Lung Cancer:

What you should know about testing and treatment

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Please join in!

- Vote in the polls
- Ask questions
- Complete the survey

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Physician Panel

Bhanu Patibandla, MD
Pulmonology

Svetlana Kotova, MD
Thoracic Surgery

Shushan Rana, MD
Radiation Oncology

Gurleen Dhami, MD
Radiation Oncology

Ali Dadla, MD
Medical Oncology

Bhanu Patibandla, MD
Moderator/Speaker

Lung Cancer Facts, Screening and Diagnosis

LUNG CANCER AWARENESS MONTH

What I'll cover:

- Prevalence
- Types & Stages
- Screening for lung cancer
- Lung Nodule risk assessment
- Diagnosis

2021 Lung Cancer Facts

#1 cause of cancer deaths worldwide

- Approximately 131,880 Americans die of lung cancer annually
- 27% of all cancer deaths in the U.S.
- More people die of lung cancer than breast, prostate colorectal, kidney and melanoma combined

2021 Lung Cancer Facts

2nd most common cancer in both men & women

- Second to breast cancer in women

- Second to prostate cancer in men

- 235,760 new cases in 2021 in the U.S.

Risk Factors for Lung Cancer

Smoking

- Leading risk factor
- 80% of lung cancers
  - Cigarettes: x 20 risk
  - Cigar/pipe: x 5 risk
  - Secondhand smoke: x1.34
  - Marijuana: 8% per year

Radon Gas

- 2nd leading risk factor
- Naturally occurring radioactive gas
- Colorless & odorless
- Visit epa.gov/radon for more information

Other Risk Factors for Lung Cancer

- Asbestos
- Occupational exposures e.g., silica, arsenic, nickel
- Air pollution
- Other lung diseases e.g., COPD, pulmonary fibrosis
- Radiation treatment to chest
- Family history of lung cancer

Poll

What risk factors are most concerning to you?

A. Smoking cigarettes
B. Radon
C. Asbestos
D. Other lung disease
E. Prior radiation

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Lung Cancer is not one disease

Non-small cell lung cancer (84%)

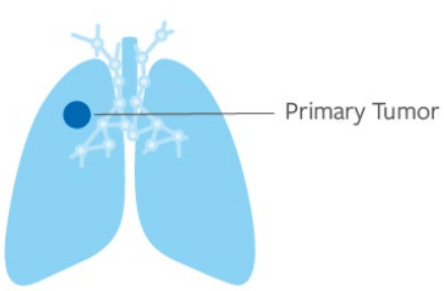
- Adenocarcinoma
- Squamous cell carcinoma
- Large cell carcinoma

Small cell lung cancer (13%)

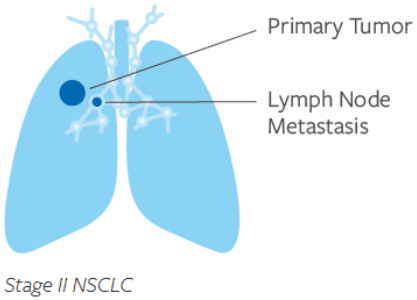
Others (3%)

- Mesothelioma, Carcinoid etc.

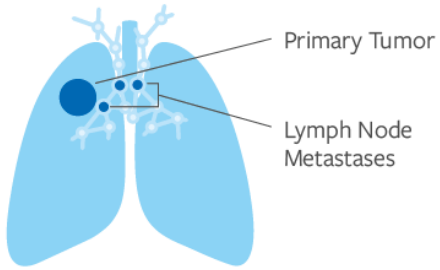
Stages of Non-Small Cell Lung Cancer



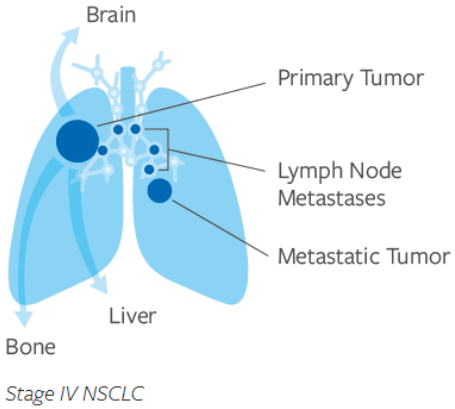
Stage I NSCLC



Stage II NSCLC



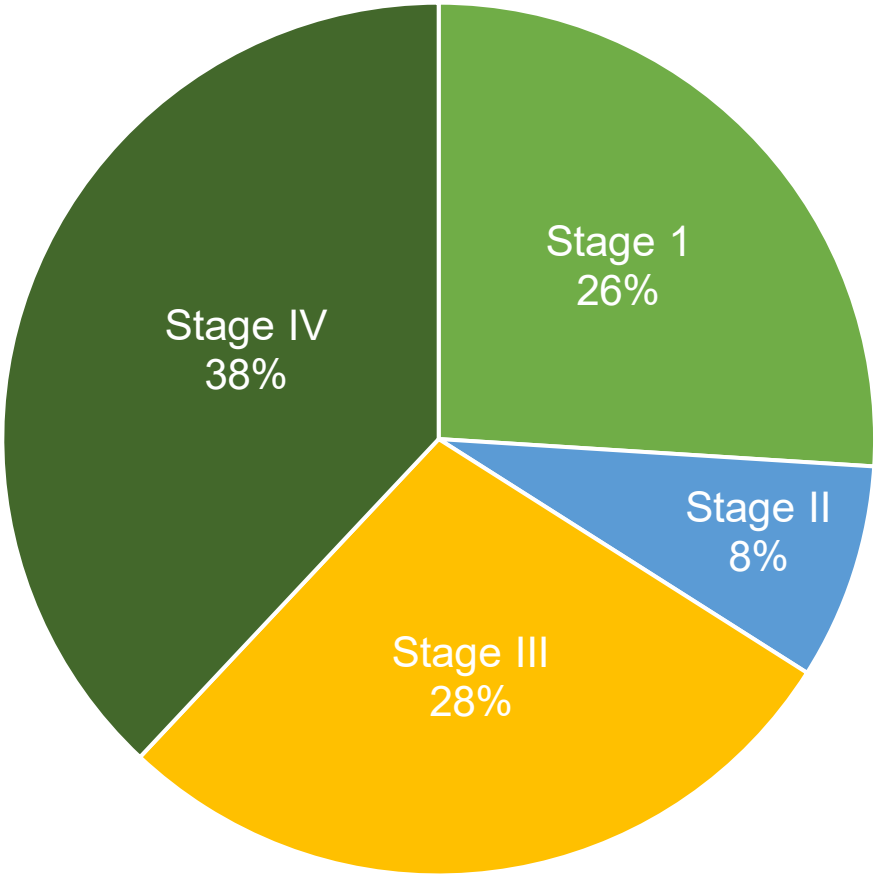
Stage III NSCLC



Stage IV NSCLC

Stages I-IV

Lung Cancer is often diagnosed at advanced stages

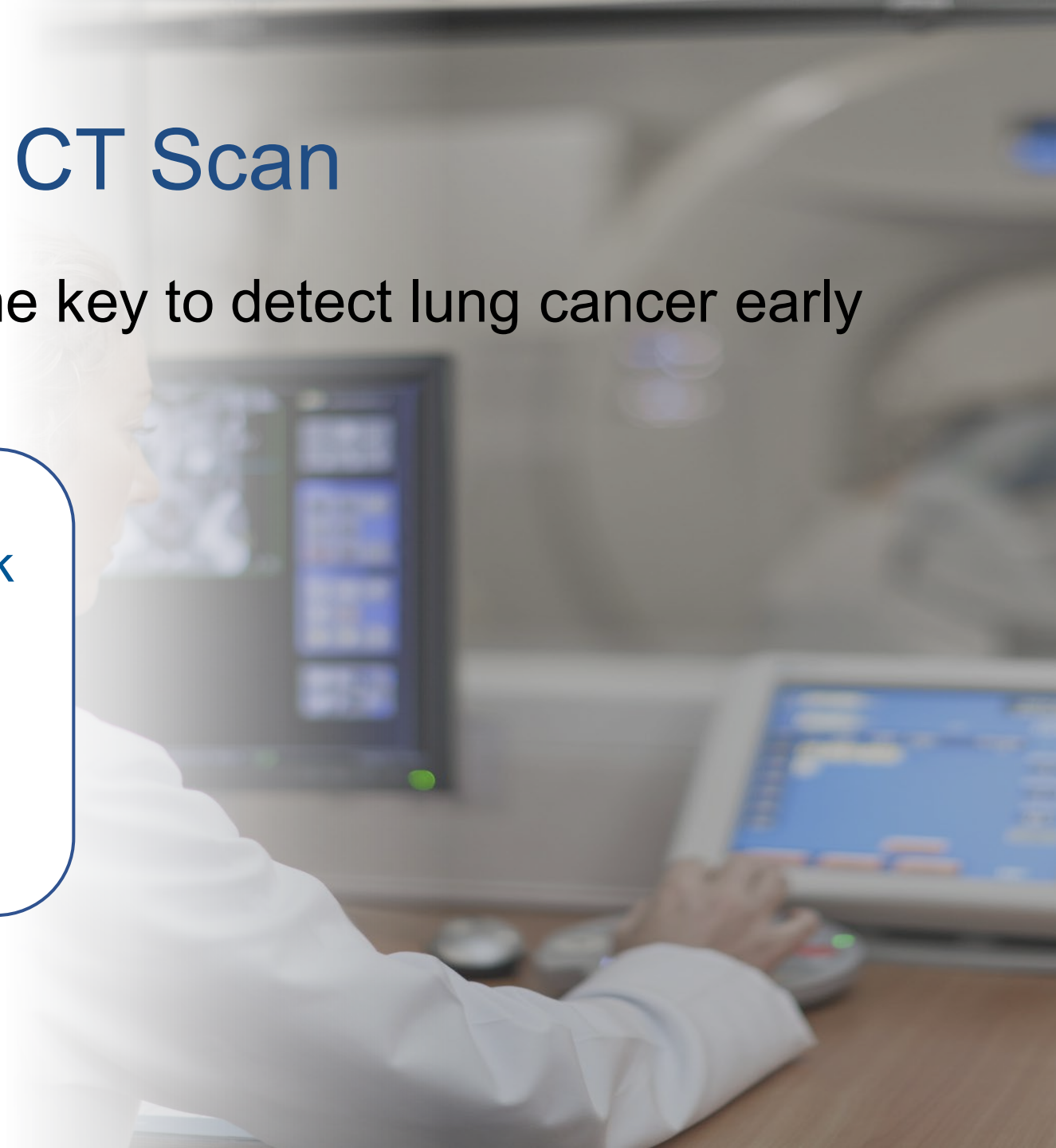


2 in 3
lung cancers
are diagnosed
at
advanced stages

Low Dose CT Scan

Screening is the key to detect lung cancer early

Reduces the risk of dying from lung cancer by **at least 20%**



Criteria for Lung Cancer Screening

- Age: 55-80 years
- Current or former smokers, quit within **15 years.**

- **30 pack years** (packs per day x years smoking)

