Evaluation of Syncope: PBL

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Learning Objectives

1. Practice applying new knowledge and competencies gained from syncope sessions, and receive feedback from expert faculty.
2. Interact collaboratively with peers to solve complex and challenging case-study scenarios.
3. Develop problem-solving skills that promote effective reasoning to manage syncope within the context of professional practice.

Audience Engagement System

Step 1 Step 2 Step 3

Chief Complaint

"I fainted"

History of Present Illness

A 19yo female presents after a fainting episode. Reports episode occurred upon standing from a seated position on a hot, crowded bus returning from a college track meet. Reports running the 1 mile event. Reports minimal water intake.

Is this true syncope?

Definition

- Transient loss of consciousness
- Rapid, brief, spontaneous recovery

Global
Cerebral Hypoperfusion

Non-syncope

Non-syncope TLOC
- Seizures
- Traumatic(concussion)
- Metabolic(hypoglycemia)
- Psychogenic(pseudo-syncope)

Mimickers
- Cerebrovascular accident
- Intoxication
- Breath-holding spells
- Narcolepsy
- Hypoxia/Hypercapnia
- Vertigo

What historical questions would you ask?

What further information do you want?

History

Before, during, after…

Evaluation

History
- Preceding circumstance/symptom
- Prodrome
- During TLOC
- Postdrome
- Background (FMHx, PMHx, Meds)

History of Present Illness

- Reports preceding heat exposure and dehydration
- Reports prodrome of nausea
- No tongue biting, loss bladder, or jerking
- Reports feeling fatigue afterwards

Past Medical History

- Denies prior episode of syncope
- Reports:
  - Seasonal allergies
  - Menorrhagia

Medications, Allergies

- NKDA
- Cetirizine and Flonase
- Ibuprofen prn pain or cramping

History

- FMHx: Denies history of sudden cardiac death, unexplained accidents/death, drowning
- SHx: Denies ETOH or illicit drugs

Physical Examination

- Unremarkable physical exam including normal CV exam w/o MRG, neuro exam, and orthostatic vitals. No trauma from syncope.
- ECG: NSR, intervals wnl, ST wnl, no Qwave, QTc wnl

FMX

How would you classify this syncope episode?

FMX

Classification

- Cardiac
- Non-Cardiac
  - Reflex (Neurally mediated)
  - Orthostatic hypotension

FMX

Classification

Reflex (Neurally) Mediated

- Vasovagal
  - Common faint – noxious stimuli
- Situational
  - Cough, micturition, defecation, postprandial
- Carotid sinus syncope

FMX

Classification

Orthostatic Hypotension

- Autonomic dysfunction
  - Primary
  - Secondary
- Drug-induced
- Volume depletion

FMX

Assessment?

Risk stratify: High or low risk?

FMX

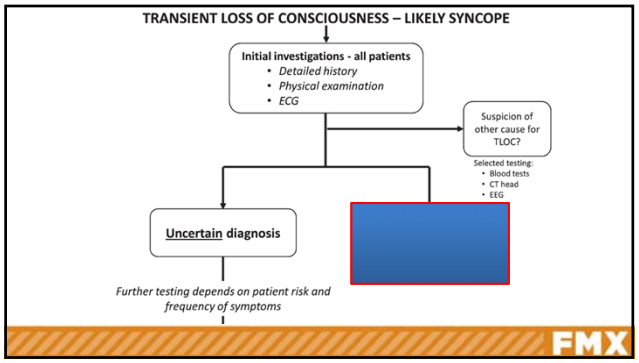
Evaluation – Risk Stratification

High risk:
- History suggests arrhythmia
- Comorbid conditions
- Abnormal ECG
- Family history sudden death
- Older age

Low risk:
- Age younger than 50
- No history of CV disease
- Normal ECG
- History consistent with non-cardiac syncope
- Unremarkable CV exam

Plan?

What would you tell this patient?



Chief Complaint

"I fell out"

History of Present Illness

A 75yo male w/ CAD, HTN presents with an episode of syncope without prodrome. He does report recent SOB with activity. Reports his elbow hurts from the fall.

What historical questions would you ask?

