

Advanced Cardiac Physical Exam

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Description

- This presentation will provide guidance on advanced physical exam techniques and how to integrate these techniques into practice.
- We will discuss how to perform specific maneuvers to elicit heart murmurs as well as explore physical exam findings that may be indicative of underlying pathology.

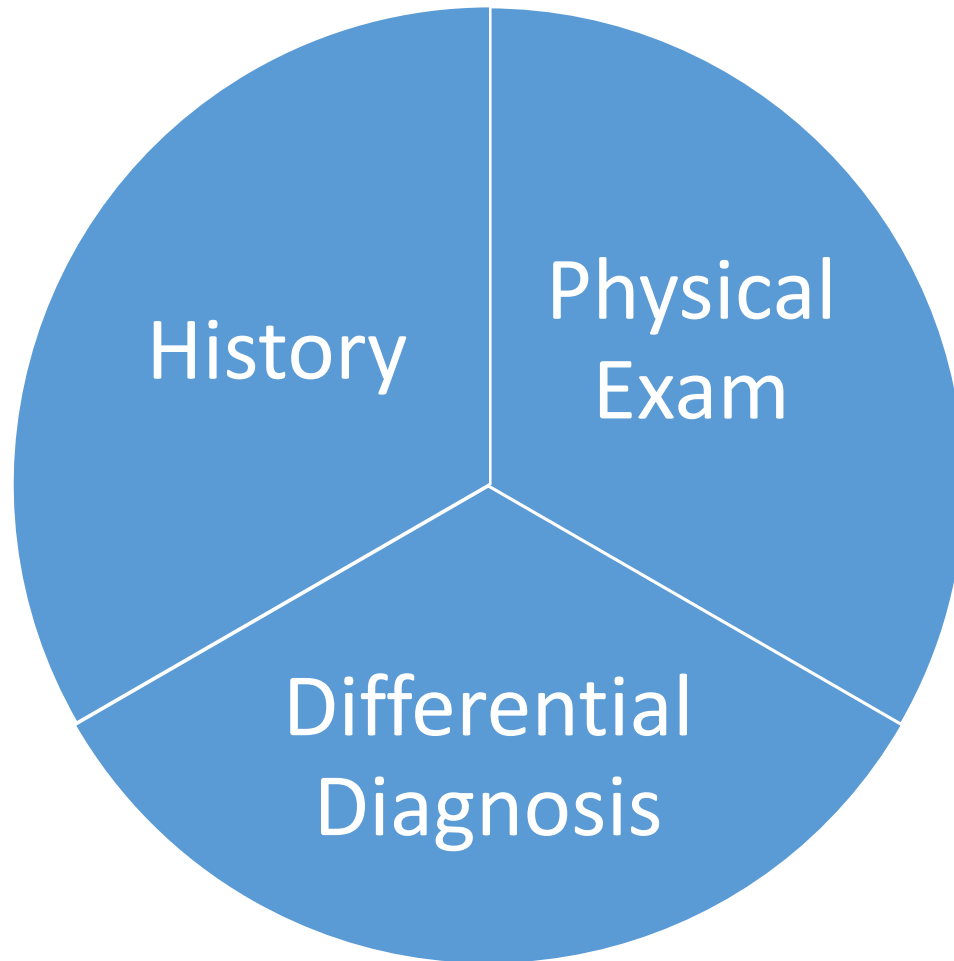
Objectives

- Describe gross cardiac anatomy and how it relates to physical exam.
- Discuss physical exam techniques which are specific to a cardiovascular exam.
- Identify major physical exam findings which may be indicative of cardiovascular disease.
- Discuss maneuvers for eliciting specific heart murmurs

