Exhibit C23

MR-Integrated Proton Therapy

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Objectives

- Explain MR-Linac: Technology, Team, Benefits, Limitations

- Explain Proton Therapy: Technology explanation, Difference to Linac

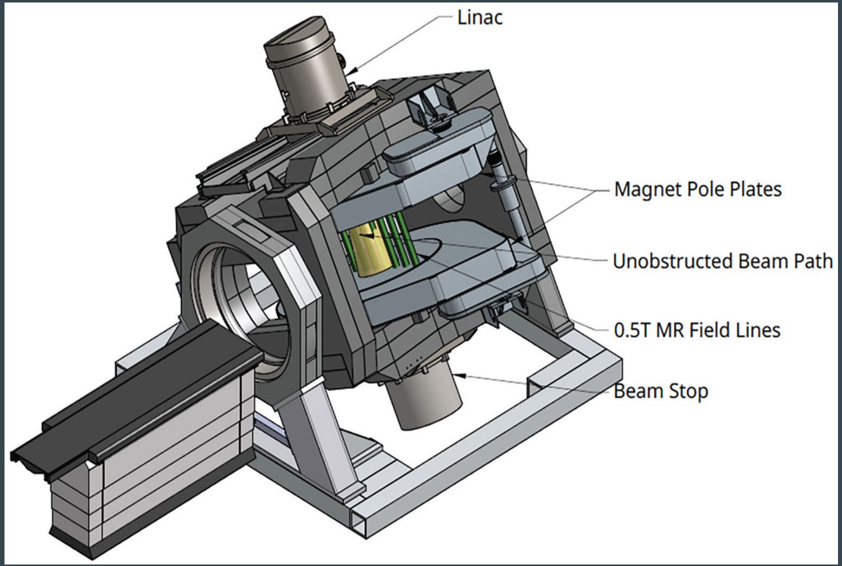
- MR-Integrated Proton Therapy (MRiPT): Benefits, Contraindications

- MR-Linac, Proton Therapy, MRiPT: Where they're at today

MR Linac Overview

- MR-Linac combines MR imaging, along with a linear accelerator and high-energy x-ray technology to dynamically view real-time imaging, and treat a multitude of cancers and growths.

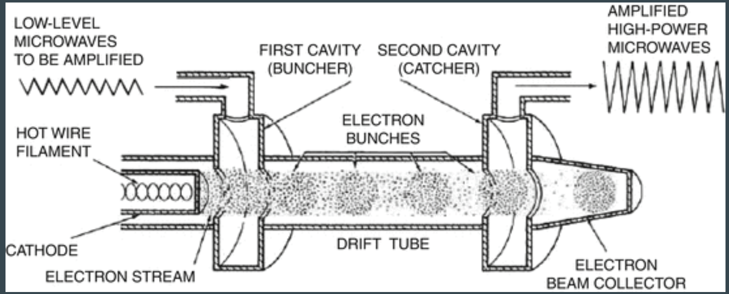
- In order for the therapeutic x-ray beam to reach its target without interruption from the magnetic field, the field is “split” open.



https://journals.sagepub.com/doi/10.1177/14736691221141950?icid=int.sj-abstract.similar-articles.3

MR Linac Technology

- The Linear-Accelerator utilizes microwaves to accelerate electrons, eventually colliding them with a heavy metal target, ultimately producing high-energy x-rays.



https://link.springer.com/referenceworkentry/10.1007/978-3-540-85516-3_37

- Therapeutic x-ray beam is shaped by a multi-leaf collimator, it is shaped to the size/ configuration of the target within the patient, avoiding tissue not related to the pathology of interest.

https://www.researchgate.net/figure/arian-Millennium-multileaf-collimator-68_fig1_346400145

- The beam rotates around the MRI bore, allowing for multiple angles to irradiate the target

MR Linac:

Care Team:

- Radiation Oncologist: Prescribes treatment/ dose
- Physicists/ Dosimetrists: Produce dose/ maintain equipment
- Radiation Therapist: Operates MR-Linac
- Supporting Staff: Nurse(s), etc.

