

Preclinical Performance of the Combined Application of Two Robotic Systems in Microsurgery – a Two-Center Study



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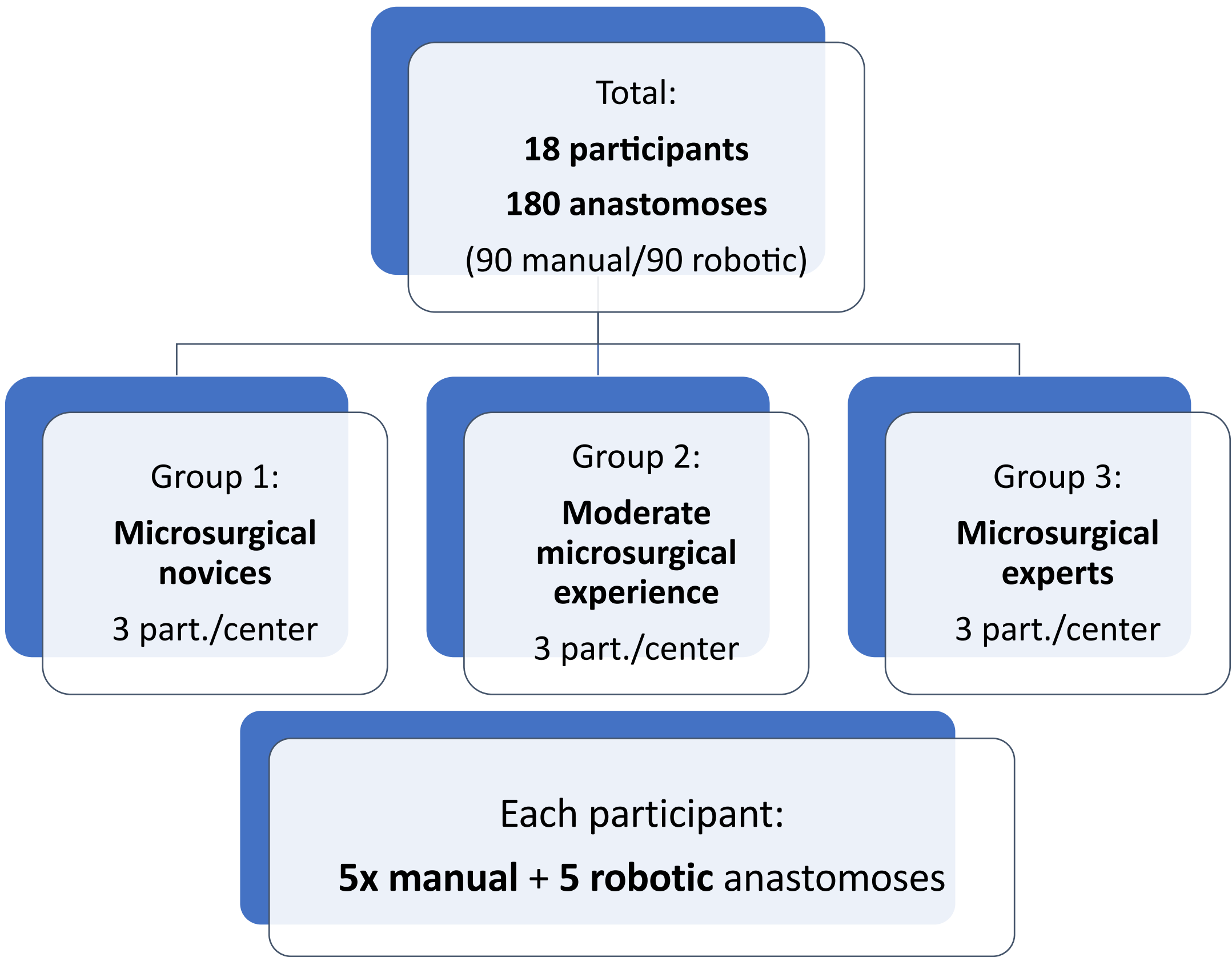
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Background

The concept of **robotic microsurgery** bears the potential to **offset manual surgical limitations** and is recently gaining increasing relevance. Training with these devices is essential to verify their potential clinical utility. This study assesses the **learning curves** of microsurgeons with different levels of experience using the **Symani Surgical System** (MMI) in combination with an exoscope (**RoboticScope**, BHS Technologies).

