



RADIATION

Let There Be Light!



OBJECTIVES

- ⦿ Radiation Delivery Systems
- ⦿ Radiation Modalities
 - ⦿ Photon and Electron Energies
- ⦿ External Beam Radiation Planning Techniques
- ⦿ Radiation Coding Tips



RADIATION DELIVERY APPROACHES



Radiation therapy can be given in 3 ways:

External Beam Radiation

Internal Radiation

Systemic Radiation



The type of radiation administered depends on the type of cancer being treated and where it is

In some cases, more than one type is used



EXTERNAL BEAM RADIATION

External beam radiation is the most common type of radiation therapy used for cancer treatment

A machine is used to aim high-energy rays (or beams) from outside the body into the tumor

Types of External Beam Radiation Therapy

- ⊗ 3D conformal radiation
- ⊗ Image-guided radiation therapy (IGRT)
- ⊗ Intensity-modulated radiation therapy (IMRT)
 - ⊗ Stereotactic radiosurgery (SRS)
 - ⊗ Stereotactic body radiotherapy (SBRT)

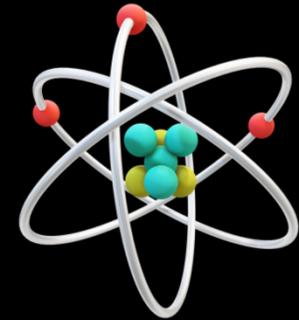


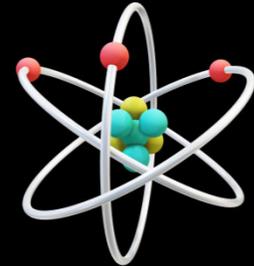
LINEAR ACCELERATORS

A **medical linear accelerator** (LINAC) is the device most commonly used for external beam radiation treatments (EBRT) for patients with cancer

It delivers high-energy x-rays (aka, photons) or electrons to the *region* of the patient's tumor

- ☸ Used in 90% of all radiation treatment
- ☸ Uses Photons and Electrons



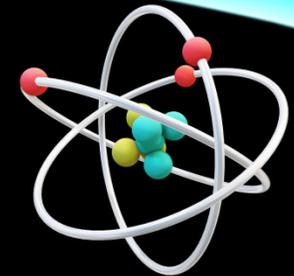


PHOTON BEAMS

Referred to as: **X or MV**

- ⊛ Photon radiation therapy is the *most commonly used* form of radiation oncology
- ⊛ A photon is a particle of light which essentially is a packet of electromagnetic radiation
- ⊛ Photons are a higher energy version of the same X-rays used for diagnostic imaging
- ⊛ These high-energy X-rays can be pointed at a part of the body where a cancer is located and, through a series of interactions inside of the body, they break the DNA inside the cancer cell, rendering it unable to repair or copy itself. As a result, the cancer cell dies.
- ⊛ When the treatment summary refers to beam energy with **X or MV** (example, 6X, 12MV)
 - ⊛ Treatment Modality should be coded to **02: External Beam, photons**





ELECTRON BEAMS

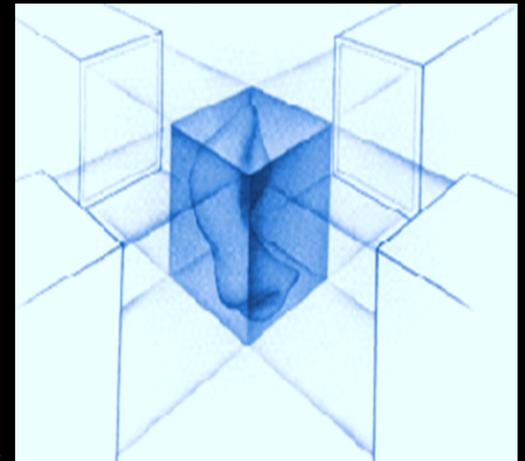
Referred to as : E, eboost, MeV and “en face”

- ⊗ Electrons have become a viable option in treating superficial tumors up to a depth of about 5 cm
- ⊗ Electron depth dose characteristics are unique in that they produce a high skin dose but exhibit a falloff after only a few centimeters.
 - ⊗ Electron absorption in human tissue is greatly influenced by the presence of air cavities and bone. The dose is increased when the electron beam passes through an air space and is reduced when the beam passes through bone.
- ⊗ **Common uses:** The treatment of skin lesions, such as basal cell carcinomas, and boosting of areas that have previously received photon irradiation, such as the postoperative lumpectomy or mastectomy scar in breast cancer patients, as well as select nodal areas in the head and neck.
- ⊗ RT treatment summary refers to beam energies using **E, eboost, MeV, or “en face”**
 - ⊗ Treatment modality will be assigned: **(04: external beam, electrons)**



