Treatment 2025

NAACCR 2024-2025 Monthly Webinar Series

1

Q&A

Please submit all questions concerning the webinar content through the Q&A panel.

If you have participants watching this webinar at your site, please collect their names and emails.

We will be distributing a Q&A document in about one week. This document will fully answer questions asked during the webinar and will contain any corrections that we may discover after the webinar.

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Fabulous Prizes

3

Guest Presenters

- Wilson Apollo, MS, ODS
- Fernanda Silva Michels, MSc, PhD, ODS-C

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Pediatric Data Item Initiative

Fernanda Silva Michels, MSc, PhD, ODS-C

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NAACCR Pediatric SSDI Workgroup

Angela Costantini, UNC Health, Chair
Jennifer Ruhl, NCI SEER, Co-Chair
Fernanda Michels, NAACCR support

✓ Members: more than 10 pediatric registrars (all volunteers).

✓ Goals:

    ✓ Create a comprehensive **Pediatric Manual**, containing detailed information on Pediatric Cancer, along with standardized sections by tumor group,
    ✓ Develop and provide support during implementation of the **Pediatric Data Collection System (PDCS)**
    ✓ Design and implement **trainings** to guide registrars with skills needed to use the PDCS.

✓ Resources:

    ✓ **NAACCR Pediatric Resources Website**
    ✓ **Ask a SEER Registrar**: for questions related to Pediatric abstracting

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Slide 7

Pediatric Manual	PDCS (Pediatric Data Collection System)

Pediatric Manual (form image):

Pediatric Tumor Type:

Primary Site(s)
Histology(ies)

Brief Introduction: (describe the tumor and some general information about it; include references)

Staging System(s): (one or multiple, historical, and current staging systems; include references)

WHAT TO EXPECT: Clinical Workup
- Physical Exam Text:
- Imaging Text:
- Pathology Text:
- Labs Text:
- Cytogenetics:

WHAT TO EXPECT: Treatment
- Surgery Text:
- Radiation Text:
- Other Radiation Text:
- Chemotherapy Text:
- Hormones Text:
- Immunotherapy Text:
- Hematopoietic Text:
- Other Text:

ABSTRACTING NUANCES/TIPS
- Surgical codes for bilateral primaries abstracted as one primary:
- Commonly associated genetic abnormalities:
- Accompanying SSDI:

OTHER
- Established clinical trials:
- Pediatric Major Group/Classification:
- Resources:

PDCS (Pediatric Data Collection System):

The Pediatric Data Collection System (PDCS) has been developed to collect Pediatric staging and site-specific data item (SSDI) information.

Beginning with 2025 diagnoses, **select hospitals (SEER regions) are required to collect the PDCS**
- Ages 0-19 (required), Ages 20-39 (optional).

If you are not required to collect PDCS but choose to: any hospital can collect PDCS as a volunteer. You will need to contact your software vendor to make sure they include the Pediatric API in your upgrade.

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Slide 8

NAACCR Pediatric Resources Website

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Questions?

9

The Basics of Electron Therapy

10

The Basics of Electron Therapy

Wilson Apollo, MS, CTR

WHA Consulting

NAACCR

April 3, 2025

WHA Consulting

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2

Objectives

- Discuss the different types of radiation,
- Compare the characteristics of photon and electron therapy, and how these are generated in a modern linear accelerator (Linac)
- Compare and contrast the therapeutic use of photon and electron therapy,
- Explore how radiation therapy work in tissue,
- Review the characteristic of photon and electron isodose curves, PDDs (percentage depth dose), Dmax,
- Review the use of electron boost for breast cancer.

3

FIRST CURE OF CANCER BY X-RAYS
1899 - BASAL CELL CARCINOMA
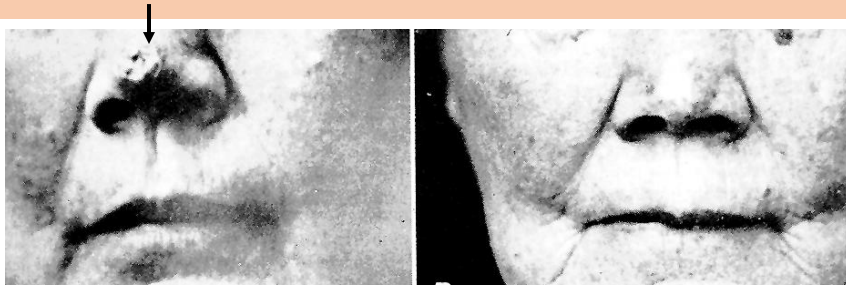
X-rays were used to cure cancer very soon after their discovery

4

Photon & Electron Therapy

Plan target	Beam Energy	Fraction (cGy)	# of fractions	Start Date	End Date
LT breast	6X/3D	265	16/16	01/06/2025	01/27/2025
CD5240	6E	250	4/4	01/28/2025	01/31/2025

- Why is phase 1 treated with **photon** therapy?
- Why is phase 2 treated with **electron** therapy?
- Can they be use interchangeably?
- Why are breast boosts sometimes delivered via photons vs. electron and vice versa?

5

Types of Radiation

➢Alpha (α)

➢Beta (β)

➢Electrons

➢Photons, Gamma (γ)

➢Proton

Particulate vs. non-particulate

6

Radiation Penetration
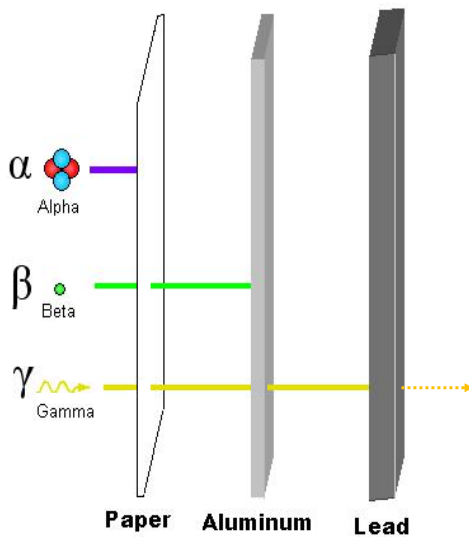
α-particles are heavy enough to be stopped by a piece of paper. Easily stopped by the skin. They are an internal risk.

β- and **γ-**radiation pass into the body and can damage tissue.

γ-radiation is very penetrating, thus need for shielding to protect pt and staff.

Cobalt-60 is an example of a gamma(**γ**) emitter

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3

Photons

- Like gamma rays, have no mass
- Very penetrating, requiring substantial shielding to protect staff and the public,
- Generated by Linacs
- Deposits energy along its entire path as it traverses through tissue and matter,
- When generated by Linacs, produces **isotropic** (multidirectional) pattern,
- Photon beam generated by Linacs have a spectrum of energies (**polyenergertic**).

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GAMMA RAYS

-Produced by radioactive decay.

-**Cobalt-60** is commonly used to produce gamma rays. Produced artificially…not found in nature. Cobalt is bombarded w/ neutrons until it gains an additional neutron. Energy emitted are two gamma rays of 1.17 and 1.33 MV, with Avg of **1.25 MV**.

^{60}Co

γ Rays
1.17 MV
1.33 MV

9

4
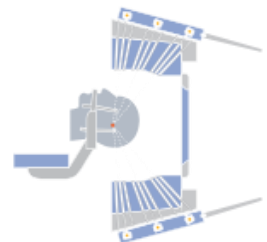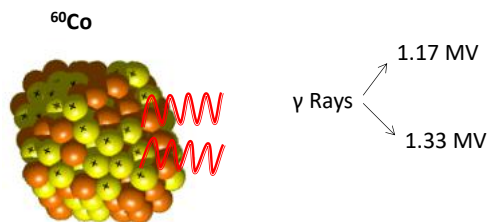
Linac Treatment Room Shielding-Door

Steel capsule on Cobalt-60 source is sufficient to absorb the beta (**electron**) particles resulting from the radioactive decay.

Door to contain 3" lead inner layer (toward vault/room interior), followed by 6" normal polyethylene, 5" borated polyethylene and an outer layer of 3" lead, with minimum 0.25" steel covers.
Total door thickness= 17.25 inches!
Varian Linac Truebeam unit

10
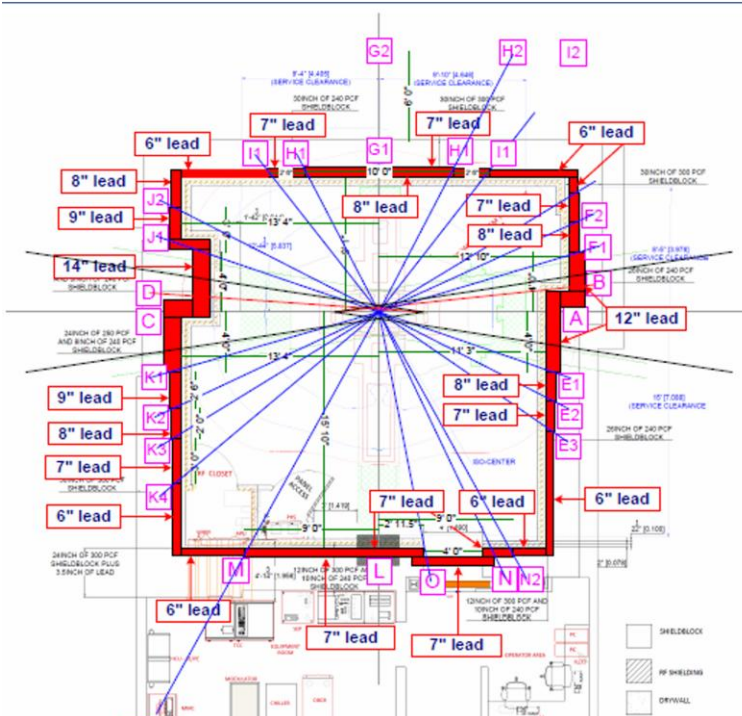
Linac Room Shielding Design

11

5

3" lead x 12' W x 1' L

OCCUPIED

2nd floor

6" lead x 11' W x 4' L

9" lead x 10' W x 12' L

6" lead x 11' W x 4' L

3" lead x 12' W x 4' L

O N M N O P

6' 0"

