

# Force analysis may help distinguish surgeon skill level

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(HealthDay)—Force-sensing bipolar forceps and force analysis may help

differentiate surgeon skill level, according to a study published online Nov. 15 in *JAMA Surgery*.

Taku Sugiyama, M.D., Ph.D., from the University of Calgary in Canada, and colleagues compared force variables among 16 neurosurgeons with different skill levels (novice, intermediate, and experienced) to evaluate whether a force-based metric can differentiate skill level. Strain gauge sensors were used to develop a force-sensing bipolar forceps. The neurosurgeons performed surgery on 26 patients with various conditions.

The researchers found that the force strengths exerted by novice [surgeons](#) were significantly higher than those of experienced surgeons. Force variability decreased from novice to intermediate to experienced surgeons, although these differences varied among surgical tasks. The rate of high force error and force variability error was inversely correlated with surgeon level of experience. The rate of low force error significantly increased among intermediate and novice surgeons versus experienced surgeons. Combined use of these error rates could accurately discriminate the groups (87.5 percent).

"Force-sensing bipolar forceps and force analysis may help distinguish surgeon skill level, which is particularly important as surgical education shifts to a competency-based paradigm," conclude the authors.

All of the study authors were involved in the development of the SmartForceps and are working toward its commercialization.

**More information:** [Abstract/Full Text \(subscription or payment may be required\)](#)

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