111 Validity of a synthetic abdominal wall model for training of laparoscopic port insertion

European Urology Supplements 2019;18(2):e2417

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Introduction & Objectives: Simulation is established as a key tool in surgical skill training. Laparoscopic port insertion is a common skill practised by many surgical specialties and can lead to intra-operative difficulties if performed sub-optimally. There is a lack of validated models for simulating this task and teaching trainees. Animal / cadaveric models are expensive and require strict infection control measures.
The purpose of this study was to assess face validity of a novel low fidelity abdominal wall simulator for training of laparoscopic port insertion at the Urology Simulation Bootcamp course (USBC).

Materials & Methods: During the USBC, trainees used a novel low-fidelity synthetic abdominal wall model of 30x30cm created by faculty members to simulate laparoscopic port placement (Figure 1). Abdominal wall was made using synthetic materials to represent layers (Table 1).

Table 1: Materials used to create synthetic abdominal wall model

Layer	Material
Skin	Vinyl sheet
Subcutaneous fat	10 mm soft foam
Anterior rectus sheath & muscle	Floor mat
Posterior rectus sheath	Masking wall tape
Peritoneum	Cello tape

The model was assessed for face validity by trainees and experts (consultant urologists) using a 5-point Likert Scale. Data was analysed using IBM SPSS Statistics V25. Intra-class correlation was calculated using a “One-way Random model”. The “Kruskall-Wallis test” was applied to assess for differences in responses in the simulation properties of the model and for its use in training. A Bonferonni correction was applied to adjust for the number of hypothesis tested.

Results: 93 trainee and 6 expert responses are shown in table 2.
For all aspects of the synthetic abdominal wall, good or very good scores ranged from 52.7–69.2%, whereas, very poor rating ranged from 0 – 4.3%.
There was no significant difference in responses for face validity of the model between trainees and experts. There was high intraclass correlation

amongst responses from trainees (0.89) and experts (0.79). Approximately 76.3% of trainees and experts felt that the model was a useful tool for training.

Table 2: Responses from Both Trainees and Experts on Simulation Characteristics of the model (n=99)

Face Validity	Scoring on a 5-point Likert Scale (%)				
	1 Very Poor	2 Poor	3 Neutral	4 Good	5 Very Good
Appearance	0	12.9	23.7	49.5	14.0
Representation of anatomy	4.3	7.4	22.3	48.9	17.0
Feel of insertion of ports	0	9.7	37.6	43.0	9.7
Realism of port simulation	2.1	10.6	28.7	48.9	9.6
Ability of the model to simulate the task	2.1	9.6	19.1	51.1	18.1

Conclusions: Our study demonstrates that this synthetic low-fidelity abdominal wall model has high face validity. The model may be explored for use in training laparoscopic port placement for both urology and general surgery trainees.