

Coding for Arrhythmia Management Devices

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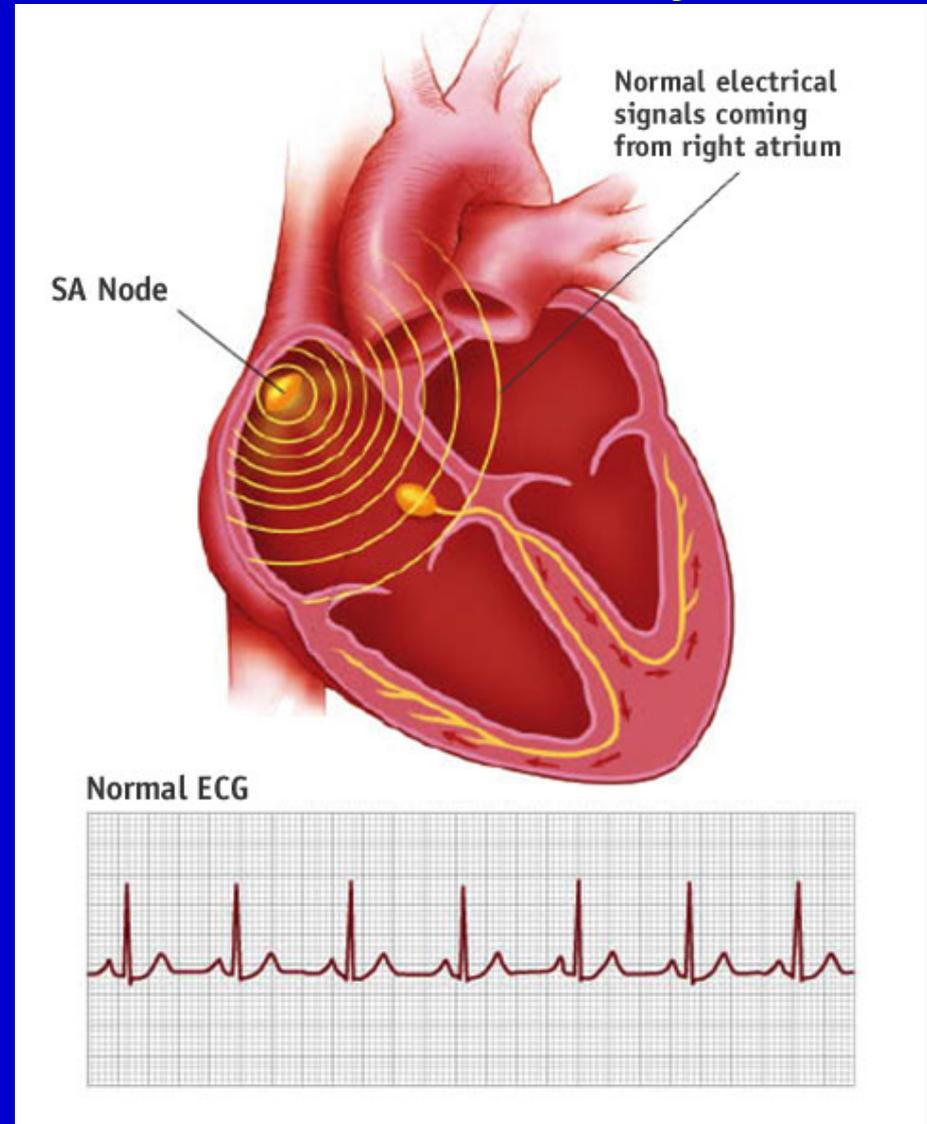
Objectives

- 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

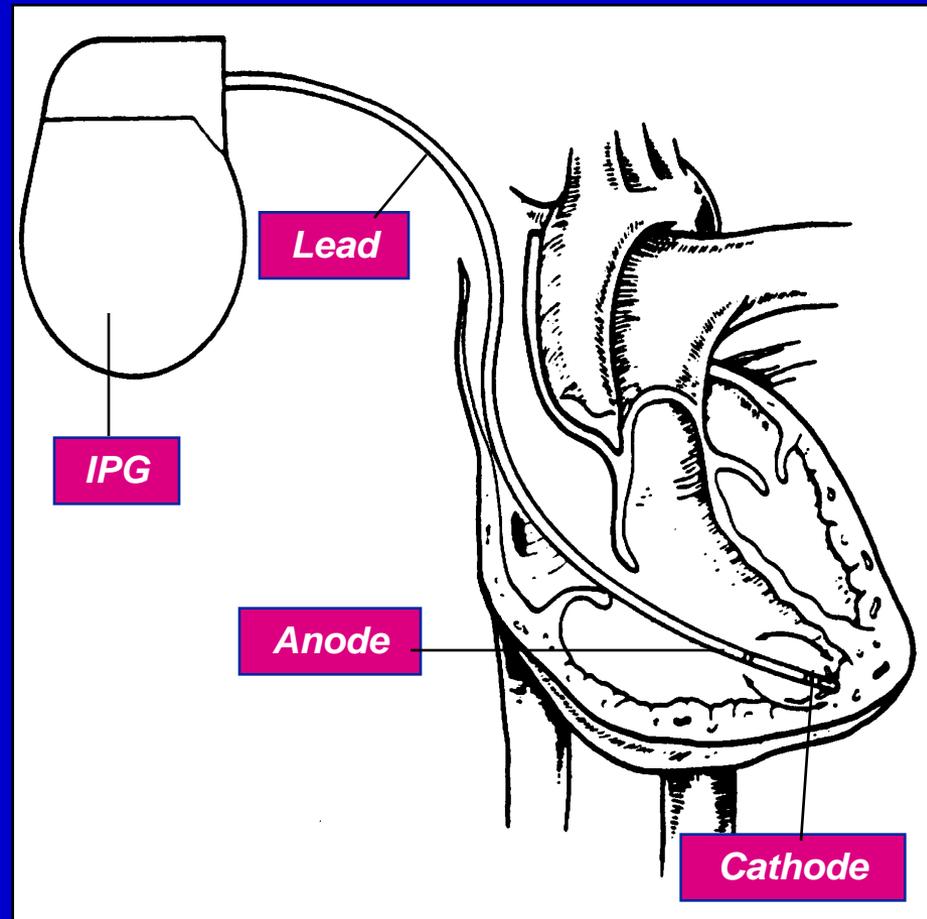
Diseased Heart Tissue May:

- Prevent impulse generation in the SA node
- Inhibit impulse conduction



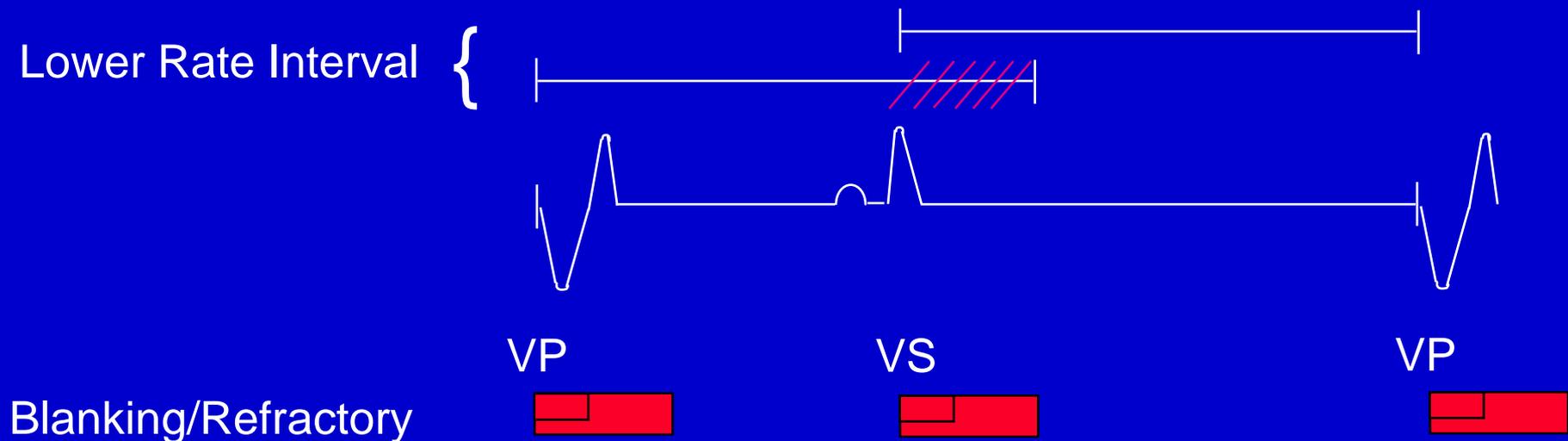
Pacemaker Components Combine With Tissue to Form a Complete Circuit

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

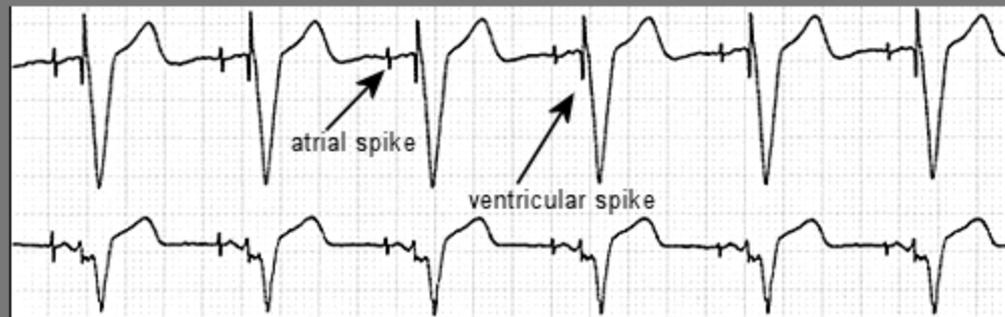
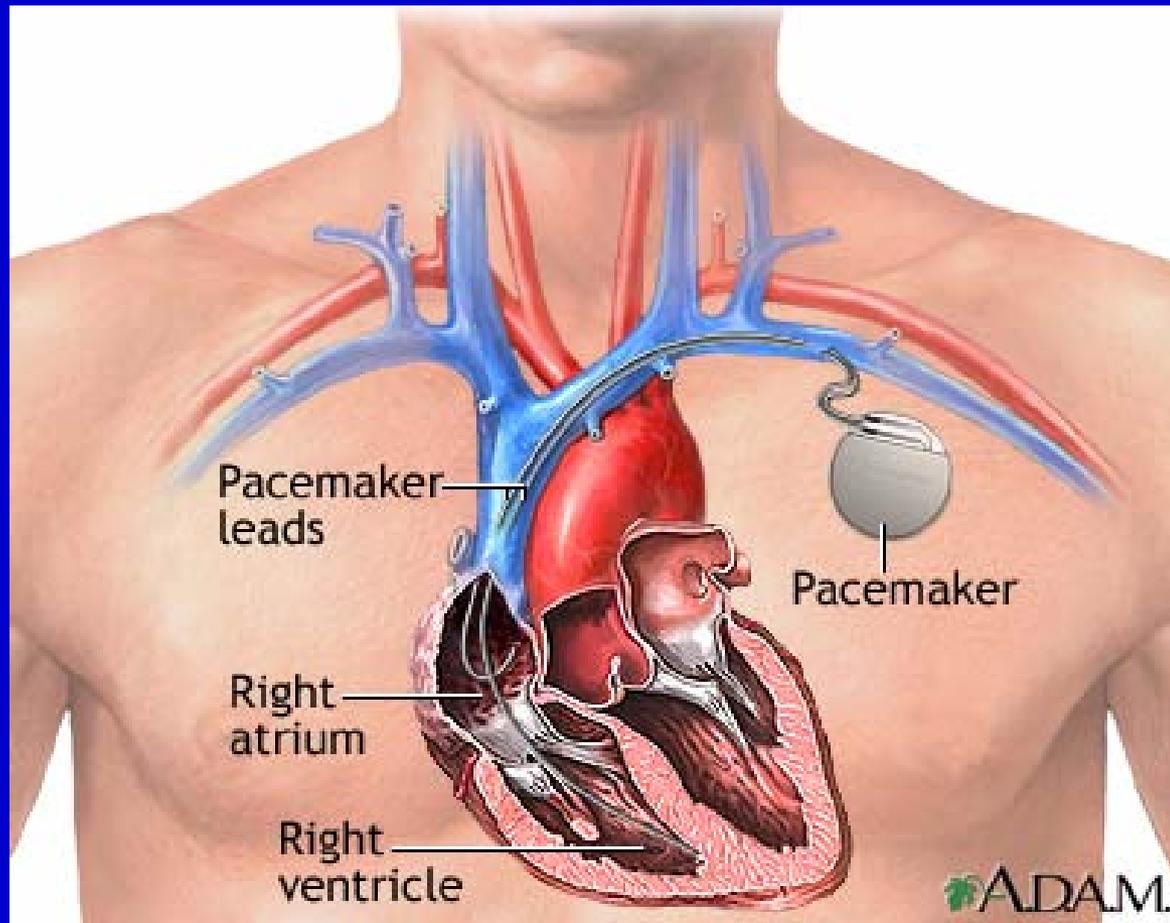