2D RADIATION THERAPY

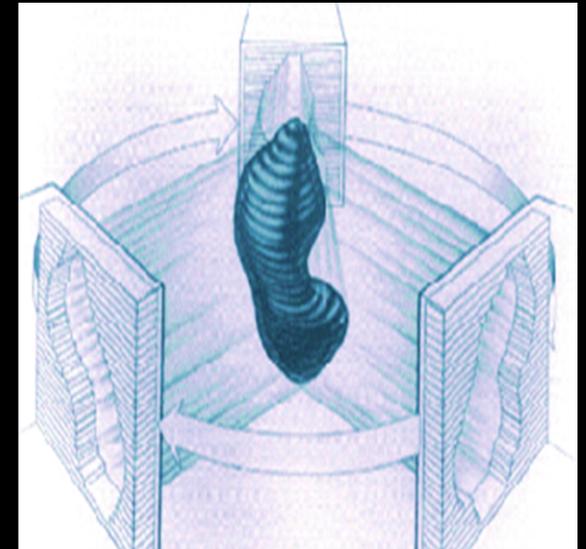
- ⊛ **Conventional (2D) radiation therapy** refers to the old techniques of radiation therapy
- ⊛ Treatments planned using a limited number of beams with the boundaries outlined from the patient's x-rays
- ⊛ Replaced by other conformal external beam radiation therapies, which use CT images to plan the treatment
- ⊛ Beam shaping is limited, and typically simple square or rectangular beams are used (a typical beam arrangement is the four-field box)
- ⊛ The low conformity of treatments, cause adjacent tissues/organs to often fall into the high dose region resulting in treatment side effects
- ⊛ The amount of radiation delivered to the targeted tumor is usually not adequate resulting in less effective treatment
- ⊛ Though 2D radiotherapy is now rarely used, it still has a role in **urgent and/or palliative** treatments which use generous margins and where the simplicity of the planning process allows same-day treatment



3D CONFORMAL

3D conformal radiation therapy is a cancer treatment that shapes the radiation beams to match the shape of the tumor

- ⊕ Uses the targeting information to focus precisely on the tumor, while avoiding the healthy surrounding tissue
- ⊕ This exact targeting makes it possible to use higher levels of radiation in treatment thus, is more effective in shrinking and killing tumors
- ⊕ Imaging equipment used to take a 3D image of the tumor will analyze the shape of the tumor, and radiation beams are conformed to the shape of the tumor



FIELD-IN-FIELD AND E-COMP

Electronic tissue compensation (eComp) is an external beam planning technique allowing user to manually generate dynamic beam fluence to produce more uniform or modulated dose distribution

- ⊗ Electronic compensator designed for curved surfaces
- ⊗ Results in a plan customized to the patient's body outline
- ⊗ Particularly helpful in the treatment of breast cancer

Field-in-Field (FIF) or (FnF), this technique uses several less-weighted fields with a small field size to optimize dose distribution

Widely used in whole breast irradiation

CODING TIP

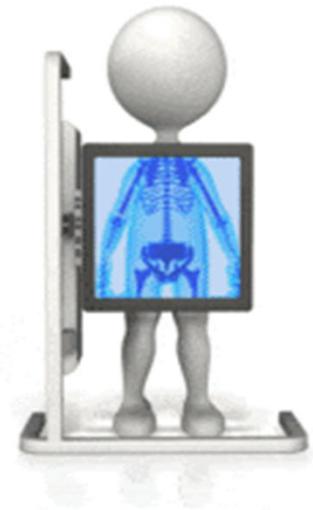
When the treatment summary states FnF or e-comp: **Planning Technique coded: 04-3D conformal** (Unless stated otherwise, IMRT)



IMAGE-GUIDED RADIATION THERAPY (IGRT)

Image-guided radiation therapy (IGRT) is the use of x-ray images taken immediately before, during or after radiation therapy treatment session to improve the accuracy and precision of treatment

- ⊕ IGRT may be used in conjunction with other radiation therapy treatments, including:
 - ⊕ Three-dimensional conformal radiation therapy
 - ⊕ Intensity-modulated radiation therapy
 - ⊕ Volumetric modulated radiation therapy
 - ⊕ Stereotactic radiosurgery
 - ⊕ Stereotactic body radiation therapy
 - ⊕ Gated radiation therapy
 - ⊕ Adaptive radiation therapy



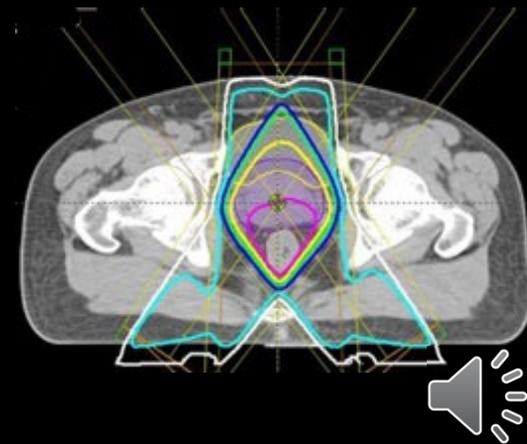
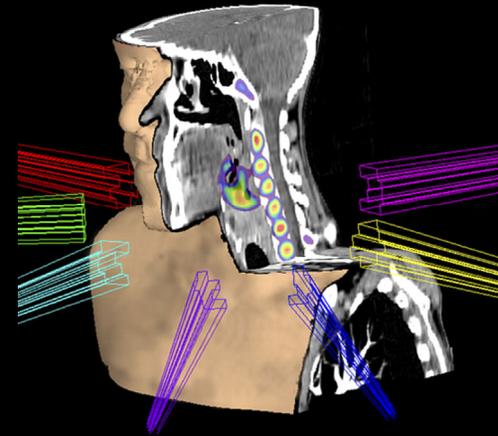
INTENSITY-MODULATED RADIATION THERAPY (IMRT)