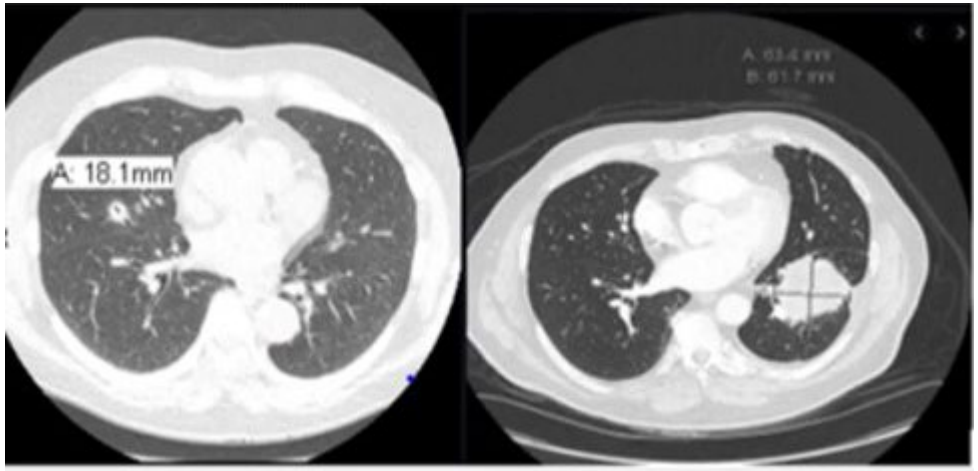
Screening Frequency:

Annually

What is a lung nodule

- Lung nodule is a spherical opacity <= 3cm in diameter that is surrounded by lung parenchyma
- If it is > 3 cm, it is called a mass

Nodule Mass



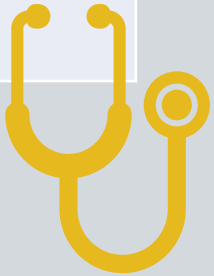
Not all lung nodules are cancerous
Lung Nodule Risk Assessment

Patient History
- Age
- Smoking History
- Exposures
- Family History
- History of other cancers

Nodule Features
- Size
- Margins
- Intensity of the nodule
- Location
- Growth over time

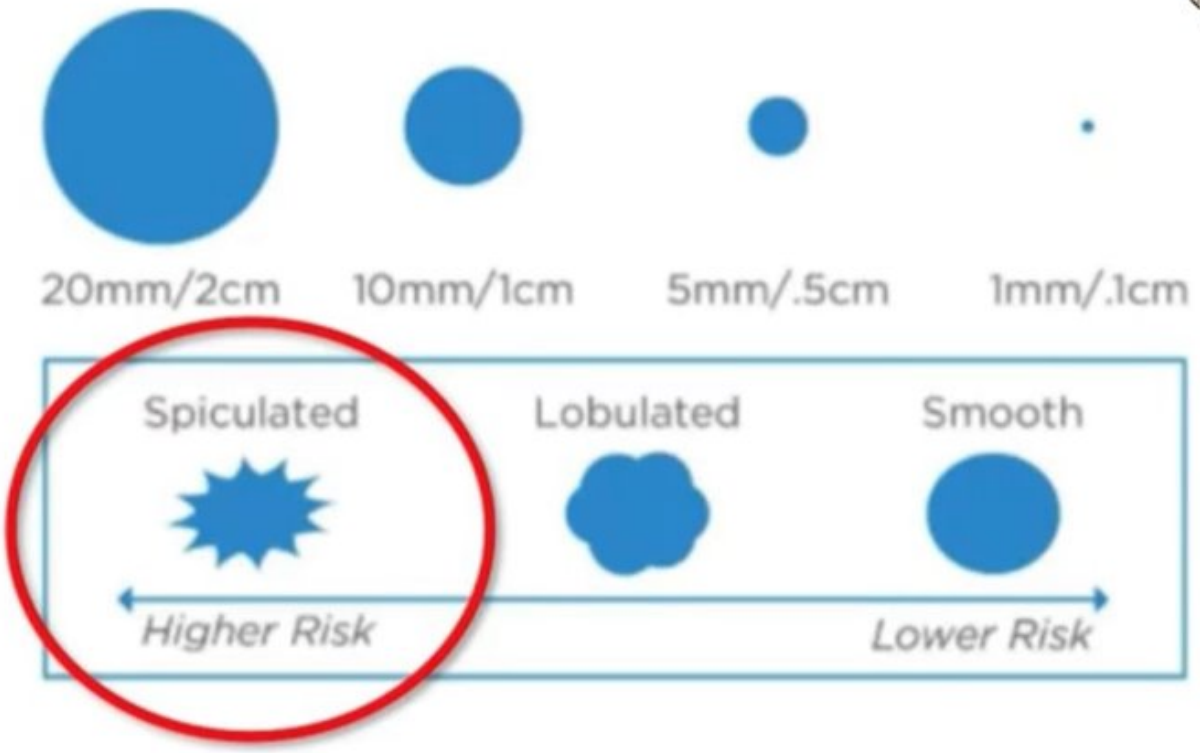
Nodule Risk Assessment

Probability of malignancy		
Low	**Intermediate**	**High**
▪ Young ▪ No/less smoking ▪ No prior cancer ○ Small nodule size ○ Smooth borders ○ Not in upper lobes	Mixture of low & high probability features	▪ Older ▪ Heavy smoking ▪ Prior cancer ○ Larger size ○ Irregular margin ○ Upper lobe location



Nodule Risk Assessment

RULE OF THUMB



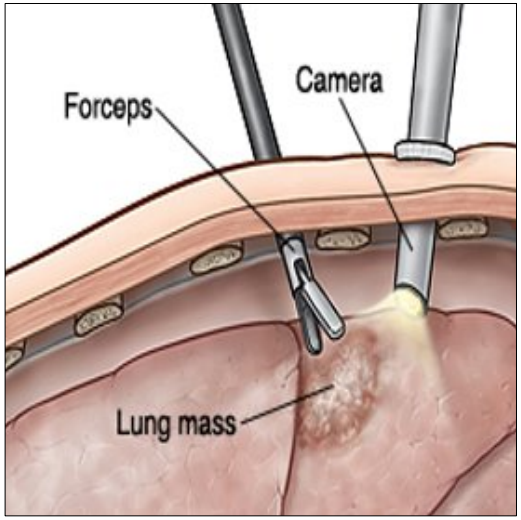
Next steps driven by risk of cancer

Probability of malignancy		
Low	**Intermediate**	**High**
▪ Follow up CT chest	▪ PET-CT scan ▪ Biopsy ○ *CT guided IR* ○ *Bronchoscopy* ○ *Surgical*	▪ Surgical resection

