**Abstract**

**Background:** Proton beam therapy is a newer modality of radiation therapy which allows accurate targeting of tumors with fewer side effects to surrounding normal tissue. As there are few proton centers worldwide, there have been a few limited publications on the safety and techniques of providing anesthesia for proton radiation therapy. As new proton centers continue to emerge, there is a need for a description of current practice for the anesthetic management for safe and successful proton therapy.

**Objectives:** To compare the anesthesia practices for pediatric patients in proton therapy centers worldwide.

**Methods:** Anesthesiologists who agreed to participate in the study received an email with an electronic link to a ten question survey.

**Results:** Participant survey response was 70%. Four U.S. based and three European based proton centers responded of the total known centers.

**Conclusion:** Both TIVA and general anesthesia techniques may provide a safe environment for anesthesia for pediatric patients undergoing proton therapy.

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**Methods:**

- A list of proton therapy centers in the United States was obtained from the National Association for Proton Therapy website (http://www.proton-therapy.org/members_section.html). A list of centers in Europe was obtained from colleagues practicing in Sweden and Switzerland.
- An introductory email was sent out to the facilities to establish contact with the anesthesiologists in charge of providing care. After receipt of the appropriate email address, an email describing and inviting participation in our study was sent. Anesthesiologists who agreed to participate in the study received a follow up email with an electronic link to a ten question survey.

**Proton Centers responding to Survey**

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**Results**

- Participant survey response was 70%. Four U.S. based and three European based proton centers responded of the total known centers.
- The majority (57%) of the group used Total Intravenous Anesthesia (TIVA) and the remainder used LMA with sevoflurane.
- The dates the proton centers opened range from 1984-2010, with a patient census of 1-200 per month.
- All centers recover patients in the Post-Anesthesia Care Unit, or a designated recovery area.

**Background**

Proton beam therapy is a newer modality of radiation therapy which allows accurate targeting of tumors with fewer side effects to surrounding normal tissue (1, 2). Patients undergoing this form of therapy are required to remain immobile during treatment. This requirement is usually not an issue for adults and children over the age of 8 years, but can be particularly challenging in younger children. Treatment is usually divided over several weeks, with a single treatment lasting anywhere from thirty to ninety minutes. Immobilization devices in the form of masks may be a source of discomfort for many children. As a result, younger children need to be sedated to allow successful completion of treatment. Several authors have described different techniques for anesthetizing children undergoing conventional radiation (3). Anesthesia for proton therapy is unique because of the longer duration of individual treatments and the stand alone nature of many of the current treatment facilities. As there are few proton centers worldwide, there have been a few limited publications on the safety and techniques of providing anesthesia for proton radiation therapy (4). As new proton centers continue to emerge, there is a need for a description of current practice for the anesthetic management for safe and successful proton therapy.

**References**