

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

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Objective

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

Study Design

Descriptive study

Setting

Columbia University Vagelos Simulation Center

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
 Respect for tissue
 Time and motion
 Instrument handling

Respect for tissue					
	1	2	3	4	5
	Frequently uses unnecessary force on tissue or caused damage		Careful handling of tissue by occasionally cause inadvertent damage		Consistently handled tissue appropriately with minimal damage
MIGS expert					
Gyn- Onc expert					
MIGS fellow					
Time and Motion					
	1	2	3	4	5
	Many unnecessary moves		Efficient time/motion but some unnecessary moves		Clear economy of movement and maximum efficiency
MIGS expert					
Gyn- Onc expert					
MIGS fellow					
Instrument Handling					
	1	2	3	4	5
	Repeated tentative or awkward moves with instruments *by inappropriate use of instruments		Competent use of instruments, but occasionally stiff or awkward		Fluid moves with instruments, and no awkwardness
MIGS expert					
Gyn- Onc expert					
MIGS fellow					

We **reverse** the focus to score the prototype functions *in lieu of the surgeon* in the standardized categories:
1. Grasping -- 2. Cutting -- 3. Dissection -- 4. Electrosurgery -- 5. Suturing

Grasping	
Overall	2.83
Respect for tissue	3.5
Time and motion	2.67
Instrument handling	2.33
Cutting	
Overall	3.0
Respect for tissue	3.0
Time and motion	3.0
Instrument handling	3.0
Dissection	
Overall	3.0
Respect for tissue	3.17
Time and motion	2.83
Instrument handling	3.0
Electrosurgery	
Overall	3.61
Respect for tissue	3.5
Time and motion	3.67
Instrument handling	3.67
Suturing	
Overall	2.83
Respect for tissue	2.83
Time and motion	2.83
Instrument handling	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.