147 lb/ft³

1" lead x 13' W x 5' L

147 lb/ft³ concrete

4' 0"

4' 0"

147 lb/ft³

12' 0"

2' 8"

18' 0"

13' 0"

12' 0"

18' 0"

7' 0"

13' 0"

3.11A

Linac Room Ceiling Shielding Design

Photon & Proton depth dose profiles

Depth dose profiles

Bragg Peak →

relative dose

photons 21 MeV
^{12}C 270 MeV/u
protons 148 MeV/u

depth in water [mm]

12

13
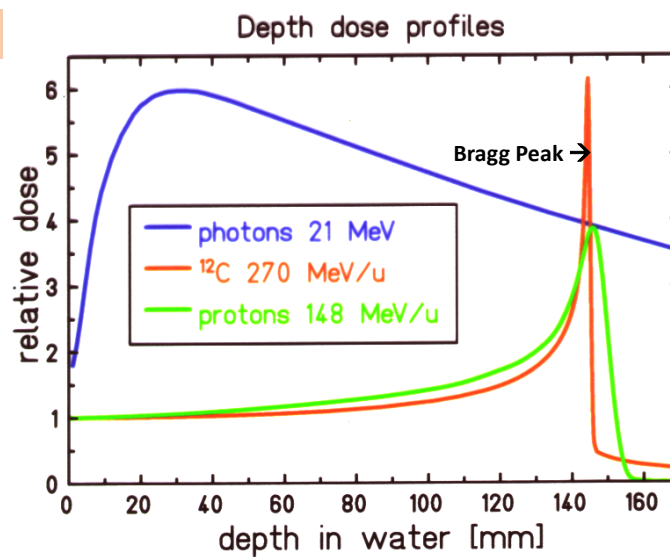
Sources of Radiation Exposure
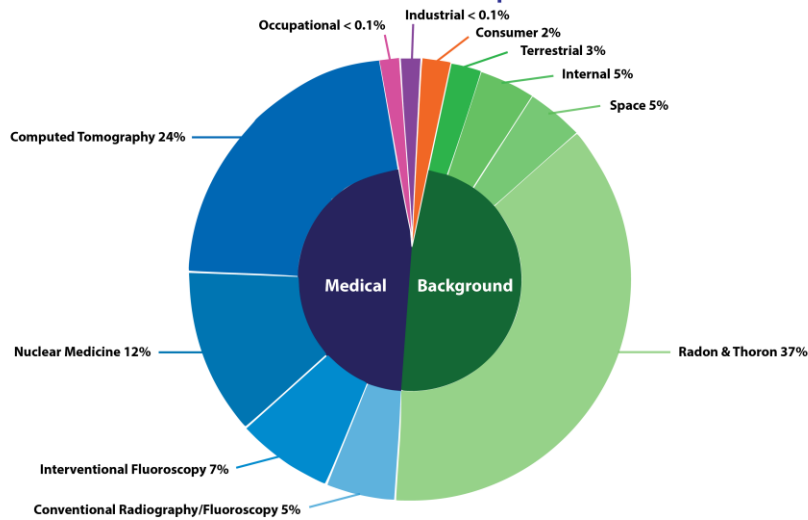
Average Annual Radiation Dose											
Sources	**Radon & Thoron**	**Computed Tomography**	**Nuclear Medicine**	**Interventional Fluoroscopy**	**Space**	**Conventional Radiography/ Fluoroscopy**	**Internal**	**Terrestrial**	**Consumer**	**Occupational**	**Industrial**
Units mrem (United States) mSv (International)	228 mrem 2.28 mSv	147 mrem 1.47 mSv	77 mrem 0.77 mSv	43 mrem 0.43 mSv	33 mrem 0.33 mSv	33 mrem 0.33mSv	29 mrem 0.29 mSv	21 mrem 0.21 mSv	13 mrem 0.13 mSv	0.5 mrem 0.005 mSv	0.3 mrem 0.003 mSv

(Source: National Council on Radiation Protection & Measurements, Report No. 160)

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Electrons

- Negatively charged particle,
- About 1/1800 the mass of a proton,
- Equivalent energy= 0.511 MeV (same as beta particles),
- Finite range in tissue
- Energy loss in tissue = 2 MeV/ cm
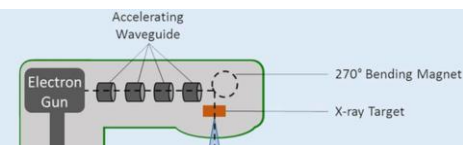
Electron vs. Beta Particles?

15

7

Linear Accelerator-Linac
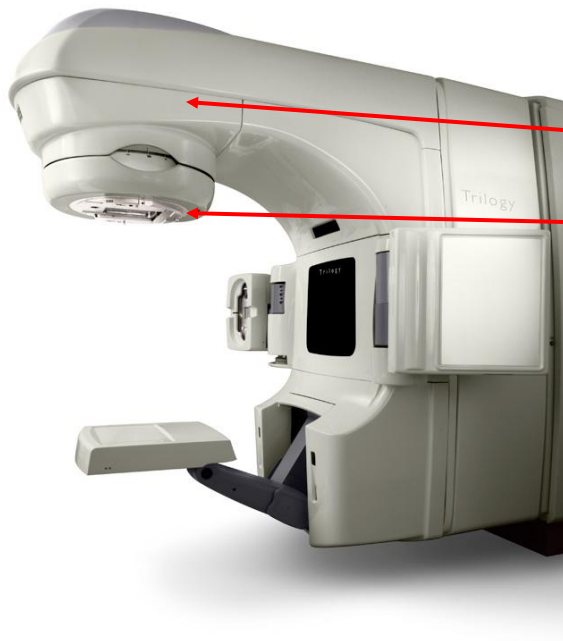
Gantry

Collimator
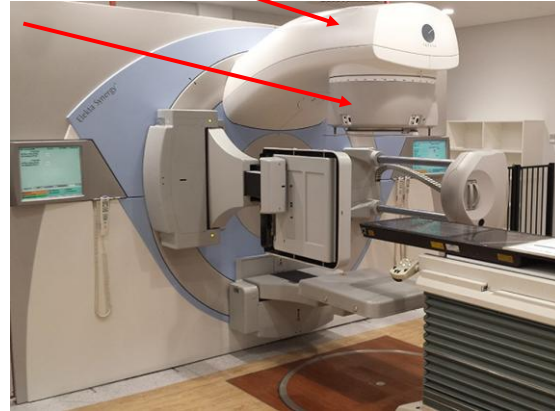
16

Linacs

- Many linear accelerators have beam energies of 6 MV through 20 MV as well as electron energies of 4-20 MeV.
- The linear accelerator can be used to treat deep seeded as well as superficial tumors due to these wide range of energies.
- **Keep in mind**: Many modern linacs can treat with either photons or electrons.

17
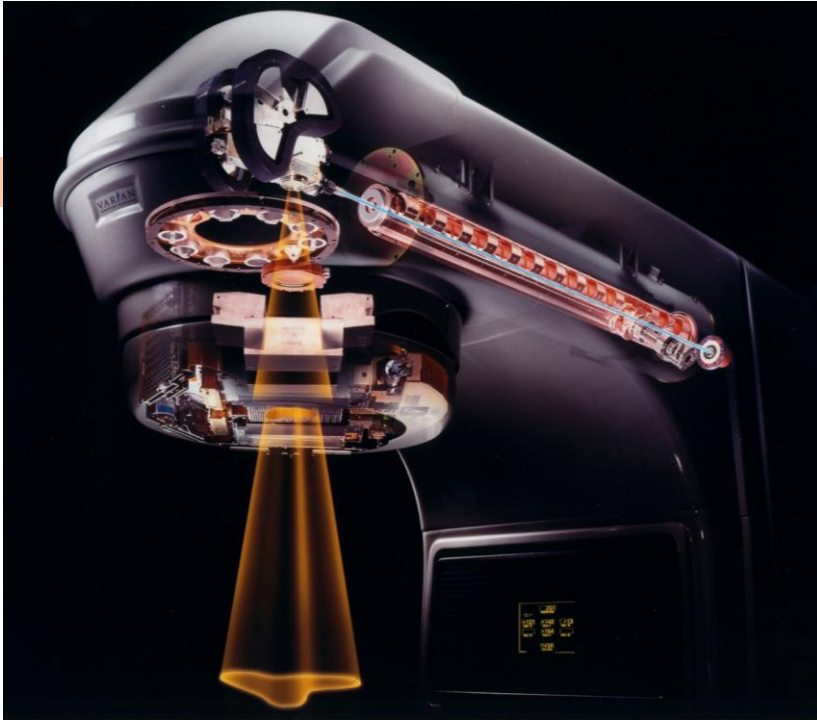
Note conical (cone) shape of photon beam.

Term "**Cone down**" (CD) comes from this physical feature of photon beams.

 CD boost refers to dose delivered to a much smaller volume within the planned tumor volume (PTV).