https://www.cromwellhospital.com/newsroom/blog/the-benefits-of-mr-linac-radiotherapy-for-treating-cancer/

Benefits:

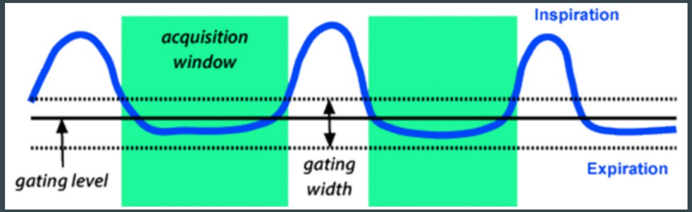
- Increased target accuracy of beam, decreasing unnecessary peripheral toxicity
- MR allows for real-time imaging specializing in soft-tissue, increasing the accuracy of the beam, as well as allowing for ample image time with no radiation dose to the patient or providers
- Better effectiveness against neoplasms that are affected by normal physiological motion, in areas such as the abdomen or chest.

Limitations/ Contraindications:

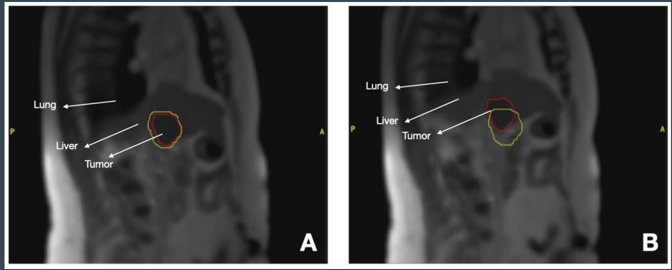
- Cannot deliver electron-beam therapy
- Capital Costs: MR-Linac costs roughly $10 million
- Normal MRI contraindications (implants, claustrophobia, pt. size, etc.)
- Limited mobility of the table the patient is laying on

Gating

- Gating is a technique used in MRI imaging to time the capture of images relative to the natural motion of organs
  - Most common in abdominal imaging with respiratory gating
    - Patient's breathing is monitored, images are captured at a specific point in the breathing cycle to minimize the difference in organ location between captures
    - Can be done by an elastic belt (bellows) or by fluoroscopically tracking movement of the diaphragm during scanning
  - Can also use cardiac gating with EKG
- Especially useful in Linac because accuracy of the treatment applied is crucial to minimize damage to surrounding tissues and increase effectiveness to target tissue
  - With Linac, the acquisition window in gating is when anatomy would be in position and thus treatment would be applied during that window



https://mriquestions.com/respiratory-comp.html



https://www.mdpi.com/2072-6694/16/2/270

- This is a representation of the effect of physiological motion on a neoplasm
- Gating would compensate for this and thus increase accuracy of treatment

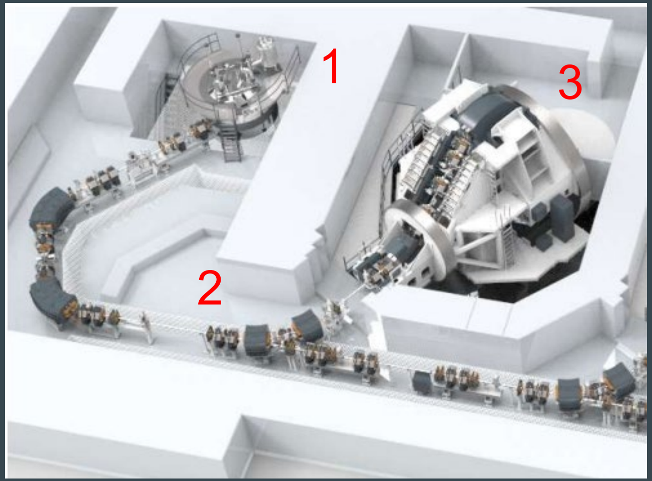
Proton Therapy

- A type of radiation therapy that utilizes high energy protons rather than x-ray
  - Can be used on a wide variety of cancers
  - Studies suggest fewer side effects due to higher accuracy/ability to control the beam
- Care team
  - Radiation Oncologist (Physician)
  - Advanced Practice Providers
  - Clinical Nurse
  - Radiation Therapist
  - Other Supporting Staff

