# Training in the use of basic functions of the daVinci Xi® robot: comparison study of residents' skills


# Summary

**Background**

The rapid spread of the robotic surgical system has not been accompanied by an equally rapid creation of standardized training courses for the use of this technology.

The purpose of our study was to evaluate skill acquisition in the handling and use of the Davinci Xi by comparing two groups of surgical residents.

**Methods**

Surgical residents from the University of Turin were enrolled. The participants were divided into two groups: Group A: residents who had participated in at least 8 robotic surgical procedures, and Group B: residents who had never attended robotic surgery. All were administered two instructional videos on the patient cart and console exercises to be performed. Subsequently, the residents were tested and recorded to be evaluated by a senior surgeon experienced in robotic surgery, according to a previously assessed evaluation score. The time of the procedure was also recorded for each test.

**Results**

Patient cart exercises were completed by all participants. We found statistically significant differences as regards the execution times between two groups for the first (use of the arms and endoscope aiming; p=0.0000) and third (tool replacement and gearbox eye endoscope; p=0.0002) patient cart tests and for every test on the surgeon's console except the endoscope handling exercise. Group A scored higher on the patient cart exercises, and the difference reached statistical significance (p=0.0001). We didn't found statistically significant differences as regard the total score between two groups for the console exercises. The placement of a single hand-sewn knot on the silicone suture pad was the only exercise that was not fully completed by all participants and showed no statistical difference. The correlation analysis between surgical experience and final score was significant in group A.

**Conclusions**

DaVinci Xi® robotic platform could be adequately managed in its basic functions by young surgeons after a short education program, albeit with significant differences in execution times of some excercises. Patient-side cart training seems conditioned by technical characteristics of daVinci Xi® platform. Nevertheless, surgeon console appears to be more manageable, and thus independently from previous surgical and robot specific experience, highlighting the great advancement of biomedical engineering.

Overcoming the limitations related to the absence of tactile feedback and reducing usage times are closely related to training pathways regardless of theoretical training. Further studies are needed to validate and standardize a training model that reduces learning curve times in clinical practice.