- ⊕ IMRT is an advanced form of 3D Conformal Radiotherapy
- ⊕ IMRT uses the same type of radiation as other radiation therapy treatments
- ⊕ Uses multiple beams with varying intensities, delivering the highest dose to the tumor while minimizing exposure to surrounding tissue
- ⊕ Shields move while the radiation beam is on, allowing the amount of radiation dose to be varied
- ⊕ Using many beams from different directions, allows the radiation dose to be sculpted even more precisely, following the shape to “paint” the radiation dose onto the tumor
- ⊕ IMRT is used in conjunction with image-guided radiation therapy (IGRT), where imaging is done before treatment, ensuring accuracy of treatment delivery



IMRT Targeted Cancers

- ⊛ Head and neck cancers, as well as prostate cancer are most commonly treated using IMRT, in part because these tumors tend to be located close to critical organs and tissues in the body
- ⊛ Can also be used to treat lung cancer, brain cancer, gastrointestinal cancers, and breast cancer.
- ⊛ It may also be used to treat lymphoma, sarcoma, gynecologic cancers, and select pediatric cancers



VOLUMETRIC MODULATED ARC THERAPY (VMAT)

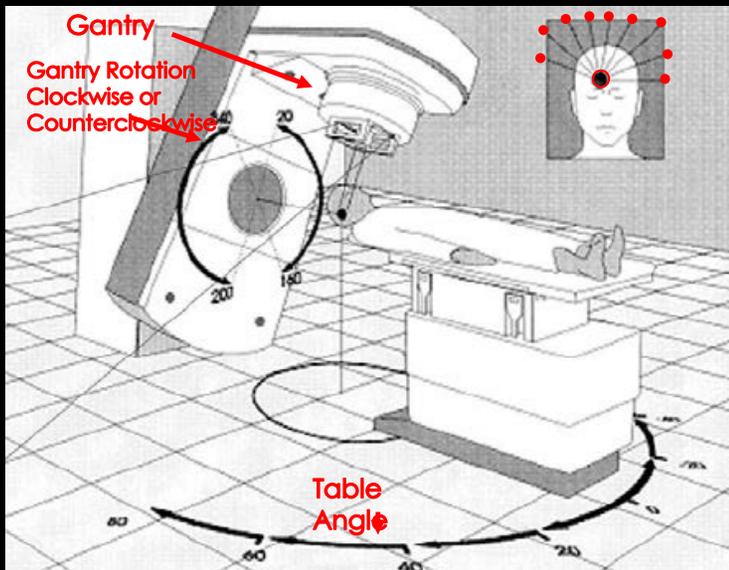
Rotational Therapy

- ⊛ An advanced form of IMRT
- ⊛ VMAT works similarly to intensity-modulated radiation therapy (IMRT) in the way the radiation dose is varied throughout treatment
- ⊛ Delivers the radiation dose continuously as the treatment machine rotates Accurately shapes the radiation dose to the tumor while minimizing the dose to the organs surrounding the tumor
- ⊛ VMAT is particularly useful for delivering radiation therapy to tumors near sensitive body organs and can be an effective treatment for many types of cancer.

Coded: **05-Intensity modulated therapy**



VMAT UNDERSTANDING THE TREATMENT PLAN INFORMATION

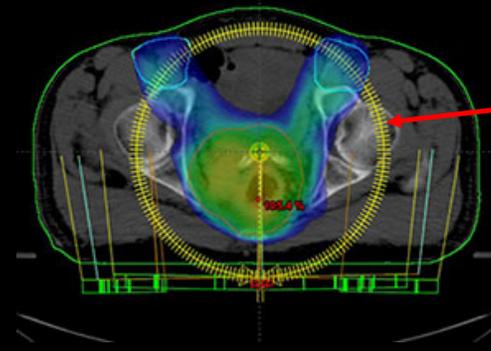


VMAT Machine

Table 2 Gantry, collimator, and couch angles for the coplanar and non-coplanar VMAT beam arrangements

Beam name	Gantry (degree)	Collimator (degree)	Couch (degree)
Coplanar beam arrangement			
V1	CW181-180	45	0
V2	CCW180-181	45	0
V3	CW181-180	45	0
V4	CCW180-181	45	0
Non-coplanar beam arrangement			
V1	CW181-180	45	0
V2	CCW180-181	45	0
V3	CW181-180	45	0
V4	CCW180-181	45	0
V5	CW190-310	330	70

CW, clockwise; CCW, counterclockwise; VMAT, volumetric-modulated arc therapy.



Treatment Images: rotation/arc grid
Seeing this on a treatment image is an indicator that rotation therapy was used

Arc	Plan	Gantry start angle (°)	Gantry stop angle (°)	Gantry rotation direction	Table angle (°)
1	2-arc, 4-arc	181	179	Clockwise	0
2	2-arc, 4-arc	181	10	Clockwise	90
3	4-arc	10	181	Counterclockwise	45
4	4-arc	179	350	Counterclockwise	315

Treatment Plan Summary
Look for the gantry range of rotation/arc.
CW: Clockwise
CCW: Counterclockwise

AW YISS!
Breadcrumbs!