Shared decision-making is the KEY determinant in deciding next steps

Biopsy Modalities

Surgical biopsy



CT guided biopsy

Bronchoscopy

Bronchoscopy

Conventional

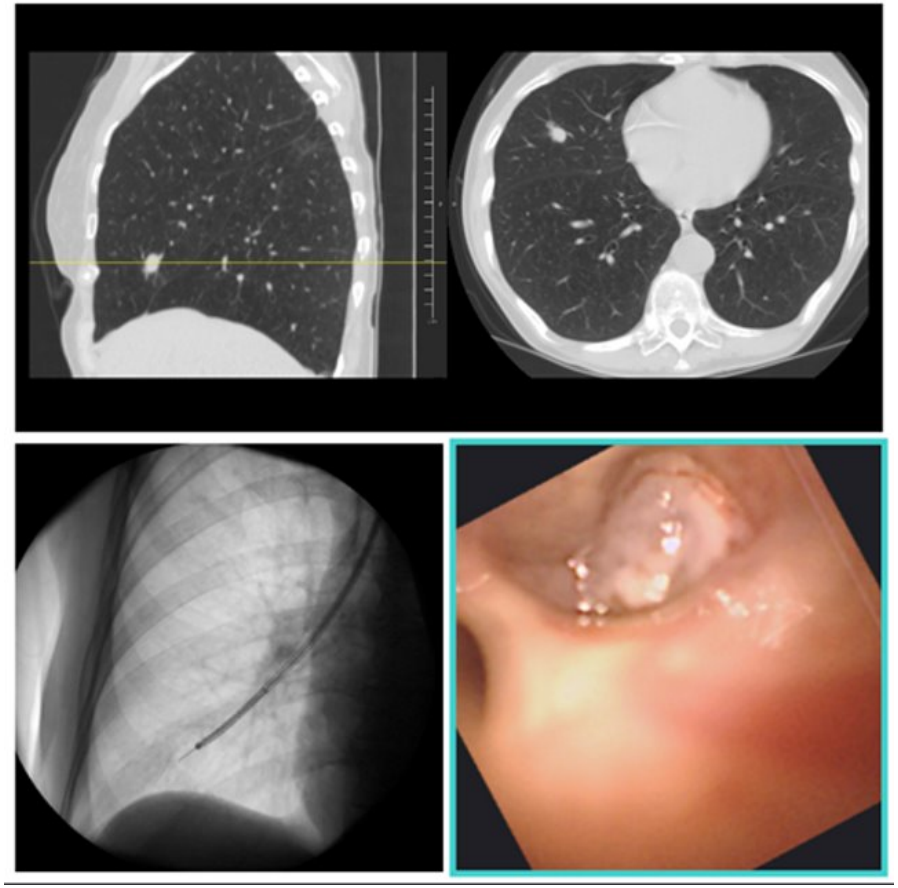
Electromagnetic navigation

Robotic assisted navigation

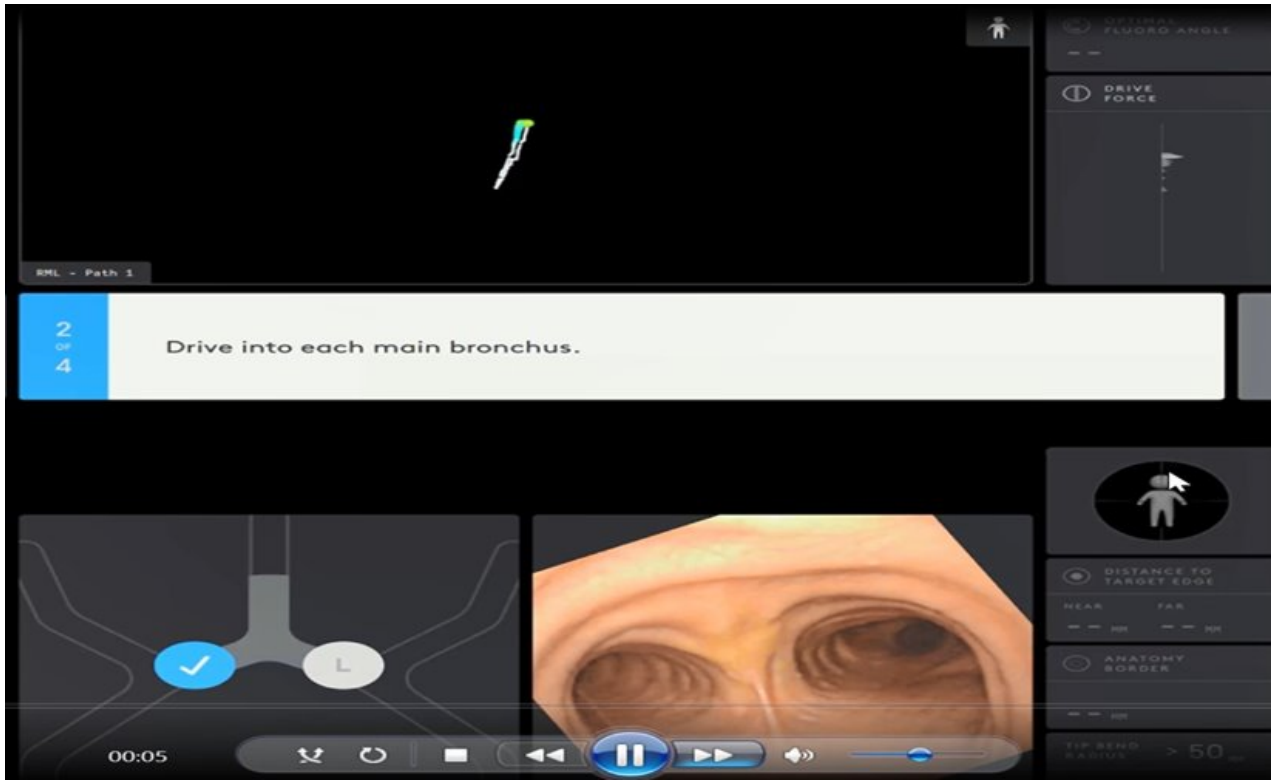
PeaceHealth Southwest Medical Center is the only hospital in the PNW to offer…

ION Robotic Assisted Navigation Bronchoscopy

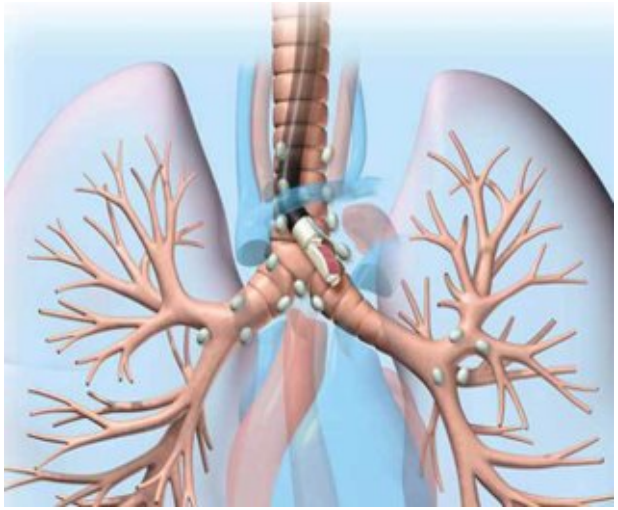
We are going deeper into the lung **reliably, safely & precisely** performing lung biopsies using robotic assistance

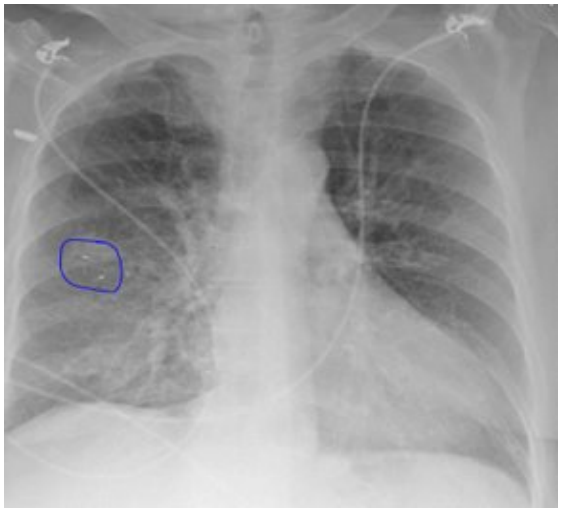


Video available on resource page with link provided later



Diagnosing, staging and facilitating treatment all in the same procedure





Conclusions

- Lung Cancer is the #1 cause of cancer deaths
- Cigarette smoking is the #1 cause for lung cancer followed by radon gas exposure
- Lung Cancer screening saves lives
- Not all lung nodules are cancer
- Advances in biopsy modalities improve chances to diagnose lung cancer at early stages, when it can be potentially curable

Poll

If you have quit smoking or would like to quit smoking, what motivates you?

A. Being able to breathe easier
B. Decreased risk of getting cancer
C. My friends/family
D. Advanced treatment options
E. Other (type in the questions)

Your Speakers

Gureen Dhami, MD
Shushan Rama, MD

Radiation Therapy in Lung Cancer

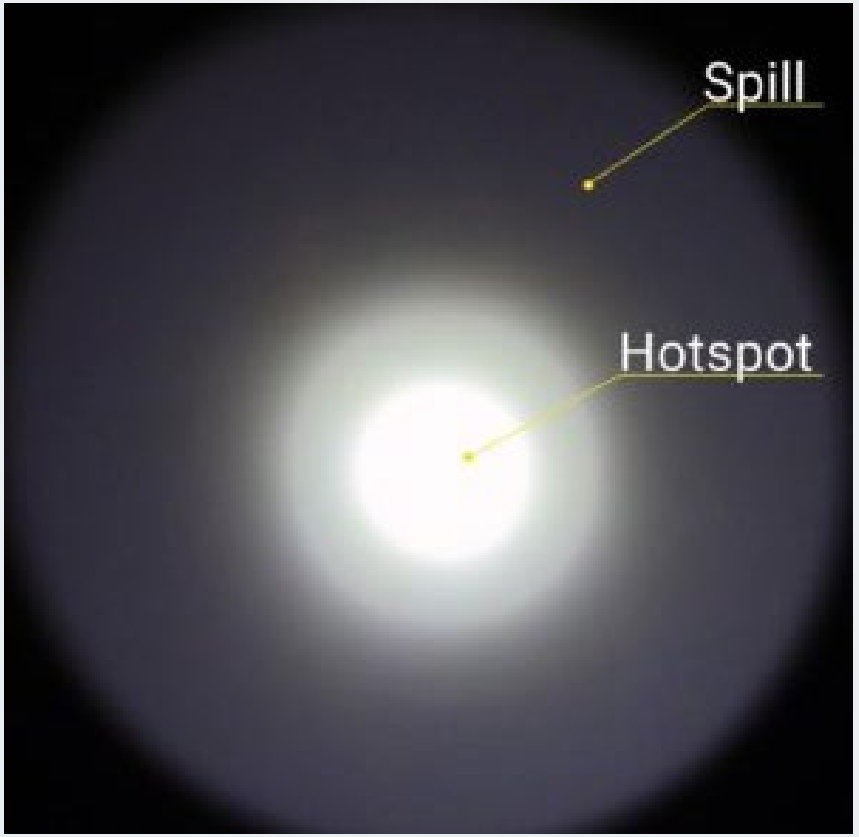
Radiation Therapy (RT)

- Radiation Therapy has a potential role in all stages of lung cancer as either definitive or palliative therapy

