

# **SUPPLEMENTAL MATERIAL**

**Table S1. International Classification of Diseases, 9<sup>th</sup> revision, clinical modification (ICD9-CM)  
diagnostic and procedural codes used to identify complications.**

<b>Condition</b>	<b>ICD-9 CM diagnosis codes</b>	<b>ICD-9-CM procedure codes</b>
<b>Permanent pacemaker implantation</b>		00.50, 37.8 – 37.83
<b>Acute kidney injury</b>	584 – 584.9	
<b>Transient ischemic attack or stroke</b>	344.6 – 344.61, 431, 433.01, 433.11, 433.21, 433.31, 433.81, 433.91, 434.01, 434.11, 434.91, 435 – 435.9, 997.02	
<b>Cardiogenic shock</b>	785.51	
<b>Cardiac arrest</b>	427.5	
<b>Bleeding</b>	430, 431, 432 – 432.9	
<b>Blood transfusion</b>		99.00 – 99.09
<b>Vascular complications</b>	441.0 – 441.03, 441.1, 441.3, 441.5, 441.6, 414.1 – 414.19, 443.22, 444 – 444.9, 447.0, 868.04, 900 – 904.9, 997.7, 998.2, 999.2	39.31, 39.41, 39.49, 39.52, 39.56, 39.57, 39.59, 39.79

**Table S2. Demographics and characteristics of patients excluded from the standardized morbidity ratio (SMR) weighted analyses. TAVR patients excluded represent individuals ‘always treated’ with TAVR, and SAVR patients excluded represent individuals ‘never treated’ with TAVR.**

	<b>TAVR n=4,050</b>	<b>SAVR n=2,175</b>
<b>Year, n (%)</b>		
2012	305 (8)	805 (37)
2013	685 (17)	730 (34)
2014	1,265 (31)	425 (20)
2015*	1,795 (44)	215 (10)
<b>Age, years, median (IQR)</b>	86 (83 – 88)	81 (80 – 83)
<b>Male, n (%)</b>	2,095 (52)	1,225 (56)
<b>Race/ethnicity, n (%)</b>		
Non-Hispanic White	2,565 (90)	1,200 (89)
Non-Hispanic Black	105 (4)	15 (1)
Hispanic	80 (3)	65 (5)
Other	90 (3)	65 (5)
<b>CCI, median (IQR)</b>	2.9 (1.4 – 4.0)	0.1 (0 – 1.3)
<b>Primary insurance, n (%)</b>		
Medicare/Medicaid	3,820 (95)	280 (94)
Private	135 (3)	95 (4)
Other/self-pay	65 (2)	45 (2)
<b>Median household income<sup>†</sup>, n (%)</b>		
Low	940 (22)	280 (14)
Medium	1,170 (31)	460 (23)
High	810 (22)	620 (31)
Highest	920 (25)	620 (31)
<b>Hospital region, n (%)</b>		
Northeast	550 (14)	540 (25)
Midwest	1,430 (35)	975 (45)
South	1,365 (34)	295 (14)
West	705 (17)	365 (17)
<b>Hospital location, n (%)</b>		
Rural, non-teaching	303 (1)	30 (1)
Urban, non-teaching	385 (10)	405 (19)
Urban, teaching	3,635 (90)	1,740 (80)
<b>Hospital size<sup>‡</sup>, n (%)</b>		
Small	240 (5)	105 (5)
Medium	645 (16)	295 (14)
Large	3,165 (78)	1,775 (82)

TAVR, transcatheter aortic valve replacement; SAVR, surgical aortic valve replacement; IQR, interquartile range; CCI, Charlson Comorbidity index

\*Only includes patients admitted between January 1, 2015 and September 30, 2015

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<sup>†</sup>Median household income for each patient's ZIP code was characterized into quartiles within each ZIP code

<sup>‡</sup>Hospital size is based on the number of hospital beds; cut points were chosen for each region and location combination so that approximately  $\frac{1}{3}$  of hospitals would appear in each category

**Table S3. Demographics and characteristics of patients included in the standardized morbidity ratio (SMR) weighted analyses.**

	TAVR		SAVR	
	Unweighted n=15,095	Unweighted n=7,640	SMR Weighted* n=15,303	
<b>Year, n (%)</b>				
2012	1,965 (13)	1,620 (21)	2,335 (15)	
2013	3,585 (24)	2,270 (30)	3,759 (25)	
2014	4,870 (32)	2,095 (27)	4,955 (32)	
2015 <sup>†</sup>	4,675 (31)	1,655 (22)	4,253 (28)	
<b>Age, years, median (IQR)</b>	84 (82 – 86)	82 (81 – 85)	84 (82 – 86)	
<b>Male, n (%)</b>	8,025 (53)	4,195 (55)	8,085 (53)	
<b>Race/ethnicity, n (%)</b>				
Non-Hispanic White	13,555 (90)	6,775 (89)	13,852 (91)	
Non-Hispanic Black	415 (3)	200 (3)	274 (2)	
Hispanic	540 (4)	330 (4)	536 (4)	
Other	585 (4)	335 (4)	641 (4)	
<b>CCI, median (IQR)</b>	1.8 (0.7 – 2.9)	0.9 (0.1 – 2.0)	1.9 (0.8 – 3.0)	
<b>Primary insurance, n (%)</b>				
Medicare/Medicaid	14,290 (95)	7,210 (94)	14,458 (94)	
Private	620 (4)	335 (4)	663 (4)	
Other/self-pay	185 (1)	95 (1)	182 (1)	
<b>Median household income<sup>‡</sup>, n (%)</b>				
Low	3,045 (20)	1,415 (19)	3,253 (21)	
Medium	3,595 (24)	1,700 (22)	3,919 (26)	
High	4,010 (27)	2,045 (27)	3,921 (26)	
Highest	4,445 (29)	2,480 (32)	4,210 (28)	
<b>Hospital region, n (%)</b>				
Northeast	4,070 (27)	2,290 (30)	3,864 (25)	
Midwest	3,125 (21)	1,595 (21)	2,892 (19)	
South	4,925 (33)	2,195 (29)	5,382 (35)	
West	2,975 (20)	1,560 (20)	3,164 (21)	
<b>Hospital location, n (%)</b>				
Rural, non-teaching	130 (1)	90 (1)	177 (1)	
Urban, non-teaching	1,545 (10)	865 (11)	1,369 (9)	
Urban, teaching	13,420 (89)	6,685 (88)	13,757 (90)	
<b>Hospital size<sup>§</sup>, n (%)</b>				
Small	785 (5)	370 (5)	784 (5)	
Medium	2,875 (19)	1,370 (18)	2,688 (18)	
Large	11,435 (76)	5,900 (77)	11,831 (77)	

TAVR, transcatheter aortic valve replacement; SAVR, surgical aortic valve replacement; IQR, interquartile range; CCI, Charlson comorbidity index

\*Standardized morbidity ratio (SMR) weighted, using admit year, sex, age, race/ethnicity, the individual components for the Charlson comorbidity index (CCI), primary insurance type, income,

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hospital region, hospital type, and hospital size; both age and CCI were modeled as restricted cubic splines

<sup>†</sup>Only includes patients admitted between January 1, 2015 and September 30, 2015

<sup>‡</sup>Median household income for each patient's ZIP code was characterized into quartiles within each ZIP code, per year

<sup>§</sup>Hospital size is based on the number of hospital beds; cut points were chosen for each region and location combination so that approximately  $\frac{1}{3}$  of hospitals would appear in each category