https://emoryproton.com/what-is-proton-therapy/

Proton Therapy

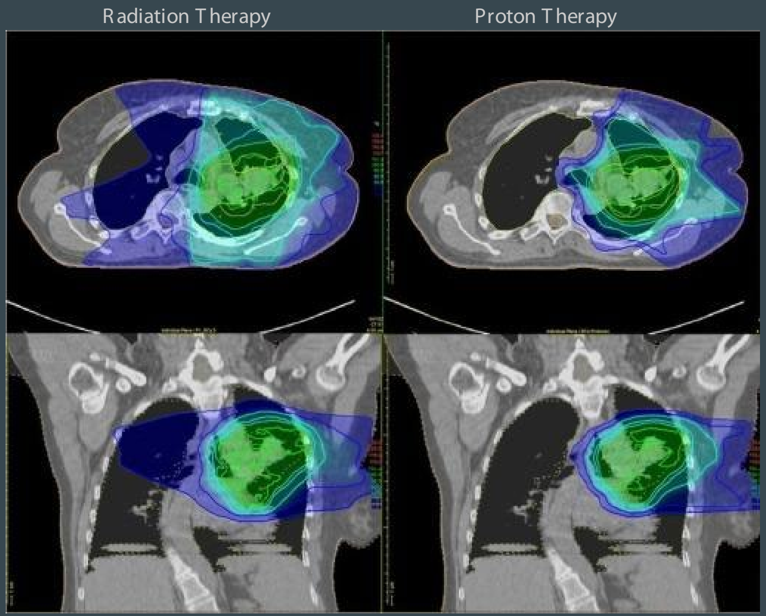
- Main components
  - Cyclotron (1)
    - 90 ton superconductor
    - Accelerates protons to about 60% of light speed
    - Gives the protons the energy to reach deep tumors
  - Beamline (2)
    - Long vacuum tube
    - Steers and focuses proton beam to the treatment room
  - Gantry (3)
    - Large overall structure
    - Approximately three stories tall and 270 tons
    - Can rotate 360 degrees around patient to direct beam towards patient



https://radiationdosimetry.org/files/documents/0000104/283-10-pvdt-radiation-protection.pdf

Proton Therapy

- Beam difference compared to normal radiation therapy
  - Radiation therapy uses x-ray photon beams that notably travel through the tumor and continue beyond the target tissue
  - Proton beams are designed to stop in the tumor and prevent harm of the tissues beyond the target
- Difference in affected area visualized in diagram to the right
  - Traditional radiation therapy is on the left (top and bottom), proton therapy is on the right (top and bottom)
  - The area of effect is substantially larger with traditional radiation therapy, leading to higher probability of off-focus tissue damage



https://www.cancer.gov/news-events/cancer-currents-blog/2020/proton-therapy-safety-versus-traditional-radiation#:~:text=Traditional%20radiation%20delivers%20x%2Drays,to%20damage%20nearby%20healthy%20tissues.

Integration of MR and Proton Therapy

Current image guidance in proton therapy has been mostly limited to 2D x-ray images. Some have 3D CT guidance, but even this has relatively poor soft tissue contrast while still exposing the patient to significant ionizing radiation. An MR imaging system could solve both of these limitations.

