - Supratentorial brain (left and right)
  - Cochlea (left and right)
  - Hypothalamus/pituitary
  - Eyes (left and right)
  - Optic nerves (left and right)
  - Optic chiasm
  - Cervical spinal cord (foramen magnum to top of C2)
  - Skin (non-specified tissues)
Organs at Risk

Left supratentorial brain (LSB)  Right supratentorial brain (RSB)
Organs at Risk

Left supratentorial brain
Right supratentorial brain

LSB  RSB
Organs at Risk

Left supratentorial brain  Right supratentorial brain
Organs at Risk

Left supratentorial brain  Right supratentorial brain

LSB  RSB
Organs at Risk

Left supratentorial brain  Right supratentorial brain

LSB  RSB
Organs at Risk

Left supratentorial brain

Right supratentorial brain

Top of Cerebellum (CB)

Hypothalamus/Pituitary (HPA)
Note brain in area above cribriform plate.
Note brain in area above cribiform plate.
Organs at Risk

LON = Left Optic nerve
RON = Right Optic nerve

SLICE: -0.00 CM
OAR9
ZOOM: 2
Organs at Risk

- LSB
- CB
- RSB
- BS
- LON
- RON
- Left Eye
- Left Lens
- Right Eye
- Right Lens

SLICE: -0.50 CM
OAR10
ZOOM: 2
Organs at Risk

- CB: Cerebral Body
- BS: Basal Sinus
- LSB: Left Side Brain
- RSB: Right Side Brain
- Left Eye
- Right Eye
Organs at Risk

- Left Cochlea
- Right Cochlea
Organs at Risk

Left Cochlea

Right Cochlea

OAR14b

SLICE: -2.50 CM

ZOOM: 2
Organs at Risk

SLICE: -3.00 CM  OAR15  ZOOM: 2
Organs at Risk

SLICE: -3.50 CM

OAR16

BS
Organs at Risk

Cervical Spinal Cord
Organs at Risk

Cervical Spinal Cord
Organs at Risk

Cervical Spinal Cord
Organs at Risk

Cervical Spinal Cord
Organs at Risk

Cervical Spinal Cord
Organs at Risk
Treatment Plan Data Submission

- **Treatment Planning CT**
  - Submit copies (digital or hardcopy) with contours displayed on images for QA purposes

- **Isodose Display**
  - Axial, Coronal, Sagittal display of isodose (in absolute dose Gy)
  - CSI, Boost(s), AND *Composite*

- **Dose Volume Histograms**
  - All targets and organs at risk
  - CSI, Boost(s), AND *Composite*