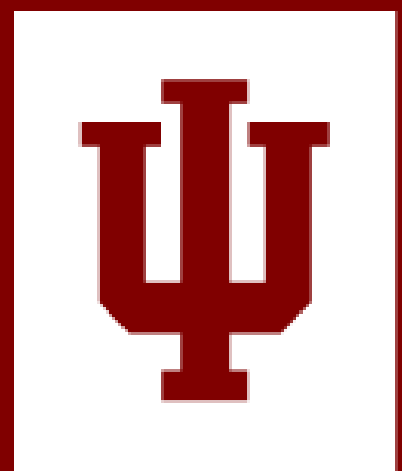




## BACKGROUND

- Posterior spinal fusion cases are increasing in the U.S. (+62% from 2004 – 2015)
- Postoperative wound infections occur in almost 20% of cases
- Aging population → increased comorbidities → increased complication risk → morbidity, reoperations, prolonged hospitalizations
- Prophylactic paraspinal muscle flaps may reduce postoperative complications in high-risk patients, **yet definition of ‘high-risk’ is not well defined**
- The Modified Frailty Index-5 (mFI-5) is a validated frailty index used to quantify surgical risk, but its role in guiding prophylactic muscle flap use in spine surgery is unclear

## METHODS

- **Data source:** ACS NSQIP (2005–2020)
- **Population:** Patients ≥50 years undergoing primary posterior spinal surgery who are frail (**mFI-5 ≥ 2**)
- **Groups:** Standard closure vs. prophylactic muscle flap
  - 4:1 propensity matching
- **Excluded:** prior spinal surgery, concurrent non-spine procedures
- **Outcomes:** 30-day postoperative complications
- **Statistics:**
  - Chi-square / Fisher’s exact tests
  - Multivariate logistic regression
  - Significance:  $p < 0.05$

## RESULTS

- 850 patients (170 flap vs 680 no flap)
- No significant differences in: Age, sex, BMI, smoking status, comorbidities
- **Univariate outcomes:**
  - ↓ Superficial surgical site infection with flap closure [0.6% vs 3.4%,  $p = 0.049$ ]
  - ↑ Transfusion with flap closure [35.3% vs 5.1%,  $p < 0.0001$ ]
  - No differences in: deep/organ space infection, wound dehiscence, reoperation, medical complications
- **Multivariate outcomes:**
  - Flap closure → ↓ odds of superficial surgical site infection [OR 0.06 (94% reduction),  $p = 0.022$ ]
  - BMI → ↑ infection risk [OR 1.09 per unit,  $p = 0.003$ ]
  - Remaining outcomes, including transfusion need, not statistically significant

