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Welcome

Lakeridge Health Surgical Update for Primary Care Physicians

Oct. 16th 2014

Housekeeping Items

- Please ensure that all mobile devices are **off** or **silent**

- Your audience response device can be used to provide anonymous responses to any question asked throughout this event.

- Parking exist passes (provided to all participants) can be used directly at the parking exit gates (re-insert the pass you obtained when entering our parking facility, followed by insertion of the exit the pass provided at this event.

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Surgical Update
Lung Cancer- From Suspicion to Treatment

Dr. Shannon Trainor

Thursday October 16th 2014

Objectives

- Presentation of Lung Cancer
- Work up/evaluation
- Central East Thoracic Surgery Diagnostic Assessment Program (DAP)
- Brief Overview Management of Lung Cancer
- VATS Lobectomy
- Future- Screening

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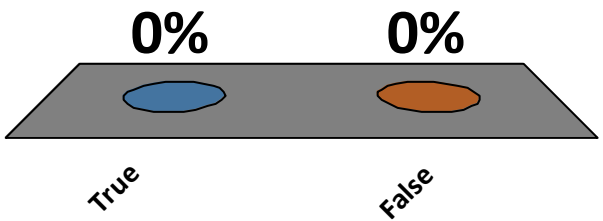
Question #1:

In Ontario, Deaths from Lung Cancer exceed deaths by any other cancer cause.

✓ A. True

B. False

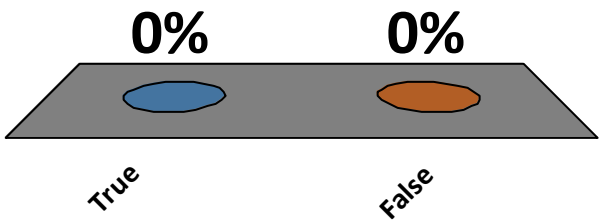


Question # 2:

Approximately 1 in 12 Canadian men and 1 in 20 Canadian women are expected to develop lung cancer during their lifetime.

A. True

✓B. False



Burden of Disease- Statistics

- It is estimated that in 2014:
    - 26,100 Canadians will be diagnosed with lung cancer. This represents 14% of all new cancer cases in 2014.
    - 20,500 Canadians will die from lung cancer. This represents 27% of all cancer deaths in 2014.
    - On average, 72 Canadians will be diagnosed with lung cancer every day.
    - On average, 56 Canadians will die from lung cancer every day.

Canadian Cancer Society Statistics 2014

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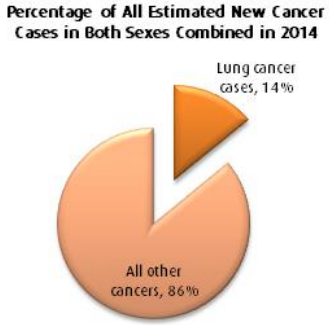
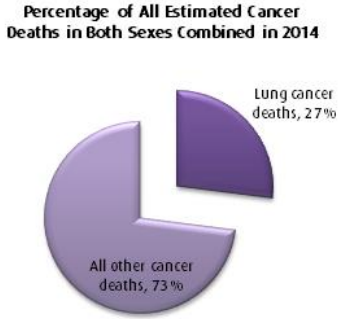
Burden of Disease





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Risk Factors

- Cigarette smoking
  - 2nd hand smoke exposure
- Asbestos exposure
- Radon exposure
- Chronic inflammation
- Pulmonary fibrosis (IPF)
- Personal or Family History of Lung Cancer
- Exposure To radiation

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Relative Risk of Lung Cancer

Smoking Category	*Relative Risk*
• Never smokers	• 1.0
• Current Smokers	• 15
• Former Smokers	
• Years of abstinence	
• <10	• 5-15
• 10-20	• 2-6
• >20	• 2-4

Adapted from –Samet et al. Clin Chest Med 1991:12:673

Presentation

- Asymptomatic (i.e... Often found on X-rays done for another purpose)
  - Will become less frequent as CXR not done as routine pre-op
- Local symptoms
  - Broncho-pulmonary
  - Non broncho-pulmonary
- Symptoms from Metastatic Disease
- Paraneoplastic Syndromes

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Presentation

- Local- Broncho-pulmonary Symptoms:
    - Cough is most common symptom (50-70%)
        - Worsens or non resolving
    - Hemoptysis
    - Wheezing or stridor (from airway obstruction)
    - Dyspnea
    - Post obstructive infectious symptoms

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Presentation

- Local- Non Broncho-pulmonary Symptoms:
  - Pain
  - Pancoast Syndrome (ipsilateral Horner's, pain and muscular atrophy of the arm and hand)
  - Dysphagia
  - Hoarseness
  - Superior Vena Cava Syndrome (swollen face, conjunctival hemorrhage, brain edema)
  - Symptoms from pleural or pericardial effusions

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Presentation

- Symptoms From Metastatic Disease:
    - Most common site is brain, bone, liver and adrenal glands
    - Bone metastases often cause pain or pathologic fractures
    - 20% of patients have bone metastases on presentation
    - Brain metastases can cause headache, blurred vision, nausea and changes in mental status
    - Adrenal mets are usually asymptomatic
    - Liver mets are also usually asymptomatic until late in the disease
    - Palpable adenopathy

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Presentation

- Symptoms from Para-neoplastic Syndromes:
    - The production of secretory products that invoke immune response on distant end-organs
    - May present even before lung masses are visible on imaging studies
    - Most often associated with small cell or squamous cell ca
    - 2% of lung cancer
    - Hypercalcemia, SIADH (hyponatremia),anemia, peripheral neuropathy, clubbing

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Table 96-1. Intrathoracic Signs and Symptoms of Lung Cancer

Cough	29–87%
Hemoptysis	9–57%
Chest pain	6–60%
Dyspnea	3–58%
Wheezing or stridor	2–14%
Hoarseness	1–18%
Pleural effusion	7%
Dysphagia	2%
Superior vena cava syndrome	4–11%
Pancoast's syndrome	3–5%
Phrenic nerve paralysis	1%

Data from Chute et al. (1985), Hyde and Hyde (1974), Rahim and Sarma (1984), Lam et al. (1983), Hopwood et al. (1995), Cohen (1974), LeRoux (1968), and Chernow and Sahn (1977).

Paraneoplastic Syndromes Associated with Lung Cancer†

Systemic
- Anorexia, cachexia, weight loss*
- Fever
- Orthostatic hypotension
- Nonbacterial thrombotic endocarditis
- Dermatomyositis/polymyositis
- Systemic lupus erythematosus

Cutaneous
- Acquired hypertrichosis lanuginosa
- Acrokeratosis (Bazex's syndrome)
- Clubbing*
- Dermatomyositis
- Erythema gyratum repens
- Exfoliative dermatitis
- Hypertrophic pulmonary osteoarthropathy
- Superficial thrombophlebitis*
- Tripe palms
- Acanthosis nigricans
- Acquired ichthyosis
- Acquired palmoplantar keratoderma
- Erythema annulare centrifugum
- Florid cutaneous papillomatosis
- Pemphigus vulgaris
- Pityriasis rotunda
- Pruritus
- Sign of Leser-Trelat
- Sweet's syndrome
- Vasculitis

Renal
- Glomerulopathies
- Tubulointerstitial disorders

Endocrine/metabolic
- Cushing's syndrome
- Hypercalcemia*
- Hyponatremia*
- Hyperglycemia
- Hypertension
- Acromegaly
- Hyperthyroidism
- Hypercalcitoninemia
- Gynecomastia
- Galactorrhea
- Carcinoid syndrome
- Hypoglycemia
- Hypophosphatemia
- Lactic acidosis
- Hypouricemia
- Hyperamylasemia

Hematologic
- Anemia*
- Polycythemia
- Hypercoagulability
- Thrombocytopenic purpura
- Dysproteinemia (including amyloidosis)
- Leukocytosis/Leukoerythroblastic reaction
- Eosinophilia

Neurologic
- Peripheral neuropathy*
- Lambert-Eaton myasthenic syndrome*
- Necrotizing myelopathy
- Cerebral encephalopathy
- Visual loss
- Visceral neuropathy

†Modified from Patel, AM, Jett, JR, Clinical presentation and staging of lung cancer. In: Comprehensive Textbook of Thoracic Oncology, Aisner, J, Arrigada, R, Green, MR, et al (Eds), Williams & Wilkins, Baltimore, 1996, p. 293.

* Indicates more common paraneoplastic syndromes

Imaging

- Chest X-ray:
  - Often initial imaging
  - Inexpensive and easy access
  - Poor detail for staging

- CT Scan:
  - Provides details regarding features of a pulmonary nodule/mass
  - Assess regional lymphadenopathy
  - Some assessment of the abdominal solid organs
  - Does not provide a tissue diagnosis

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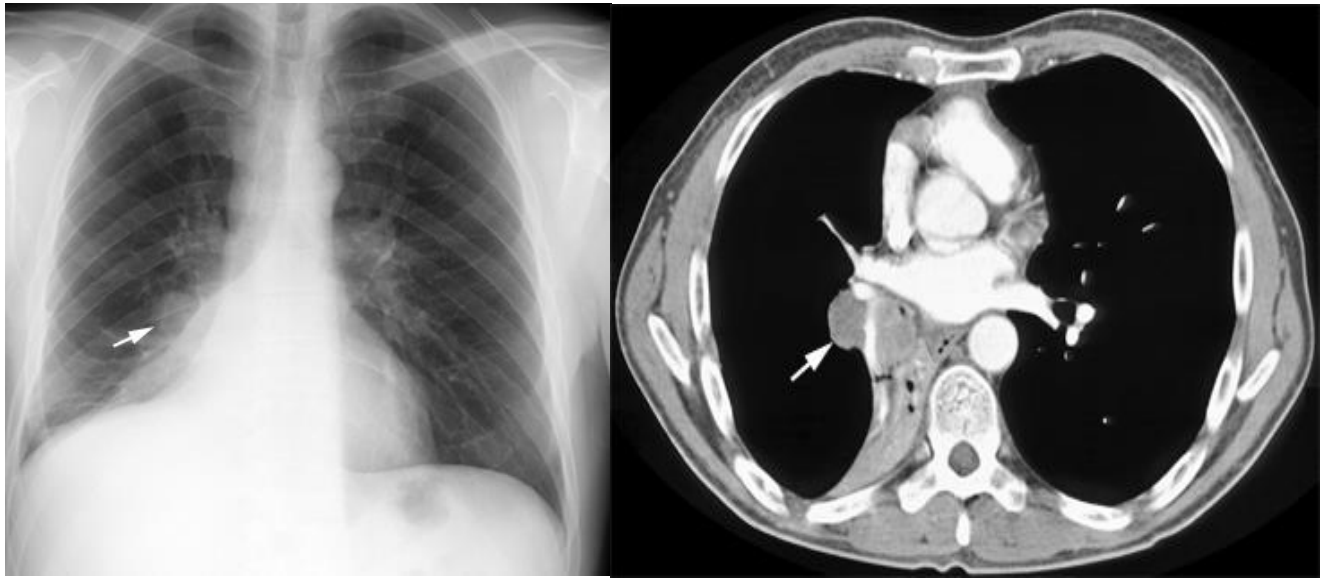
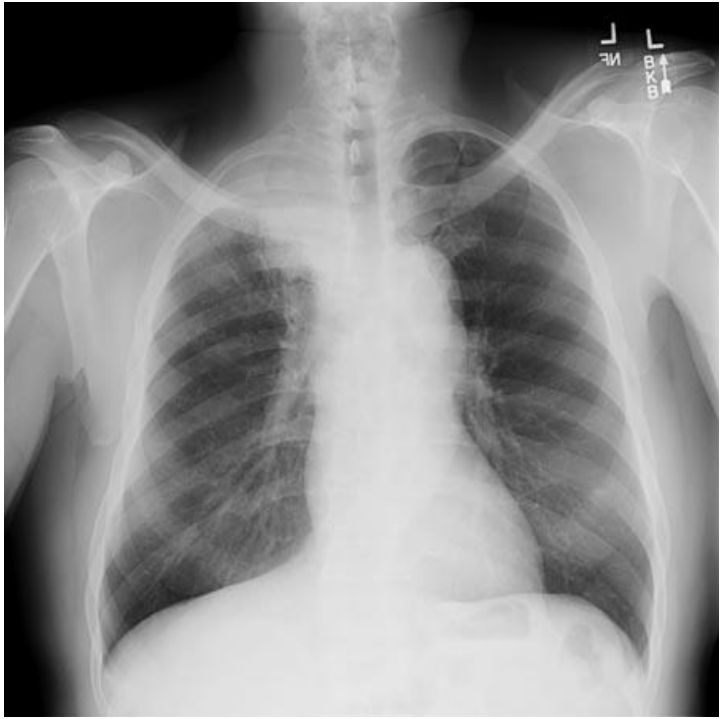
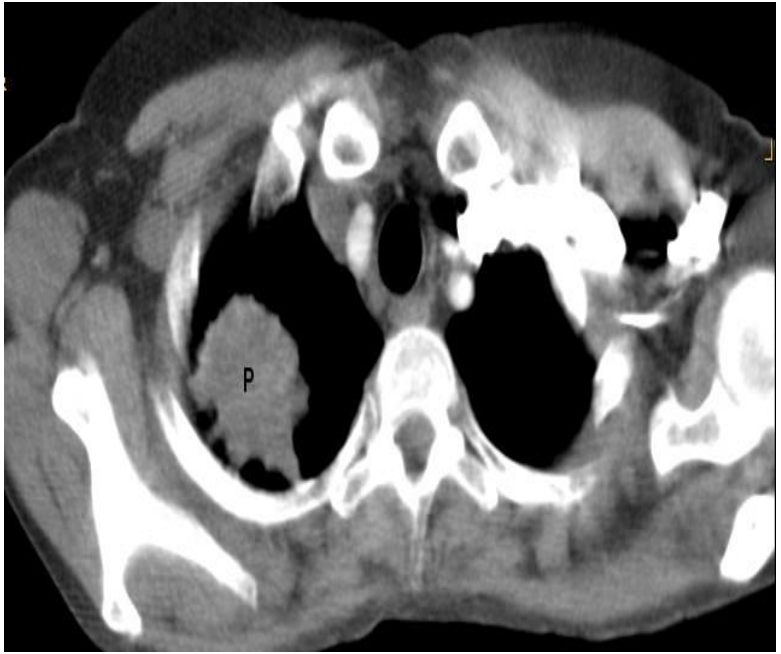
Imaging



Imaging





Your Most Important Role!

