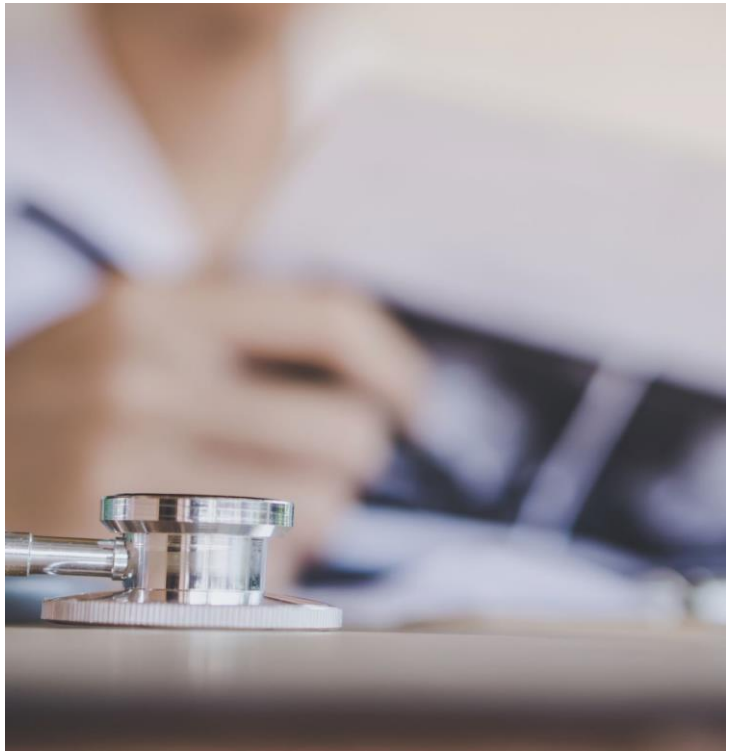
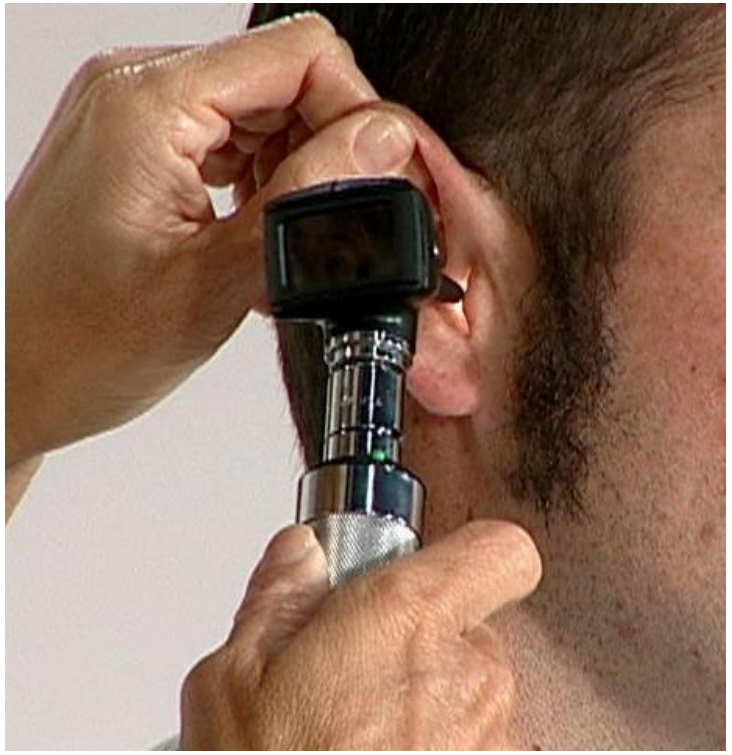
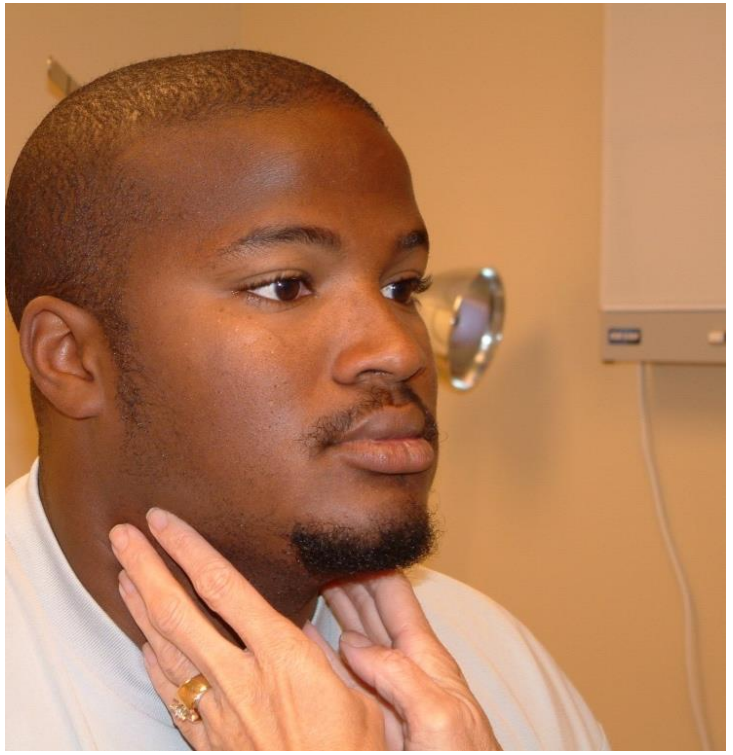




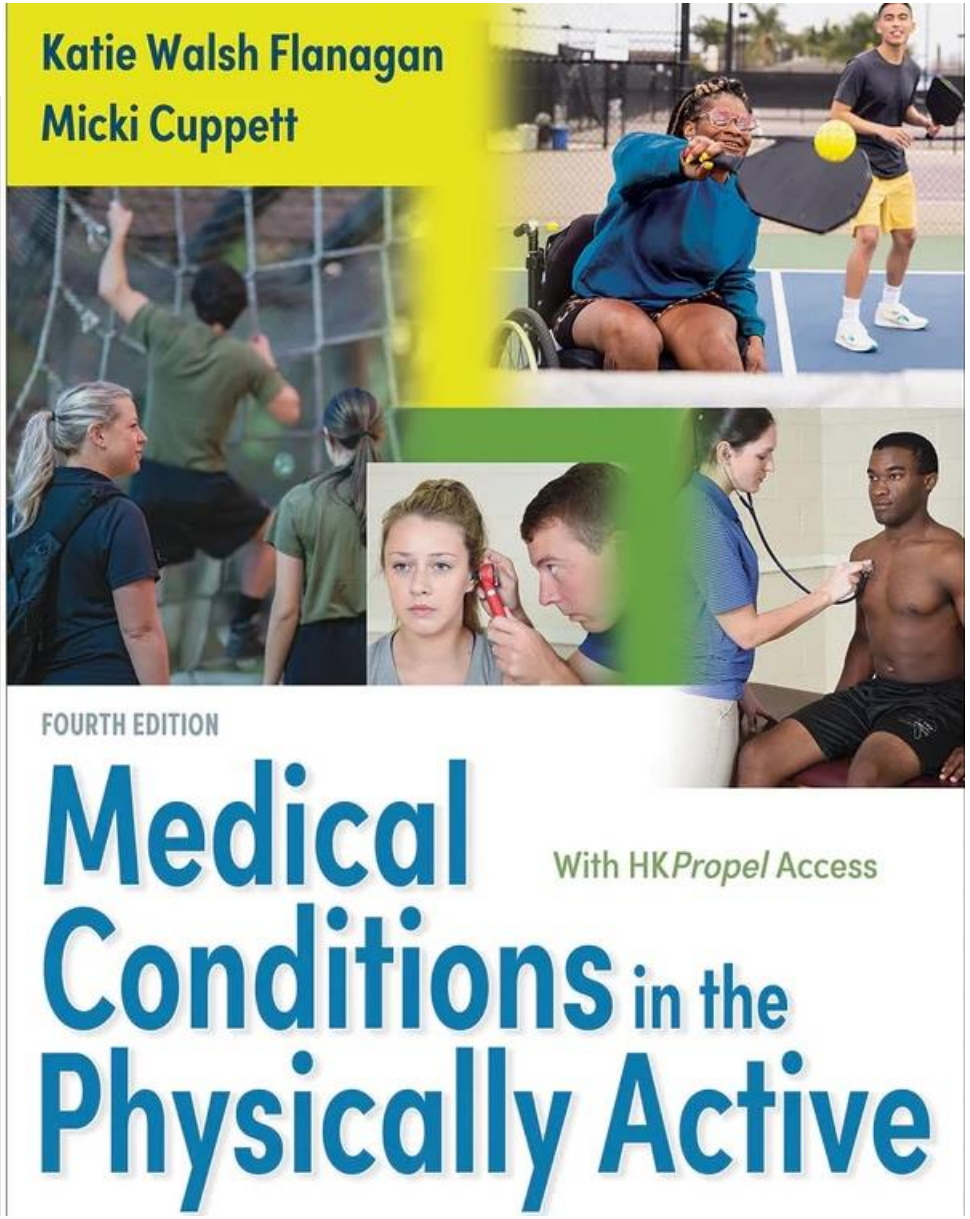


Clinical Pearls to Enhance Your Medical Examination Skills

CATA Symposium, Ottawa
May 11, 2024

Micki Cuppett, EdD, LAT, ATC, FNAP

MICKI CUPPETT
Consulting Services



Disclosures

Owner of Micki Cuppett Consulting

Co-author of Medical Conditions in the Physically Active, Human Kinetics, 2024. Much of the artwork and tables in this presentation are from the text.