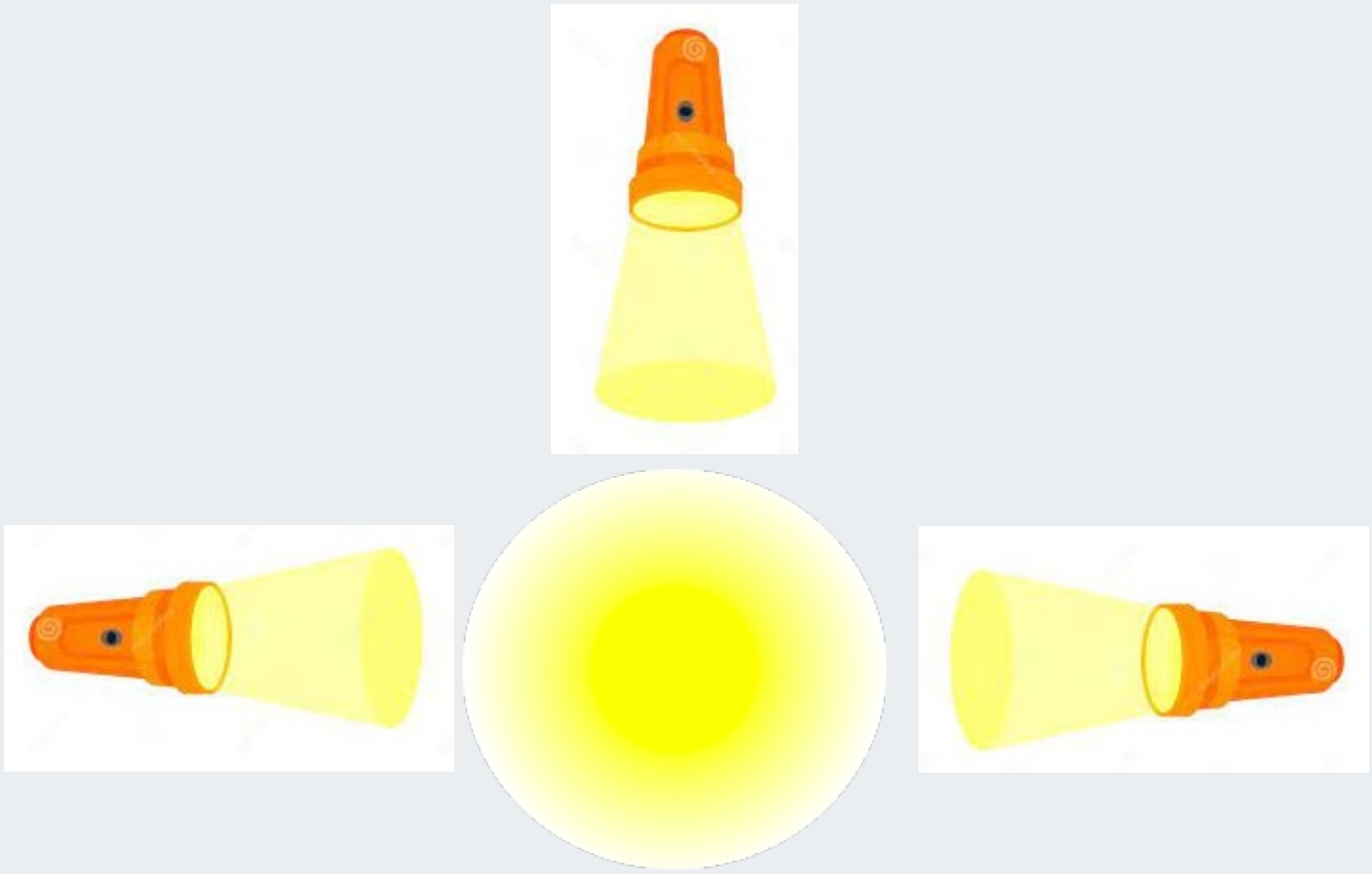
- Early Stage
  - Hypofractionation
    - Stereotactic body radiation therapy
    - Moderately hypofractionated regimens

- Locally Advanced Lung Cancer
  - Conventional fractionation
    - Intensity Modulated radiation therapy (IMRT)

