Radiation Therapy

- Radiation therapy has a pivotal role in the treatment of cancer.
- Indications for radiation therapy range from definitive treatment of localized tumors to palliation of symptoms from widely metastatic disease
- Recent advances have improved the effectiveness, decreased the complications, and expanded the implications of radiation therapy.
- These advances include three-dimensional conformal radiation therapy, intensity-modulated radiation therapy, stereotactic radiotherapy, brachytherapy, and radioimmunotherapy.
- Each of these modalities has improved radiation targeting, thereby limiting radiation exposure of healthy tissues.
- In certain circumstances, radiation therapy has disease control rates comparable with those of surgery, but with less morbidity.
- In the curative setting, RT can be offered as the sole radical treatment. It can also be combined with surgery, being given during (intra-operative), before (neoadjuvant) or after resection (adjuvant), or with systemic therapy, sometimes for organ preservation (such as larynx, breast, urinary bladder, etc)
- A series of incremental technologic advances has improved the targeting of external beam radiation therapy. Computed tomography (CT) and magnetic resonance imaging (MRI) have largely replaced plain radiography in radiation treatment planning.
- Contemporary imaging modalities, such as CT and MRI, have also been directly incorporated into radiation delivery machines, allowing for frequent confirmation of the tumor and patient positioning throughout the course of treatment.
- With brachytherapy, the radiation source is permanently or temporarily placed within the patient, near the target tumor. Temporary brachytherapy, administered via intracavitary catheters or larger applicators, is used to treat gynecologic malignancies, such as cervical cancer.
- The radiation treatment itself is painless. Patients undergoing external beam radiation therapy are not radioactive because the source of radiation remains outside the body; radiation exposure occurs only when the beam is turned on during the treatment session.

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