

TREATMENT OF CANCER WITH RADIATION THERAPY

**Principles, aims
and indications.**

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Key points

- ✓ What is radiation therapy? How does it work?
- ✓ Role of radiation in cancer treatment. Types of radiation therapy. Mode of administration.
- ✓ Objectives of radiotherapy:
 - ✓ Healing
 - ✓ Prevent recurrences
 - ✓ Treating Symptoms
- ✓ Indications for radiotherapy



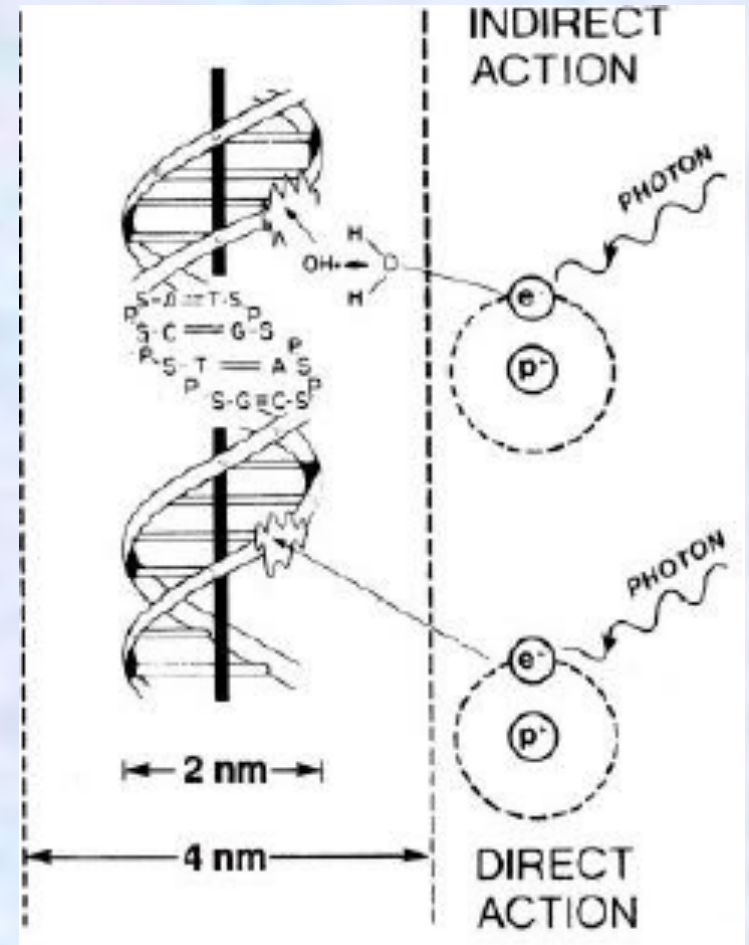
What is radiation therapy?

Radiation therapy is the use of high energy ionizing radiation (by subatomic particles or electromagnetic waves) for therapeutic purposes.

How is it work?

Its action is based on the interaction with tissues.

Injures or kills tumor / normal cells by damaging their genetic material (prevents growth and multiplication).¹



1. National Cancer Institute [Internet]. US. [April 8, 2008 ; May 28, 2014]. Radiation therapy for cancer. <http://www.cancer.gov/cancertopics/factsheet/Therapy/radiation>

Role of radiation therapy

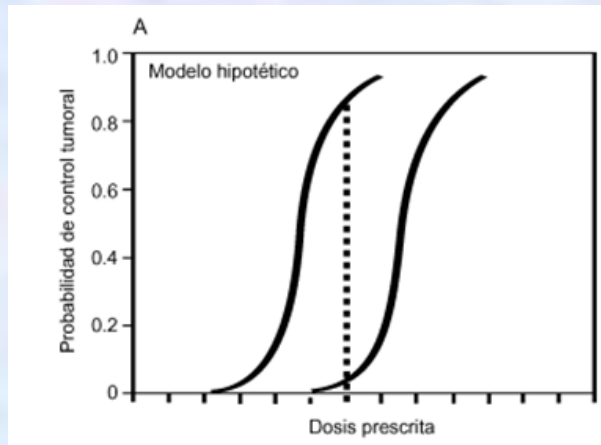
- ✓ It is one of the two most effective treatments for treating cancer.²
- ✓ Used as a single or adjuvant treatment.
- ✓ Objective: Placing sufficient tumor dose / induce minimal damage healthy tissues.



Principles of radiotherapy

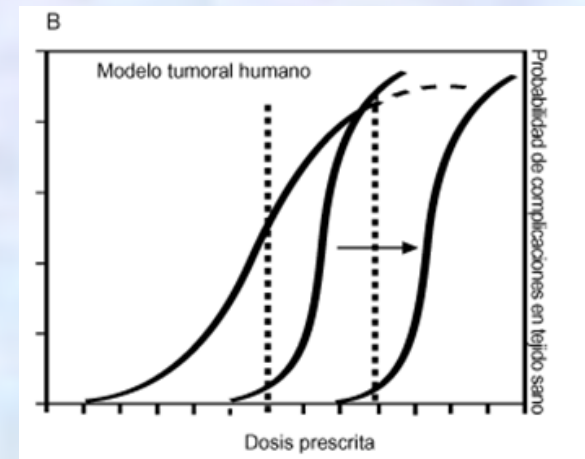
Theoretical Model:

- ✓ Sigmoid curves.
- ✓ Tumor control curves parallel complications.
- ✓ Hypothetically sufficiently separated.



Real Model:

- ✓ Slope of the curve always smaller than the tumor control curve complications.
- ✓ Limits the ability of high doses of radiation.