The dose conformity of proton therapy and the accurate, real-time imaging of MR could combine into the most efficient and effective cancer treatment to date. However, there are a few areas of research that needs to be explored before wider implementation can be realized:

- Experimental investigations of EM interactions between MRI and PT systems
- Physical limitations of the scanner
- MRI-only based proton treatment planning approaches
- Proton dose calculation algorithms in magnetic fields

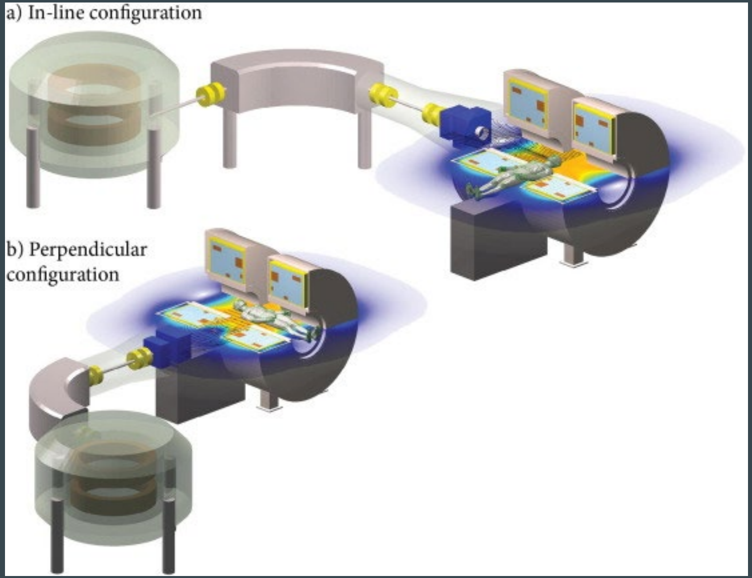
Interactions between Proton therapy and MR-Imaging

The implementation of these two technologies starts with a substantial hurdle: The pencil beam scanning (PBS) assembly that many proton systems use utilize magnetic guidance to steer protons. This, and the MR field negatively impact one another. An Australian study aimed at finding how feasible the two systems could work together clinically. They found that:

- MR imaging field non-uniformity increased by a factor of 8 with the influence of the active PBS assembly
  - This change is correctable by traditional MR image processing, leading researchers to believe MR image quality can be maintained during simultaneous operation
- Conversely, the pencil beam undergoes an energy dependent and complex deflection as it passes through the MR field.
  - A detailed calibration process is required to correct for each pencil beam in order to preserve the bragg-peak. (area of peak intensity for the delivered dose to the area of interest)

Physical Limitations of MRiPT scanner

- An MR-Proton system would need a magnet that is either split or open bore
  - Allows the proton beam access to the patient
  - Open/split bore scanners are known for reduced strength which could impact image quality
- Systems can be perpendicular (patient is positioned along the long axis of the bore like traditional MR) or in-line (patient lies perpendicular to the magnetic field)
  - Both affect the proton steering calculations in different ways and have unique advantages/disadvantages between each other



https://www.thegreenjournal.com/article/S0167-8140%2822%2900116-5/fulltext

MRiPT: Overview

- MR-Integrated proton therapy, despite substantial challenges in development, can potentially be the next best option for hard to treat/moving cancers
  - Allows for dose efficacy that allows providers to either to keep the whole body dose smaller for the same amount of acute exposure to the tumor, or conversely, to more aggressively target a tumor while still keeping the dose to healthy tissue at a manageable level

Benefits:

- MR imaging soft-tissue visualization
- Dose management and delivery of proton therapy
- Dynamic tracking of moving pathology
- Imaging does not contribute to dose

Drawbacks:

- Expensive and resource intensive
- Limited availability
- Standard MR limitations
- Weaker fields from the split bore MR can cause image resolution loss

Where is the science at today

- MR-Linac was FDA approved in 2018, with the installation of the first machine in the Netherlands in late 2018. Currently, there are approximately 85 clinically utilized machines worldwide
- Proton therapy centers are widely utilized today, with approximately 89-100 available worldwide.
- In January of 2024, National Center for Radiation Research in Oncology in Dresden, Germany introduced the first MRiPT scanner.
  - Continuous testing is ongoing, adjusting factors to optimize this approach for clinical application in the near future.

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