

Background

- **Devasting complications** (~8%)¹ in pediatric spine surgery due to hardware, lack of soft tissue over bony vertebrae, proximity to central nervous system
- **Local paraspinal flaps** provide well vascularized, layered soft tissue closure & minimize dead space
- Often performed at salvage operations
- Adult studies indicate utility for **prophylactic use of paraspinal flaps at index operations** ²⁻⁵
- Only two single center studies in pediatric populations, both show promising results ^{6,7}

Purpose Robust national analysis of prophylactic paraspinal flaps in pediatric spine surgery

Methods

- Retrospective analysis of **Pediatric National Quality Improvement Program (PNSQIP)**
- Patients from **2016 to 2021** undergoing complex spine surgery
- Cohorts: **Paraspinal flaps vs no flaps**, determined by additional CPT 15734 (muscle flap)
- Outcomes: Baseline characteristics, 30-day surgical site infections (SSI), wound healing complications

χ^2 , t-test, multivariate regression model, propensity score matching

Results

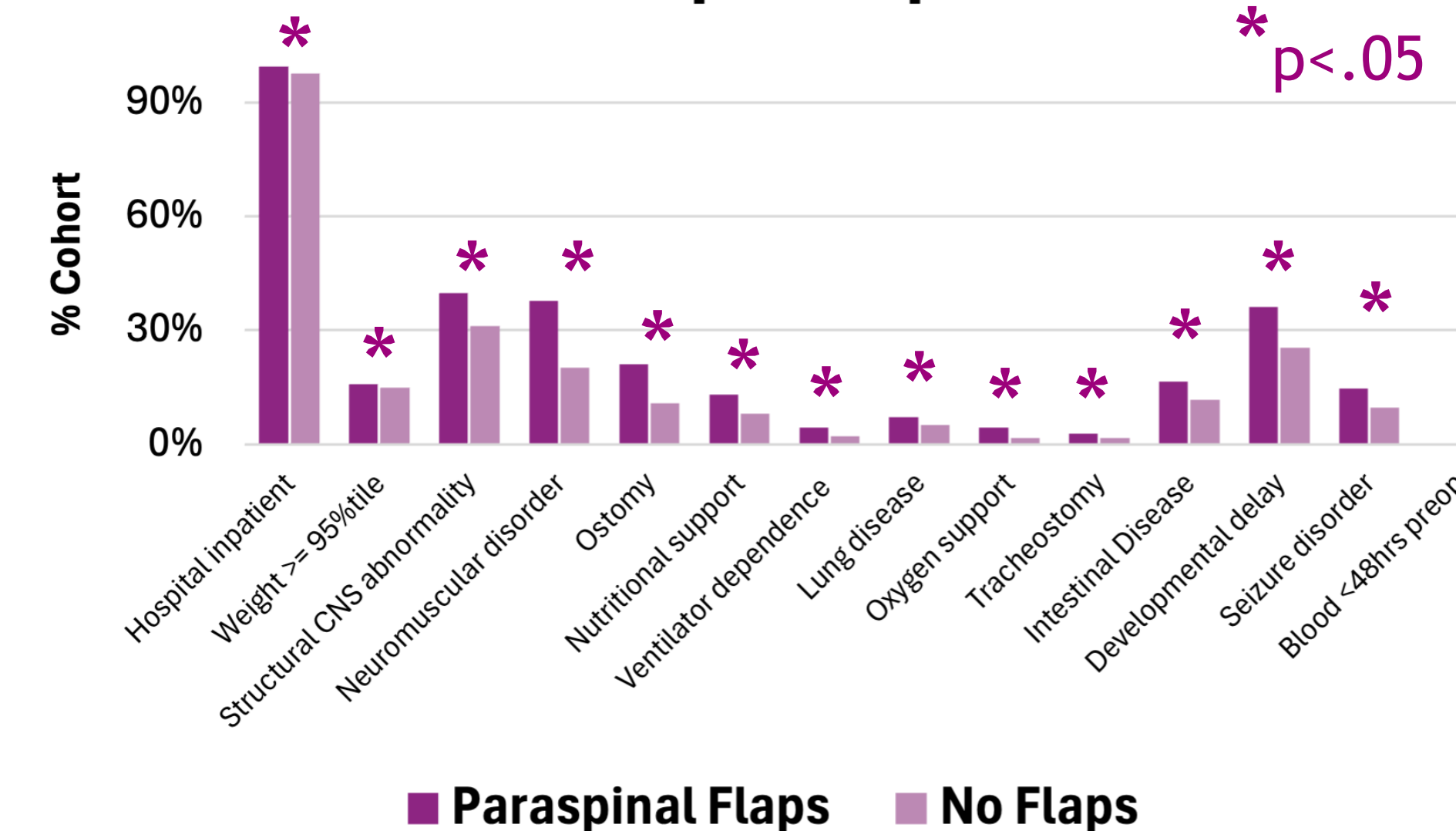
43,678 patients underwent complex spine surgery