STEREOTACTIC RADIOSURGERY (SRS)

Stereotactic radiosurgery is a type of radiation treatment that gives a large dose of radiation to a small tumor area

- ⊕ Used for brain tumors and other tumors inside the head
- ⊕ The goal is to deliver doses that will destroy the tumor and achieve permanent local control
- ⊕ Despite its name, SRS is a non-surgical procedure
- ⊕ Delivers precisely-targeted radiation at much higher doses, in only a single or few treatments
- ⊕ The principles of cranial SRS, is high precision radiation where delivery is accurate to within one to two millimeters
- ⊕ Permits maximum dose delivery within the target while minimizing dose to the surrounding healthy tissue
- ⊕ Once the exact location of the tumor is known from brain scans, radiation is sent to the area from many different angles
- ⊕ The radiation is very precisely aimed to affect nearby tissues as little as possible



STEREOTACTIC BODY RADIATION THERAPY (SBRT)

Hypofractionation Treatment: A treatment schedule in which the total dose of radiation is divided into large doses and treatments are given once a day or less often

This is a specialized type of external beam radiation that allows highly precise delivery of high doses of radiation to small targets outside of the brain

How SBRT Differs from Conventional Therapy

- ⊕ Conventional therapy, radiation is delivered in relatively small doses over the course of several weeks, with patients receiving daily treatments during that time. (average dose per fraction is 180-200 cGy)
- ⊕ SBRT, delivers a greater combined dose of radiation over fewer treatments. Typically, treatment is completed in 3-5 treatments over the course of 1-2 weeks, opposed to the daily standard external beam radiation treatment.
 - ⊕ Example: 1200cGy x 3fx (400 cGy per fraction)

CODING TIPS

Treatment summary may refer to this planning technique as IMRT/VMAT/SBRT
Maybe used for certain lung, spine, and liver tumors.

Code: 06-Stereotactic radiotherapy or radiosurgery, NOS



Intraoperative Radiation Therapy (IORT)

Intraoperative radiation therapy (IORT), radiation treatment administered during surgery

- ⦿ Early Stage (I and II) and localized cancers
- ⦿ Offers targeted and localized tumor control
- ⦿ Allows direct radiation to the target area while sparing normal surrounding tissue
- ⦿ Administered directly into the cavity where the tumor has just been removed
- ⦿ Used to treat cancers that are difficult to remove during surgery
- ⦿ When there is a concern that microscopic amounts of cancer may remain



IORT DELIVERY METHODS

External Beam Photons

Treatment Modality:

02: Photons

Planning Technique:

02: Low energy x-ray/photons

External Beam Electrons

Treatment Modality:

04: Electrons

Planning Technique:

03: 2-D therapy
04: 3-D conformal (in most cases)

Brachytherapy Intracavitary, HDR

Treatment Modality:

09: Brachytherapy

Planning Technique:

88: NA

- ⊕ Used in accelerated partial breast irradiation (APBI)
- ⊕ Seeds implanted during surgery



ELECTRONIC BRACHYTHERAPY eBx IORT

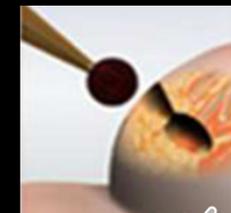
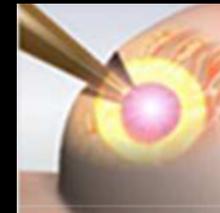
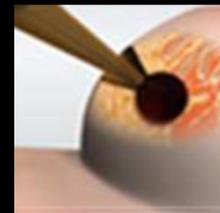
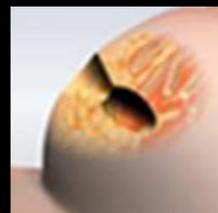
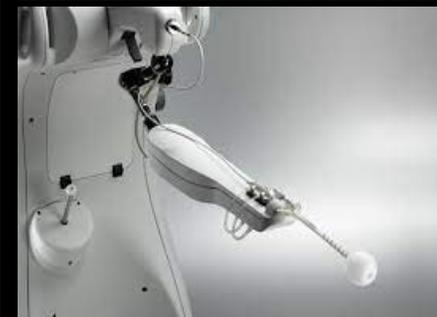
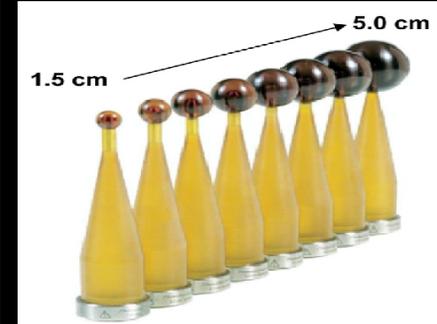
Equipment:

Zeiss Intrabeam
XOFT Axxent

Delivers low-energy photon therapy (50 kV range)

Modality code: 02-photons

Planning technique: 02-Low energy x-ray/photon



RADIATION AND GYN CANCERS

Uterine Cancer

- ⊕ In some cases, both brachytherapy and external beam radiation therapy are used
 - ⊕ Typically, external beam radiation is given first, followed by brachytherapy
- ⊕ The stage and grade are used to help decide what areas to treat, and which types of radiation are used
- ⊕ Women who are not healthy enough for surgery may get radiation as their main treatment
 - ⊕ In cases such as these, the treatment involves both brachytherapy and external beam radiation therapy
- ⊕ External beam radiation is used to treat a larger targeted area: the uterine cancer and potential areas of spread of the cancer, such as the lymph nodes
- ⊕ Radiation is most often used after surgery
- ⊕ Less often, radiation might be given before surgery to help shrink a tumor so it's easier to remove
- ⊕ Sometimes chemotherapy is given along with the radiation to boost its effectiveness



