

MCC QE II Preparation Course

Data Gathering

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Objectives

- Stations
- Spectrum of Clinical Problems
- History and Physical Examination
- Laboratory Data
- Differential Diagnosis
- Cases

Before we get started...

- I expect there is plenty of experience and expertise in the class
 - some may have expertise in some / all areas
 - some may be generalists or specialists
 - Canadian Health care setting may / may not be different from what you've been examined on before.
 - The exam style may be novel to you.

Stations

- Five + Five Minute Couplet Station
 - 5 minutes with patient
 - 5 minutes to answer questions
- Ten Minute Comprehensive Station
- Be sure to review the pamphlet from the MCC.

Spectrum of Clinical Problems

- Five Problems in Medicine
 - diagnosis
 - therapy
 - prevention
 - prognosis
 - harm
- We think of these problems implicitly, but at some risk.
 - ‘cough therefore antibiotics’
 - but what’s the working diagnosis?

Spectrum of Clinical Problems

- The most frequent problems are ...
- Diagnosis
 - What disease is responsible for the abnormalities?
- Therapy
 - What treatment is appropriate - if any - for the disease

Medical History

- Functions
 - suggests a diagnosis
 - guides therapy and prognosis
 - suggests preventative strategies

 - establishes rapport
 - establishes trust
 - gives a physician time to think
 - medical-legal documentation

Medical History

- Identifying Data
- History of Present Illness
- Past medical History
- Family History
- Psycho-social History
- Medications
- Allergies
- Review of Systems

Medical History

- Remember to use 'lay language'
- Grade 10 - 12 is about right.

Medical History

- ID
 - name
 - age
 - sex
 - +/- occupation
 - +/- handedness (neurology cases)
 - tend not to add race unless it adds something

Medical History

- ID
- This is a 28 year old female homemaker.

Medical History

- Chief Complaint
 - Why did the patient come to the clinic?
 - In the patient's own words
 - e.g. 'my chest hurts', not 'angina pectoris'

Medical History

- History of Present Illness
 - Descriptive Phase
 - establishes a presentation
 - Diagnostic Phase
 - establishes a working and differential diagnosis

Medical History

History of Present Illness

- Descriptive Phase
 - let patient speak freely for a few moments but guide the interview once the information is not useful then...
 - duration, onset, progression
 - has the patient had this before
 - location and radiation
 - quality and severity
 - associated symptoms
 - aggravating and relieving factors

History of Present Illness

- When finished, should be able to create a paragraph...

‘The patient was well until 3 days ago when she developed a sudden onset of left sided chest pain that was made worse with deep breathing and better with rest. The pain is sharp and moderately intense. She felt short of breath since the pain started.’

Medical History

History of Present Illness

- Diagnostic Phase
 - What is the presentation?
 - What is the most likely diagnosis?
 - What are other diagnoses that could present this way?
 - think about high morbidity / mortality items (no matter how rare)
 - Ask questions that help you to rule in your most likely diagnosis
 - Ask questions that help you to rule out competing diagnoses

History of Present Illness

- In your mind...
 - The main presentation is ‘pleuritic chest pain’ with associated dyspnea
 - Pulmonary embolism is a good possibility
 - Otherwise consider...
 - pleuritis for other reasons (pneumonia, tumor, viral)
 - musculoskeletal causes for chest pain
 - congestive heart failure (pericarditis, myocarditis)

History of Present Illness

- Ask...
 - Questions specific to venothrombotic disease
 - recent travel, trauma, surgery, illness
 - family history of DVT / PE
 - estrogen use
 - previous history of DVT / PE
 - hemoptysis, leg edema or pain
 - Questions specific to the differential diagnosis
 - cough with sputum
 - flulike illness
 - smoking history
 - is pain positional

History of Present Illness

- By time the diagnostic phase is completed, you should have a pretty good idea a potential diagnosis.