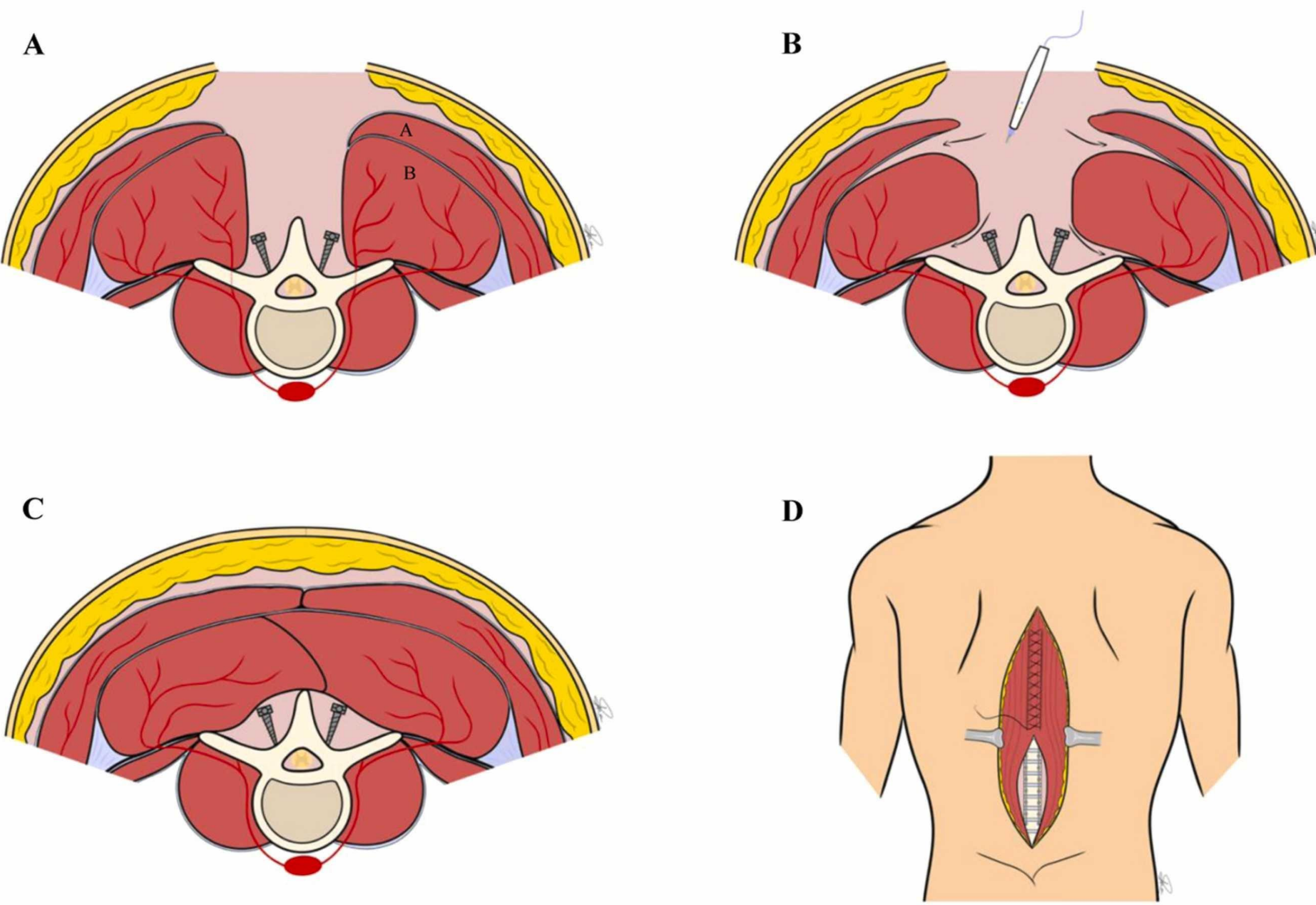
## CONCLUSIONS

### Key Findings:

- Prophylactic muscle flap coverage in high-risk (mFI-5 ≥2) patients → decrease in superficial surgical site infections (94% reduction in odds), without increase in overall complications or reoperation rates

### Takeaways:

- Supports prophylactic flap use during index spinal surgery in high-risk patients
- Provides a standardized method (mFI-5) to identify candidates
- Reduces reliance on subjective surgeon judgment



## REFERENCES

- Martin BI, Mirza SK, Spina N, et al. Trends in lumbar fusion procedure rates and associated hospital costs for degenerative spinal diseases in the United States, 2004 to 2015. *Spine (Phila Pa 1976)*. 2019;44(5):369–376.
- Maruo K, Berven SH. Outcome and treatment of postoperative spine surgical site infections: predictors of treatment success and failure. *J Orthop Sci*. 2014;19(3):398–404.
- Houten JK, Weinstein GR, Collins MJ, et al. Bilateral paraspinal muscle flap closure technique for reduction of wound complications from posterior thoracolumbar spinal fusion. *J Neurosurg Spine*. 2021;34(2):211–217.
- Wright MA, Weinstein AL, Bernstein JL, et al. Muscle flap closure following complex spine surgery: a decade of experience. *Plast Reconstr Surg*. 2020;146(5):642e–650e.
- Dalton T, Darner G, McCray E, et al. Prophylactic muscle flaps decrease wound complication rates in patients with oncologic spine disease. *Plast Reconstr Surg*. 2024;153(1):221–231.