Any resources mentioned in this presentation are just from my experience and I have no financial relationship with any of the vendors mentioned.

At the conclusion of this presentation, the learner should be able to:

1. Differentiate between a focal orthopedic examination and a medical examination of conditions that may affect many organ systems.

2. Recognize some common pathological conditions including signs and symptoms, differential diagnosis and standard medical treatment for common non-musculoskeletal conditions in the physically active.

3. Identify appropriate initial management of common disorders, conditions that may preclude the athlete from participation and recognize which symptoms are self-limiting.

4. Develop a plan with online resources to practice examination of medical conditions.

Examination of the Patient With a Medical Condition

- Often no identifiable onset
- May be few signs that anything is wrong
- Begins with a thorough history
- Followed by an overall systemic review
- The examiner must rely heavily on the patient's history to guide the examination

Comprehensive History

- Typically completed during a physical examination or first appointment with a practitioner, but pertinent when examining a medical condition that may not have obvious origins.
- Comprehensive history contains:
  - Past medical history: childhood and adult illness, injury, and accidents
  - Current health status: alcohol and drug use, diet, exercise, and immunizations
  - Family history: diabetes, heart disease, hypertension, kidney disease, cardiovascular disorders (e.g., DVT, stroke), allergies, asthma, mental illness, and addictions.

The History

- The history taking process drives the examination, diagnosis, and treatment
- Listen to your patient!

- Important points for taking a medical history
  - Duration of signs and symptoms
  - Onset (e.g., rapid, insidious, gradual)
  - Do symptoms tend to occur at a specific time (after eating, when exercising, after exposure to an allergen, at night, etc.)?
  - Do symptoms come and go, or are they constant? Positional changes?
  - Disability from symptoms
- Don't focus on just one system
- Need to consider comorbid conditions

Listen to what your patient tells you.



Systemic	Musculoskeletal
Constant	Intermittent
No change with movement or posture	Consistent change with movement or posture
No change or worse at rest	Relief with rest
Worse at night	Relief at night
Worse with organ function	Unaffected by organ function

What is their description of discomfort?



System	Descriptors
Vascular	Pulsing, throbbing, pounding, cramping, heavy
Neurologic	Shooting, stabbing, sharp, pressing, burning, tingling, stinging, radiating
Musculoskeletal	Dull, sore, aching
Pscyhoemotional	Splitting, exhausting, sickening, cruel, unbearable, tight, cold, nagging

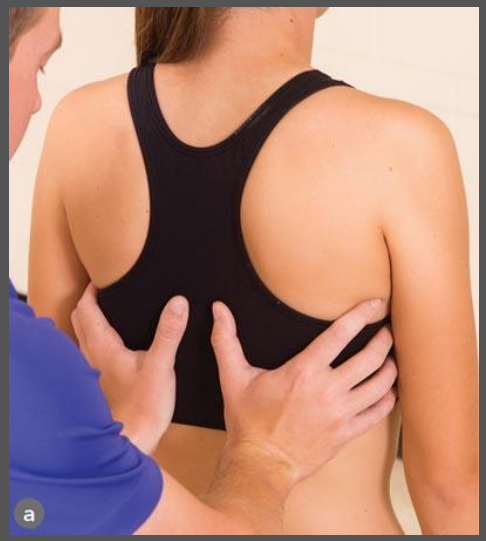


Red Flags that need follow-up

- Constant pain
- Heart palpitations/flutter
- Syncope
- Night pain, night sweats
- Dyshpagia
- Unexplained weight loss
- Insomnia
- Incapacitating pain
- Severe dyspnea
- Recurrent nausea, vomiting
- Pulsating or severe cramping pain
- Difficult or painful urination
- Blood in the urine
- Severe or progressive dizziness
- Malaise, fatigue

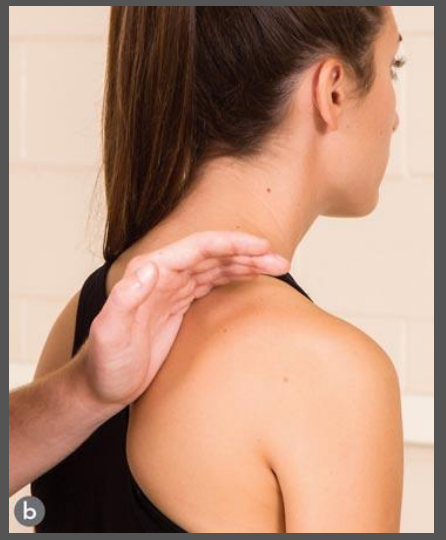
Physical Exam

- Exam follows universally accepted cephalocaudal sequence for the physical examination
- General survey includes observation of the patient's apparent state of health, level of consciousness, signs of distress
- The physical assessment is performed in the same order as review of systems
- Begins with the vital signs
- Use of Palpation









Auscultation

The skilled listening by a trained ear for sounds produced by the body

Most body sounds, including the heart, lung, and bowel, are not audible without the use of a stethoscope

Auscultation takes practice so that the sounds can be identified and isolated from each other. A quiet environment is a must.



Stethoscope

A **good-quality** acoustic or digital stethoscope is required for auscultation for most examinations

- Diaphragm used to hear high-pitched sounds
- Bell used to hear low-pitched sounds
- Be sure to align stethoscope to your ears
- Ideally directly on skin

Listen not only for the presence or absence of sound but also for intensity, pitch, duration, and quality





Be patient!

Do you know how to open and close the bell and diaphragm?



