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Case Presentations & Medical School

Respiratory System
Nervous System
Medical School

Michael Smith

BSc, UBC MD Class of 2026
Island Medical Program

May 25, 2023
10:00 AM – 2:00 PM



THE UNIVERSITY OF BRITISH COLUMBIA
Faculty of Medicine



University
of Victoria

let's talk 
science

About Me

Intro and Medical School



Hello! I'm Michael Smith, a 1st year medical student from UBC's Island Medical Program.

I'm from White Rock, BC, went to Earl Marriott Secondary (Class of 2016) and UBC Vancouver (Class of 2020, BSc Major in Pharmacology).

Medical School:

I started medical school in August 2022 and will graduate in 2026. I am happy to answer to any questions you may have at the end of this lecture where I will talk a bit about my journey and what I wish I knew when I was your age!

My Why:



Territorial Acknowledgement

I would like to begin by acknowledging that I am joining you from the unceded territory of the Kumeyaay nation. The Kumeyaay people continue to maintain their political sovereignty and cultural traditions as vital members of the San Diego Community. I am grateful for the opportunity to work, live, and play on their lands.

I also acknowledge the audience joins from the unceded territory of the ləkʷəŋən (Lekwungen) speaking peoples, including the Songhees, Esquimalt, and W̱SÁNEĆ (hw̱a - say - netch) peoples whose historical relationships with the land continue to this day.





Disclosure

I am a first year medical student. While some clinical information will be presented in this presentation, these talks do not constitute or substitute for medical advice. Please consult with a healthcare provider if you or others you know have any personal health-related concerns.





Today's Agenda

Case Presentations and Medical School

Respiratory System

Nervous System

Medical School

Let's get started!



Today's Agenda

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CASE STUDY

- You are a medical student in pre-clerkship (1st/2nd year) and you are doing your weekly shadowing in a local family practice clinic in Victoria. You are asked to meet the next patient alone and take a history.
- A 62-year-old person identifying as male presents to the clinic with chronic cough and shortness of breath that has been progressively worsening over the past few years. He also complains of frequent wheezing and chest tightness.

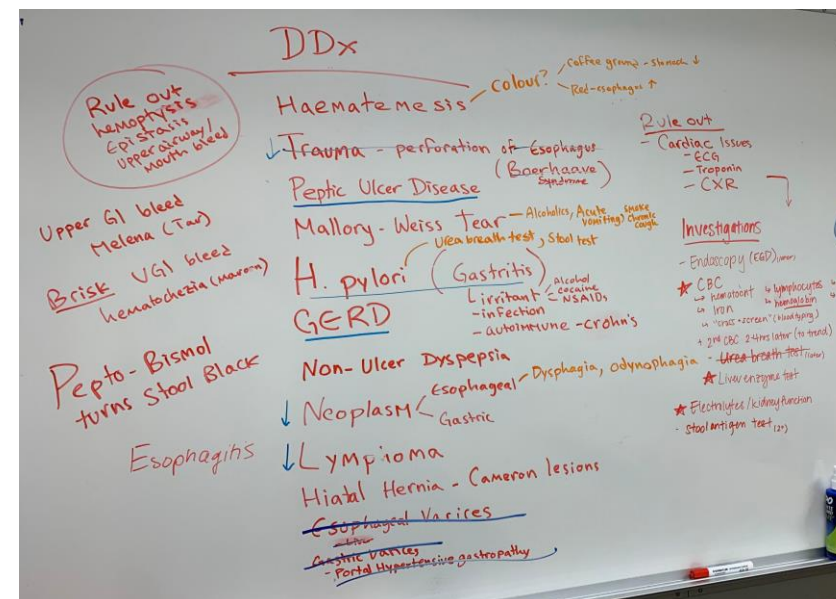
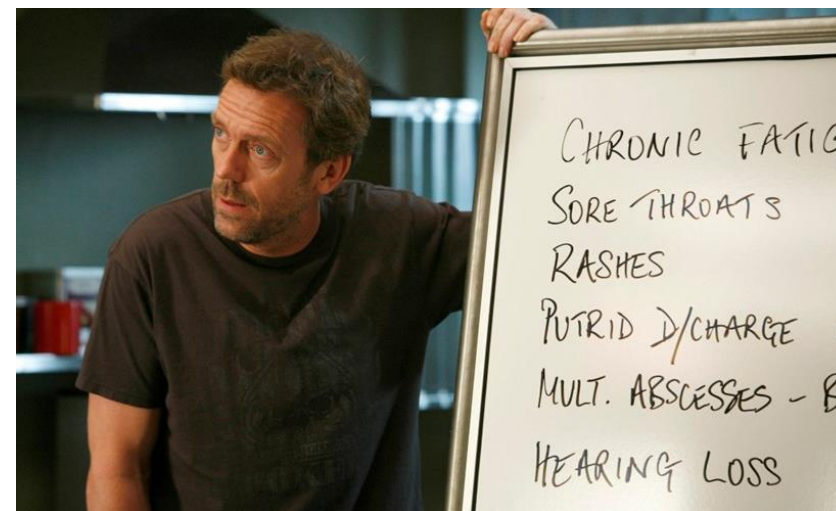