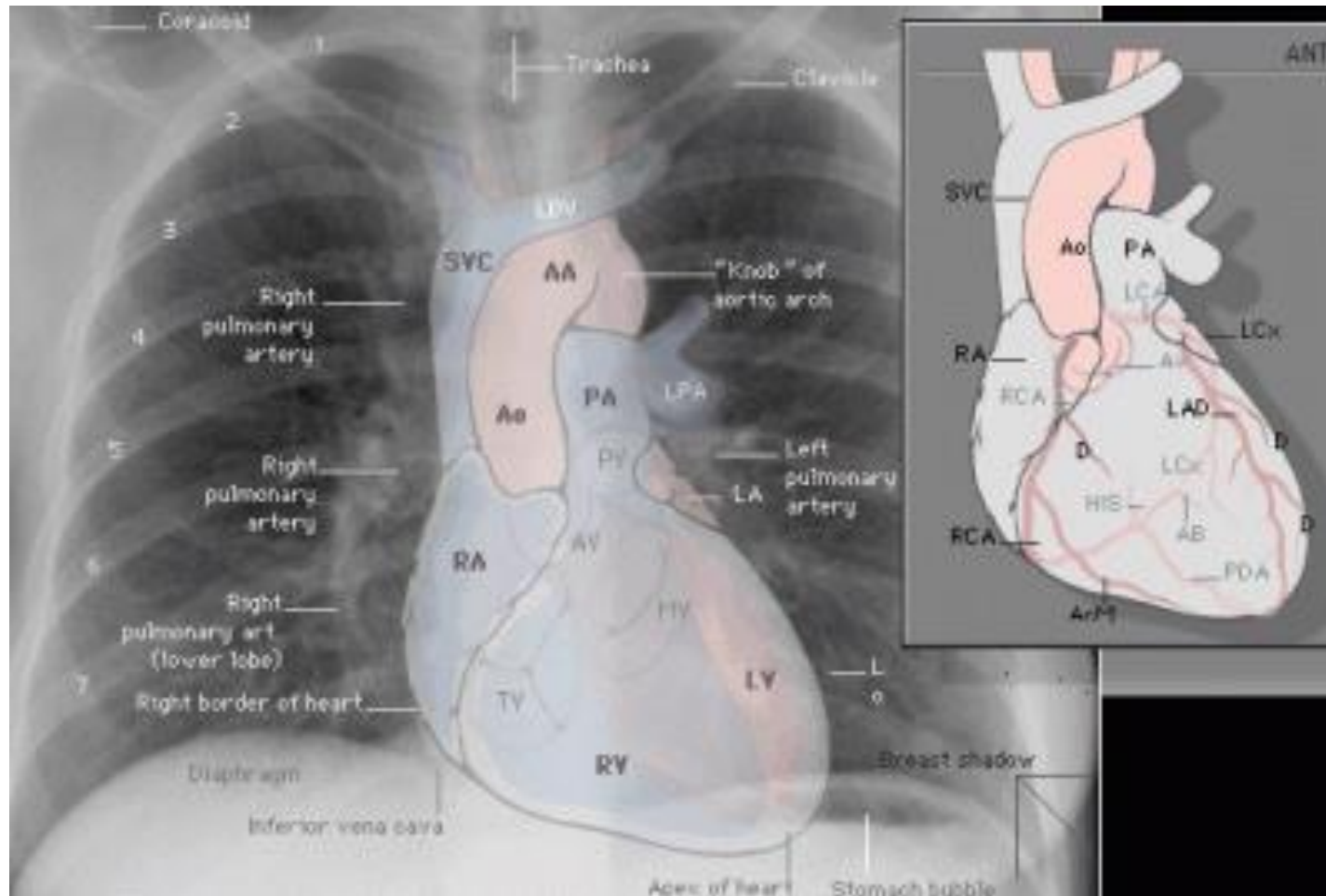
Outline

- Basic Anatomy
- Basic Hemodynamics Related to the Exam
- Auscultation
- Special Maneuvers for heart murmurs
- Non-cardiac Clues to Diagnosis

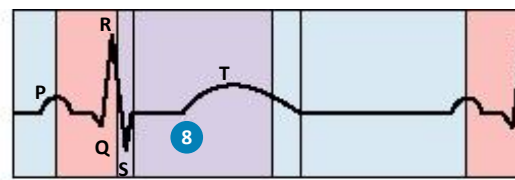
Standard approach



Cardiac Anatomy within the chest

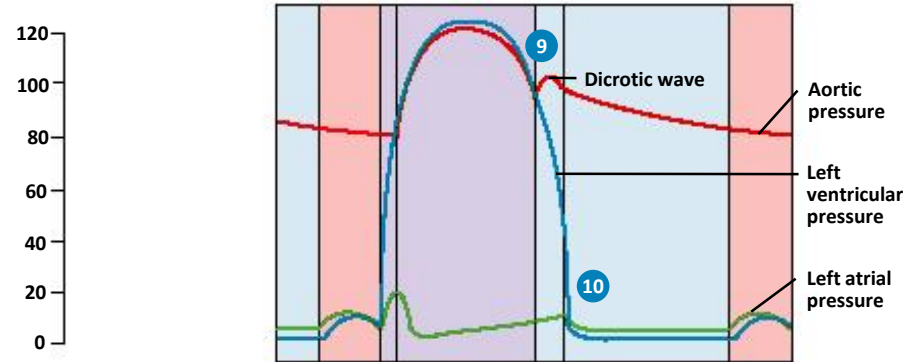


(a) ECG

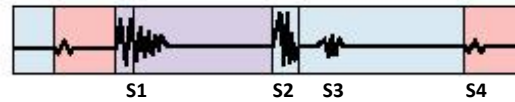


0.1 sec	0.3 sec	0.4 sec
Atrial systole	Ventricular systole	Relaxation period

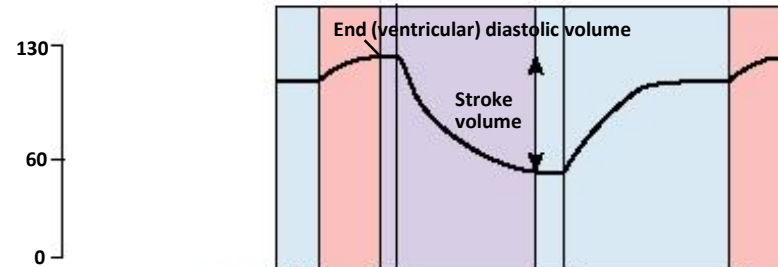
(b) Pressure (mmHg)



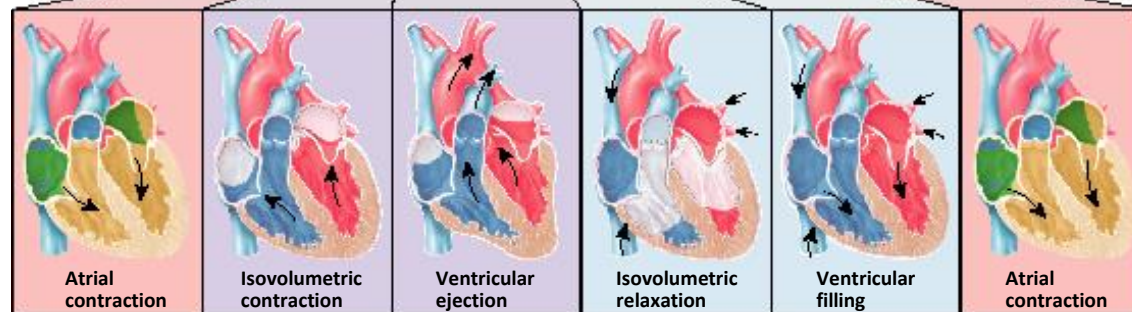
(c) Heart sounds



(d) Volume in ventricle (mL)