History

Before, during, after…

Evaluation

History
- Preceding circumstance/symptom
- Prodrome
- During TLOC
- Postdrome
- Background (FMHx, PMHx, Meds)

History of Present Illness

- Reports no preceding trigger
- Occurred at rest
- Reports no prodrome symptoms
- No tongue biting, loss bladder, or jerking
- Spouse reports cyanosis during episode
- Immediate return to baseline

What additional relevant history would you want?

ROS

- Reports SOB with exertion at times
- Denies lower extremity edema, orthopnea
- Denies current chest pain

Past Medical History

- Reports two prior similar episodes of syncope
  - One hospital admission, negative workup(holter)
- Reports:
  - CAD with MI in 2010(1 vessel stent)
  - HTN, Hyperlipidemia
  - Osteoarthritis
  - Depression

History

- FMHx:
  - Denies history of sudden cardiac death, unexplained accidents/death, drowning
- SHx:
  - Lives with spouse
  - Denies ETOH or illicit drug use

FMX

Medications, Allergies

- Allergy: Cough with lisinopril
- Metoprolol, amlodipine, HCTZ, Clonidine patch
- Atorvastatin
- Ibuprofen prn
- Tadalafil
- Citalopram 60mg daily
- Gabapentin 300mg TID

FMX

What concerns do you have from this medication reconciliation?

FMX

Physical Examination

- BP 135/90, HR: 55, normal orthostatic vitals
- CV: no MRG, no JVD, no carotid bruits, bilateral LE edema
- Pulm: bilateral rales lung base

FMX

Initial Evaluation

- ECG: NSR, intervals wnl, ST wnl, no Qwave, QTc wnl
- CXR: mild fluid overload, no other acute cardiopulmonary disease
- Labs: CBC, BMP – wnl, BNP - 400

FMX

How would you classify this syncope episode?

FMX

Classification

- Cardiac
- Non-Cardiac
  - Reflex (Neurally mediated)
  - Orthostatic hypotension

Classification

Cardiac
- Arrhythmia
  - Bradyarrhythmia
    - Sinus node dysfunction(sick sinus syndrome)
    - AV conduction dysfunction(2nd/3rd)
    - Implanted device malfunction
  - Tachyarrhythmia
    - Supraventricular tachycardia
    - Ventricular

Classification

Cardiac
- Structural
  - Hypertrophic Cardiomyopathy(HCM), Cardiac mass, pericardial tamponade
  - Aortic stenosis
  - Acute MI, anomalies of coronary arteries
- Other
  - PE, aortic dissection

Classification

Orthostatic Hypotension
- Autonomic dysfunction
  - Primary
  - Secondary
- Drug-induced
- Volume depletion

Assessment?

- Risk stratify:
  - High or low risk?
  - Hospital admission?

Evaluation – Risk Stratification

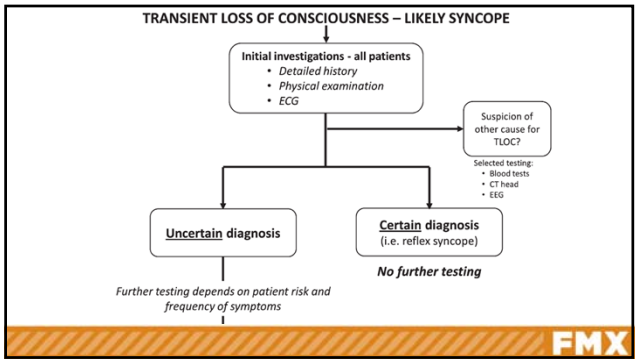
<u>High risk</u>:
- History suggests arrhythmia
- Comorbid conditions
- Abnormal ECG
- Family history sudden death
- Older age

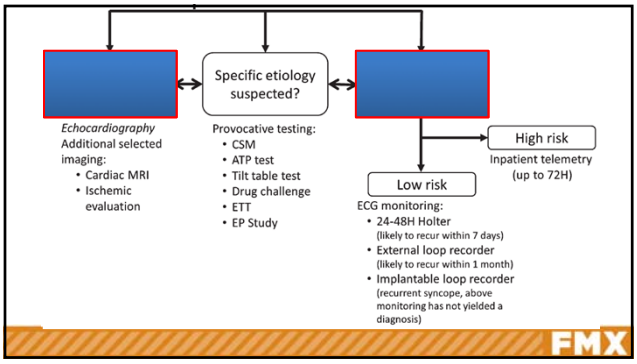
<u>Low risk</u>:
- Age younger than 50
- No history of CV disease
- Normal ECG
- History consistent with non-cardiac syncope
- Unremarkable CV exam

