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Preoperative Transfusion and Total Shoulder Arthroplasty Outcomes

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Disclosures

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Nothing to disclose

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Nothing to disclose
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Nothing to disclose
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Nothing to disclose
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Nothing to disclose

Background on Total Shoulder Arthroplasty

Total shoulder arthroplasty (TSA) has become more prevalent since approval of reverse TSA in 2003

Models show increase in TSA over next 20 years; 2017 study estimated 800k+ patients living with a shoulder replacement

Notable shift from inpatient to outpatient TSA may indicate strong outcomes and set positive patient expectations

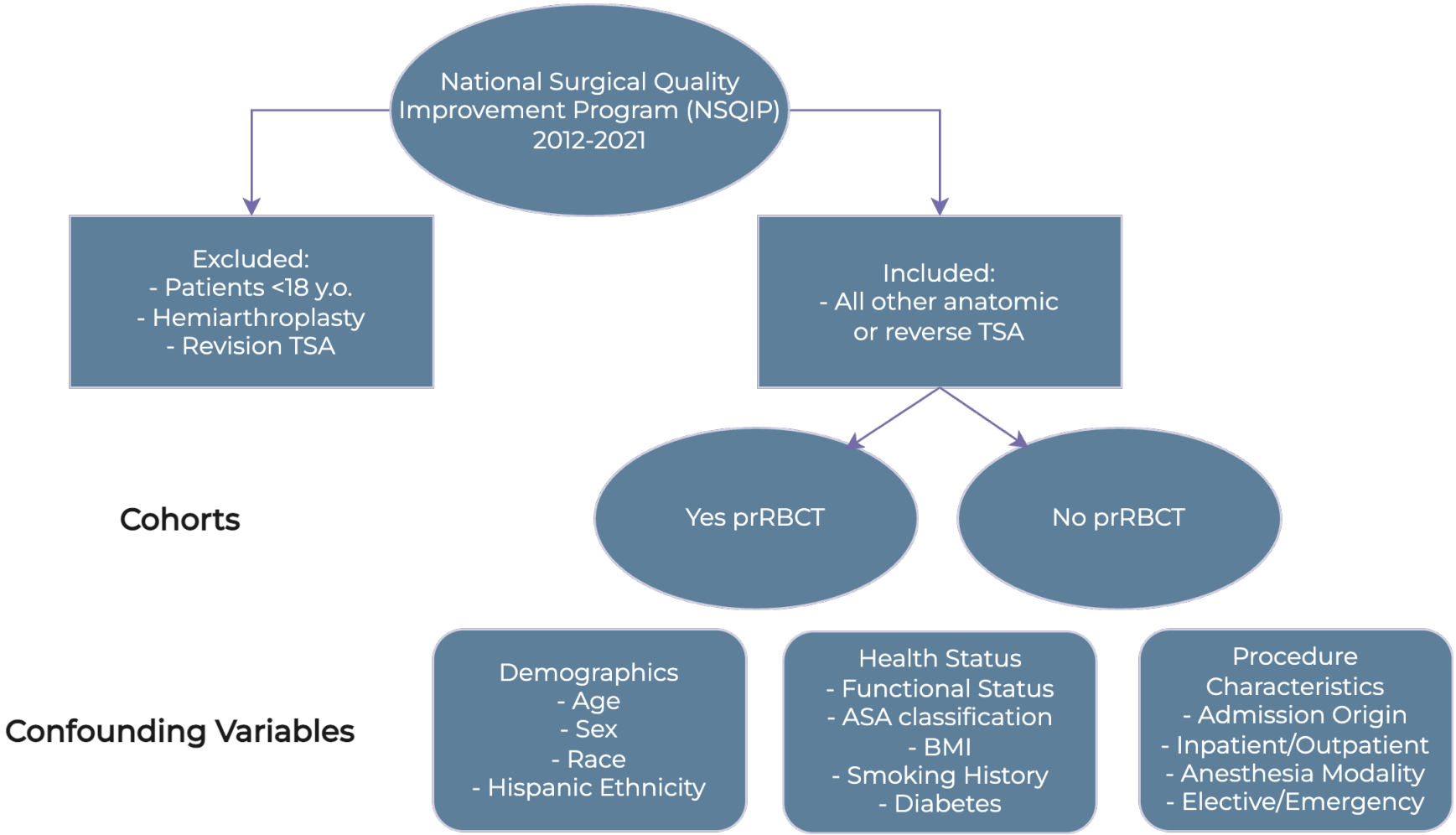
Prior studies demonstrate associations between anemia and postoperative complications for TSA patients