VVI Mode

- Pacing inhibited with intrinsic activity



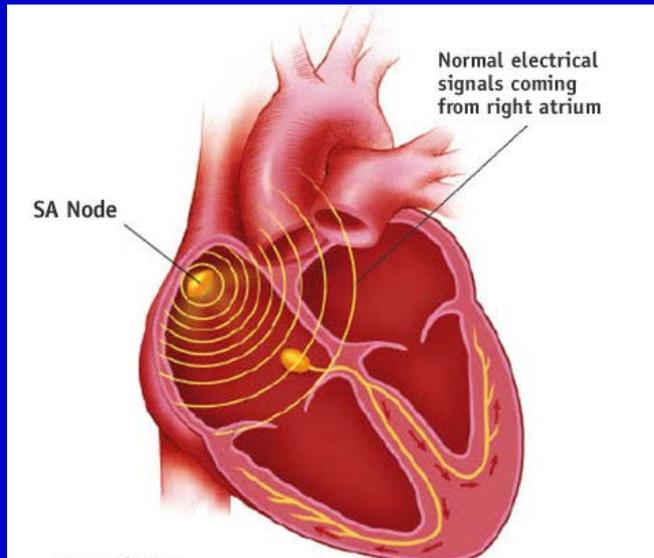
VVI / 60



dual pacemaker (DDD)

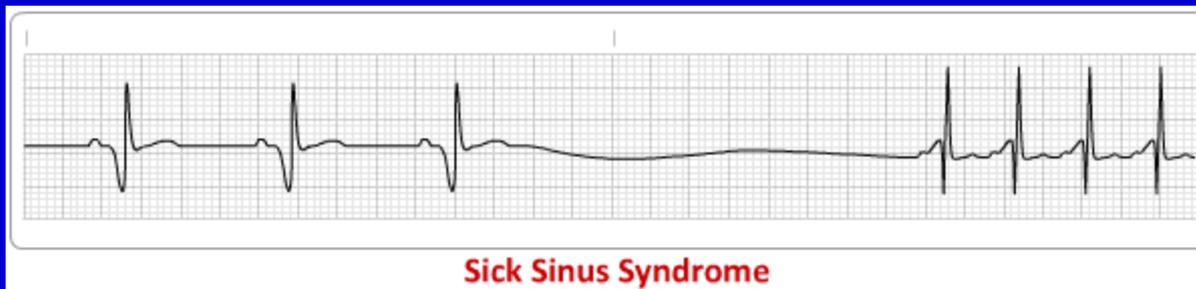
Sinus Node Dysfunction

Indications for Pacemaker Implantation

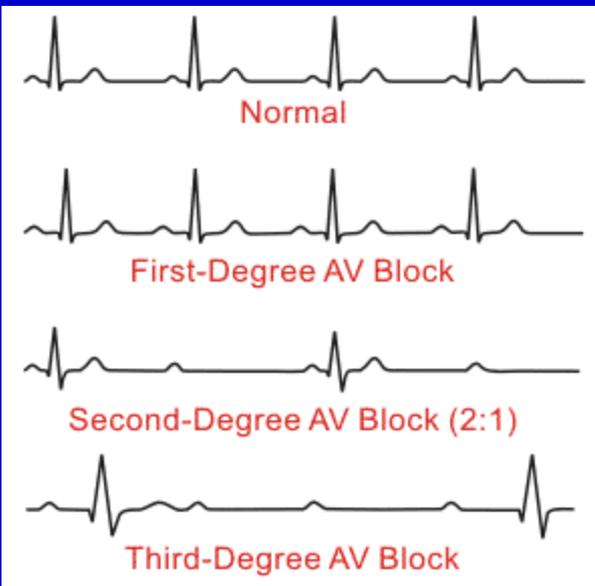
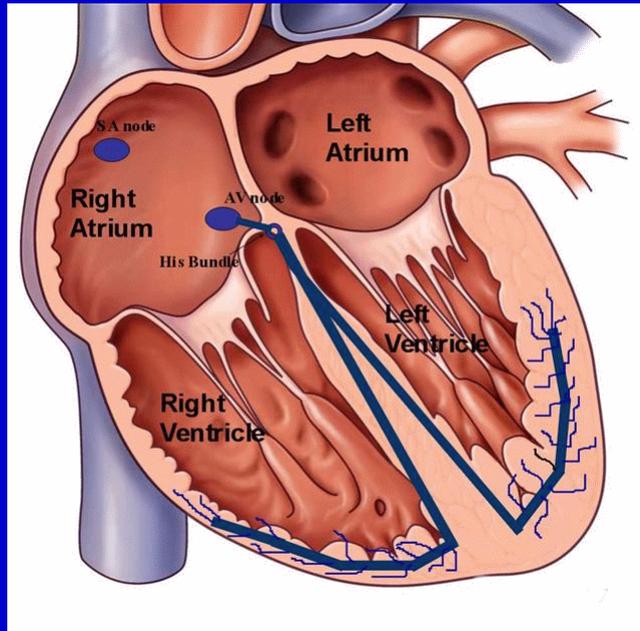


My Indications

- 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

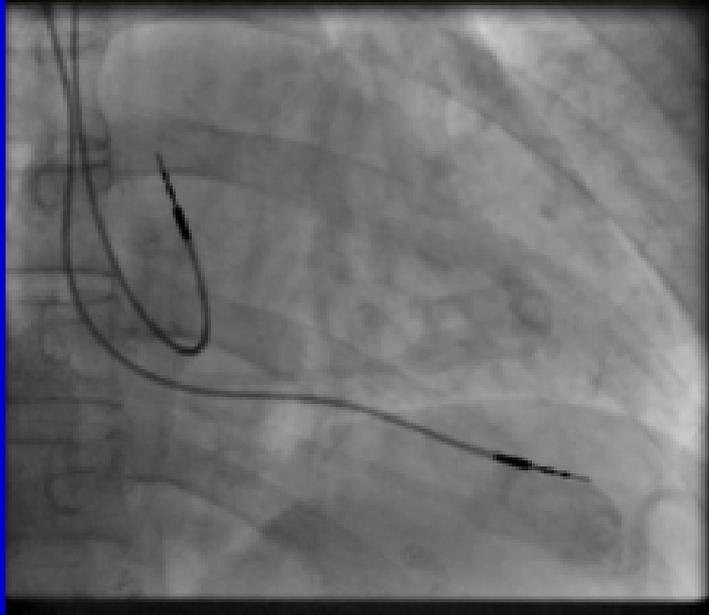
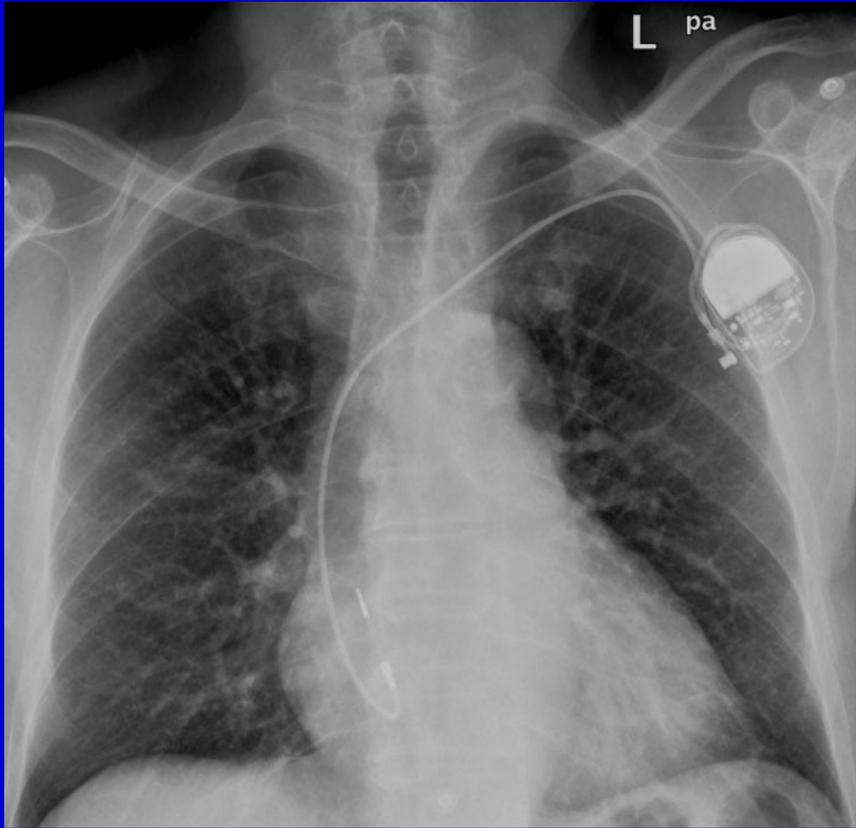
- Intermittent 3rd degree AV block
- Type II 2nd degree AV block

