

IABP and outcomes in surgical mitral regurgitation

Supplementary Table 1. ICD-10-CM codes for included diagnoses and procedures

Variable	ICD-10-CM code
Mitral Regurgitation	I34.0
Mitral Valve Repair	O2QG0ZZ, O2QG3ZZ, O2QG4ZZ, O2RG0JZ, O2RG07Z, O2RG08Z
Intra-aortic Balloon Pump	5A02210, 5A02110

Supplementary Table 2. ICD-10-CM codes for included outcomes

Variable	ICD-10-CM code
Acute Heart Failure	I5021 I5023 I5031 I5033 I5041 I5043 I50811 I50813
Acute Stroke	I639 I638 I6359 I63549 I63219 I63212 I63211 I6320 I6309 I63039 I63032 I63031 I6302 I63019 I63012 I63011 I6300
Major Bleeding	I61, I62, I69, K92, I92, I85, K22, K25, K29, K26, K27, K57, K51, K50, K62, I60, K920, K921, K922, R040, R042, R58, N920, N939, R319, T810XXA, S065X0A
VTE	I82210, I82220, I82290, I824, I8241, I8242, I8243, I8244, I8245, I8246, I8249, I824Y, I824Z, I826, I8261, I8262, I82A1, I82B1, I82C1, I8281, I82890, I8290, I82.409
Pericardial Complications	I314, I312, I970
Endotracheal Intubation	OBH17EZ, OBH18EZ
Pulmonary Embolism	I26.XX
Cardiogenic shock	R570
Sudden cardiac arrest	I46
Acute Kidney Injury	N17, N170, N171, N172, N178, N179

All codes are available at "<https://www.icd10data.com/>". Abbreviations: VTE: venous thromboembolism.

Supplementary Table 3. ICD-10-CM Codes for major baseline comorbidities

Variables	ICD-10 CM Codes
Hypertension	I10, I1150, I1151, I1152, I1158, I1159
Hyperlipidemia	E785, E7889, E7800, E781, E782, E783, E784, E784, E780, E7801, Q998, Z8639
Active Smoking	F17, F172, F1720, F17200, F17201, F17203, F17208, F17209, F1721, F17210, F17211, F17213, F17218, F17219, F1722, F17220, F17221, F17223, F17228, F17229, F1729, F17290, F17291, F17293, F17298, F17299, Z87891
Obesity	E66.0, E66.1, E66.2, E66.3, E66.8, E66.9
Pneumonia	J12.0, J12.1, J12.2, J12.3, J12.8, J12.9, J13, J14, J15, J15.0, J15.1, J15.2, J15.3, J15.4, J15.4, J15.5, J15.5, J15.6, J15.7, J15.8, J15.8 J16, J17, J18.0, J18.1, J18.2, J18.8, J18.9
Liver Disease	K70.0, K70.1, K70.2, K70.3, K70.4, K70.9, K71.0, K71.1, K71.2, K71.3, K71.4, K71.5, K71.6, K71.7, K71.8, K71.9, K72.0, K72.1, K72.9, K73.0, K73.1, K73.2, K73.8, K73.9, K74.0, K74.1, K74.2, K74.3, K74.4, K74.5, K74.6, K75.0, K75.1, K75.2, K75.3, K75.4, K75.8, K75.9, K76.0, K76.1, K76.2, K76.3, K76.4, K76.5, K76.6, K76.7, K76.8, K76.9, K77
Complicated Diabetes	E10.6, E10.7, E11.6, E11.7, E13.6, E13.7, E11.21, E11.22, E11.42, E11.51
Uncomplicated Diabetes	E11.9, E10.9, E13.9
Chronic Kidney Disease	N18.1, N18.2, N18.3, N18.30, N18.31, N18.32, N18.4, N18.5, N18.6, N18.9
Peptic Ulcer Disease	K25.3, K26.3, K27.3, K28.3
Psychosis	F20.0, F20.1, F20.2, F20.3, F20.5, F20.8, F20.9, F22, F23, F25.0, F25.1, F25.2, F25.8, F25.9, F10.5, F11.5, F12.5, F13.5, F14.5, F15.5, F16.5, F19.5, F06.0, F06.2, F06.3, F28, F29
Depression	F32.0, F32.1, F32.2, F32.3, F32.4, F32.5, F32.8, F32.9, F33.0, F33.1, F33.2, F33.3, F33.4, F33.8, F33.9