18
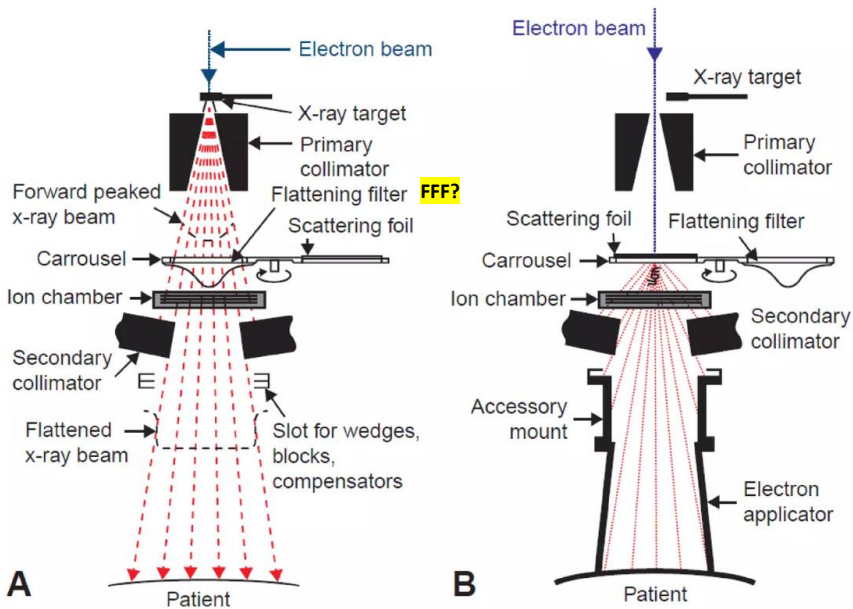
Linac Treatment Modes:

A. Photon mode

B. Electron mode

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100 cm

Central Axis (CAX)

Isocenter

D-max

20

Photon beam energy & pt thickness

6 MV

Seen commonly in breast tangents treatments.
If planning technique is 3D conformal, the mixed beam energies will not change the code of **04 (3D)**.

RAO   LAO

RAO

RPO

LPO

Patient supine

Spinal cord

30 cm

LPO

Sometimes, mixed energies work well. Note that the use of multiple beam energies does not alter the treatment technique used.

10 MV/10X/10MVX. Distance PA photon beam needs to traverse through tissue is > AP beam

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Beam energy & pt thickness

6 MV

30 cm

10 MV
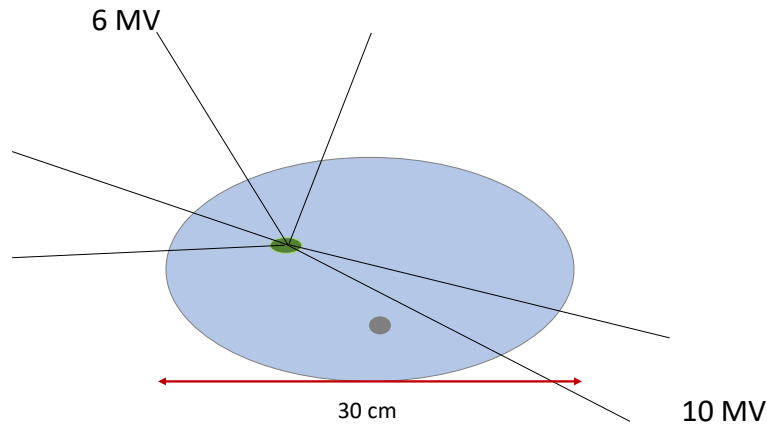
Sometimes, mixed energies is necessary.

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Isodose Curves

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Isodose curves

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Isodose curves
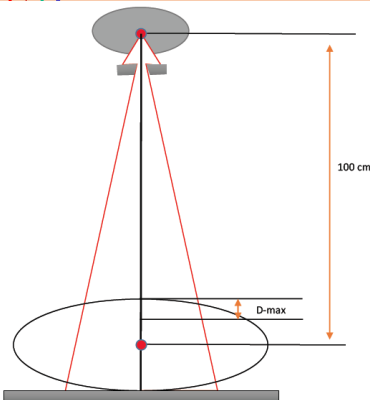
Graphic illustration of dose distribution. Line passing through areas of equal dose, similar to topographic lines on a map;

- Shape of isodose curves depend primarily on beam energy and field size,
- Beam energy determines the isodose distribution at depth,
- Dose along central axis is always greater, at any depth,
- Dose slowly drops as you move away from the central axis due to beam attenuation and inverse square law,
- Complexity increases with each added field.

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Photon & Electron Isodose Curves
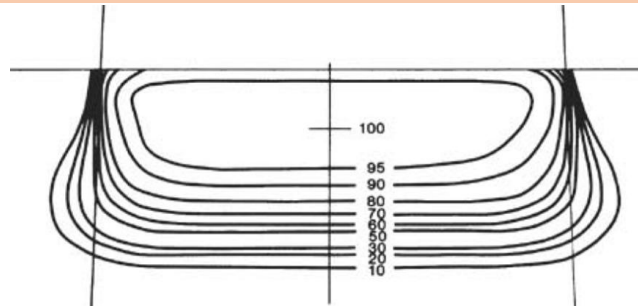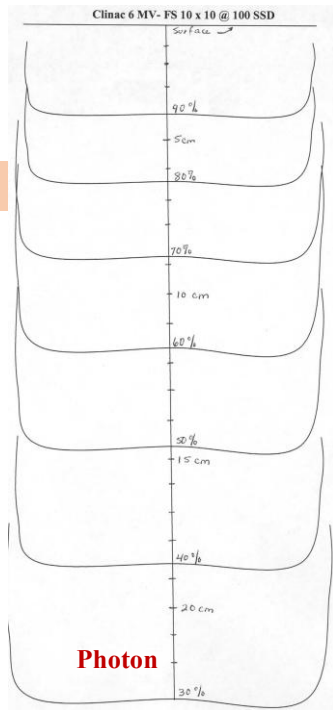
Photon

Electron

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Photon & Electron Isodose Curves
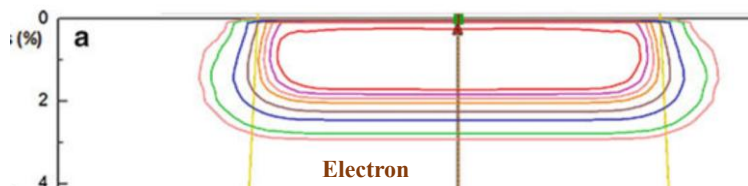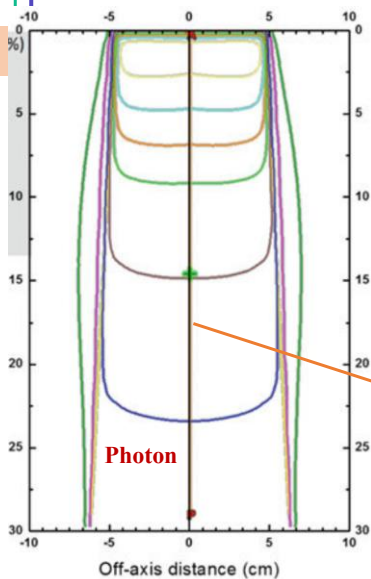
Central Axis(CAX)

Photon

Electron

27
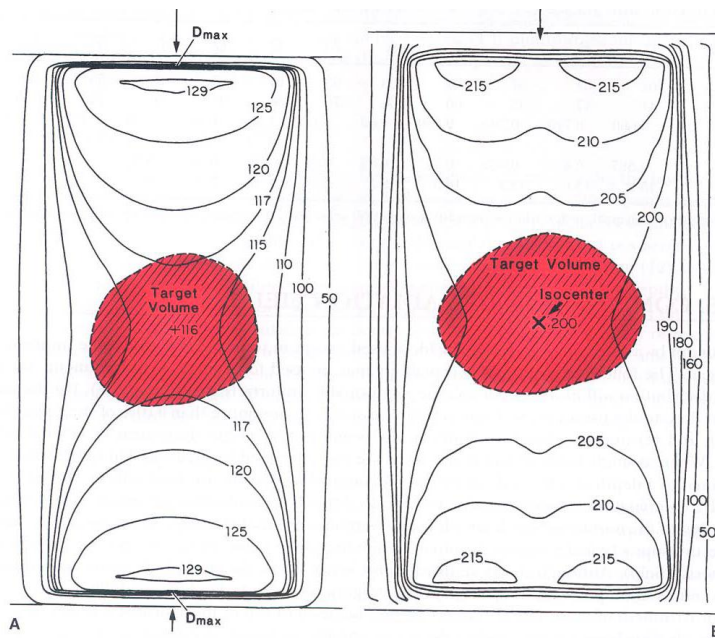
Isodose Curves

28

AP/PA photon isodose curves

29

14
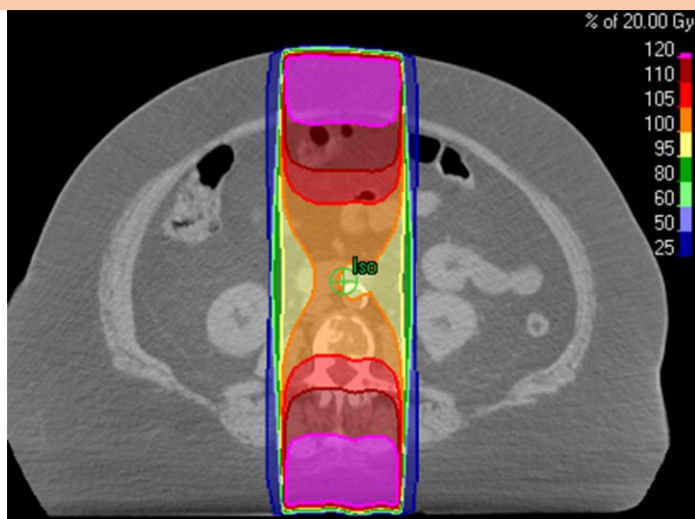
3D Conformal & IMRT Plans
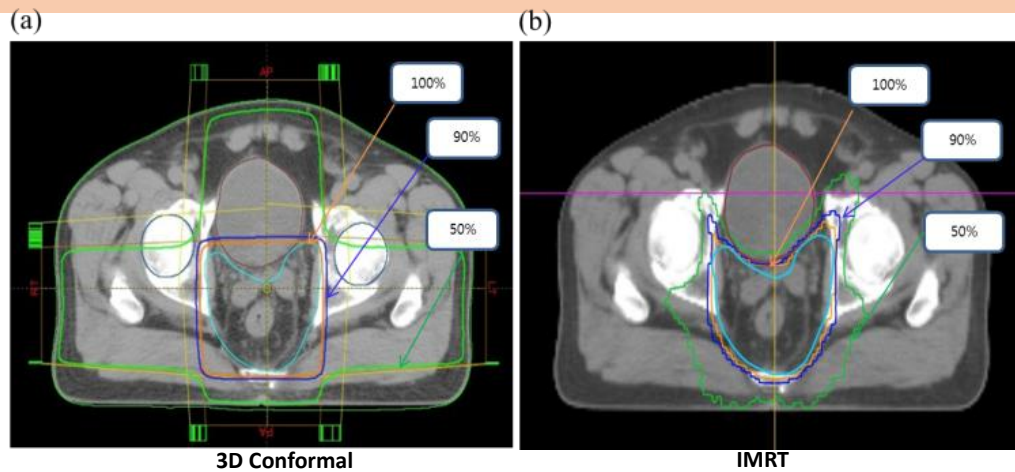
30