Medical History

- Past Medical History
 - Have you had this before? (if not asked)
 - Medical conditions
 - Surgeries
 - Childhood Illnesses

Medical History

- Family History
 - Anyone in your family have something similar?
 - Any diseases in your parents, siblings, children?
 - Any diseases that ‘run in the family’

Medical History

- Psycho-social History
 - Marital status (single, divorced, same-sex)
 - Occupation
 - Tobacco, alcohol, street drug use
 - **will need to be selective owing to time**

Medical History

- Medication Use
 - prescribed
 - over the counter
 - herbals / vitamins / supplements
 - *Must Ask This*

Medical History

- Allergy
 - drug and reaction
 - environmental agent and reaction

 - *Must Ask This*

Medical History

- Review of Symptoms
 - if the history was adequate, this will not be time efficient
 - skin
 - head, neck, eyes, ears, nose, throat
 - chest
 - breast / axillae
 - gastrointestinal
 - genitourinary
 - musculoskeletal
 - neurological (include mental status items)

BE SELECTIVE

Special History

- Pediatric History
 - vaccinations
 - seat belt use
 - home safety
 - nutrition and water supply
 - care givers
 - school
 - behavior and socialization

Special History

- Obstetrical History
 - number of pregnancies
 - number of live births
 - number of abortions

 - sexually transmitted diseases
 - vaccination for rubella
 - HIV testing?

Special History

- Patient in Extremis
 - **A Possible Scenario**
 - Introduce yourself quickly
 - Airway
 - Breathing
 - Circulation
 - Get oxygen, make patient comfortable
 - Focus on Cardiopulmonary disease
 - Tell the examiner your concerns and how you would get help. (e.g. call 911 in office)

Physical Examination

- General Appearance
- Vitals Signs (weight / height for peds)
- Integument (derm)
- Head and Neck
- Eyes, Ears, Nose and Throat
- Breast / Axillae
- Respiratory
- Cardiac
- Abdomen (Rectal / Pelvic exams)
- Neurological (MSE, motor, sensory, DTR)
- Musculoskeletal

Physical Examination

- General Appearance
 - patient appears well, unwell, distressed
 - should always make some observation
- Vital Signs
 - pulse, blood pressure, respiratory rate, temp*
 - *‘clinically afebrile’ if no thermometer
 - may need to ask these or estimate if time is very short

Physical Exam

- Selected Examination
 - have a method ready to go
 - practice - practice - practice

BE SURE YOU KNOW WHAT WAS ASKED

Physical Examination

- General
 - The patient appears moderately distressed.
- Vital Signs
 - Her pulse is 100, respiratory rate 24, blood pressure 140 / 85, temperature 37.8.

Physical Examination

- Appropriate Exams: respiratory and cardiac
 - Respiratory (peripheral and central)
 - no cyanosis or clubbing
 - Inspection shows no bruising, rash
 - Palpation is negative for pain or deformity
 - Percussion is normal
 - Auscultation is normal
 - Cardiac (peripheral and central)
 - no edema, pedal pulses normal, JVP normal
 - inspection unlikely helpful
 - palpation: PMI not palpable
 - percussion not helpful
 - auscultation: S1, S2, S4 no murmur

Laboratory Data

- Sometimes referred to as 'paraclinical data'
 - Blood work
 - Urine and other body fluid
 - Diagnostic Imaging
 - Cardiac Diagnostics - ECG mainly
 - Less likely to get pulmonary functions
- May be asked to order or interpret.

Laboratory Data

- Ordering Laboratory Tests
 - There is usually a role for less invasive, less costly, variable sensitivity, low specificity tests prior to ordering gold standard investigations.
 - However, watch the wording on the questions.
- For our chest pain patient...
 - Normally: CBC, electrolyte, creatinine, PT, PTT
 - But they may ask... if you are considering pulmonary embolism, what is the first test you will order to confirm the diagnosis? V/Q scan

Laboratory Data

- Ordering Tests
- Caution:
 - Consent for tests is usually implied.
 - HIV testing pre-test counseling is mandatory
 - Invasive tests: consider risk
 - IV contrast: consider risk

An Aside on Test Characteristics

- Sensitivity: $P(T+ | D+)$
 - probability that test is positive given disease is present
 - good for ruling out disease ‘SnOut’
- Specificity: $P(T- | D-)$
 - probability that test is negative given disease is absent
 - good for ruling in disease ‘SpIn’

