

# Proton Therapy Dosimetry Head

Model 731-HN



## **TISSUE EQUIVALENT FOR PROTON AND PHOTON THERAPY**

The CIRS Proton Therapy Dosimetry Head is an anthropomorphic head phantom designed for commissioning and treatment planning system (TPS) verification with any conformal or IMRT Proton Therapy system<sup>1</sup>.

The phantom is constructed of CIRS tissue-equivalent materials, which mimic reference tissues within 1.5% for protons and within 1% for photons from 50 KeV to 15 MeV. The Proton Therapy Head can be used during all standard IMRT procedures from CT image acquisition to proton beam delivery verification<sup>1,3</sup>.

Tissue equivalency of detailed internal structures makes the phantom ideal for treatment plan evaluation in high density-gradient locations, which are specifically important in proton therapy<sup>2</sup>, such as air cavity vs. bone structures. Internal structures include brain, bone with cortical and trabecular distinction, larynx, trachea, fully-open sinus cavities, nasal and mouth cavities, and teeth with distinct dentine, enamel and root structure.

Model 731-HN approximates the average male human head in both size and structure to allow for intuitive set up with any patient positioning or fixation device.

One half of the phantom is sectioned in 2 cm increments for three film locations in the cranio-caudal direction starting from the approximate center of the sagittal plane. Because slices are orthogonal to the CT axial plane, artifacts caused by residual air gaps are noticeably reduced compared to standard axial slices.

Proton system commissioning is enhanced by placement of a tungsten BB in a molar and a titanium prosthesis attached by two screws at C3 and C5 vertebra.

### **Features**

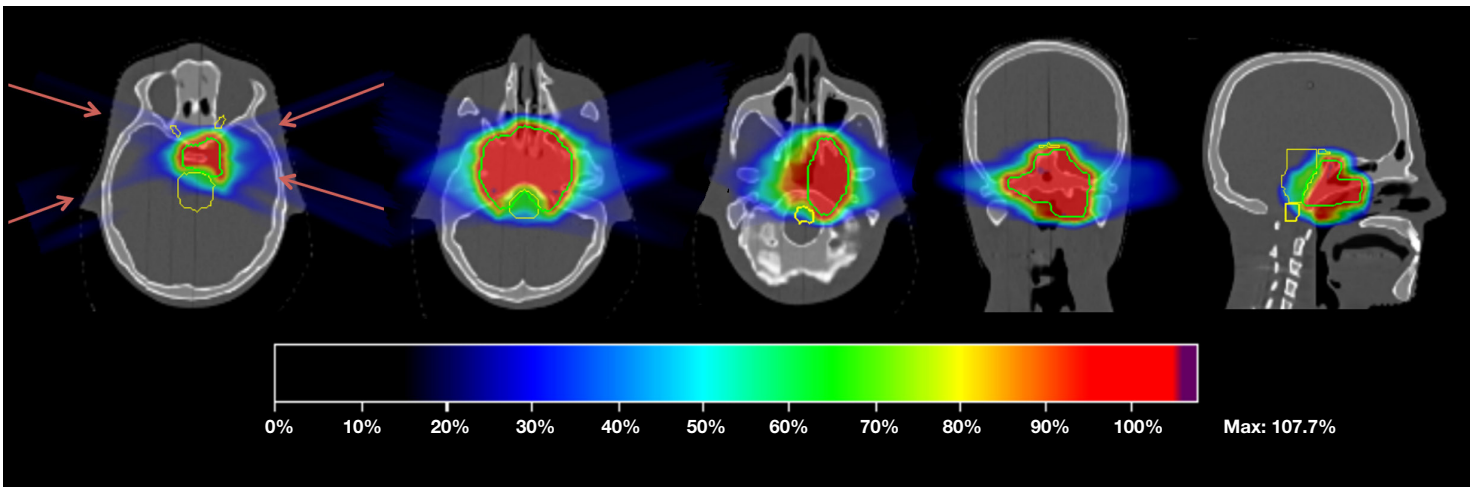
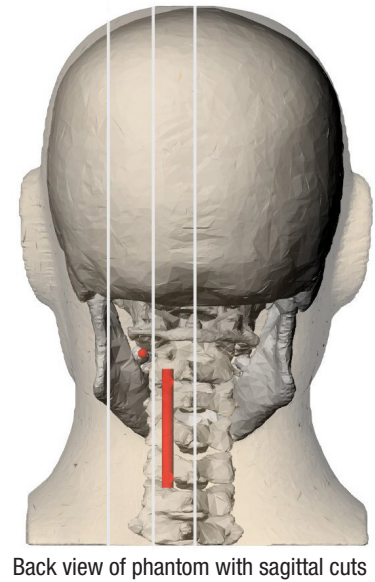
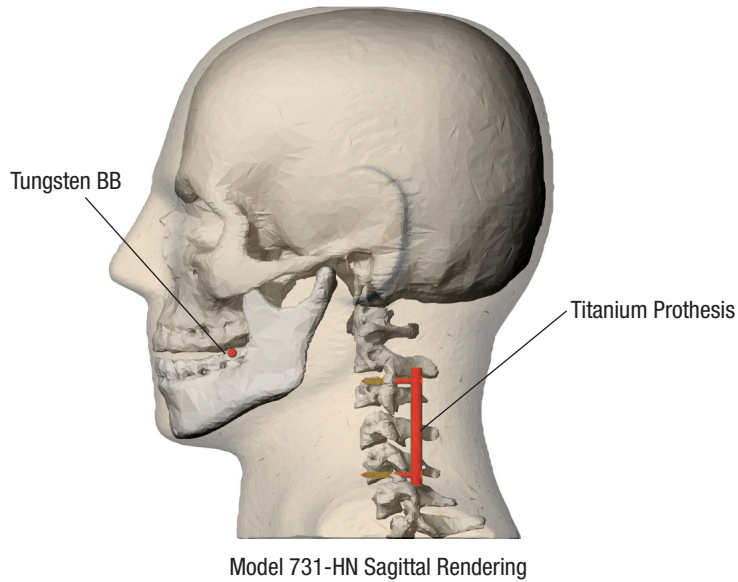
- Detailed internal anatomy including bone and air
- Three film locations in sagittal direction
- Tissue Equivalent for protons and photons
- Dental filling and spine prosthesis