Electron PDD (Percentage Depth Dose)
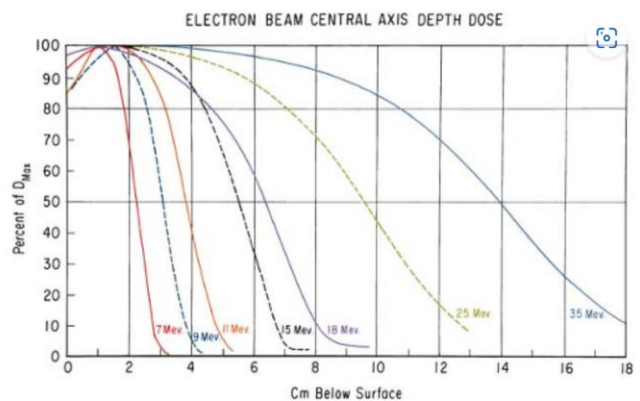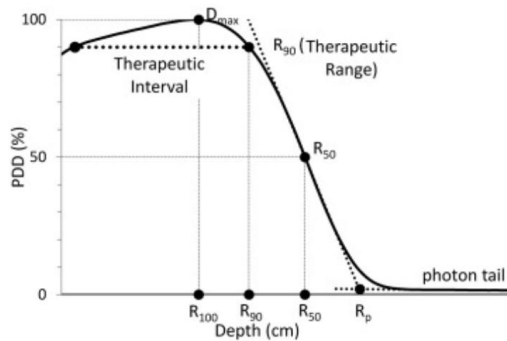
31

Dmax

EBRT is considered **ionizing radiation**. When interacting with tissue, photons knock off electrons from the outer shell of atoms.

Isocenter

D-max
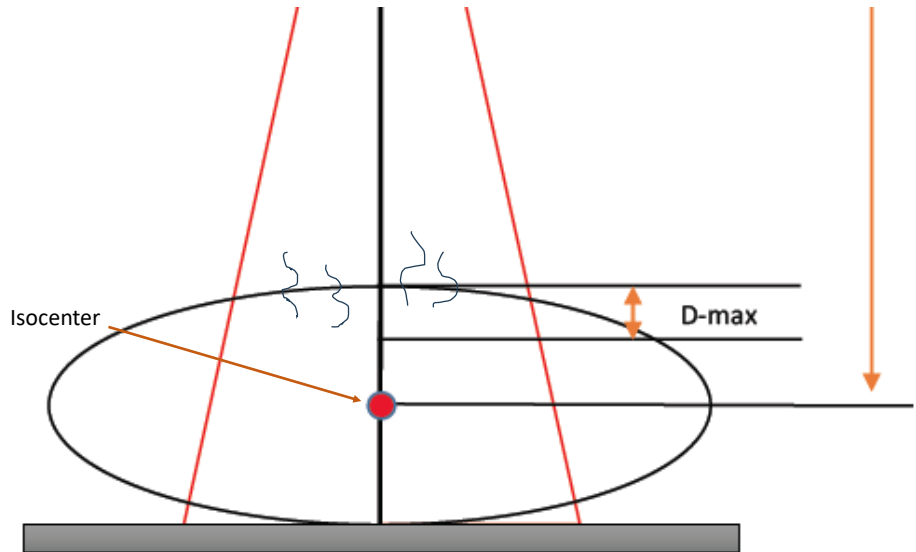
32

Selecting the correct electron beam energy

PDD (%)

- – – 6MeV
- —— 9MeV
- ······ 12MeV
- —— 15MeV

Depth (cm)
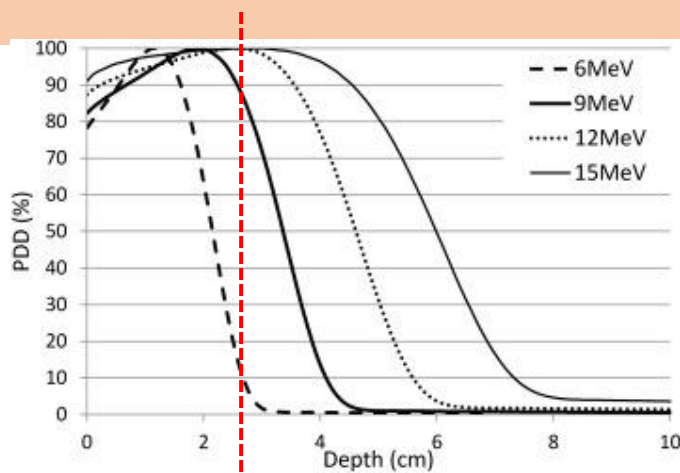
33

Scattered dose

Total dose = Primary dose + Scattered dose
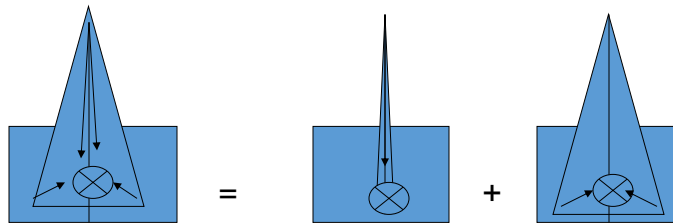
The primary beam is not the only contributor to dose to the patient!
Scatter dose must be taken into account. Major sources of scatter are:
a. Collimator scatter,
b. Patient scatter from w/i pt and from w/o pt

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Skin-Sparing Effects-Photons D_{max}

A. D_{max} refers to the depth of maximum dose. (AKA charged particle equilibrium, CPE)

B. D_{max} is dependent on photon beam energy, field size and the composition of the irradiated volume.

Photon Energy	D_{max} (cm)	PDD @ 10 cm
Cobalt-60 @80 SSD/SAD	0.5 cm	56%
6MV	1.5 cm	67%
10MV	2.5 cm	76%
18MV	3.2 cm	80%

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Skin-Sparing Effects-Photons vs. Electrons

A. The higher the **photon** energy, the higher the skin-sparing effect,

B. With **electrons**, it is the opposite; the higher the beam energy, the greater the skin reaction.

Energy	Surface Dose	Dmax	R90%	R50%
6MeV	78%	1.2 cm	1.7 cm	2.3 cm
9MeV	81%	2.0 cm	2.7 cm	3.5 cm
12MeV	86%	2.8 cm	3.9 cm	5.0 cm
15MeV	91%	3.2 cm	4.9 cm	6.3 cm
20MeV	95%	3.5 cm	6.0 cm	8.5 cm

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Use of bolus in electron therapy

Bolus is made of tissue equivalent material. It is primarily used to:

1. Increase skin (surface) dose,
2. Shorten the range of electrons in the patient
3. Flatten out inhomogeneous surfaces on the patient,
4. Reduce the electron beam penetration in some parts of the treatment field.

Bolus can be used for photon _and_ electron therapy.

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Bolus…
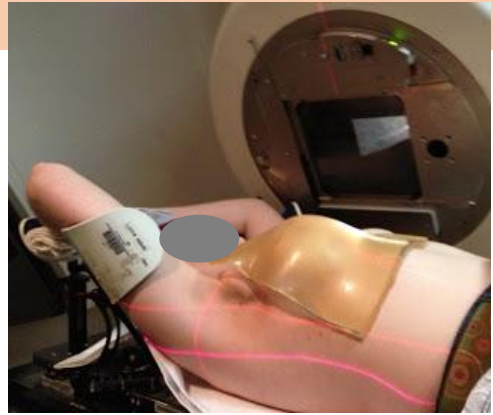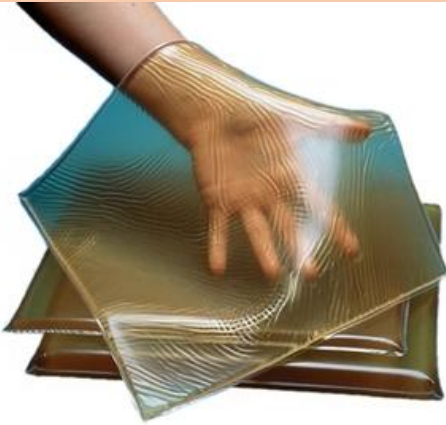
Skin-Sparing Effects-Photons vs. Electrons

A. The smaller the **electron** field size (electron cut-out), the greater the surface dose,

B. The greater the angle of **obliquity**, the more the surface dose starts to increase
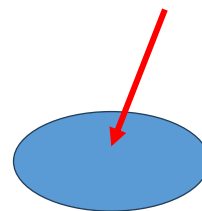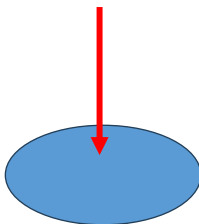
What happens when the body is irradiated?