Of these, 847 underwent paraspinal flaps (1.9%) and 42,831 had no flap (98.1%)

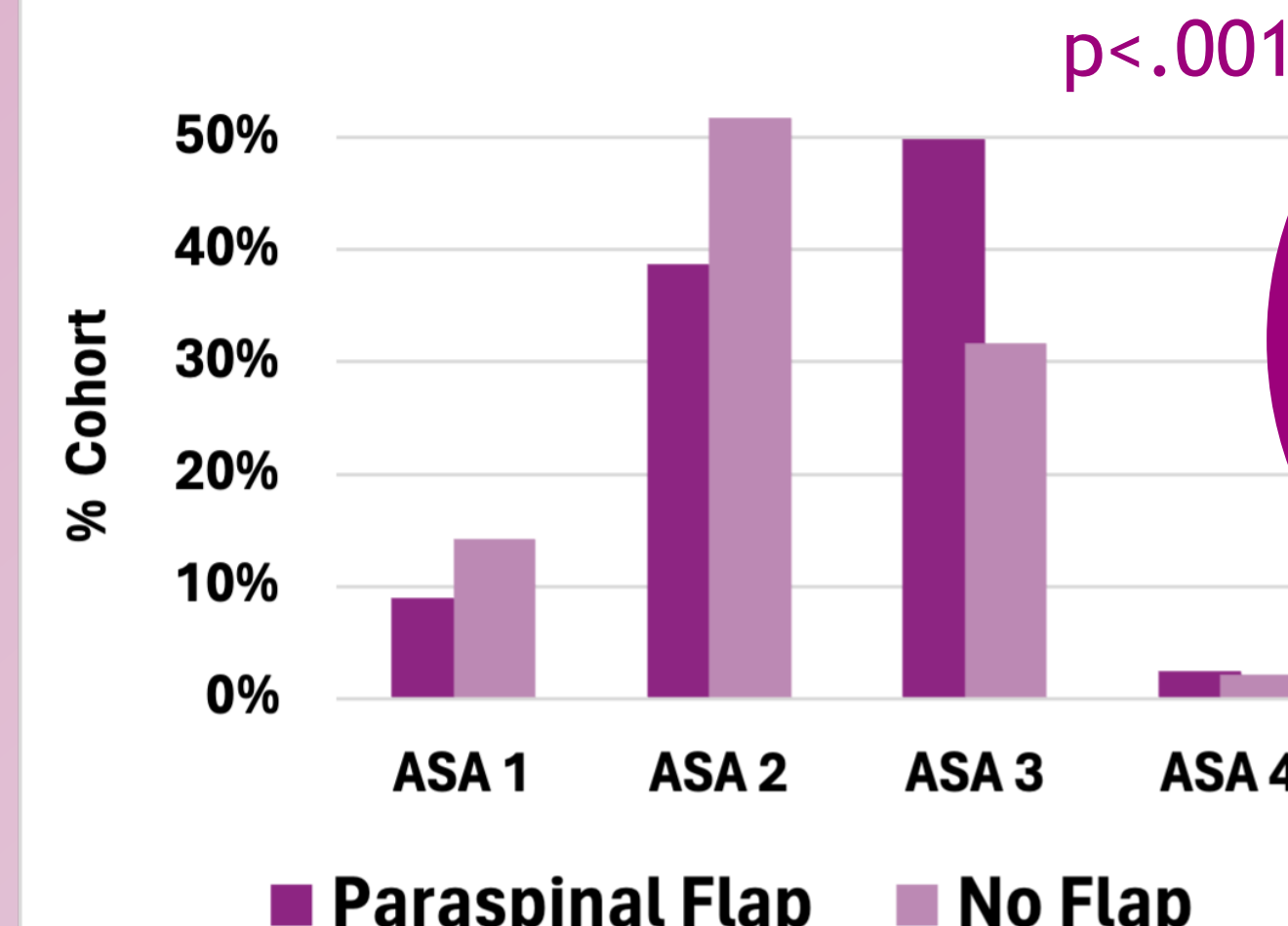
	Paraspinal Flaps	No Flaps	P
Age 6-13 years	50.1%	42.8%	<.001
13-18 years	35.1%	40.9%	
Female Sex	61.7%	63.9%	<.001
Race African American	13.7%	12.8%	<.001
White	61.9%	66.9%	
Other	10.7%	4.8%	
Unknown	14.6%	14.6%	