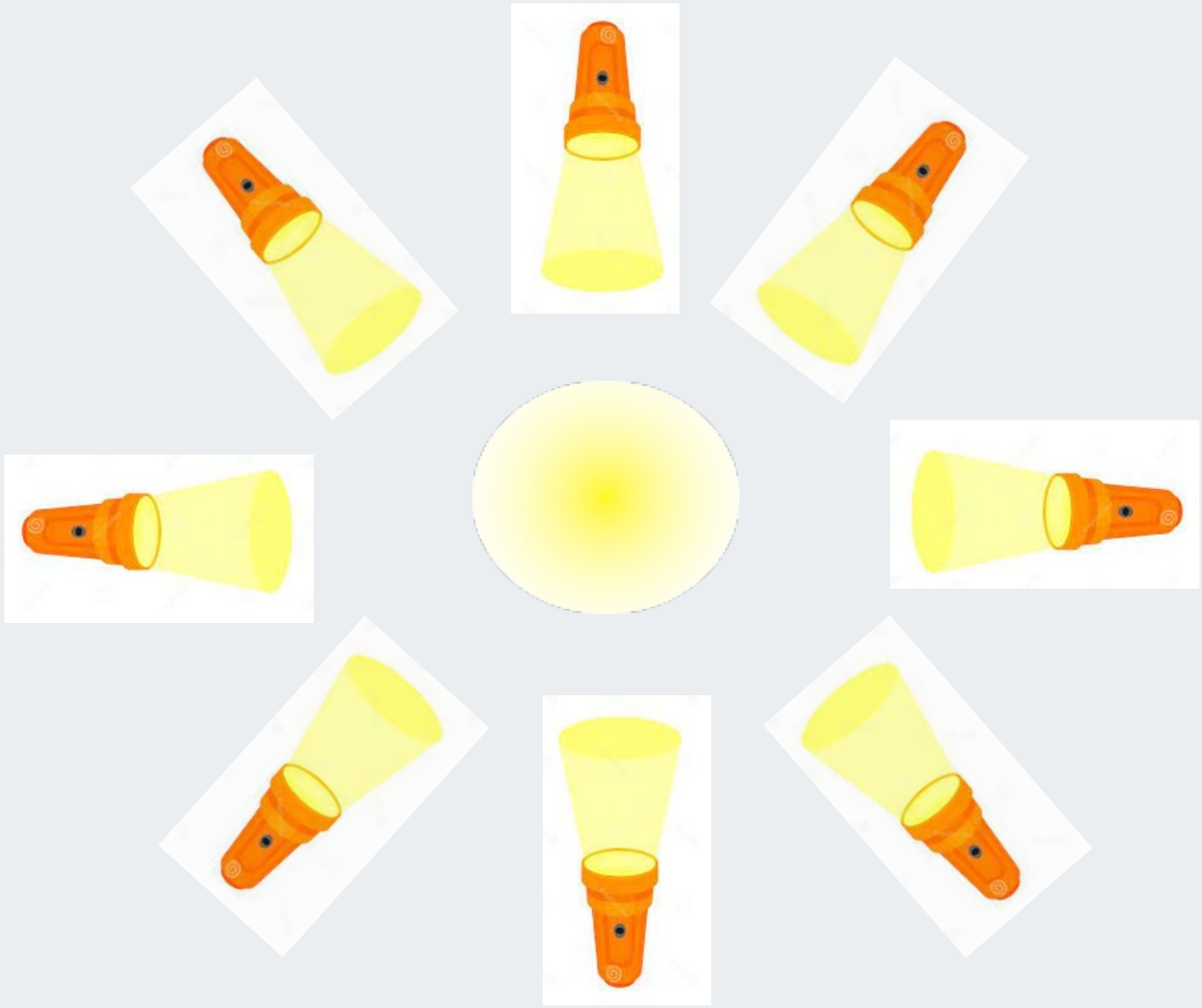
Radiation: Flashlight Analogy



Radiation: Flashlight Analogy

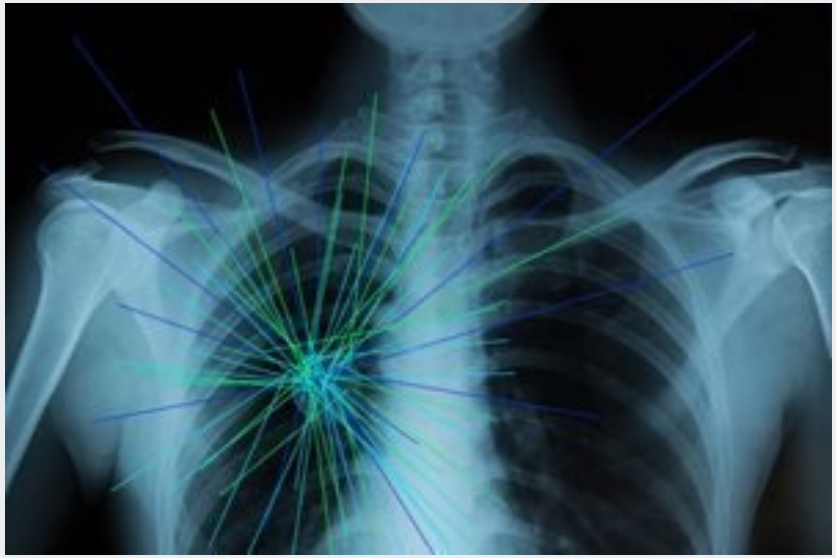


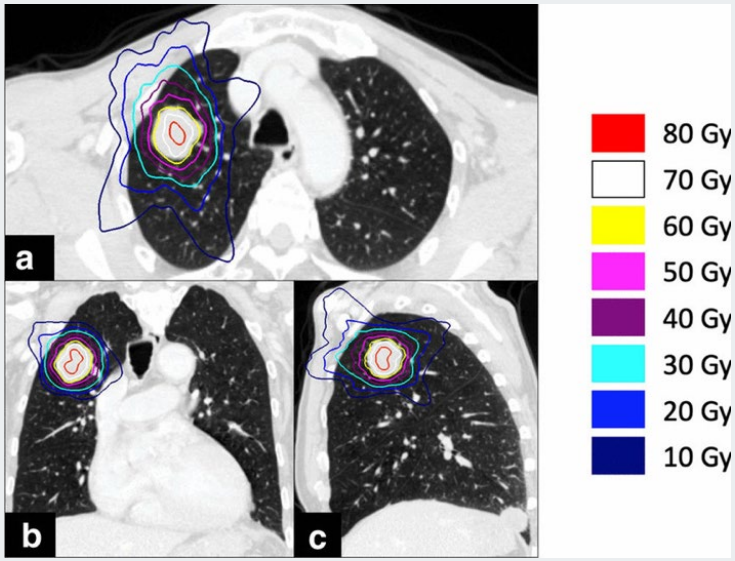
Radiation: Flashlight Analogy



Hypofractionation Using SBRT/SABR

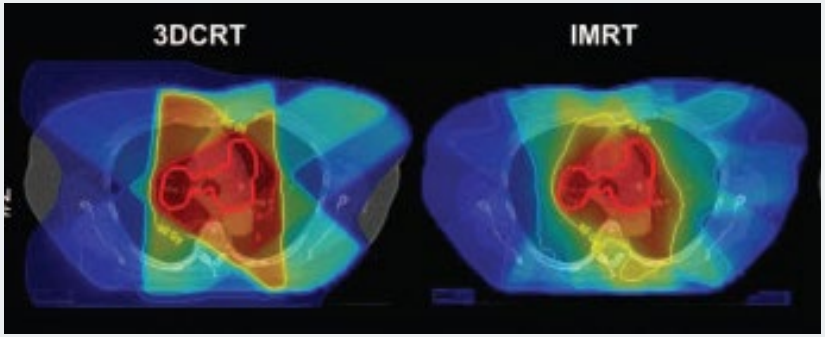
- For early-stage cancer
  - Medically inoperable
  - Patients who refuse to have surgery after thoracic surgery evaluation
  - High-risk surgical patient



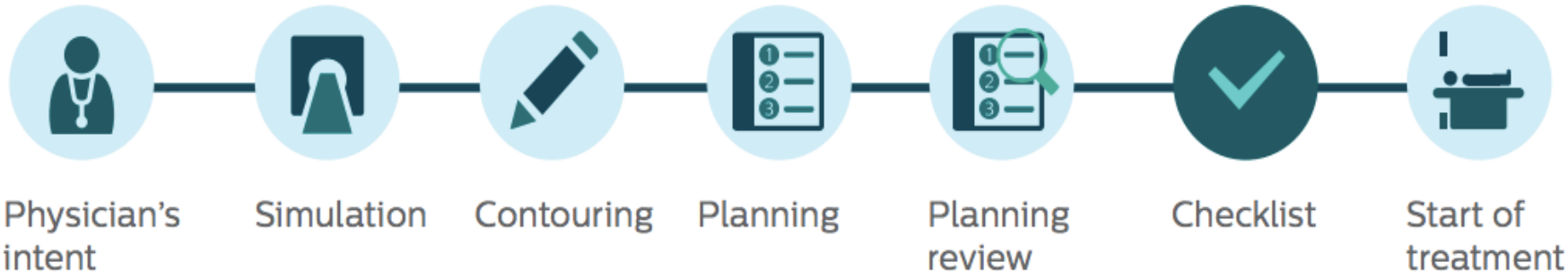


3D Conformal versus IMRT

- For locally advanced NSCLC or SCLC
  - Larger target volumes encompassing primary tumor and involved nodes
  - Typically given with chemotherapy
- Target often near normal structures
- Given Monday-Friday daily over several weeks.

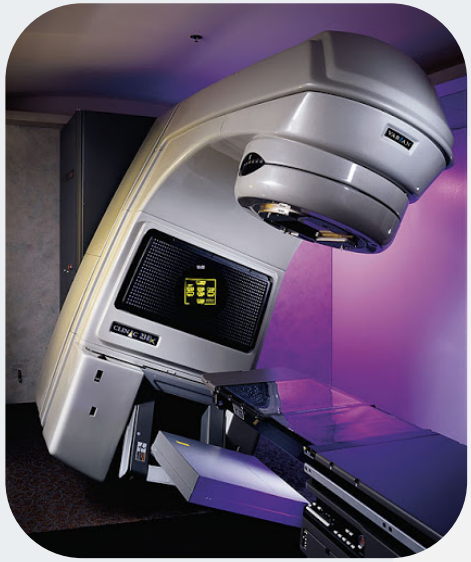


Radiation Oncology Workflow



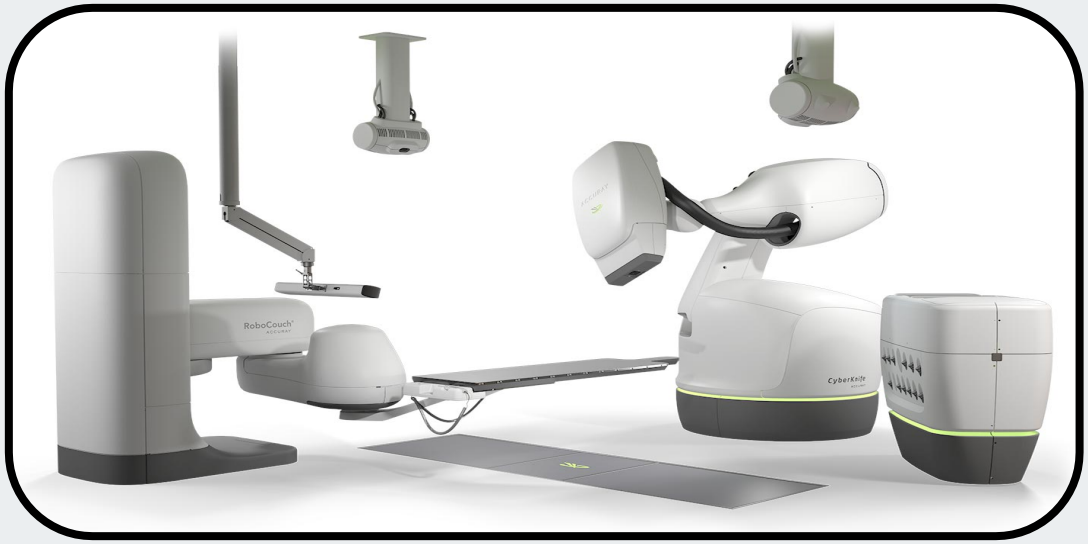
Radiation Oncology Treatment Machines

23EX



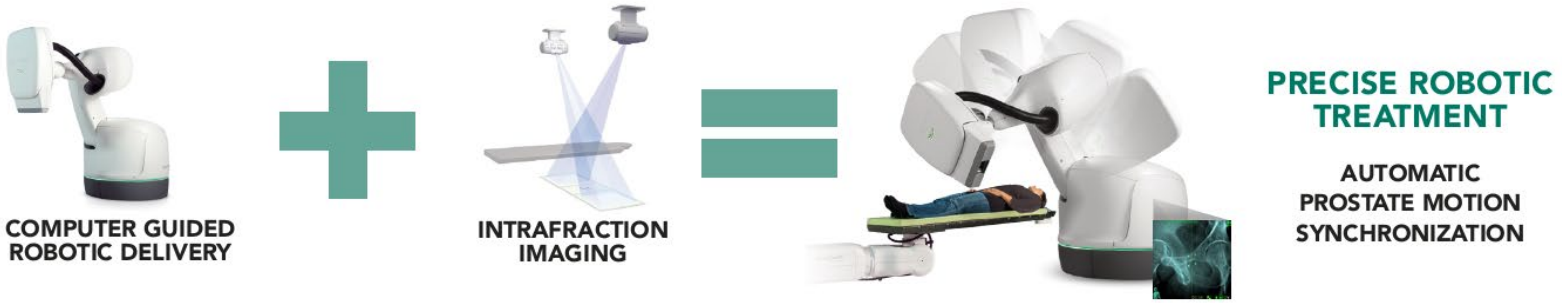
3D
IMRT
IGRT

Accuray CyberKnife



Portland Metro Area's Only Provider of CyberKnife Stereotactic Body Radiation Therapy (SBRT) and Stereotactic Radiosurgery (SRS)

CyberKnife: How it works



Advantages:

- No invasive frame required for immobilization of head or body
- High ablative dose delivery
- Frequent imaging with low energy X-ray so the machine can adjust and move with you as you breathe
- Reduces overall treatment time from 5 - 6 weeks of radiation → anywhere between 1 day to 1.5 weeks of treatment
- Each treatment typically takes 20 - 45 minutes

Radiation Side Effects During Treatment

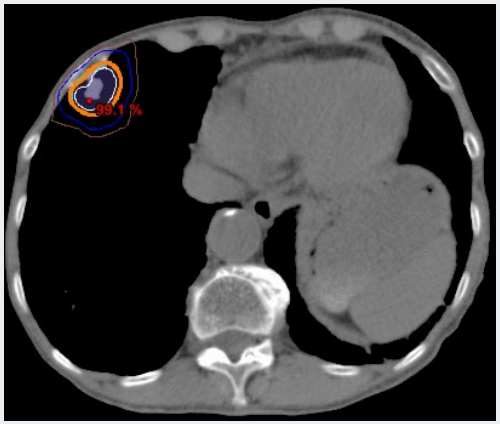
- Risk and severity of side effects depend mainly on:
  - Location and size of primary tumor and involved lymph nodes
  - Type of concurrent chemotherapy, performance status of patient and Radiation technique.
- **Acute (Early) Side Effects:**
  - Fatigue
  - Acute esophagitis
  - Dry, nonproductive cough
  - Skin desquamation/dermatitis

How do we know radiation worked?

