

Reverse Objective Structured Assessment of Technical Skills (Reverse-OSATS) as a means of measuring the capability of the Titan Medical SPORT Surgical System on core surgical principles

Chetna Arora, MD, William B. Burke, MD, Arnold P. Advincula, MD

Study Objective: To assess the capability of new robotic technology on core surgical principles when applied to the Titan Medical SPORT Surgical System prototype.

Design: Descriptive study.

Setting: Columbia University.

Participants: Fellowship-trained gynecologic surgeons in both Gynecology Oncology and Minimally-Invasive Gynecologic Surgery (MIGS).

Interventions: A novel approach to measuring the capability of new technology around the core surgical principals of respect for tissue (RFT), time and motion (TM), and instrument handling (IH) as defined by the validated OSATS. We reverse the focus to score the prototype functions in lieu of the surgeon in the following standardized categories: grasping, cutting, dissection, electrosurgery, and suturing. Each category scores from 1 to 5, with the latter demonstrating more capability as mirrored from the OSATS. Each surgeon scored for both themselves and each other. A MIGS fellow scored them both, thus providing six values for each category.

Measurements and Main Results: Two participants completed standardized tasks on live porcine models using the robotic prototype. Grasping overall scored at 2.83, with RFT scoring at 3.5, TM scoring at 2.67, and IH scoring at 2.33. Cutting overall and in each category scored a 3.0. Dissection overall scored at 3.0, with RFT at 3.17, TM at 2.83, and IH at 3.0. Electrosurgery scored at 3.61, with RFT scoring at 3.5, and TM and IH both scoring at 3.67. Suturing overall and in each category scored at 2.83.

Conclusion: While continued evolution of the prototype is needed, as well as validation in its ability to complete a surgical procedure, application of this new robot to successfully perform all the necessary tasks is demonstrated.