(e) Phases of the cardiac cycle



- 1 Atrial depolarization
- 2 Begin atrial systole
- 3 End (ventricular) diastolic volume
- 4 Ventricular depolarization
- 5 Isovolumetric contraction
- 6 Begin ventricular ejection
- 7 End (ventricular) systolic volume
- 8 Begin ventricular repolarization
- 9 Isovolumetric relaxation
- 10 Ventricular filling

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Vital Signs

- Patient comfortable
- Ask about hot/cold beverage recently
- Ask about smoking/vaping
- Ask if they usually wear oxygen

Measuring blood pressure accurately

- Use the appropriate size cuff
- Individual is seated with two feet on the floor for at least 10 minutes
- Patient comfortable
- Arm extended at the level of the heart
- Center of the cuff over the brachial artery
- Inflate rapidly, deflate slowly
- Compare both arms and treat the higher value

What usually happens?

- Automatic cuff
- Rushing from waiting room
- Recent tobacco and/or caffeine use
- Patient and or healthcare professional talking

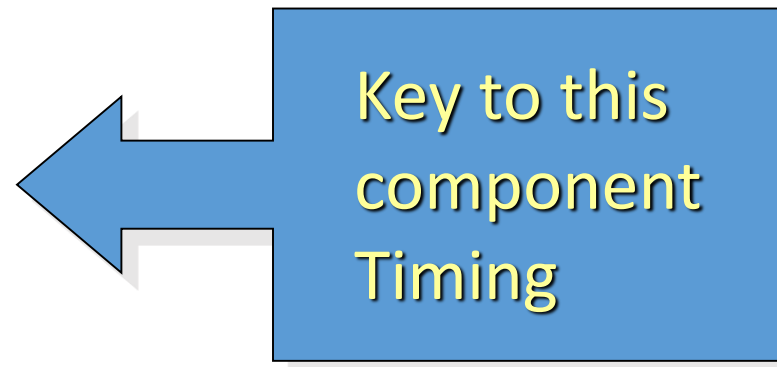
Out of office bp monitoring

- Reveals undiagnosed hypertension
- Detects white coat hypertension
- Engages patient in self-monitoring



Approach to the Cardiac Physical Exam

- Vital Signs
- Physical Appearance and mental status
- Face/Head/Neck
- Chest
- Abdomen
- Lower extremities
- Skin
- **Cardiac exam**
 - Palpation
 - Auscultation

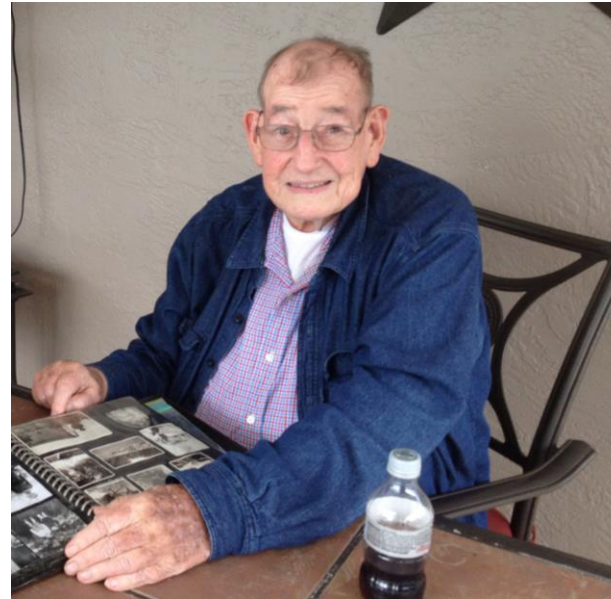


Appearance

“Looks good, looks bad”



Assess body habitus



Mental status

- Indicative of cerebral perfusion
- Can reveal atherosclerotic disease



Face/Head

- Dull, expressionless face, loss of lateral eyebrows.
 - Hypothyroidism
- Head or neck bobbing
 - Severe AR- “de Musset’s sign”
- Facial edema
 - Constrictive pericarditis
- High arched palate, prominent ears
 - Marfan syndrome



Systemic Lupus Erythematosus

Autoimmune disorder which can affect vasculature

Malar rash in butterfly configuration

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Temporal Arteritis (aka-Giant Cell arteritis)

Indicative of systemic inflammatory
vasculitis

THINK- vascular disease!

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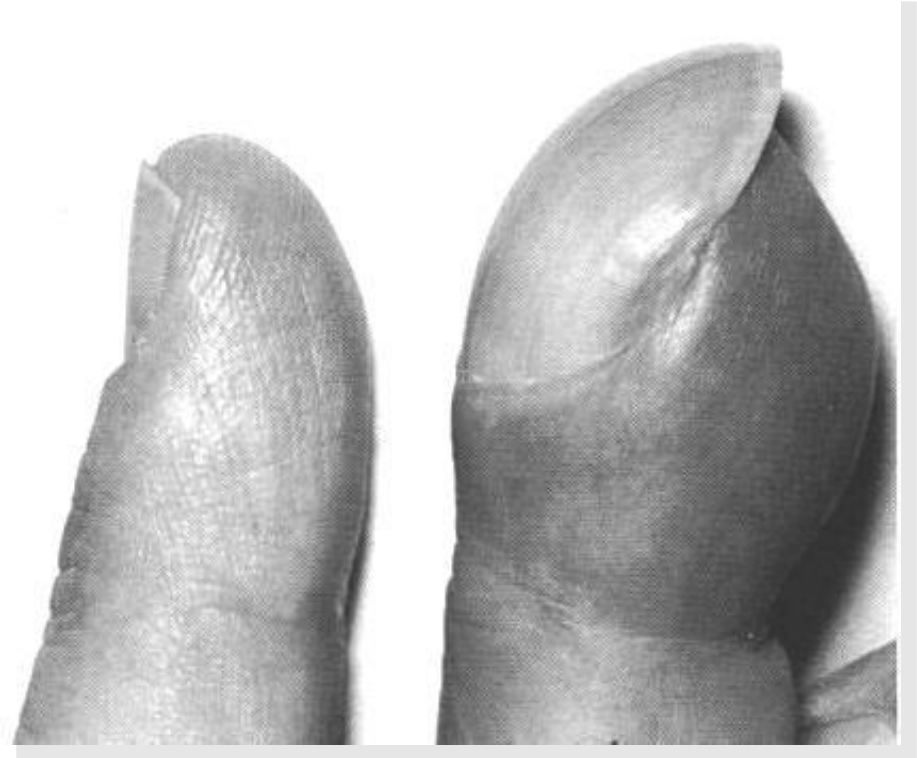
Frank's sign

