MUM
IMS

APPROACH TO SYNCOPE

Definition

LOC (loss of consciousness)

- A result of widespread interruption of cerebral cortical or brainstem function

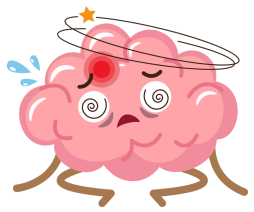
Categories: Causes of LOC

SYNCOPE	**Vasovagal, orthostatic, cardiac**
SEIZURE	Generalised Tonic-Clonic Seizure, Absence Seizure
METABOLIC	Hypoglycemia, Hepatic encephalopathy
NEUROLOGIC	Stroke, Brain tumour
PSYCHOGENIC	Conversion Disorder, Psychogenic Non-Epileptic Seizure
TRAUMA	Head injury, Concussion

Note: All syncope = LOC, but not all LOC = syncope

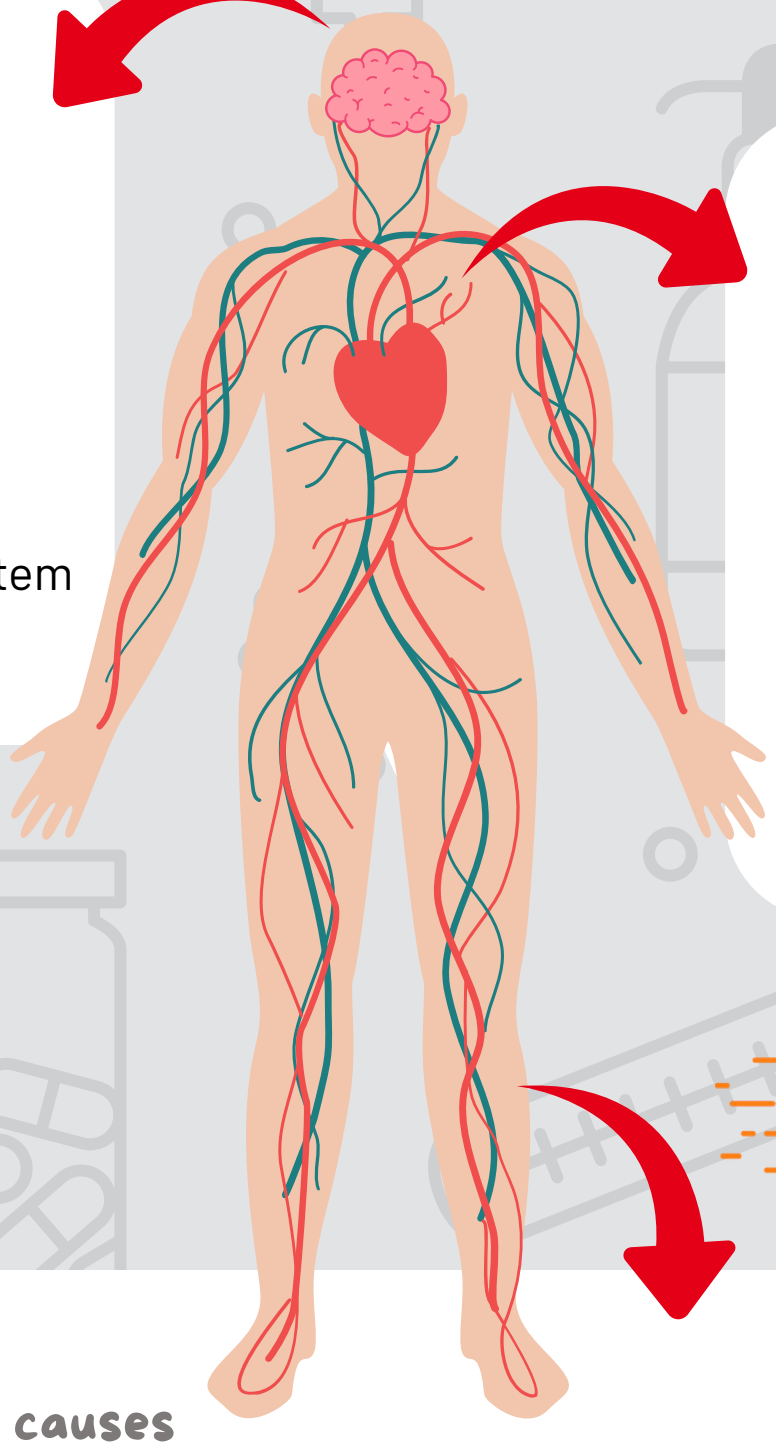
	Syncope	Seizure
PRECEDING SYMPTOMS	Lightheadedness, sweating, palpitations, chest pain, SOB, nausea	Aura (e.g. olfactory), confusion, hyperexcitability
DURATION OF LOC	Brief	Longer (>1 min)
DURING THE EPISODE	Pallor, possible brief twitching & incontinence	Tongue biting *(often lateral)*, tonic-clonic jerking common, incontinence
RECOVERY	Quick	Slow
POST-ICTAL	Flushing, slow, nausea, lightheadedness	Prolonged confusion (>5 mins), headache, amnesia