• It depends on…
1. Delivery system, technique used,
2. Beam energy and modality,
3. Five Rs of radiobiology
4. Biologic, chemical and physical factors,
5. Dose, volume, and fractionation,
6. Cell type, cycle, organ,
7. Patient characteristic and age

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Direct and Indirect DNA Damage
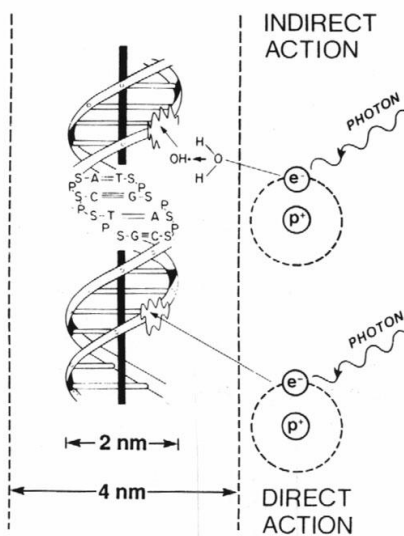
Most common ionizing event in tissue is **radiolysis**, photon interacting w/ outer shell electron resulting in a free radical (AKA Reactive Oxygen Specie, ROS). This is what occurs in the **indirect effect/action**, the most prevalent interaction when tissue is irradiated.

The vast majority of **DNA damage** is caused by the free radicals created by radiolysis. The hydroxyl radical (**OH·**) plays a major role in producing double strand breaks in the DNA helix that ultimately leads to cell death, apoptosis.

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3/4

Electron Therapy-Summary

1. Beam is not as penetrating as photon beam,
2. Energy loss in tissue = 2 MeV/ cm
3. The higher the beam energy, the greater the skin dose. This is the <u>opposite</u> of photon beams.
4. Isodose curves look very different from photon beams (flatter & lesss penetrating).
5. Treatment is often prescribed to the **90% isodose curve**.
6. Often used to boost the dose to <u>superficial tumors or tumor bed or lumpectomy scars</u>.
7. Linear accelerators use a **scattering foil** when in the electron therapy mode.

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Electron Therapy Applications

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Electron Therapy Approaches/Techniques

1. **CD** (Cone Down) boost. Used to boost the surgical bed following breast surgery.

2. **TSEBT**: Total skin electron beam therapy. Used for treatment of primary cutaneous T-cell lymphoma (pCTCL), aka mycosis fungoides.

3. **UHDR RT**: Ultrahigh-dose rate radiation therapy. Appears to deliver flat, homogeneous UHDR electrons in the clinical size range and depth.

4. **IOERT**: Intraoperative electron radiation therapy. Study shows it is a feasible option to whole breast irradiation (WBI). However, ipsilateral recurrence (IR) was higher with IOERT.

5. **eFLASH-RT**: modified version of ultrahigh dose-rate electron RT.

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Clinical Case 1- Breast CD?

Plan target	Beam Energy	Fraction (cGy)	# of fractions	Start Date	End Date
LT breast	6X/3D	265	16/16	01/06/2025	01/27/2025
CD5240	6E	250	4/4	01/28/2025	01/31/2025

- CD (Cone down)= boost
- What is boosted? Typically, it's the lumpectomy bed.
- What determines whether the boost is delivered via photons vs. electrons?
  - The boost modality is based on the depth of the tumor bed. For superficial (close to the skin) tumor beds, electrons is the preferred method. Electrons are far less penetrating than photons.

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Case 1: Breast w/ eBoost

A couple of questions to consider/clarify:

1. How many phases are we coding?
2. Is the entire breast or partial breast being irradiated?
3. What planning technique do we code for an electron breast boost?

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Electron Therapy
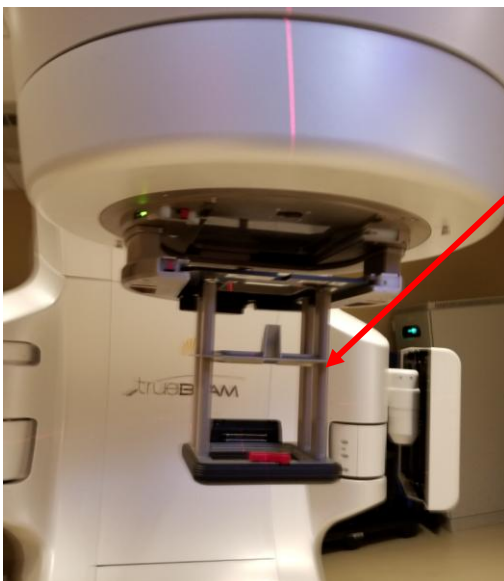
Electron cone
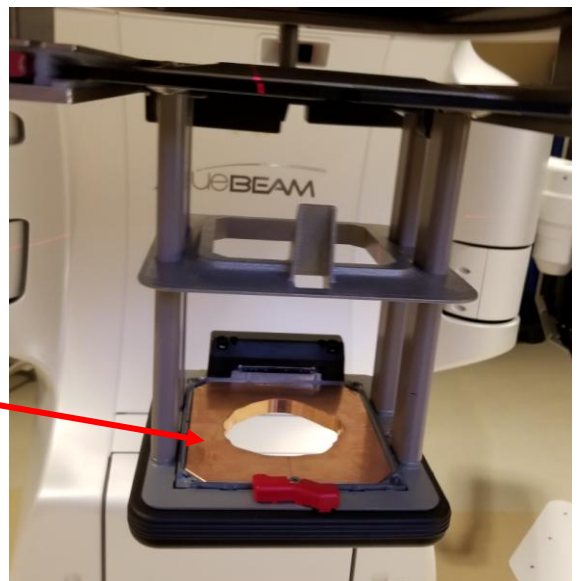
Electron cut-out

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Case 2: eBoost-3D

Electron cutout

En Face
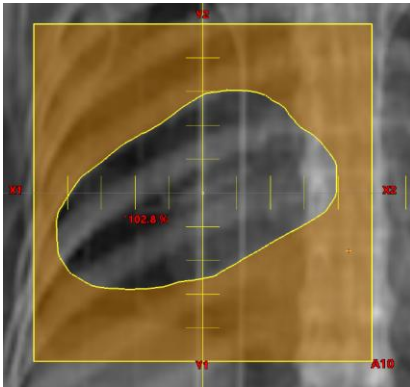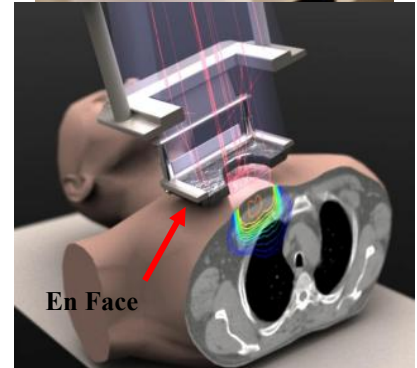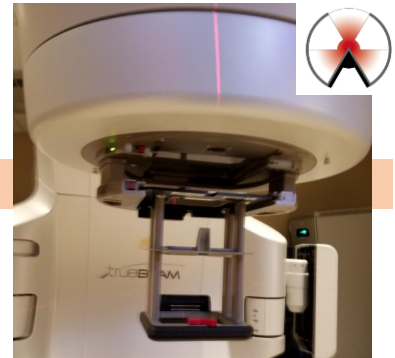
48

Seg	#	Field	Code/Definition
Summary	1	Rad/Surg Sequence	3 Radiation after surgery
	2	Reason No Rad	0 Radiation was admin..
	3	Location of Rad	1 All RT at this facility
	4	Date RT Started/Flag	01/06/25
	5	Date RT Ended/Flag	01/31/25
	6	Number of Phases of RT	02
	7	RT Discontinued Early	01 Radiation completed
	8	**Total Dose**	**005240**
Phase 1	9	Primary Treatment Volume	40 Whole breast
	10	Rad to Draining LNs	00 No RT to draining LNs
	11	Treatment Modality	02 External beam, photons
	12	Planning Technique	04 3D Conformal
	13	Dose per Fraction	00265
	14	Number of Fractions	016
	15	Phase I Total Dose	004240
Phase 2	16	Primary Treatment Volume	41 Partial breast
	17	Rad to Draining LNs	00 No RT to draining LNs
	18	Treatment Modality	04 Electrons
	19	Planning Technique	04 3D Conformal
	20	Dose per Fraction	00250
	21	Number of Fractions	004
	22	Phase II Total Dose	001000
Phase 3	23	Primary Treatment Volume	00
	24	Rad to Draining LNs	
	25	Treatment Modality	
	26	Planning Technique	
	27	Dose per Fraction	
	28	Number of Fractions	
	29	Phase III Total Dose	

Case 1 Coding Logic:

- **#8**: You **can** add dose from phases using photons and electrons, both are EBRT.
- **#9-10**: Treatment summary does not mention partial breast or regional lymphatics.
- **#16**: A boost phase (photon or electron) always targets a smaller volume, partial breast.
- **#17**: Lymphatics are not targeted with electron therapy. Typically, it is the tumor bed or chest wall/surgical scar.
- **#18**: "6E" indicates electron mode.

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Case 2: Breast w/ eBoost & bolus

RT Completion Summary:

Treatment Site	Dose (cGy)	Energy, Technique	Fx	Start	End
LT Breast	4240	10MV/3D	16	04/11/24	05/02/24
LT Breast Boost (en face)	1000	9E/3D	4	05/03/24	05/06/24

"en face" & 9E both refer to electron therapy, **modality code 04**.

As per the treatment plan, **bolus** was used on alternate dates during the first phase of treatment: 8 days w/ bolus; 8 days w/o bolus.

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Case 2: Breast-Bolus and no bolus

In this case, use of bolus is on alternate days. Plan remains the same. *Irradiated target volume is the same*. Consider bolus on/bolus off, as in this case, to be a **single phase**.

Electron boost is a separate phase due to change in modality & volume.