Cervical Cancer

⊕ Radiation as part of the main treatment

- ⊕ Some stages of cervical cancer, the preferred treatment is radiation alone or surgery followed by radiation
- ⊕ When EBRT is used as the main treatment, the preferred treatment is to combined it with chemotherapy
- ⊕ EBRT can also be used as the main treatment of cervical cancer in patients who can't tolerate chemoradiation, can't safely have surgery, or choose not to have surgery
- ⊕ It can also be used alone to treat areas of cancer spread
- ⊕ Brachytherapy is mainly used in addition to EBRT as a part of the main treatment
 - ⊕ Rarely, it might be used alone in very specific cases of early-stage cervical cancers

⊕ To treat cervical cancer that has spread or that has come back after treatment

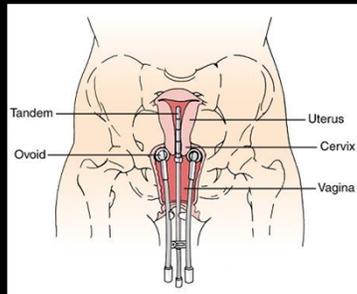
- ⊕ Radiation therapy may be used to treat cervical cancers that have spread to other organs and tissues.



BRACHYTHERAPY - GYN CANCERS

Uses intracavitary applicators

Tandem and Ovid (T&O)

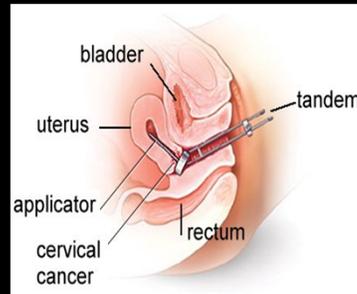


T&O/T&R Usage:

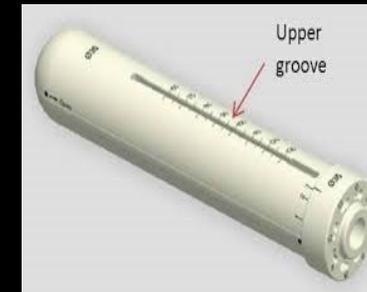
Treats women who still have a uterus

- ⊕ Cervical Cancers
- ⊕ Endometrial Cancers when the patient is not a surgical candidate

Tandem and Ring (T&R)



Vaginal Applicator



Vaginal Applicator Usage:

Treats women who have had a hysterectomy

- ⊕ Uterine Cancer post hysterectomy
- ⊕ Cervical Cancer post hysterectomy
- ⊕ The radioactive material is placed in a tube in the vagina

Uses Isotopes

- ⊕ C-137 (LDR)
- ⊕ Ir-192 (HDR)
- ⊕ Dwell time ranges between just a few minutes-25 minutes



VAGINAL CUFF BRACHYTHERAPY IR-192

Treatment Modality	09-Brachytherapy, Intracavitary, HDR
Planning Technique	88-NA
Treatment Volume	72-Vagina
RT to Draining Lymph Nodes	00-No RT to draining lymph nodes

Coding Tips!

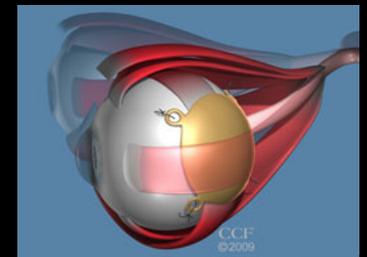
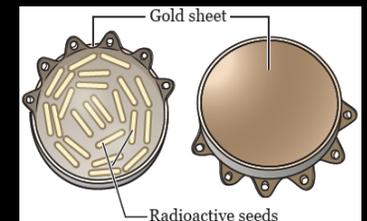
- ⊕ Brachytherapy is localized and irradiates small volumes thus, it does not include lymph nodes
- ⊕ If treatment summary states Brachytherapy-Vaginal Cuff, it will be coded to Intracavitary
- ⊕ If Interstitial and Intracavitary are delivered simultaneously, Code: **07-brachytherapy, NOS**



PLAQUE RADIOTHERAPY

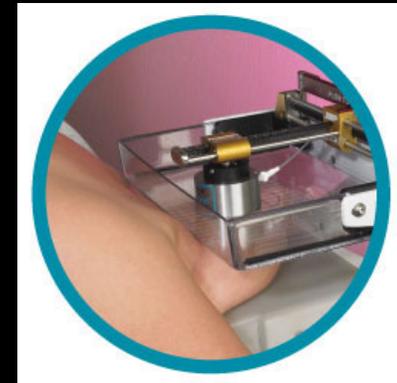
Episcleral plaque radiotherapy or episcleral plaque brachytherapy (EPBRT)

- ⊛ Used for the “eye-sparing” treatment for retinoblastoma (childhood eye cancer), choroidal melanoma and for metastatic tumors (that have spread from another part of the body to the eye)
- ⊛ Radiation source used for brachytherapy
- ⊛ Radioactive seeds (I-125) are placed in the plaque and is temporarily sewn to the eyeball over the tumor
- ⊛ The plaque gives off radiation constantly while in place on the wall of the eyeball
- ⊛ Once the plaque is removed, no radioactivity is left inside the body
- ⊛ A plaque is a small, gold covered, dish-shaped device
- ⊛ Plaques are custom made to the dimensions of the tumor, can range in size from 12 to 22 mm in diameter (about the size of a quarter)
- ⊛ Once the plaque is removed, no radioactivity is left inside the body
- ⊛ **Code: 07-Brachytherapy, NOS**