- Suspicion Leads to Imaging
- Biggest issue is delay in diagnosis
- Referral for Evaluation
- Centralized Referral Process for Thoracic Surgery
- Call us if concerns any time

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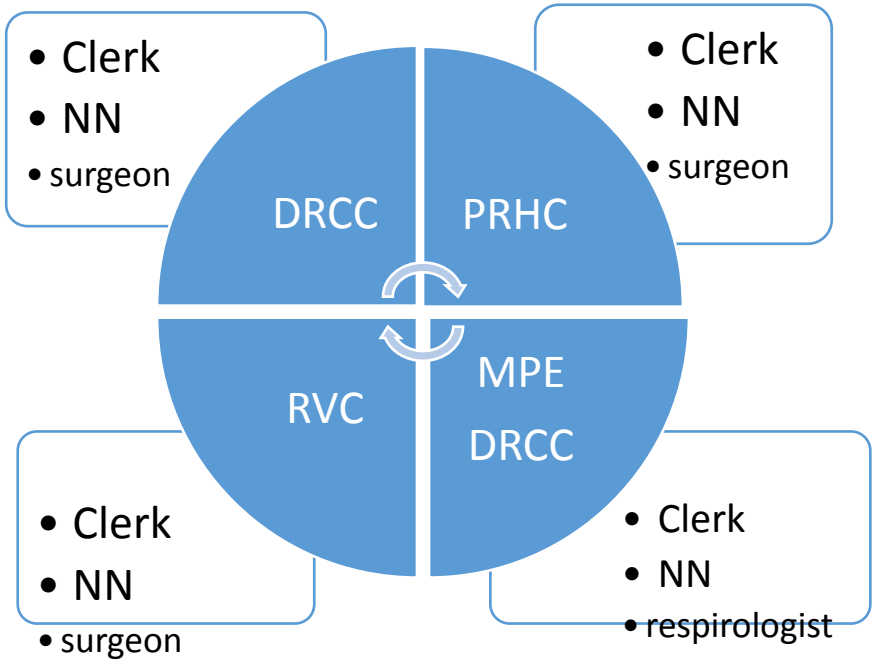
Central East Thoracic DAP: Triage Process



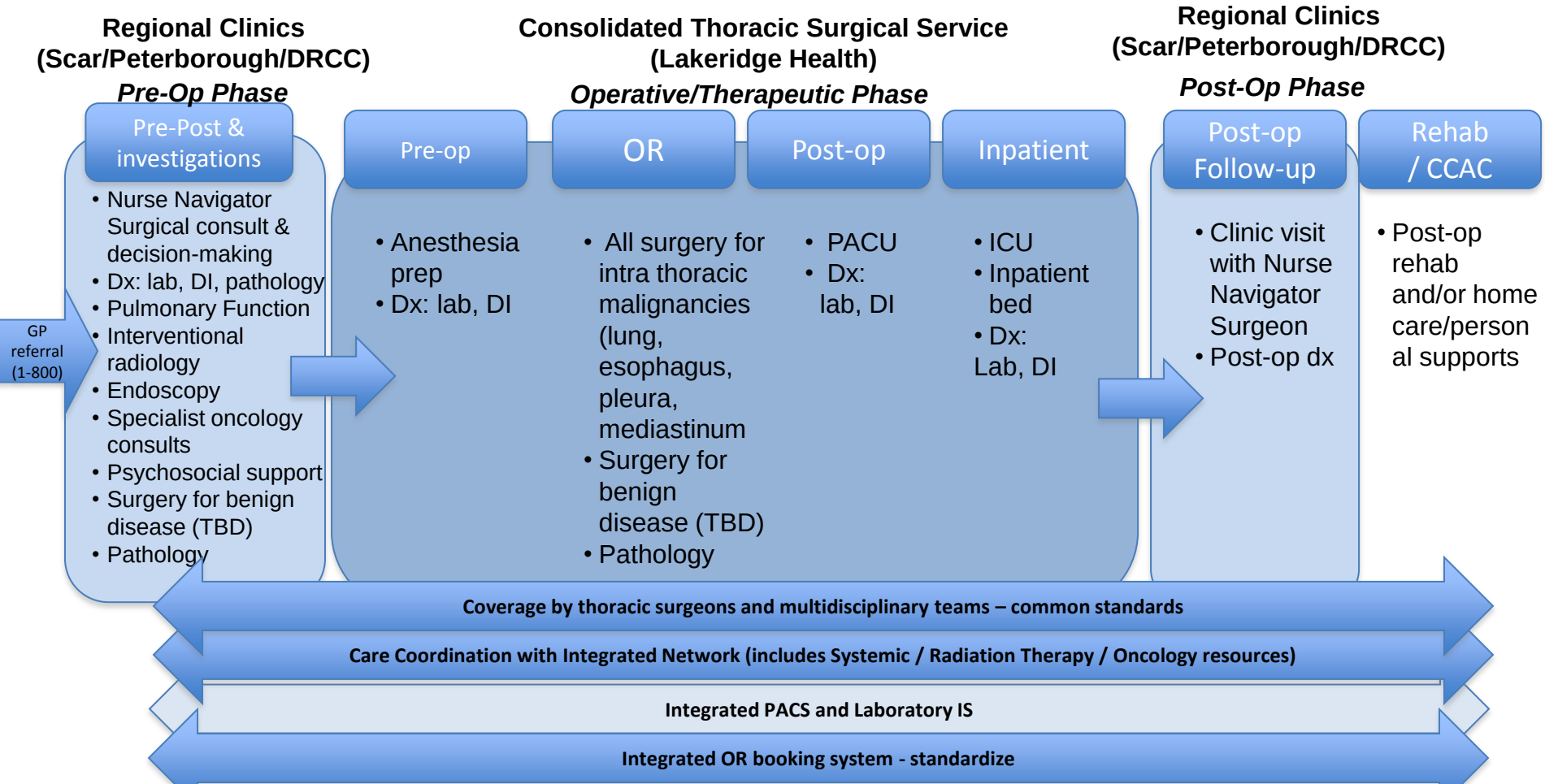
* ***Priority 1:***
New or suspicious for malignancy and acutely symptomatic with…
Wait time goal: 5 business days or next available

Priority 2:
New or suspicious for malignancy but not acutely symptomatic (see above)
Wait time goal: 1-2 weeks or next available

Priority 3:
Known treated malignancy
Wait time goal: 2-3 weeks or next available

Priority 4:
Benign disease
Wait time goal: 28 days or next available

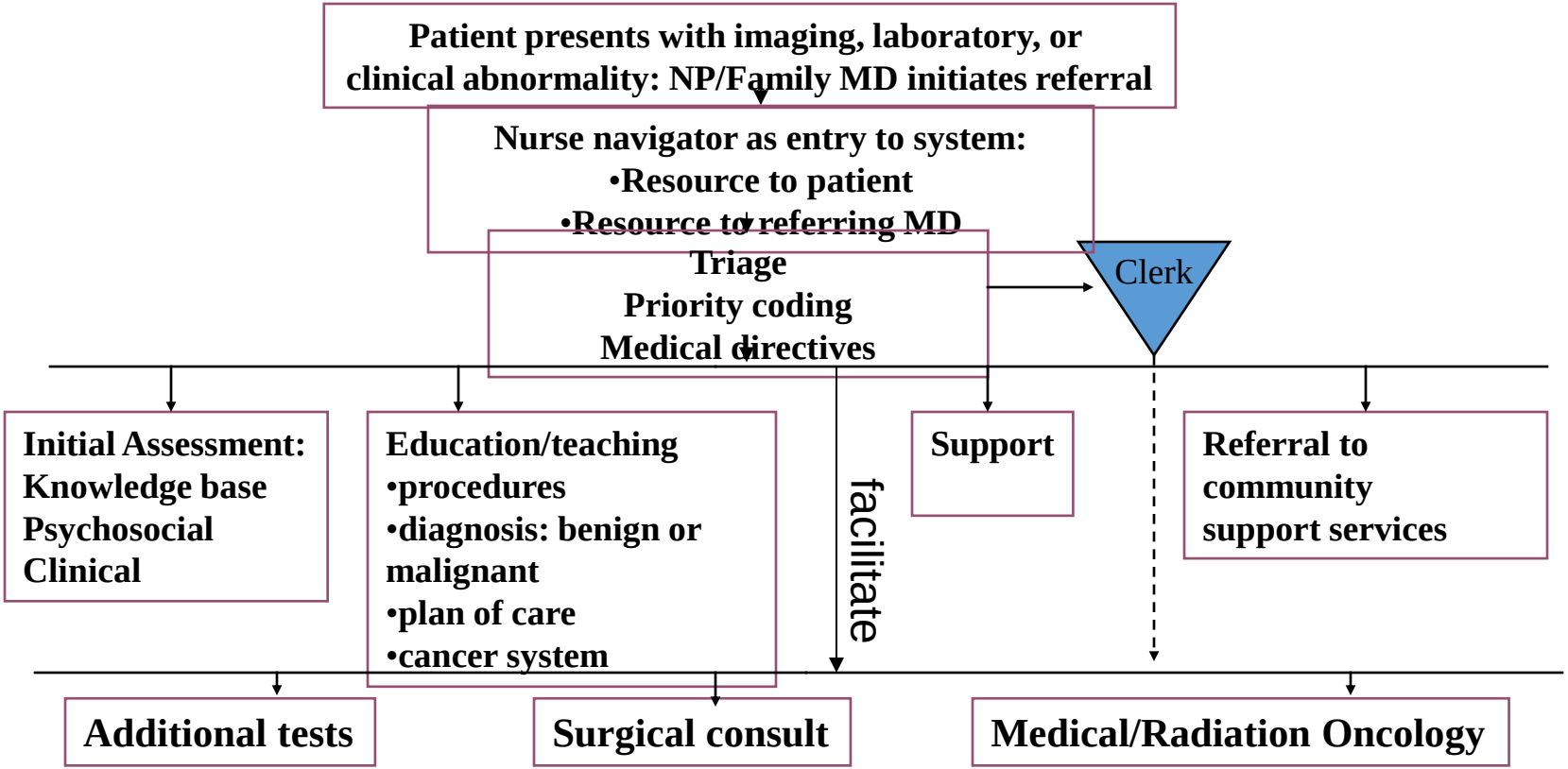
CE Thoracic Surgery Process Flow



central east regional cancer program

in partnership with cancer care ontario

DAU: Active Coordination Navigation Model



(Canadian Breast Cancer Initiative, 2002)

Work Up

- Review Imaging
    - Need details of tumor/nodule itself (size, location)
    - Assess the mediastinum
    - Rule out distant disease
- Full bloodwork
- Physical Examination
- Determine means to obtain a diagnosis
- Discuss smoking cessation
- Staging
- Determination of Treatment

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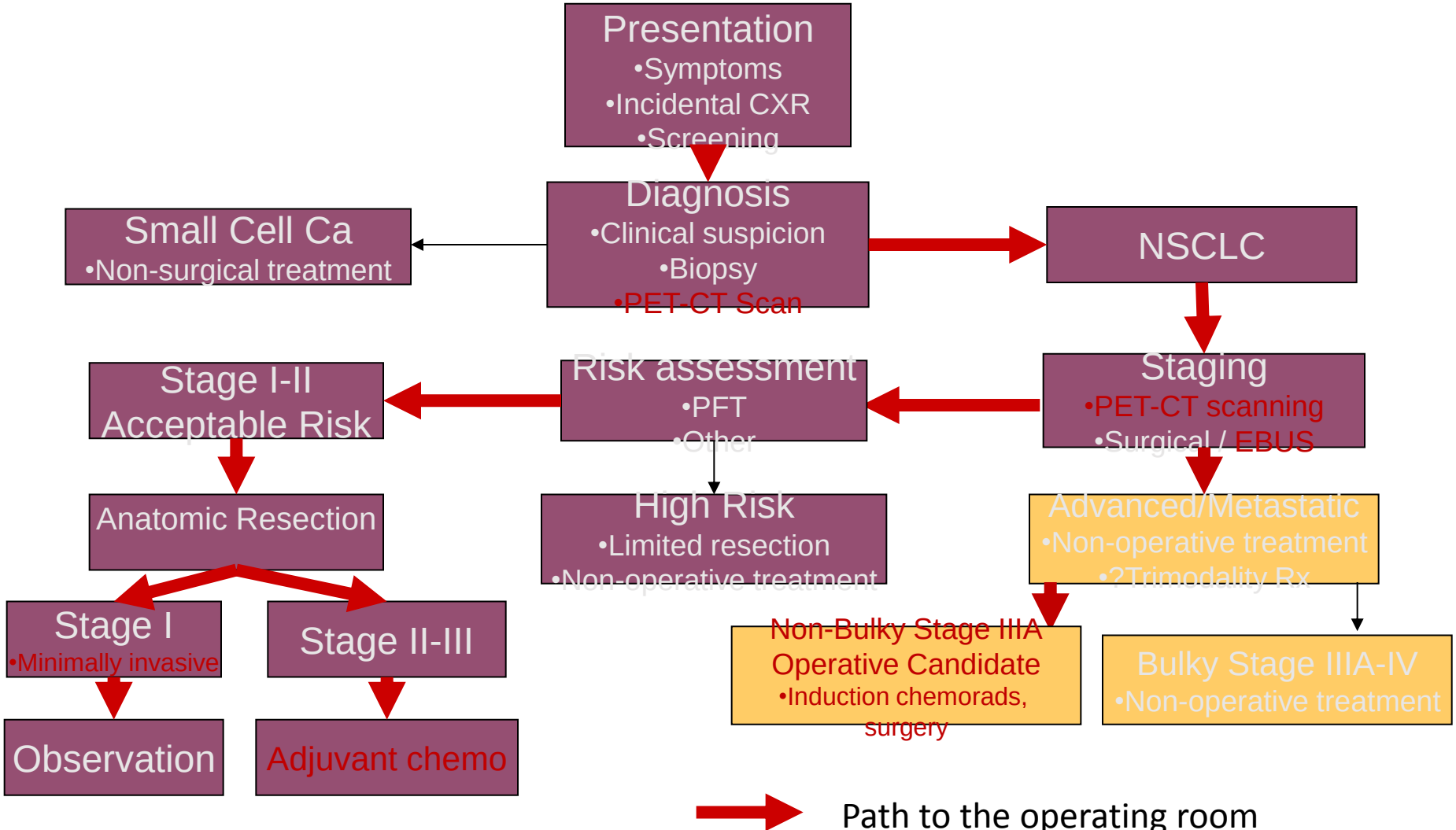
Presentation
•Symptoms
•Incidental CXR
•Screening
Diagnosis
•Clinical suspicion
•Biopsy
•PET-CT Scan
Small Cell Ca
•Non-surgical treatment
NSCLC
Staging
•PET-CT scanning
•Surgical / EBUS
Risk assessment
•PFT
•Other
Stage I-II
Acceptable Risk
High Risk
•Limited resection
•Non-operative treatment
Advanced/Metastatic
•Non-operative treatment
•?Trimodality Rx
Anatomic Resection
Stage I
•Minimally invasive
Stage II-III
Observation
Adjuvant chemo
Non-Bulky Stage IIIA
Operative Candidate
•Induction chemorads, surgery
Bulky Stage IIIA-IV
•Non-operative treatment
Path to the operating room

Suspicion of Cancer

- Nodule is more likely to be cancer when:
  - Size:
    - larger size or known increase in size
  - Age increases
  - Smoking history
  - Spiculated appearance
  - upper lobe location
  - Patient history malignancy
  - PET positive

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Follow up of Pulmonary Nodules

Recommendations for Follow-up and Management of Nodules Smaller than 8 mm Detected Incidentally at Nonscreening CT

Nodule Size (mm)*	Low-Risk Patient†	High-Risk Patient‡
≤4	No follow-up needed§	Follow-up CT at 12 mo; if unchanged, no further follow-up‖
>4–6	Follow-up CT at 12 mo; if unchanged, no further follow-up‖	Initial follow-up CT at 6–12 mo then at 18–24 mo if no change‖
>6–8	Initial follow-up CT at 6–12 mo then at 18–24 mo if no change	Initial follow-up CT at 3–6 mo then at 9–12 and 24 mo if no change
>8	Follow-up CT at around 3, 9, and 24 mo, dynamic contrast-enhanced CT, PET, and/or biopsy	Same as for low-risk patient

Note.—Newly detected indeterminate nodule in persons 35 years of age or older.

* Average of length and width.

† Minimal or absent history of smoking and of other known risk factors.

‡ History of smoking or of other known risk factors.

§ The risk of malignancy in this category (<1%) is substantially less than that in a baseline CT scan of an asymptomatic smoker.

‖ Nonsolid (ground-glass) or partly solid nodules may require longer follow-up to exclude indolent adenocarcinoma.

Fleischner Society Guidelines 2013

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Question #3

- What is the most accurate means to obtain a tissue diagnosis in a peripheral stage 1 lung cancer?

1. sputum cytology
2. bronchoscopy
3. ct guided FNA biopsy
4. diagnostic wedge resection

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Question #3:

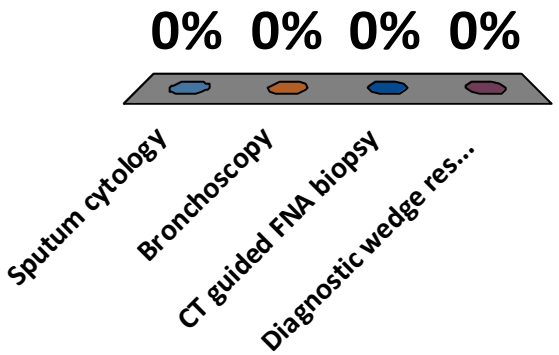
What is the most accurate means to obtain a tissue diagnosis in a peripheral stage 1 lung cancer?