Digital Stethoscopes



Can toggle between amplified and analog, some offer Bluetooth technology

$250-$500

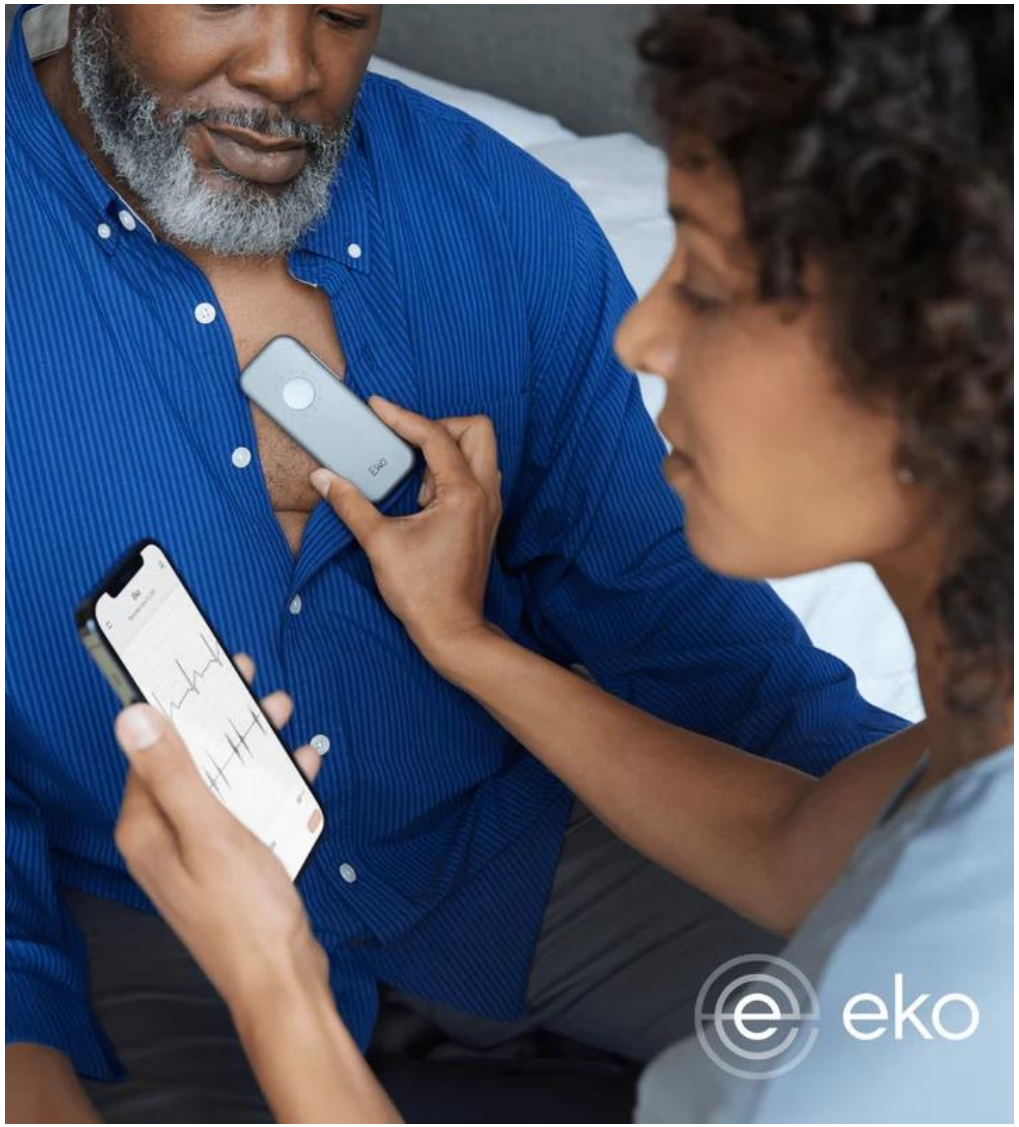


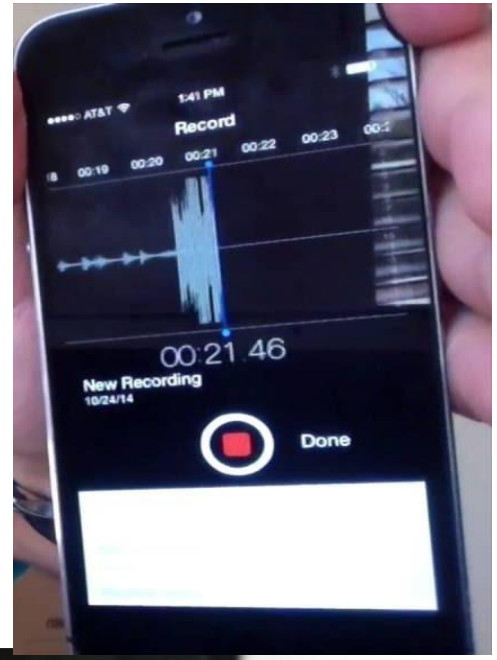
Innovation in auscultation-

-AI gets FDA clearance for auscultation devise. Detects Low EF

-Ability to record and send digital sounds

-Tele-health- remote monitoring of patient health







Characteristics of Sound

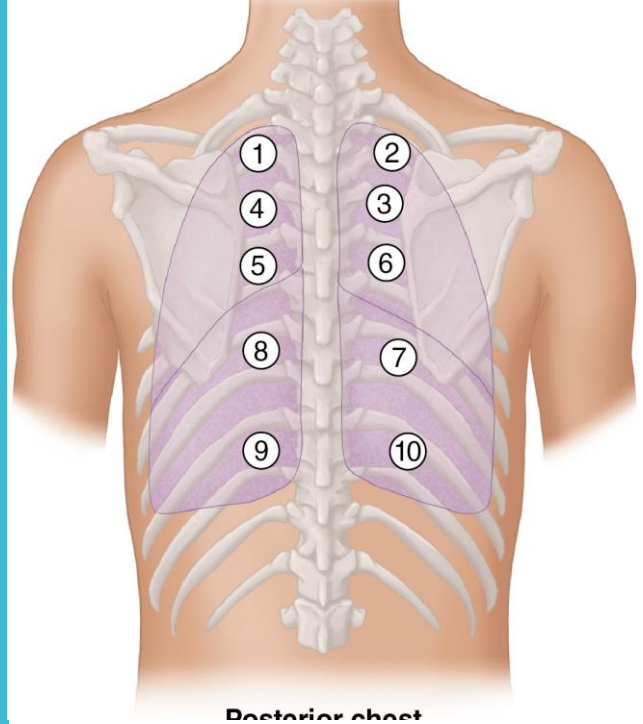
Characteristic	Description
Pitch	Number of sound wave cycles generated per second by a vibrating object. The higher the frequency, the higher the pitch of a sound and vice versa.
Loudness	Amplitude of a sound wave. Auscultated sounds are described as loud or soft
Quality	Sounds of similar frequency and loudness from different sources. Terms such as *gurgling* describe quality of sound
Duration	Length of time from when the sound is first hear to when the sound stops. Duration of sound is *short*, *medium*, or *long*.



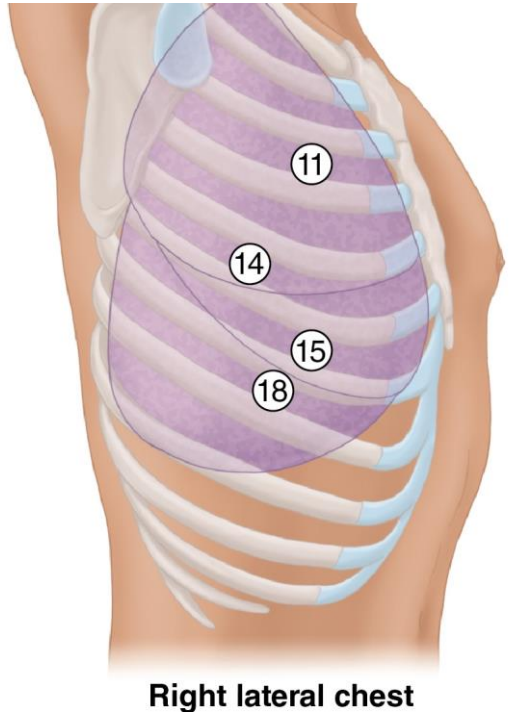
Suggested Sequence of Lung Auscultation



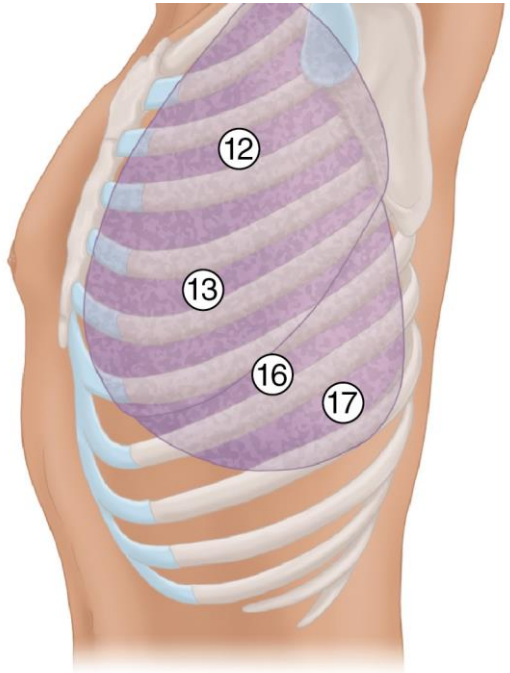
You will need to mentally "block out" the cardiac sounds.



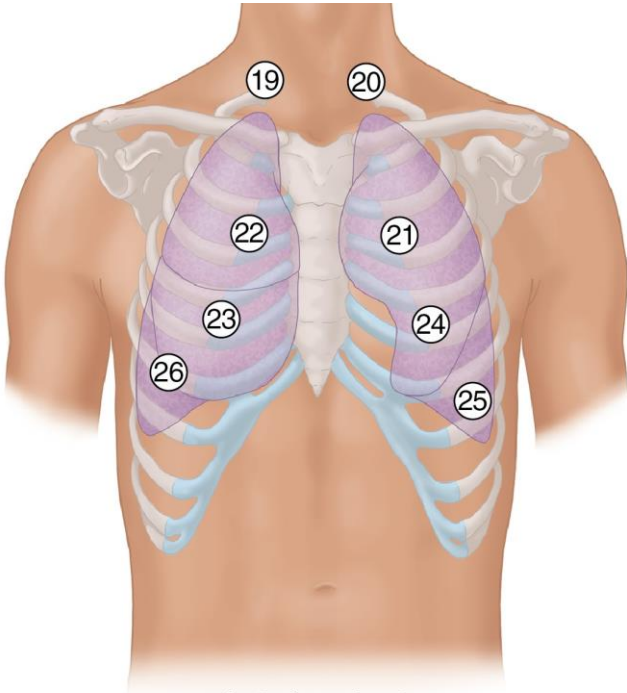
Posterior chest



Right lateral chest

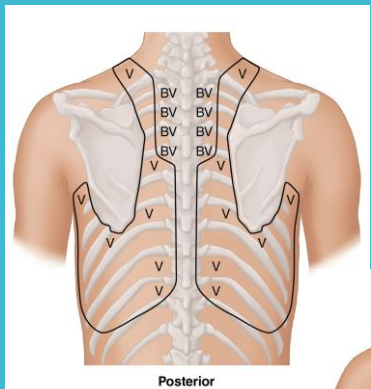


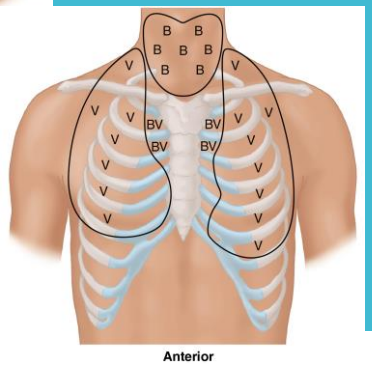
Left lateral chest



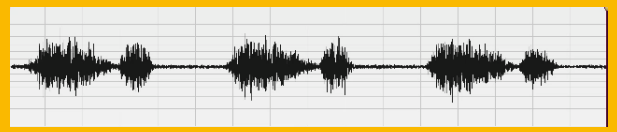
Anterior chest

Normal Lung Sounds-Listen for duration, pitch and intensity



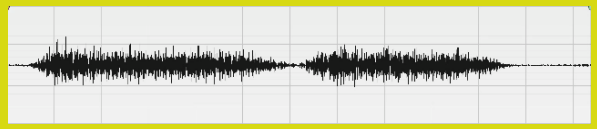


Vesicular



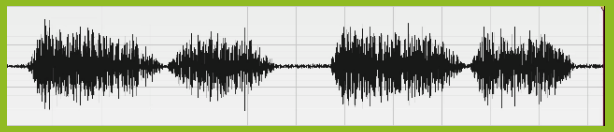
- Inspiration > expiration

Bronchovesicular



- Inspiration = expiration

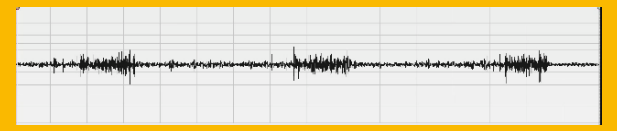
Bronchial



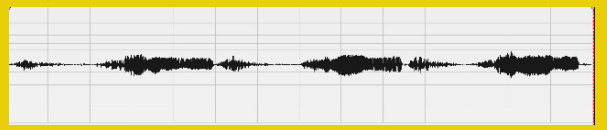
- Expiration > inspiration

Adventitious Breath Sounds

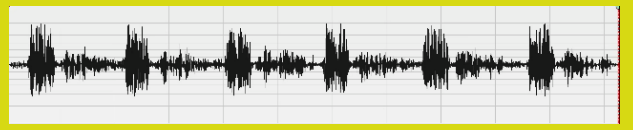
Crackles (rales)