ACCUBOOST NON-INVASIVE BREAST BRACHYTHERAPY (NIBB)

- ☢ Delivers partial breast radiation therapy for Breast Conservation Therapy (BCT).
- ☢ Dose is delivered via Ir-192 HDR sources
 - ☢ The source is not implanted into the patient
 - ☢ Avoids having indwelling as used in intracavitary or interstitial breast brachytherapy, reducing complications/infection
- ☢ It employs a common platform to immobilize, image, target and deliver radiation to the tumor bed
- ☢ Mammography imaging to identify the tumor bed
 - ☢ The immobilization minimizes breast motion during treatment
 - ☢ Allowing for minimal margins and smaller treatment volumes
- ☢ Delivers a targeted and conformal dose to the tissue at risk under image guidance, precisely pinpointing the radiation field
 - ☢ Allows delivery of the full dose to the target tissue while exposure to healthy tissue
- ☢ Modality: Best choice is: **07, Brachytherapy, NOS**



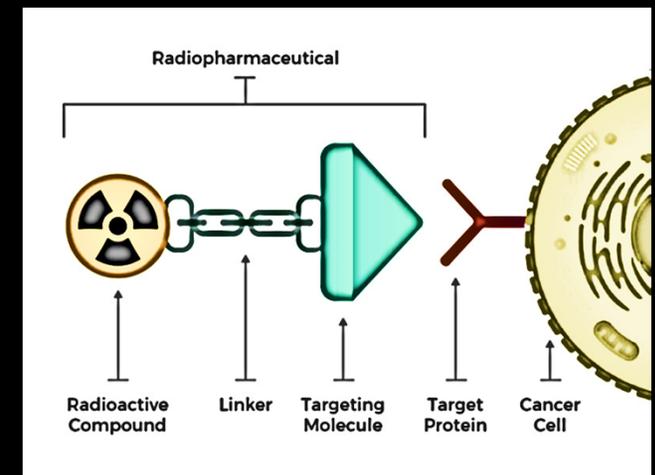
RADIOISOTOPES

What is Radioisotope Therapy?

Precision treatment in which a radioactive drug compound seeks and destroys cancer cells

Benefits

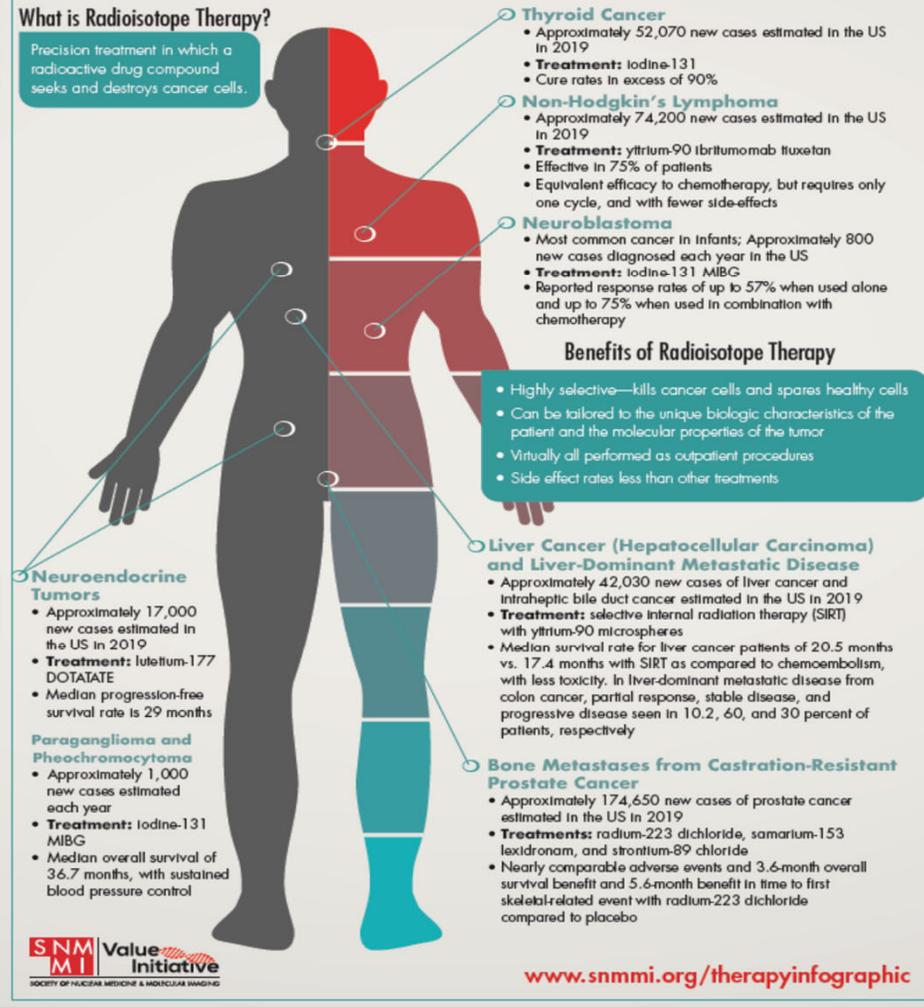
- ⊛ Highly selective, it kills cancer cells while sparing healthy cells
- ⊛ Can be tailored to the unique biologic characteristics of the patient and the molecular properties of the cancer
- ⊛ Usually, all treatment is performed outpatient
- ⊛ Side effects are less than other forms of therapy



Targeted Cancer Treatment with Nuclear Medicine Therapy

What is Radioisotope Therapy?

