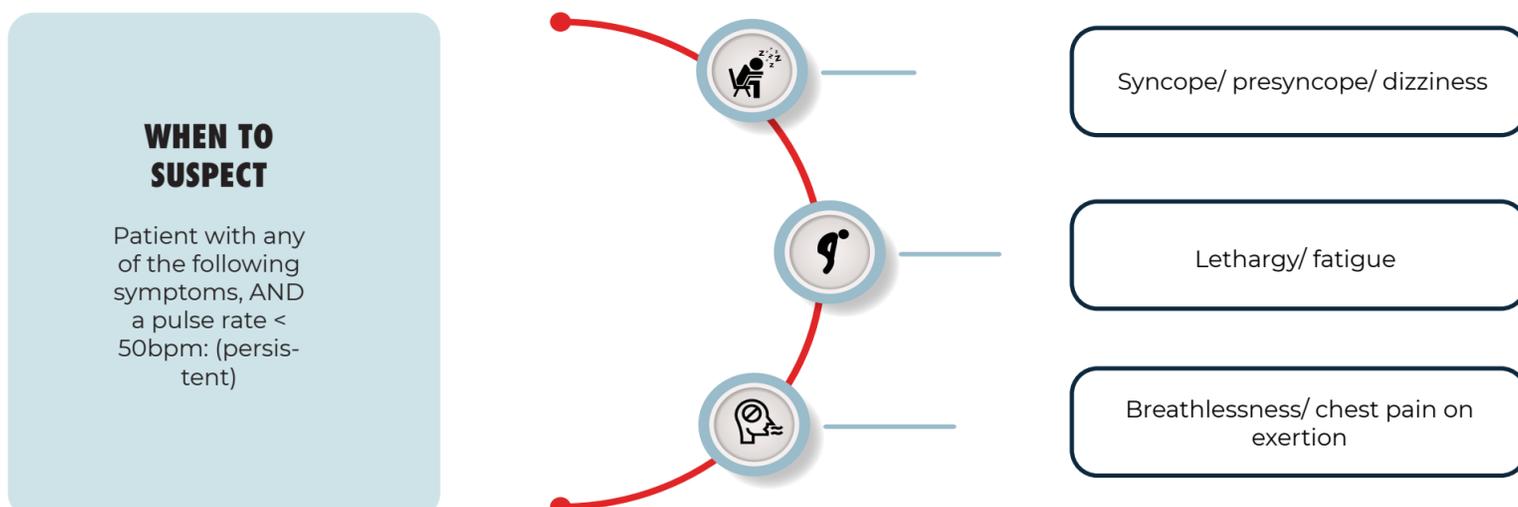




## Standard Treatment Workflow (STW)

# BRADYARRHYMIAS IN SYMPTOMATIC PATIENTS

ICD-11-MC81.1



## BASIC EVALUATION

### HISTORY

- Syncope/presyncope: frequency, associated fall/ injury/incontinence
- Exertional angina or known coronary artery disease
- Sleep apnea
- Look for reversible cause like drugs
- Known hypothyroidism or kidney disease
- On beta-blockers, Calcium Channel Blockers or digoxin
- Patient with an implanted pacemaker or other device
- Yellow oleander poisoning

### EXAMINATION

- Drowsiness/ impaired consciousness
- BP, heart rate

### TESTS TO BE DONE

#### Patient presenting to PHC/CHC:

- 12-lead ECG
- Blood urea, serum creatinine
- Electrolytes
- Blood sugar
- TSH

## EVALUATION AND TREATMENT OF UNSTABLE PATIENTS

### 1. TREATMENT OF ASSOCIATED CONDITIONS

#### - Hyperkalemia

- iv insulin (1 U/kg bolus followed by 0.5 U/kg/h) with glucose (or) iv glucagon if available

#### - Suspected drug (BB or CCB) overdose:

- Withhold the drug

### 2. TEMPORARY PACEMAKER INSERTION

(iv dopamine or isoprenaline may be given till the time TPI can be placed)

## EVALUATION AND MANAGEMENT OF STABLE PATIENTS

### Findings on 12-lead ECG

- Atrioventricular block
- Sinus node dysfunction
- Other conduction disorders with 1:1 AV conduction
- Non-diagnostic ECG

## INDICATIONS FOR URGENT TREATMENT/REFERRAL

- Hypotension (SBP <90 mmHg), impaired consciousness or ongoing chest pain
- Recurrent or ongoing syncope/presyncope
- Associated headache with or without neurologic deficit (suspect intracranial event)
- Patient with a pre-existing device
- If ECG available, evidence of any of the following
  - Complete heart block
  - Sinus node disease with pauses >3 s long
  - Bradycardia (HR < 50 bpm)
 (with or without hyperkalemia, serum K > 5 mEq/L)

