The On-Board Imager At-a-Glance

The On-Board Imager (OBI) is part of the radiation treatment machine (linear accelerator) and allows for digitally controlled X-ray images that are taken at the time of treatment. It allows for digitally controlled X-ray images to be taken at the time of treatment. These images can be used to verify that the tumor is treated in the proper location and to adjust the treatment if necessary. Images can be taken before, during, or after the treatment to ensure that the tumor is being treated accurately and safely.

Key Strategies

- Understand the clinical situation and qualifications of common radiation therapy applications.
- Minimize the time, cost, and number of steps involved in the radiation therapy process.
- Select the appropriate technology to fit the needs of each patient.

The On-Board Imager allows radiographic, fluoroscopic, and 3D cone-beam CT images to be swiftly acquired at the time of treatment. Treatment appointment lasts an average of 10 to 15 minutes, and is administered over a period of time based on anatomic landmarks with a high degree of precision. Images are taken to pinpoint tumor site, adjust patient positioning, and the treatment room.

The On-Board Imager is mounted on the treatment machine (linear accelerator) and uses robotically controlled arms that operate along three axes of motion. The arms can be positioned optimally for the best possible view of the tumor—allowing for the best possible position for the patient. Any adjustments to the patient's position can be made during the treatment to ensure that the tumor is being treated accurately and safely.

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Image-guided radiation therapy (IGRT) is a technique that allows for the precise delivery of radiation therapy to tumors, reducing the impact of organ motion on the radiation dose. IGRT uses imaging technologies to ensure that the radiation beams hit the intended target with high accuracy. This is especially important in the treatment of tumors that move due to breathing or other physiological processes.

IGRT is particularly valuable in the treatment of lung cancer, where tumors can move significantly during the breathing cycle. By using IGRT, we can ensure that the radiation beams are delivered accurately, even as the tumor moves. This can result in higher cure rates and improved patient outcomes.

Practical Tips

1. **Identify a clinical champion.** A clinical champion is someone who is passionate about the new technology and is willing to lead the implementation process. This person will help guide the team through the implementation process and ensure that the technology is used effectively.

2. **Plan for a phased-in, step-by-step implementation.** This will allow the team to properly train, test, and support each new addition to the system.

3. **Train the entire team.** Not only will the therapists need to be trained, but also the doctors, the nurses, and the administrative staff.

4. **Mitigate the need for fiducial markers.** This can be done by using advanced imaging techniques, such as 4D imaging, to track tumor motion.

5. **Monitor patient outcomes.** This will help to ensure that the technology is working as intended and that the patients are benefiting from it.

In conclusion, IGRT is an invaluable tool in the treatment of cancer. With the right planning and execution, it can improve patient outcomes and reduce the impact of organ motion on the radiation dose.

**References:**