Material & Methods



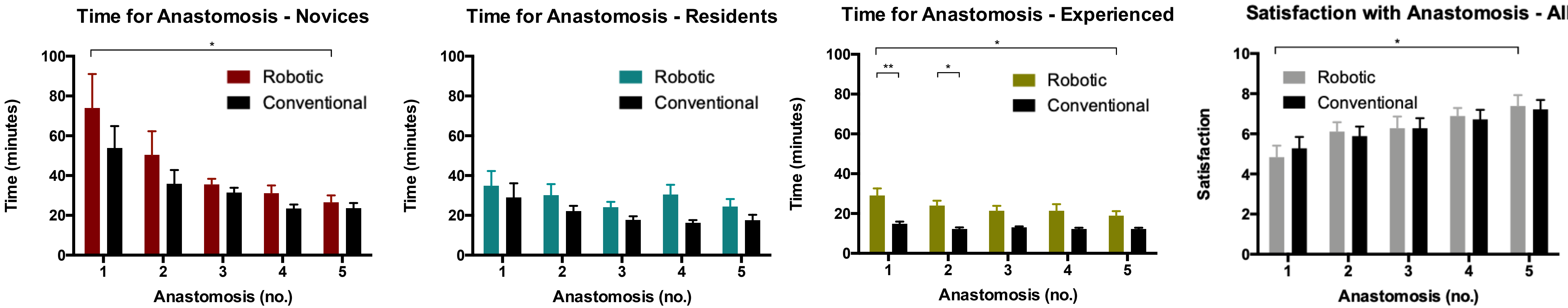
Measured outcomes:

- **Time per anastomosis** – operative flow, efficiency
- **Multidimensional Questionnaire** – Participant satisfaction, subjective ergonomics¹
- **Rapid Entire Body Assessment** (REBA)² – Objective Ergonomics
- **Structured Assessment of Microsurgery Skills** (SAMS)³ – Dexterity, Operative flow
- **Anastomosis Lapse Index**⁴ (ALI) – Anastomosis quality