Wheezes



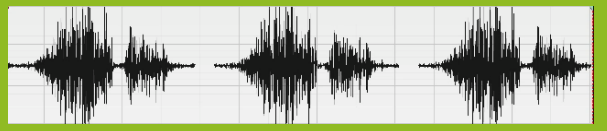
Rhonchi



Stridor



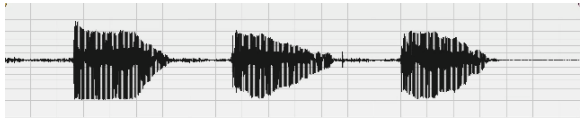
Pleural Rub

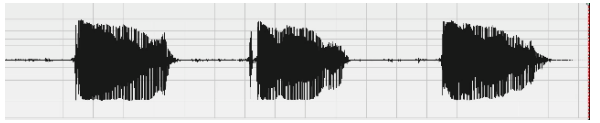


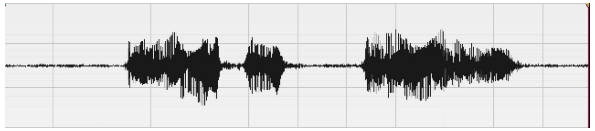
Sounds from of easyauscultation.com

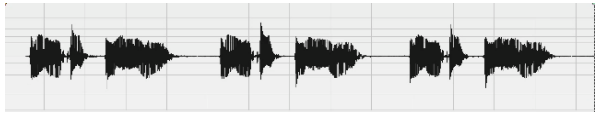
Transmitted Lung Sounds

- **Egophony**
  - During auscultation, the patient says ” e-e-e," but the examiner hears "a-a-a “
  - suggests pleural effusion or consolidation
- **Bronchophony**
  - Voice heard with abnormally increased clarity and intensity through the stethoscope
  - Pt says “99”
  - Suggests consolidation









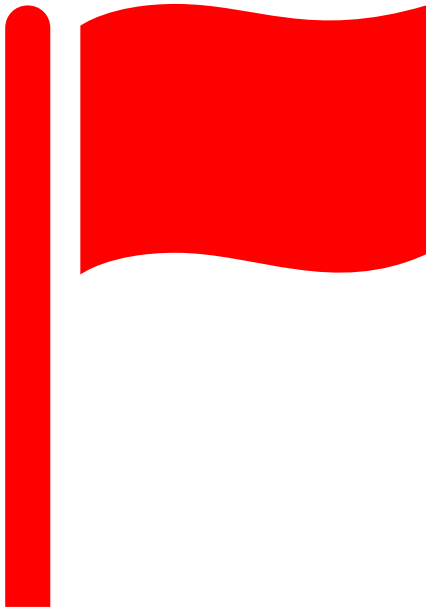
Physical Findings Associated with Common Respiratory Conditions

Condition	Inspection	Palpation	Percussion	Auscultation
Asthma	Tachypnea Dyspnea "locker room cough	Tachycardia	Occasional hyperresonance	Prolonged expiration Wheezes
Bronchitis	Occasional tachypnea Occasional shallow breathing Often no deviation from normal	Tactile fremitus	Resonance	Occasional crackles Occasional expiratory wheezes
Pneumonia	Tachypnea	Increased fremitus in presence of consolidation	Dullness	Variety of crackles Egophony, bronchophony
Pneumothorax	Tachycardia Cyanosis Respiratory distress Tracheal deviation	Diminished to absent fremitus	Hyperresonance	Absent breath sounds on one side Sternal clicks and crackling

Adapted from J. Ball, et al., 2021. Seidel's guide to physical examination, An interprofessional approach, 10th ed. (St. Louis: Mosby).

Red Flags for Respiratory Conditions

- Labored breathing with use of accessory muscles
- Adventitious breath sounds
- Hemoptysis
- Orthopnea
- Dyspnea of rapid onset
- Prolonged cough
- Deviated trachea



Cardiac





Cardiac History

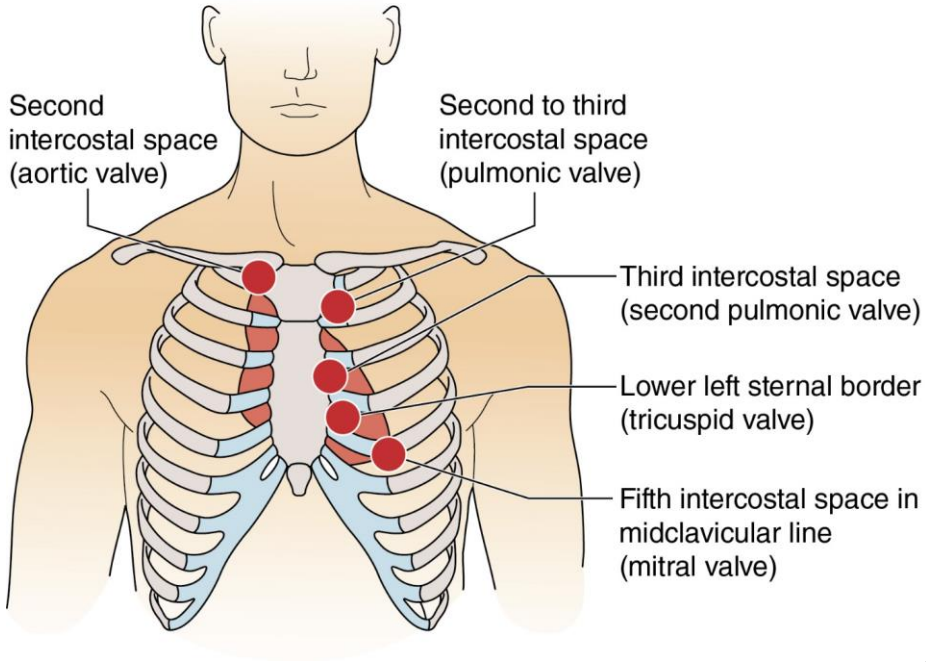
- Cardiac Questionnaire
  - Are you dizzy, have you passed out during exercise?
  - Chest pain?
    - During exercise
    - After exercise
  - Feel heart skipping or racing?
  - Do you get tired more quickly than teammates?
  - Have you ever been told you have a heart murmur?
  - Family history?
  - Have you had severe viral infection in the last month?



Cardiac Auscultation

Close your eyes when auscultating or palpating. It makes you focus on what you are hearing and feeling.

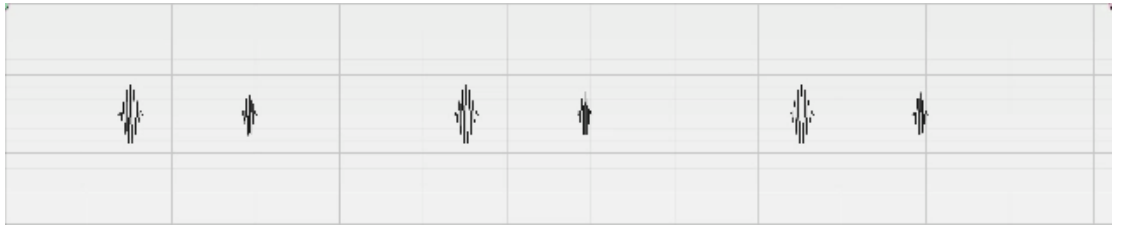
- A good stethoscope is a MUST
- Patient is supine to start
- Order of auscultation-
  - Aortic
  - Pulmonic
  - Tricuspid
  - Mitral
- "All Physicians Take Money"
- Environment must be quiet



Ferri, 2022

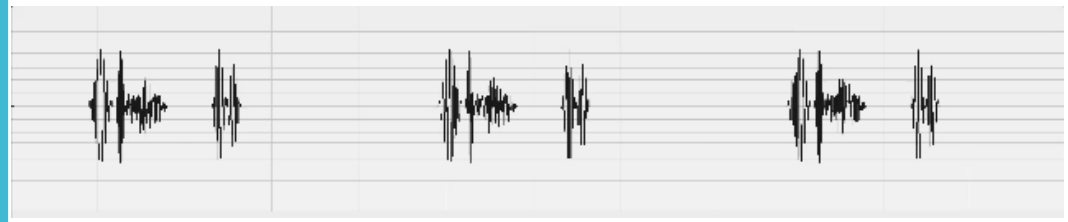
Auscultation

- What am I hearing?
- First sound- closing of mitral and tricuspid valves. S1
- Second sound- closing of aortic and pulmonic valve. S2
- Learn what “normal” sounds like



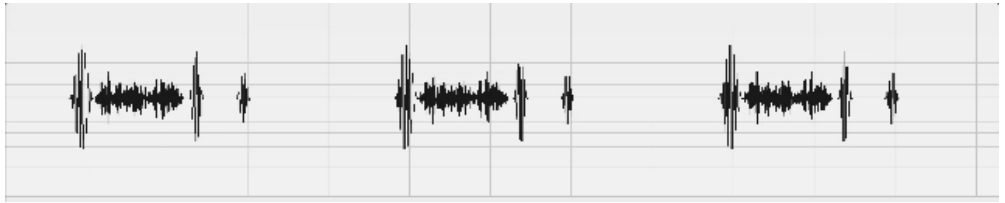
Abnormal

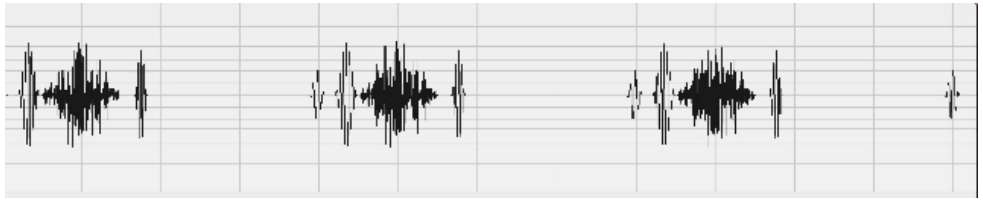
- Systolic Murmurs and Clicks
  - What do you hear?