Chief Complaint:

- : concise statement in English or other natural language of the symptoms that caused a patient to seek medical care (Wagner & Hogan, 2006)
- Allows us to begin to form a Differential Diagnosis (DDx)

Differential Diagnosis (DDx):

- : a systematic process used to identify the proper diagnosis from a set of possible competing diagnoses (Cook & Decary, 2020)
- **Now your turn to try it!**





1. What do you think is the cause of this patient's issues? (Differential Diagnosis). Write your suggestions on Sli.do - CC: chronic cough & SOB

Some hints:

- Start with localization. Where could the issue be originating from? What lies in that area?
- Do a systems approach. What are the bodies systems (respiratory, cardiac, gastrointestinal, etc.) relevant to the location and symptoms?

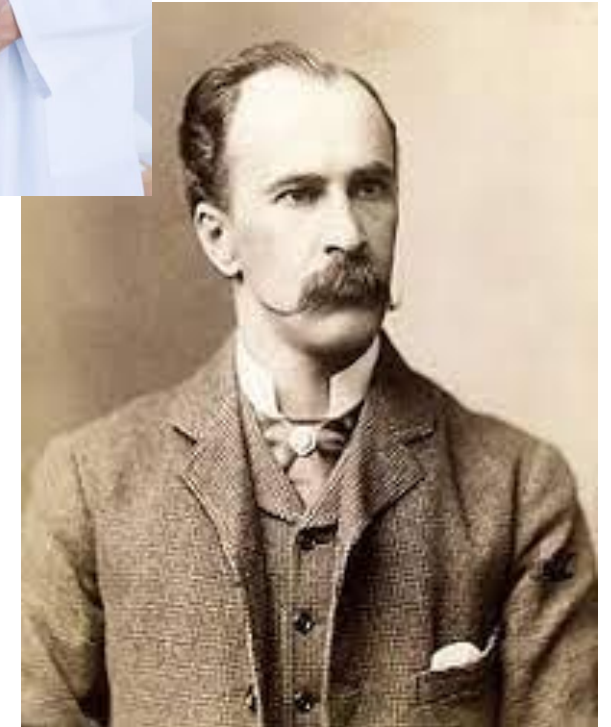


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History

- Allows us to differentiate between the different possible diagnoses
- **Most important first step in non-emergent cases**
- Informs the need for further investigations (physical exams, laboratory tests, imaging, etc.)

- **“Listen to your patient; they are telling you the diagnosis.”**
– **Sir William Osler**



*Focused History

- In addition to the History of Presenting Illness (HPI)
- Forms a more complete picture of patient experience and symptoms us
- **Important for refining the differential diagnosis even more.**
- **Example – Respiratory:**
 - Triggers, Recent Infections
 - Cough – sputum?
 - Smoking History (pack years)
 - Medication Use Frequency
 - Associated Symptoms (chest pain, wheeze, blood)



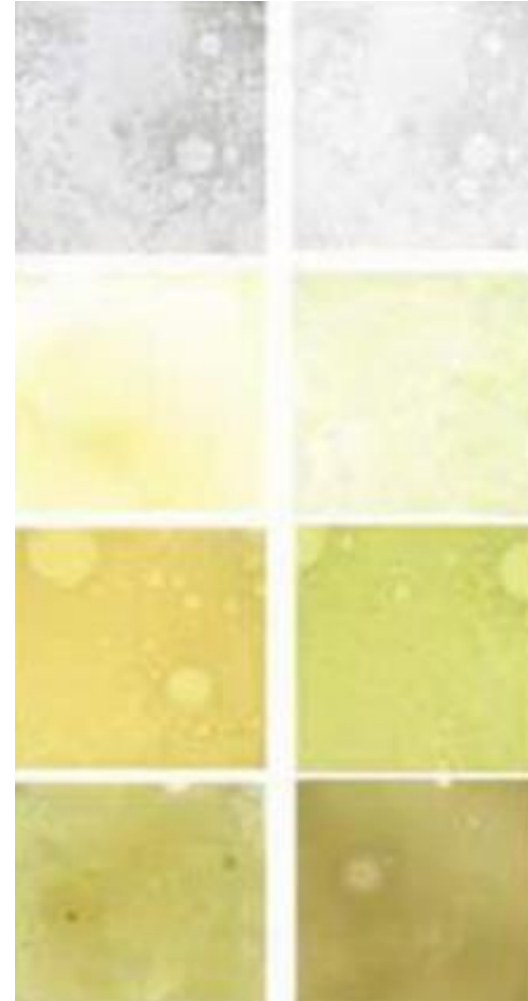
Our Patient's History

WWQQAA

- **When:** 5 year hx, more at night and during triggers (dust, exercise)
- **Where:** in chest
- **Quality:** deep, wet cough
- **Quantity:** 6/10
- **Aggravating:** triggers (dust, exercise)
- **Associated Symptoms:** yellowish sputum with cough, no blood