Diagonal earlobe crease associated with CAD, PVD and cerebrovascular disease



Clubbing

- Nail becomes enlarged and curved.
- Associated with pulmonary, cardiovascular and thyroid diseases.
- May be seen in cirrhosis and colitis.



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Quincke's sign

- In addition to the head bobbing associated with aortic regurgitation
- [Pulsation in nailbed](#)

Eyes

Exophthalmos

High output failure

Arcus

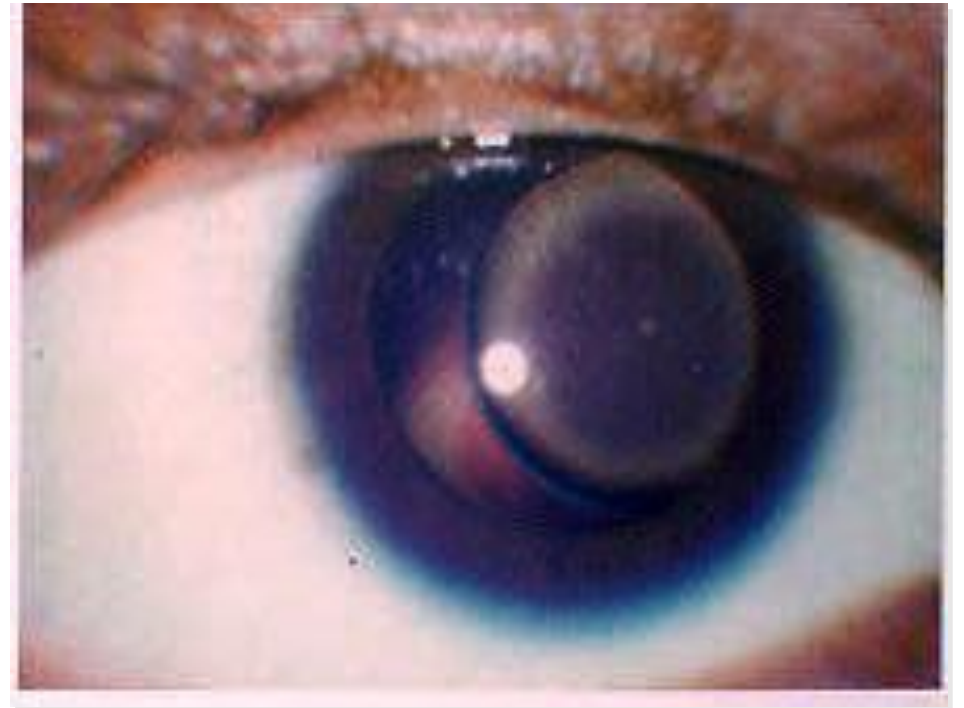
Hypercholesterolemia

Blue sclera

Marfan syndrome

Jaundice sclera

Liver disease



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Marfan Syndrome

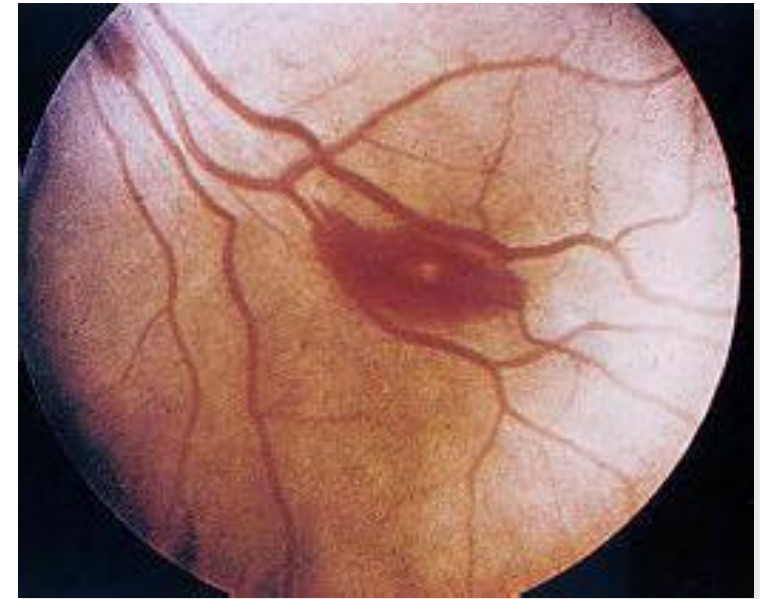
Fundoscopy

Retinal artery beading
Hypercholesterolemia

Papilledema
Htn

Cotton wool spots
Htn

Roth's spots
Infective endocarditis, leukemia, diabetes
collagen-vascular disease