Preoperative blood management studies have proved beneficial for other total joint arthroplasty, including total knee

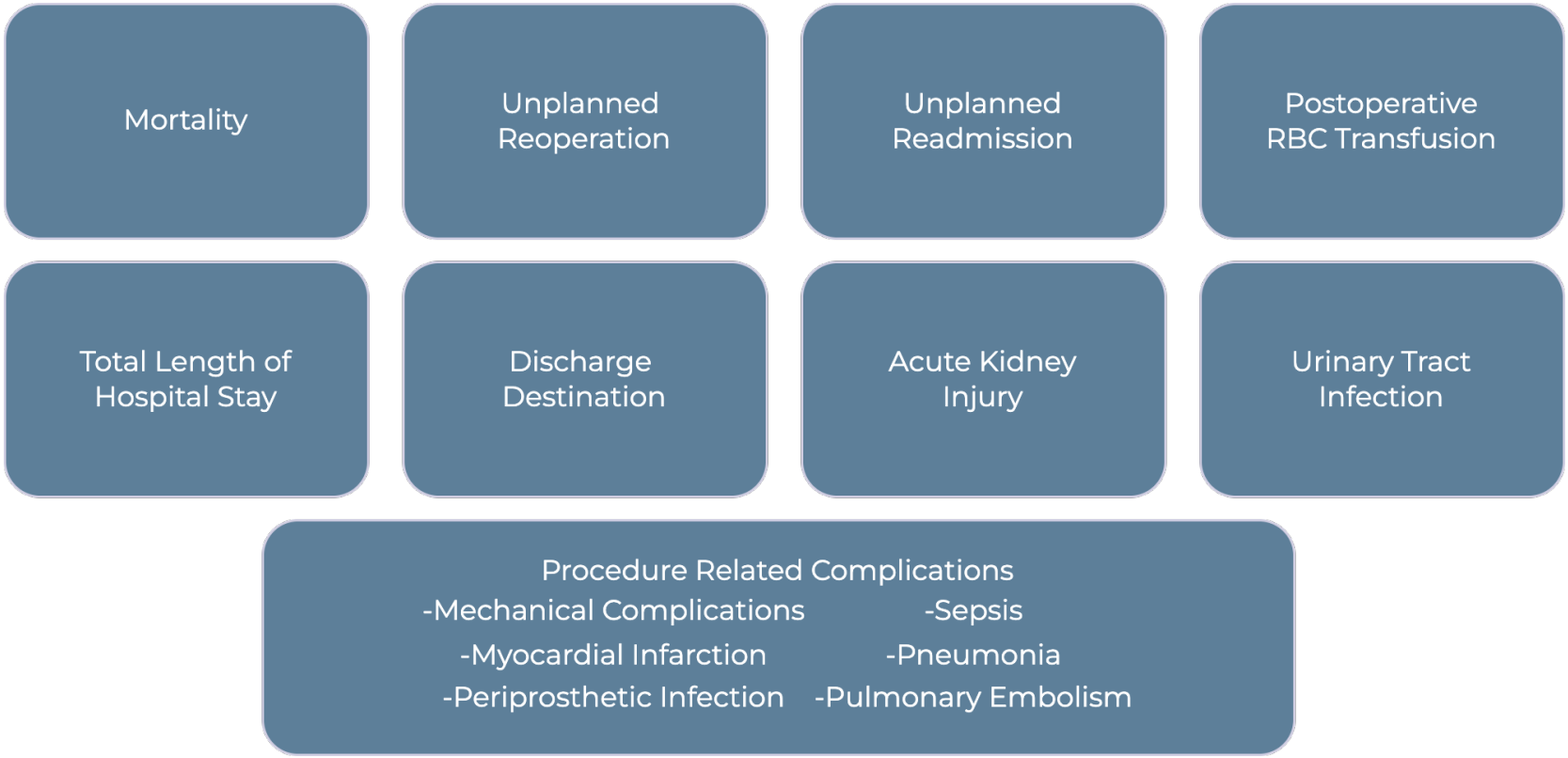
Purpose of Study

This study examines the relationship between preoperative red blood cell transfusion (prRBCT) and complication rates following TSA.