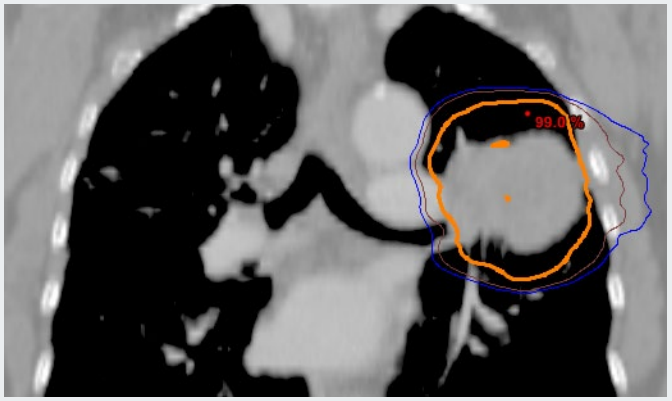
Follow up visits every 3-6 months for the first two years, then yearly

- Assess for late-term side effects
- CT scan of the chest
  - Assess tumor response
  - Assess for any potential radiation damage

Potential SBRT Side Effects Dependent on Tumor Location and Size



- Fatigue
- Skin redness or thickening
- Chest tenderness
- Rib fracture

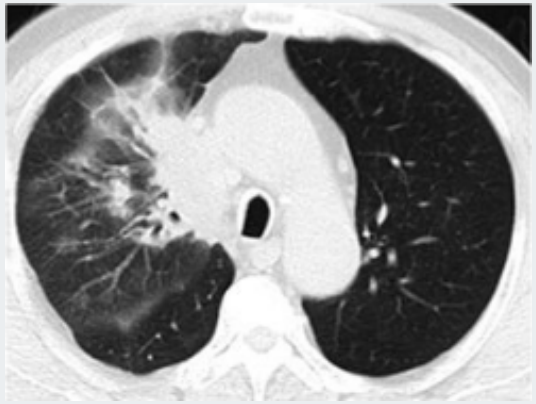


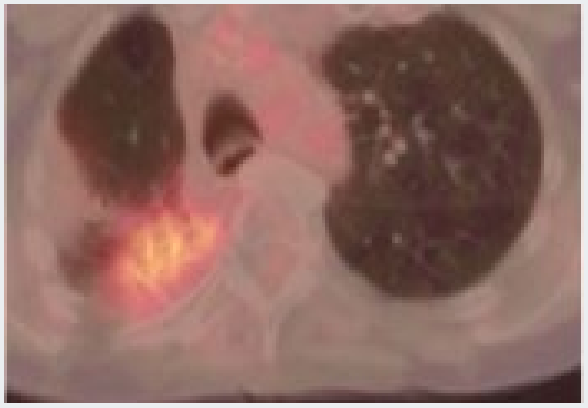
- Fatigue
- Chest wall pain
- Rib fracture
- Pneumonitis (lung inflammation)
- Atelectasis (partial lung collapse)
- Hemoptysis (airway blood vessel damage -> cough up blood)

Risk of toxicity can be mitigated through patient-specific tailored dosing

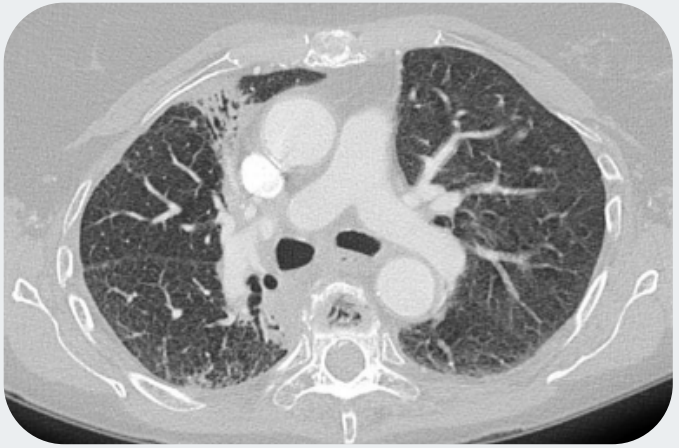
Radiation Side Pneumonitis (Inflammation of the Lung)

- NOT an early side effect – a delayed reaction
  - Usually develops 1-12 months after radiation (typically 3-6 months)
- Chest X-ray or CT may show “haziness in lung” = patchy alveolar ground glass or consolidative opacities
- PET-CT can tell us if there is active inflammation
- Treated with steroids





Rare Late Radiation Side Effects



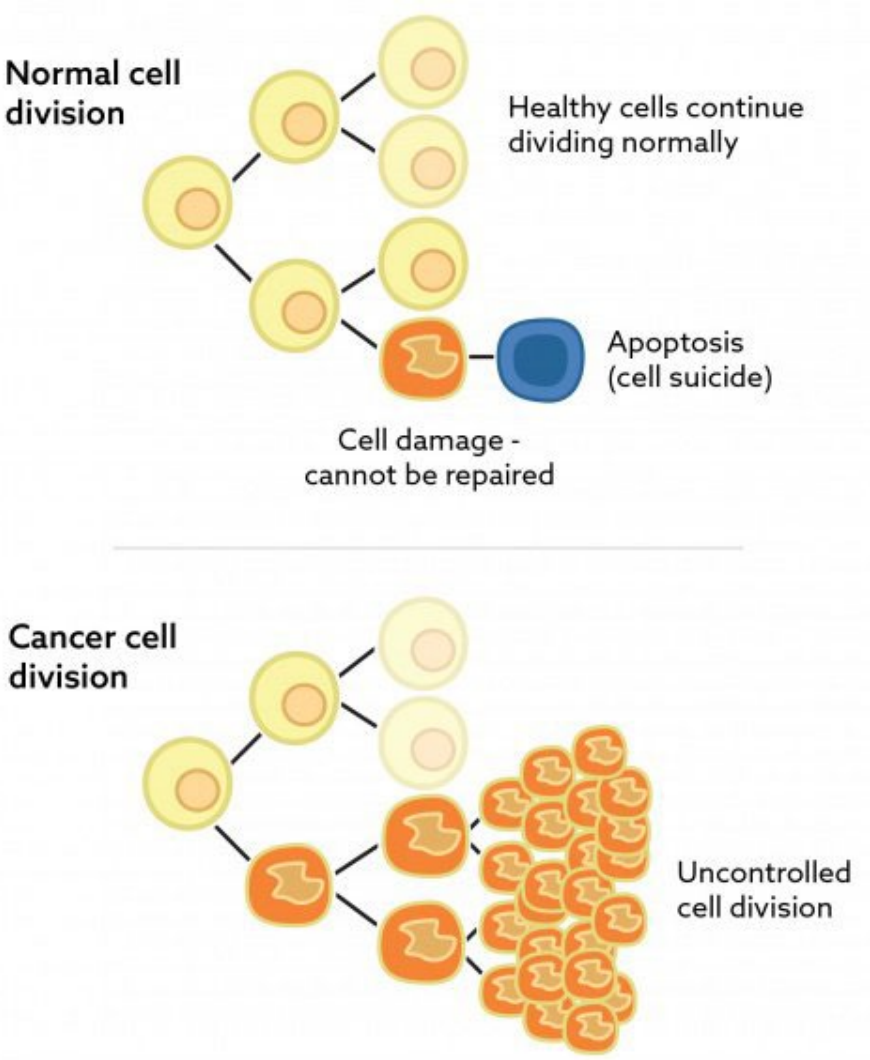
- Lung Scarring aka Fibrosis
  - Often occurs in areas of prior pneumonitis or in high radiation dose region
- Rib Fracture
  - More likely to be seen in tumor close to ribs
  - Median onset: 18 mo. after treatment
- Esophageal Narrowing aka Stricture
  - Can occur 3-4 years after treatment
  - Treated with dilation
- Radiation Injury to the Heart
  - Pericarditis, ischemia, effusions, etc.

Your Speaker

Ali Dadla, MD

Immunotherapy in Lung Cancer

What is Cancer?



Why does uncontrolled growth occur?

- Genetic changes or mutations so growth cannot be controlled

- Immune system cannot recognize this growth

What is chemotherapy?

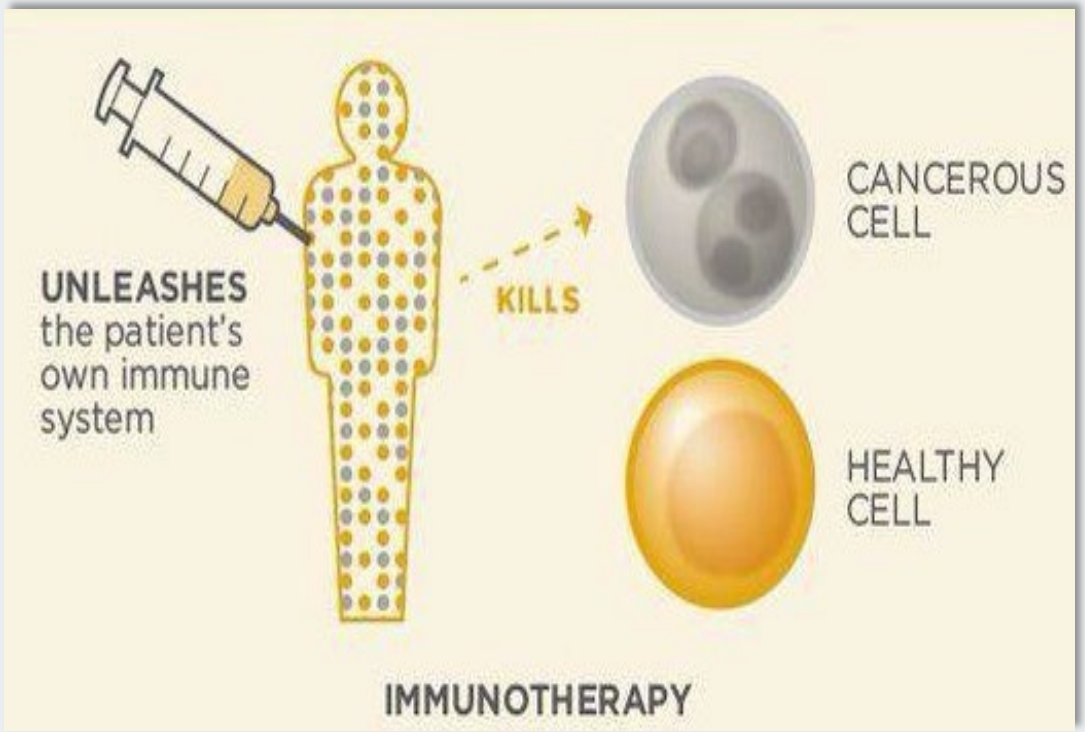
Traditional anticancer drugs that kill fast growing cells