Other

- Recurrent infections past 1-2 years
- Borrows partners asthma inhaler
- **Smokes** – 2 packs/day 15 years (30 pack year hx)
- Visually - clubbing





2. What do you think is the most likely cause now? Rank the following options on Sli.do:

Congestive Heart Failure

Lung Cancer

Chronic Obstructive Pulmonary Disease (COPD)

Asthma



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2. What do you think is the most likely cause now? Rank the following options on Sli.do:

Congestive Heart Failure

Lung Cancer

Chronic Obstructive Pulmonary Disease (COPD)

Asthma



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Chronic Obstructive Pulmonary Disease (COPD)

Pathophysiology:

- Irreversible lung disease caused by recurrent damage/infl. -> obstructive
- Chronic Bronchitis (narrowing) & Emphysema (loss of stretch)

Causes:

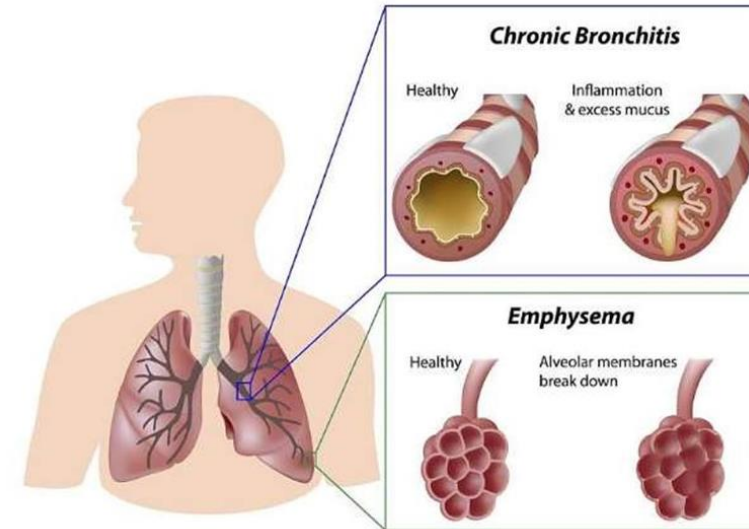
- Smoking
- Also genetic susceptibility / exposures to poor air quality

Prevalence: smokers >40, top 5 mortality

Complications:

- Exacerbations, Respiratory Failure, Recurrent Infections, Pulmonary Hypertension

Chronic Obstructive Pulmonary Disease (COPD)



Diagnosis and Tests

DDx:

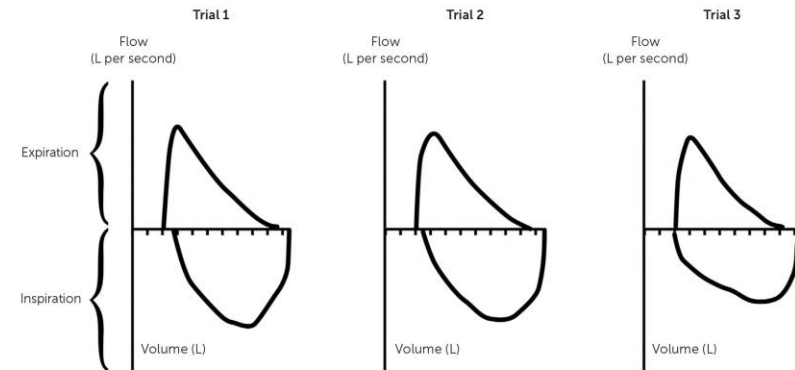
- Heart Failure, Asthma
- Pneumonia, Tuberculosis
- Cystic Fibrosis, Malignancy (Cancer)

Confirming Diagnosis/Tests:

- Physical Exam and Vitals
- Spirometry = Diagnosis
 - $FEV_1/FVC < 0.7$ *
- Other Tests
 - Chest X-ray / CT Scan
 - Arterial Blood Gas (ABG)



	Predicted	Best	% of predicted	1	2	3
FVC (L)	3.66	3.04	83	2.93	3.04	2.94
FEV ₁ (L)	2.96	2.12	72	2.09	2.12	2.02
FEV ₁ /FVC (%)	83	70	84	71	70	69
FEF _{25%-75%} (L per second)	3.36	1.36	40	1.44	1.36	1.23
PEF	6.65	4.71	71	5.07	4.71	4.67



FEF_{25%-75%} = forced expiratory flow at 25% to 75% of FVC; FEV₁ = forced expiratory volume in one second; FVC = forced vital capacity; PEF = peak expiratory flow.