Evaluation – Risk Stratification

Risk score	Risk factors	Accuracy (Sens/Spec)
San Fran Syncope Rule	SBP<90, h/o SOB, ECG abnl, h/o CHF, Hct<30	98% / 56%
ROSE score	BNP>300, HR<50, DRE w/ FOB+, Hgb<9, ECG abnl, O2 sats<94%	87% / 66%
OESIL score	Age>65yo, h/o CV, syncope w/o prodrome, ECG abnl	97% / 73%

What evaluation would you complete on this patient?



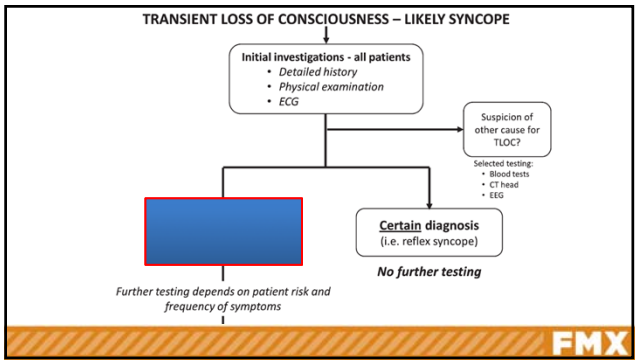


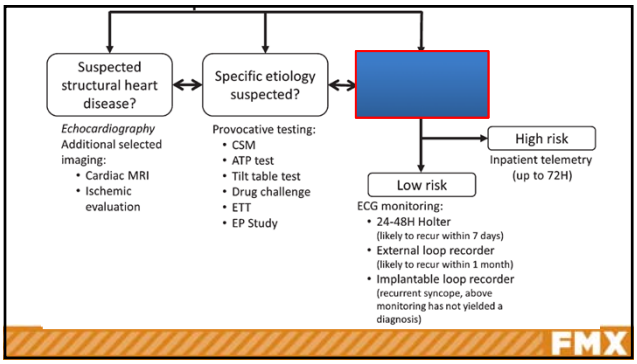
Evaluation

- Echo: LVEF 40%, mild MR, no other valvular dysfunction
- Telemetry: no arrhythmia noted
- Non-diagnostic hospital course

Plan?

What would you tell this patient?





Plan

- Concern for OH
  - Adjust/remove concerning medications
- Concern for arrhythmia
  - ECG monitoring strategy

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Evaluation – follow-on

Monitoring tests

- Inpatient telemetry (24-72hrs)
- Holter monitor (24-48hrs)
- External loop recorder (30 days)
- Implantable loop recorder (3 years)

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Mid-Point Q&A

Questions???

FMX

What constitutes an abnormal EKG?

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ECG Abnormalities

Conduction abnormal:
- Bifascicular block
- AV node block
- Sinus bradycardia
- Sinus pause > 3sec
- Afib w/ RVR
- SVT

Structural disease:
- Pre-excited QRS complex
- Long or Short QT interval
- RBBB ST elevation V1-3
- ARVC
- HCM
- Q waves

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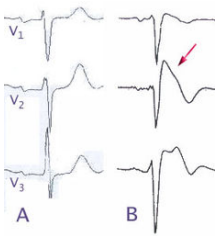
Specific Arrhythmia

Brugada Syndrome
- Channelopathy
- Syncope with rest, supine, or fever
- RBBB w/ ST elevation V1-3



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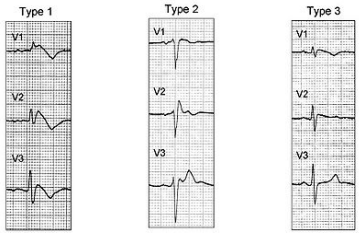
Arrhythmia - Brugada



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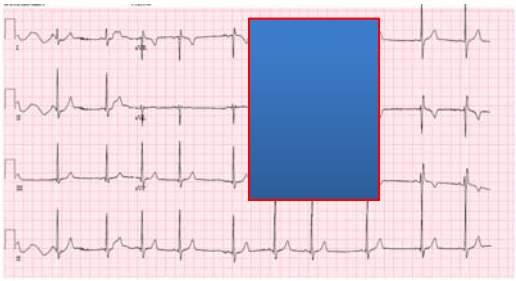
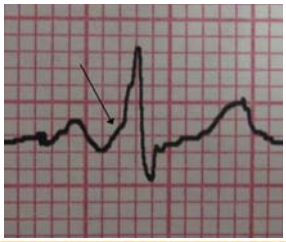
Arrhythmia – Brugada Syndrome