Differential diagnosis of LOC



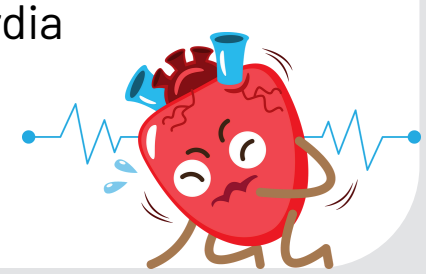
HEAD - CNS causes

H: Hypoxia
E: Epilepsy
A: Anxiety & hyperventilation
D: Dysfunctional brainstem (basivertebral TIA)



HEART – Cardiac causes

H: Heart attack (ACS)
E: Embolism (PE)
A: Aortic obstruction (AS or myxoma)
R: Rhythm disturbance
T: Tachycardia

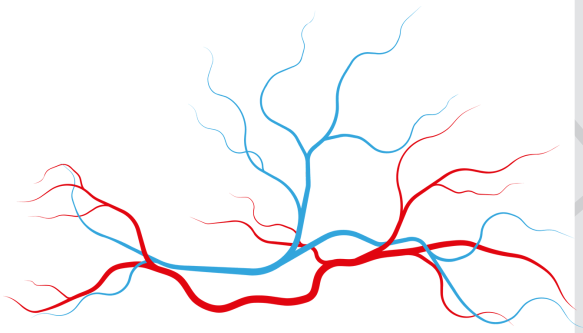


VESSELS – Vascular causes

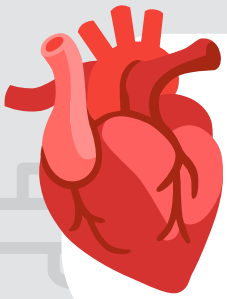
V: Vasovagal (emotional reactions) or Valsalva (micturition, cough, straining etc)
E: haEmorrhage (and other causes of hypovolemia)
S: Situational
S: Subclavian steal
E: ENT (glossopharyngeal neuralgia)
L: Low systemic vascular resistance

- Autonomic dysfunction: E.g. Addison's, diabetic vascular neuropathy
- Drugs: E.g. CCBs, beta-blockers, anti-hypertensives

S: Sensitive carotid sinus



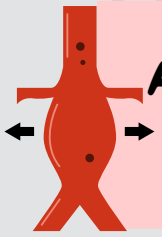
Swipe !!
to read more on the differentials of LOC



Differentials of LOC [CVS ed.]