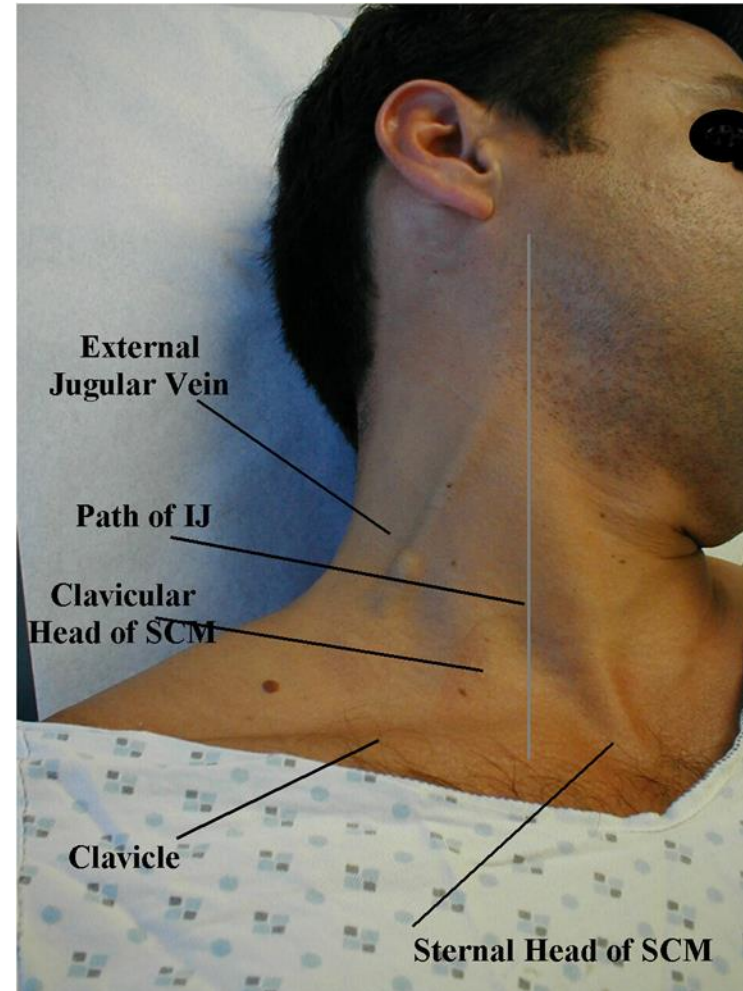


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Roth Spot

Neck

- Jugular venous pressure
- Carotid
 - Pulses
 - Bruits
- Thyroid
 - Thyromegaly



Elevated JVP

- Reflects an increase in right atrial pressure
 - Heart failure
 - Decrease in right ventricular compliance
 - Pericardial disease
 - Hypervolemia
 - SVC obstruction

Jugular Venous Pressure (JVP)

- Internal jugular vein is evaluated
- Reflects the dynamics of the right side of the heart
 - Venous wave pattern
 - Venous pressure measurement
- Realistic approach to assessment of JVP in a clinic
 - Start with patient at 45 degree angle
 - Evaluate the right side of the neck
 - Patient is lying comfortably

Differentiating Carotid and Jugular Pulses

- Arterial pulse
 - Single upstroke, rapid movement, localized
 - Difficult to visualize, easier to palpate
 - Pulsation does not change with upright position
 - Not affected by compression of the root of the neck

Assessment of pulses

- Carotid
- Radial
- Brachial
- Femoral
- Popliteal
- Dorsalis pedis
- Posterior tibial

Carotid Pulse

- Rate of rise= upstroke
- Normal upstroke= rapid and smooth
- Normal downstroke= less abrupt

Pulse Abnormalities

- Pulsus parvus et tardus
- Bisferiens pulse
- Pulsus alternans
- Pulsus paradoxus



Personal photo Bowers

Chest

- Inspection

- Shape of chest
- Lifts/heaves

- Auscultation

- Identify adventitious sounds
- Don't forget about egophony

- Percussion

- Pleural effusion- dull to flat
- Lobar pneumonia- dullness
- Emphysema- hyperresonance

- Palpation

- PMI apical impulse
- Left sternal border
- 2nd ICS left and right lower sternal border

- Positioning

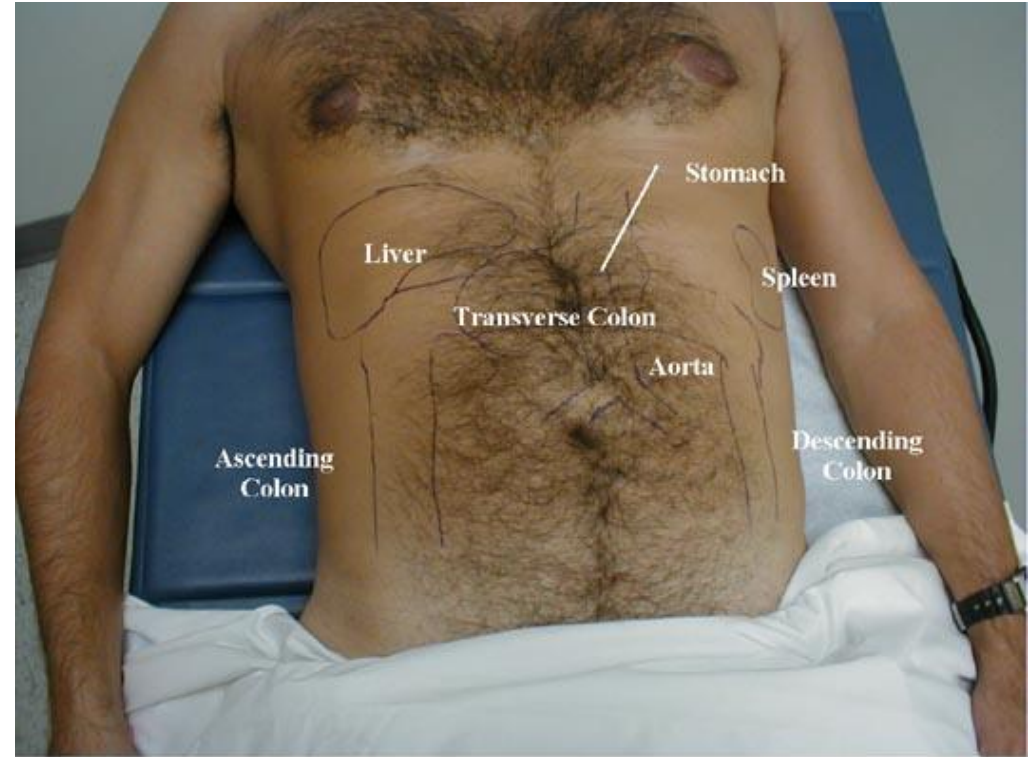
- Sitting up leaning forward
- Left lateral decubitus