RESPIRATORY SYSTEM



RESPIRATORY SYSTEM



Treatment

First Line:

- Smoking Cessation (w/ Medication)
- Short Acting Bronchodilator
- Vaccinations

Depending on Severity:

- Inhaled Corticosteroids
- Pulmonary Rehabilitation
- Long Acting Bronchodilator
- Oxygen Therapy
- Surgery

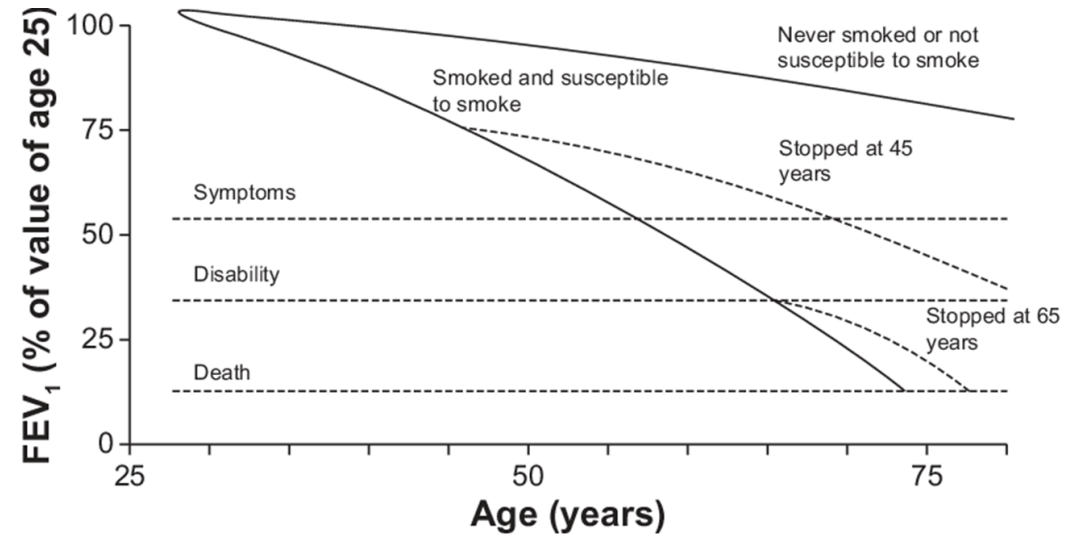
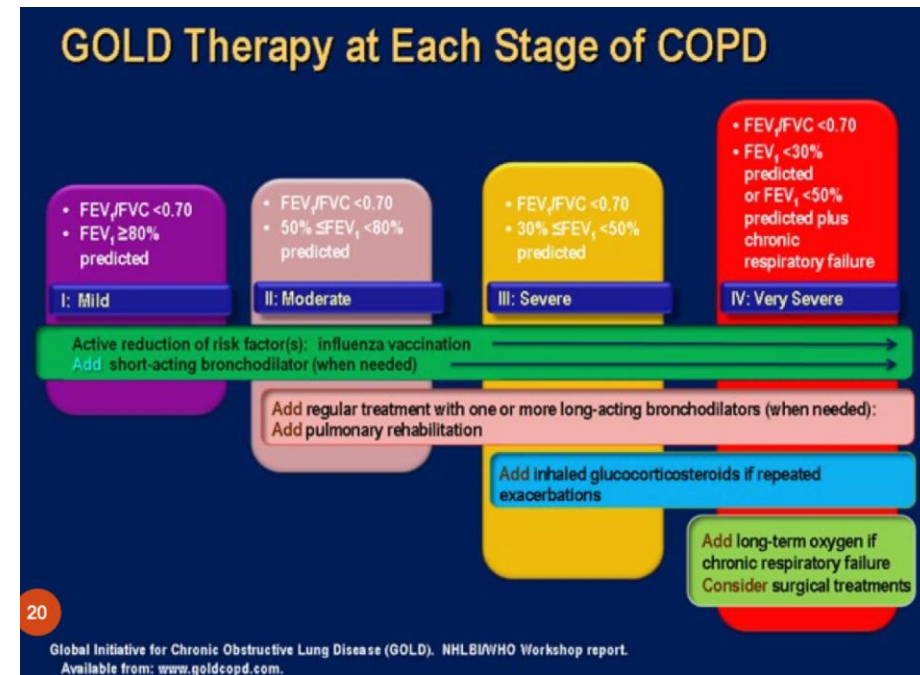


Figure 10-10. Predicted decline in FEV1 in the first 50 years of life for different smoking statuses.