ACUTE MYOCARDIAL INFARCTION

- Chest pain: Radiating to left arm or jaw
- Diaphoresis
- Dyspnea
- Nausea & vomiting

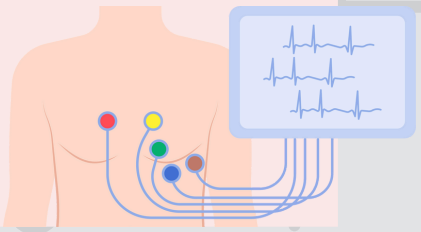


ABDOMINAL AORTIC ANEURYSM

- Sudden onset
- Tearing pain radiating to back
- Shock: Dizziness, syncope, diaphoresis

ATRIAL FIBRILLATION

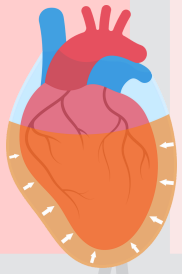
- Palpitations before collapse
- Chest pain, dyspnea, dizziness
- Irregularly irregular pulse



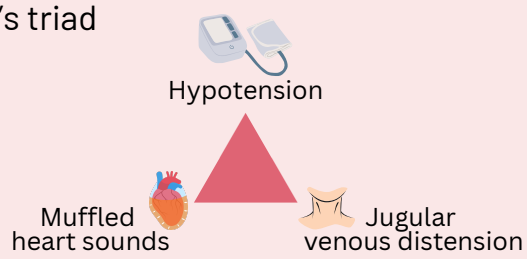
AORTIC STENOSIS

- SAD: **S**yncope, **A**ngina, **D**yspnea
- Ejection systolic murmur
- Signs of left heart failure

CARDIAC TAMPONADE



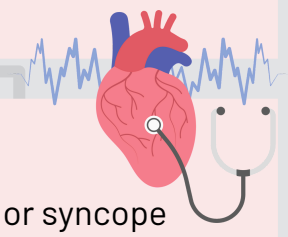
- Beck's triad



- Pulsus paradoxus
- Sinus tachycardia

PULMONARY HYPERTENSION

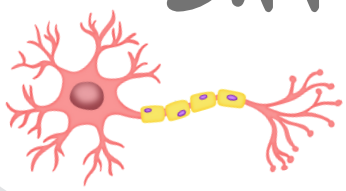
- Often asymptomatic
- Exertional dyspnea
- Hemoptysis, fatigue, early exhaustion, palpitations, dizziness, and syncope



HYPERTROPHIC CARDIOMYOPATHY

- Often asymptomatic
- May cause arrhythmias, chest pain, SOB or syncope
- Dynamic systolic murmur that intensifies from squatting to standing or during Valsalva maneuver

Differentials of LOC [CNS ed.]



STROKE

- Headache
- Sudden onset focal neurological symptoms
- Risk factors: Hypertension, smoking, atrial fibrillation, diabetes

SEIZURES

- Prodromal & post-ictal phase
- Motor or non-motor symptoms
- Prolonged confusion

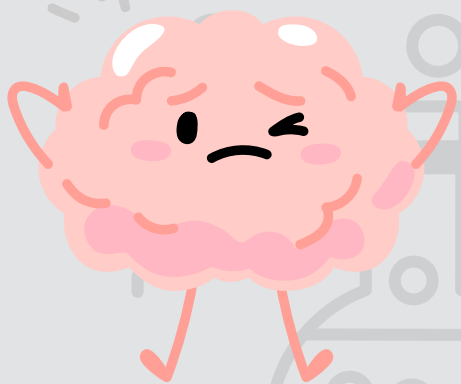
Read more in our next post - Epilepsy!!!

BRAIN TUMOUR

- New onset seizure
- Symptoms of raised ICP
- Focal neurologic deficits

HEAD TRAUMA

- Mechanism of injury
- Injuries sustained
- LOC duration
- Post-fall confusion or focal deficits
- Preceding symptoms



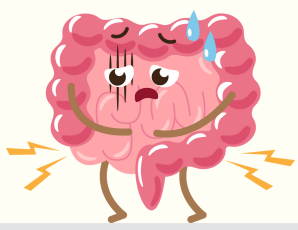
Differentials of LOC [Others]

HYPOGLYCEMIA

- Hx of diabetes + recent exercise, lack of food, excess insulin
- Nausea, sweating, tremors
- Confusion