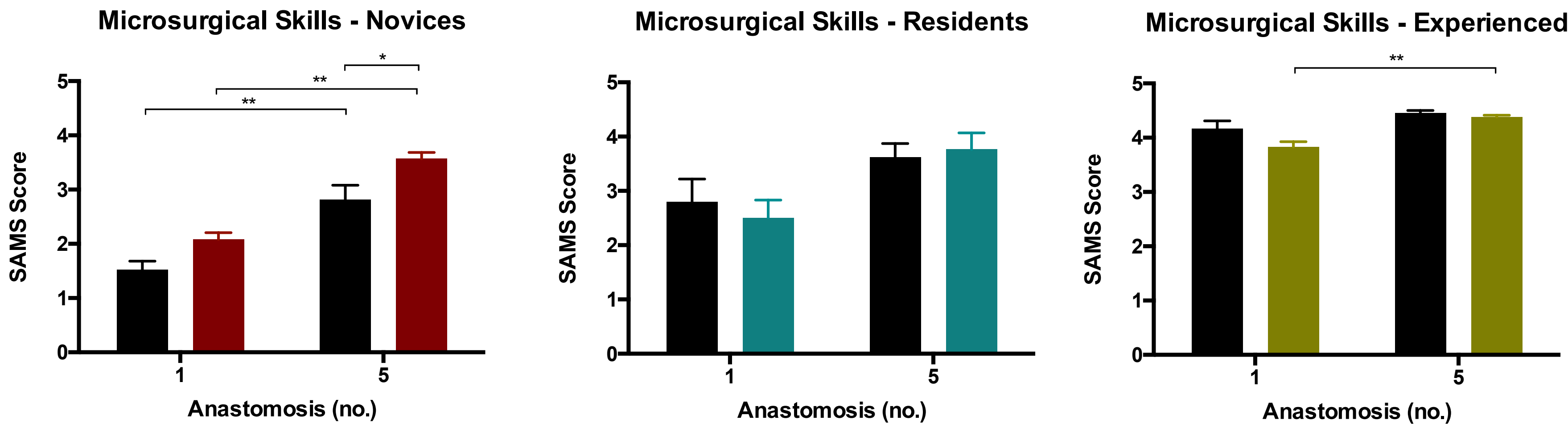
Results

Significant increase in satisfaction with robotic anastomoses in all user groups.

Reduction of robotic anastomosis time in all groups.

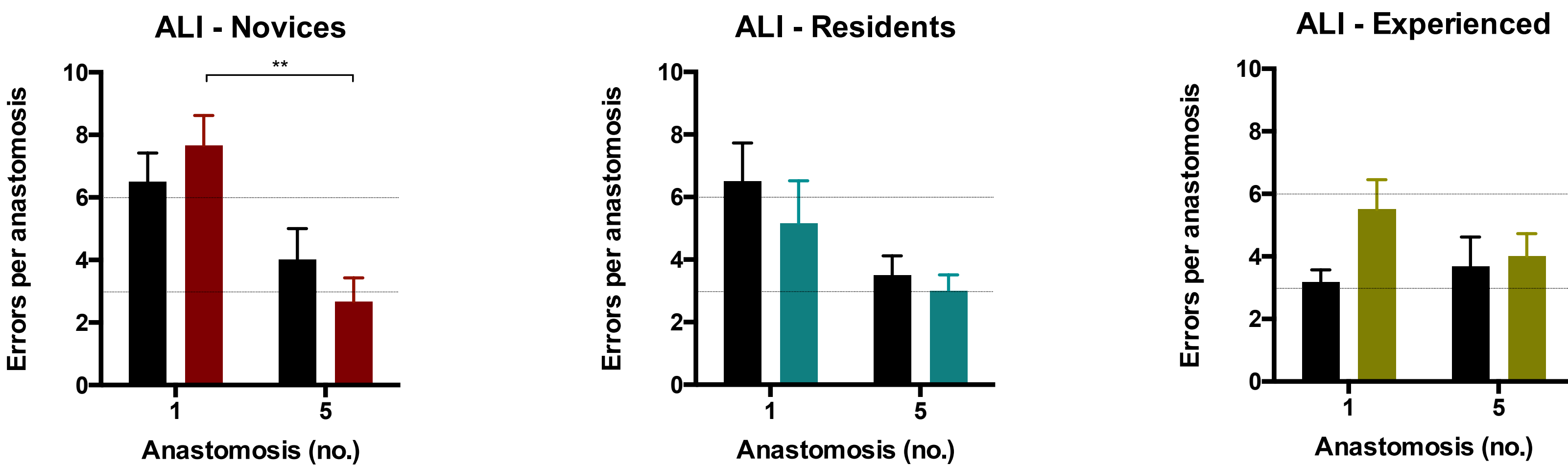


SAMS: Skill improvement in all three robotic user groups.