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



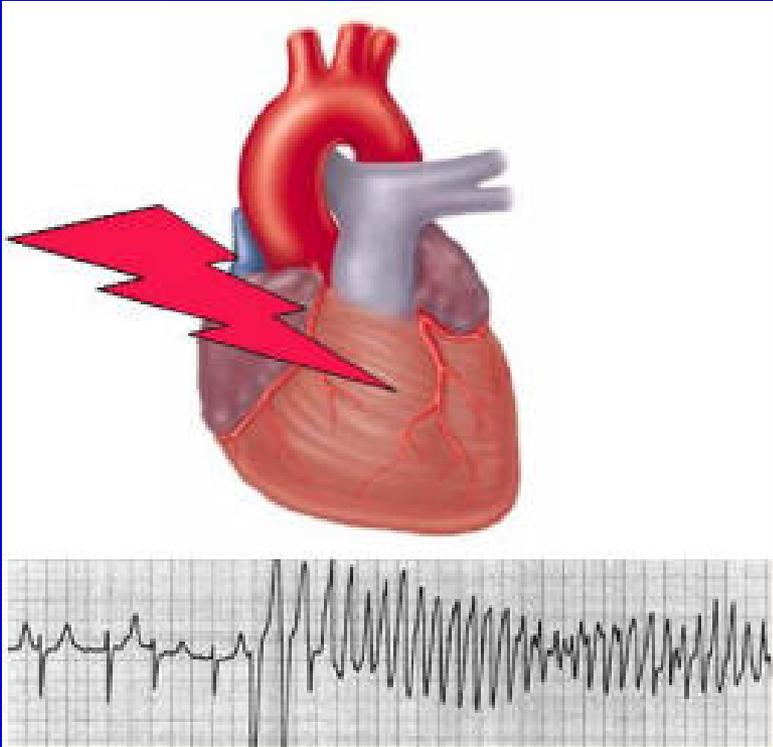
Pacemaker Coding

- **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)

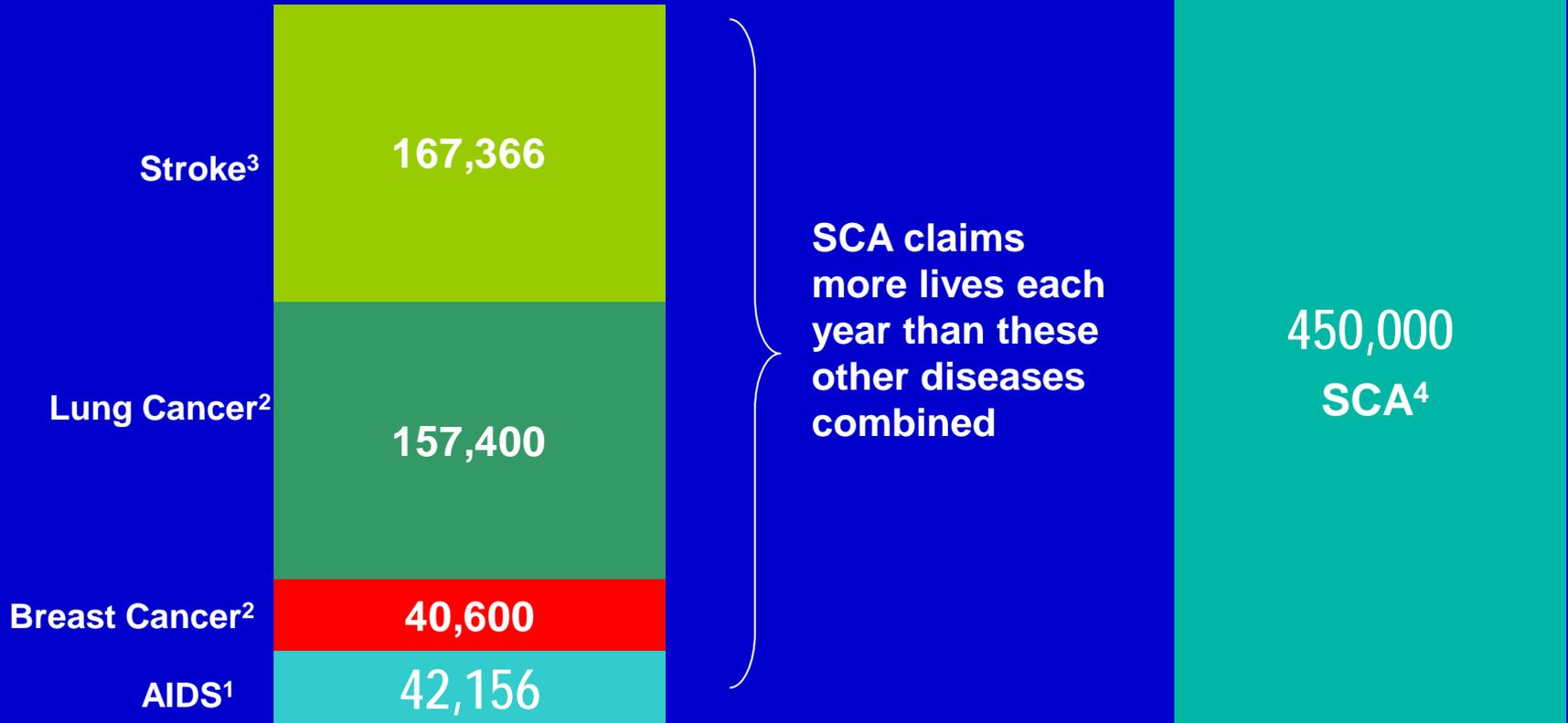
Pacemaker Coding

- **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



¹ U.S. Census Bureau, *Statistical Abstract of the United States: 2001*.