BOWEL ISCHEMIA

- Acute, central abdominal pain
- Minimal clinical signs
- Hypovolaemia: Pallor, syncope



INFECTION

- Fever
- Confusion or delirium
- Pain at infection site

DRUG OVERDOSE OR TOXICITY

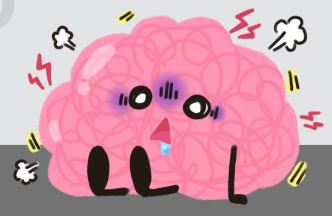
- New medication or recreational drug use
- Drug taken prior to collapse
- Symptoms depend on drug
- Vasodilators, diuretics, nitrates

PSYCHIATRIC ILLNESS

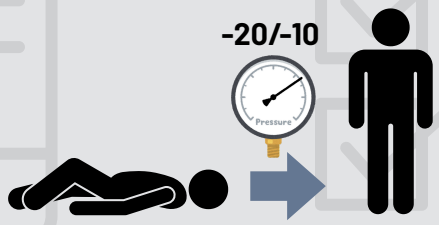
- Anxiety attacks
- Pseudoseizures / Psychogenic Non-Epileptic Seizure

Syncope	Presyncope
• Transient, self-limiting loss of conscious • **Due to loss of cerebral perfusion** • Short duration, rapid onset Followed by spontaneous, complete recovery	• Sensation of impending syncope, without loss of consciousness • Due to reduced cerebral perfusion

Note: All syncope = LOC, but not all LOC = syncope



Causes of syncope



Cardiac

Arrhythmia
- AV Block
- SVT
- VT

Structural cardiac disease
- Acute MI
- Obstructive cardiomyopathy
- Aortic stenosis
- PE
- Tamponade
- Atrial Myxoma

Neurally mediated

Vasovagal
- Stress
- Heat

Situational
- Defecation

Others
- Carotid sinus syndrome/hypersensitivity

Orthostatic hypotension

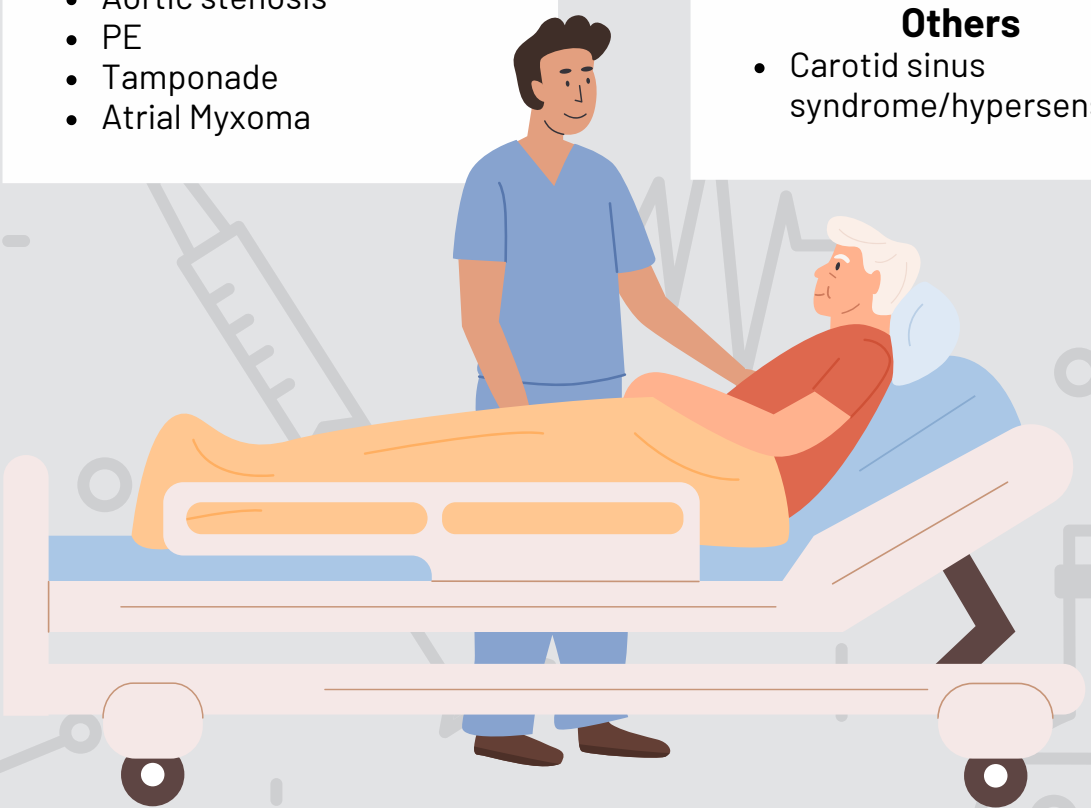
Postural drop of >20 systolic and >10 diastolic within 3 mins of standing after being supine for ≥5 mins