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Seg	#	Field	Code/Definition
Summary	1	Rad/Surg Sequence	3 Radiation after surgery
	2	Reason No Rad	0 Radiation was admin..
	3	Location of Rad	1 All RT at this facility
	4	Date RT Started/Flag	04/11/24
	5	Date RT Ended/Flag	05/06/24
	6	Number of Phases of RT	02
	7	RT Discontinued Early	01 Radiation completed
	8	**Total Dose**	**005240**
Phase 1	9	Primary Treatment Volume	40 Whole breast
	10	Rad to Draining LNs	00 No RT to draining LNs
	11	Treatment Modality	02 External beam, photons
	12	Planning Technique	04 3D Conformal
	13	Dose per Fraction	00265
	14	Number of Fractions	016
	15	Phase I Total Dose	004240
Phase 2	16	Primary Treatment Volume	41 Partial breast
	17	Rad to Draining LNs	00 No RT to draining LNs
	18	Treatment Modality	04 Electrons
	19	Planning Technique	04 3D Conformal
	20	Dose per Fraction	00250
	21	Number of Fractions	004
	22	Phase II Total Dose	001000
Phase 3	23	Primary Treatment Volume	00
	24	Rad to Draining LNs	
	25	Treatment Modality	
	26	Planning Technique	
	27	Dose per Fraction	
	28	Number of Fractions	
	29	Phase III Total Dose	

Case 2 Coding Logic:

- **#6:** The use of bolus does not change the # of phases used,
- **#8**: You **can** add dose from phases using photons and electrons, both are EBRT.
- **#9-10**: Treatment summary does not mention partial breast or regional lymphatics.
- **#16**: A boost phase (photon or electron) always targets a smaller volume, partial breast.
- **#17**: Lymphatics are not targeted with electron therapy. Typically, it is the tumor bed or chest wall/surgical scar.
- **#18**: "en face" & "9E" indicates electron mode.
- **#19**: If an electron cut-out is used, code to 3D-Conformal.

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Clinical Scenario 3

- Step 1: Extract treatment information in a format that can be readily interpreted:

Treatment Site	Dose (cGy)	Energy /Technique	Fx	Start date	End date
LT breast tangents	5,000	10MV conformal	25	7/23/24	8/24/24
LT SCV/Axilla	5,000	10X conformal	25	7/23/24	8/21/24
LT breast boost, enface/mini tangents	1,000	15E	5	8/27/24	8/31/24
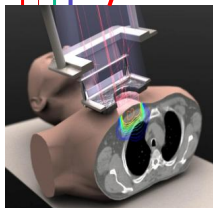
- # of phases
- Order of phases,
- Primary Volume
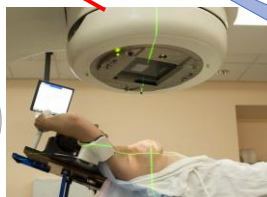
- Treatment Modality,
- Planning Technique

53

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Seg	#	Field	Code/Definition
Summary	1	Rad/Surg Sequence	3 Radiation after surgery
	2	Reason No Rad	0 Radiation was admin..
	3	Location of Rad	1 All RT at this facility
	4	Date RT Started/Flag	07/23/24
	5	Date RT Ended/Flag	08/31/24
	6	Number of Phases of RT	02
	7	RT Discontinued Early	01 Radiation completed
	8	**Total Dose**	**006000**
Phase 1	9	Primary Treatment Volume	40 Whole breast
	10	Rad to Draining LNs	04 RT to draining LNs
	11	Treatment Modality	02 External beam, photons
	12	Planning Technique	04 3D Conformal
	13	Dose per Fraction	00200
	14	Number of Fractions	025
	15	Phase I Total Dose	0050000
Phase 2	16	Primary Treatment Volume	41 Partial breast
	17	Rad to Draining LNs	00 No RT to draining LNs
	18	Treatment Modality	04 Electrons
	19	Planning Technique	04 3D Conformal
	20	Dose per Fraction	00200
	21	Number of Fractions	005
	22	Phase II Total Dose	001000
Phase 3	23	Primary Treatment Volume	00
	24	Rad to Draining LNs	
	25	Treatment Modality	
	26	Planning Technique	
	27	Dose per Fraction	
	28	Number of Fractions	
	29	Phase III Total Dose	

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Case 3 Coding Logic:

- **#6:** You can abstract this case w/ two or three phases, preferably **two phases**,
- **#8**: You **can** add dose from phases using photons and electrons, both are EBRT.
- **#10**: Treatment summary specifically mentions regional lymphatics.
- **#16**: A boost phase (photon or electron) always targets a smaller volume, partial breast.
- **#17**: Lymphatics are not targeted with electron therapy. Typically, it is the tumor bed or chest wall/surgical scar.
- **#18**: "en face" & "9E" indicates electron mode.

LIAC & NOVAC Linear Accelerators

- Electron linear accelerators
- Used for IORT or IOERT
- Since treatment modality is electron, <u>code to 04, External beam, electrons</u>.

55

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56

Shane & Lily
Apollo.

57

58
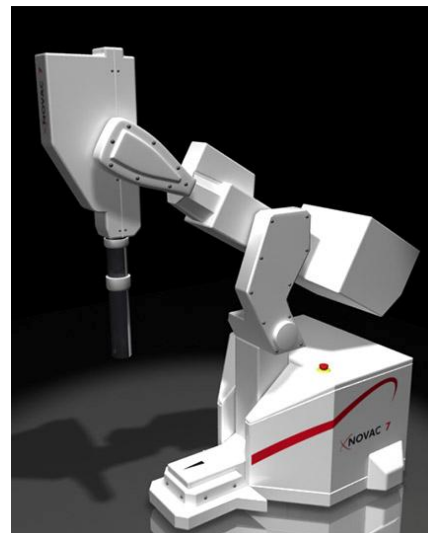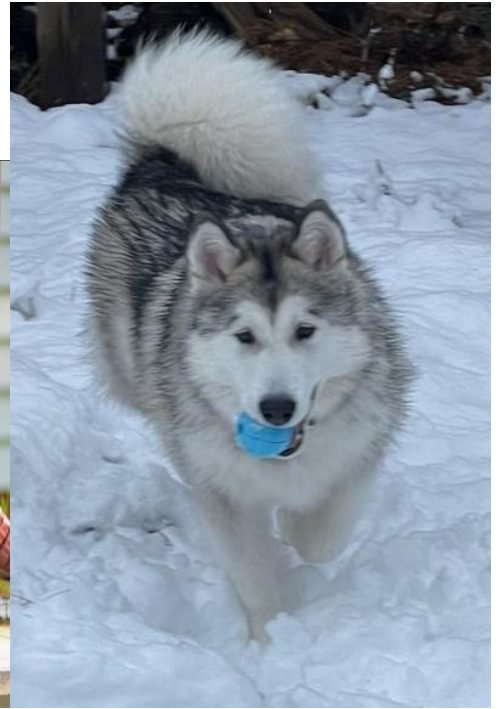
Treatment

First Course of Treatment

- Includes all methods of treatment recorded in the treatment plan
- Administered to patient before disease progression or recurrence.
- Types of treatment
  - Surgery
  - Radiation
  - Systemic Treatment
  - Other Treatment
  - Palliative Care
  - No Treatment
  - Active Surveillance

First Course of Treatment

- Time Periods for First Course of Treatment
  - If first course treatment was provided, the Date of First Course of Treatment [1270] is the earliest of Date of First Surgical Procedure [1200], Date Radiation Started [1210], Date Systemic Therapy Started [3230], or Date Other Treatment Started [1250].
    - If no treatment is given, record the date of the decision not to treat, the date of patient refusal, or the date the patient expired if the patient died before treatment could be given.
    - If active surveillance ("watchful waiting") was selected, record the date of that decision.

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Treatment Plan

- A treatment plan describes the type(s) of therapies intended to modify, control, remove, or destroy proliferating cancer cells.
  - Curative
  - Palliative
- Part of patients record
  - Discharge Plan
  - Protocol or Management guidelines
  - If there is no treatment plan, established protocol, or management guidelines, and consultation with a physician advisor is not possible, use the principle: "initial treatment must begin within four months (1 year per SEER) of the date of initial diagnosis."

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Treatment Protocols

- Standardized approach incorporating evidence-based guidelines
  - ASCO-American Society of Clinical Oncology
  - NCCN-National Comprehensive Cancer Network
  - ESMO-European Society for Medical Oncology

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Treatment Protocols

- Stage 3 colon cancer treatment protocol (example)
  - Segmental resection with lymph node dissection
  - Adjuvant chemotherapy
    - FOLFOX: A combination of 5-fluorouracil (5-FU), leucovorin, and oxaliplatin.
    - Typically given over 6 months
    - Started 4-8 weeks after surgery

- Stage 3 rectal cancer protocol (example)
  - Neoadjuvant chemoradiation
    - Long Course:
      - 5040 cGy in 28 fractions over a 5-to-6-weeks with 5-fu or capecitabine
    - Chemotherapy: FOLFOX (12-16 weeks)
  - Surgery (LAR and TME)
  - Adjuvant chemotherapy (if required)