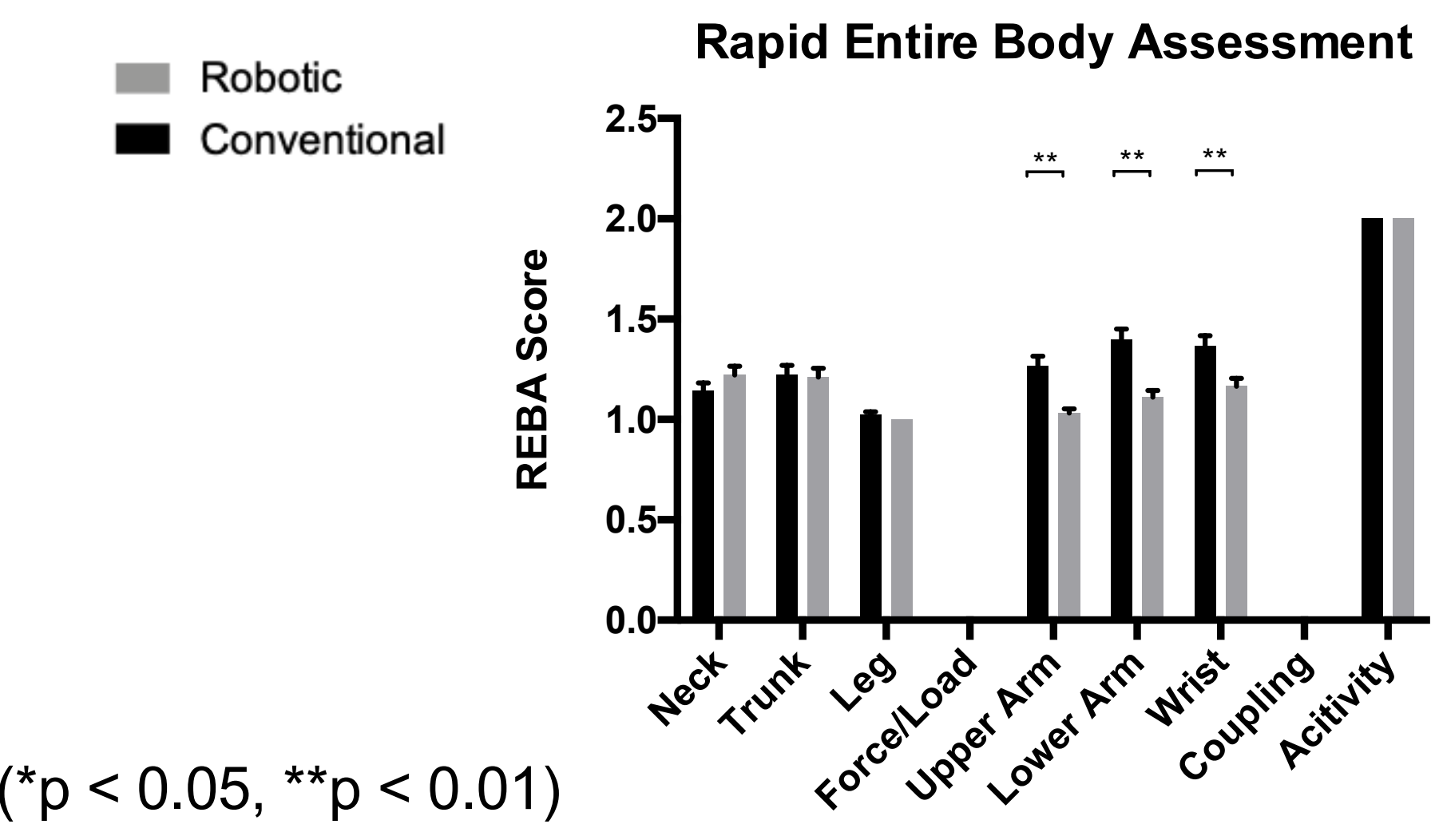
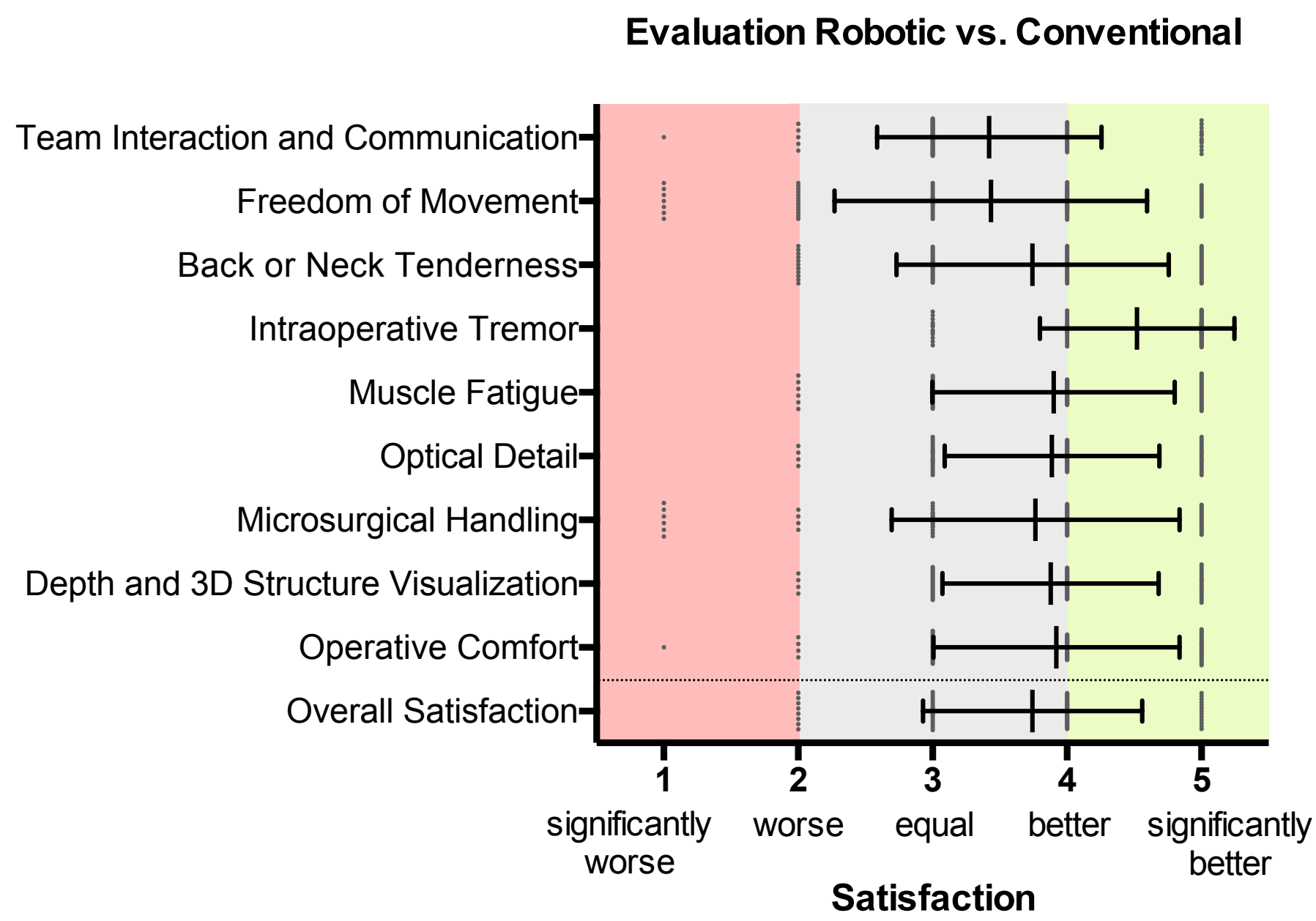


ALI: Decreased total error rate with robotic systems.

Improved anastomosis quality with robotic systems in all groups.



Improved subjective and objective ergonomics with robotic approach



(*p < 0.05, **p < 0.01)

Summary of Results

- Steep learning curve with robotic systems
- Increased precision and dexterity
- High user satisfaction
- Improved surgical ergonomics
- Longer anastomosis time

Conclusions

The concept of robotic microsurgery holds **great potential to improve precision and ergonomics** in microsurgery.

In addition, combined surgical and visual robotic systems could leverage **remote microsurgery** in the future.

References

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