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CASE STUDY

- You are a clerk (3rd/4th year medical student) doing your 4 week rotation in the emergency room where you work and see patients. This is called clerkship.
- A 25 year old patient presents into the ER via ambulance with paralysis and tingling in their limbs. Their friend states this occurred right after diving head first into a shallow pool and they needed to be rescued from the water.
- Hx: previously healthy, incident occurred couple hours ago, C spine precautions taken. Patient awake and alert. No medications or other relevant history.





**3. What do you think is the cause of this patient's issues? (Differential Diagnosis). Write your suggestions on Sli.do -
CC: paralysis/tingling in extremities**

Some hints:

- While some things may seem obvious, you don't always get the full story
- Important to address immediate concerns, but be wary of parts of the story that may not fit with the diagnosis



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NERVOUS SYSTEM

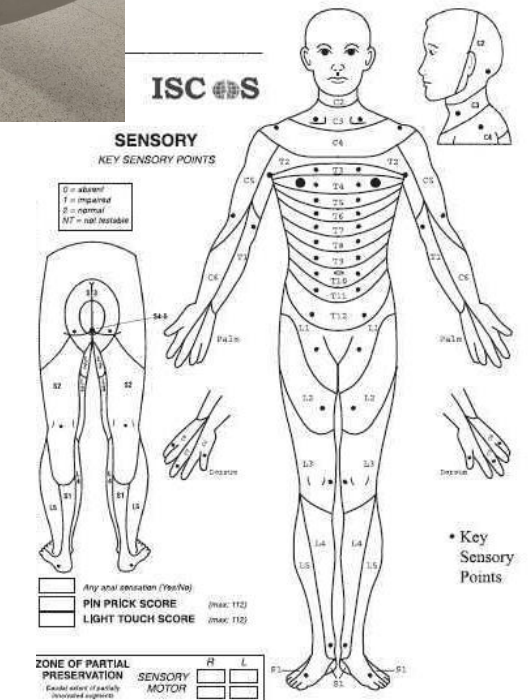
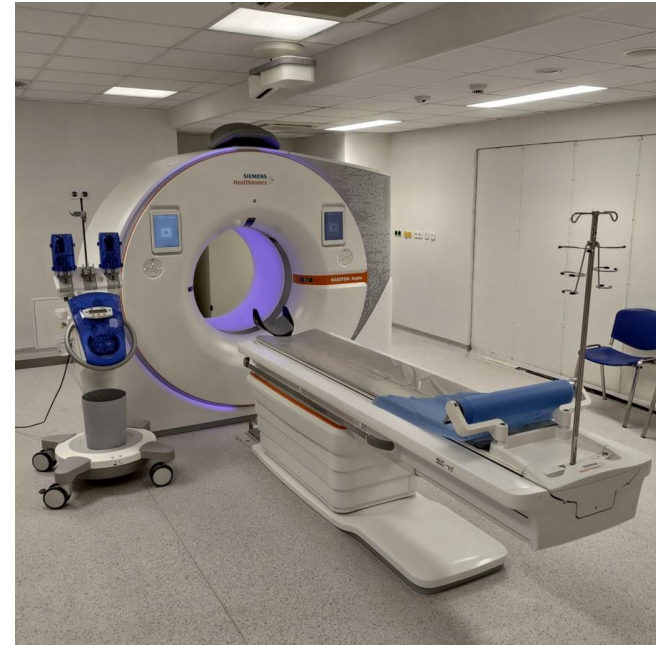
Physical + Imaging

Send for Imaging if Indicated:

- Canadian C Spine Rules

Physical Exam Systematic Approach:

- **General Wellness** - sick / not sick
- **Vital Signs:** HR, RR, BP
- **Neurologic Exam**
 - Mental Status, Cranial Nerves
- **& Musculoskeletal Exam**
 - Upper and Lower Extremities
 - Motor/Strength /5
 - Sensory Modalities /2
 - Deep Tendon Reflexes /4
 - Coordination



NERVOUS SYSTEM

Our Patient

Imaging = **cervical spinal cord dislocation / fracture (C6/7)**

Physical Exam:

- Awake, alert, signs of paralysis
- HR, RR, BP - stable

Musculoskeletal Exam

- R Leg no movement (0/5)
- L Leg restricted movement (2/5)
- R/L Arm no hand movement or elbow extension (0/5), can flex elbows (5/5)
- Biceps Reflex Intact, others absent
- Pin Prick Sensation until Medial Hand (middle to pinky) bilaterally
- *Spinal Shock





4. What do you think is the most likely cause now? Think about the following options:

Spinal Cord Injury

Seizure / Epilepsy

Stroke

Hypoglycemia (Diabetes)



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4. What do you think is the most likely cause now? Think about the following options:

Spinal Cord Injury

Seizure / Epilepsy

Stroke

Hypoglycemia (Diabetes)



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Cervical Spinal Cord Injury

Pathophysiology:

- Disruption of the axons of nerves running through spinal cord
- = loss of motor & sensory function below the level of injury.
- Various outcomes -> anatomy

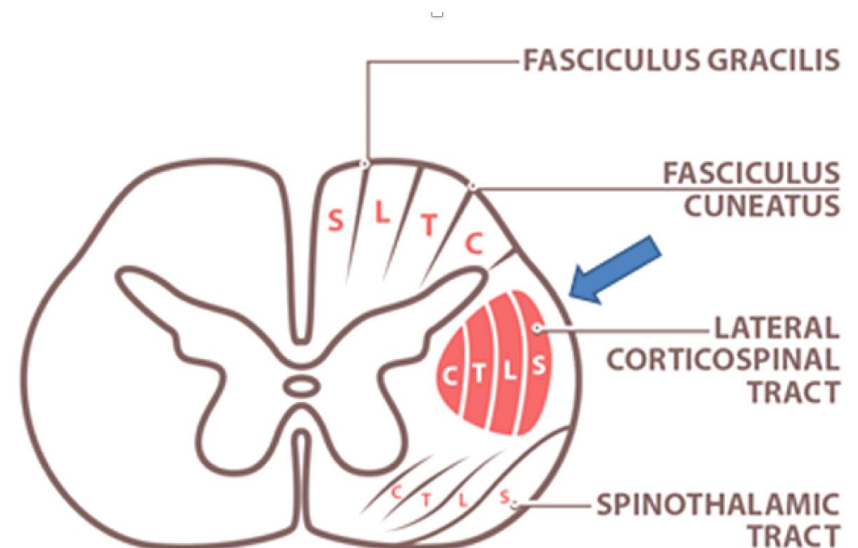
Cause: Trauma > Non-Trauma

- Fracture / Dislocation / Hyperextension
- Laceration, Loss of Blood Flow, etc.

Prevalence: ages 15-30 yrs., 17k/yr. USA

Complications:

- Respiratory Distress, Tetra/Paraplegia
- Neurogenic Bladder, Pressure Ulcers, Sexual Dysfunction



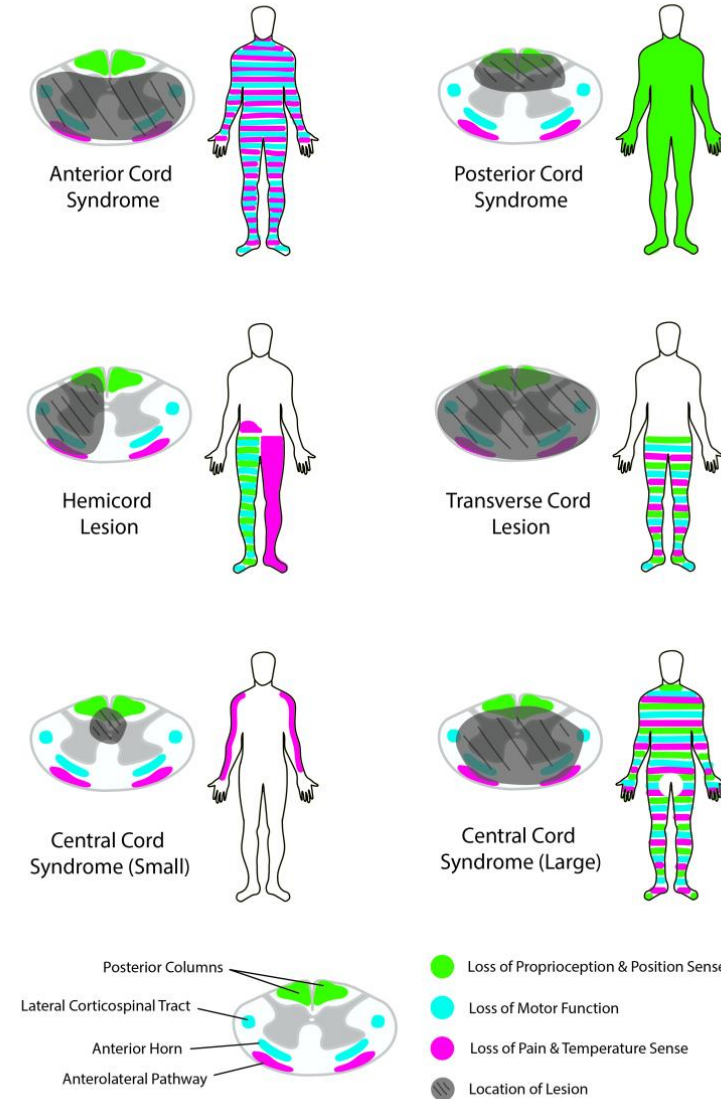
Diagnosis and Tests

DDx:

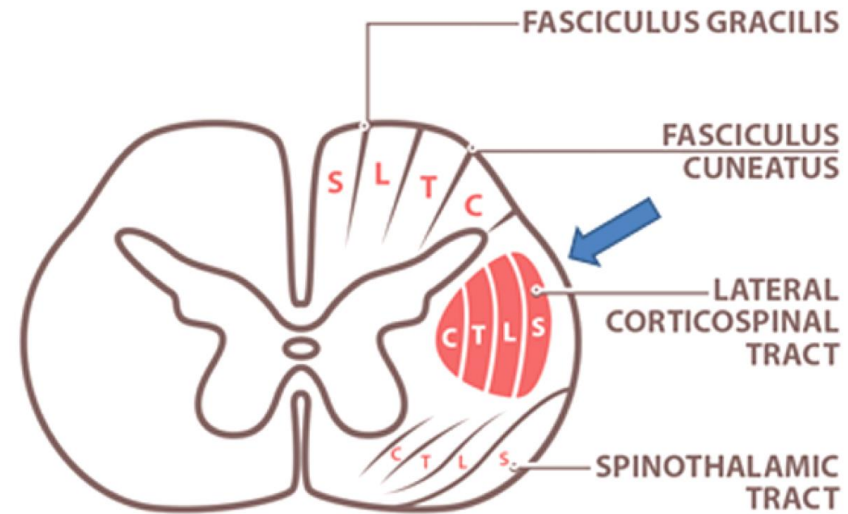
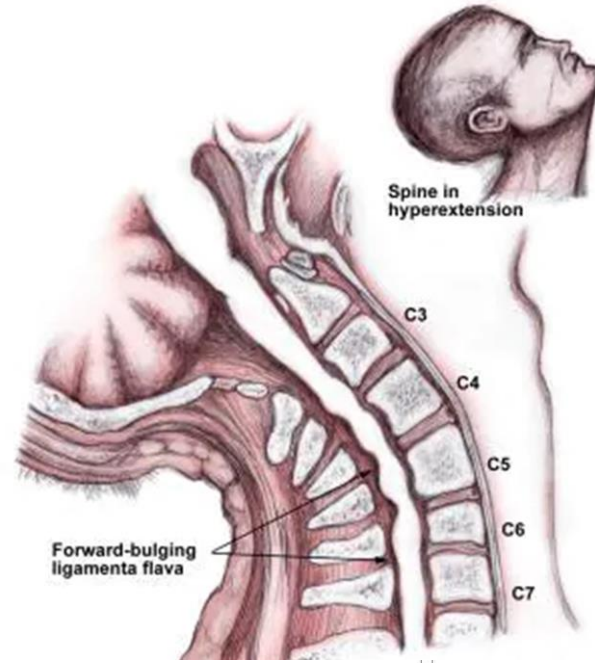
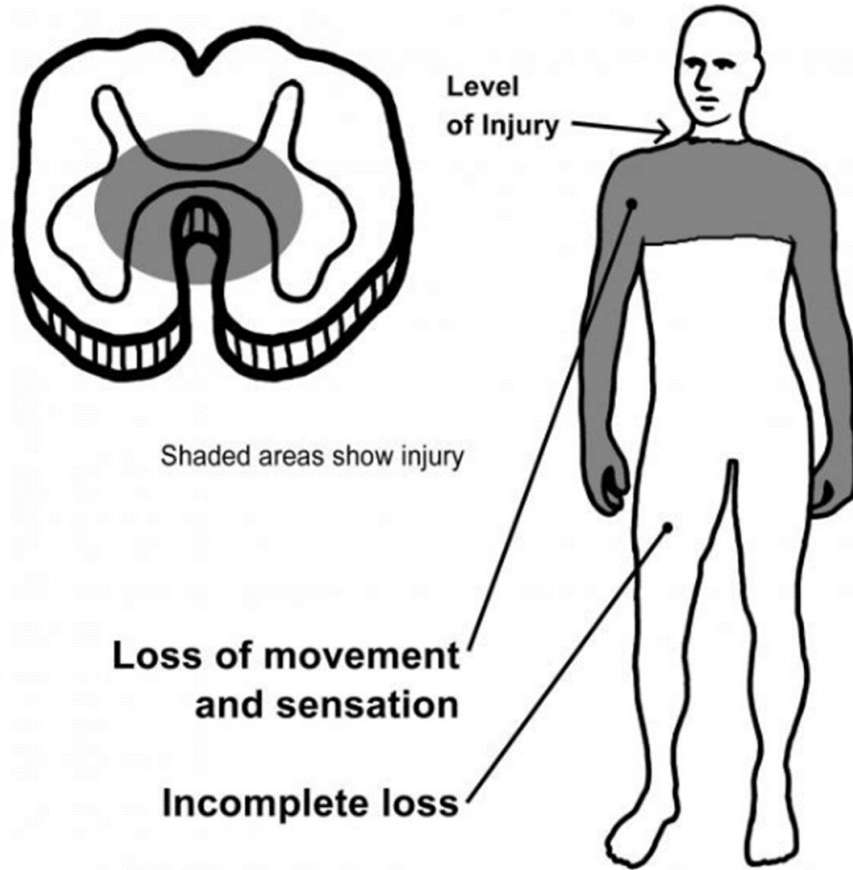
- Spinal Cord Injuries (Complete or Incomplete)
- Other Spinal Cord Pathologies (Disc Herniation, Radiculopathy)
- Seizures (Epilepsy)
- Stroke
- Guillain Barre Syndrome
- Hypoglycemia, Hypocalcaemia