Aortic Stenosis

Mitral Valve Regurgitation



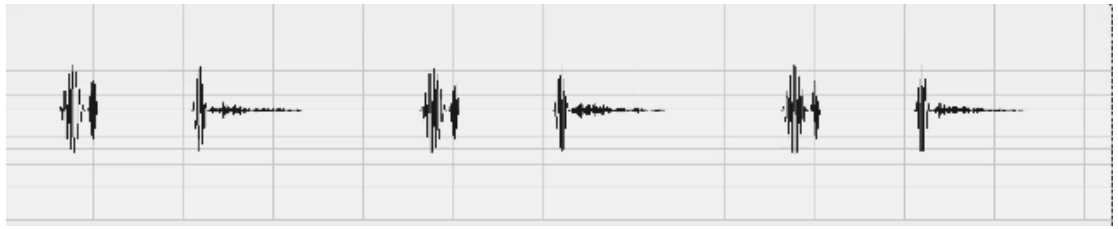


Hypertrophic Cardiomyopathy



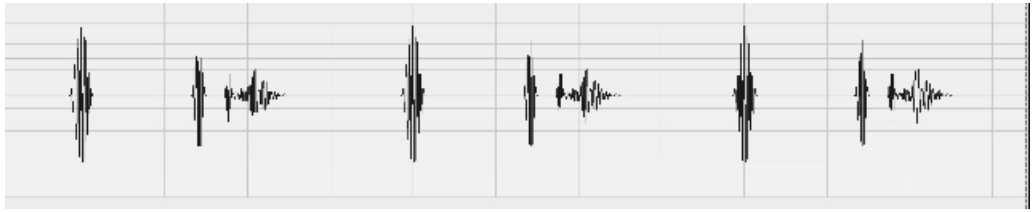
Abnormal

- Diastolic Murmurs and Clicks



Aortic Regurgitation

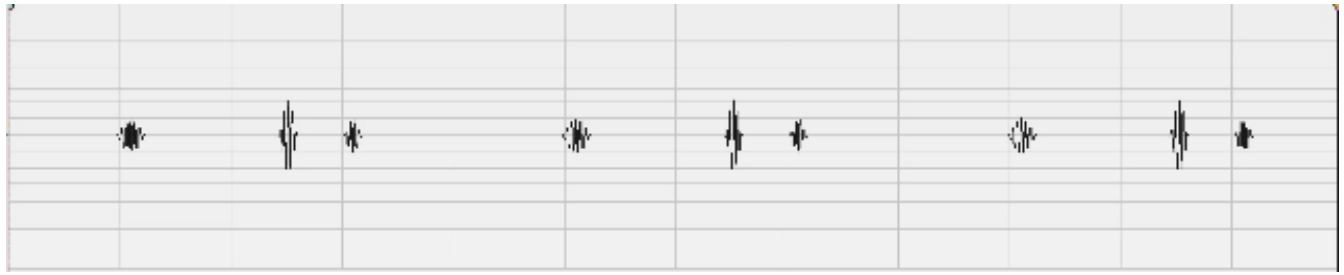
Mild Mitral Stenosis



Third Heart Sound

S_3

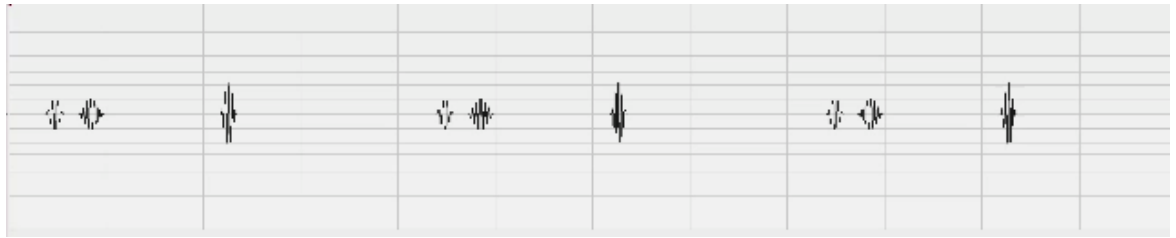
- Third sound- caused by a sudden deceleration of blood flow into the left ventricle from the left atrium
- Can be normal in athletic population- but needs follow-up
- Older population – Congestive heart failure
- Younger population- Myocarditis, pericarditis
- Think "Kentucky"



Fourth Heart Sound.

S_4

- Late diastole just prior to first heart sound (atrial gallop)
- Increase in stiffness of left ventricle or greatly thickened left ventricular wall
- Think "Tennessee"

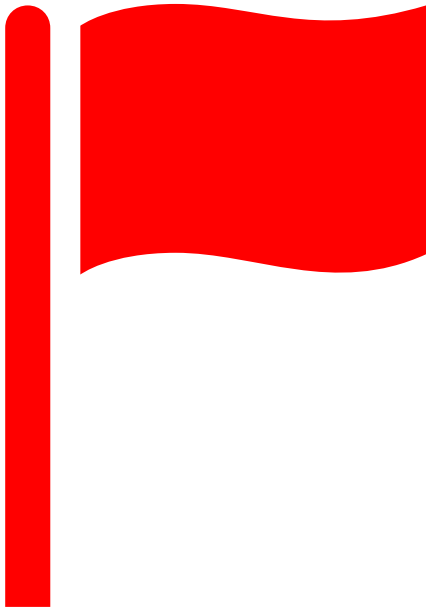


Differentiating Signs & Symptoms

	Signs & Symptoms
Myocarditis	Viral symptoms Fatigue Chest pain Dyspnea Pitting edema Palpitations Tachycardia Prominent S_3 "Kentucky" Rales at base of lung
Aortic Stenosis	Hypotension Exertional syncope Arrhythmias Loud crescendo-decrescendo systolic murmur heard at upper right sternal border
Mitral Valve Prolapse	Chest pain Heart palpitations SOB Syncope, near syncope Systolic apical click Systolic murmur, accentuated with squatting or Valsalva maneuver

Cardiac Red Flags

- Syncope
- Palpitations
- Chest pain
- Abnormal auscultation
- SOB
- Exercise Intolerance
- Pitting edema
- Flu like symptoms (myocarditis)
- Limb pain or swelling
- Heat intolerance



Putting all together



19 y.o. football player c/o fatigue, tightness in chest, difficulty catching his breath.

