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INTERPRETATION

(6 steps)

1. Instantaneous Heart Rate is:
 - a. Normal
 - b. Abnormal (includes several premature beats) only during:
 - i. **Resting Baseline** therefore will use average of other baselines for interpretation.
 - ii. **Deep Breathing or Baseline following Deep Breathing** suggesting a possible parasympathetic trigger to arrhythmia
 - iii. **Valsalva, Stand Baseline, Initial Stand challenge** suggesting a possible sympathetic trigger to arrhythmia
 - iv. Two to three minutes into Stand suggesting postural orthostatic tachycardia syndrome
 - c. Abnormal throughout
 - i. The initial baseline ratio below 0.5 suggesting a parasympathetic component to the arrhythmia
 - ii. The initial baseline ratio between 0.5 and 3.0 suggesting no neurogenic component to the arrhythmia
 - iii. The initial baseline ratio above 3.0 suggesting a sympathetic component to the arrhythmia.
 - d. The resting mean heart rate and blood pressure are _____
2. The parasympathetic response to Deep Breathing is
 - a. Normal
 - b. High suggesting possible respiratory difficulties
 - c. Low suggesting mild acute autonomic dysfunction
3. The sympathetic response to Valsalva is
 - a. Normal
 - b. High suggesting possible hypertension or pre-clinical hypertension
 - c. Low suggesting moderate acute autonomic dysfunction
4. The Stand response is
 - a. Normal – double check LFa in the yellow highlighted portion of the Table, like the Ratio, it should also increase
 - b. Abnormal indicating sympathetic withdrawal suggesting possible orthostasis and possible chronic autonomic dysfunction
 - i. Since the standing BP is the same or normally higher than resting baseline BP, Orthostatic Intolerance is suggested
 - ii. Since the standing BP is the slightly (between 0 and 20 mmHg systolic) lower than resting baseline BP, pre-clinical Orthostatic Hypotension is suggested
 - iii. Since the standing BP is the significantly (more than 20 mmHg systolic) lower than resting baseline BP, clinical Orthostatic Hypotension is suggested
 - iv. Since the standing BP is the slightly (between 20 and 30 mmHg systolic) higher than resting baseline BP, pre-clinical Orthostatic Hypertension is suggested
 - v. Since the standing BP is the significantly (more than 30 mmHg systolic) higher than resting baseline BP, clinical Orthostatic Hypertension is suggested
 - vi. Since the standing HR is > 120 or more than 30 bpm over baseline, clinical Postural Orthostatic Tachycardia Syndrome is suggested.
5. Also, paradoxical parasympathetic syndrome (PPS) is indicated based on an abnormal increase in parasympathetic response to
 - a. Valsalva (if the increase over baseline is greater than 2 fold)
 - b. Stand (any increase over baseline), or
 - c. both

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6. The initial baseline response indicates
 - a. Normal
 - b. High risk of sudden death (RFa < 0.1) and suggests critical autonomic dysfunction
 - c. Sympathetic excess (Ratio > 3.0) and suggests possible chronic autonomic dysfunction
 - d. Parasympathetic excess (Ratio < 0.5) and suggests possible chronic autonomic dysfunction
 - e. Cardiac instability (LFa and or RFa > 10.0)

QUESTIONS TO ASK TO CONFIRM WITH POSSIBLE THERAPY OPTIONS USED BY OTHER PHYSICIANS

- Orthostasis (to confirm)
 - Do you get dizzy frequently when you stand up? If so consider Midodrine starting at 2.5 mg, titrating to 5.0 mg bid as needed, retest in 2 months, consider d/c in 6 months based on resolution of sympathetic withdrawal.
- PPS
 - Three or more positive responses to the following help to confirm PPS.
 - Do you have restless leg syndrome or night-time edema?
 - Do you have difficulty falling asleep (can take up to several hours) or wake frequently during the night?
 - Do you have any GI upset (GERD, frequent diarrhea or constipation)?
 - Do you get frequent morning migraines or headaches?
 - Do you frequently have morning cognitive difficulties (memory, function)?
 - (If 35-45 y;/o female) Do you get hot flashes?
 - Do you get dizzy frequently when you stand up?
 - PPS is the only known disorder that masks sympathetic withdrawal on ANS test. Therefore, most physicians initiate Midodrine (as above) along with therapies below, instead of waiting for the patient to complain of intolerance. Midodrine has resolved the intolerance in less than ten days in virtually every case.
 - If cardiac patient and on a peripheral beta-blocker, switch to dose equivalent Coreg, titrate as needed, retest in 2 to 3 months. If symptoms abate, consider d/c in 12-15 months, otherwise continue as maintenance dosing.
 - If cardiac patient not on a peripheral beta-blocker, initiate Coreg 6.25 mg bid and titrate as needed.
 - If non-cardiac patient, but presents with symptoms of sleep difficulties, pain, depression, anxiety, bi-polar disorder, or other limbic issues, initiate Amytriptaline or Nortryptaline 10 mg 12 hours before waking, titrate to no more than 25 mg bid. If more is needed, add Coreg starting at 3.125 mg bid.
 - If non-cardiac patient without above symptoms, start on Coreg 3.125 mg bid titrate to no more than 12.5 mg bid. If more is needed, add the Amytriptaline or Nortryptaline.
- For ANS dysfunction consider 200 to 600 mg tid Alpha-Lipoic Acid.
- Otherwise, based on earlier detection, it is business as usual, but consider lower dosing or shorter term therapy.

Reminder: Do not treat primary ANS dysfunctions without complaint of symptoms. The patient's lifestyle may already be compensating.. Simply note it for latter, in the event of co-morbidities or symptoms.

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