Coding for Arrhythmia Management Devices

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Objectives

• Briefly discuss the components of pacing/ICD systems and their respective functions
• Discuss ACC guidelines related to devices
• Review the code that support the use of devices
Pacemakers
Diseased Heart Tissue May:

- Prevent impulse generation in the SA node
- Inhibit impulse conduction
Pacemaker Components Combine With Tissue to Form a Complete Circuit

- Pulse generator: power source or battery
- Leads or wires
- Cathode (negative electrode)
- Anode (positive electrode)
- Body tissue
VVI Mode

- Pacing inhibited with intrinsic activity

Low Rate Interval

Blanking/Refractory

VVI / 60
Sinus Node Dysfunction
Indications for Pacemaker Implantation

My Indications

- Bradycardia that is SYMPTOMATIC, even due to medically necessary drugs
- Contraindicated in asymptomatic SSS
AV Block – Indications

My Indications

• 3rd degree AV block and advanced 2nd degree AV block that is acquired, even due to medically necessary drugs

• In congenital indicated, but not emergency

Contraindicated

• Asymptomatic 1st degree AV block

• Asymptomatic Type I 2nd degree AV block

• AV block expected to resolve and unlikely to recur
Bifascicular and Trifascicular Block (Chronic) – Indications

Class I Indications
- Intermittent 3rd degree AV block
- Type II 2nd degree AV block

Class II Indications
- Class IIa:
  - Syncope not proved to be due to AV block when other causes have been excluded, specifically VT
  - Severe conduction system disease
- Class IIb: Neuromuscular disease

Class III Indications
- Asymptomatic fascicular block without AV block
- Asymptomatic fascicular block with 1st degree AV block

ACC/AHA/NASPE 2002 Guidelines
Pacemaker Coding

- **33206** Insertion of new or replacement of permanent pacemaker with transvenous electrode(s); atrial
- **33207** ventricular
- **33208** atrial and ventricular
- **33212** Insertion of pacemaker pulse generator only; with existing single lead
- **33213** with existing dual leads
- **33221** with existing multiple leads (new code)
Pacemaker Coding

- **33227** Removal of permanent pacemaker pulse generator with replacement of pacemaker pulse generator; single lead system (new code)

- **33228** dual lead system (new code)

- **33229** multiple lead system (new code)

- **33233** Removal of permanent pacemaker pulse generator only

- **71090** (fluoroscopy, pacemaker system) was deleted effective January 1, 2012
ICDs
Magnitude of SCA in the US

SCA claims more lives each year than these other diseases combined

- Stroke\(^3\): 167,366
- Lung Cancer\(^2\): 157,400
- Breast Cancer\(^2\): 40,600
- AIDS\(^1\): 42,156

Total: 450,000 SCA\(^4\)

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3 2002 Heart and Stroke Statistical Update, American Heart Association.
4 Circulation. 2001;104:2158-2163.
Implantable Cardioverter Defibrillator

First-line therapy for patients at risk for SCA

- Small devices, pectoral implant site
- Transvenous, single incision
- Local anesthesia; conscious sedation
- Short hospital stays
- Few complications
- Perioperative mortality < 1%
- Programmable therapy options
- Single- or dual-chamber therapy
- Battery longevity up to 9 years
- 80,000 implants/year (2000 E)

Sudden Cardiac Death
Incidence and Total Events

Overall Incidence in Adult Population

- High Coronary Risk Sub-Group
- Any Prior Coronary Event
- EF < 30% Heart Failure
- Out-of-Hospital Cardiac Arrest Survivors
- Convalescent Phase VT/VF After MI

# Implantable Cardioverter Defibrillator Trials for Secondary Prevention of SCD

<table>
<thead>
<tr>
<th>STUDY GROUP</th>
<th>Control</th>
<th>ICDs</th>
<th>2-year Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rel RR</td>
</tr>
<tr>
<td><strong>AVID</strong></td>
<td>VF, sustained VT; EF ≤ 40% ICD vs amiodarone</td>
<td>25%</td>
<td>18%</td>
</tr>
<tr>
<td><strong>CIDS</strong></td>
<td>VF, symptomatic VT; EF ≤ 35%, CL &lt; 400ms</td>
<td>21%</td>
<td>15%</td>
</tr>
<tr>
<td><strong>CASH</strong></td>
<td>Survivors of SCD (VF/VT) propafenone/metoprolol/amiodarone/ICD</td>
<td>20%</td>
<td>12%</td>
</tr>
</tbody>
</table>

AVID = Antiarrhythmics vs Implantable Defibrillators. NEJM 1997; 337:1576 (terminated early)
CIDS = Canadian ICD study. Circulation 2000;101:1297
# ICD Trials for Primary Prevention of SCD

