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Transfusion Rates for Specific Spine Surgery Procedures Based on Preoperative Anemia and Patient Characteristics.

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Introduction

- Transfusions are a known risk factor for spine surgery and have been shown to be related to higher rate of complications, mortality, and prolonged length of stay.
- There remains a paucity of data regarding the rate of blood transfusion across specific spinal surgery procedures.

Methods

- CPT codes for 12 common surgical spine procedures were queried from the ACS-NISQIP databases, excluding patients who underwent simultaneous procedures.
- Preoperative lab values and demographic data were reviewed. Univariate, multivariate and Bonferroni adjusted intergroup analyses were performed.

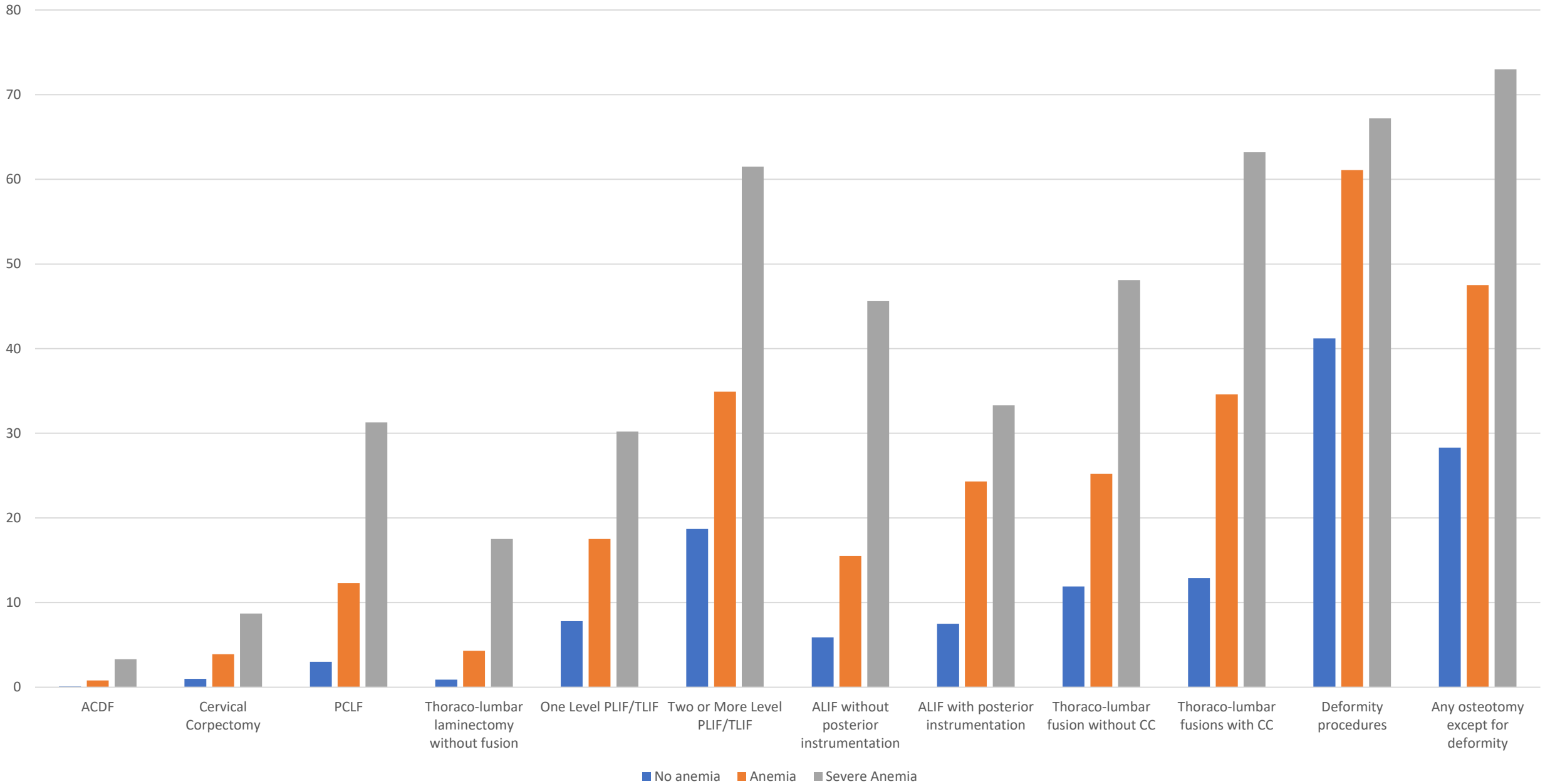
Results

- 172,753 patients were identified. The average age was 57.5, with 51.3% males. Transfusion prevalence across 12 common spine surgery procedures are reported.
- Irrespective of preoperative Hct, the three procedure groups with the highest transfusion rates were deformity (46.1%), any osteotomy except deformity (32.1%), and two or more level PLIF/TLIF (21.5%).
- The ACDF (0.2%), cervical corpectomy (1.4%), and thoracolumbar laminectomy without fusion (1.5%) had the lowest rates.
- The overall transfusion rates for these groups were 6.1%, 13.5% and 36.6% respectively. If a patient had significant anemia it portended a transfusion rate 11 times greater than in patients without anemia (OR 11.4, $p < 0.001$).

	Operative Case Data		Demographics				Preoperative Anemia (%)	
	No of Cases	Operative Time (h)	Age	Male (%)	Female (%)	BMI (kg/m ²)	Anemia (%)	Significant Anemia (%)
ACDF	34,226	2.1	54.0	48.5	51.5	30.4	12.4	0.4
Cervical Corpectomy	4,179	2.4	56.5	49.4	50.6	30.3	14.9	0.6
PCLF	5,554	3.0	60.7	56.4	43.6	29.6	23.3	1.2