Chemo side effects:

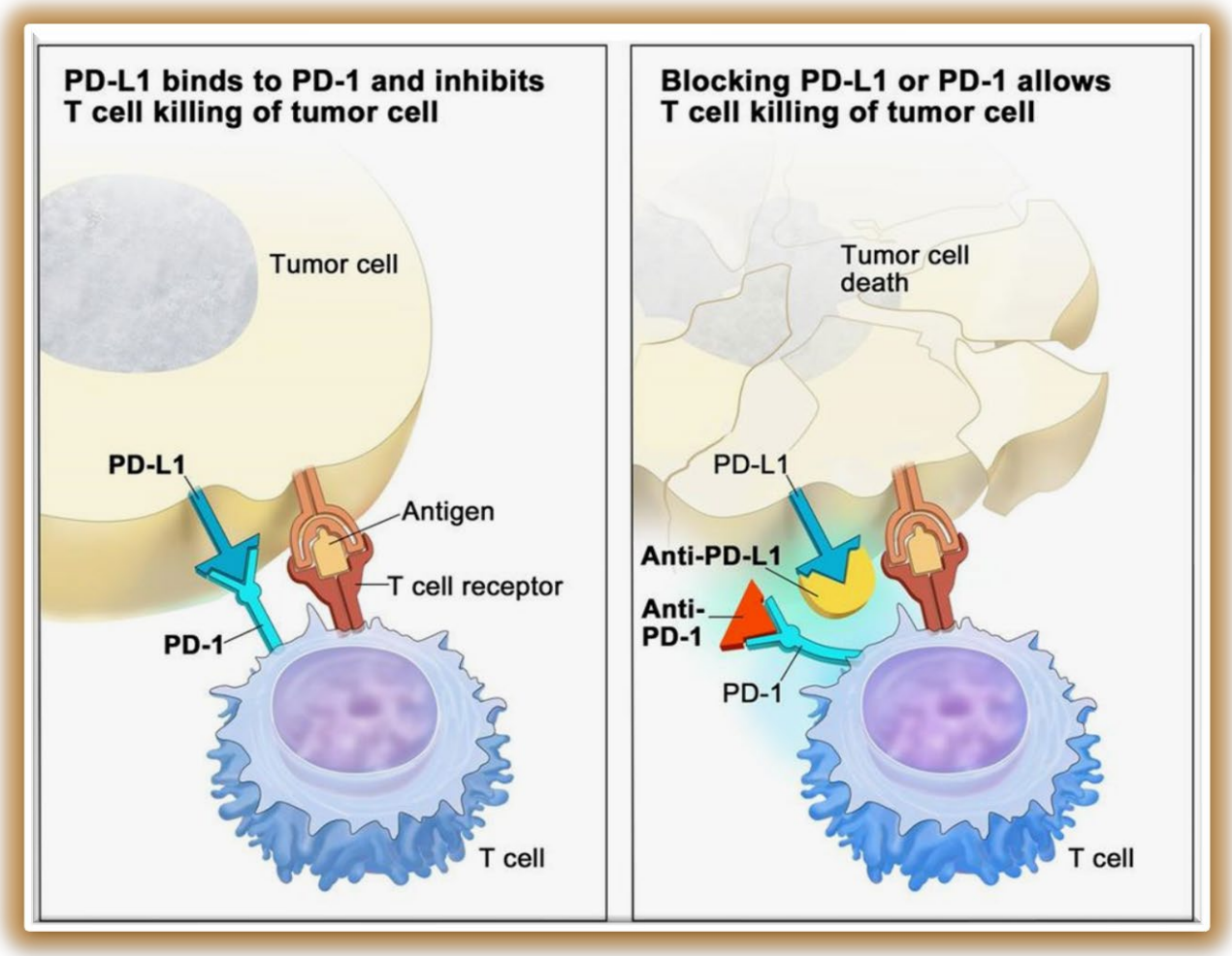
- Hair loss
- Nausea
- Fatigue

What is immunotherapy?

Unleashes the body's immune system against cancer with minimal side effects



How does immunotherapy work?



Immunotherapy Side Effects

- Thyroid
- Skin Rash
- Diarrhea
- Liver

What is personalized or precision medicine?

Treatment that targets genetic changes in your cancer

When is surgery or radiation by itself sufficient?

Stage 1A Non-Small Cell Lung Cancer – less than 3cm

Lung Cancer as a poppy plant

Who is eligible for immunotherapy?

70% of Stage II Lung Cancers

All Stage III and Stage IV

Who is eligible for personalized medicine?

Tumors with actionable mutation

34% never smokers

5.5% smokers

Numbers to take home

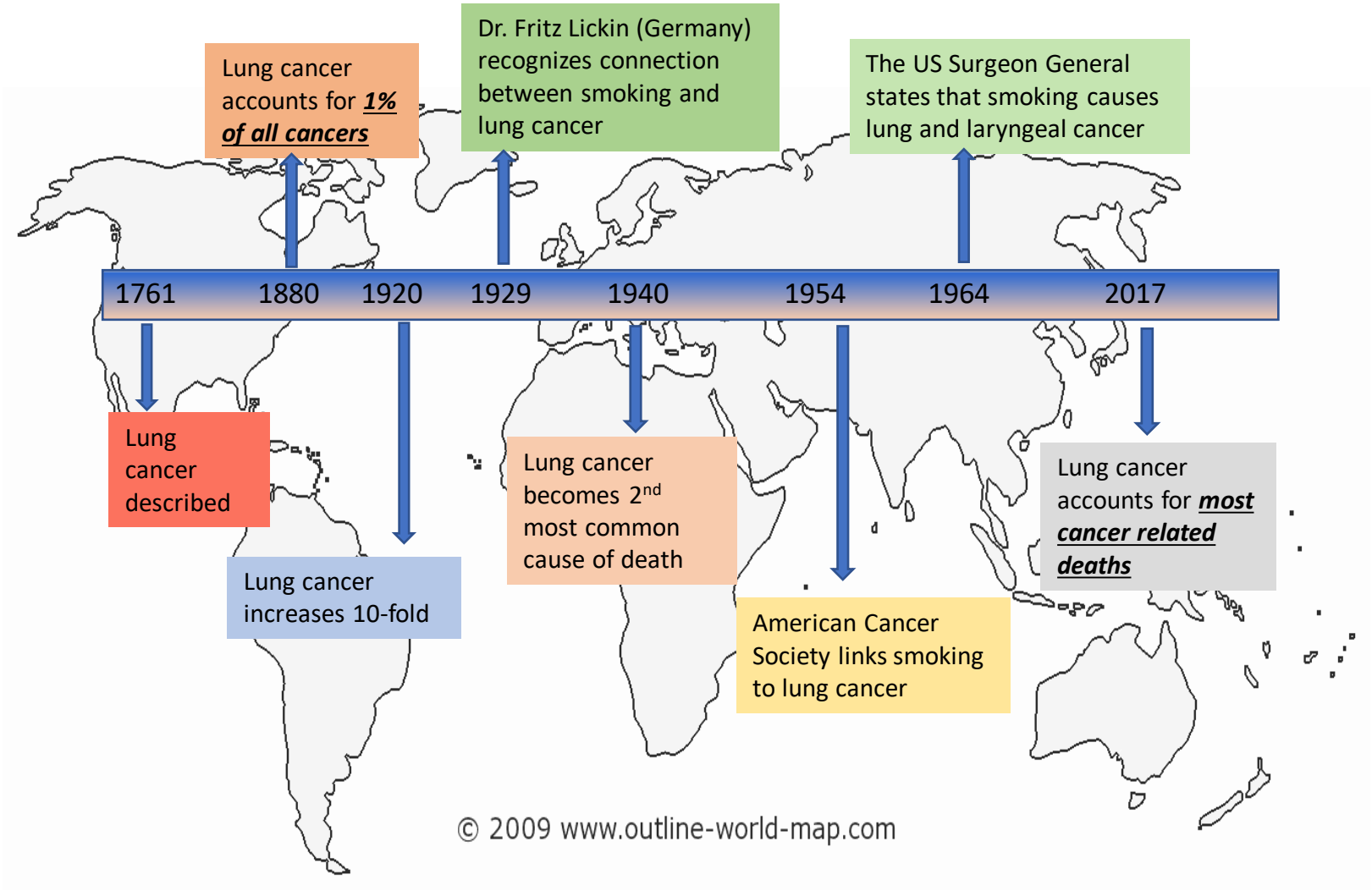
- Average age of diagnosis: 70 years
- 86% of patients are smokers
- Quitting smoking reduces risk of cancer starting at 5 years with a progressive decline in risk by 15 years
- Quitting smoking before age 40 decreases risk by 90% and before age 54 by 78%

Your Speaker

Svetlana Kotova, MD

Multidisciplinary Fight against Lung Cancer

Lung cancer timeline



Lung Surgery - The Beginning

- First successful surgery in 1933
- By Dr. Evarts Graham
- Barnes Hospital in St. Louis, MO.