History

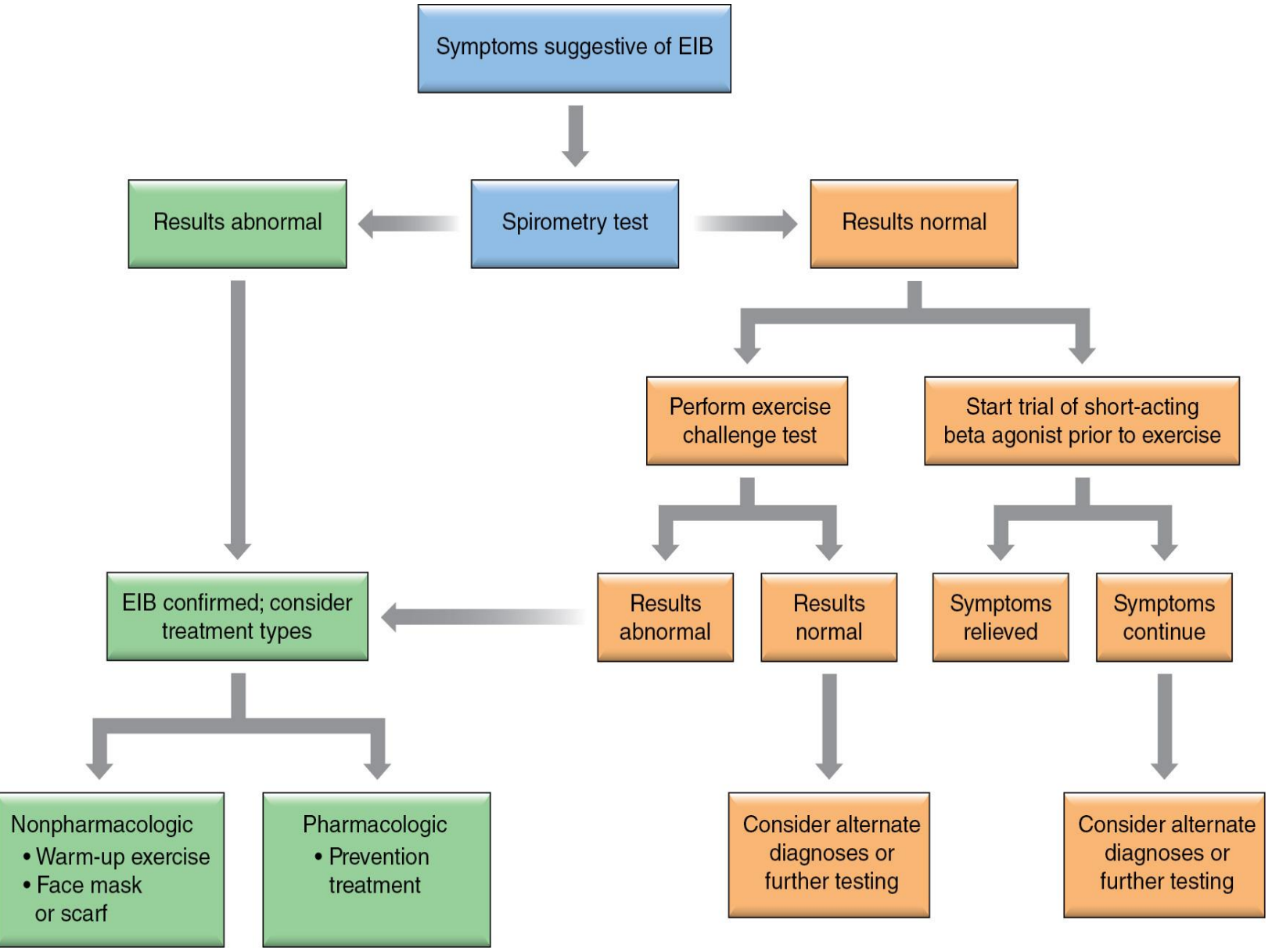
- How long has he been experiencing these symptoms?
- What exacerbates the condition?
- How severe?
- Do you have a cough?
  - Dry?
  - Productive? Color of sputum?
- Timing of cough
  - Worse at night?
  - Positional?
  - After workout?
- SOB?
  - On inhalation, exhalation or both?
  - Only with extreme activity or also at rest?
- Associated chest pain? Palpitations?
  - Trauma?
  - Heartburn?
- Past medical history, family history, medications?

Patient's Pertinent History

- Few weeks duration
- Dyspnea, mild
- Increased with exertion
- Occasional cough, minimally productive , mostly after exertion
- Increasing in frequency (1-2 X per week)
- No fever, occasional nasal congestion/sneezing
- No palpitations
- No past or family history of respiratory issues
- No medications

Physical Exam

- Temp 98.6 Pulse 62 Resp 14 BP 110/62
- O2 saturation 100%
- HEENT –painful and puffy frontal sinuses
- Neck – normal
- Lungs- CTA B w/o WRR
- CV- RRR w/o MGR



Differentials?

- Seasonal allergic rhinitis
- Mild asthma, EIB
- GERD

Next steps?

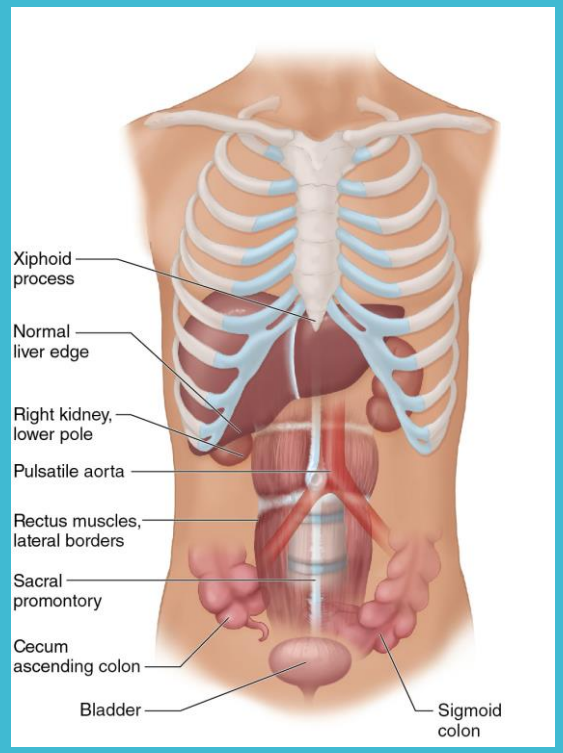
- OTC seasonal allergy meds
- Monitor, if no improvement, then
  - Chest x-ray
  - Follow algorithm

Abdomen

A few more pearls……



Abdominal Examination



- History:
  - Pain: onset, duration, quality, severity, radiation
  - Associated symptoms: nausea, vomiting, diarrhea, constipation, fever, fatigue painful urination
  - Aggravating or alleviating factors
  - Medications
  - Appetite and food intolerance
  - Bowel Habits

Observation

- Shape and symmetry
- Assessment of skin and scars

Auscultation

- Bowel sounds
- Vascular sounds

Percussion and Palpation

- Percussion
- Light palpation
- Deeper palpation
  - Spleen, liver, kidneys and McBurney's point

Learn to ask the right questions…. Even if a bit awkward

Knowing the character of the vomited material or stool will assist in the diagnosis.

- Vomit
  - food pieces
  - coffee grounds consistency
  - Blood
  - Bile
  - Foul smelling stool-like
- Bowel
  - Blood in stool
  - Red or maroon stools
  - Black or tarry
  - Clay color



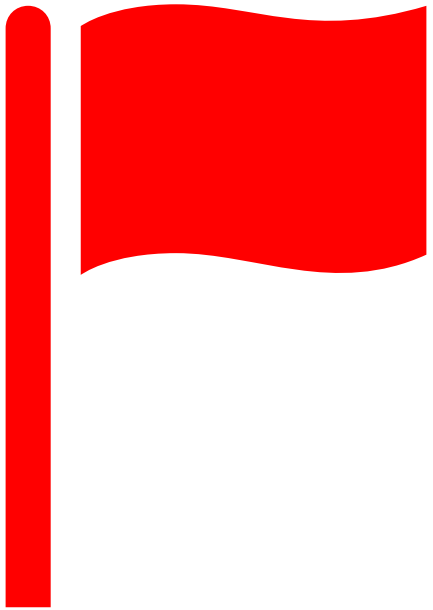


GI disorders and common characteristics

	Signs & Symptoms	Treatment
Viral Gastroenteritis	Watery diarrhea Nausea with or w/o diarrhea Fever Diffuse aches, pains chills	OTC Imodium Supportive treatment Allow stomach to quiet down Usually resolves in 2-3 d
Bacterial Diarrhea	Severe abdominal cramps High fever Severe diarrhea *Staphlococcus* or *Salmonella*	Supportive Watch for dehydration
GERD	Heartburn sensation Belching Regurgitation of food and acid Chronic cough laryngitis	Avoid irritant Antacids Histamine (H_2) blockers PPI
Peptic Ulcer Disease	Mild to moderate mid-abdominal pain Loss of appetite Nausea Eating aggravates Tarlike black stools Coffee grounds vomitus	Begin with same treatment as GERD Lab tests for *H. pylori* Endoscopy Upper GI series Antibiotic treatment

Abdominal Pain

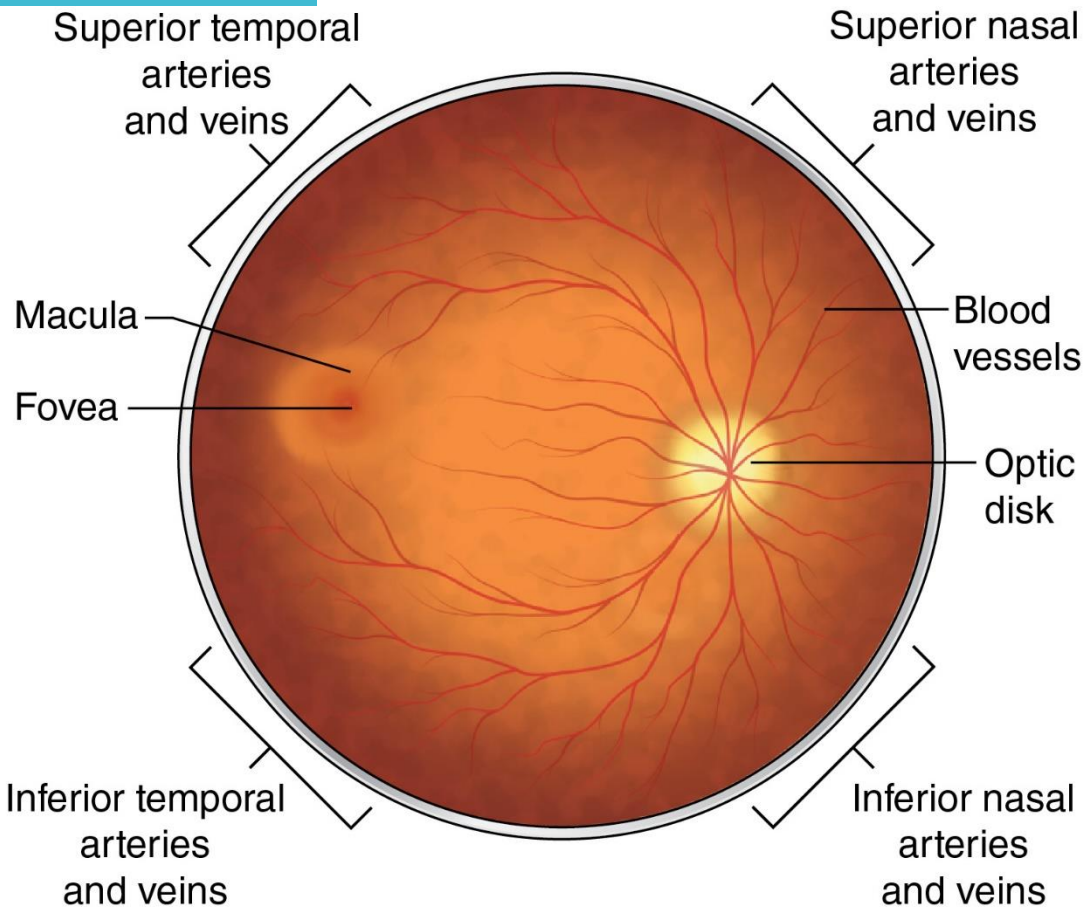
- Vomiting bright red blood or black material that looks like coffee grounds
- Fever of 38.3° C (101° F) or more accompanied by severe abdominal pain
- Persistent vomiting, can't keep any fluids down for more than 24-36 hours.
- Localized RLQ pain