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Typical Timeline

Diagnosis → Work-up → Surgery →

Adjuvant Treatment
Systemic
  Chemo
  BRM/Immuno
  Hormone
Radiation
Other

17

Neoadjuvant Therapy

Diagnosis → Work-up → Neoadjuvant Treatment → Work-up → Surgery

Total time of neoadjuvant therapy varies.
Not uncommon for it to take 6 months or more.
Patient may need recovery time before surgery.
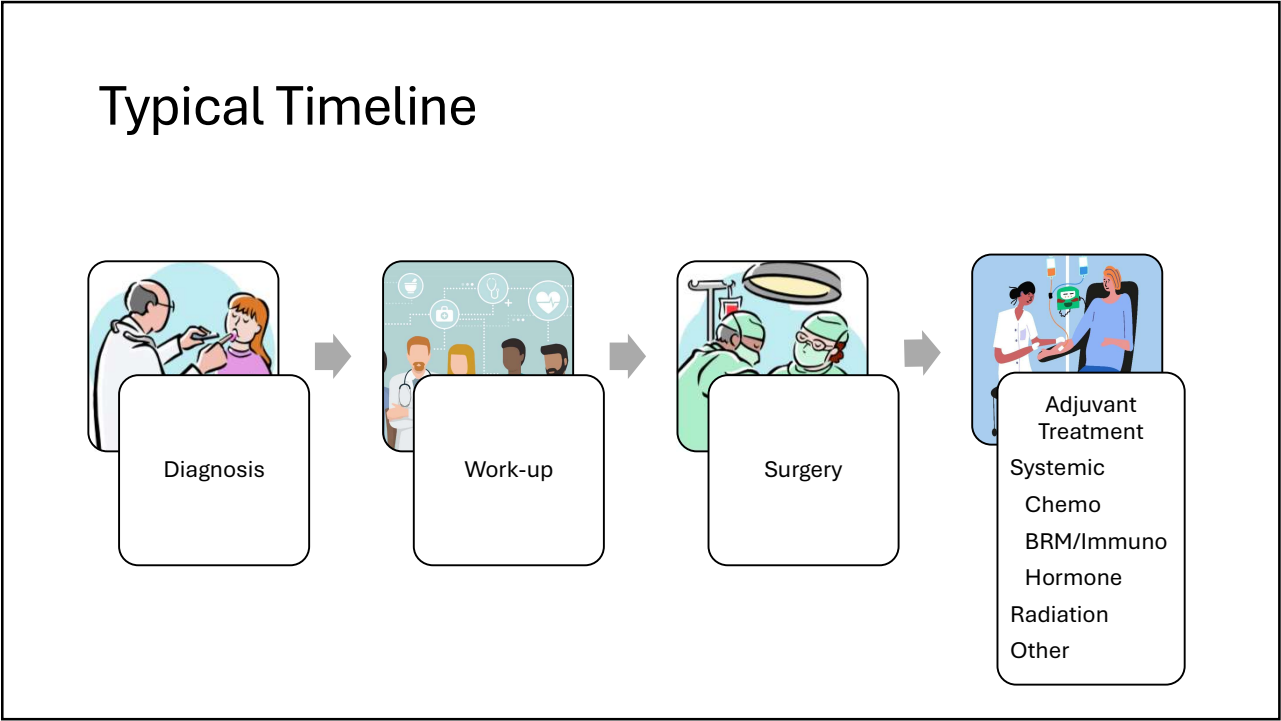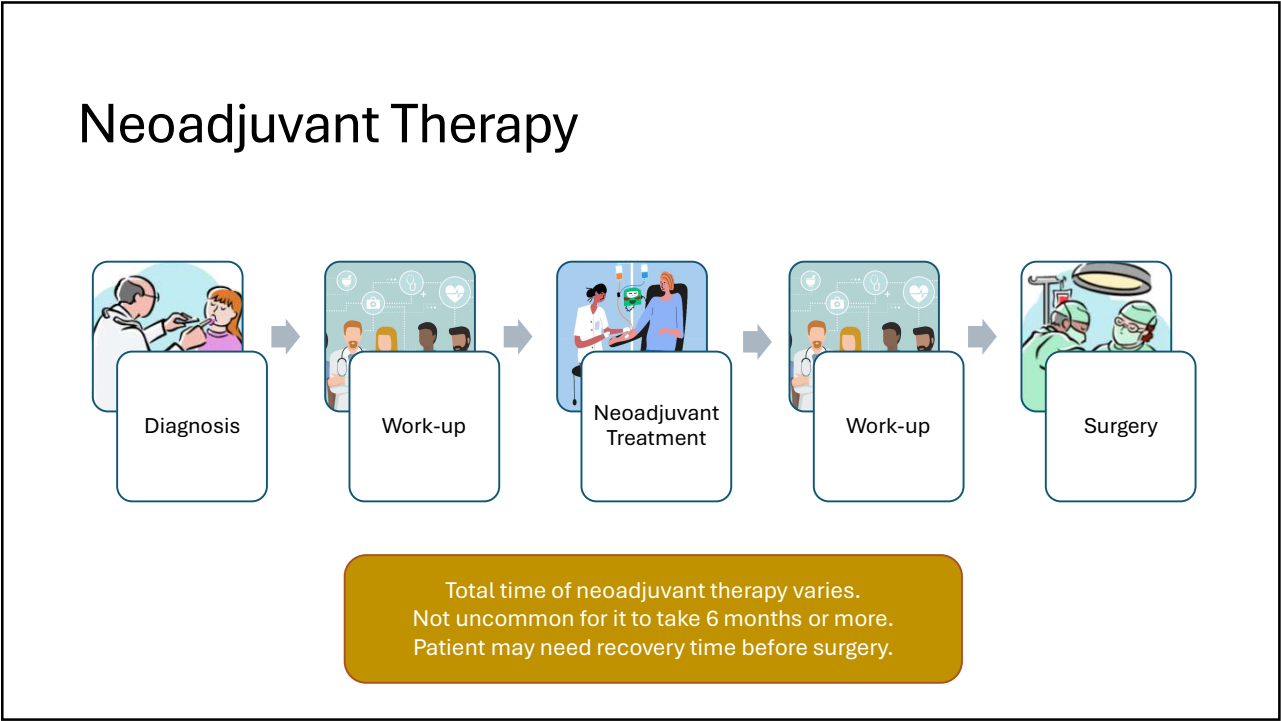
18

Scenario 1

- 1/5/25-Patient present for TURB and is found to have high grade muscle invasive urothelial bladder cancer (T2).
- 1/13/25-patient begins a 4-week regimen of MVAC* induction chemotherapy.
- 2/21/25-TURB shows residual high grade urothelial bladder cancer confined to the urothelium.
- 3/1/25-Cystectomy
  - No residual malignancy.
  - Pelvic nodes: 4 negative for malignancy

Data Item	Code
Clinical AJCC Stage	cT2 cN0 cM0 Stage 2
Pathological AJCC Stage	pT, N, M blank, Stage 99
yC Stage	ycTis ycN0 cM0 Stage 88
yP Stage	ypTis ypN0 cM0 Stage 99
Summary Stage 2018	1 Localized
Surgery Primary Site 1/5/25	A270
Surgery Primary Site 2/21/25	A270
Surgery Primary Site 3/1/25	A500
Chemotherapy 1/13/25	03
Systemic/Surgery Sequence	7- Surgery both before and after systemic therapy

*MVAC-Methotrexate, vinblastine, doxorubicin, and cisplatin

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Pop Quiz 1

- 3/1/24: Patient presents with a 3cm clinical T2N0M0 breast primary.
- 3/17/24: The patient begins neoadjuvant chemotherapy and immunotherapy.
  - 4/29/24: *The breast mass is no longer palpable*
  - 5/27/24:*The breast mass becomes palpable again.*
- 6/21/24: The patient has breast surgery.

Yes →

1. Is the breast surgery first course treatment?
   a. Yes
   b. No

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Pop Quiz 1 (cont.)

- 4/17/24: Patient is diagnosed with renal cell carcinoma. Bone, brain, and distant node metastasis are present at the time of diagnosis.
  - The patient is started on chemotherapy (surgical resection of the primary site is not recommended)
- 12/19/24: The patient responded well to the systemic treatment.
  - The patient requested surgery.
  - The physician explained surgery was unlikely to show a survival benefit, but consented to do a total nephrectomy.
- 1/12/25: Nephrectomy

No →

2. Is the kidney surgery first course treatment?
a. Yes
b. No

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Surgical Diagnostic and Staging Procedure

- Only record positive procedures.
- If both biopsy of the primary site and biopsy of a metastatic site, use code 02 (Incisional biopsy of primary site).
- If a node is biopsied to diagnose lymphoma, and that node is NOT the only node involved, use code 02.
- Do not code surgical procedures which aspirate, biopsy, or remove **regional lymph nodes**
- If a needle biopsy precedes an excisional biopsy or more extensive surgery, and the surgical margins are clear (i.e., no tumor remains),DO NOT consider the needle biopsy to be an excisional biopsy.

Code	Label
00	No surgical diagnostic or staging procedure was performed.
01	A biopsy (incisional, needle, or aspiration) was done to a site other than the primary site. No exploratory procedure was done.
02	A biopsy (incisional, needle, or aspiration) was done to the primary site; or biopsy or removal of a lymph node to diagnose or stage lymphoma.
03	A surgical exploration only. The patient was not biopsied or treated.
04	A surgical procedure with a bypass was performed, but no biopsy was done.
05	An exploratory procedure was performed, and a biopsy of either the primary site or another site was done.
06	A bypass procedure was performed, and a biopsy of either the primary site or another site was done.
07	A procedure was done, but the type of procedure is unknown.
09	No information of whether a diagnostic or staging procedure was performed.

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Pop Quiz 2

- Patient was found to have a mass in her breast.
- A core biopsy of the tumor was performed on 1/29/25.
  - Pathology was positive for fibroadenoma.
- On 2/24/25 the patient had an excisional biopsy of the tumor.
  - Pathology showed an adenoma with an area of carcinoma in situ.

a. →

1. What is Dx Staging procedure?
   a. 00 No surgical dx staging procedure done
   b. 01 biopsy other than primary site
   c. 02 biopsy of primary site
   d. None of the above

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Pop Quiz 2 (cont.)

- CT shows a tumor in the lung and the in the liver. The patient had a core biopsy of both.
  - Both were positive for carcinoma.
- Physician stated the patient most likely had a lung primary with liver mets.

- A patient presents with cervical and mediastinal lymphadenopathy.
- An excisional biopsy of an axillary lymph node is positive for DLBCL.

c. →

2. What is Dx Staging procedure?
   a. 00 No surgical dx staging procedure done
   b. 01 biopsy other than primary site
   c. 02 biopsy of primary site
   d. None of the above

c. →

3. What is Dx Staging procedure?
   a. 00 No surgical dx staging procedure done
   b. 01 biopsy other than primary site
   c. 02 biopsy of primary site
   d. None of the above

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Scope of Regional Node Surgery

- Collected even if surgery of the primary site was not performed
- Record aspirations, biopsy or removal of lymph nodes to diagnose or stage
- Codes are hierarchal
- Subsequent procedures include cumulative effect if 2 or more lymph node procedures performed
- Use operative report to determine if sentinel lymph node biopsy or dissection or both
- Do not code surgery to distant lymph nodes in scope of regional lymph node surgery
- Coding info in scope of regional lymph node surgery is not necessarily treatment for class of case

Code	Label
0	None
1	Biopsy or aspiration of regional lymph (single) node
2	Sentinel Lymph Node Biopsy
3	Number of regional lymph nodes removed unknown
4	1-3 regional lymph nodes
5	4 or more regional lymph nodes removed
6	Sentinel node biopsy and code 3, 4, or 5 at same time, or timing not stated
7	Sentinel node biopsy and code 3, 4, or 5 at different times
9	Unknown

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Pop Quiz 3

- 2/1/25: Patient presents to your facility for a mediastinoscopy.
  - The patient has an incisional biopsy of an enlarged mediastinal lymph node.
  - The node is found to be positive for metastatic squamous cell carcinoma.
- 2/7/25:The patient goes to another facility for further work-up and staging.
  - He is found to have squamous cell carcinoma of the lung with widespread metastasis.
- 2/15/25: The patient opted for hospice care based on physician(at other facility) recommendation.
- No further work-up or treatment done.