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Pulmonary Disease	J449, J444, J440, J441
Hypothyroidism	E02, E30, E31, E32, E33, E34, E35, E36, E37, E38, E39
Anemia	D501 D508 D509 D500 D510 D511 D512 D513 D518 D519 D520 D528 D529 D53 D530 D531 D532 D538 D539
Valvular Disease	I058, I059, I060, I061, I062, I069, I070, I071, I072, I078, I080, I081, I082, I083, I088, I089
Pulmonary Circulation Disorders	I2601, I2602, I2609, I2690, I2692, I2693
Renal Failure	N170, N171, N172, N178, N179, N181, N182, N183, N1830, N1831, N1832, N184, N185, N186, N189, N19, N200, N201, N202, N209, N210, N211, N218, N219, N22
Fluid and Electrolyte Disorders	E860, E861, E869, E870, E871, E872, E873, E874, E875, E876, E8770, E8771, E8779, E878
Alcohol Abuse	F1010, F1011, F10120, F10121, F10129, F10130, F10131, F10132, F10139, F1014, F10150, F10159, F10180, F10181, F10182, F10188, F1019. F1020, F1021, F10220, F101221, F10229, F10230, F10231, F10232, F10239, F1024, F10250, F10251, F10259, F1026, F1027, F10280, F10281, F10282, F10288, F1029, F10920, F10921, F10929, F10930, F10939, F1094, F10950, F10951, F10959, F1096, F1097, F10980, F10981, F10982, F10988, F1099
Drug Abuse	F1110, F1011, F1110, F1111, F1210, F1211, F1310, F1311, F140, F1411, F1510, F1511, F1610, F1611, F1810, F1811, F1910, F1911
Complicated Hypertension	I150, I151, I152, I158, I159, I270. I272, I2720, I2721, I2722, I2723, I2729, I87311, I87312, I87313, I87319, I87321, I87322, I87323, I87329, I87331, I87332, I87333, I87339, I87391, I87392, I87393, I87399

All codes are available at "<https://www.icd10data.com/>".

Supplementary Table 4. Matching variables used in multivariate logistics regression

Matching Demographic Variables

Age
Gender
Elective/non-elective
Hospital Bed Size
Hospital Type (ownership, location, teaching status)
Hospital Region
Transferred in/Not Transferred
Transferred Out Indicator
Admission Day (weekend vs. weekday)
Payer Type
APR-DRG
Cardiogenic shock
HTN
HLD
Obesity
Protein-energy malnutrition
Liver disease
Psychosis
Diabetes Mellitus
Depression
Chronic kidney disease
Smoker
Pulmonary disease

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Hypothyroidism
Anemia
Valvular Disease
Pulmonary Circulation Disorders
Renal Failure
Peptic Ulcer Disease
Pneumonia
Fluid and Electrolyte Abnormalities
Alcohol Abuse
Drug Abuse

Supplementary Table 5. Variables Used for Propensity Score Matching

Variables included in Propensity Matching

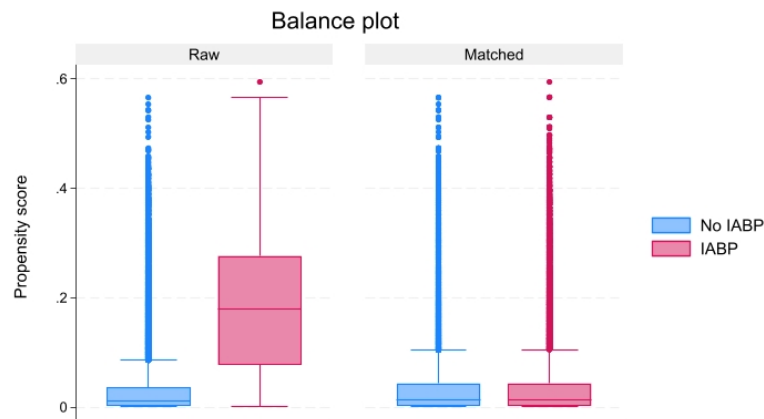
Age
Gender
Race
Rehab Transfer
Elective/non-elective admissions
Hospital Bed Size
Hospital Location & Teaching Status
Hospital Region
Weekend Admission
Payer Type
APR-DRG
Cardiogenic shock
Hypertension
Obesity
Smoking
Pulmonary diseases
Hypothyroidism
Anemia
Liver disease
Valvular diseases
Pulmonary hypertension
Diabetes
Chronic kidney disease
Peptic ulcer disease
Fluid electrolyte imbalance
Drug abuse
Alcohol use disorder
Psychosis
Depression
Hyperlipidemia