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Tissue Simulation & Phantom Technology



Dose Distribution of sample treatment plan on Model 731-HN

**SPECIFICATIONS**

|                                |                                              |
|--------------------------------|----------------------------------------------|
| <b>APPROXIMATE DIMENSIONS:</b> | 18 cm x 22 cm x 27 cm<br>(7" x 8.6" x 10.6") |
| <b>WEIGHT:</b>                 | 6.4 kg (14 lbs)                              |
| <b>PHANTOM MATERIALS:</b>      | Epoxy Resin                                  |

**REFERENCES:**

1. Albertini F, Casiraghi M, Lorentini S, Rombi B, Lomax AJ. Experimental verification of IMPT treatment plans in an anthropomorphic phantom in the presence of delivery uncertainties. *Phys Med Biol.* 2011;56(14):4415-31.
2. Lorentini S, Menegotti L, Delana A, Schwarz M. PO-0873 DOSIMETRIC VERIFICATION OF IMRT PLANS WITH A CUSTOMIZED ANTHROPOMORPHIC PHANTOM. *Radiotherapy and Oncology.* 2012;103:S342.
3. Demez N, Lee T. EP-1320 STUDY ON THE COMPATIBILITY OF TISSUE EQUIVALENT PHANTOMS FOR USE IN PROTON BEAM THERAPY QA. *Radiotherapy and Oncology.* 2012;103:S501.

**MODEL731-HN INCLUDES**

| QTY | COMPONENT DESCRIPTION       |
|-----|-----------------------------|
| 1   | Proton Therapy Head Phantom |
| 1   | Foam-Lined Carry Case       |
| 1   | User Guide                  |
| -   | 48 Month Warranty           |

**ADDITIONAL OPTIONS**

| PART NO. | DESCRIPTION                      |
|----------|----------------------------------|
| 038-20   | SRS Frame Support Cups, Set of 4 |