<table>
<thead>
<tr>
<th>STUDY GROUP</th>
<th>Control</th>
<th>ICDs</th>
<th>Rel RR</th>
<th>AbsRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>MADIT</td>
<td>Prior MI, EF ≤ 35%, NSVT, inducible VT/VF, failed IV PA</td>
<td>32%</td>
<td>13%</td>
<td>-59%</td>
</tr>
<tr>
<td>MUSTT</td>
<td>Prior MI, EF ≤ 40%, NSVT, inducible VT, EP guided Rx</td>
<td>55%</td>
<td>24%</td>
<td>-56%</td>
</tr>
<tr>
<td>CABG-PATCH</td>
<td>CABG, EF ≤ 36%, SAECG (+)</td>
<td>18%</td>
<td>18%</td>
<td>0</td>
</tr>
<tr>
<td>MADIT-2</td>
<td>MI (&gt;1 month), EF ≤ 30%</td>
<td>19.8%</td>
<td>14.2%</td>
<td>-28%</td>
</tr>
<tr>
<td>SCD-HeFT</td>
<td>CHF FC II-III, EF ≤ 35%</td>
<td>-23%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MADIT = Multicenter Automatic Defibrillator Implantation Trial. NEJM 1996; 335:1933 (terminated early)
MUSTT = Multicenter Unsustained Tachycardia Trial. NEJM 1999; 341:1882
CABG-PATCH = CABG/ICD Trial. NEJM 1997; 337: 1569
SCD-HeFT = Sudden Cardiac Death in Heart Failure
Indications for ICD

Secondary Prevention

• Cardiac arrest due to VT or VF not due to a transient or reversible cause
• Spontaneous sustained VT in association with structural heart disease
• Syncope with hemodynamically significant VT/VF during EP study
• Spontaneous VT in patients with structurally normal hearts not amenable to other treatments.

Primary Prevention

• NSVT in patients with CAD, LV dysfunction and inducible VT during EP study
• CAD, prior MI, LVEF < 30% at least 40 days after MI, and 3 months post CABG.
• EF < 35%, class II-III CHF
• Genetic conditions
ICD Coding

• 33249 Insertion or replacement of permanent pacing cardioverter-defibrillator system with transvenous lead(s), single or dual chamber

• 33240 Insertion of pacing cardioverter-defibrillator pulse generator only; with existing single lead

• 33230 with existing dual leads (new code)

• 33231 with existing multiple leads (new code)

• 33241 Removal of pacing cardioverter-defibrillator pulse generator only
ICD Coding

- **33262** Removal of pacing cardioverter-defibrillator pulse generator with replacement of pacing cardioverter-defibrillator pulse generator; single lead system (new code)
- **33263** dual lead system (new code)
- **33264** multiple lead system (new code)
Defibrillator Testing Codes

NIPS (With Induction of Arrhythmia)

93640  EP evaluation of defibrillator, including DFT evaluation and arrhythmia induction and termination, at time of initial implantation or replacement;

93641  with testing of defibrillator pulse generator

93642  EP evaluation of defibrillator, including DFT evaluation and arrhythmia induction and termination, and reprogramming

Unlike pacemakers, defibrillators are typically tested immediately after implantation. They also continue to be tested on a periodic basis afterwards.

Example: Bi-V Defibrillator

| 33249 | Insert or replace ICD system w transvenous lead(s), single or dual chamber |
| 93641 | Device eval w induction |
Cardiac Resynchronization (BiVentricular Pacing)

Simultaneous activation of both ventricles will overcome IVCD, restore more normal patterns of contraction and improve function.
Prevalence and Prognosis of Ventricular dyssynchrony

LBBB More Prevalent with Impaired LV Systolic Function

<table>
<thead>
<tr>
<th>Preserved LVSF (1)</th>
<th>Impaired LVSF (1)</th>
<th>Mod/Sev HF (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8%</td>
<td>24%</td>
<td>38%</td>
</tr>
</tbody>
</table>

Increased All-Cause Mortality with Wide QRS at 45 Months (3)

\[ P < 0.001 \]

<table>
<thead>
<tr>
<th>QRS &lt; 120 ms</th>
<th>QRS ≥ 120 ms</th>
</tr>
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<tbody>
<tr>
<td>34%</td>
<td>49%</td>
</tr>
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</table>

Ventricular Dysynchrony
Resynchronization with BiV Pacing
Pharmacologic and Device Therapy Across the Continuum

Post-MI LV dysfunction → Mild CHF → Moderate CHF → Severe CHF

- AIRE/SAVE (ramipril/captopril)
- SOLVD Treatment (enalapril)
- CONSENSUS (enalapril)
- US Carvedilol/MERIT (carvedilol/metoprolol)
- COPERNICUS (carvedilol)
- CAPRICORN (carvedilol)
- EPHESUS (eplerenone)
- CHARM/Val-HeFT (candesartan/valsartan)
- RALES (spironolactone)
- MADIT, MUSTT (ICD)
- SCD-HeFT, MADIT-II (ICD)
- MIRACLE, COMPANION, MUSTIC (CRT +/- ICD)
- CARE-HF
Bi-ventricular pacemakers and defibrillators use the same codes as conventional pacemakers and defibrillators. The left ventricular lead is then shown with an add-on code.