Precision treatment in which a radioactive drug compound seeks and destroys cancer cells.



Thyroid Cancer
 • Approximately 52,070 new cases estimated in the US in 2019
 • **Treatment:** Iodine-131
 • Cure rates in excess of 90%

Non-Hodgkin's Lymphoma
 • Approximately 74,200 new cases estimated in the US in 2019
 • **Treatment:** yttrium-90 ibritumomab ituxetan
 • Effective in 75% of patients
 • Equivalent efficacy to chemotherapy, but requires only one cycle, and with fewer side-effects

Neuroblastoma
 • Most common cancer in Infants; Approximately 800 new cases diagnosed each year in the US
 • **Treatment:** Iodine-131 MIBG
 • Reported response rates of up to 57% when used alone and up to 75% when used in combination with chemotherapy

Benefits of Radioisotope Therapy

- Highly selective—kills cancer cells and spares healthy cells
- Can be tailored to the unique biologic characteristics of the patient and the molecular properties of the tumor
- Virtually all performed as outpatient procedures
- Side effect rates less than other treatments

Neuroendocrine Tumors
 • Approximately 17,000 new cases estimated in the US in 2019
 • **Treatment:** Lutetium-177 DOTATATE
 • Median progression-free survival rate is 29 months

Paraganglioma and Pheochromocytoma
 • Approximately 1,000 new cases estimated each year
 • **Treatment:** Iodine-131 MIBG
 • Median overall survival of 36.7 months, with sustained blood pressure control

Liver Cancer (Hepatocellular Carcinoma) and Liver-Dominant Metastatic Disease
 • Approximately 42,030 new cases of liver cancer and Intrahepatic bile duct cancer estimated in the US in 2019
 • **Treatment:** selective internal radiation therapy (SIRT) with yttrium-90 microspheres
 • Median survival rate for liver cancer patients of 20.5 months vs. 17.4 months with SIRT as compared to chemoembolism, with less toxicity. In liver-dominant metastatic disease from colon cancer, partial response, stable disease, and progressive disease seen in 10.2, 60, and 30 percent of patients, respectively

Bone Metastases from Castration-Resistant Prostate Cancer
 • Approximately 174,650 new cases of prostate cancer estimated in the US in 2019
 • **Treatments:** radium-223 dichloride, samarium-153 lexidronam, and strontium-89 chloride
 • Nearly comparable adverse events and 3.6-month overall survival benefit and 5.6-month benefit in time to first skeletal-related event with radium-223 dichloride compared to placebo



www.snmni.org/therapyinfographic

Radioisotopes

This chart identified the most commonly used radionuclides for therapeutic purposes

Listed are:

- Yttrium90
- I-131
- Radium 223
- Strontium-89

Important!!

Also listed is Lutetium-177 (but there is a special coding rule for this!)

You can find this image at the following website: <https://s3.amazonaws.com/rdcms-snmni/files/production/public/images/2020%20TRT%20Infographic%20%281%29.pdf>



LUTETIUM-177

SEER Manual
Pages: 234-236
Note 2d

Considered Peptide Receptor Radionuclide Therapy (PRRT)

- ☢ Code as OTHER Therapy
 - ☢ Code 1-Other



Per the SEER*Rx Interactive Antineoplastic Drugs Database

Name

Lutrin

Alternate Names

Lutetium texaphyrin

Motexafin **lutetium**

Lutetium Lu77

Lutathera

Abbreviations

LU-177

Category

Radiation

Subcategory

See remarks for [coding](#) instructions
radioisotope

Remarks

Feb 2, 2018 FDA has approved **lutetium** LU 177 dotatate, a [radiolabeled](#) somatostatin [analog](#), for the [treatment](#) of somatostatin [receptor](#)-positive gastroen-teropancreatic neuroendocrine tumors, including [foregut](#), [midgut](#), and [hindgut](#) neuroendocrine tumors in adults.

IMPORTANT INSTRUCTIONS: This agent is coded in Other [Therapy](#). See program manuals for [coding](#) instructions.

Coding

This drug should be coded



References

SINQ: 20180106

<https://seer.cancer.gov/seertools/seerrx/>

Note: There is contradictory information on CAnswer Forum stating to code as Radiation Therapy. The SEER*Rx database has since been updated specifically instructing to code this agent in "OTHER Therapy"



RADIOISOTOPES

STORE: Page 268-269

Use code 13-Radioisotopes, NOS for radioembolization procedures, (e.g., intravascular Yttrium-90 for cases diagnosed January 1, 2019 and later

Don't forget about codes 14, 15 and 16!

13	Radioisotopes, NOS
14	Radioisotopes, Radium-223
15	Radioisotopes, Strontium-89
16	Radioisotopes, Strontium-90



CODING TIPS



PRIMARY TREATMENT VOLUME

Don't let the word primary confuse you

Primary Treatment Volume: The intended target, the site receiving the most/majority of the radiation.

