

Incidence and Outcomes of Permanent Pacemaker Placement after Aortic Valve Replacement

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Introduction

- Aortic valve replacement (AVR) is associated with conduction abnormalities
- Conduction abnormalities may require placement of a permanent pacemaker (PPM)

We sought to investigate the incidence of PPM placement after isolated AVR



Methods

- Retrospective utilization of the State Inpatient Database, Healthcare Utilization Project, AHRQ
- Contains records of patients discharged from non-federal, non-psychiatric community hospitals
- More than 100 clinical/non-clinical variables
- Isolation of aortic valve surgery
 - 2006-2011
 - New York, Florida and California
 - ICD-9 procedure and diagnosis codes
- Exclusion criteria: Additional valvular or coronary surgery



Patient Demographics and Hospital Information

	PPM		No PPM		Total Cases		P-value
Total	N	(%)	N	(%)	N	(%)	
	2727	(5.7)	44854	(94.3)	47581		
Patient Demographics							
State							0.13
California	1137	(5.9)	18208	(94.1)	19345		
Florida	746	(5.9)	11920	(94.1)	12666		
New York	844	(5.4)	14726	(94.6)	15570		
Age							<0.0001
Mean, Mean +/-5%	70.5	(70.0, 71.0)	68.4	(68.2, 68.5)			
Age by category							<0.0001
<45	126	(4.6)	3004	(6.7)	3130	(6.6)	
45-54	186	(6.8)	4188	(9.3)	4374	(9.2)	
55-64	474	(17.4)	7729	(17.2)	8203	(17.2)	
65-74	671	(24.6)	11905	(26.5)	12576	(26.4)	
>75	1270	(46.6)	18028	(40.2)	19298	(40.6)	
Gender							<0.0001
Male	1445	(53.0)	26128	(58.3)	27573	(58.0)	
Female	1281	(47.0)	18686	(41.7)	19967	(42.0)	
Devo Index, average							<0.0001
Mean, Mean +/-5%	1.7	(1.7, 1.8)	1.6	(1.5, 1.6)			
Hospitalization Information							
Length of stay							<0.0001
Mean, Mean +/-5%	14.8	(14.4, 15.2)	10.7	(10.6, 10.8)			
Disposition							<0.0001
Routine	683	(25.1)	13967	(31.1)	14650	(30.8)	
Transfer to short-term hospital	46	(1.7)	406	(0.9)	452	(1.0)	
Transfer to other/ unknown	807	(29.6)	10114	(22.6)	10921	(23.0)	
Home health care	1138	(41.7)	19204	(42.8)	20342	(42.8)	
Died	53	(1.9)	1160	(2.6)	1213	(2.6)	



Postoperative complications and procedures

	PPM		No PPM		Total Cases		P-value
	N	(%)	N	(%)	N	(%)	
Total	2727	(5.7)	44854	(94.3)	47581		
Complications							
In-hospital mortality	53	(1.9)	1160	(2.6)	1213	(2.6)	0.039
Cardiac or Pulmonary Complications	1258	(46.1)	18137	(40.4)	19395	(40.8)	<0.00001
CVA or Stroke	352	(12.9)	5023	(11.2)	5375	(11.3)	0.006
Pulmonary Embolism	138	(5.1)	2023	(4.5)	2161	(4.5)	0.180
Sepsis	160	(5.9)	1555	(3.5)	1715	(3.6)	<0.0001
Shock	153	(5.6)	1858	(4.1)	2011	(4.2)	<0.0001
Pneumonia	305	(11.2)	4054	(9.0)	4359	(9.2)	0.0002
Myocardial Infarction	207	(7.6)	3365	(7.5)	3572	(7.5)	0.865
Acute renal failure	598	(21.9)	7219	(16.1)	7817	(16.4)	<0.0001
Hemorrhage	887	(32.5)	12966	(28.9)	13853	(29.1)	<0.0001
Infection	422	(15.5)	4341	(9.7)	4763	(10.0)	<0.0001
Acute respiratory failure	1006	(36.9)	14045	(31.3)	15051	(31.6)	<0.0001
Procedures							
Postoperative blood transfusions	1443	(52.9)	21867	(48.8)	23310	(49.0)	<0.0001
Mechanical Ventilation	430	(15.8)	5483	(12.2)	5913	(12.4)	<0.0001



Discussion

- Preliminary data suggests permanent pacemakers have a lower frequency of death
- Future investigation
 - Timing of permanent pacemaker placement
 - Comorbidities and combination procedures
- Limitation
 - Variable criteria for placement across institutions
 - Data entry errors
 - Secondary data source
 - Narrow scope of study

