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**ACC/AHA/HRS Guidelines for  
Implantation of Cardiac Pacemakers  
and Antiarrhythmia Devices**

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# Guidelines for implantation of cardiac pacemakers and anitarrhythmia devices

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# Class I and II Indications:

## Pacing for Idiopathic Dilated Cardiomyopathy

### Class I

1. Class I indications for SN dysfunction or AV block as previously described.

### Class IIa:

1. Biventricular pacing in medically refractory, symptomatic NYHA Class III/IV patients with idiopathic dilated or ischemic cardiomyopathy, prolonged QRS interval ( $\geq 130$  msec), LV end-diastolic diameter  $\geq 55$ mm, and LVEF  $\leq 35\%$ .

### Class IIb: None

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- Several observational studies have shown some improvement in patients with symptomatic dilated cardiomyopathy refractory to medical therapy with dual-chamber pacing with a short AV delay. This short AV delay may optimize the timing of (mechanical) AV synchrony and ventricular filling time.
  - This new recommendation allows for biventricular pacing in patients with advanced heart failure, specific indices of LV dysfunction, and prolonged QRS duration. Multiple trials (MUSTIC-SR, MIRACLE, CONTAK-CD) have demonstrated clinical and structural cardiac improvement with this cardiac resynchronization therapy.

# Class III Indications:

## Pacing for Idiopathic Dilated Cardiomyopathy

1. Asymptomatic dilated cardiomyopathy.
2. Symptomatic dilated cardiomyopathy when patients are rendered asymptomatic by drug therapy.
3. Symptomatic ischemic cardiomyopathy **when the ischemia is amenable to intervention.**

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**Section II:**  
**Indications For Implantable Cardioverter  
Defibrillator Therapy**

Recommendations for ICD Therapy

**(changes from 1998 version highlighted in yellow text)**

## Class I Indications for ICD Therapy

1. Cardiac arrest due to VF or VT not due to a transient or reversible cause.
2. Spontaneous sustained VT **in association with structural heart disease.**
3. Syncope of undetermined origin with clinically relevant, hemodynamically significant sustained VT or VF induced at EP study when drug therapy is ineffective, not tolerated, or not preferred.

## Class I Indications for ICD Therapy

4. Nonsustained VT in patients with coronary disease, prior MI, LV dysfunction, and inducible VF or sustained VT at EP study that is not suppressible by a Class I antiarrhythmic drug.
5. Spontaneous sustained VT in patients without structural heart disease not amenable to other treatments.

## Class IIa Indications for ICD Therapy

1. Patients with left ventricular ejection fraction of less than or equal to 30% at least 1 month post myocardial infarction and 3 months post coronary artery revascularization surgery.
- There were no Class IIa ICD indications in the 1998 guidelines

## Class IIb Indications for ICD Therapy

1. Cardiac arrest presumed to be due to VF when EP testing is precluded by other medical conditions.
- Severe symptoms (e.g. **syncope**) attributable to sustained ventricular tachyarrhythmias while awaiting cardiac transplantation.
  - Familial or inherited conditions with a high risk for life-threatening ventricular tachyarrhythmias such as long QT syndrome or hypertrophic cardiomyopathy.

## Class IIb Indications for ICD Therapy

- 4. Nonsustained VT with coronary artery disease, prior MI, and LV dysfunction, and inducible sustained VT or VF at EP study.**
- 5. Recurrent syncope of undetermined etiology in the presence of ventricular dysfunction and inducible ventricular arrhythmias at EP study, when other causes of syncope have been excluded.**

## Class IIb Indications for ICD Therapy

- 6. Syncope of unexplained origin or family history of unexplained sudden cardiac death in association with typical or atypical right bundle-branch block and ST-segment elevation (Brugada syndrome).**
- 7. Syncope in patients with advanced structural heart disease in whom thorough invasive and noninvasive investigations have failed to define a cause.**

## Class III Indications for ICD Therapy

1. Syncope of undetermined cause in a patient without inducible ventricular tachyarrhythmias **and without structural heart disease.**
2. Incessant VT or VF.
3. VF or VT resulting from arrhythmias amenable to surgical or catheter ablation; for example atrial arrhythmias associated with Wolfe-Parkinson-White syndrome, right ventricular outflow tract VT, idiopathic left ventricular tachycardia, or fascicular VT.

## Class III Indications for ICD Therapy

4. Ventricular tachyarrhythmias due to a transient or reversible disorder (e.g. AMI, electrolyte imbalance, drugs, or trauma) **when correction of the disorder is considered feasible and likely to substantially reduce the risk of recurrent arrhythmia.**
5. Significant psychiatric illnesses that may be aggravated by device implantation or may preclude systematic follow-up.
6. Terminal illnesses with projected life expectancy less than 6 months.

## Class III Indications for ICD Therapy

- 7. Patients with coronary artery disease with LV dysfunction and prolonged QRS duration in the absence of spontaneous or inducible sustained or nonsustained VT who are undergoing coronary bypass surgery.**
- 8. NYHA Class IV drug-refractory congestive heart failure in patients who are not candidates for cardiac transplantation.**

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- thank you