Thoracolumbar laminectomy without fusion	69,626	1.7	57.5	57.4	42.6	30.4	15.3	0.5
One Level PLIF/TLIF	17,772	3.4	58.5	44.9	55.1	30.8	14.9	0.5
Two or More Level PLIF/TLIF	3,760	4.2	61.0	46.4	53.6	31.0	17.5	0.7
ALIF without posterior instrumentation	6,499	2.9	55.4	46.8	53.2	30.0	15.7	0.9
ALIF with posterior instrumentation	778	3.8	56.3	48.7	51.3	30.0	14.3	0.4
TF	24,322	3.4	61.6	45.2	54.8	30.8	19.4	0.8
TFC	1,153	3.8	59.9	47.4	52.6	30.9	18.6	1.7
Deformity procedures	2,657	5.5	56.4	35.5	64.5	28.4	24.7	2.5
Any osteotomy except for deformity	2,227	4.6	59.9	44.5	55.5	29.8	19.9	1.7

		Transfusion Rates (%)			
	No of Cases	All cases requiring transfusion	No anemia	Anemia	Significant Anemia
ACDF	34,226	0.2	0.1	0.8	3.3
Cervical Corpectomy	4,179	1.4	1.0	3.9	8.7
PCLF	5,554	5.2	3.0	12.3	31.3
Thoracolumbar laminectomy without fusion	69,626	1.5	0.9	4.3	17.5
One Level PLIF/TLIF	17,772	9.3	7.8	17.5	30.2
Two or More Level PLIF/TLIF	3,760	21.5	18.7	34.9	61.5
ALIF	6,499	7.4	5.9	15.5	45.6
ALIF with posterior instrumentation	778	9.9	7.5	24.3	33.3
Thoracic Fusion without corpectomy	24,322	14.5	11.9	25.2	48.1
Thoracic Fusion with corpectomy	1,153	16.9	12.9	34.6	63.2
Deformity procedures	2,657	46.1	41.2	61.1	67.2
Any osteotomy except for deformity	2,227	32.1	28.3	47.5	73.0

Transfusion Rate per Surgical Procedure



Discussion

- This study demonstrates the transfusion rates for common spinal fusion and thoracolumbar decompression procedures. Significant preoperative anemia, female gender, DFS, ASA classification, hypoalbuminemia, and certain procedures constitute significant risk factors for ALBT. Surgeons should assess the risks and benefits of delaying surgery to address preoperative anemia prior to performing spinal fusion and thoracolumbar decompression procedures. Taking a patients preoperative Hct levels and comorbidities to risk stratify patients may reduce the number of perioperative ALBT in spine surgery and improve outcomes.