An Aside on Test Characteristics

- Positive Predictive Value $P(D+ | T+)$
 - probability that disease is present given test is positive
- Negative Predictive Value $P(D- | T-)$
 - probability that disease is absent given test is negative
- + Likelihood Ratio $P(T+ | D+) / P(T+ | D-)$
 - how more likely is the test going to be positive among those with disease compared to those without the disease

Lab Testing

- Our chest pain case...
- D-dimer
 - sensitivity of $> 90\%$
 - specificity of $\sim 50\%$ (preg, surg, neoplasm)
 - If her test is negative.... the probability of her having a pulmonary embolism is very low!
 - If her test is positive.... we still must go on to prove the diagnosis

Interpreting Laboratory Data

- Identify the patient and test
- State your observations
- State your test interpretation
- State your clinical interpretation (differential diagnosis)

- You may be asked to only comment on the abnormality! Time may preclude anything else.

Interpreting Laboratory Data

Identify the patient and test

- Unlikely to get tricked but...
 - state that the test is on the right patient!
 - state the test that was done
 - e.g. serum glucose versus CSF glucose
 - e.g. units of measurement
 - Canada: SI units, reference ranges should be provided.
- ‘Ms. X’s blood work reveals a hemoglobin concentration of 85 g/l.’

Interpreting Laboratory Data

- State your observations e.g. ECG
 - atrial rate = 90
 - ventricular rate = 90
 - p waves are normal
 - PR interval 180 msec
 - QRS complexes normal morphology
 - QRS interval 80 msec
 - ST segments are elevated by 3 mm in the anterior leads
 - QRS axis is + 45 degrees

Interpreting Laboratory Data

- State your test interpretations e.g. ECG
 - normal sinus rhythm
 - ‘current of inschemic injury’ or infarction in progress
 - abnormal ECG
- State your clinical interpretation
 - myocardial infarction in progress
 - ddx: less likely pericarditis, or recent MI

Differential Diagnosis Approaches

- Anatomical (e.g. chest pain)
 - skin, msk, heart, lungs, esophagus, spine
- Physiological (e.g. jaundice)
 - pre-hepatic, hepatic, post-hepatic
- Pathological (e.g. if anatomy is known)
 - neoplasm, infection, ischemic cerebral lesion
- Epidemiological (e.g. what's most likely here)
 - ectopic pregnancy versus cecal carcinoma
- Pattern Recognition
 - I've seen this before, it all fits! (can be risky)

Differential Diagnosis Approaches

- May have to integrate approaches
- e.g. Anatomy and pathology in setting of epidemiology..

Differential Diagnosis

Physical versus Psychological

- Every condition has a psychological component.
- Be wary of non-specific complaints and complaints that do not fit known anatomy or pathology.
- Be wary of abuse, addiction, depression, suicidal tendencies.

Above All

- Do what they ask you to do...

Now that we've covered 'everything'
don't do 'everything'.

Case #1

- Ronald McDonald, a 74 year old man presents to you complaining of blood in his sputum.
- *In the next 5 minutes take a focused and relevant history...*

Case 1

- We have the ID and Chief Complaint... so take the focused and relevant history
- Descriptive phase...
 - When did it start?
 - Have you had it before?
 - How much blood is in the sputum?
 - Is it getting more frequent or larger amounts?
 - Anything make it worse, or better?
 - Anything else? Short of breath, chest pain?
 - Blood elsewhere? (nose bleeds, hematuria?)

Case 1

- Diagnostic Phase
 - ddx: (anatomy) & pathology & epidemiology
 - bronchogenic carcinoma
 - acute / chronic bronchitis
 - bronchiectasis

Differential Diagnosis of Hemoptysis

Airways diseases

Acute or chronic bronchitis
Bronchiectasis
Neoplasms
Foreign bodies
Airway trauma
Bronchovascular fistulae

Pulmonary parenchymal diseases

Infection (especially tuberculosis, pneumoconiosis, mycetoma, or lung abscess)
Immune disorders (eg, Wegener's granulomatosis, Goodpasture's syndrome, idiopathic pulmonary hemosiderosis)