## GENERAL APPROACH TO PATIENTS WITH SYMPTOMATIC BRADYCARDIA

### 1. Rule out associated conditions

- Renal dysfunction, hyperkalemia
- Drug toxicity (BB, CCB, clonidine, Lithium)
- Sleep apnea (clinical scoring systems such as Epworth Sleepiness Scale may be used for initial assessment)

### 2. Transthoracic echocardiography

## INDICATIONS FOR PERMANENT PACING

### AV NODAL DISEASE

- Complete heart block, advanced AV block, or Mobitz Type II block
- Symptomatic patients with AV block other than above
- Associated neuromuscular disease

### SINUS NODE DYSFUNCTION

- Symptomatic patients with sinus pauses > 3s long with symptom correlation or heart rate <40/min during awake hours
- Asymptomatic patients with sinus pauses > 6s long

### OTHER CONDUCTION DISORDERS WITH 1:1 AV CONDUCTION

- Symptomatic patients with HV ≥100 ms on EPS
- Others (alternating BBB, infiltrative/ neuromuscular disease)

## RECOMMENDED PACING MODES

### 1. SND with intact AV conduction

- Atrial-based single or dual chamber pacing
- VVI pacing is reasonable if symptoms are infrequent

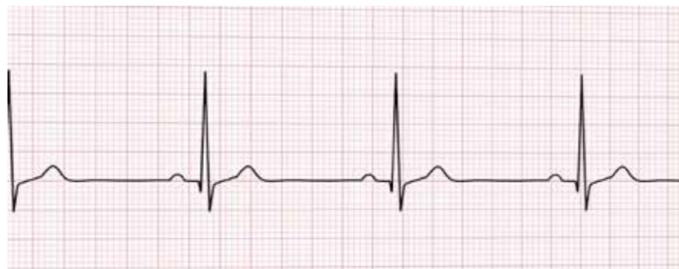
### 2. AV node disease

- VVI/Dual chamber pacing in patients with LVEF >50%
- CRT or conduction system pacing in patients with LVEF <40%

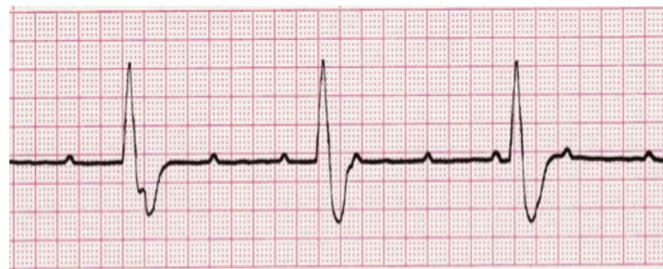
## ADDITIONAL TESTING

1. **Advanced imaging** (cMRI) may be needed if infiltrative disease is suspected
2. **Ambulatory ECG** may be needed
  - In patients with first or second degree AV block for symptom correlation
  - In patients with suspected sinus node disease for detection of pauses and symptom correlation
  - In symptomatic patients with LBBB or bifascicular block
3. **Implantable Loop Recorder and EPS** (consult published society guidelines)

## ECG: SINUS BRADYCARDIA



## ECG: THIRD DEGREE HEART BLOCK



## ABBREVIATIONS

**BB:** Beta Blocker

**CCB:** Calcium Channel Blockers

**CMRI:** Cardiac Magnetic Resonance Imaging

**CRT:** Cardiac Resynchronization Therapy

**ECG:** Electrocardiogram

**LVEF:** Left Ventricular Ejection Fraction

**VVI:** Velocity Vector Imaging

## REFERENCES

1. Kusumoto FM et al. 2018 ACC/AHA/HRS guidelines on evaluation and management of patients with bradycardia & cardiac conduction delay. J Am Coll Cardiol(2019)74,e51-156
2. Glikson M et al. 2021 ESC guidelines on cardiac pacing and cardiac resynchronization therapy. European Heart J (2021)00,1-94

## BRADYARRHYTHMIA MANAGEMENT: RESTORING LIFE'S NATURAL RHYTHM

This STW has been prepared by national experts of India with feasibility considerations for various levels of healthcare system in the country. These broad guidelines are advisory, and are based on expert opinions and available scientific evidence. There may be variations in the management of an individual patient based on his/her specific condition, as decided by the treating physician. There will be no indemnity for direct or indirect consequences. Kindly visit our web portal ([stw.icmr.org.in](http://stw.icmr.org.in)) for more information.

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