Types of radiation therapy

✓ Radical radiotherapy

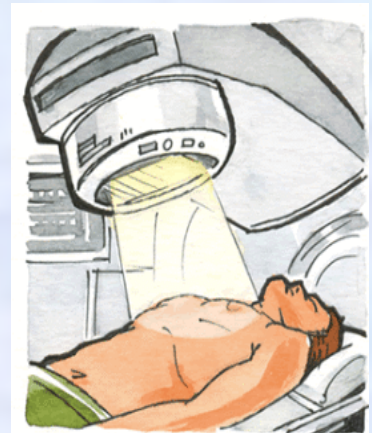
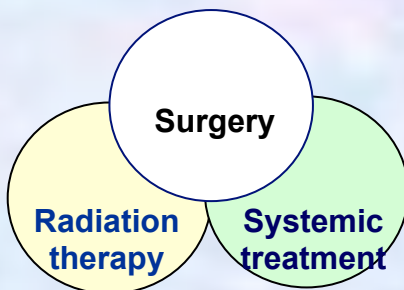
Including tumor and lymphatic structures within the irradiation volume. Dose of 60-80Gy.

✓ Palliative radiotherapy

Relieve chronic derived acute symptoms and tumor development.

✓ Adjuvant radiotherapy

Radiotherapy associated with other treatment options that supplement.



Mode of administration I

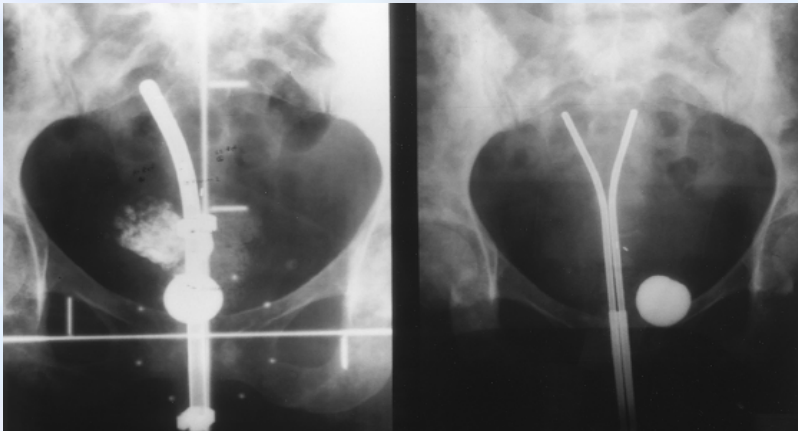
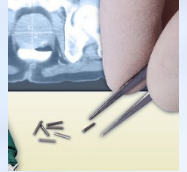
- ✓ External: electron linear accelerator and cobalt bomb
- More used. More frequently with photons.³
- Issue of external radiation to the white tumor.
- Affects normal tissue as it passes through on their way in and out of the body.



External RT :1,5-2Gy daily for 5 days,
for 2-7 weeks.

Mode of administration II

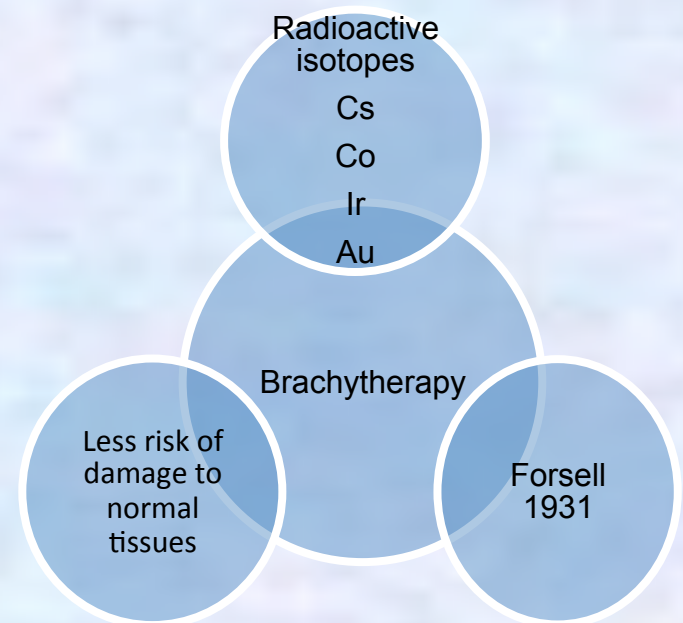
- ✓ Internal: Uses radioactive sources
 - ✓ Interstitial: source of radiation within the tumor.
 - ✓ Intracavitary: radiation source in a body cavity



Uterine tandem

Vaginal colpostate

Internal RT: 7h of continuous treatment.



Mode of administration III

- ✓ Metabolic RT: administration of a drug which contains a radioactive element, intravenously or orally. Requires inpatient hospitalization.



Administration of radiiodine (100-200 mCi) in differentiated thyroid cancer.

Aims of radiation therapy

- ✓ To reduce the size of the tumour/ To heal it: To reduce the tumour or to make it disappear completely.
- ✓ Treatment of distant recurrences: treatment and prophylaxis of metastasis in areas where often spread (pre-RT).
- ✓ Treatment of symptoms: To ease complications (analgesia, preserve function, improvement of obstructive syndromes, bleeding control) produced by advanced cancer.

Indications for radiation therapy

Kinds of cancer:

- ✓ Solid tumours: mama, lung, cervix and uterus, pancreas, larynx, prostate and stomach (amongst many others).
- ✓ Lymphoma and leukemia.

Indications:

- ✓ In cancers that can not be solved with surgery.
- ✓ In cancers where it is preferred to preserve organ function.
- ✓ Radiation therapy before and after surgery.

Bibliography

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