Pulmonary vascular disorders

Pulmonary thromboembolism
Pulmonary arteriovenous malformations
Left atrial hypertension (eg, mitral valve disease, poor left ventricular performance)

Miscellaneous

Coagulopathy
Cocaine use
Catamenial hemoptysis
Iatrogenic
Cryptogenic

Case 1

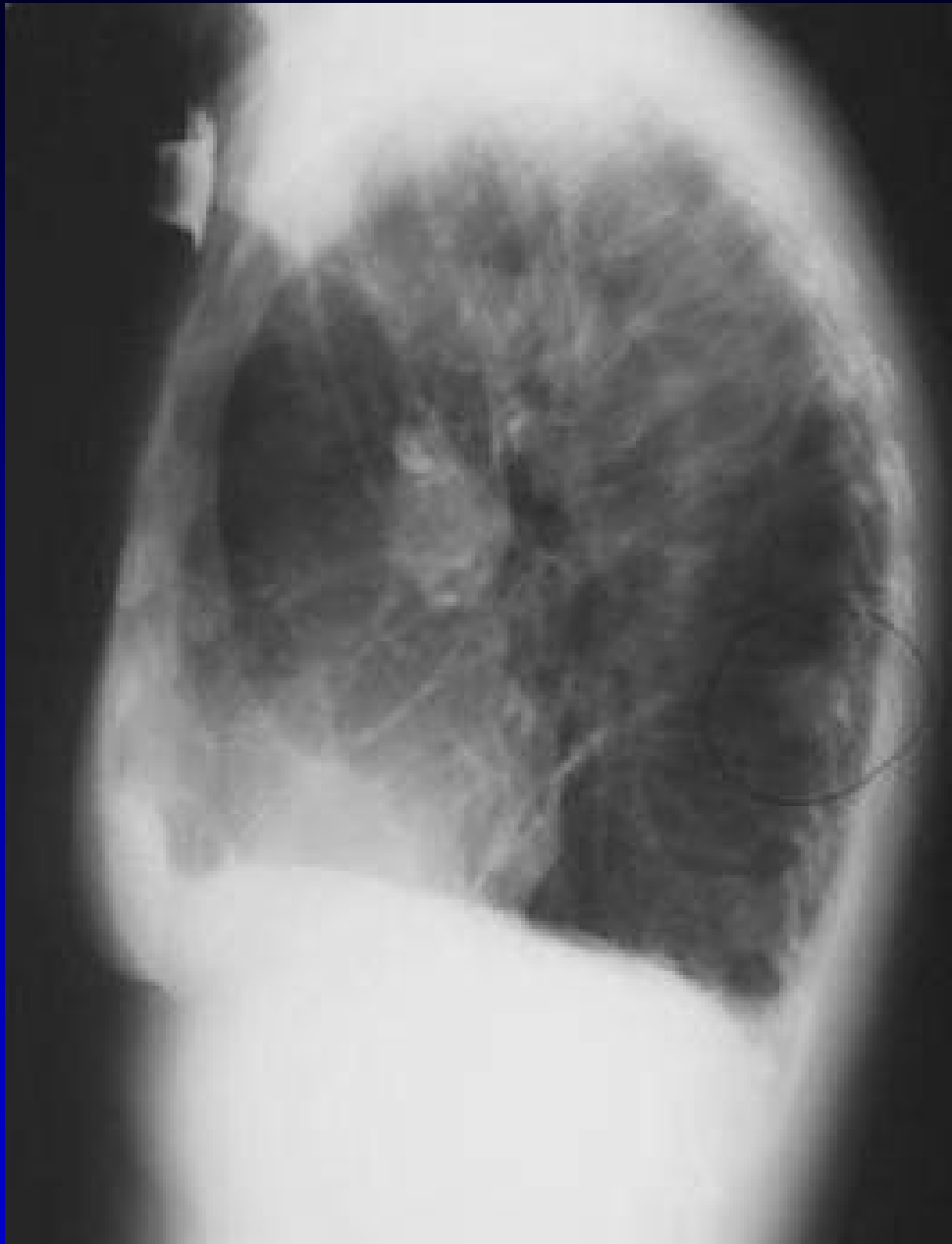
- Diagnostic Phase
 - Re: Bronchogenic Carcinoma... Ask
 - Smoking history including passive smoke?
 - Occupation?
 - Weight loss?
 - Change in voice?
 - Previous history of lung or other cancer?
 - Family history of lung or other cancers?
 - Any inhaled medications?
 - Re: Bronchitis and bronchiectasis
 - Change in sputum
 - History of lung infections