A. Sputum cytology

B. Bronchoscopy

C. CT guided FNA biopsy

✓ D. Diagnostic wedge resection



Diagnosis

- How do we determine diagnosis of malignancy (tissue) or work up a tumor?
  - Sputum cytology
  - Bronchoscopy
  - Fine Needle Aspiration of Nodes
  - Needle Biopsy (typically CT scan guided)
  - Mediastinoscopy/ EBUS
  - Surgery
    - Pleuroscopy
    - Diagnostic wedge resection

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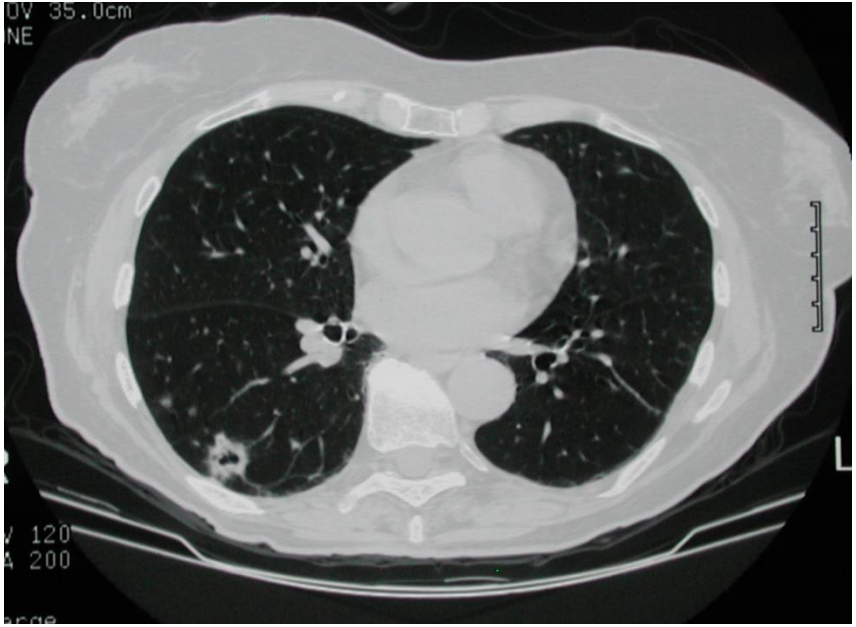
Bronchoscopy

- May provide a diagnosis by tissue biopsy if there is an endobronchial component or by washings
- Helps determine resectability with tumors in the proximal airway
- Can allow palliation thru stents and lasers
- Low yield for peripheral tumours

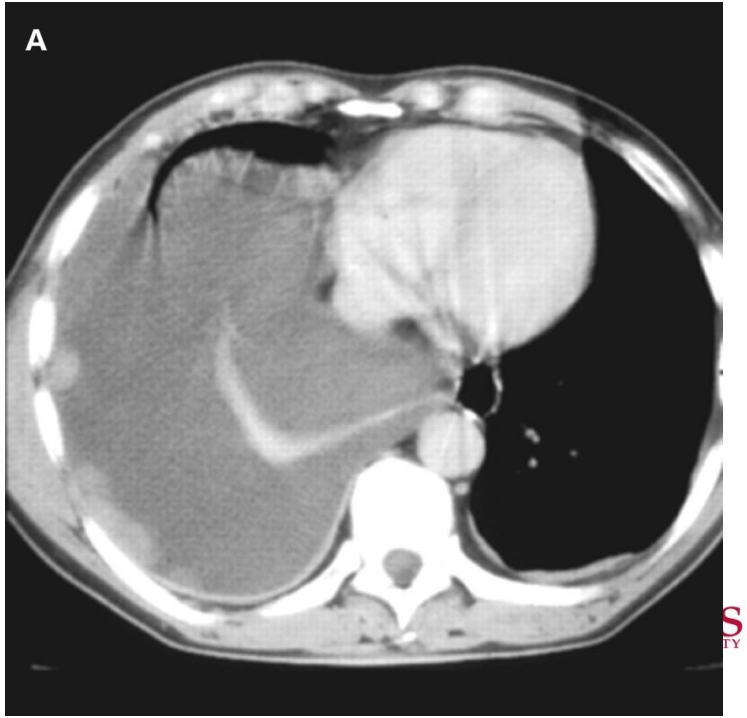
Percutaneous Needle Biopsy



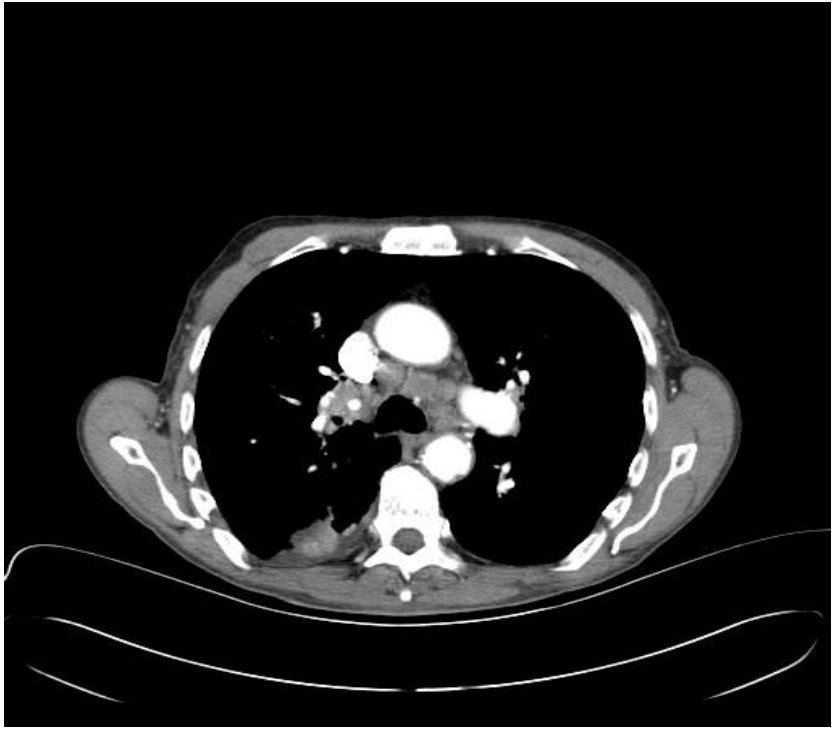
- Typically CT guided
- Core biopsy preferred
  - Diagnosis now not just cancer vs benign disease
  - NSCLC vs SCLC
  - Chemotherapy treatment is more sophisticated
  - Adeno vs squamous
  - EGFR and ALK mutation testing

Pleuroscopy

- Direct Assessment of the Pleural Space
- Pleural Nodularity or effusion
- Thoracentesis alone yields diagnosis 50-60%
- Cytology and pleural biopsy diagnostic yield is >95%
- Allows for diagnosis but also fusion of the pleural space:
  - Talc pleurodesis
  - Indwelling pleurex catheter



Mediastinoscopy



- Invasive staging of mediastinal lymph nodes
- Obtains a diagnosis
- Staging to rule out N2 or N3 disease
- Facilitates good tissue for mutation testing etc.
- All patients with tumors >3cm, central lesions or PET Avid nodes

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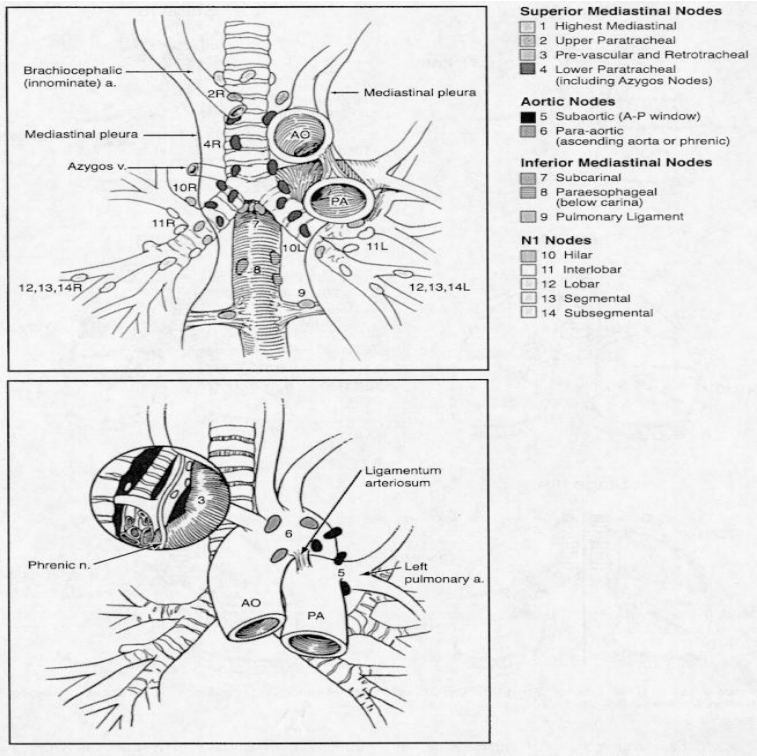

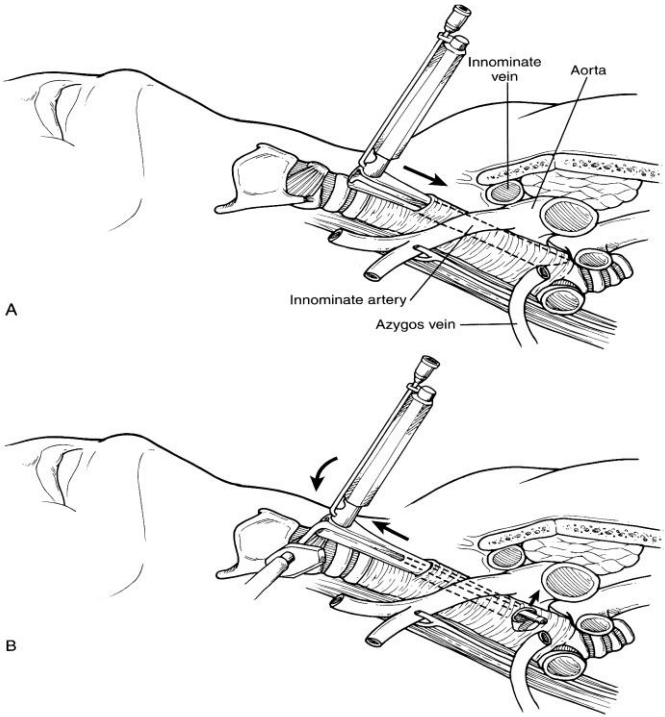

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TNM Staging: T = Tumor

- T1: < 3 cm; no structures invaded
- T2: > 3 cm but less than 7 cm; involvement of visceral pleura and more than 2 cm from the carina
- T3: > 7cm,invading chest wall, < 2 cm from carina
- T4: invading unresectable structures, carina, malignant effusion or satellite tumor

TMN- Nodal Status

- N0
- N1- ipsilateral intrapulmonary nodes or hilar nodes
- N2- ipsilateral mediastinal or subcarinal nodes
- N3- contralateral, scalene or supraclavicular nodes

TMN- Metastases

- Distant Metastases (M)
    - Mx presence of distant metastases cannot be assessed
    - M0 no distant metastases
    - M1 distant metastases present

TNM staging system for lung cancer (7th edition)

Primary tumor (T)	
T1	Tumor ≤3 cm diameter, surrounded by lung or visceral pleura, without invasion more proximal than lobar bronchus*
T1a	Tumor ≤2 cm in diameter
T1b	Tumor >2 cm but ≤3 cm in diameter
T2	Tumor >3 cm but ≤7 cm, or tumor with any of the following features:
	Involves main bronchus, ≥2 cm distal to carina
	Invades visceral pleura
	Associated with atelectasis or obstructive pneumonitis that extends to the hilar region but does not involve the entire lung
T2a	Tumor >3 cm but ≤5 cm
T2b	Tumor >5 cm but ≤7 cm
T3	Tumor >7 cm or any of the following:
	Directly invades any of the following: chest wall, diaphragm, phrenic nerve, mediastinal pleura, parietal pericardium, main bronchus <2 cm from carina (without involvement of carina)
	Atelectasis or obstructive pneumonitis of the entire lung
	Separate tumor nodules in the same lobe
T4	Tumor of any size that invades the mediastinum, heart, great vessels, trachea, recurrent laryngeal nerve, esophagus, vertebral body, carina, or with separate tumor nodules in a different ipsilateral lobe
Regional lymph nodes (N)	
N0	No regional lymph node metastases
N1	Metastasis in ipsilateral peribronchial and/or ipsilateral hilar lymph nodes and intrapulmonary nodes, including involvement by direct extension
N2	Metastasis in ipsilateral mediastinal and/or subcarinal lymph node(s)
N3	Metastasis in contralateral mediastinal, contralateral hilar, ipsilateral or contralateral scalene, or supraclavicular lymph node(s)
Distant metastasis (M)	
M0	No distant metastasis
M1	Distant metastasis
M1a	Separate tumor nodule(s) in a contralateral lobe; tumor with pleural nodules or malignant pleural or pericardial effusion
M1b	Distant metastasis (in extrathoracic organs)

Stage groupings			
Stage IA	T1a-T1b	N0	M0
Stage IB	T2a	N0	M0
Stage IIA	T1a,T1b,T2a	N1	M0
	T2b	N0	M0
Stage IIB	T2b	N1	M0
	T3	N0	M0
Stage IIIA	T1a,T1b,T2a,T2b	N2	M0
	T3	N1,N2	M0
	T4	N0,N1	M0
Stage IIIB	T4	N2	M0
	Any T	N3	M0
Stage IV	Any T	Any N	M1a or M1b

* The uncommon superficial spreading tumor of any size with its invasive component limited to the bronchial wall, which may extend proximal to the main bronchus, is also classified as T1a.

Adapted from: Goldstraw P, Crowley J, Chansky K, et al. The IASLC Lung Cancer Staging Project: Proposals for the revision of the TNM stage groups in the forthcoming (seventh) edition of the TNM classification of malignant tumours. J Thorac Oncol 2007; 2:706.