Abdomen

- Look for pulsations
- Listen for bruits
- Percuss and palpate liver

Hepatojugular reflux

- Patient supine
- Using flat hand
- Apply firm pressure over liver 30-60 seconds
- Observe the jugular vein for elevation



CC

Lower Extremities

- Edema
 - Pitting or non-pitting
 - Rubor
 - Venous stasis
 - Hemosiderin deposits

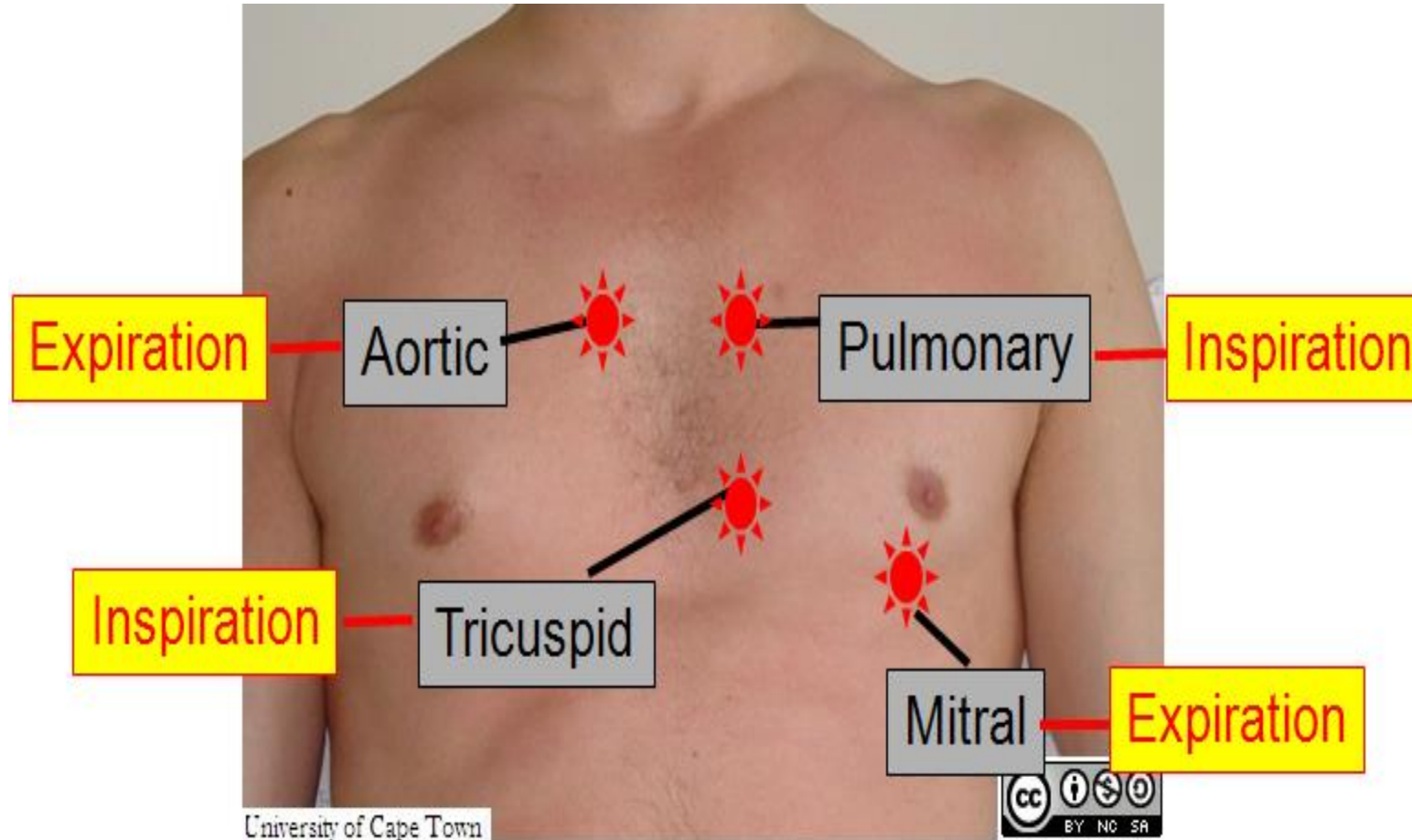


Personal photo Bowers

Skin

- Color
- Temperature

Auscultation of the Heart



Auscultation

- Right 2nd ICS aortic
- Left 2nd ICS pulmonic
- Left 3rd ICS
- Left 4th ICS
- Left 5th ICS tricuspid
- Apex mitral

Murmurs

- Timing and duration
- Location
- Radiation
- Intensity I-VI
- Pitch
- Pattern
- Quality
- Respiratory variations

Murmur Grades		
Grade	Volume	Thrill
1/6	very faint ,not heard in all positions	no
2/6	Soft ,heard in all positions	no
3/6	loud ,no thrill.	no
4/6	Loud ,with palpable thrill	yes
5/6	heard with the stethoscope partially off the chest	yes
6/6	heard with the stethoscope completely off the chest	yes

Special maneuvers

Squat

Isometric grip

Valsalva

- [Maneuvers to elicit heart murmurs](#)

What could it be?