Case 1 - Second Station

- *The patient has a 40 pkyr history of cigarette use and has lost 10 lbs. Examination was negative.*
- *What are your principle diagnostic considerations?*
- Bronchogenic carcinoma
- Bronchitis (acute)

Case 1 - Second Station

- *What investigations will you order initially in the work-up of this patient?*
 - CBC, electrolytes/creatinine, PTT, PT
 - Chest PA/LAT radiograph
 - Sputum for cytology



- What is the abnormality seen in this chest radiograph?
- Pulmonary nodule

Case #2

- Mr. Ray Thomas, a 45 year old accountant presents with a 6 month history of progressive knee pain.
- *In the next 5 minutes conduct a focus and relevant physical examination.*

Case #2

- Examination of the knee is most correct.
(watch for radiating pain syndromes)
- Perform a Diagnostic Examination
(what's the differential diagnosis?)

Osteoarthritis

Internal derangement: meniscus or ligament tear

Patellar disease (misalignment)

Inflammatory diseases (seronegative, RA, gout)

Periarticular disease

Tumor / infection less likely

Case 2

- Inspect: while sitting and ambulating
- Palpate and state anatomy
 - anterior: quadriceps, patella, patellar ligament, tibial tuberosity, pre-patellar bursa, infrapatellar bursa, anserine bursa, joint line
 - check for effusion: bulge, patellar tap
 - lateral: head of fibula, LCL
 - medial: MCL
 - posterior: popliteal artery, lymphnodes, Baker's cyst

Case 2

- Active ROM
- Passive ROM
 - crepitus over patella, ligamentous laxity
- Special Manouvers
 - check for ACL/PCL stability (Lachman's / drawer's)
 - check for tear of meniscus (McMurray's)

Examination Tips

- Practice verbally instructing patients
- State to the examiner what you are doing
- State to the examiner your conclusion.

- ‘Please stand facing me with your feet shoulder width apart’
- ‘I’m checking to see if the patient can bear weight and for alignment.’ (Check from 4 sides)
- ‘He can bear weight, the right knee has a valgus deformity.’

Case 2

- *Your clinical assessment suggests osteoarthritis. What is your management of this otherwise well patient?*
 - weight bearing knee radiograph (AP/LAT)
 - simple analgesia (acetominaphen)
 - weight loss
 - non-traumatic exercise
 - NSAIDs
 - reassessment in 4 weeks

Case 3

- *Mr. Johnny Walker-Oban, a 42 year old accountant presents with difficulty sleeping and shaky hands. He lost his job last week. In the next 10 minutes complete a relevant history.*

Case #3

- HPI - descriptive
 - When was he last well?
 - What happened first?
 - How severe are the symptoms?
 - Are they continuous?
 - Have they progressed?
 - What makes you feel better, worse?
 - What else is happening?
 - Has this happened before?

Case 2

- Diagnostic Phase
 - (his answers lead you to believe alcoholism)
 - Ask the CAGE questionnaire
 - Have you ever felt you should **C**ut down on your drinking?
 - Have people **A**nnoyed you by criticizing your drinking?
 - Have you ever felt bad or **G**uilty about your drinking?
 - Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover (**E**ye opener)?

Case 3

- Consider differential diagnosis
 - Other substance abuse, depression
- Past Medical History
 - chronic diseases, chronic pain, thyroid disease
- Family History
 - alcoholism, abuse
- Psychosocial
 - other stressors, family at risk
- Medications and Allergies
 - other depressants (benzodiazepines, opiates)

Summary

- Spectrum of clinical problems
- The Medical History
- Laboratory Ordering / Interpretation
- Differential Diagnosis

- Good Luck!