

SURGERY

Cognitive scores measure surgical skill

The first study to use cognitive assessment of surgeons performing robot-assisted surgery (RAS) training exercises has demonstrated the ability to discriminate between surgeons on the basis of their skills and experience. Cognitive assessment could be a useful tool in the development of competency-based training for RAS.

Modern medicine is making increasing use of RAS, and urology is certainly no exception. Training surgeons in the use of this new technology in a safe environment and with an acceptable learning curve is challenging, particularly as the benchmarks for measuring acquisition of skills in RAS have not yet been established.

The study assigned 10 surgeons in Buffalo, NY, to three groups on the basis of their experience with RAS, and according to the Dreyfus model of skill acquisition. The groups were beginner (BG; $n = 2$), competent and proficient (CPG; $n = 5$), and expert (EG; $n = 3$). The surgeons performed basic, intermediate, and advanced training tests on a *da Vinci*® Surgical System

(Intuitive Surgical, USA). Tool-based assessment metrics included time to task completion, number of times the camera was moved or the clutch used, and the number of errors, such as instrument collisions. Cognitive assessment was via an electroencephalography recording device, monitoring brain activity and reporting engagement, workload, and mental state.

Tool-based metrics could distinguish between BG and either CPG or EG when performing basic tasks, and completion time was a useful measure even for advanced tasks, but cognitive assessment provided better discrimination across all tasks. Surgical experience was inversely related to mental state, cognitive load, and high-level engagement scores, indicating that experienced surgeons had developed a degree of automatic mental processing of the robotic manipulations.

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Original article Khurshid, A. G. *et al.* Cognitive skills assessment during robot-assisted surgery: separating wheat from chaff. *BJU Int.* doi:10.1111/bju.12657