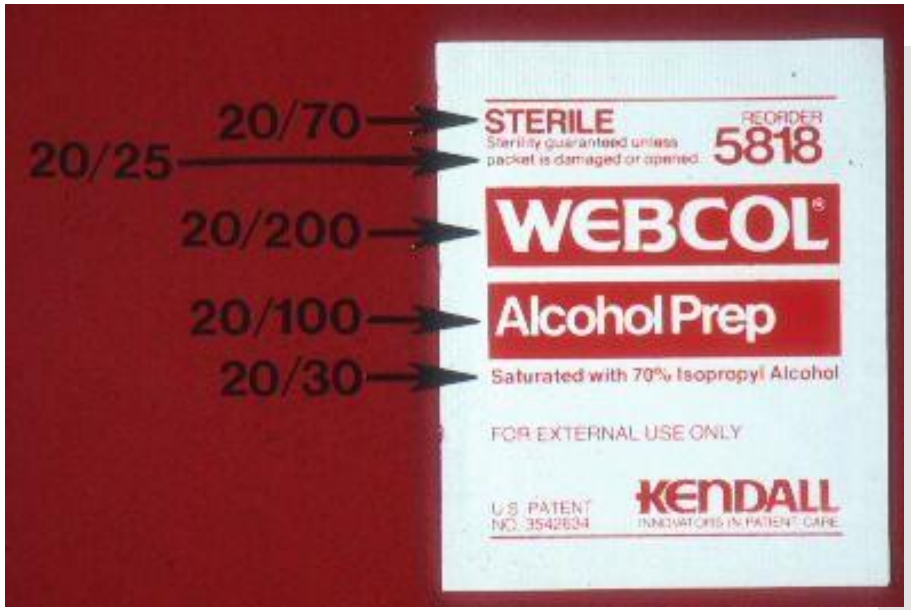




Eyes, Ears, Nose and Throat

Eyes


Superior temporal arteries and veins
Superior nasal arteries and veins
Macula
Fovea
Blood vessels
Optic disk
Inferior temporal arteries and veins
Inferior nasal arteries and veins


20/70
20/25
20/200
20/100
20/30
STERILE
REORDER
5818
WEBCOL
Alcohol Prep
Saturated with 70% Isopropyl Alcohol
FOR EXTERNAL USE ONLY
KENDALL



Tips for use of ophthalmoscope

- Room must be dark
- Use of ophthalmoscope takes practice
- Panoptic may be easier for the beginner
- Watching a game through a hole in the fence







Differentiating conditions through observation

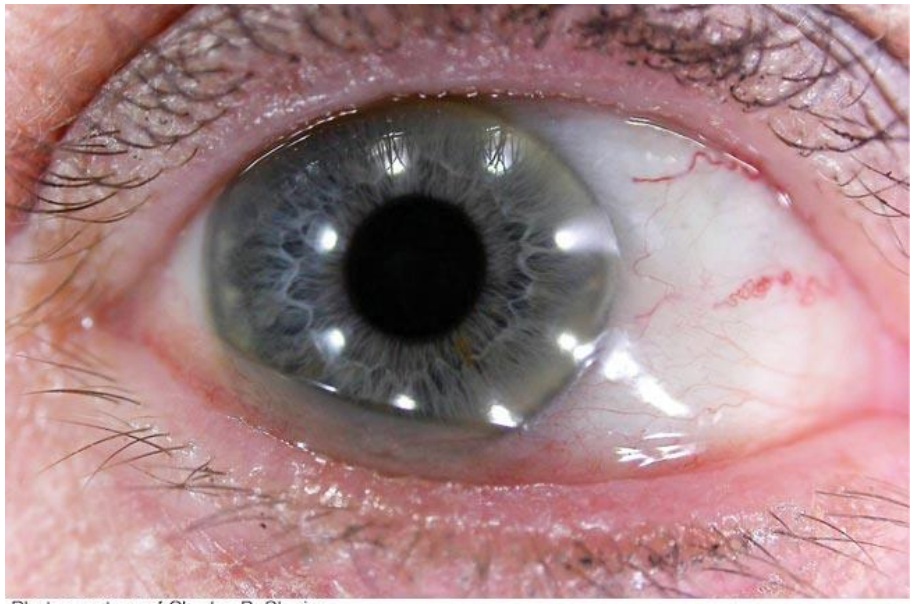
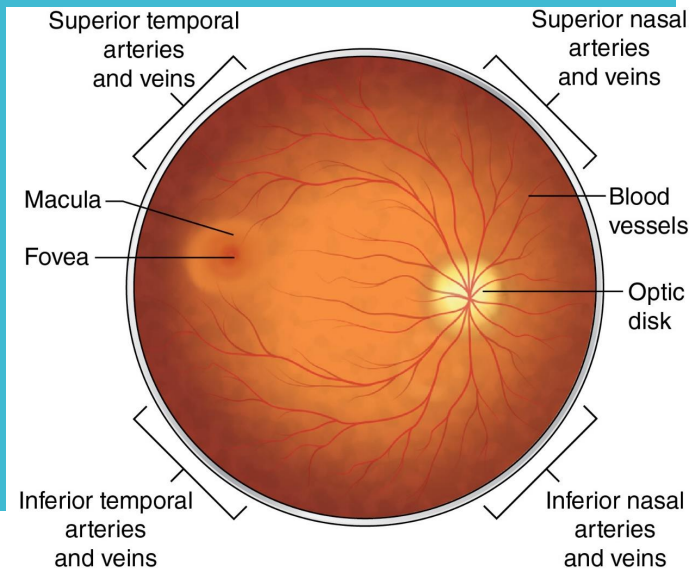
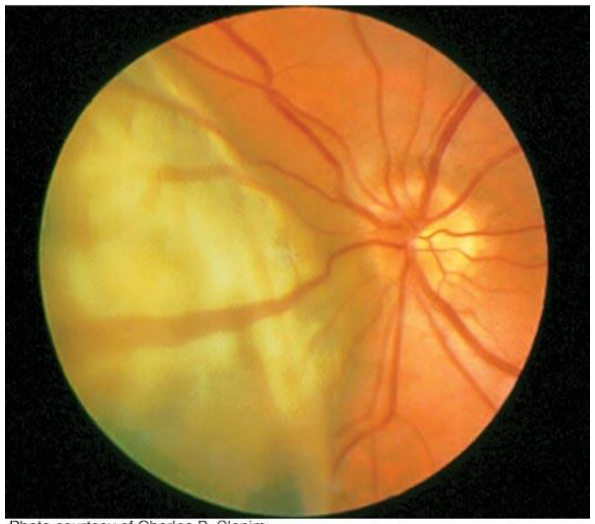

