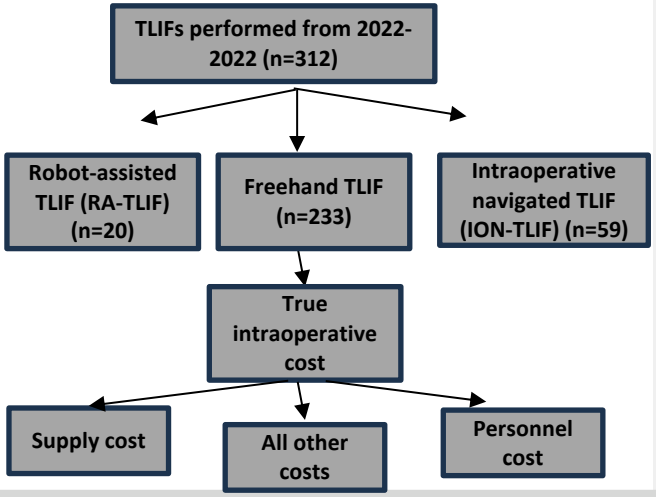
How do robot assistance and image-guided navigation impact drivers of intraoperative cost for transforaminal lumbar interbody fusion? A time-driven activity-based cost analysis

Objective

To utilize time-driven activity-based costing (TDABC) to compare the marginal intraoperative cost of three different methods of pedicle screw placement as part of transforaminal lumbar interbody fusions (TLIFs)

Study Design



Results

Type of TLIF	Total cost of surgery (mean +/-SD)
RA-TLIF (n=20)	$24,838 +/- $10,748
ION-TLIF (n=55)	$15,991 +/- $6,254
Freehand TLIF (n=233)	$14,498 +/- $6,580
Total (n=312)	$15,442 +/- $7,284

Descriptive statistics

Total cost of surgery	β-coefficient	p-value
RA-TLIF compared to ION-TLIF	$7,383 +/- $1,575	**<0.001**
ION-TLIF compared to freehand TLIF	$799 +/- $801	0.32
RA-TLIF compared to freehand TLIF	$8,182 +/- $1,523	**<0.001**

Multivariable regression analysis

Conclusions

- TDABC is a feasible, automated costing methodology to identify the true intraoperative costs associated with specific neurosurgical procedures
- RA-TLIF is more expensive than ION-TLIF and freehand TLIF. This cost difference is primarily driven by supply cost.
- When accounting for confounders, the use of navigation does not add extra intraoperative cost compared to freehand TLIF

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