Staging

- PET Scan
  - Done in the absence of metastatic disease
  - Stages the mediastinal nodes and distant disease
  - 14% of the time picks up metastases not detected by other modalities
  - Does not evaluate the brain
- MRI Brain
  - Done in patients with tumors >clinical stage 1
  - Any symptomatic patients
- Physiologic Work up
  - Pulmonary function
  - Selective cardiac tests

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Staging

- If advanced disease on presentation
  - Bone scan
  - MRI brain
  - Or as directed to symptoms

  - Referral to medical/radiation oncology
  - No physiologic work up

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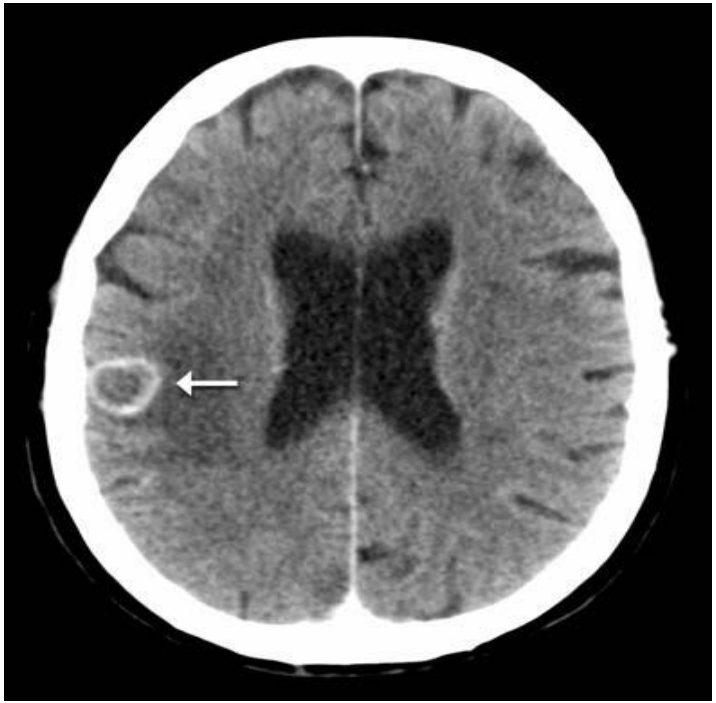
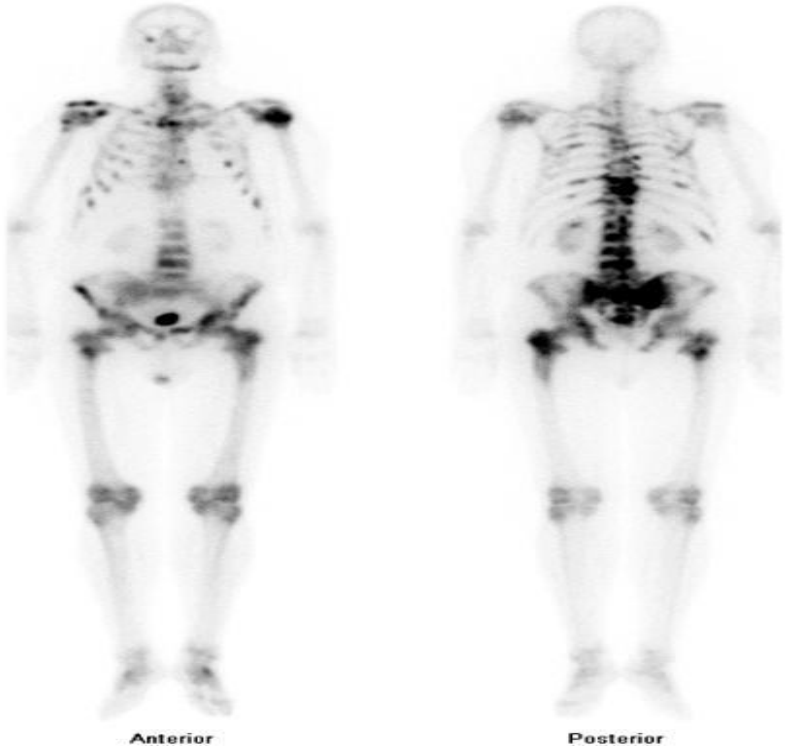
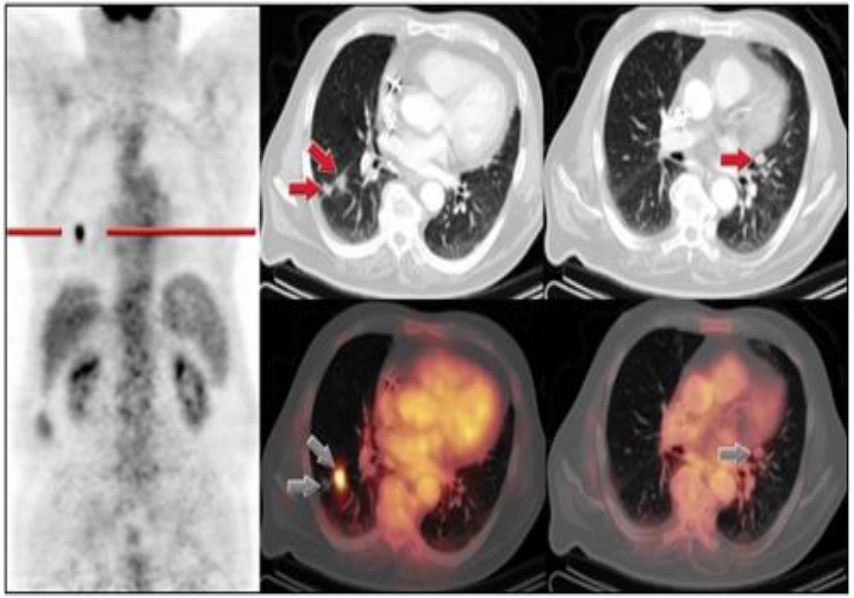
Staging





Staging – PET Scan

- Nuclear medicine scan
- Utilizes different rates of glucose metabolism in different tissues
  - ^{18}FDG (fluorodeoxyglucose) injection
- SUV (standard uptake value) helps determine malignancy
- PET-CT provides anatomic detail, improves diagnostic accuracy



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Physiologic Evaluation

- Key information on history regarding exercise tolerance
  - Flights of stairs

- All candidates for surgery have pulmonary function
- Echo should be done if considering pneumonectomy
- Cardiac evaluation as required
- If borderline, FEV 1< 60% , DLCO<60% may need
  - Exercise testing to determine VO2 Max
  - Post op predicted numbers must be 30-40%

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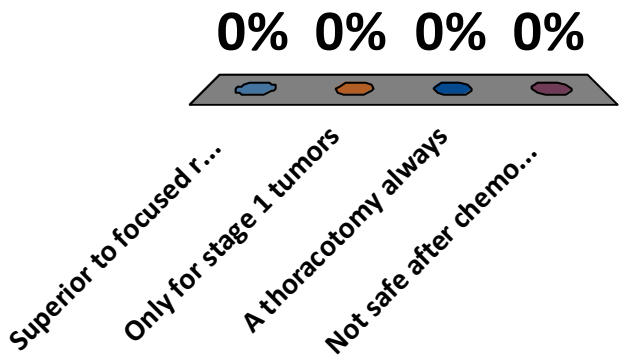
Question #4:

Surgery is:

- ✓ A. Superior to focused radiation (SBRT) for local control and staging
- B. Only for stage 1 tumors
- C. A thoracotomy always
- D. Not safe after chemotherapy and/or radiation



Treatment:

Surgery the first choice

Chemotherapy
Or
Radiotherapy
A distant
second choice

Non Surgical Therapy

- SBRT
  - Stereotactic body radiation treatment
  - Fractionated dosing in few treatments
  - accomplished by using multiple beams (typically 10 to 12)
  - Goal is to minimize damage to surrounding lung tissue
  - Local control approx. 90%

Role of Surgery

- Gold Standard of Treatment
- All patients with early stage disease
  - Stage 1 and 2
- Stage 3 disease (ipsilateral nodal mets)
  - Induction chemoradiation

  -Young patients

  -Non bulky nodal disease
- Pancoast/Superior Sulcus Tumors
  - Induction chemoradiation followed by surgery

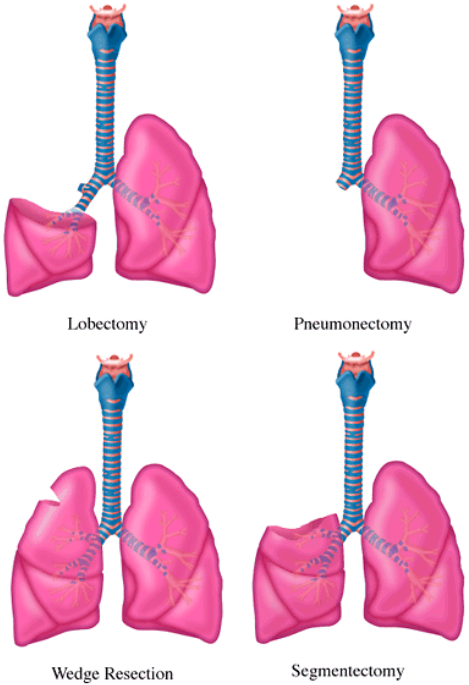
No Surgery

- Bulky Stage 3a disease
- Stage 3 b disease
- Stage 4 disease

  -except palliation of symptoms

  Ie. effusions

Surgery- Resections



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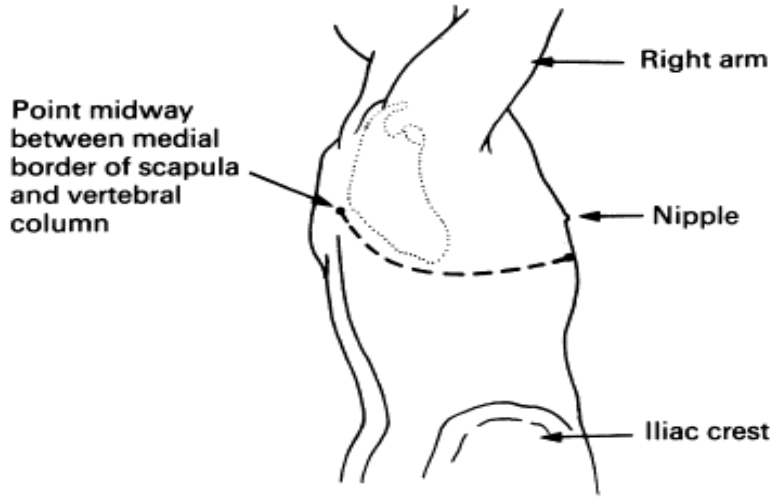
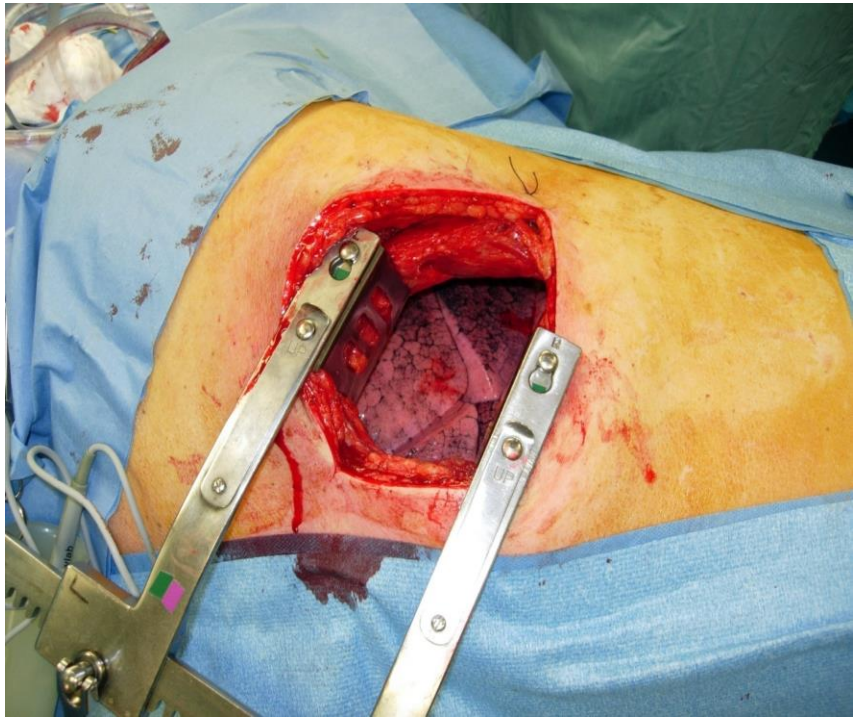
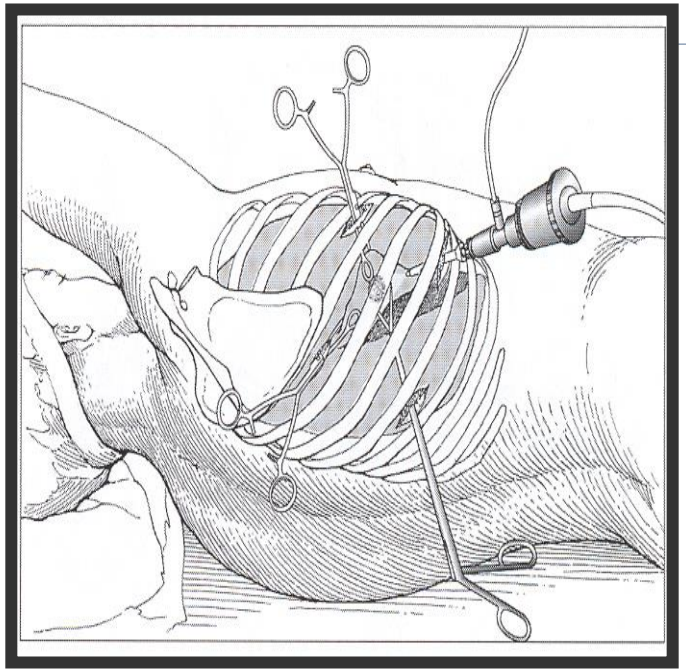
Thoracotomy

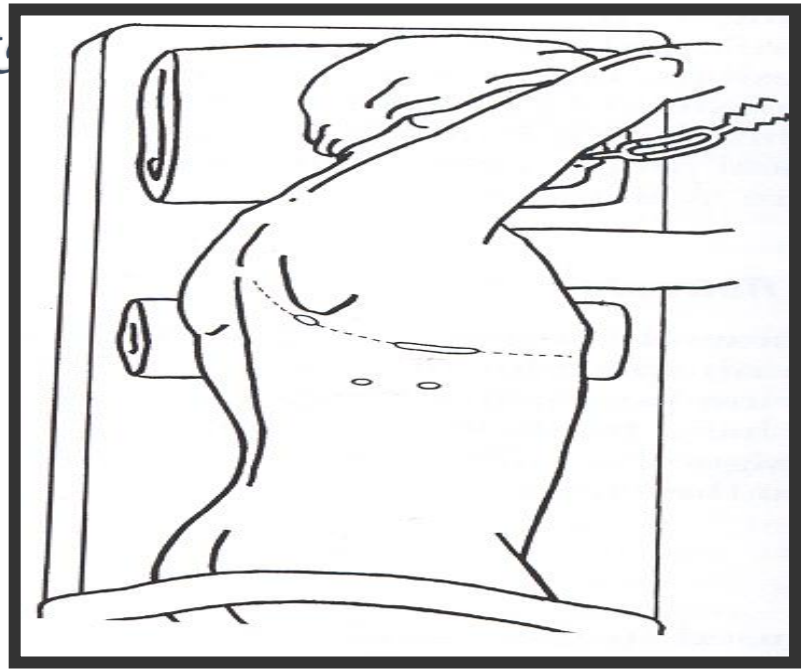


igure 1 Diagram showing the line of skin incision.