88 Years Later

Thoracotomy

5-8 days in the hospital

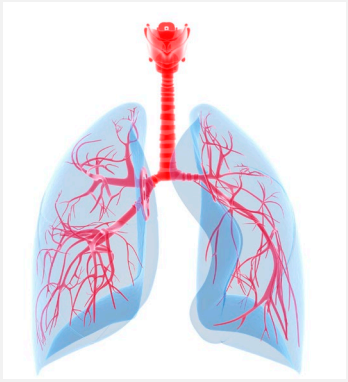
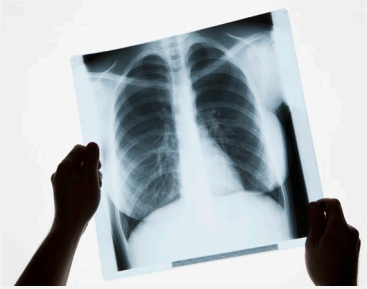
Thoracoscopy

2-3 days in the hospital

Robotic Surgery

1-2 days in the hospital

Lung Cancer Stepwise Approach

1	2	3	4
Detection (early detection)	Staging	Patient evaluation for surgery (lung reserve, overall health)	Treatment plan based on stage and individual factors
			

Surgeon's role in Lung Cancer Treatment

Early-Stage Lung cancer

- Resection of cancer to achieve cure
- Confirm stage to guide treatment

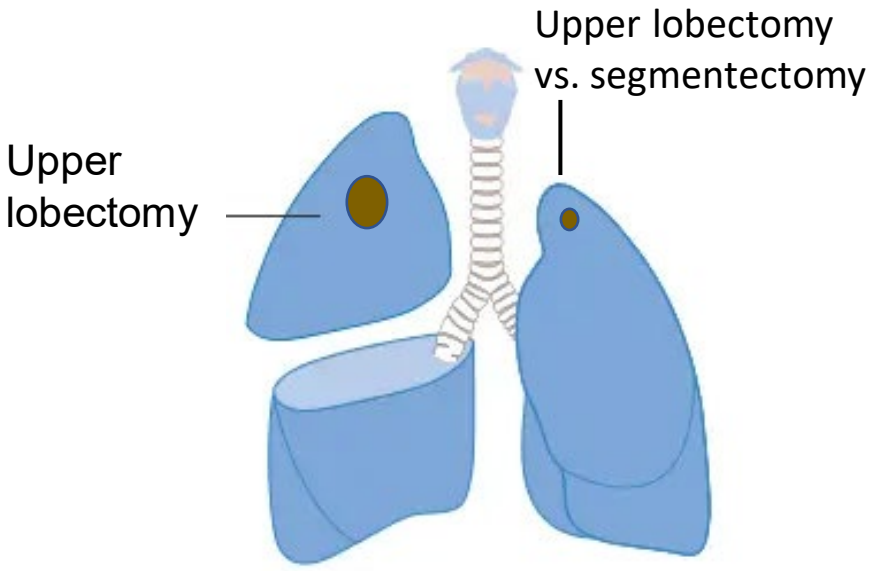
Advanced Stage Lung Cancer

- Diagnosis if other options not possible
- Obtain additional tissue for thorough testing
- Palliation of symptoms
  - Fluid around the lung
  - Tumor compressing or occluding airway

Types of Surgery for Lung Cancer

Lobectomy

- Segmentectomy
- Non-anatomic resections



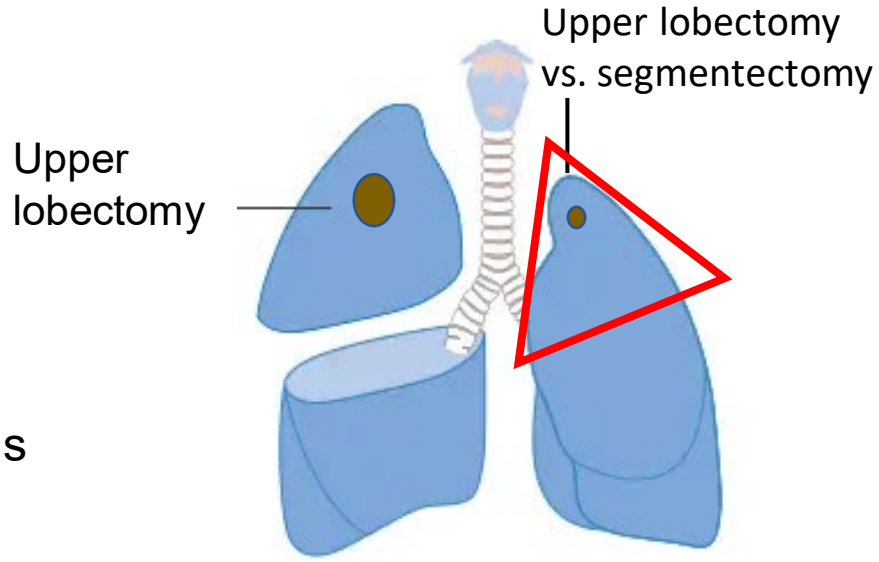
Types of Surgery for Lung Cancer

Lobectomy

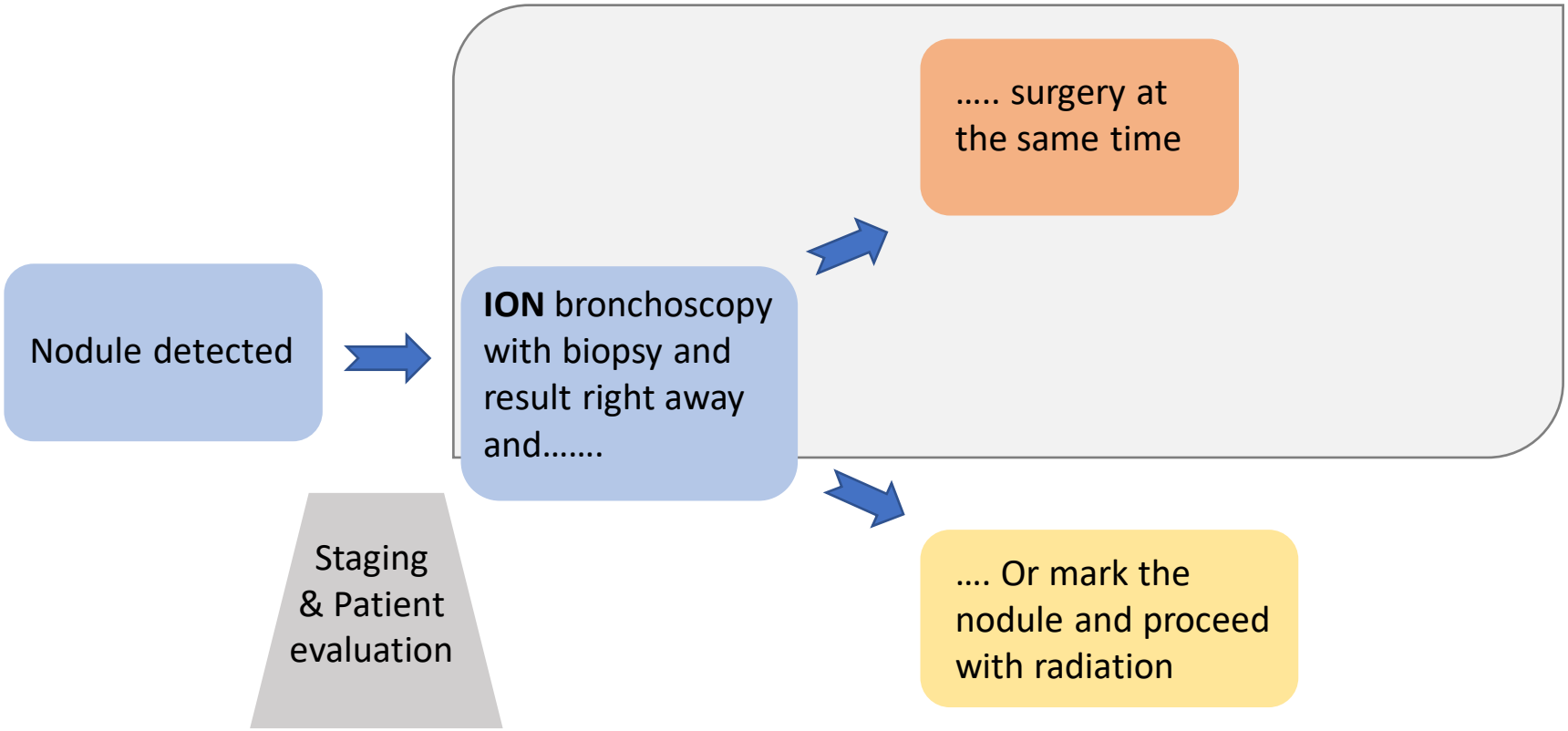
- Segmentectomy
- Non-anatomic resections

Screening

- Shifts towards early stage
- Detect cancers of 6-10 mm
- Surgery is adapting to reflect this



Multidisciplinary Lung Cancer treatment at PeaceHealth



Conclusions

- Lung cancer treatment is a multispecialty game
- You don’t have to figure it all out on your own
- We are here to help streamline care and provide state of the art approaches

Q & A

Questions after the webinar?

Send to: **swcommunications@peacehealth.org**

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Resources & Handouts

- Recording
- Slides
- Handouts

PeaceHealth

https://www.peacehealth.org/healthy-you/lung-cancer-what-you-should-know-about-testing-treatment

Survey

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