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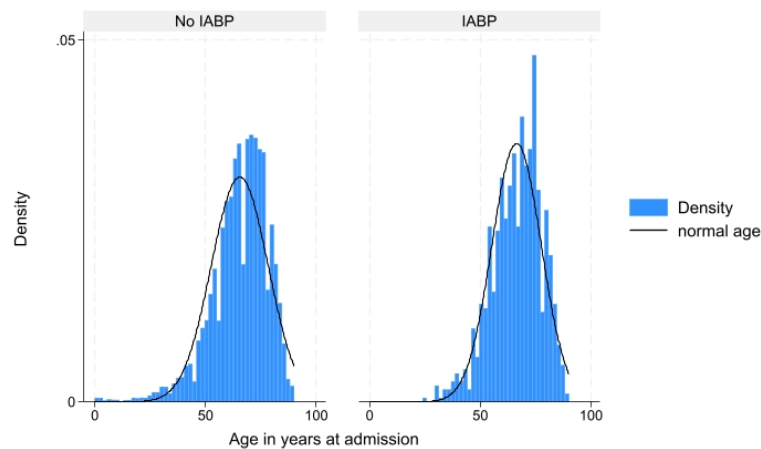
Supplementary Table 6. Propensity score-matched readmission rates

Readmission Rates on Propensity Matched Cohort			
30 day Readmissions	No IABP	IABP	<i>P</i> -value
	N = 898	N = 898	
	N (%)	N (%)	
Readmits	105 (11.7)	75 (8.3)	0.02
90 day Readmissions	No IABP	IABP	<i>P</i> -value
	N = 744	N = 744	
	N (%)	N (%)	
Readmits	174 (23.4)	161 (21.6)	0.42
180 day Readmissions	No IABP	IABP	<i>P</i> -value
	N = 487	N = 487	
	N (%)	N (%)	
Readmits	149 (30.6)	139 (28.5)	0.5

Abbreviations: MR: Mitral Regurgitation; IABP: Intra-Aortic Balloon Pump.



Supplementary Figure 1. Box plot demonstrating covariate balance after propensity matching in MR patients with and without preoperative IABP.



Supplementary Figure 2. Histogram showing distribution of study population by age in the index hospitalization.

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Supplementary Table 7. Methodological checklist for studies published using the national readmission data

Section A. Research Design

- Yes Does the study consider that it can only detect disease conditions, procedures, and diagnostic tests in hospital settings?
- Yes Does the study acknowledge that it includes encounters, not individual patients?
- Yes Does the study avoid diagnosis/procedure-specific volume assessment for units that are not a part of the sampling frame of the NRD, and, therefore not representatively sampled, including
- a) Geographic units, like U.S. states
 - b) Healthcare facilities (after 2011)
 - c) Individual healthcare providers?
-

Section B. Data Interpretation

- Yes Does the study attempt to identify disease conditions or procedures of interest using administrative codes or their combinations that have been previously validated?
- Yes Does the study limit its assessment to only in-hospital outcomes rather than those occurring after discharge?
- Yes Does the study distinguish complications from comorbidities or clearly not where it cannot?
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Section C. Data Analysis

- Yes Does the study clearly account for the survey design of the NRD and its components - clustering, stratification, and weighting?
- Yes Does the study adequately address changes in data structure over time (for trend analyses)?
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