Drug induced
- Alpha Blocker
- Antihypertensive drugs
- TCAs (Antidepressants)

Primary autonomic failure
- Multiple cerebral atrophy
- Parkinson's disease

Secondary autonomic failure
- Diabetic neuropathy

Others
- Postural tachycardia syndrome
- Volume depletion



HISTORY TAKING: SYNCOPE

Dr, I suddenly felt like I was about to faint yesterday morning. The next thing I remember, I was on the ground.

Hmm, what can I ask in the history? This is syncope, right?

Hey! Beware of syncope mimics!

Any witness of the event?

Did you hit your head?

Is this your first episode?

↓

Before onset

Any preceding event/trigger

Syncope	Prodromal symptoms: Sudden black out, lightheadedness, palpitations
	• **Cardiac**: Occurs upon exertion or in supine (sudden) • **Neurally mediated (situational)**: Coughing, defecation, eating, laughing, urination • **Neurally mediated (vasovagal)**: Emotional distress, fear, pain, prolonged standing, warm or crowded area • **Neurally mediated (carotid sinus)**: Head movement, shaving, tight collar • **Orthostatic hypotension**: Sudden change in posture, prolonged standing, vomiting, diarrhea, alcohol, post prandial
Seizure	Feeling of warmth, anxiety, irritability, aura (deja vu, visual flash, fear)
Hypoglycaemia	Excessive hunger, sweating

During the episode

- Confirm presence of LOC: Not responsive
- Exclude other mimicking conditions of syncope
  - Seizure Sx: Any fits, tongue biting, teeth clenching, up-rolling of eyes, urinary incontinence
  - Hypoglycaemic Sx: Shaky hands? Sweating? Palpitations? Skip meals? Insulin? Oral Hypoglycaemic Agent?
- Total duration of LOC
- How did the LOC resolve

After the event

Complete recovery: Return to usual self

Seizure: Prolonged confusion

Vasovagal: Fatigue, nausea, vomiting

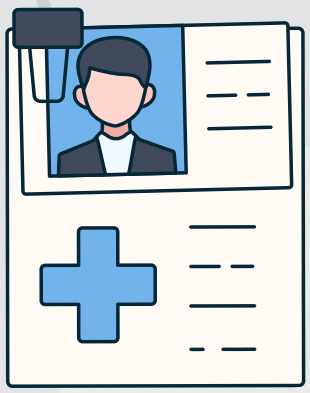
Associated symptoms:

- **Cardiac syncope**: chest pain/ dyspnoea/ exertional SOB
- **Neurally mediated (reflex) syncope**:
  - Autonomic activation symptoms: nausea, vomiting, pallor, sweating
- **Orthostatic hypotension syncope**: blurry vision, lightheadedness

HIGH RISK features

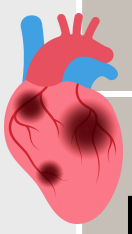
- Syncope during exertion or in supine position
- Preceded by sudden palpitation
- No warning before collapse
- Head trauma
- Prolonged confusion after event