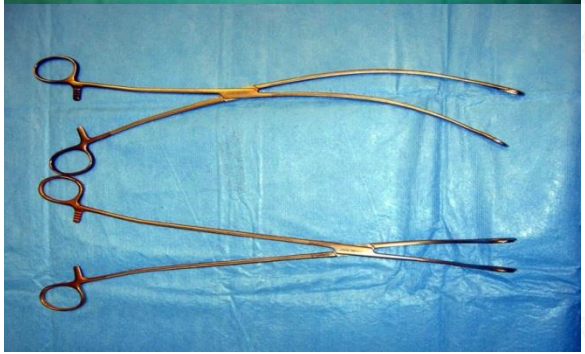


VATS





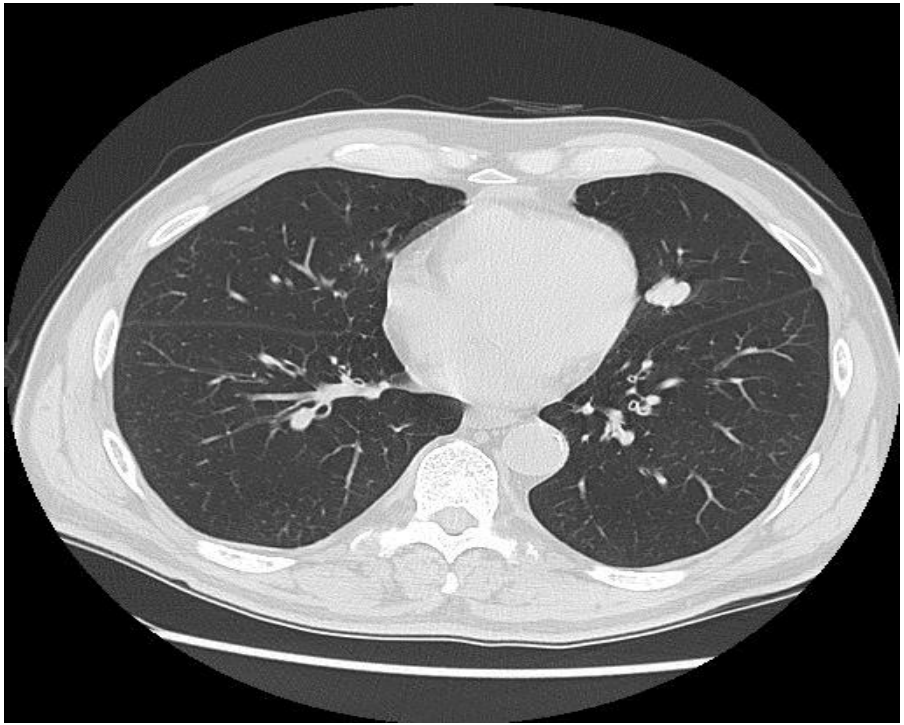
Equipment



VATS LOBECTOMY- Potential Advantages of Compared to Thoracotomy

- Reduced surgical trauma
- Decreased postoperative pain
- Faster return to full activity
- Shorter chest tube duration
- Shorter length of stay
- Preserved pulmonary function
- Superior cosmetic result
- Improved delivery of adjuvant therapy

VATS Lobectomy- Ideal



VATS Lobectomy- Not Ideal

Complications of Pulmonary Surgery

- Death
  - Lobectomy 1-2 %
  - Pneumonectomy 2-4%
- Pulmonary complications: PE, pneumonia, atelectasis
- Cardiac Complications: most common a fib
- Wound infection
- Bleeding
- Prolonged airleak
- Empyema 2-15% Post thoracotomy chronic pain

Follow up

- We follow our patients quite closely
- Q3months for 2 years
- Then q6month for 1 years
- Then yearly for 5 years total
- CXR, history and physical examination
- Annual CT scan
- Done for detection of metastases from their resected tumour
  - Also risk of developing 2nd malignancy
  - Approx. 2% per year

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Adjuvant Therapy

- Stage IB ≥ 4cm – consider adjuvant chemo
- N1 or N2 Disease
- Incomplete Resection

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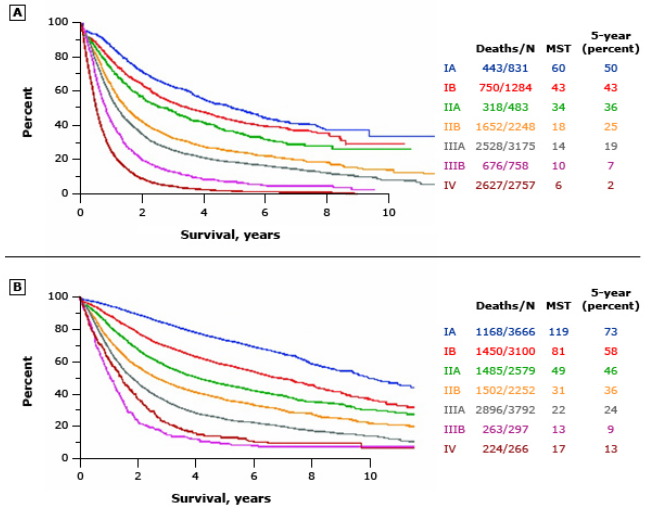
5 year survival- 17%

Overall survival by TNM grouping, non-small cell lung cancer



Overall survival, expressed as median survival time (MST) and five-year survival, using the seventh edition of TNM staging system by (A) clinical stage and (B) pathologic stage.

Question #5

With respect to screening for lung cancer:

1. It should be done on all smokers
2. A CXR is adequate
3. Has been shown to decrease lung cancer deaths
4. Is widely implemented in Canada

Question #5:

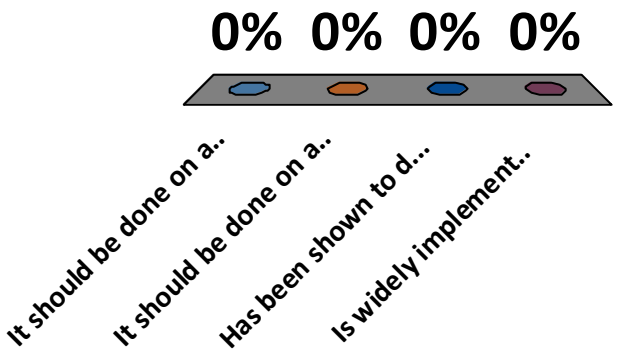
With respect to screening for lung cancer:

A. It should be done on all smokers

B. It should be done on all smokers

✓ C. Has been shown to decrease lung cancer deaths

D. Is widely implemented in Canada



Future- Screening

- National Lung Screening Trial
  - annual low-dose CT screening
  - in patients with a 30 pack-year history of smoking
  - including those who quit smoking in the preceding 15 years,
  - demonstrated a decrease in lung cancer and all-cause mortality
  - relative reduction in the rate of death from lung cancer of 20.0%

N Engl J Med 2011; 365:395-409 *August 4, 2011*

Future- Screening

Cancer Care Ontario Guidelines
Recommendation :
Screening for lung cancer with LDCT is recommended in high-risk
populations defined as persons 55 to 74 years of age with a minimum smoking history of ≥30 pack-years* who currently smoke or have quit within the past 15 years and are disease free at the time of screening.

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"Are you sure this is the only way
the nicotine patch will work for you?!"

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Thank You

References

- Up to Date
- Fleishner Society Guidelines 2013 for management of Solitary Pulmonary Nodules

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Surgical Update

Common Hand Injuries

For Primary Care Physicians

Dr. Alexander Golger

Plastic Surgeon

OCTOBER 16, 2014

Introduction

Injuries of the hands are a common reason for visits to primary care clinics and emergency departments, comprising approximately 10% of all admissions.

A series of 1,000 consecutive hand injuries showed the following distribution: 42% lacerations, 27% contusions, 17% fractures, and 5% infections. Hand injuries account for about 17% of all workday loss injuries.

To care for such injuries well and communicate the extent of the injuries to the specialist, clinicians must have a sound grasp of basic hand anatomy.

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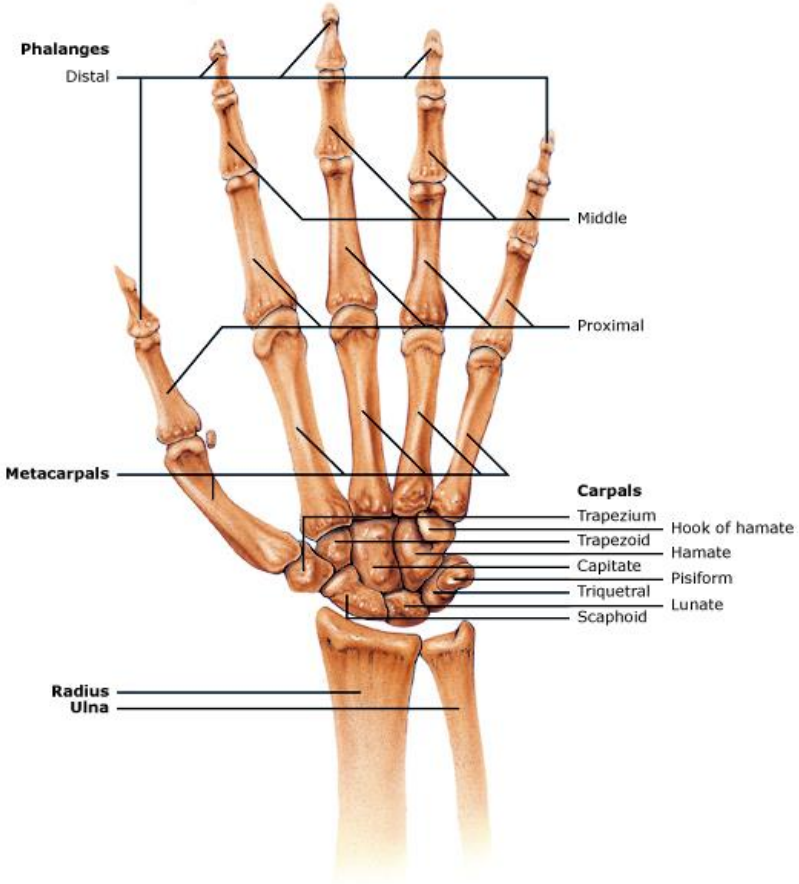

Joints:
Distal inter phalangeal (DIP)
Proximal inter phalangeal (PIP)
Metacarpal Phalangeal (MCP/MP)
Carpometacarpal (CMC)

Thumb:
Inter phalangeal (IP)
Metacarpal Phalangeal (MCP/MP)
Basal/Carpometacarpal

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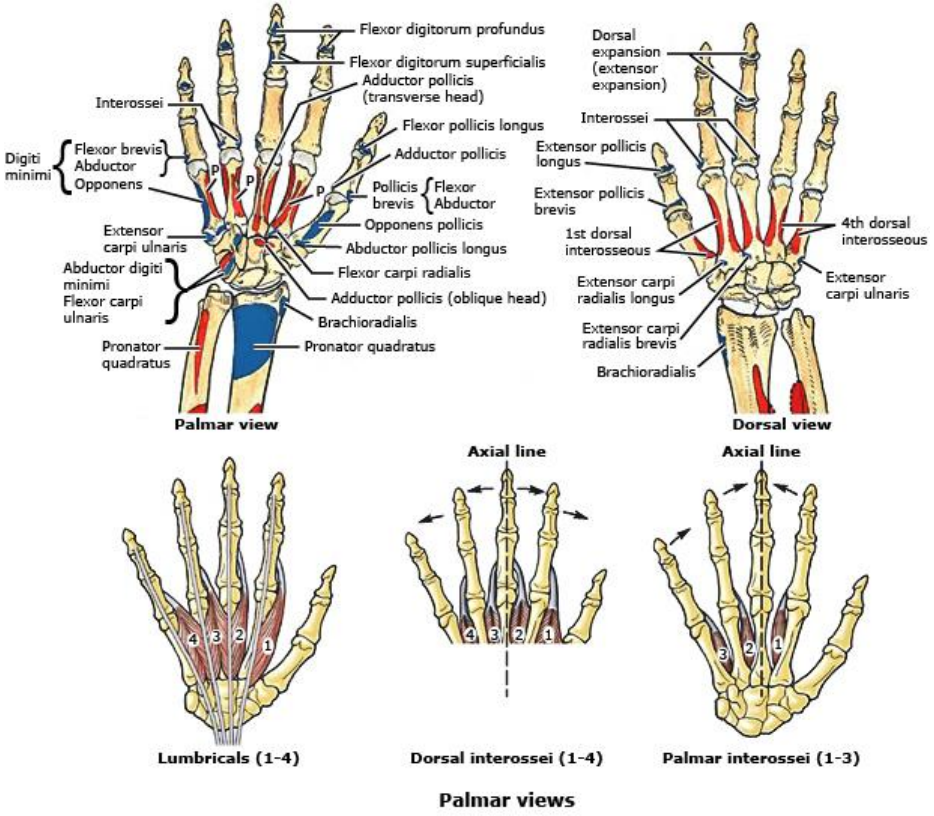
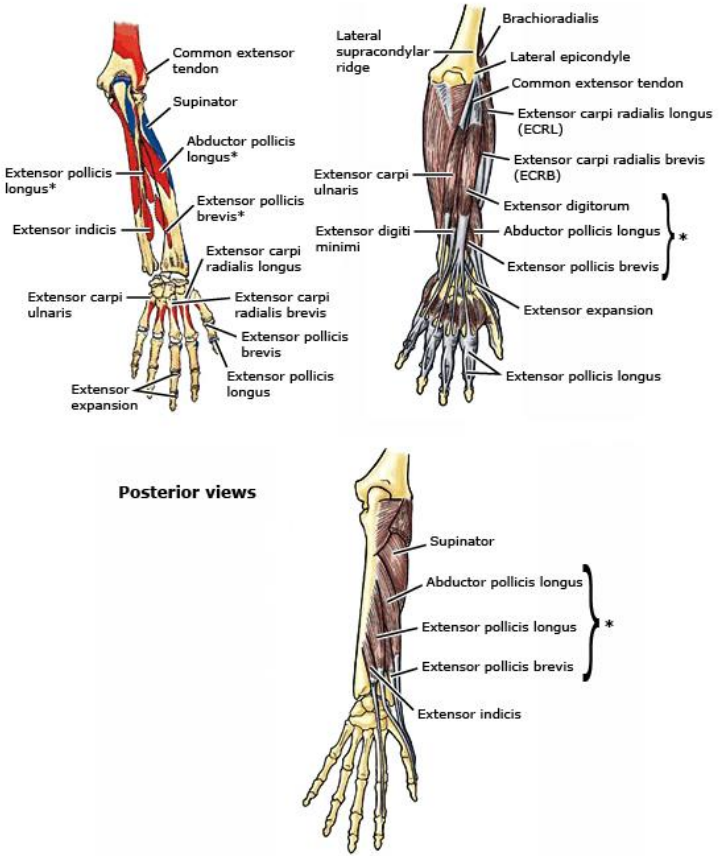
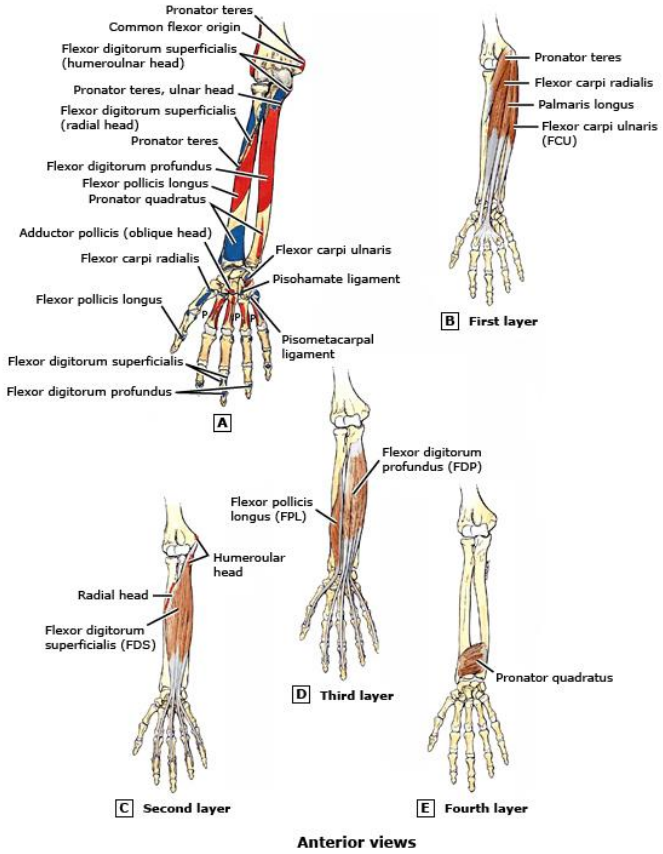
INTRINSIC MUSCLES OF THE HAND