**+33225** Insertion of pacing electrode, cardiac venous system, for left ventricular pacing, at time of insertion of defibrillator or pacemaker pulse generator (including upgrade to dual chamber system and pocket revision)

<table>
<thead>
<tr>
<th>Example: Bi-V Pacemaker</th>
<th>Example: Bi-V Defibrillator</th>
</tr>
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<tbody>
<tr>
<td>33208</td>
<td>33249</td>
</tr>
<tr>
<td>Insertion of new or replacement of pacemaker with transvenous electrodes, atrial and ventricular</td>
<td>Insertion or replacement of permanent pacing cardioverter-defibrillator system with transvenous lead(s), single or dual chamber</td>
</tr>
<tr>
<td>+33225</td>
<td>+33225</td>
</tr>
<tr>
<td>Insertion of LV lead</td>
<td>Insertion of LV lead</td>
</tr>
</tbody>
</table>
Implantable Loop Recorder

- Is a subcutaneous, single-lead, electrocardiographic (ECG) monitoring device used for diagnosis in patients with recurrent unexplained episodes of palpitations or syncope

- Best diagnostic yield for undiagnosed syncope
Implantable Loop Recorder

- 33282 Implant ILR
- 33284 Remove ILR
Pacemaker Remote and TTM

Interrogation (W/O Induction of Arrhythmia)

**93294** Interrogation device evaluation(s) (remote), up to 90 days; single, dual, or multiple lead pacemaker system with interim physician analysis, review(s) and report(s)

**93296** Interrogation device evaluation(s) (remote), up to 90 days; single, dual or multiple lead pacemaker system, or ICD system, remote data acquisition(s), receipt of transmissions and technician review, technical support and distribution of results

**93293** Transtelephonic rhythm strip pacemaker evaluation(s) single, dual, or multiple lead pacemaker system, includes recording with and without magnet application with physician analysis, review and report(s), up to 90 days

2012 CPT code book:
Do not report 93293-93296 if the monitoring period is less than 30 days. Report only remote services when an in person interrogation device evaluation is performed during a period of remote interrogation device evaluation. A period is established by the initiation of the remote monitoring.
Pacemaker In Person Evaluation

Interrogation & Programming Evaluation (W/O Induction of Arrhythmia)

93288  Interrogation device evaluation pacemaker system; single, dual or multiple lead pacemaker system
93279  Programming device evaluation; single lead pacemaker system
93280  Programming device evaluation; dual lead pacemaker system
93281  Programming device evaluation; multiple lead pacemaker system

Pacemaker devices are evaluated periodically after implant to verify proper functioning. All device functions, including the battery, programmable settings and lead(s), when present, are evaluated. To assess capture thresholds, iterative adjustments (e.g., progressive changes in pacing output of a pacing lead) of the programmable parameters are conducted.
Defibrillator In Person Evaluation

Interrogation & Programming Evaluation (W/O Induction of Arrhythmia)

- **93289** Interrogation device evaluation defibrillator system; single, dual or multiple lead system, including analysis of heart rhythm derived data elements
- **93282** Programming device evaluation; single lead defibrillator system
- **93283** Programming device evaluation; dual lead defibrillator system
- **93284** Programming device evaluation; multiple lead defibrillator system

Defibrillator devices are evaluated periodically after implant to verify proper functioning. All device functions, including the battery, programmable settings and lead(s), when present, are evaluated. To assess capture thresholds, iterative adjustments (e.g., progressive changes in pacing output of a pacing lead) of the programmable parameters are conducted.
Defibrillator Remote

Interrogation (W/O Induction of Arrhythmia)

93295 Interrogation device evaluation(s) (remote), up to 90 days; single, dual or multiple lead implantable cardioverter-defibrillator system, physician analysis, review(s) and report(s)

93296 Interrogation device evaluation(s) (remote), up to 90 days; single, dual or multiple lead pacemaker system, or implantable cardioverter-defibrillator system, remote data acquisition(s), receipt of transmissions and technician review

2012 CPT code book:
Do not report 93293-93296 if the monitoring period is less than 30 days. Report only remote services when an in person interrogation device evaluation is performed during a period of remote interrogation device evaluation. A period is established by the initiation of the remote monitoring.
Questions?