Personal photos Bowers





Picwickian



Hyperthyroidism

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Marfan Syndrome

Long fingers, arms and legs

High arched palate

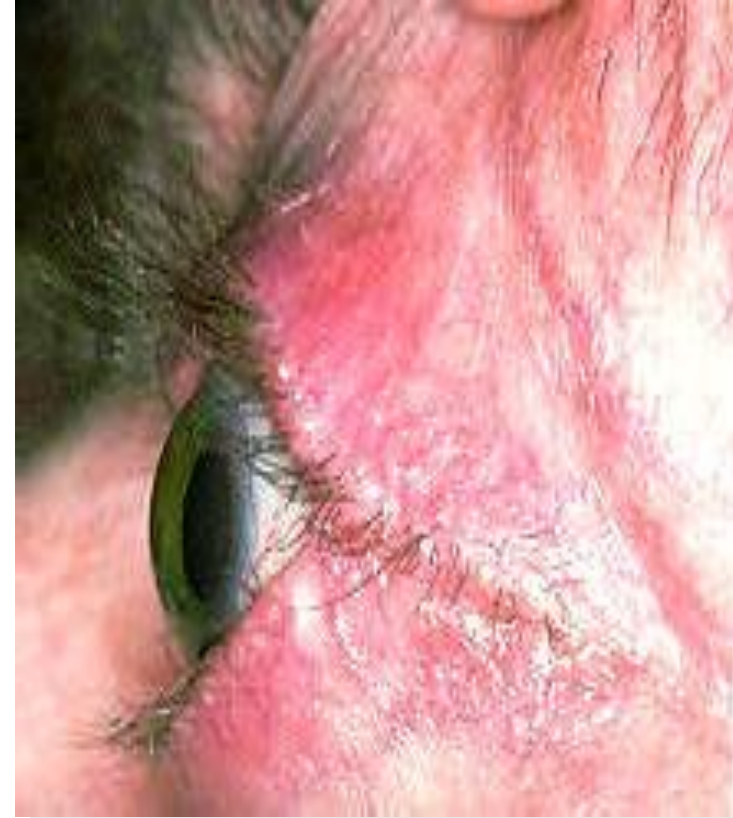
Crowded teeth

Flexible joints

Arm span > height

(fingertip to fingertip)

Hyperthyroidism



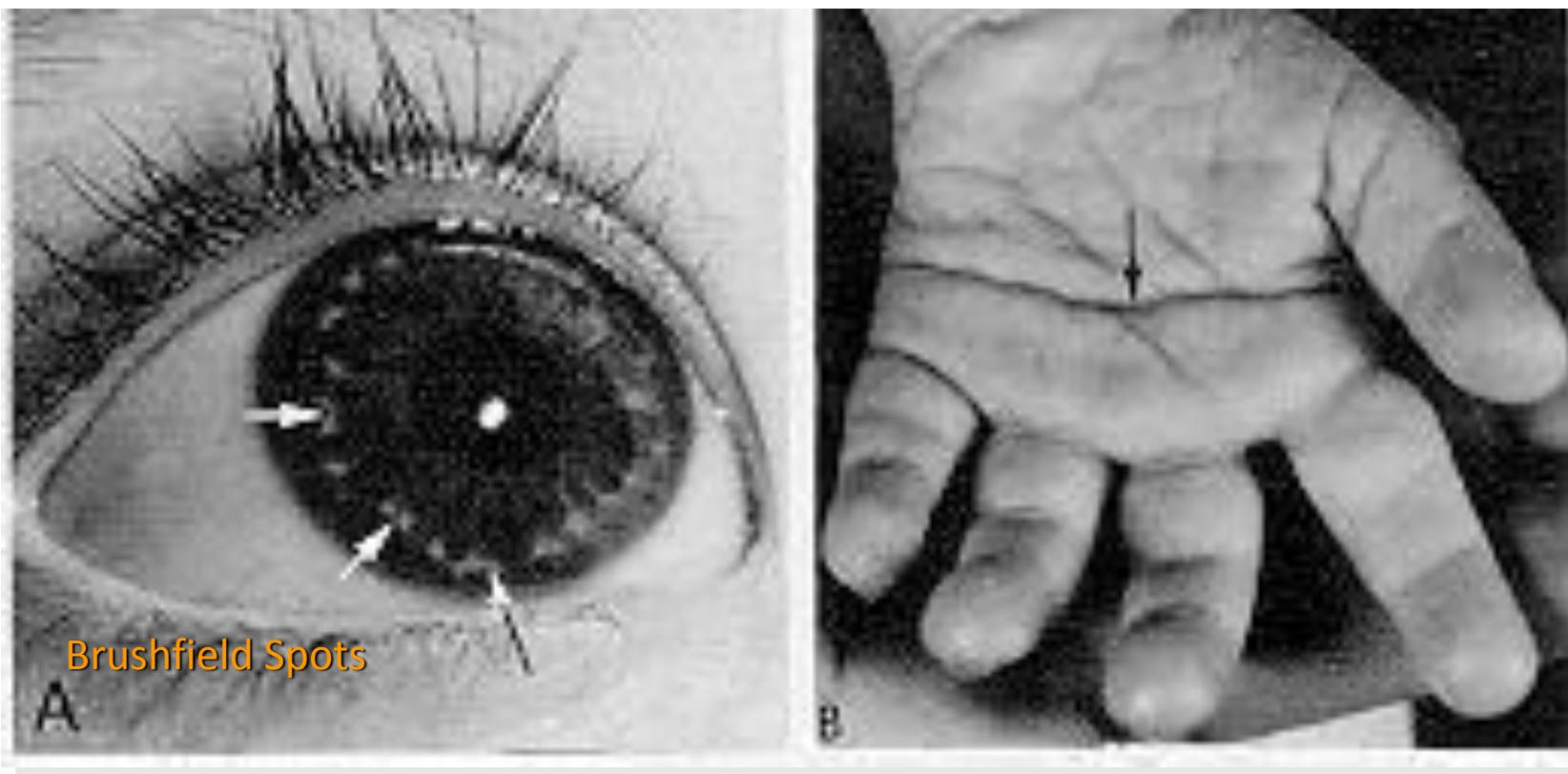
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Osteogenesis Imperfecta