Study Cohorts



Outcomes and Analysis



- Analyses
  - Univariate: Pearson's Chi-squared, Fischer's exact test, Wilcoxon rank sum test
  - Multivariable: Logistic Regression with adjustment for confounding variables
    - Log linear regression for continuous outcomes (length of stay)

Results – Basic Demographics

Table 1: Univariate Analysis – Basic Demographics

	Preoperative Transfusion N (%) N = 87	No Preoperative Transfusion N (%) N = 38,173	*p* value
Female Sex	67 (77%)	21,229 (56%)	<0.001
Age Groups			<0.001
18-59	9 (10%)	5,303 (13.9%)	
60-69	13 (15%)	13,031 (34.1%)	
70-79	28 (32%)	14,693 (38.5%)	
80-89	27 (32%)	4,907 (12.9%)	
90+	10 (11%)	239 (0.6%)	
Race			0.236
White	68 (78%)	31,666 (83%)	
Black or African American	8 (9.2%)	1,735 (4.5%)	
Other	1 (1.1%)	577 (1.5%)	
Unknown	10 (11.5%)	4,195 (6%)	
Ethnicity			0.012
Not Hispanic	64 (74%)	31,873 (83.5%)	
Hispanic	9 (10%)	1,636 (4.3%)	
Unknown	14 (16%)	4,553 (12.2%)	

Results – Baseline Health Status

Table 2: Univariate Analysis – Baseline Health Status

	Preoperative Transfusion N (%) N = 87	No Preoperative Transfusion N (%) N = 38,173	*p* value
Functional Status			**<0.001**
Independent	75 (87%)	36,987 (97.7%)	
Dependent	11 (13%)	857 (2.3%)	
BMI			**<0.001**
Normal Weight	25 (30%)	6,093 (16%)	
Underweight	5 (6.1%)	264 (0.7%)	
Overweight	22 (27%)	12,133 (32%)	
Obese	30 (37%)	19,449 (51%)	
ASA Class			**<0.001**
<3	5 (5.8%)	16,421 (43%)	
=3	60 (70%)	20,565 (54%)	
>3	21 (24%)	1,140 (3%)	
Smoking	10 (11%)	3,881 (10%)	0.682
Diabetes			**<0.001**
No	56 (64%)	31,332 (82%)	
Oral Agents	15 (17%)	4,889 (13%)	
Insulin	16 (18%)	1,952 (5%)	

Results – Procedure Characteristics

Table 3: Univariate Analysis – Procedure Characteristics

	Preoperative Transfusion N (%) N = 87	No Preoperative Transfusion N (%) N = 38,173	*p* value
Institutional Admission Source	7 (8.8%)	297 (0.8%)	<0.001
Setting			<0.001
Inpatient	85 (98%)	31,272 (82%)	
Outpatient	2 (2%)	6,901 (18%)	
Emergency Case Designation	10 (11%)	205 (0.5%)	<0.001
General Anesthesia	83 (95%)	37,019 (97%)	0.334

Results – Outcomes

Table 4: Univariate Analysis – Outcomes

	Preoperative Transfusion N (%); Median (IQR) N = 87	No Preoperative Transfusion N (%) ; Median (IQR) N = 38,173	*p* value
Mortality	4 (4.6%)	54 (0.1%)	<0.001
Unplanned Reoperation	2 (2.3%)	509 (1.3%)	0.324
Unplanned Readmission	7 (8.0%)	1,077 (2.8%)	0.012
Postoperative Transfusion	32 (37%)	778 (2.0%)	<0.001
Total Length of Stay (Days)	6.0 (3.5-10)	1.0 (1.0-2.0)	<0.001
Institutional Discharge	49 (58%)	3,132 (8.2%)	<0.001
Acute Kidney Injury	0 (0%)	155 (0.4%)	>0.999
Urinary Tract Infection	4 (4.6%)	267 (0.7%)	0.003
Procedure Related Complications	7 (8.0%)	517 (1.4%)	<0.001

Results

Table 4: Adjusted Multivariable Regression of Preoperative Transfusion and Outcomes

	Odds Ratio	95% Confidence Interval	*p* value
Mortality	7.93	2.02-23.81	<0.001
Unplanned Reoperation	1.31	0.21-4.36	0.711
Unplanned Readmission	1.21	0.42-2.83	0.679
Postoperative Transfusion	7.50	4.20-13.05	<0.001
Total Length of Stay	2.38	2.10-2.69	<0.001
Institutional Discharge	4.47	2.55-7.94	<0.001
Urinary Tract Infection	1.65	0.26-5.67	0.498
Procedure Related Complications	2.74	1.93-6.39	0.036

Concluding Takeaways and Future Studies

Total shoulder arthroplasty patients who received preoperative transfusion, compared to those without, had **higher odds of mortality, prolonged length of stay, institutional discharge, postoperative transfusions, and procedure-related complications**

Database limitations involve lack of information on primary reasons for transfusion

Further studies might look to characterize whether prRBCT is an acceptable management strategy for anemic preceding TSA

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Thank You!

Citations

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