Baseline Characteristics

Comorbidities Significantly Higher in Flap Group



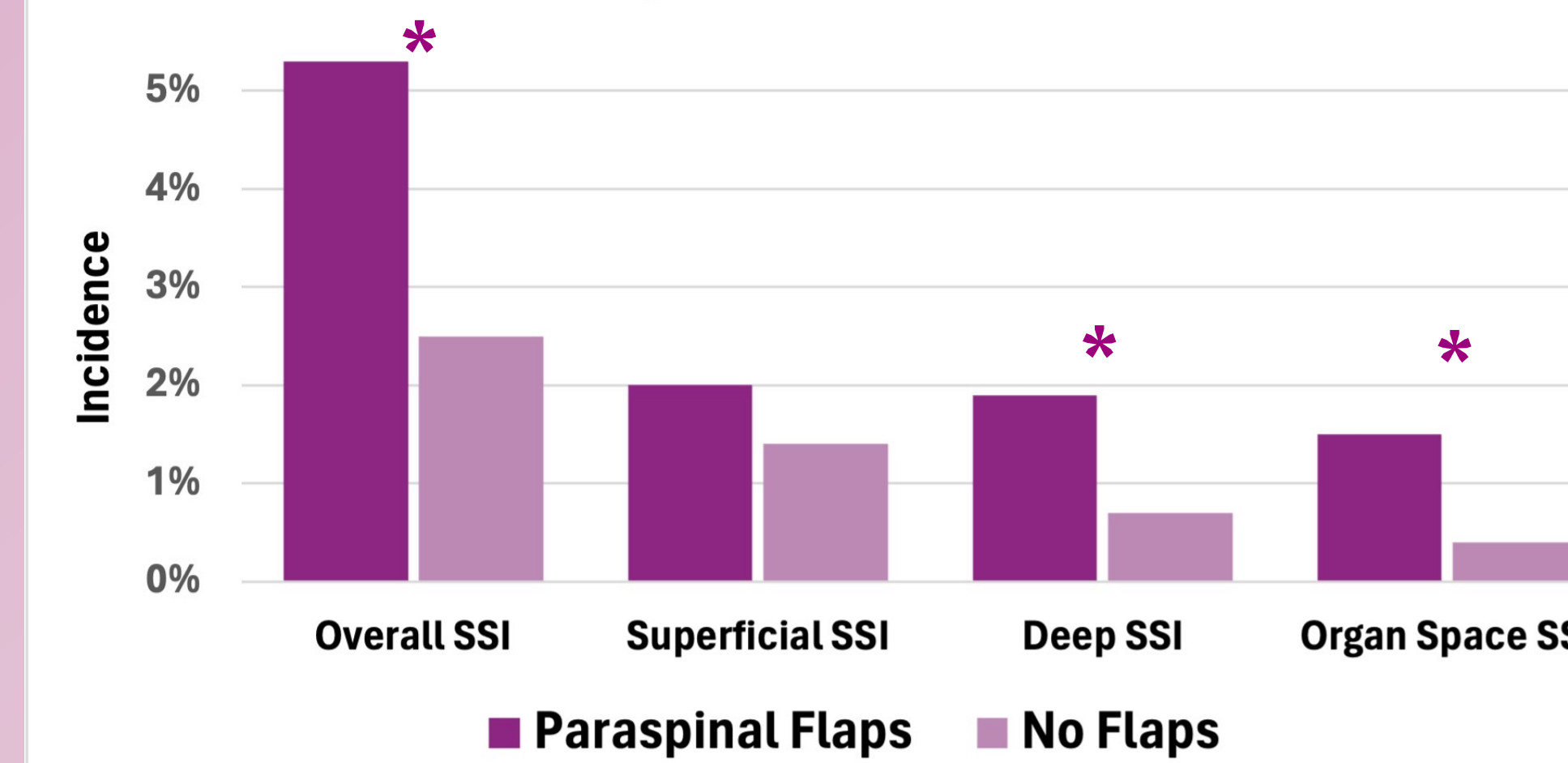
ASA Class



Flaps more common in high-risk patients
OR 2.52 in ASA 3
p<.001

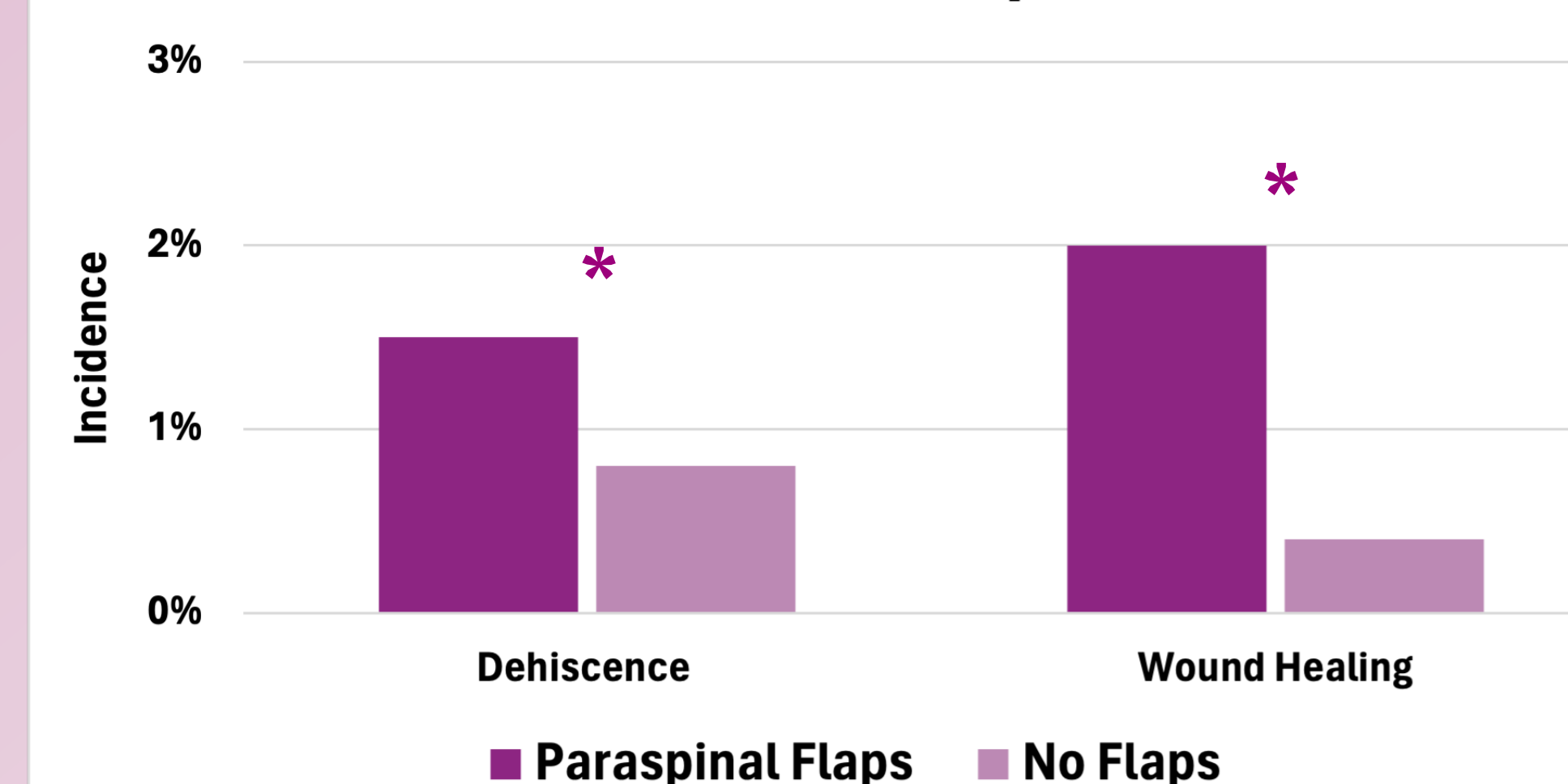
Outcomes

Rate of Surgical Site Infections (SSI)



Overall SSI	5.3%	2.5%	<.001
Superficial SSI	2%	1.4%	.176
Deep SSI	1.9%	0.7%	<.001
Organ Space SSI	1.5%	0.4%	.02

Rate of Wound Complications



Dehiscence	1.5%	0.8%	.02
Wound Healing	2%	0.4%	<.001

Propensity Score Matching

Outcome	Paraspinal Flaps	No Flaps	P
Overall SSI	5.3%	4.4%	.428
Superficial SSI	2%	2.4%	.74
Deep SSI	1.9%	0.9%	.15
Organ Space SSI	1.5%	1.1%	.52
Dehiscence	1.5%	1.5%	1

Loss of significance when baseline variables controlled

Conclusions

- Patient selection favoring complex patients