Confirming Diagnosis/Tests:

- Physical Exam (full Neuro + MSK)
 - Graded using ASIA Impairment Scale – assess functioning
- Imaging for Confirmation / Surgery



NERVOUS SYSTEM



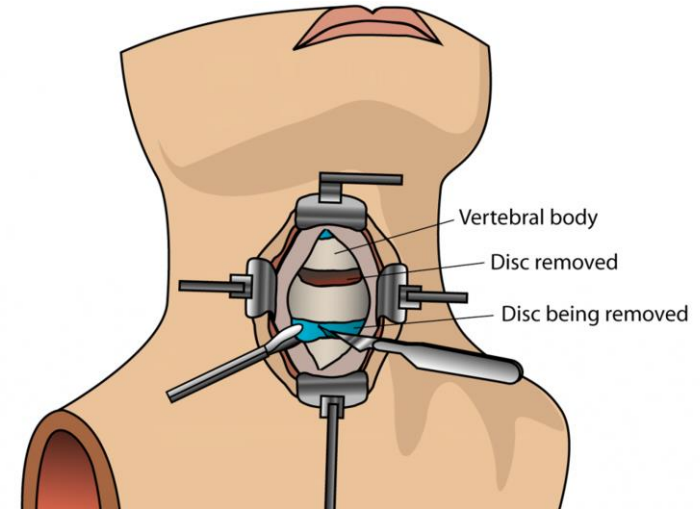
Treatment

Initial Treatment

- Manage Immediate Concerns
- Airways / Breathing
- Other Associated Injuries
- Bladder Control
- Pain Control
- -> Surgical Fix (Anterior Cervical Decompression and Fusion (ACDF))

Long Term

- No Cure
- **Maximal Gains in Neurological Functioning within 1-2 years**
- **(Spinal Shock resolves days-months)**
- Multidisciplinary Rehabilitation



CASE STUDY

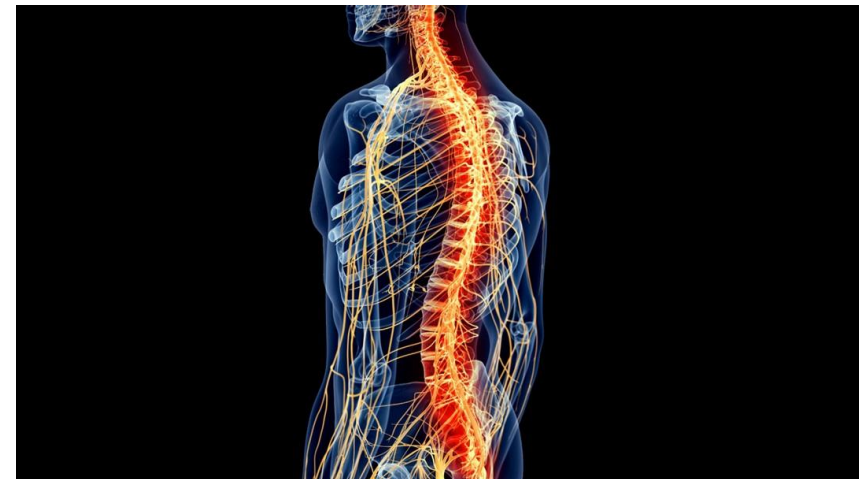
Summary of Cases

Patient Evaluation:

- Chief Complaint
- History of Presenting Illness
- Complete Patient History
- Physical Exam
- Laboratory Tests/Imaging/Other

Chronic Obstructive Pulmonary Disease (COPD)

Cervical Spinal Cord Injury (SCI)





References

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MEDICAL SCHOOL

Medical School!

Earl Marriott Secondary (Class of 2016)
UBC Vancouver (Class of 2020, BSc Major in
Pharmacology)

Wrote MCAT in Summer 2020

Applied to UBC, Western, and McMaster for 2021
cycle. Interviewed and accepted to UBC, deferred to
start in 2022.

I'll do my best to answer any of your application
questions, but the UBC website is the best resource
(<https://mdprogram.med.ubc.ca/admissions/before-you-apply/>). Other sources for MCAT, etc.





Thank you!

Any Questions?



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