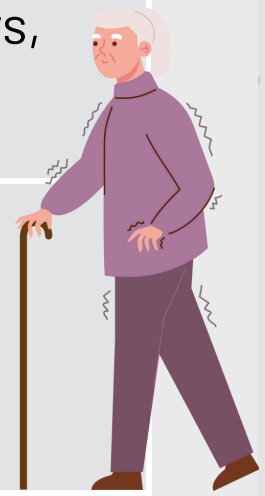
- **Always ask about position, trigger, warning signs, recovery time, and witness account!**
- **Beware of syncope mimics!**

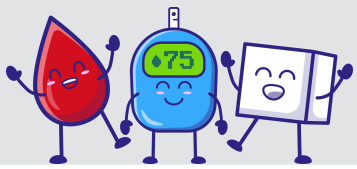


PAST MEDICAL HISTORY:

Recurrent syncope	Information on recurrences (e.g. the time from the first syncopal episode and on the number of spells)
Previous cardiac disease	Check for scars, pulses, murmurs, pacemakers and other devices
Neurologic history	• Parkinsonism • Epilepsy • Narcolepsy
Metabolic disorders	Diabetes

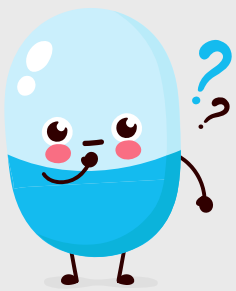






MEDICATIONS:

- ☑ Antihypertensives
- ☑ Antianginal
- ☑ Antidepressants
- ☑ Antiarrhythmic
- ☑ Diuretics
- ☑ QT prolonging agents
- ☑ Antihyperglycemic agents

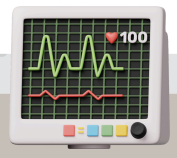


FAMILY HISTORY:

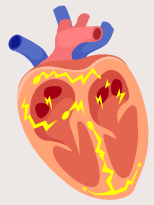
Family history of sudden death, congenital arrhythmogenic heart disease or fainting

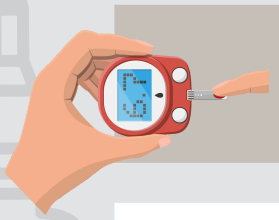
Investigations

BEDSIDE



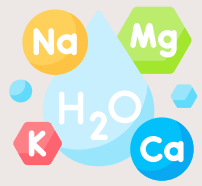
Electrocardiography (ECG)	• Arrhythmia • Conduction defects • Evidence of structural heart disease
Glucometer	Hypoglycemia

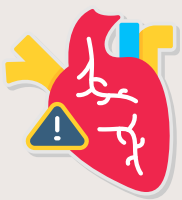


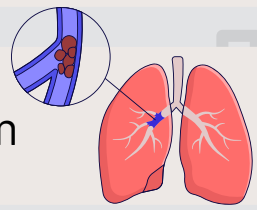


BLOOD TESTS

FBC	Anemia
Urea & electrolytes	Look for contributing causes and TRO seizures & secondary causes
Troponin	NSTEMI, STEMI
Brain natriuretic peptide	Heart failure
D-dimers	Pulmonary embolism



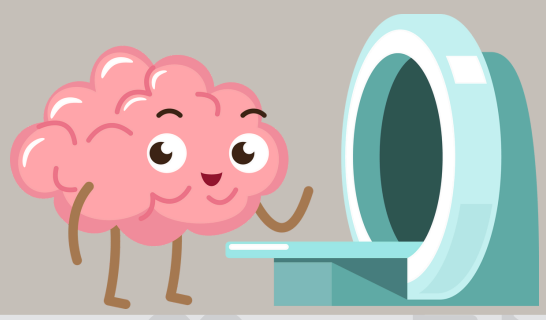




Investigations

IMAGING

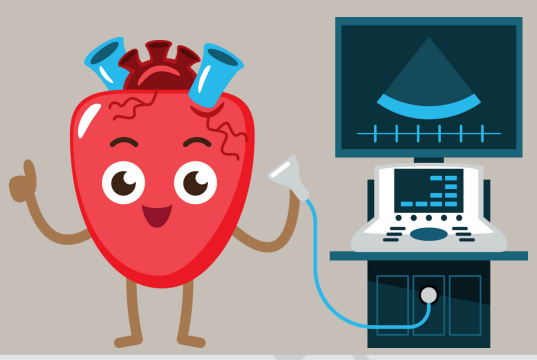
CT Brain



Indications:

- Suspected first seizure
- Secondary trauma sustained during the syncopal episode (“trauma above the clavicle”)
- Suspected TIA or stroke
- Neurological deficit or ongoing altered conscious state
- Age >65
- Sudden onset headache
- Patients on warfarin

Echocardiography

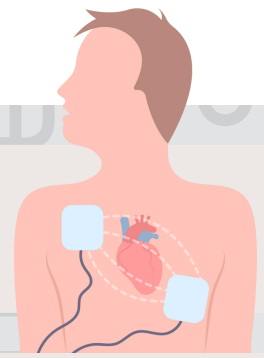


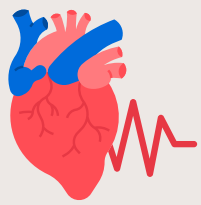
- Obstructive lesions
- Cardiomyopathies
- Valvular heart disease
- Pulmonary hypertension

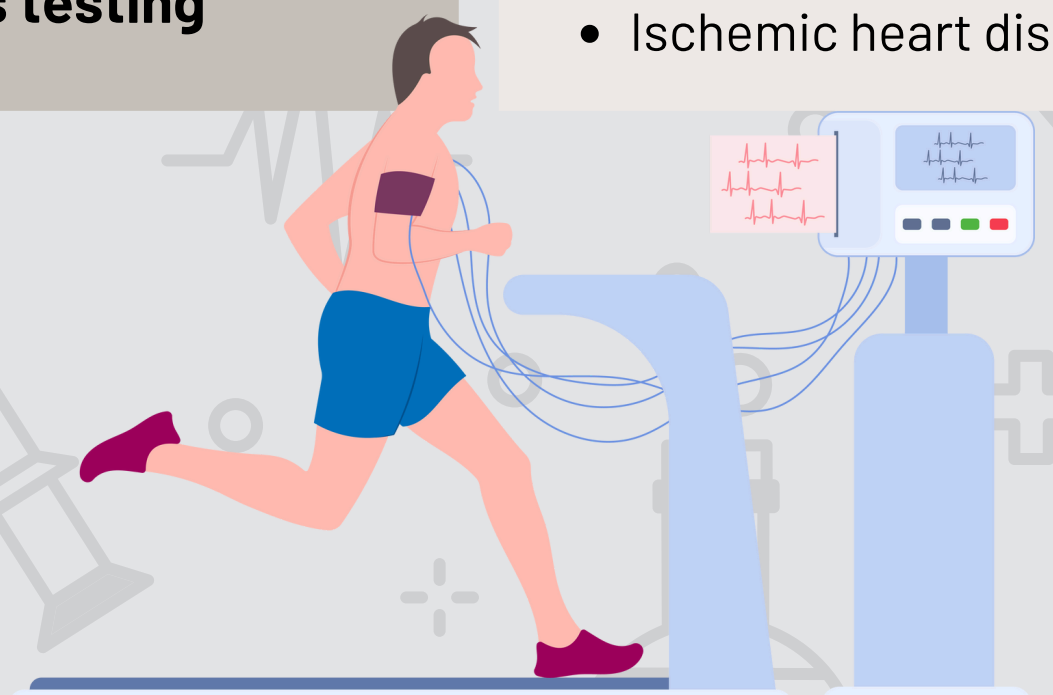
Investigations

SPECIAL TESTS

Holter monitoring	Arrhythmias
Implantable loop recorder	For patients in recurrent, unexplained syncope
Invasive electrophysiologic studies	Arrhythmias
Head-up tilt-table testing	Neurocardiogenic syncope
Carotid sinus massage	Carotid sinus syndrome
Stress testing	• Exercise-associated syncope • Ischemic heart disease







MUM IMS

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