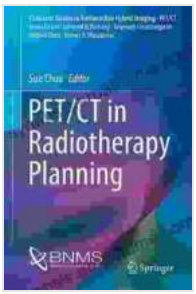
PET CT in Radiotherapy Planning: Clinicians' Guide to Radionuclide Hybrid Imaging

PET CT is a hybrid imaging technique that combines the functional information provided by PET with the anatomical information provided by CT. This combination provides a unique opportunity to visualize and quantify metabolic processes in the body, which can be very helpful in radiotherapy planning.

Technical Aspects of PET CT

PET CT scanners are typically equipped with a PET scanner and a CT scanner that are mounted on a single gantry. The PET scanner detects the gamma rays emitted by radioactive tracers, which are injected into the patient prior to the scan. The CT scanner provides anatomical information that can be used to localize the radioactive tracers and to create a more accurate image of the body.



PET/CT in Radiotherapy Planning (Clinicians' Guides to Radionuclide Hybrid Imaging) by Gisele Sarmento

4.8 out of 5

Language	: English
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Text-to-Speech	: Enabled
Enhanced typesetting	: Enabled
Print length	: 129 pages
Screen Reader	: Supported

The most common radioactive tracer used in PET CT is fluorodeoxyglucose (FDG),which is a glucose analog that is taken up by cells that are actively metabolizing glucose. FDG PET CT is commonly used to detect and stage cancer, as well as to assess treatment response.

Clinical Applications of PET CT in Radiotherapy Planning

PET CT can be used in radiotherapy planning for a variety of purposes, including:

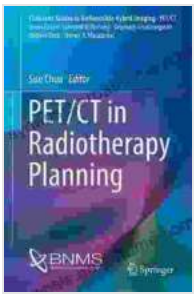
- Tumor delineation: PET CT can help to identify the boundaries of tumors, which can be difficult to visualize on CT alone. This information can be used to create more accurate treatment plans that target the tumor while minimizing damage to surrounding healthy tissue.
- Treatment planning: PET CT can be used to plan the delivery of radiation therapy. The information provided by PET CT can help to determine the optimal dose of radiation to deliver, as well as the best way to deliver the radiation.
- Treatment response assessment: PET CT can be used to assess the response of tumors to radiotherapy. A decrease in FDG uptake on PET CT after radiotherapy is often a sign that the tumor is responding to treatment.

Guidelines for the Use of PET CT in Radiotherapy Planning

The American Society for Radiation Oncology (ASTRO) has developed guidelines for the use of PET CT in radiotherapy planning. These guidelines recommend that PET CT be used in the following situations:

- For the staging of lung cancer, esophageal cancer, head and neck cancer, and lymphoma
- For the delineation of tumors in patients with breast cancer, lung cancer, and head and neck cancer
- For the assessment of treatment response in patients with lung cancer, esophageal cancer, head and neck cancer, and lymphoma

PET CT is a valuable tool in radiotherapy planning. It can provide information that can help to improve the accuracy of treatment planning and to assess the response of tumors to radiotherapy. The guidelines developed by ASTRO can help clinicians to use PET CT appropriately in radiotherapy planning.



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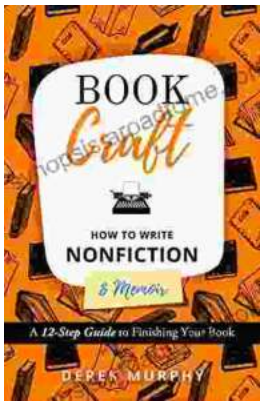

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