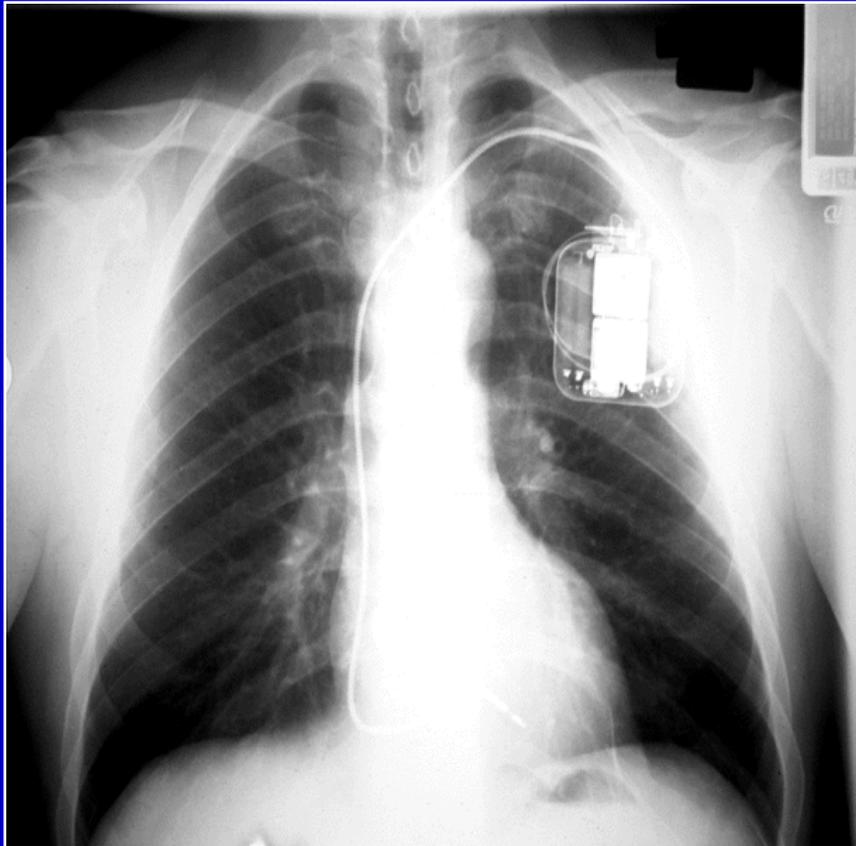
² American Cancer Society, Inc., *Surveillance Research, Cancer Facts and Figures 2001*.

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

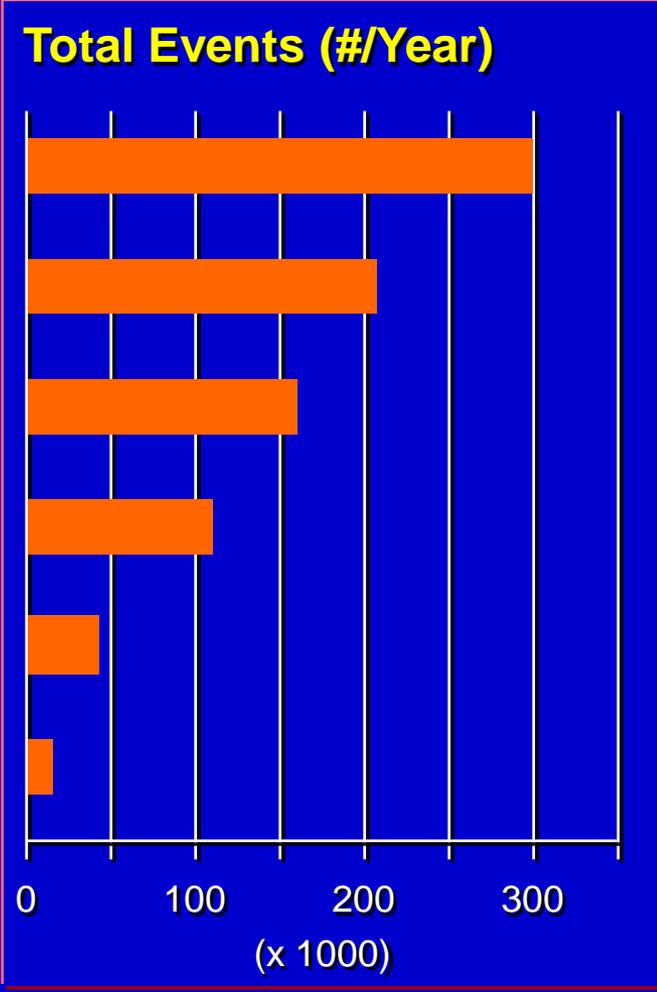
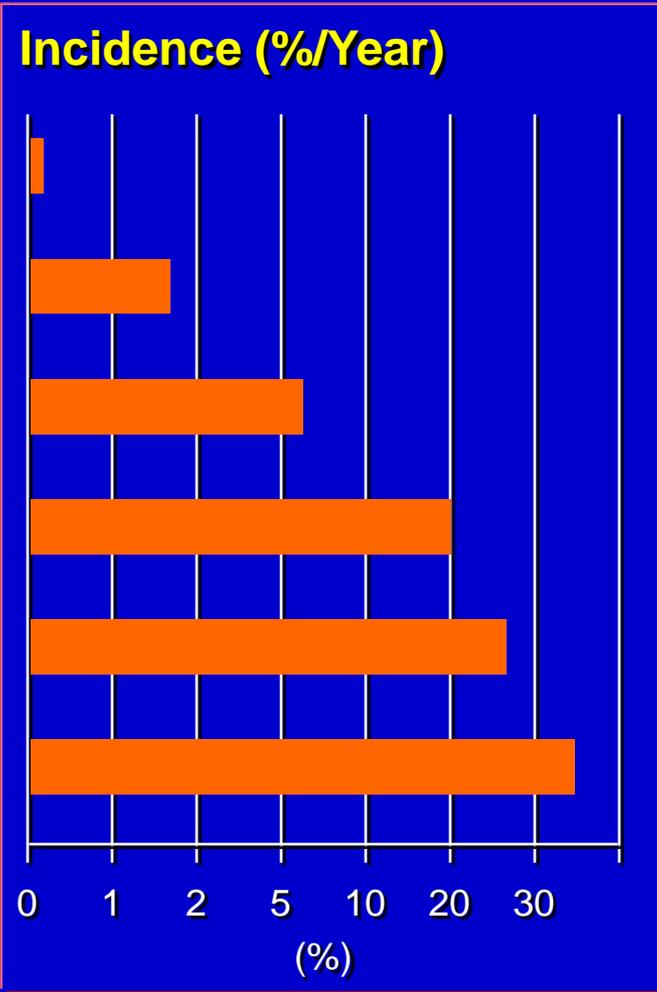
High Coronary
Risk Sub-Group