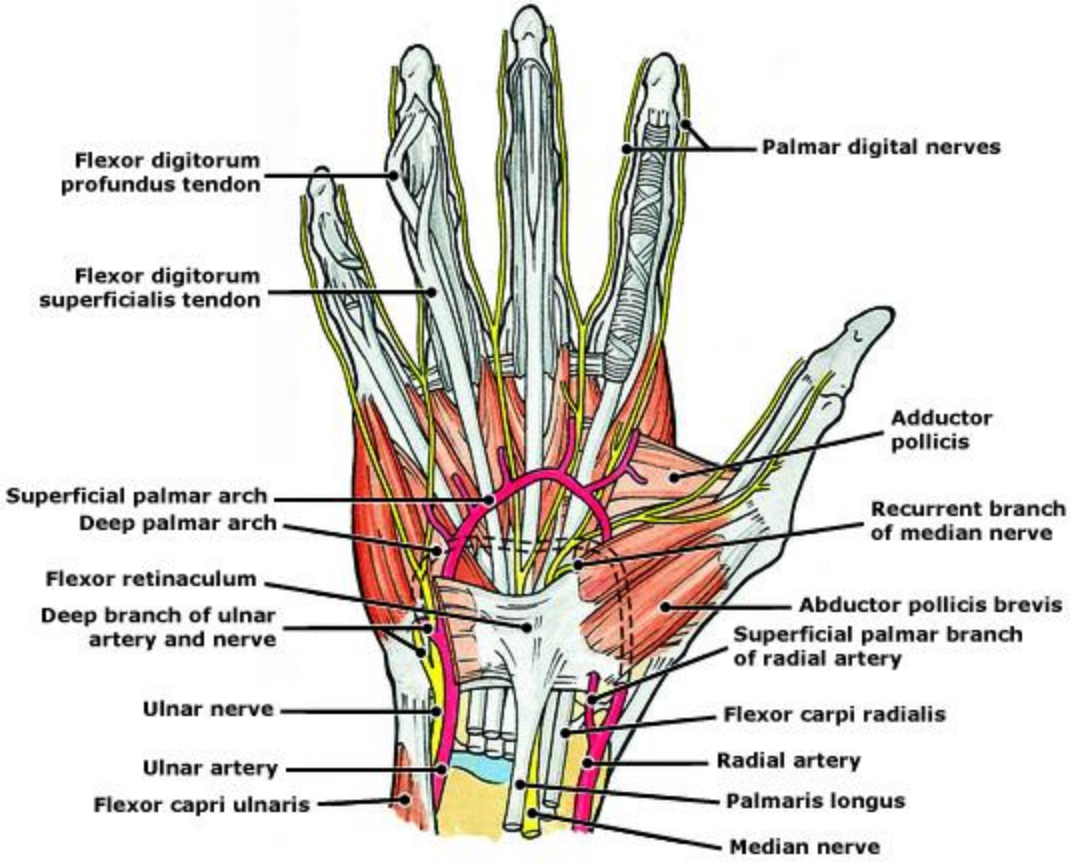
POSTERIOR COMPARTMENT OF THE FOREARM



ANTERIOR COMPATMENT OF THE FOREARM



NEUROVASCULAR ANATOMY OF THE PALM



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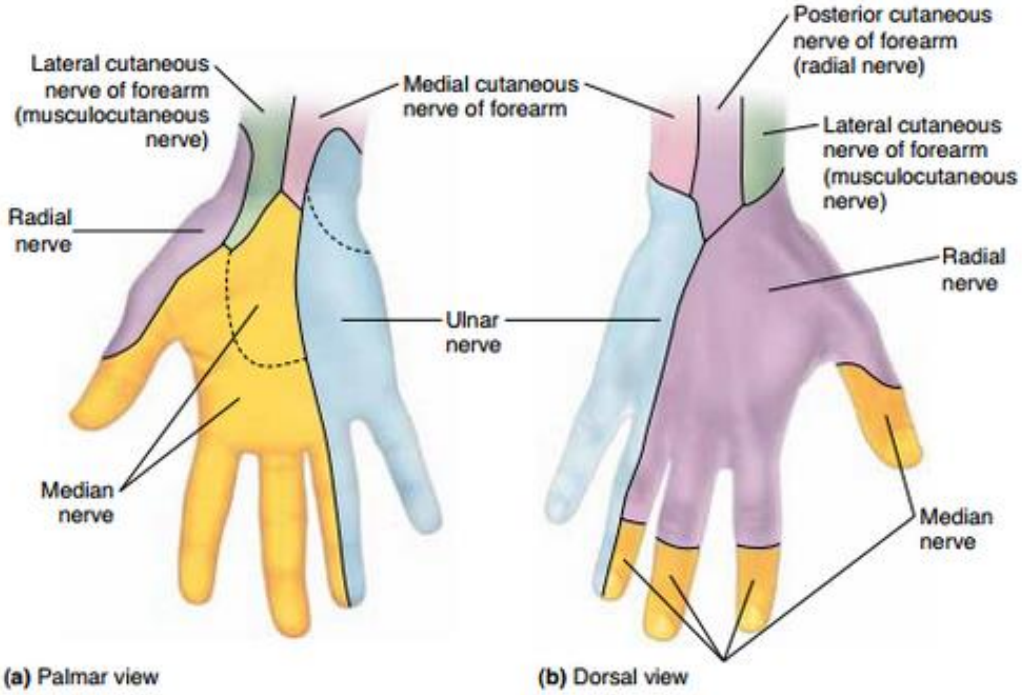
Lateral cutaneous nerve of forearm (musculocutaneous nerve)
Medial cutaneous nerve of forearm
Radial nerve
Ulnar nerve
Median nerve
(a) Palmar view
Posterior cutaneous nerve of forearm (radial nerve)
Lateral cutaneous nerve of forearm (musculocutaneous nerve)
Radial nerve
Median nerve
(b) Dorsal view

Question 1

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Question #1:

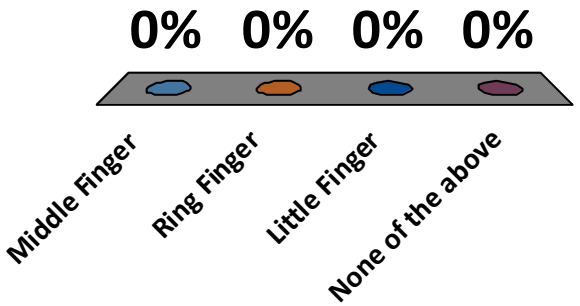
Which of the fingers FDP is completely lacerated?

A. Middle Finger

B. Ring Finger

C. Little Finger

D. None of the above



Question 2:

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Question #2:

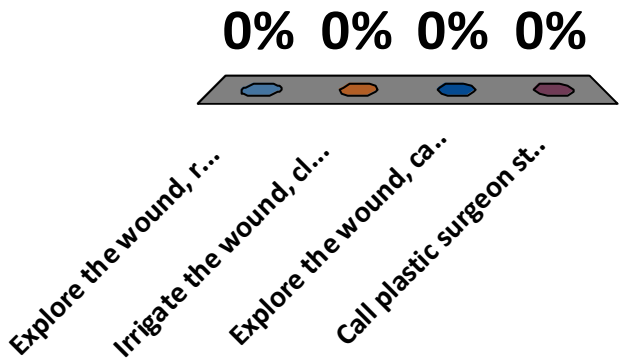
What would be the appropriate emergency room treatment for the deep laceration?

A. Explore the wound, repair injured structures, refer to a plastic surgeon

B. Irrigate the wound, close the laceration, if no functional losses, arrange for suture removal with family doctor

C. Explore the wound, call plastic surgeon on call for emergency surgery

D. Call plastic surgeon stat to ER



Question 3:

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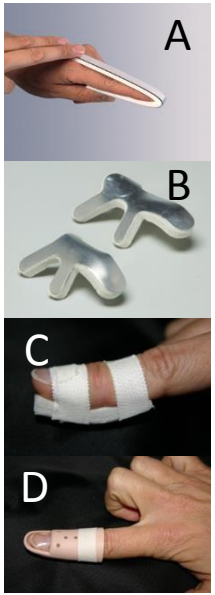
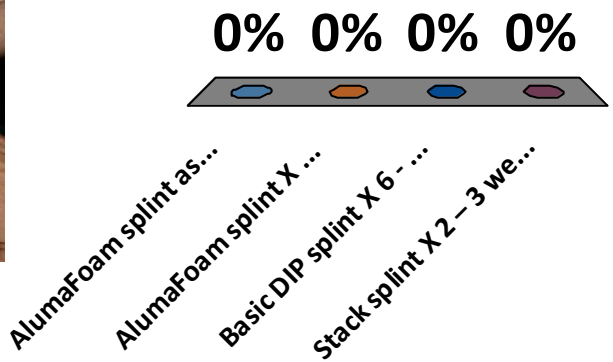
Question #3:

What is the appropriate treatment for the above injury?

A. AlumaFoam splint as needed
B. AlumaFoam splint X 6 weeks 24/7
C. Basic DIP splint X 6 - 8 weeks 24/7
D. Stack splint X 2 – 3 weeks until healed





HAND LACERATIONS

Taking relevant history

- Dominant hand, occupation, immunization, comorbidities, meds, allergies
- Mechanism of injury
- Time of the injury
- Precise side and site of the injury

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Mechanism of injury

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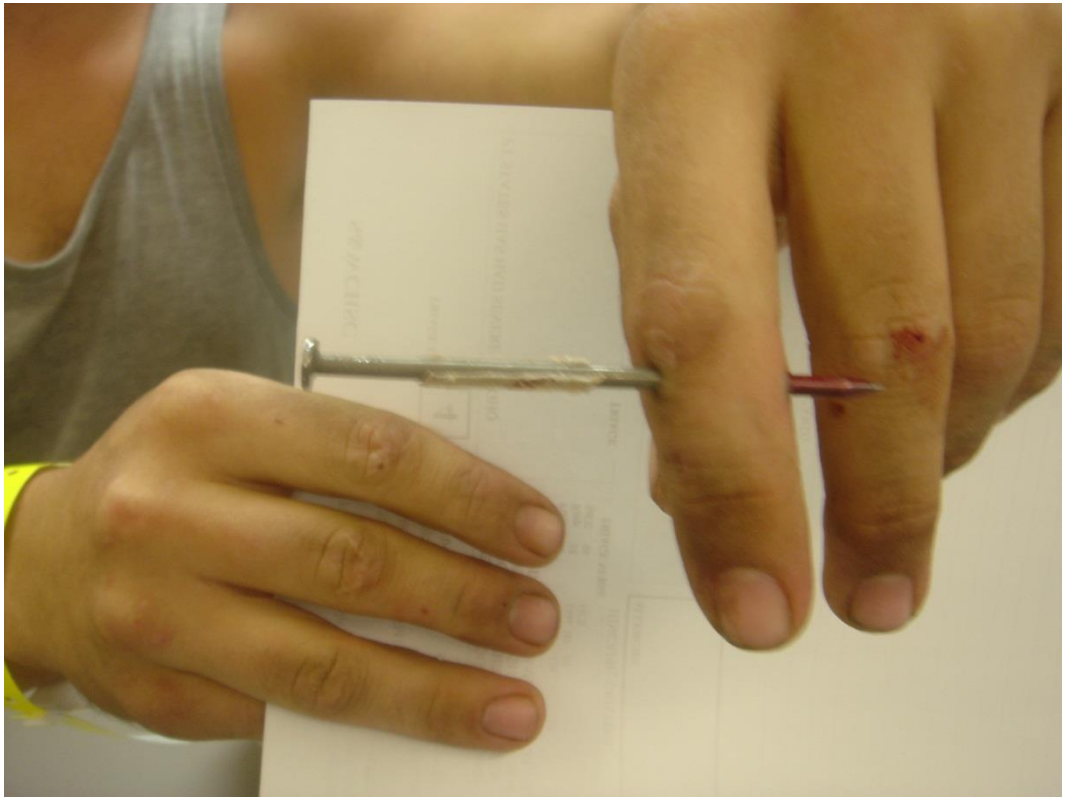
Mechanism of injury



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Mechanism of injury

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Physical Examination

Observation

Location of the laceration, hand or finger posture, swelling, color, erythema, compared to opposite hand

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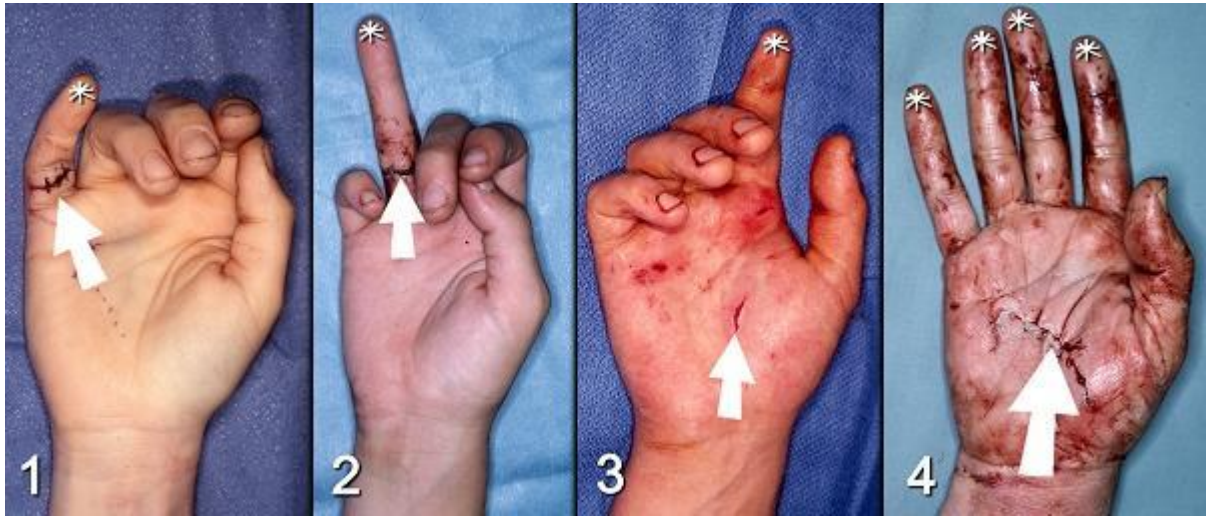
Physical Examination

Observation



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Physical Examination

Based on functional anatomy

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Physical Examination

Based on functional anatomy

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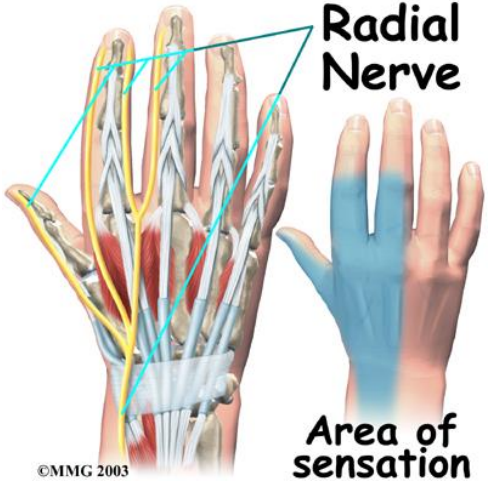
Physical Examination

Based on functional anatomy



Sharp/Dull and Two point discrimination can be quickly Assessed with a paper clip

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Physical Examination

Based on functional anatomy

Allen's test

Capillary refill test

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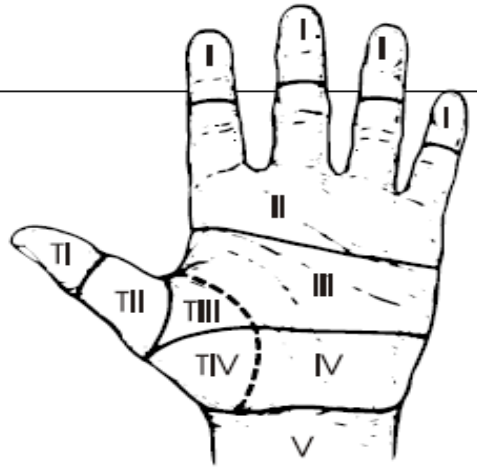
Flexor Tendon Injuries

		Fingers	Thumb	Significance
Location:	Zone I	FDP insertion to FDS insertion	At FPL insertion	Good outcome
	II	FDS insertion to proximal A1 pulley	FPL insertion to proximal A1 pulley	Worse outcome ("no man's land")
	III	A1 pulley to carpal tunnel	Within thenar compartment	Good outcome
	IV	Within Carpal tunnel	Within Carpal tunnel	Variable outcome
	V	Proximal to carpal tunnel	Proximal to carpal tunnel	Excellent outcome (except spaghetti wrist)
Extent:	Complete			
	Incomplete			
Type:	Laceration			
	Avulsion			
	Rupture			



