

Warm-up helps surgeons improve performance

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New research published in the February issue of the *Journal of the American College of Surgeons* shows a warm-up of 15 to 20 minutes with simple surgical exercises prior to an operation leads to a substantial increase in proficiency of surgical skills in surgeons of all experience levels. The researchers found that a warm-up of both psychomotor and cognitive skills raises surgeons' alertness to a higher level for surgical procedures and improves performance for fatigued surgeons.

The advent of minimally invasive surgery has created new challenges for surgeons, requiring them to perform procedures with difficult-to-manipulate tools that constrain movement. Although new developments such as surgical robotics and more intuitive surgical instruments have addressed some of these issues, modern-day surgical practice often entails prolonged, strenuous cognitive performance as well.

"Warm-up exercises are a 'common sense' practice in many high-stakes professions, such as professional sports or dance," said Kanav Kahol, Ph.D., department of biomedical informatics, Arizona State University, Tempe. "This study begins to lay a scientific foundation for adopting this approach in routine surgical practice, which has become increasingly rigorous and demanding."

Forty-six surgeons across varying specialties and experience levels participated in the study. Subjects performed standardized exercises as a preoperative warm-up. Afterwards, the standardized exercises were repeated in randomized order to examine proficiencies in psychomotor

and cognitive skills involved in surgical procedures. Proficiencies were measured by gesture-level proficiency, hand-movement smoothness, tool-movement smoothness, time elapsed and cognitive errors. Additionally, the researchers investigated generalizability of preoperative warm-up by following it with a different task, electrocautery simulation. They also examined the effect of the warm-up on fatigued participants based on their performance before and after night call.

The results showed statistically significant improvements after all of the post warm-up exercises (p

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