Specific Arrhythmia

Pre-excitation(WPW) Pattern
- Accessory pathway bypass AV node
- Syncope with exercise
- Shortened PR interval with delta wave



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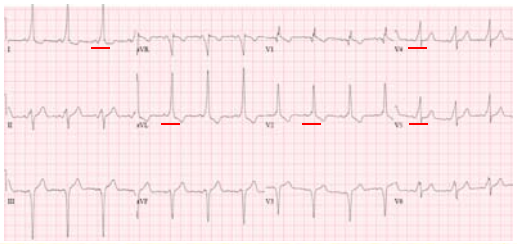
Arrhythmia - WPW



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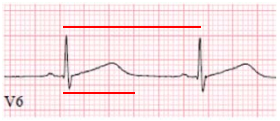
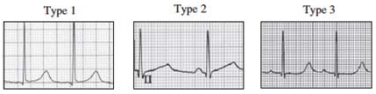
Specific Arrhythmia

Long QT Syndrome
- Channelopathy
- QT > 440ms in males, >460ms in females
- 3 subtypes





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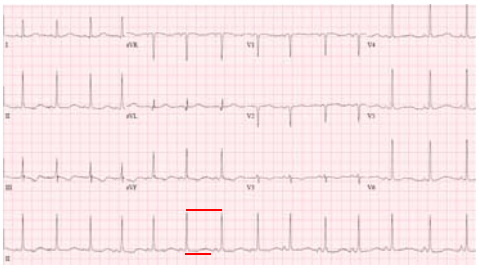
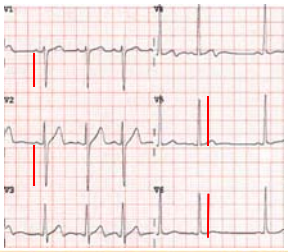
Arrhythmia – Long QT Syndrome



Specific Arrhythmia

Hypertrophic Cardiomyopathy(HCM)
- Most common inherited cardiac disease 1:500
- LV wall thickened
- Syncope with exercise
- LVH with repolarization



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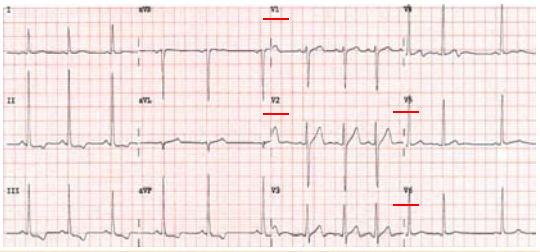
Arrhythmia - HCM



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Practice Recommendations

- Labs/imaging as clinically indicated – SOR C
- Presyncope = syncope workup – SOR C
- ECG in all patients – SOR C
- Admit high risk patients – SOR C
- Low risk patients, no further workup – SOR B

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Backup slides

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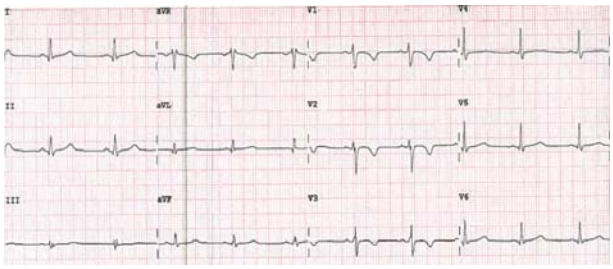
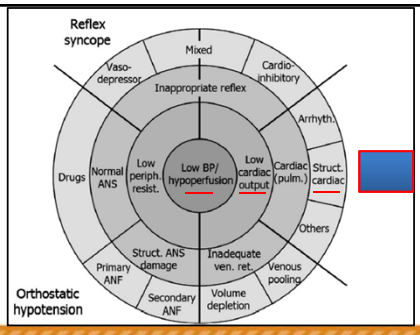
Arrhythmogenic R V Cardiomyopathy





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Associated Session

- Evaluation of Syncope

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