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Flexor Tendon Injuries

Timing of Surgical Treatment			
	Time course	Advantage/Disadvantage	Indications/contraindications
Primary	within 24 hrs	Not necessary, may not be optimal	Contraindications: • Severe, multi-level injury § • Contamination - esp human bite • Significant skin/soft tissue loss § • Unstable fractures not rigidly fixated • Unrepairable pulley system § • Concomitant injuries/medical condition
Delayed primary	up to 2 weeks	Best option - yields equivalent or better results than primary	Contraindications: • Unstable fractures not rigidly fixated • Active infection • Unstable soft tissue §
Secondary: Early	2 - 5 weeks	Comparable outcome	• May be undertaken as soon as skin heals & joints regain PROM
Late	> 5 weeks	Worse outcome - due to muscle shortening & tendon end resorption	Indications: • Late presentation • Other injuries • Pre-existing finger deformities (eg flexion contracture)

§Probably relative indications

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Flexor Tendon Avulsion (Jersey finger)

- Avulsion of FDP at its insertion is a common, mostly athletic injury (contact sports)
- Mechanism is *forced extension* of the FDP during *maximal contraction*
- Ring FDP is involved in ~75% of cases
- Males > Females

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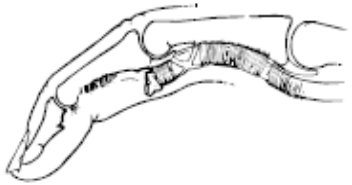
Flexor Tendon Avulsion (Jersey finger)

Type		Tendon position	Significance	
I	Both vincula ruptured	Tendon end retracts to palm	Repair within 7-10 days before significant contraction & tendon ischemia set in	
II	Long vinculum intact	Tendon retracts to PIP with or without small bone fragment	Less devascularization and shortening - late primary repair possible	
III	Fracture-avulsion	Tendon held up at A4 pulley by bone fragment	ORIF required	
IV (Smith)	Fracture of P3 with avulsion of FDP from bone fragment	Tendon retracts to palm	ORIF + tendon reinsertion required	

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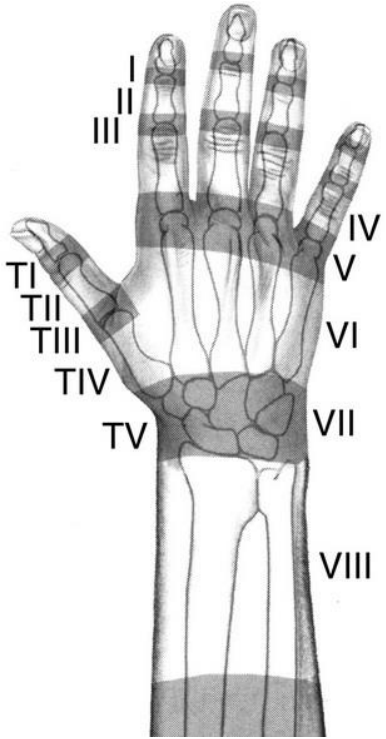
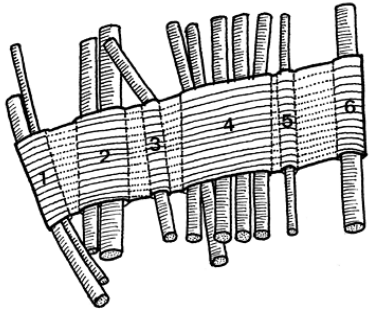
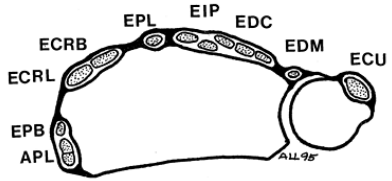
Extensor tendons injuries







Extensor tendons injuries

Zone I
Running stitch which incorporates both tendon and skin (dermatotenodesis)

Zone II
Core type suture difficult to use because of tendon thickness
Running stitch and cross stitch

Zone III - V
Core suture – modified Kessler or Bunnell – 4.0 or 5.0 nonabsorbable braided suture with a small tapered needle to prevent shredding of the thin flat tendon
Epitendinous suture – cross stitch – dorsal surface only – 5.0 nonabsorbable monofilament

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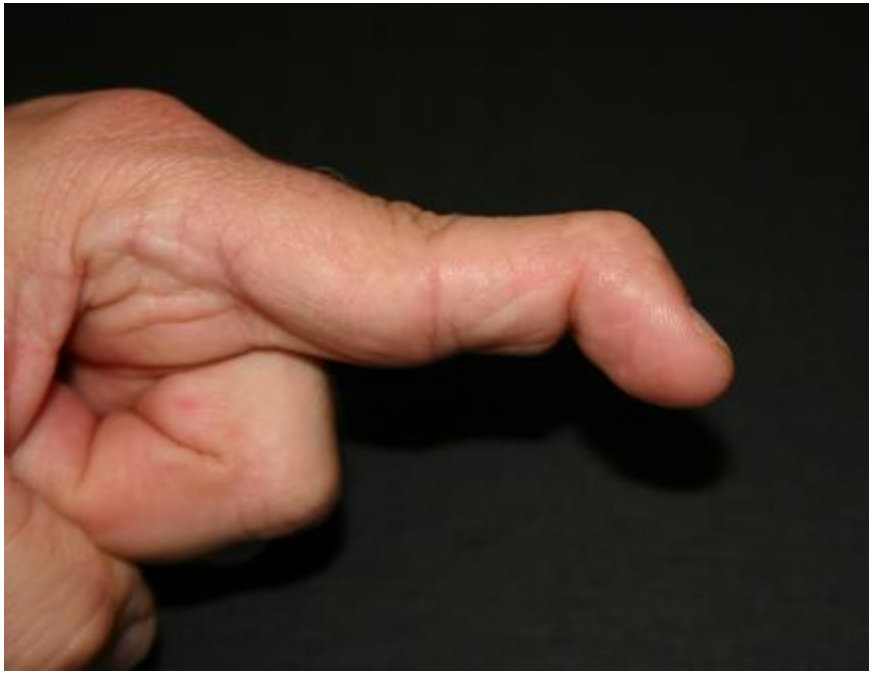
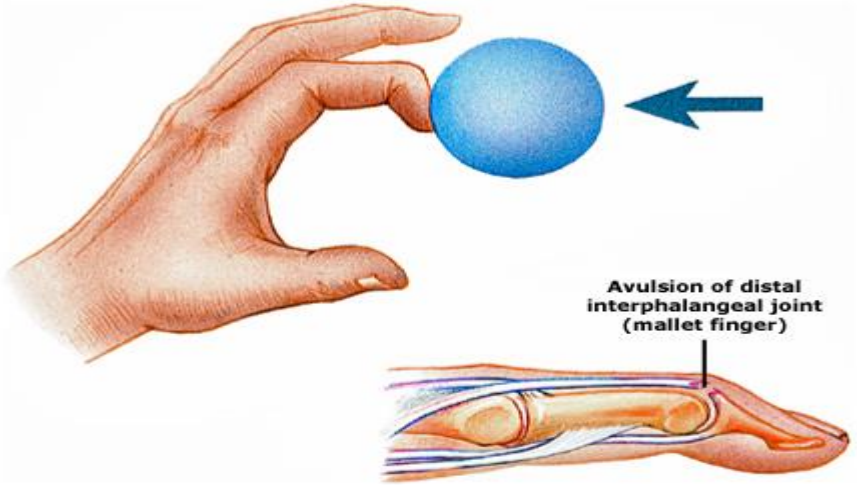
Extensor tendons injuries

Zone 1 Extensor injury – **Mallet** finger deformity



Extensor tendons injuries

Mechanism of mallet finger injury



Mallet finger occurs most commonly during a direct blow to the tip of the finger, such as when a ball strikes the fingertip or the fingertip strikes a rigid surface

Less frequently, a mallet finger may occur as part of finger injuries involving dorsal lacerations or crushing mechanisms

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Extensor tendons injuries - Mallet

Type I closed blunt trauma leads to loss of tendon continuity with or without a small avulsion fracture (most common)

Type II laceration at or proximal to the DIPJ with loss of tendon continuity

Type III deep abrasion with loss of skin, subcutaneous tissue and tendon substance

Type IVA Salter-Harris type II injury

Type IVB articular surface fracture involving 20-50% joint surface

Type IVC articular surface fracture > 50% and early or late volar subluxation of the distal phalanx

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Extensor tendons injuries (mallet finger)

INDICATIONS FOR REFERRAL — The majority of mallet finger injuries can be managed by primary care clinicians, but more complex injuries warrant evaluation by a hand surgeon. Commonly accepted indications for surgical referral include:

- Inability to achieve full passive extension of the DIP joint
- Full laceration of the extensor tendon
- Volar (palmar) subluxation of the distal phalanx
- Fracture involving greater than 30 percent of the joint surface

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Extensor tendons injuries

Treatment
(mallet finger)

- splint can be applied to either the palmar or dorsal surface of the middle and distal phalanx .
- the splint should be bent slightly to stabilize the DIP joint in 5 to 10 degrees of hyperextension
- Immobilize DIP in full continuous extension for 6 - 8 weeks (24/7)

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Fingertip Injuries

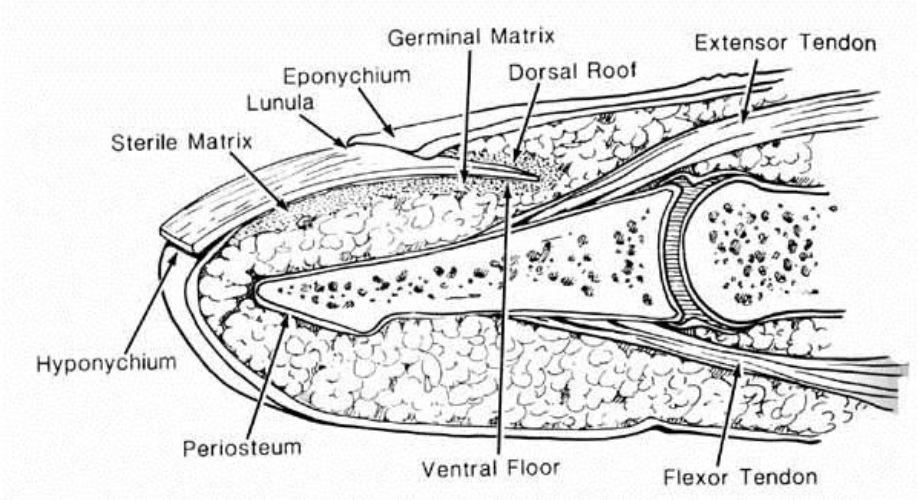
Definition

Portion of digit distal to insertion of flexor and extensor tendons

Epidemiology

Almost half of all hand injuries presenting to the ER involve the fingertip

Middle fingertip most likely to be injured, followed by ring, index, little, thumb (longest to shortest)



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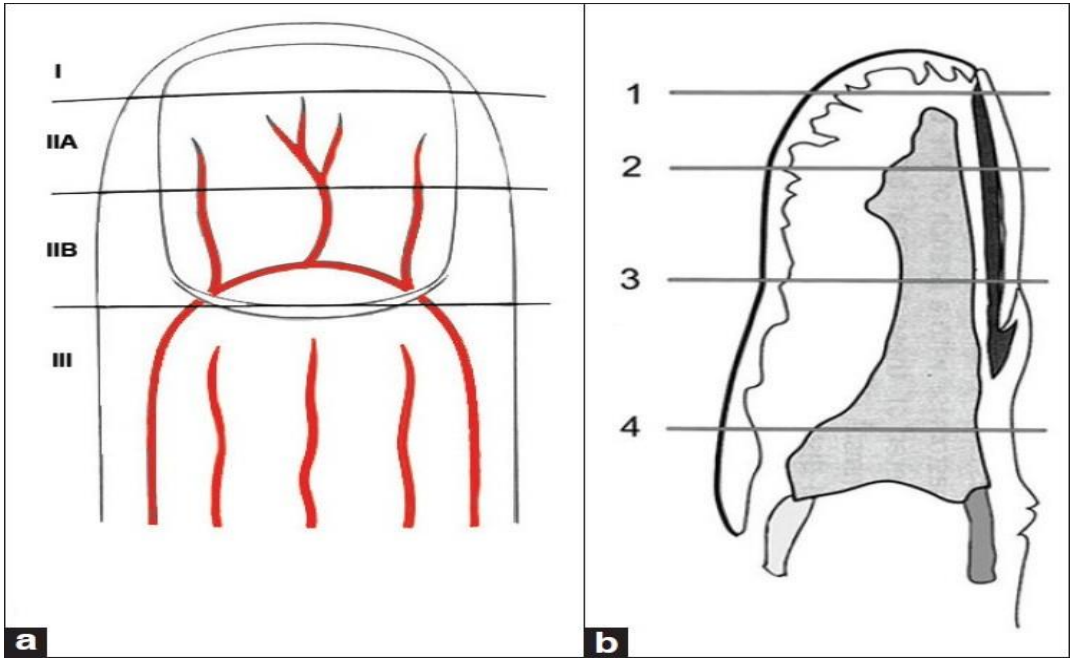
Fingertip Injuries

Allen's classification



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Fingertip Injuries
Management

- Analgesic ± local anaesthetic
- Tetanus prophylaxis
- X-ray
- Wound I&D
- Prophylactic antibiotics (grossly contaminated, immunocompromised, diabetic)
- Wound closure - technique depends on:
  pattern of skin & pulp loss
  bone - covered vs. exposed; fractures
  nailbed injuries - level, severity

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Fingertip Injuries
Management

- Composite graft
- Secondary healing
- Bony shortening and secondary healing or primary closure
- Skin graft
- Local / regional flaps
- Free flap

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Fingertip Injuries
Management

Composite grafting of amputated tip

- Greatest success distal to lunula, small children
- Alternatively, reapply to defatted skin as full thickness skin graft

Advantages: preservation of length, cosmetics
Disadvantages: poor survival; decreased sensation

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Fingertip Injuries
Management

Primary closure
Absorbable or non-absorbable suture

Advantages: Faster healing time and less wound care than secondary healing; better sensation than skin graft or flap

Disadvantages: May be difficult to perform without excessive tension; may lead to hook nail deformity if nail bed drawn over fingertip; sensory function no better than healing by secondary intention

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Fingertip Injuries
Management

Secondary healing
Daily cleansing of tip with warm, soapy water, then apply bandage and polysporin
Advantages: Better sensation than skin grafts or flaps because as wound contracts innervated glaborous skin covers part of fingertip; rapid; inexpensive; no donor morbidity; no risk joint contracture or other iatrogenic injury (c.f. local flaps)
Disadvantages: Prolonged healing may delay return to work; potential sensitivity or unstable scar if insufficient bony padding

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Fingertip Injuries

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Fingertip Injuries

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Fingertip Injuries

Therapy: Once wound is healed, may require tip desensitization therapy, ROM exercises, Coban wrapping if swollen

Outcome:

- healing usually within 3-6 weeks
- manual labourers generally return to full duties within 6-8 weeks

Sequelae of injury (regardless of treatment approach):

- cold sensitivity
- dysesthesias, hyperesthesias
- numbness
- painful neuroma

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Thank you
Questions please

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21 Questions! Rotator cuff disorders and Osteoarthritis

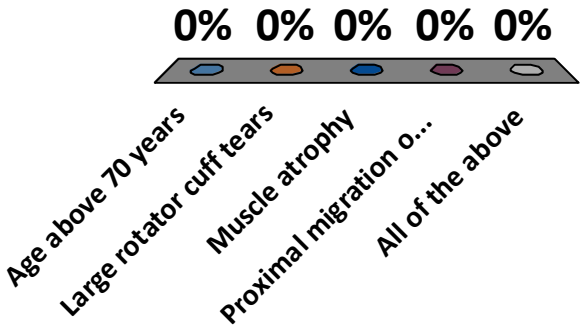
Samir Chhabra

Orthopedic Surgeon Lakeridge Health

Question:

These are poor prognostic signs for a surgical repair of rotator cuff tears:

A. Age above 70 years
B. Large rotator cuff tears
C. Muscle atrophy
D. Proximal migration of humeral head
✔ E. All of the above



Rotator Cuff Disorders

Objectives:

- Clinical Evaluation
- Role of X-rays, Ultrasound and MRI
- Management

Q.1 Who suffers from rotator cuff disorders?