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

	STUDY GROUP	Control	ICDs	2-year Mortality	
				Rel RR	Abs RR
AVID	VF, sustained VT; EF ≤ 40% ICD vs amiodarone	25%	18%	-27%	-7%
CIDS	VF, symptomatic VT; EF ≤ 35%, CL < 400ms	21%	15%	-30%	-6%
CASH	Survivors of SCD (VF/VT) propafenone/metoprolol/ amiodarone/ICD	20%	12%	-37%	-8%

AVID = Antiarrhythmics vs Implantable Defibrillators. NEJM 1997; 337:1576 (terminated early)

CIDS = Canadian ICD study. Circulation 2000;101:1297

CASH = Cardiac Arrest Study of Hamburg. ACC 47th Annual Meeting, 1998

ICD Trials for Primary Prevention of SCD

STUDY GROUP		2-year Mortality			
		Control	ICDs	Rel RR	AbsRR
MADIT	Prior MI, EF \leq 35%, NSVT, inducible VT/VF, failed IV PA	32%	13%	-59%	-19%
MUSTT	Prior MI, EF \leq 40%, NSVT, inducible VT, EP guided Rx	55%	24%	-56%	-31%
CABG-PATCH	CABG, EF \leq 36%, SAECG (+)	18%	18%	0	0
MADIT-2	MI (>1 month), EF \leq 30%	19.8%%	14.2%	-28%	-5.6%
SCD-HeFT	CHF FC II-III, EF \leq 35%			-23%	

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

MADIT-2 = Multicenter Automatic Defibrillator Implantation Trial. NEJM 2002; 346:877-83.

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

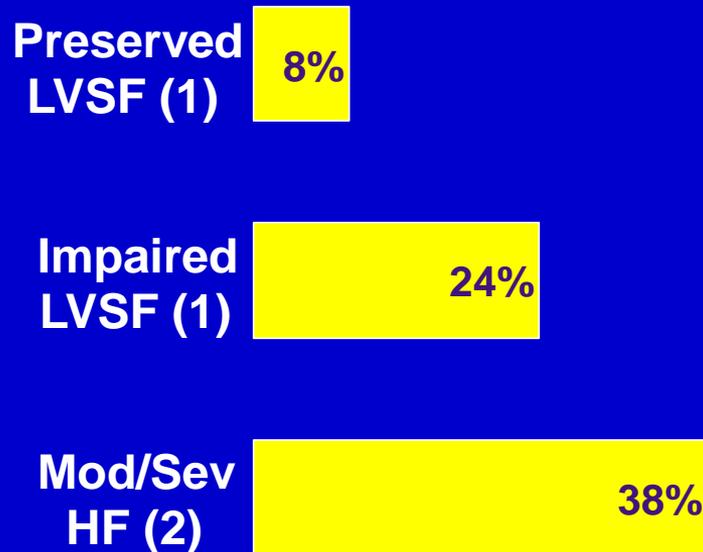
33249	Insert or replace ICD system w transvenous lead(s), single or dual chamber
93641	Device eval w induction

Cardiac Resynchronization (BiVentricular Pacing)

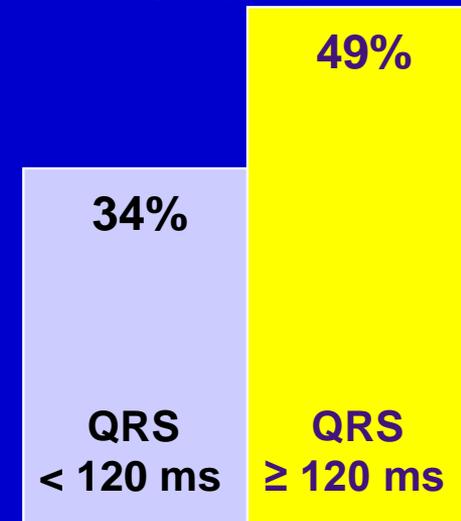
Simultaneous activation of both ventricles will overcome IVCD, restore more normal patterns of contraction and improve function.

Prevalence and Prognosis of Ventricular dyssynchrony

LBBB More Prevalent with Impaired LV Systolic Function



Increased All-Cause Mortality with Wide QRS at 45 Months (3)
P < 0.001

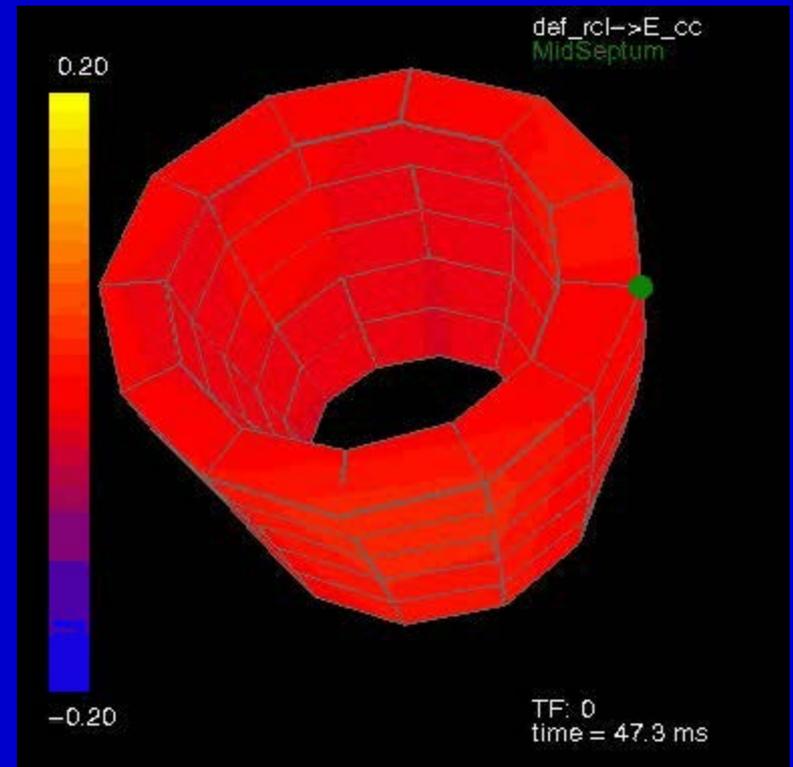
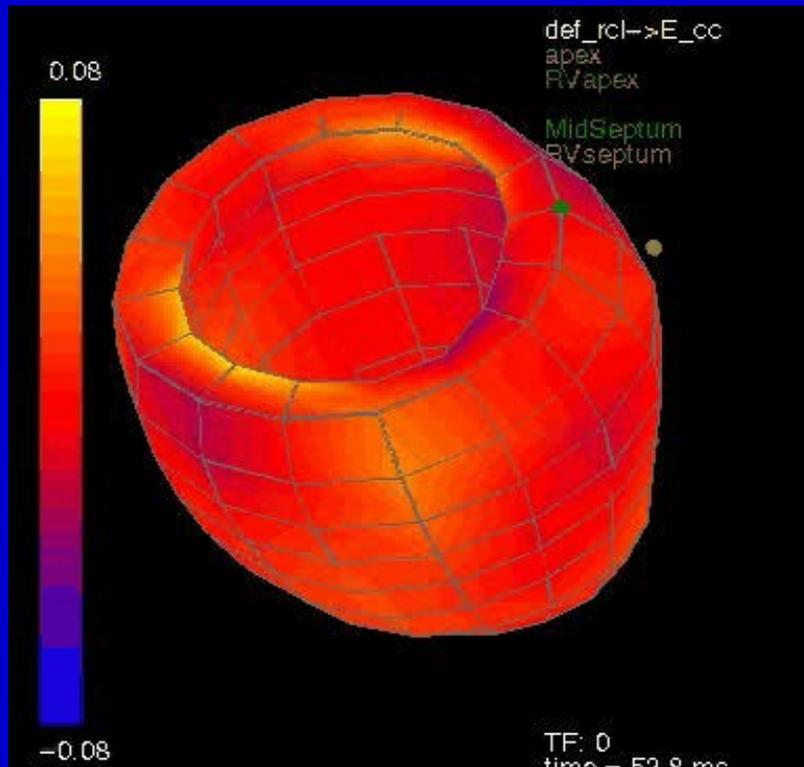