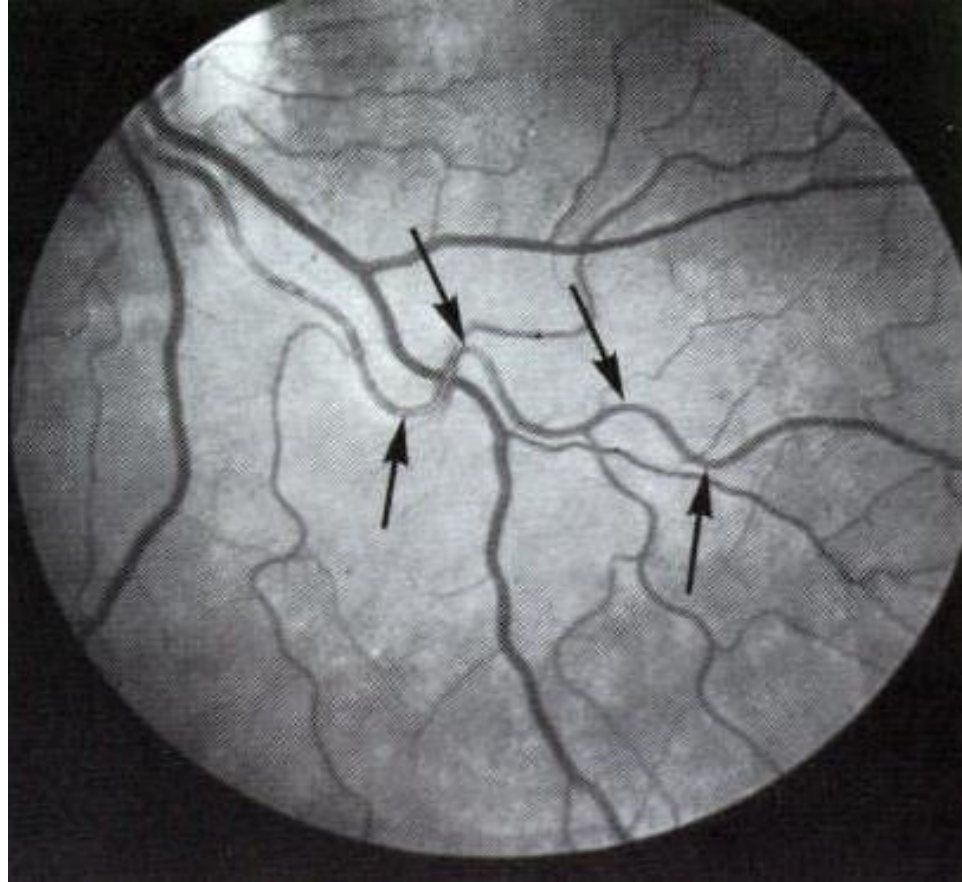
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Down Syndrome



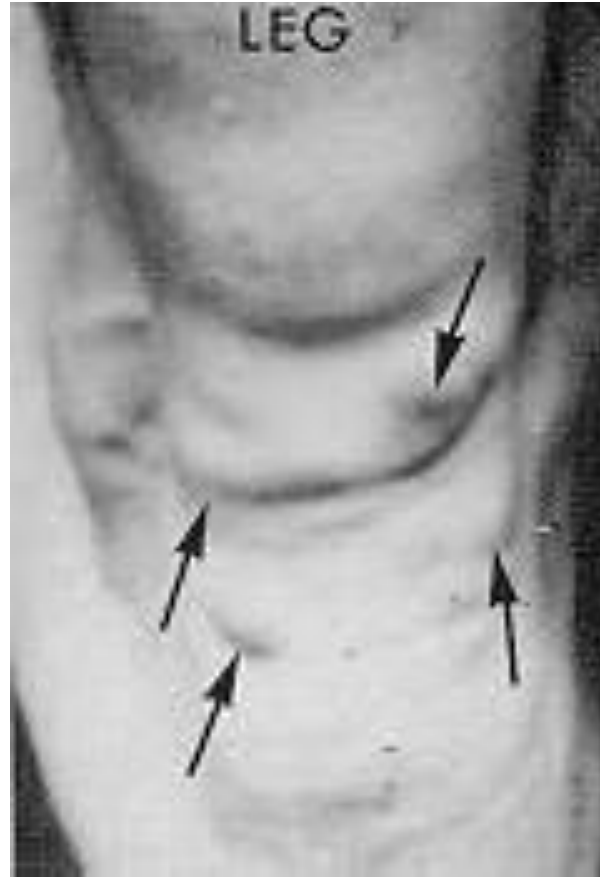
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Coarctation of the Aorta



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Tendon Xanthomas



Painless swelling.
May be seen on joints
Indicative of familial
hypercholesterolemia and
premature CAD

Xanthelasma occur on
eyelids

Summary

- Use a systemic approach
- Be observant
- Correlate findings with ekg, echo and other diagnostic studies
- Practice



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