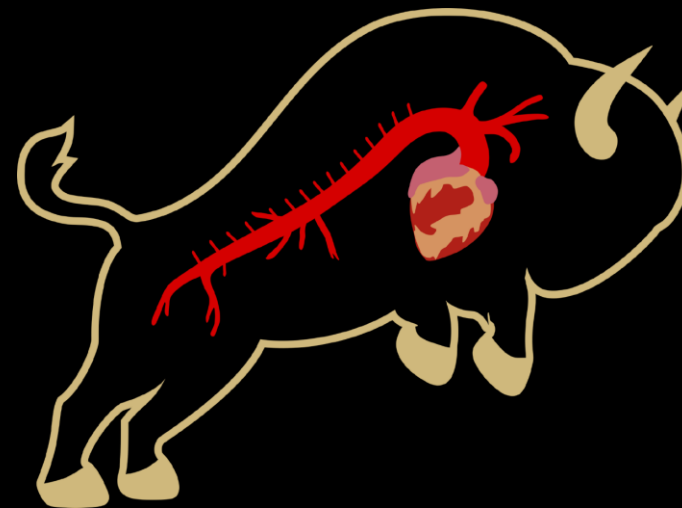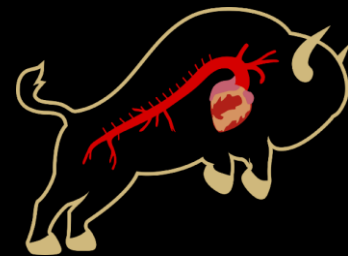# Baseline Hemoglobin as a Predictor of Outcomes Following Total Aortic Arch Replacement
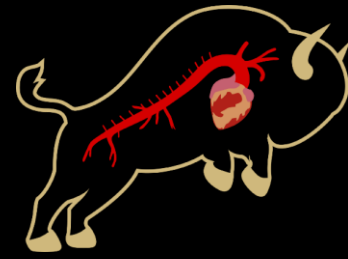
No disclosures

Introduction

- Increased availability of purpose-built aortic arch grafts

- Total arch reconstructions have increased over time

- Previous studies show anemic patients experience more complications

Aim

- To describe our institutional experience with elective total aortic arch reconstruction

- To assess the association of preoperative lab markers with morbidity and mortality
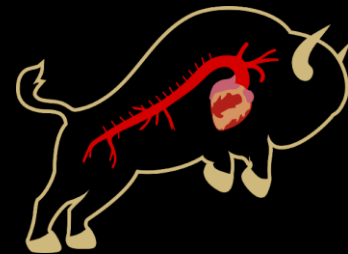
Methods

- Retrospective review of prospectively-maintained institutional aortic database from August 2009-October 2023

- Identified all patients who underwent elective aortic arch reconstruction with total arch reconstruction
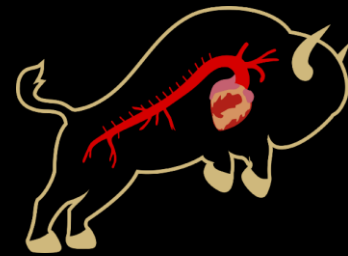
Results

- 143 patients underwent total arch

- 93 (65.0%) were male

- 66 (46.2%) had a previous aortic surgery

Table 1. Summary of Patient Demographic Characteristics and Comorbidities

	Elephant Trunk (N=99)	Non-Elephant Trunk (N=44)	Overall (N=143)	P-value
Age (Years)				
Median [IQR]	62.1 [52.1, 70.2]	58.2 [49.8, 68.5]	61.7 [51.8, 70.0]	0.466
BMI				
Median [IQR]	27.7 [24.4, 31.3]	28.0 [24.4, 31.7]	27.9 [24.3, 31.5]	0.991
Gender Male	69 (69.7%)	24 (54.5%)	93 (65.0%)	0.221
Diabetes	9 (9.1%)	3 (6.8%)	12 (8.4%)	0.959
Coronary Artery Disease	19 (19.2%)	10 (22.7%)	29 (20.3%)	0.882
Stroke	15 (15.2%)	4 (9.1%)	19 (13.3%)	0.645
Pulmonary (including OSA)	26 (26.3%)	11 (25.0%)	37 (25.9%)	1
Renal Disease	16 (16.2%)	4 (9.1%)	20 (14.0%)	0.573
Smoking	23 (23.2%)	9 (20.5%)	32 (22.4%)	0.962
History of aortic surgery	51 (51.5%)	15 (34.1%)	66 (46.2%)	0.152

