

The McLaurin Arch

The McLaurin Arch is a mechanical device designed to improve the immobilization characteristics of a thermoplastic mask system such as the Uni-Frame system created by MED-TEC. The Arch has been used to enhance immobilization either by fixation of the nasal bone or the maxilla.

Three-dimensional motion analysis of a mask system was performed by Thornton et. Al., and published in 1991. (1) That analysis revealed that rotation about the long axis of the body was a significant source of repositioning error. Since '91, the patented McLaurin Arch has been incorporated into a Precision Cranial Immobilization System which has been developed by Thornton et. al. for use in Conformal Stereotactic Fractionated Radiation Therapy. (2) In the Thornton system, the Arch is utilized to support a custom dental mold or bite block.

The McLaurin Arch has also been used to enhance cranial immobilization by fixation to the nasal bones, as in the FAST-FIT system. A version of the system is now being investigated by NOMOS for use with IMRT in a collaborative effort the MED-TEC. The Arch is composed of a highly radiolucet carbon fiber material so that it will not interfere with delivery of radiation from any angle.

MED-TEC has recently developed a system in which the position of the McLaurin Arch can be adjusted, either to attach to the nasal bone or support a bite block. This system is being developed by MED-TEC for the International Atomic Energy Agency (IAEA) as a cost-effective, sustainable head fixation system to be supplied to developing countries.

As research and development continue, further applications and enhancements of the McLaurin Arch will be explored, and the role of Fractionated Accelerator-based Stereotactic Teletherapy (FAST) will continue to expand.

R. L. McLaurin Jr., M.D.

Product Manager
Fractionated Stereotactic Systems
Med-Tec, Inc.

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