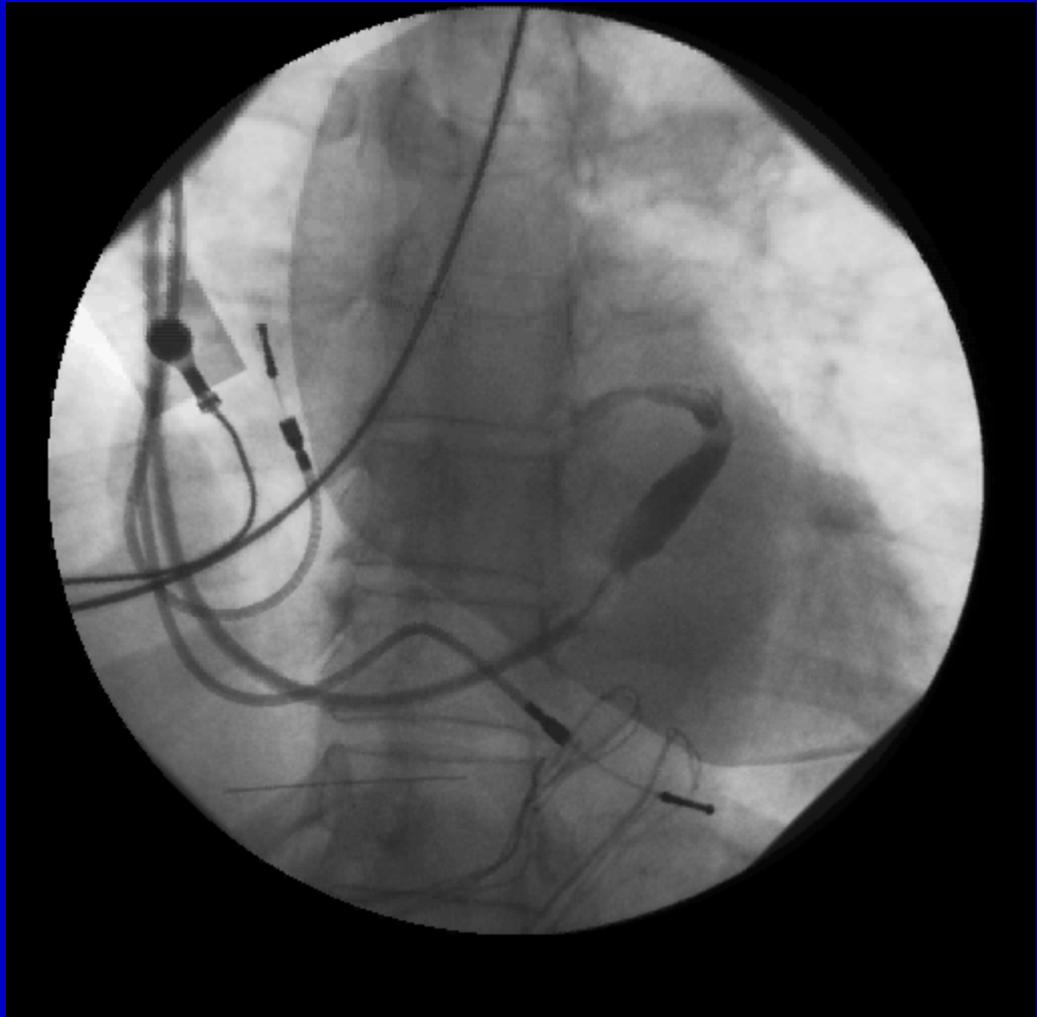
1. Masoudi, et al. *JACC*. 2003;41:217-223.

