

Moldcare RI II Facilitates Effective Proton Treatment of Head and Neck Cancers



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Challenge: Effective Proton Treatment in Head and Neck Cases Requires Precision and Reproducibility

We are a long-standing proton therapy facility that has operated for many years. We constantly evolve our practice to provide the highest level of comfort and care while maximizing the effectiveness of our care.

Proton therapy presents challenges for head and neck treatment that you don't find with photons.

- Due to the nature of current proton accelerator technology, patients stay on the table longer than traditional photon radiation treatments. With proton therapy, patients are often waiting in a beamline queue with other patients. Proton accelerators need to ramp up high amounts of energy and electromagnetic beamlines to make high-energy protons available for a treatment beam specific to a single treatment angle. At California Protons Cancer Therapy Center, the protocol for head and neck treatments using intensity-modulated proton therapy is to design treatment plans comprised of 4-5 treatment angles. The logistics of delivering proton therapy places a high premium on comfortable and reproducible patient positioning.
- Accounting for tissue and material density is vital to our treatment planning process and treatment delivery. Unreproducible gaps that occur between a patient's external anatomy and a non-customized generic immobilization device will distribute the proton dose differently than planned for.

The standard F and A blocks require the patient to conform to the device, making it more difficult for us to provide the comfort and precision that our treatment requires.

Solution: Moldcare RI II's Customizability and Conformal properties is A Good Fit for Precise and Reproducible Proton Treatment

In a clinic as large as ours with experience in treating complex cases and/or patients with limited mobility, we are well familiar with the variability of the human anatomy. Because Moldcare RI II is

customizable to each patient by accurately conforming to their external anatomy, we can ensure that every head and neck patient can comfortably tolerate our longer treatment intervals.

Even more importantly, we can effectively plan for precision in dose delivery. When using the standard A-F-blocks for head and neck immobilization, the angle options are standardized and are not customizable to a patient's anatomy. With the standard A-F blocks, patient setups experience random air gaps between the patient's external tissue and the standard block. In proton therapy, gaps that cause variance in patient positions contribute to uneven dose delivery. That is because the gaps are not highly reproducible and cannot be accurately accounted for when creating a dosimetric intensity-modulated proton radiation treatment plan.

Our goal when utilizing and forming patient immobilization in proton therapy, is to create smooth contours of abutting tissue and the immobilization device. Moldcare RI II is a conformal pillow that effectively captures and maintains a patient's position to allow us to ensure the precision we need for every patient on every simulation and treatment.

We have used Moldcare RI II cushions for all our head and neck treatments for a decade. Moldcare RI II is comprised of polystyrene beads and hydraulic urethane that allow it to set and accurately reproduce a desired patient position. It only requires minimal water to activate, forms to a patient with minimal effort and sets in a short time. It is very conformal and effectively shapeable to a patient's unique anatomy. The comfort and reproducibility that Moldcare RI II provides are essential to effective patient immobilization in proton therapy. In addition, Moldcare RI II possesses the necessary physical properties, having a low specific gravity of 0.1 with a CT value of less than -800. The Moldcare RI II's high permeability for radiation makes it an ideal immobilization device to use for effective proton treatment when considering dose distribution planning and delivery. With Moldcare RI II, the immobilization device conforms to the patient. It provides us with a unique solution for every patient that is compatible with the physical properties of using proton particle beams for radiation therapy. Moldcare RI II allows us to treat patients comfortably and with the precision required in proton radiation therapy treatment.

Conclusion: Moldcare RI II is a Head and Neck Treatment Standard at our Clinic

Moldcare RI II plays a crucial role in proton therapy immobilization by providing accurate and customized patient positioning and immobilization.

- 1) **Precise Patient Positioning:** using the Moldcare RI II involves creating personalized molds designed to fit the patient's body shape and contours. By accurately conforming to the patient's body, Moldcare RI II ensures consistent and reproducible patient positioning during proton therapy treatments.
- 2) **Immobilization and Reproducibility:** when performing proton therapy, it is crucial to immobilize the patient in the same position for each treatment. Moldcare RI II aids in

immobilizing the patient by providing a secure and comfortable fit. This helps minimize patient movement, ensuring that the treatment area remains stable and aligned with the planned radiation target.

- 3) **Target Localization:** Moldcare RI II assists in localizing the treatment target area precisely. By using Moldcare RI II, radiation therapists can align the patient's anatomy with the treatment machine's reference points, ensuring accurate and targeted delivery of proton radiation to the intended area while minimizing exposure to surrounding healthy tissues.
- 4) **Patient Comfort and Compliance:** Moldcare RI II devices are designed to be comfortable and well-fitted to the patient's body, which helps improve patient compliance with the treatment process. When patients are more comfortable, they are more likely to remain still and adhere to the treatment protocol, enhancing the overall effectiveness of proton therapy.

By providing precise patient positioning, immobilization, and target localization, Moldcare RI II contributes to the accuracy, reproducibility, and effectiveness of proton therapy. It enables radiation oncologists and therapists to deliver the intensity-modulated proton therapy dose precisely to the intended treatment area while minimizing potential damage to surrounding healthy tissues.