

Precision Medical Education in a Robotic Surgical Curriculum: Mapping Domain-Specific Improvement

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Background:

- At UT Southwestern, residents follow a proficiency-based robotic curriculum, progressing from simulation to biotissue drills before supervised OR cases.
- Technical performance is assessed using OSATS (Objective Structured Assessment of Technical Skills). Total OSATS scores may hide important strengths and gaps.
- Proficiency requires OSATS ≥ 28 and meeting drill-specific time cutoffs on two consecutive attempts.



Knowledge Gap:

→ Which technical domains improve during robotic training, and which remain weak despite residents achieving proficiency?

Methods

Study Design:

- **Population:** 30 residents completing the gastrojejunostomy(GJ) biotissue drill
- **Comparison:** First GJ attempt vs first GJ attempt reaching proficiency
- **Outcomes:**
 - OSATS domains
 - Time to completion

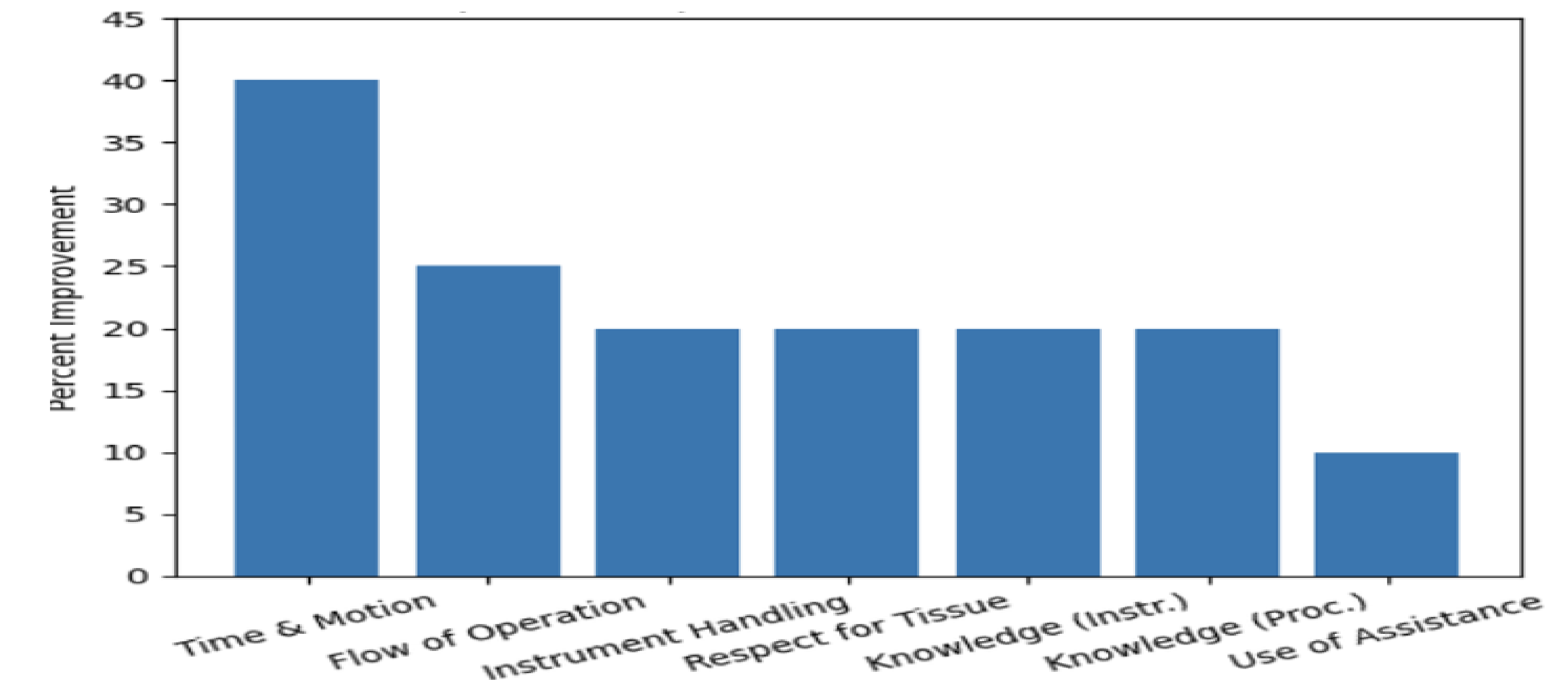
Analysis:

- Domain-level change from baseline to proficiency
- Correlating domain gains with time reduction
- Descriptive stratification by PGY level

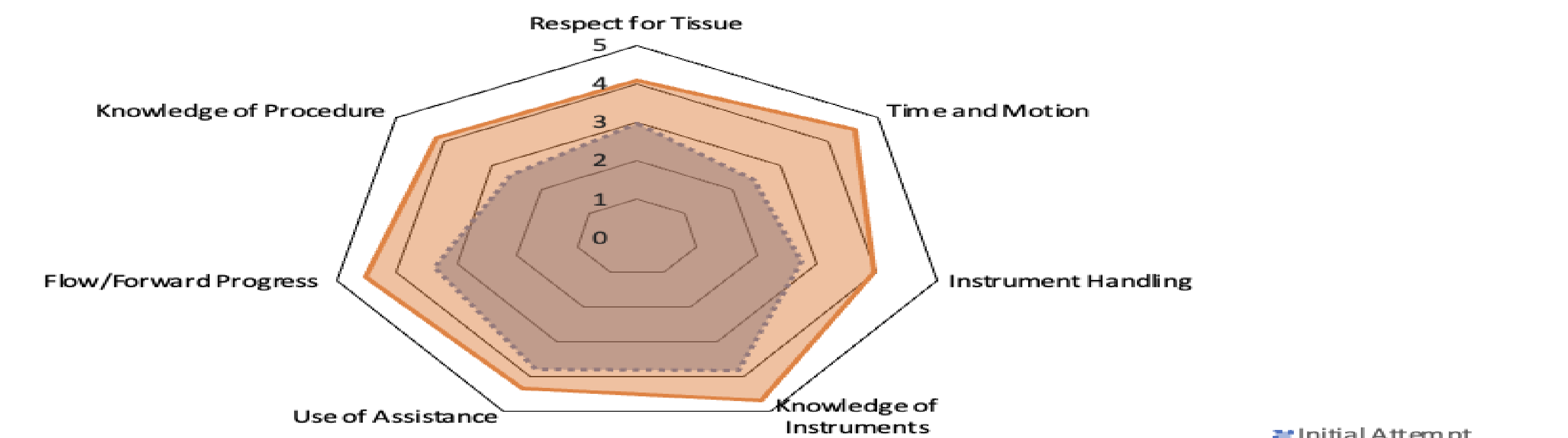
Results: N = 30 residents

PGY-2: 3 | PGY-3: 6 | PGY-4–5: 21

- Median total OSATS was **21.8/35** with a median completion time of 38.5 mins
- At proficiency, OSATS increased by **8.5 points** while completion time decreased by **12 mins** ($p < 0.001$)
- Largest gains in **Time & Motion, Flow of Operation, and Instrument Handling**
- Use of Assistance** showed the smallest improvement
- Junior residents demonstrated **greater domain-level improvement** than senior residents



A. Domain-Specific OSATS Improvement



B. Radar plot of OSATS domain scores, comparing first attempt with first proficiency attempt

Conclusion

- Robotic biotissue training produces significant domain-specific improvement in technical performance
- Time and Motion, Flow of Operation, and Instrument Handling demonstrate the largest gains
- Improvement is heterogeneous across domains
- Domain-level OSATS analysis may support precision surgical education and targeted curriculum refinement