2. Aaronson, et al. *Circulation*. 1997;95:2660-2667.

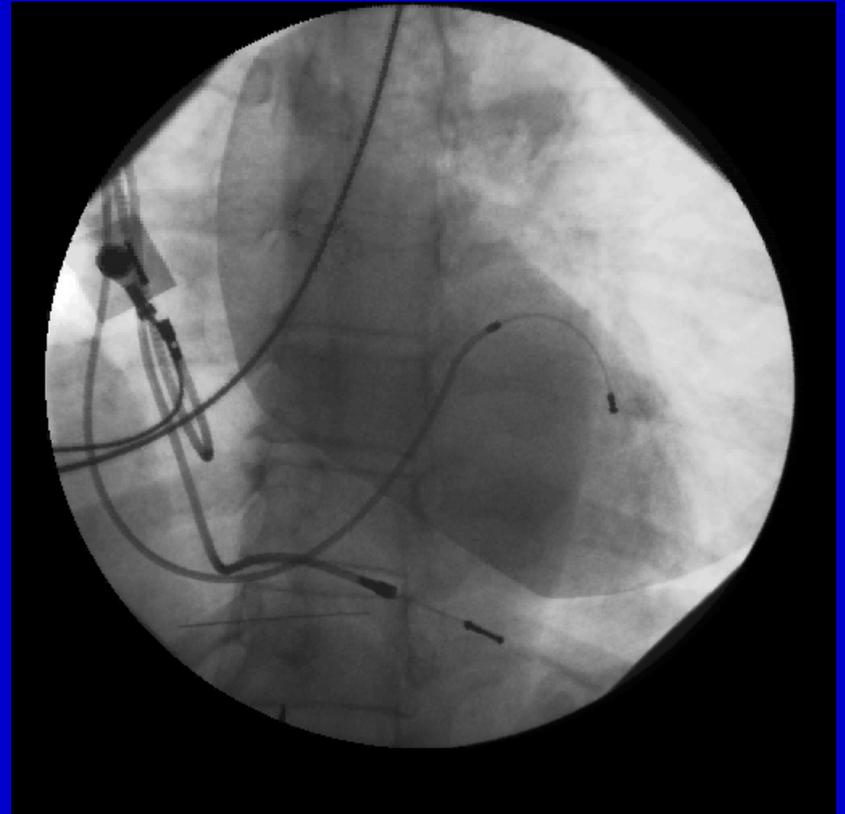
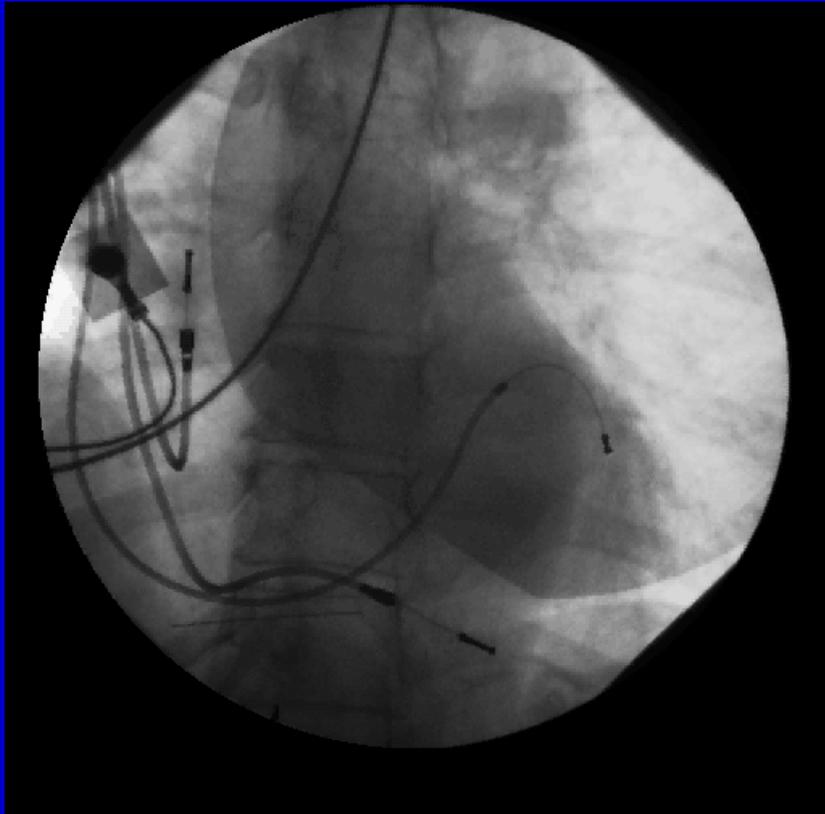
3. Iuliano, et al. *AHJ*. 2002;143:1085-1091.

Ventricular Dysynchrony



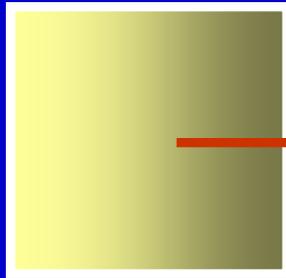


Resynchronization with BiV Pacing

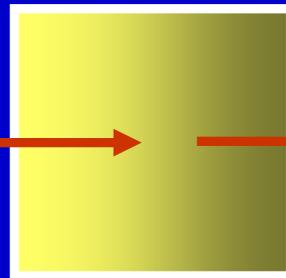


Pharmacologic and Device Therapy Across the Continuum

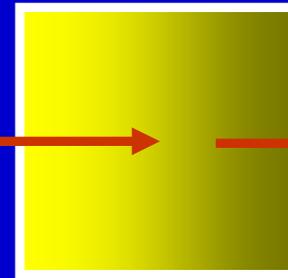
Post-MI
LV dysfunction



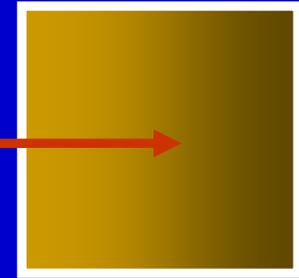
Mild
CHF



Moderate
CHF



Severe
CHF



AIRE/SAVE
(ramipril/captopril)

SOLVD Treatment
(enalapril)

CONSENSUS
(enalapril)

CAPRICORN
(carvedilol)

US Carvedilol/MERIT
(carvedilol/metoprolol)

COPERNICUS
(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 Coding

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)

Example: Bi-V Pacemaker

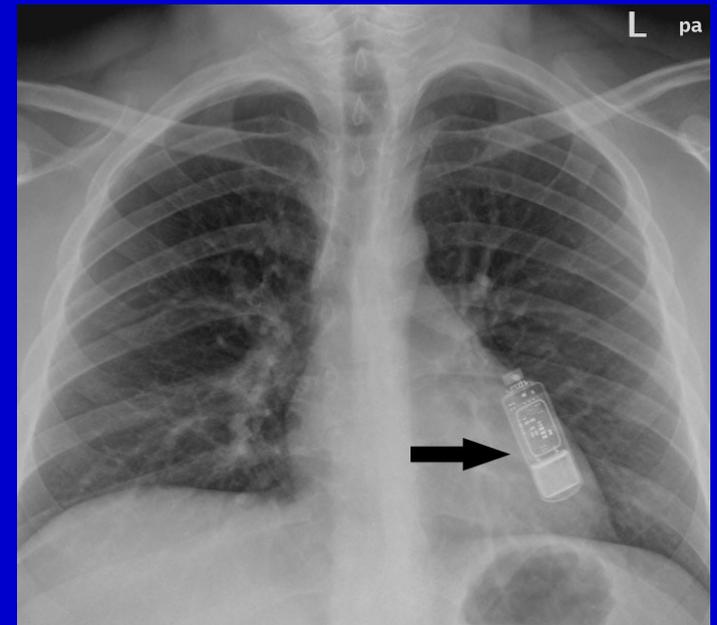
33208	Insertion of new or replacement of pacemaker with transvenous electrodes, atrial and ventricular
+33225	Insertion of LV lead

Example: Bi-V Defibrillator

33249	Insertion or replacement of permanent pacing cardioverter-defibrillator system with transvenous lead(s), single or dual chamber
+33225	Insertion of LV lead

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?