The **primary treatment volume** can be the primary tumor site, tumor bed, whole breast, lymph nodes or metastatic site

It's the area in the crosshairs where the radiation will be the most intense



PRIMARY TARGET VOLUME

STORE: Page 260-265

Starting in 2021

For many treatment volume, the same code will be used when the anatomic structure and the surgical bed of the anatomical structure is targeted

Example: Prostate Cancer

- ⊗ Treated with radiation only: Code 64 (whole prostate)
- ⊗ Treated with radiation after prostatectomy: Code 64 (whole prostate)

Prior to 2021

- ⊗ Treated with radiation after prostatectomy: Code 86 (Pelvis)



- ⊗ **Code 64 (Prostate – Whole):** When the patient is being treated for prostate cancer and the order states **“to Pelvis”**
- ⊗ When patient has prostate cancer and the orders state **“Pelvis/Prostate”** or **“Whole Pelvis”**
 - ⊗ Treatment Volume: **Code 64** (Prostate – Whole) **and**
 - ⊗ Draining Lymph Nodes: **Code 06** (Pelvic Lymph Nodes)



Breast is the exception to the rule

- ⊛ **Code 41** (Breast-Partial): Patients who have had a lumpectomy and treated with partial breast irradiation
- ⊛ **Code 40** (Breast-Whole): Patients had a lumpectomy and whole breast radiation
- ⊛ **Code 42** (Chest Wall): Patients had a mastectomy and post-mastectomy radiation

CODING TIP:

With IORT for Breast Cancer

Only the lumpectomy site is being irradiated

Treatment Volume is coded: 41-Partial Breast



Brain

Whole vs Limited

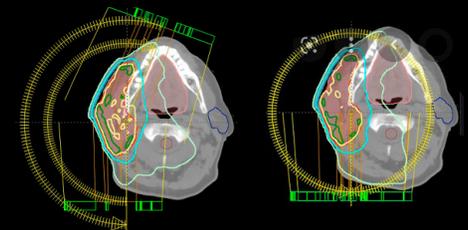
- ⊕ Most all radiation administered to the brain will be EXRT/IMRT/VMAT
 - ⊕ **Treatment Volume Coded: 13 Brain-Limited**
- ⊕ The whole brain is targeted when treating widespread brain metastases
 - ⊕ In those cases, **Treatment Volume is Coded: 12-Brain**

And Remember: The brain does not have draining lymph nodes



Tip: Look for the rotation arc/grid on treatment imaging

Limited



Partial arc grid

Complete arc grid that does **not** encompass /surround the entire head

Whole



Complete arc grid that **does** encompass /surround the entire head



RADIATION TO DRAINING LYMPH NODES

Radiation treatment commonly targets both the primary tumor (or tumor bed) and draining lymph nodes as a secondary site

- ⊛ When the primary volume is lymph nodes, draining lymph nodes are coded 88
- ⊛ When patient has prostate cancer and the orders state Pelvis/Prostate or stated as Whole Pelvis
 - ⊛ Treatment Volume: Code 64 (Prostate – Whole) **and**
 - ⊛ Draining Lymph Nodes: Code 06 (Pelvic Lymph Nodes)
- ⊛ When the pelvis is specifically mentioned in the treatment summary, we can assume that regional lymph nodes were targeted



- ⊛ When treatment is directed at a portion of the treatment volume (ie, Prostate – Partial) you can assume the lymph nodes are not to be coded as part of the target, unless otherwise specified
- ⊛ Boosts commonly target a portion of the treatment volume, thus you can assume the lymph nodes are not included and are not coded as part of the target volume
- ⊛ Pay attention to the TNM. If you have positive nodes you will assume they will be treated
- ⊛ If you have positive margins, this is also an indicator that lymph nodes might be treated
- ⊛ If there are no positive lymph nodes and margins are negative, there is no reason to treat the lymph nodes
- ⊛ Brain as treatment volume (12-Brain): there are no draining lymph nodes for the brain so Radiation to Lymph Nodes is coded (00)-no radiation treatment to draining lymph nodes



SIMULTANEOUS INTEGRATED BOOST (SIB)

- ⊛ An IMRT technique that allows the simultaneous planning and irradiation delivery of different targets at different dose levels in a single treatment fraction/session, instead of using sequential treatment plans.
- ⊛ By increasing the dose per fraction focally to the tumor itself while maintaining lower dose to the elective areas of interest, a more accurate dose distribution can be achieved, in order to improve local tumor control without putting the neighboring organs at risk.
- ⊛ This risk adaptive strategy now is modified to deliver a single efficient treatment plan with dose levels and intensities appropriate for each elected region.
- ⊛ The SIB technique offers the biological advantage of shortened treatment duration



A **new** phase **begins** when there is a **change** in one of the following:

Treatment volume of a body site: Where the dose is going

Examples: Decreasing the radiation field from Prostate (Whole) to Prostate (Partial)

Dose per fraction: How much radiation the targeted site will get

Examples: Increasing the dose per fraction from 180cGy to 200cGy **or**
Decreasing the dose per fraction from 250cGy to 200cGy

Treatment modality: What type of radiation is given

Example: Having external beam radiation then having brachytherapy

Planning technique: What is used to deliver the radiation

Example: Changing from 3D conformal to IMRT



GET IN THE KNOW!

Know your facility!

- ⊕ Know what services your facility offers
- ⊕ Know what equipment they have
- ⊕ If your facility uses on outside source, know what they offer and what equipment they use



Resources

STORE Manual

Introduction: Pages 61-63
Data Fields: Pages 257-284

CTR Guide to Coding Radiation Therapy Treatment in the STORE

Version 3.0 updated February 2021
Scenario examples have been added
Helpful quick guide with tables (pages 38-43)

Answer Forum:
<http://cancerbulletin.facs.org/forums/>

CTR Guide to Coding Radiation Therapy Treatment in the STORE

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