- As such, flap patients had more complications, **supporting the decision to perform prophylactic flaps**
- No significant outcomes when baseline characteristics were controlled, **supporting safe use**

Complex patients may be suitable candidates for prophylactic flaps as surgeons anticipate complications

References

1. Giotzbecker et al. What's the evidence? Sys lit review of risk factors and prev strategies for SSI following ped spine surgery. J Pediatr Orthop. 2013 Jul-Aug;33(5):479-87.
2. Adapa N et al. Prophylactic muscle flap reconstruction after complex spine surgery for degenerative disease. J Spine Surg. 2018 Sep;4(3):560-567. PMID: 30547119.
3. Franck P et al. Local muscle flaps minimize post-operative wound morbidity in patients with neoplastic disease of the spine. Clin Neurol Neurosurg. 2018 Aug;171:100-105.
4. Merdici AF et al. Immediate Reconstruction of Complex Spinal Wounds Is Associated with Increased Hardware Retention and Fewer Wound-related Complications: A Systematic Review and Meta-analysis. Plast Reconstr Surg Glob Open. 2019 Jan 22;7(1):e2076. PMID: 30859036.
5. Price MJ et al. Muscle Flap Closures in Spine Surgery: Predictors of Usage Patterns and Factors Associated With Postoperative Complications From the NSQIP Database. Clin Spine Surg. 2022 Feb 1;35(1):E248-E258. PMID: 34149006.
6. Ward JP et al. Wound Closure in Nonidiopathic Scoliosis: Does Closure Matter? J Pediatr Orthop. 2017 Apr/May;37(3):166-170. PMID: 26214326.
7. Imahiyerobo T et al. Plastic Multilayered Closure in Pediatric Nonidiopathic Scoliosis Is Associated With a Lower Than Expected Incidence of Wound Complications and Surgical Site Infections. Spine Deform. 2018 Jul-Aug;6(4):454-459. PMID: 29886919.