

Hadrontherapy Workshop
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Operational Experience
Choices, Capacity and Mission
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This talk will cover aspects of operational experience and challenges from my perspective at the Burr Proton Therapy Center of Massachusetts General Hospital. The operational experience that one will encounter will depend greatly on the contingencies prepared for initially, and how well one can react to situations. From the perspective of an operating system, we have learned that in addition to all the appropriate parameters and easy to use, a system has to be easily extendable, and upgradeable, since it is meant to last a long time. Although this was originally specified, it was perhaps not clear until more recently what that means.

The capabilities and systems at MGH will be described. Among the operational challenges include:

- A. Areas of internal growth, including new beam delivery modalities and space.
- B. Coping with getting older, including obsolescence
- C. External growth, including factors not controllable by the department, including Hospital expansion
- D. Treatment Capacity

An examples of A includes our scanning development. We worked with IBA to come up with a way to integrate a system in our existing system without a treatment shutdown and together we successfully developed a system which implements scanning in a completely general way, and have demonstrated that system. An example of both B&A includes dealing with obsolete motor controllers and software for our patient positioner by replacing the entire system with a robot, including replacing our 50 year old dentist chair for eye treatments with another robot from Forte automation. In the area of external growth, challenges we have faced during Hospital construction projects will be discussed.

Our treatment capacity has continued to evolve. We have treated over 100,000 fields in over 3500 patients since we began treatment operation in November of 2001. Each year we have increased our capacity significantly. It turns out, in retrospect that we have grown according to our original plan established before the facility was built.

Increasing capacity is always a subject of discussion and possible factors include:

- I. System Availability
- II. Number of operating hours per day
- III. Time for and Complexity of treatments
- IV. Number of Treatment Rooms
- V. If Number of Patients are important (as opposed to fields treated) then the number of fractions per patient will be a factor as well.

Our reliability is quite good and not a factor in our capacity. We currently treat for 10 hours/day, 5 days per week. Our mission includes treating patients as the highest priority and associated QA, and also includes R&D, Maintenance and Improvements. Second only to Treatments we spend a significant fraction of our time in development, to a large extent working with IBA in developing new modalities and improving the system operation.

The number of patients we treat in a day reflects our patient mix, which is balanced and includes almost equal amounts of Pediatric, Prostate, Head and Neck, Sarcomas and Other sites, reflecting our physicians' specialties. Different patient mixes would change our capacity. We are investigating plans for an additional treatment room, constrained by the ongoing Hospital construction.

All in all, while it's been a challenge; it's been a rewarding one with an excellent team that works well together to meet the challenges. We feel proud to be part of the early example with Loma Linda that helped to rekindle the growth of particle therapy.