1. What is Scope of Regional Lymph Node Surgery?
   a. 0: None
   b. b. 1: Biopsy or aspiration of regional lymph node(s)
   c. 4:1-3 regional lymph nodes
   d. 5: 4 or more regional lymph nodes removed
   e. 9: Unknown

2. What is Class of Case for your facility?
   a. a. 00: Initial diagnosis at the reporting facility AND all treatment or a decision not to treat was done elsewhere
   b. 13: Initial diagnosis at the reporting facility AND part of first course treatment was done at the reporting facility; part of first course treatment was done elsewhere
   c. 14: Initial diagnosis at the reporting facility AND all first course treatment or a decision not to treat was done at the reporting facility
   d. 30: Initial diagnosis and all first course treatment elsewhere AND reporting facility participated in diagnostic workup (for example, consult only, treatment plan only, staging workup after initial diagnosis elsewhere)

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Pop Quiz 3 (cont.)

- 2/1/25: Patient presents to your facility for a mediastinoscopy.
  - The patient had an incisional biopsy of an enlarged mediastinal lymph node.
  - The node is found to be positive for metastatic squamous cell carcinoma.
- 2/7/25:The patient goes to another facility for further work-up and staging.
  - He is found to have squamous cell carcinoma of the lung with widespread metastasis.
- 2/15/25: The patient opted for hospice care based on physician(at other facility) recommendation.
- No further work-up or treatment done

3. What is Date First Course Treatment?
  a. 2/1/25
  b. 2/7/25
  c. 2/15/25   **c.**
  d. None of the above

4. What is Date First Surgical Treatment?
  a. 2/1/25
  b. 2/7/25
  c. 2/15/25
  d. None of the above   **d.**

5. What is Treatment Status?
  a. 0: No Treatment Given   **a.**
  b. 1: Treatment Given
  c. 2: Active Surveillance
  d. 9: Unknown

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Pop Quiz 4

- A patient was found to have a mass in her left breast.
- On 2/5/25 she had lumpectomy and a sentinel lymph node biopsy.
  - 3 sentinel lymph nodes were removed and were positive for malignancy.
  - 2 non-sentinel nodes removed and negative for malignancy.
- Under the same anesthesia she had a modified radical mastectomy and axillary node dissection.
  - 15 lymph nodes were removed. A single axillary node was positive for malignancy. 14 nodes negative.

1. What is Date Sentinel Node Procedure?
  b. →
  a. Blank
  b. 2/5/25
  c. None of the above

2. What is Date Regional Node Dissection?
  a. Blank
  b. → b. 2/5/25
  c. None of the above

3. What are Sentinel Nodes Pos/Ex?
  a. Blank/Blank
  b. → b. 03 pos /05 ex
  c. 97 pos /05 ex
  d. None of the above

During the live session I incorrectly stated C was correct. B is the correct answer.

4. What are Regional Nodes Pos/Ex?
  a. 03 pos /05 ex
  b. 14 pos /15 ex
  c. → c. 04 pos /20 ex
  d. None of the above

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Pop Quiz 5

- A patient presents with newly diagnosed metastatic prostate cancer.
- The patient was treated with Pluvicto (*Lutetium Lu 177 vipivotide tetraxetan*).
- Patient received a total of 6 cycles (7/15/24 to 3/17/25).

SEER RX:
https://seer.cancer.gov/seertools/seerrx/rx/62979bbbe6cc1f1c475b9313/?drug_direction=UP&regimen_direction=UP&rx_type=drug&drug_field=score&regimen_field=score&drug_offset=0&regimen_offset=0&limit=25&search_mode=&q=pluvicto&mode=

1. What is coded for Phase 1 Volume?
   a. 00-No radiation treatment
   b. 64-Prostate whole
   c. 93-Whole body
   d. → d. 98-Other
   e. 99-Unknown

2. What is coded for Radiation to Draining Nodes?
   a. → a. 00-No radiation to draining nodes
   b. 06-Pelvic nodes
   c. 08-Lymph nodes, NOS
   d. 88-Not applicable

3. What is coded for Radiation Treatment Modality?
   a. 00-No radiation treatment
   b. → b. 13-Radioisotopes, NOS
   c. 14-Radioisotopes, Radium 224
   d. None of the above

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Questions?

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Documenting Text

- Text...
  - Summarizes the patient's experience & collapses it into codes
  - Ensures reliability & accuracy of coding
  - Further describes diagnosis, staging, treatment, follow-up and survivorship

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Text

- Surgery
- Radiation-Beam
- Radiation-Other
- Chemotherapy
- Hormone
- BRM
- Transplant/Endocrine
- Other

- Be sure to include the type of systemic treatment
- Be sure to include start and end dates

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Chemotherapy Regimens Received by Women With BRCA1/2 Pathogenic Variants for Early Stage Breast Cancer Treatment

Chemotherapy Data Collection

SEER registries report a summary variable stating receipt or not of chemotherapy for first-course breast cancer treatment. The data reported to SEER registries come from facilities involved in the diagnosis and/or treatment of cancer patients in each registry's coverage area. Included with these data are free text fields where the registrar is asked to enter details regarding the treatment rendered, including drug and regimen names or abbreviations (eg, "ddAC-T" for dose-dense doxorubicin and cyclophosphamide followed by taxol).

We developed an algorithm to automate review of these text fields and categorize drugs commonly used in adjuvant and/or neoadjuvant chemotherapy of stages I-III breast cancer into the following drug classes: anthracyclines (doxorubicin, epirubicin), cyclophosphamide, platinums (carboplatin, cisplatin), taxanes (docetaxel, paclitaxel), and other (all other drugs). The algorithm was initially developed and validated at the Georgia Cancer Registry. The validation dataset was created by registry staff manually coding drugs identified in the text fields. Algorithm validation occurred through an iterative process that compared random samples of the algorithm's results against manually cu-

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Questions?
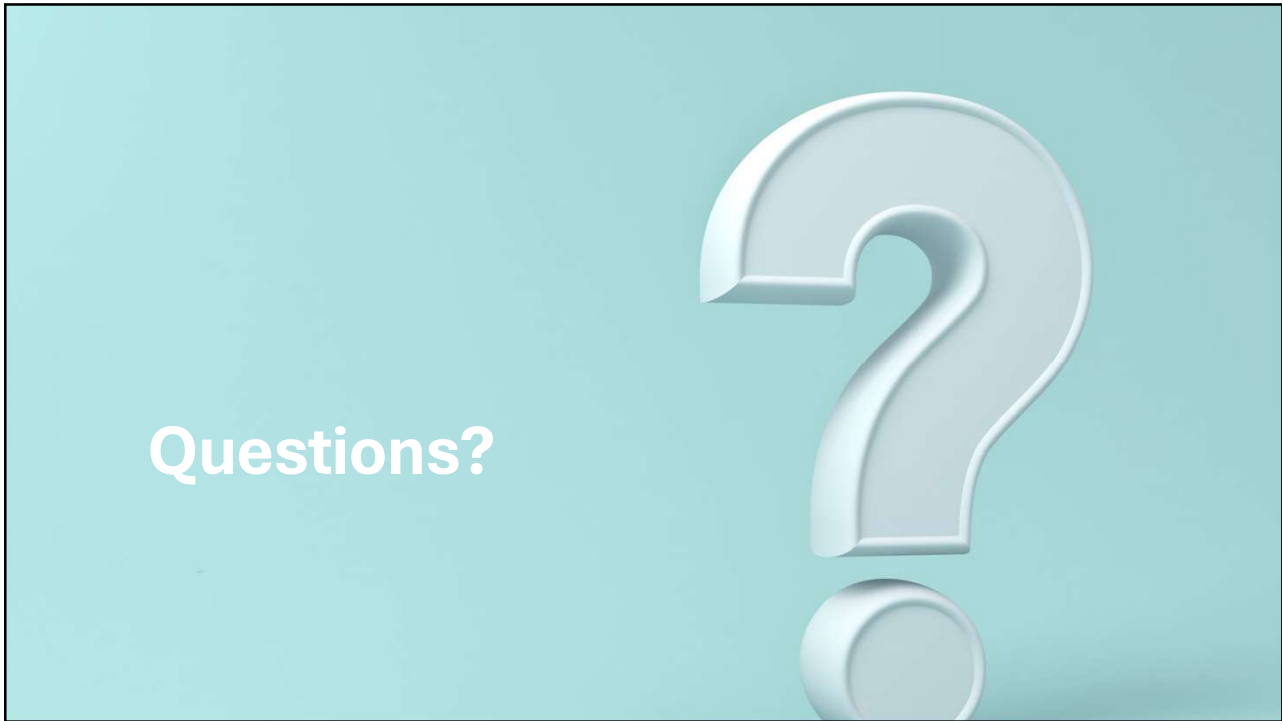
34

Fabulous Prizes

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Coming Up!

- Prostate 2025
  - Noah Reid, ODS
  - 5/14/25 and 5/15/25

- Uterus 2025
  - Janine Smith, ODS
  - 6/11/25 and 6/12/25

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CE Phrase:

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Thank you!!!

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