Photo courtesy of Charles B. Slonim

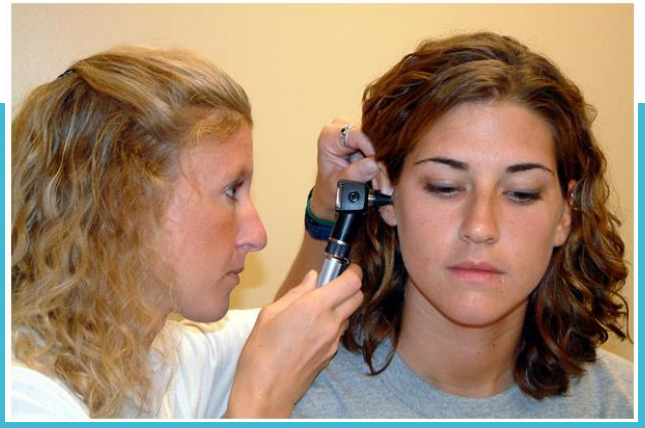

Photo courtesy of Charles B. Slonim




Photo courtesy of Charles B. Slonim

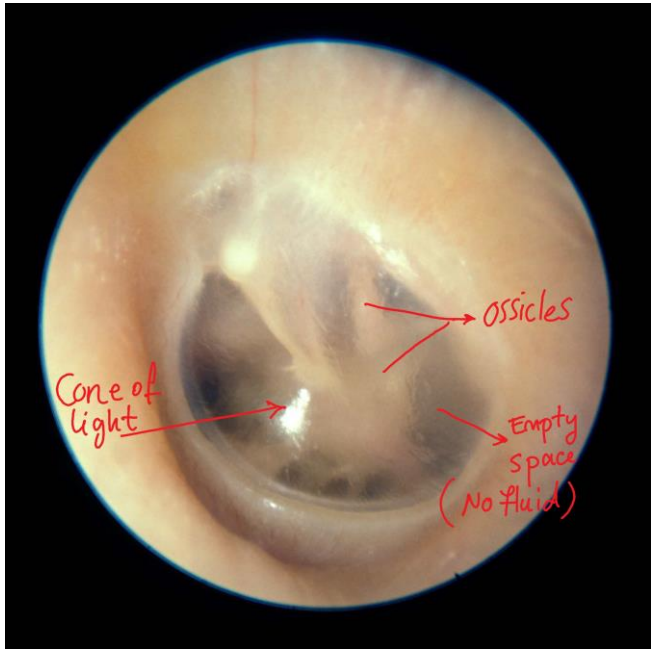


Ears

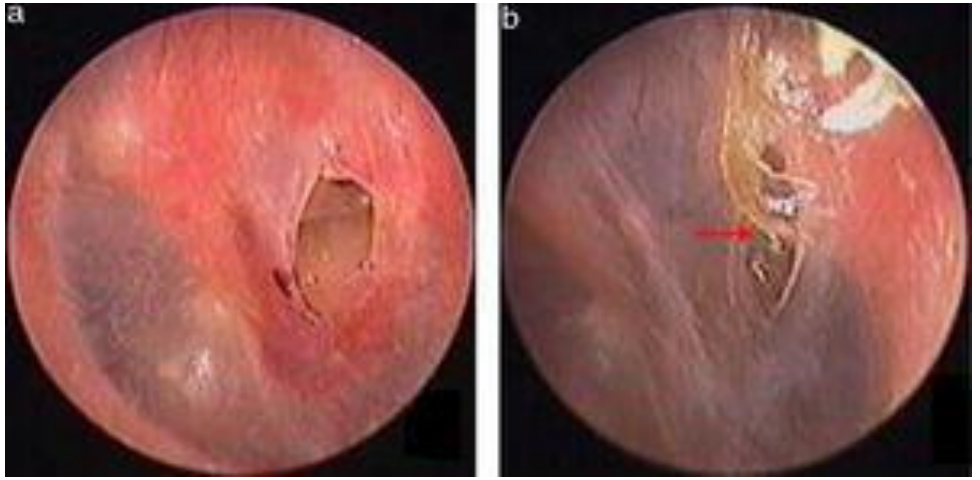




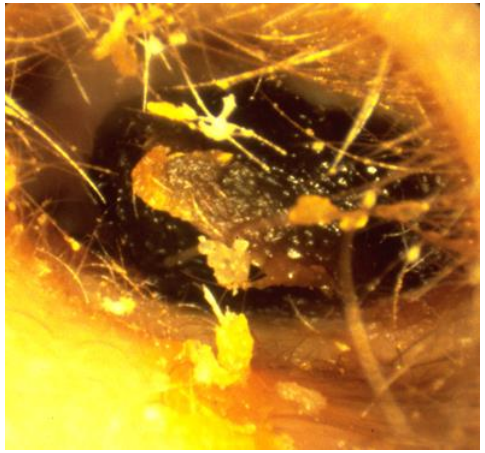
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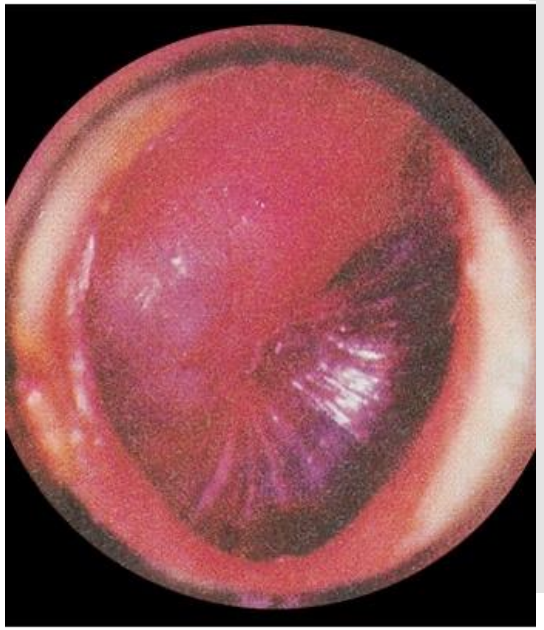
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Online Resources

- Auscultation --
  - Easy Auscultation.com- https://www.easyauscultation.com
  - The Auscultation Assistant - https://www.med.ucla.edu/wilkes/inex.htm

Fundoscopy--

- Stanford- https://stanfordmedicine25.stanford.edu/the25/fundoscopic.html
- https://www.youtube.com/watch?v=SVuP5Td23AQ

- Dermatology--
  - Skinsight- https://www.skinsight.com/
  - DermNet NZ- https://dermnetnz.org/

A.I.

- Open Evidence - https://www.openevidence.com
  - Latest evidence from scholarly journals
  - Best treatment practices
  - Ask in question format
  - Newsletter of popular topics

What is the latest standard of care for hypertension?

Answered on April 8, 2024

The American Academy of Family Physicians (AAFP) recommends treating adults with hypertension to a standard blood pressure target of less than 140/90 mm Hg to reduce the risk of all-cause mortality and cardiovascular mortality. This is a strong recommendation based on high-quality evidence. While a lower blood pressure target of less than 135/85 mm Hg may be considered based on patient preferences and values, it does not provide additional benefit in preventing mortality. The systematic review found no significant differences in total serious adverse events between the lower and standard target groups but noted a significant increase in other adverse events, such as syncope and hypotension, when treating to a lower systolic target.[1]

The American College of Cardiology (ACC) and the American Heart Association (AHA) recommend a blood pressure target of less than 130/80 mm Hg for noninstitutionalized ambulatory community-dwelling adults aged 65 years or older with an average systolic blood pressure of 130 mm Hg or higher. For adults with stage 2 hypertension, a combination of nonpharmacological and antihypertensive drug therapy is initiated, with two agents of different classes, and a repeat blood pressure evaluation in 1 month.[2]

Nonpharmacological therapy is the preferred therapy for adults with elevated blood pressure and an appropriate first-line therapy for adults with stage 1 hypertension who have an estimated 10-year atherosclerotic cardiovascular disease risk of less than 10%. Adherence to and impact of nonpharmacological therapy should be assessed within 3 to

References

1. AAFP Issues New Clinical Practice Guideline on Hypertension. Show Details
   Annals of Family Medicine. 2023 Mar-Apr;21(2):190-191. doi:10.1370/afm.2972.
2. 2019 AHA/ACC Clinical Performance and Quality Measures for Adults With High Blood Pressure: A Report of the American College of Cardiology/American Heart Association Tas Force on Performance Measures. Show Details
   Casey DE, Thomas RJ, Bhalla V, et al.
   Journal of the American College of Cardiology. 2019;74(21):2661-2706. doi:10.1016/j.jacc.2019.10.0(
   ☆ Top Journal
3. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Re of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Show Details
   Whelton PK, Carey RM, Aronow WS, et al.
   Circulation. 2018;138(17):e484-e594. doi:10.1161/CIR.0000000000000596.
   ☆ Top Journal

Bottom Line

- Listen to your patient!
- Just as you trained your fingers to feel subtle differences during palpation, you must train your ear to see subtle differences during auscultation.
- Know what "normal" sounds and looks and feels like
- Be able to describe what you are seeing, hearing or feeling. Using the same terminology your supervising physician uses.
- Don't focus on just one system…. Comorbidities!
- Practice! Practice! Practice!
  - Simulators
  - Task trainers

References

- Ball J, Dains J, Flynn J, Solomon BS, Stewart RW. Seidel's Guide to Physical Examination, An Interprofessional Approach. 10 ed. St. Louis: Elsevier; 2021. 712 p.
- Carr PC, Cropley TG. Sports Dermatology: Skin Disease in Athletes. Clin Sports Med. 2019;38(4):597-618. doi: 10.1016/j.csm.2019.06.001. PubMed PMID: 31472769.
- Ferri FF. Ferri's Clinical Advisor 2022. Philadelphia: Elsevier; 2022.
- Flanagan K, Cuppett M. Medical Conditions in the Physically Active 4th ed. Champaign, IL: Human Kinetics 2024.
- Lorin MI, Palazzi DL, Turner TL, Ward MA. What is a clinical pearl and what is its role in medical education? Medical Teacher. 2008;30(9-10):870-4. doi: 10.1080/01421590802144286.
- Magor D, et al 2023 Interpretation of heart and lungs sounds acquired via remote, digital auscultation reached fair-to substantial levels of consensus among specialist physicians. Diagnotics 2023 Oct 13((19): 3153.
- Mukwende M, Tamony P, Turner M. Mind the Gap: A handbook of clinical signs in black and brown skin. 1 ed: St. George's University of London.
- Peterson AR, Nash E, Anderson BJ. Infectious Disease in Contact Sports. Sports Health. 2019;11(1):47-58. Epub 2018/08/14. doi: 10.1177/1941738118789954.
- Seshamani M, Jacobs D, Moody-Williams J, Fleisher L. 2023 Addressing Rural health Inequities in Medicare.
- VanDurme D, editor Fundamentals of Dermatology. Dermatology for the Non-Dermatologist; 2018; Key West, Florida.

Questions?

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