Results
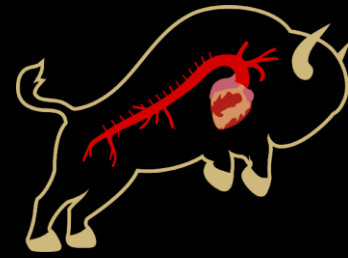
Table 2. Preoperative Lab Values

|	Elephant Trunk (N=99)	Non-Elephant Trunk (N=44)	Overall (N=143)	P-value
Baseline Hemoglobin (g/dL)				
Mean (SD)	13.0 (2.01)	13.1 (2.04)	13.0 (2.01)	0.964
Baseline Platelets (10^9/L)				
Mean (SD)	207 (61.1)	212 (61.9)	209 (61.1)	0.922
Baseline INR				
Mean (SD)	1.18 (0.283)	1.10 (0.111)	1.16 (0.247)	0.256
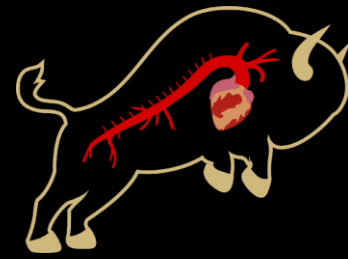
Results

- 124 (86.7%) patients received intraoperative blood products

- Platelets (n=123, 86.0%) were the most common

- 10 (7.0%) patients died during their postoperative hospitalization

Table 3. Postoperative Outcomes and Morbidities, Including Neurologic Outcomes, End-Organ Dysfunction, and Mortality

	Elephant Trunk (N=99)	Non-Elephant Trunk (N=44)	Overall (N=143)	P-value
Cardiopulmonary Bypass Time (min)				
Mean (SD)	179 (50.0)	183 (65.1)	180 (54.8)	0.934
Aortic Cross Clamp Time (min)				
Mean (SD)	85.5 (46.6)	106 (59.3)	91.8 (51.5)	0.091
Circulatory Arrest Time (min)				
Mean (SD)	23.5 (11.6)	24.0 (18.5)	23.7 (14.0)	0.986
Intraoperative Transfusion	92 (92.9%)	32 (72.7%)	124 (86.7%)	0.283
Total Length of Stay Median [IQR]	10.0 [8.00, 16.0]	8.00 [6.00, 11.8]	9.00 [7.00, 15.0]	0.103
ICU Length of Stay Median [IQR]	4.00 [3.00, 7.00]	3.00 [2.00, 4.00]	4.00 [2.41, 6.00]	0.074
Spinal Cord Ischemia	3 (3.0%)	0 (0%)	3 (2.1%)	0.746
Stroke	11 (11.1%)	2 (4.5%)	13 (9.1%)	0.502
Postoperative In-House Mortality	5 (5.1%)	5 (11.4%)	10 (7.0%)	0.376

Results
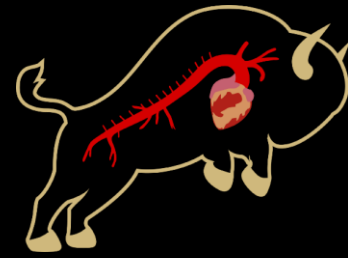
**Univariate Analysis for Independent Predictors of Postoperative Complication**

Predictor	OR	95% CI	P-Value
Age ≥ 65	3.99	1.87–9.10	**0.001****
Coronary Artery Disease	6.28	2.05–27.45	**0.012***
Pulmonary Disease	2.48	1.07–6.30	**0.042***
Preoperative Hemoglobin	0.97	0.81 – 1.16	0.733
Preoperative Platelets	0.99	0.99 – 1.00	0.070

Results
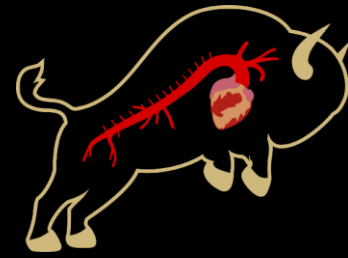
Multivariate Analysis for Independent Predictors of Postoperative Complication

Predictor	OR	95% CI	P-Value
Preoperative Platelets	1.00	0.99 – 1.00	0.412
Age ≥ 65	3.44	1.32 – 9.69	**0.014***
Gender Male	0.93	0.39 – 2.22	0.866
Diabetes	1.30	0.21 – 10.72	0.784
Coronary Artery Disease	3.65	0.99 – 17.86	0.071
Pulmonary Disease	2.26	0.79 – 7.01	0.139
Renal Disease	3.44	0.89 – 17.48	0.095
History of Aortic Surgery	2.15	0.92 – 5.24	0.084
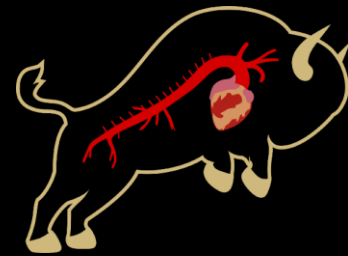
Conclusions

- Preoperative hemoglobin is not associated with intraoperative transfusion or postoperative complications.

- This suggests that potentially optimizing intraoperative oxygen delivery reverses the risk of anemia

- These data differ from published data, potentially because of our institutional practices for optimizing DO_2

Thank You!