Evolving Indications for Pacing: From Heart Block to Heart Failure

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How do we determine who gets a pacemaker?

- Classification of recommendations
- Level of evidence
Classification of recommendations
- Evidence-based
- Risk versus benefit
Indications

Classifications

- Class I
  - Benefit >>> Risk
  - This procedure SHOULD be performed/administered
  - This is deemed beneficial to the patient
**Indications**

- **Classifications**
  - Class IIa
    - Benefit >> Risk
    - Additional studies with focused objectives are needed
    - Considered reasonable to perform procedure
    - Probably recommended or indicated
Indications

- Classifications
  - Class IIb
    - Benefit ≥ Risk
    - Additional studies with broad objectives needed
    - Additional registry data would be helpful
    - Procedure MAY be considered
Indications

Classifications

- Class III
  - Risk $\geq$ Benefit
  - No additional studies needed
  - Procedure should NOT be performed
  - It is not considered helpful and may be harmful
Pacing Indications

Level of Evidence

- Level A
  - Data derived from multiple randomized clinical trials or meta analyses.
  - Multiple populations evaluated.
Pacing Indications

- Level of Evidence
  - Level B
    - Data is derived from a single randomized trial or nonrandomized studies
    - Limited populations evaluated
Pacing Indications

Level of Evidence

- Level C
  - Only consensus of experts opinion, case studies, or standard of care
  - Very limited populations evaluated
ACC/AHA/HRS 2008 Guidelines for Device-Based Therapy of Cardiac Rhythm Abnormalities

A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the ACC/AHA/NASPE 2002 Guideline Update for Implantation of Cardiac Pacemakers and Antiarrhythmia Devices) Developed in Collaboration With the American Association for Thoracic Surgery and Society of Thoracic Surgeons

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Case Study #1

- 82 year old woman with occlusive coronary artery disease and myocardial infarction with exertional angina despite long-acting nitrates and calcium blockers.
- Beta blockers are not tolerated due to bradycardia.
Case Study #1

Sinus bradycardia (46/min)
Case Study #1

- Classification I
  - Benefit >>> Risk
- Level of evidence: C
  - Only consensus of experts opinion, case studies, or standard of care
  - Very limited populations evaluated
- Need for pacing?
Case Study #1

- Follow-up
  - Patient implanted with single chamber (AAI) system
  - Atenolol 25 mg daily started with improvement in angina
Case Study #2

- 64 year old hypertensive woman admitted for evaluation of chest pain. Stress testing demonstrated no ischemic findings. She is active without dyspnea, effort intolerance, presyncope or syncope.
Sinus rhythm (80/min) with complete heart block and junctional escape rhythm (40/min)
Case Study #2

- Classification IIa
  - Benefit >> Risk
  - Probably recommended or indicated
- Level of evidence: C
  - Only consensus of experts opinion, case studies, or standard of care
  - Very limited populations evaluated
- Need for pacing?
Case Study #2

- Follow-up
  - Patient implanted with dual chamber pacemaker
  - No change in symptomatic status
  - Metoprolol 50 mg twice daily added for hypertension
Case Study #3

- 48 year old man with myotonic dystrophy type 1 with moderate skeletal muscle impairment, presenting with severe, recurrent presyncope over the past year. Echocardiogram demonstrates normal left ventricular function. Prolonged ambulatory monitoring is unremarkable.
Sinus tachycardia (100/min) with first-degree AV delay (PR 220 ms) and right bundle branch block/left anterior fascicular block (bifascicular block)
Case Study #3

- Classification IIb
  - Benefit $\geq$ Risk
  - Procedure MAY be considered
- Level of evidence: B
  - Data is derived from a single randomized trial or nonrandomized studies
  - Limited populations evaluated
- Need for pacing?
Case Study #3

Follow-up

Patient underwent dual chamber pacemaker implantation with significant reduction in number of presyncopal episodes
Case Study #4

48 year old woman presented with dizziness. Further history includes hypertension, snoring and daytime somnolence. Ambulatory monitoring is performed.
Case Study #4

Sinus rhythm (75/min) with high-degree AV block during sleep
Case Study #4

- Classification III
  - Risk $\geq$ Benefit
  - Procedure should NOT be performed
  - It is not considered helpful and may be harmful
- Level of Evidence: C
  - Only consensus of experts opinion, case studies, or standard of care
  - Very limited populations evaluated
- Need for pacing
Case Study #4

Follow-up

- Pacing not indicated as bradycardia thought to be due to transient and reversible cause.
- Evaluation and treatment for obstructive sleep apnea recommended.
Conclusion

- Adherence to treatment guidelines is recommended when approaching the patient with bradycardia.
- The type of bradycardia and nature of symptoms (if present) should be taken into account when pacing is being considered.
- The decision to perform pacemaker implantation should be individualized based on these features.
The full-text guidelines are available on the following Web sites:

ACC (www.acc.org),
AHA (www.americanheart.org), and
HRS (www.hrsonline.org)

Case studies incorporating the guidelines are available at:
www.cardiosource.com/casestudies/guidelines.asp