- Age group – middle age onwards

Q2. Symptoms and signs?

History

- Pain – laterally, upper third arm. Night pain
- Weakness

Examination:

- Atrophy
- Range
- Power

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Power testing of the rotator cuff

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Power testing of the rotator cuff

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Power testing of the rotator cuff

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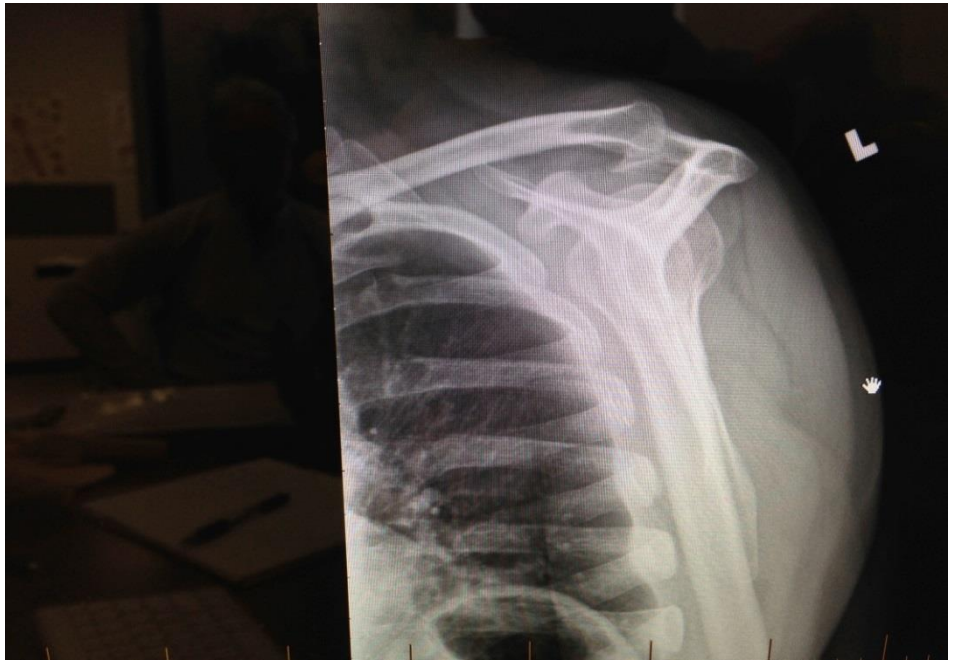
Q3. Which investigation should I order?

- X-rays
- Ultrasound
- MRI

X-Ray



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USG

- Advantages
    a. Non- invasive
    b. When MRI is contraindicated
    c. Readily available
    d. No wait time!!
- Disadvantages
    a. Operator dependent
    b. Not as sensitive and specific as the MRI

Probably its use is as a screening tool

MRI

Not for all patients !

- Elderly (Physiologically 70 – 75 years).
- Differentiate between frozen shoulder and rotator cuff disorders

Q4. How do I treat rotator cuff disorders?

Conservative:

- Analgesics and anti-inflammatories
- Physiotherapy
- Corticosteroid injections

Q5. What is role of surgery ?

Traumatic – with or without shoulder dislocation

Failure of conservative management.

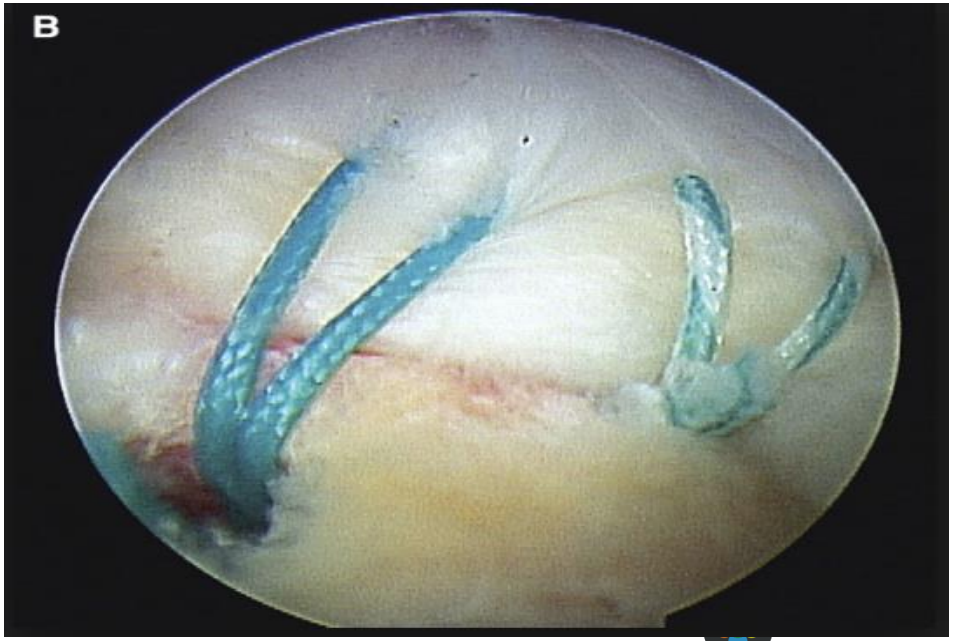
Rotator cuff tears in the elderly- don’t do well with repairs – consider reverse shoulder arthroplasty

Q.6 Types of surgery?

Arthroscopic repairs

Mini open repairs

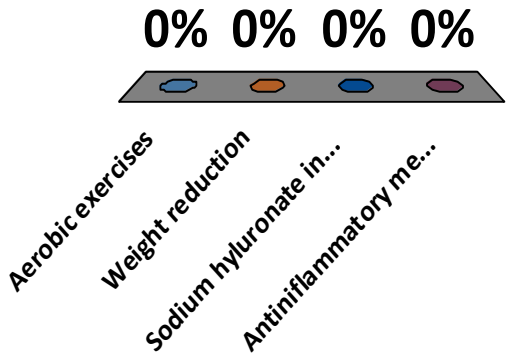
Tendon transfers



Question:

Validated options for conservative management of Osteoarthritis includes all of these modalities EXCEPT:

A. Aerobic exercises
B. Weight reduction
✓ C. Sodium hyluronate injections
D. Antiniflammatory medications



Osteoarthritis of knees /hips

Observations:

- Occurring in younger patients
- Patients living longer – a major problem in the elderly
- Expectations from reconstruction/ replacement

Q7. Conservative management – Exercises? Do they work ?

Low impact aerobic exercises

Aquatic exercises

Self management programs

Aerobic exercises

Aerobic	Muscle-Strengthening
• Walking • Dancing • Swimming • Water aerobics • Jogging • Aerobic exercise classes • Bicycle riding (stationary or on a path) • Some activities of gardening, such as raking and pushing a lawn mower • Tennis • Golf (without a cart)	• Exercises using exercise bands, weight machines, hand-held weights • Calisthenic exercises (body weight provides resistance to movement) • Digging, lifting, and carrying as part of gardening • Carrying groceries • Some yoga exercises • Some Tai chi exercises

Q7. Conservative management – weight loss? Does it work ?

WEIGHT LOSS if BMI > 25

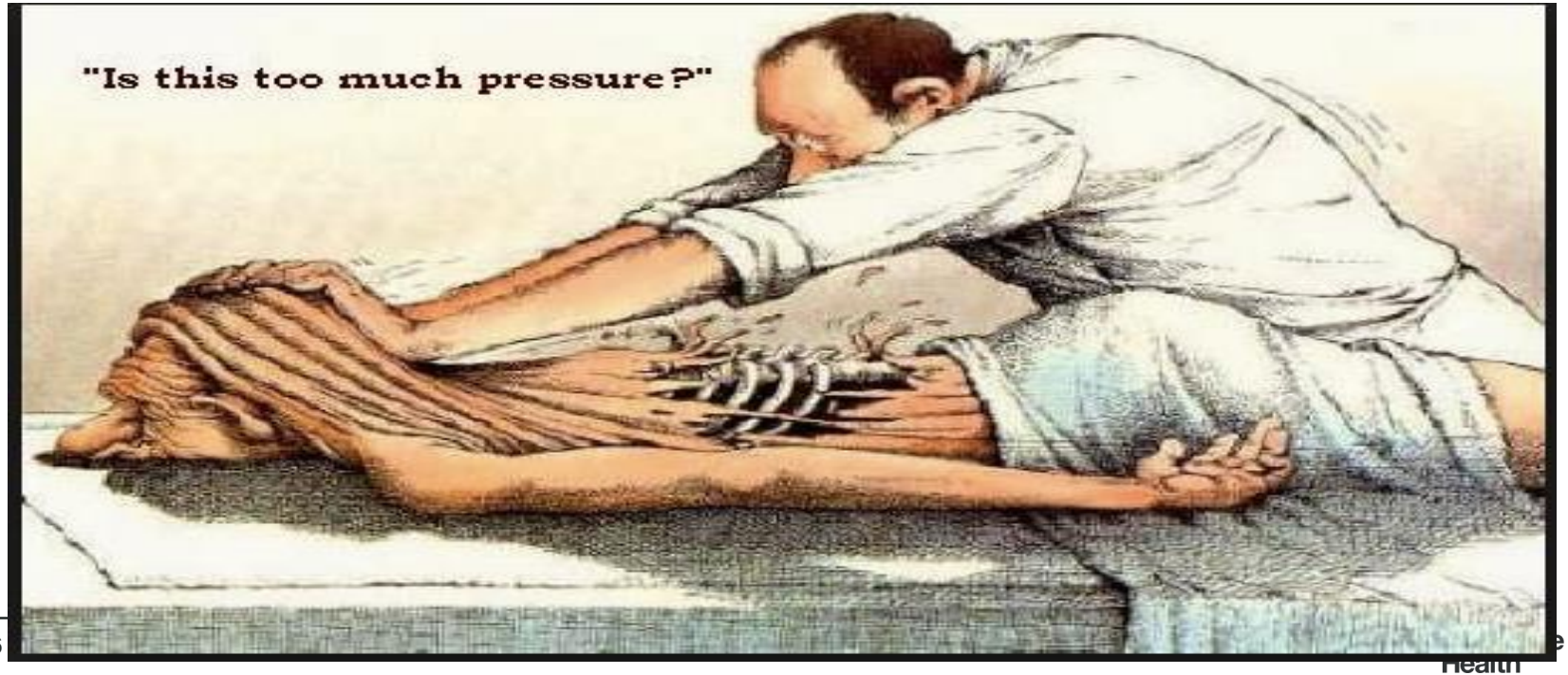
Q8. Conservative management – Acupuncture? Does it work ?

Acupuncture- Existing evidence shows that it does not work

Q9. Conservative management – Physical agents? Do they work ?

TENS, Short wave diathermy, Ultrasound – results are inconsistent

Q10. Conservative management – Massages? Do they work ?



Q11. Conservative management – Braces and Orthotics? Do they work ?

Unloader brace- inconclusive

lateral wedge insoles for patients with symptomatic medial compartment osteoarthritis of the knee – **Does not work!!**

Q12. Conservative management –Chondrotin and glucosamine? Do they work ?

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Q14. Conservative management – Hyaluronic acid? Do it work ?

Sodium Hyaluronate

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Q14. Conservative management – Hyaluronic acid? Do it work ?

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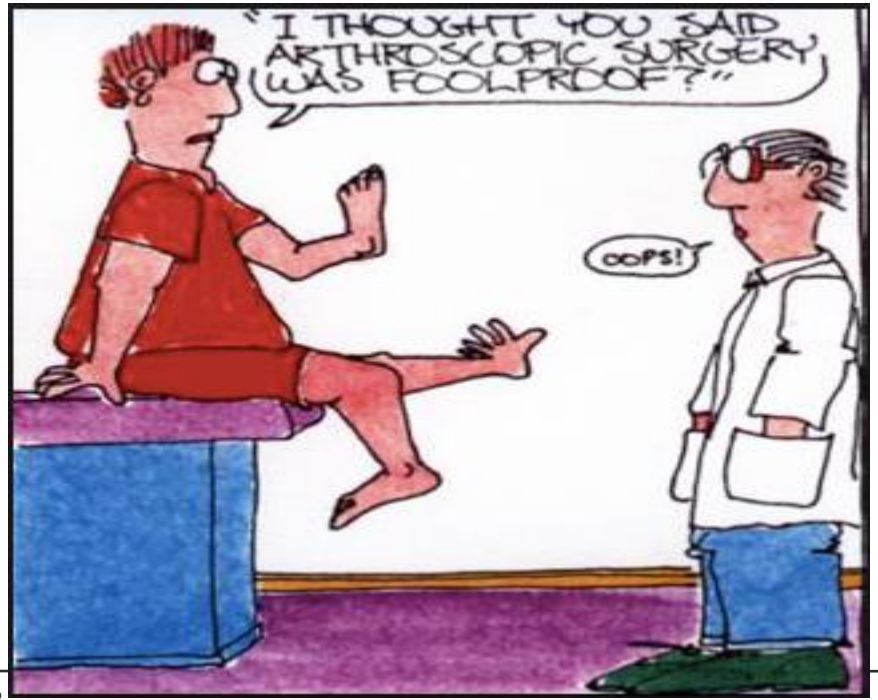
Q15. Conservative management – Cortocosteroid injections? Do they work ?

Inconclusive

Similarly with platelet rich plasma

Q16. Operative management –Arthroscopic lavage? Does it work ?



NO- DOES NOT WORK!!

Only if mechanical symptoms such as locking or giving way, then may help

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Q17. Operative management –Tibial Osteotomies ? Do they work ?

Limited evidence

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Q18. Operative management –Arthroplasty- hips

Probably the most successful operation

Stood the test of time

Survival improving with less complications

Types- metal on plastic, metal on ceramic, metal on metal

Q18. Operative management –Arthroplasty- hips Role of various types

Commonest- metal on plastic

Younger patients- Metal on Ceramic

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Q.19 Role of Metal on Metal hip replacements

Young male < 65 yrs

Large frame

Surgeon well versed with

the procedure

Aware of complications: pseudotumours / fractures

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Q20. Total knee replacements?

Good operation

Results not as great as one would expect

Takes quite a while to get better

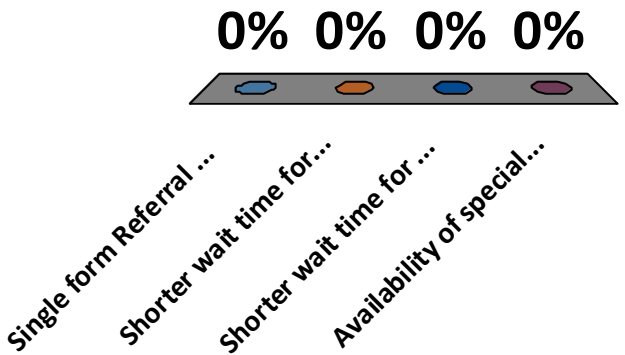
About 10-15% dissatisfaction rate

Certainly motivation to get better plays a BIG ROLE in getting a good result!!

Question:

Orthopedic services to the community physicians can be improved maximally by:

A. Single form Referral sheet
B. Shorter wait time for consultation
C. Shorter wait time for surgery
D. Availability of specialist opinion via phone or text/email during office hours

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Next event: April 30th 2014

Potential future topics:

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- **Plastic Surgery**
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- **Otolaryngology**
- **Thoracic Surgery**
- **Urology**
- **Anesthesia**
- **Obstetrics and Gynaecology**

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