

# Two Centre Evaluation of the ANGIO Mentor Electrophysiology Simulator

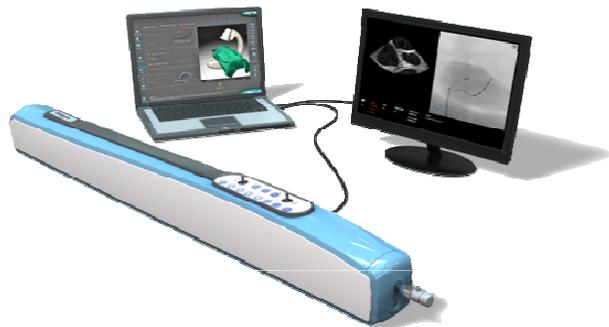
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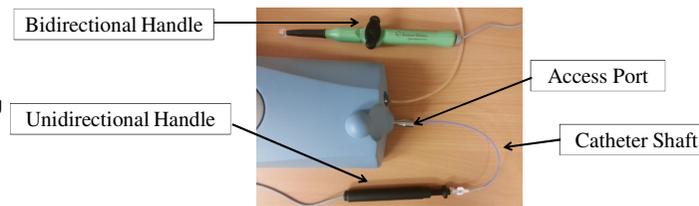
## Background

- Simulator training allows physicians to learn, practice and refine practical procedures without exposing patients to potential complications during the learning curve
- Allows for high intensity training without the restrictions of patient throughput
- Electrophysiology is a technically and intellectually complex specialty incorporating procedures with the potential for significant morbidity and mortality
- Fundamental skills in electrophysiology involve catheter manipulation within the body guided by imaging displayed on two dimensional screens
- We sought to evaluate an electrophysiological catheter manipulation simulator, the ANGIO Mentor (Symbionix, Cleveland, OH, USA)
- Our aim was to validate the simulator in terms of it's similarity to real life by correlating operator performance on the simulator with real life procedural experience.

### ANGIO mentor simulator



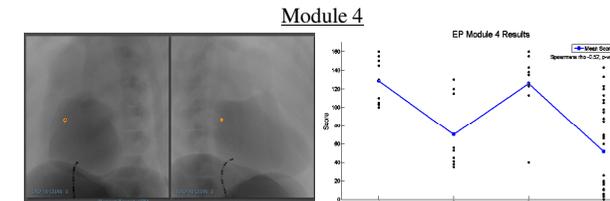
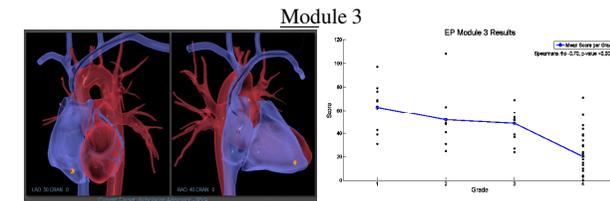
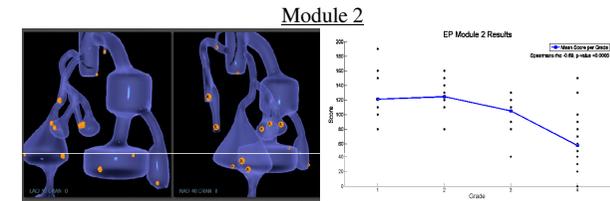
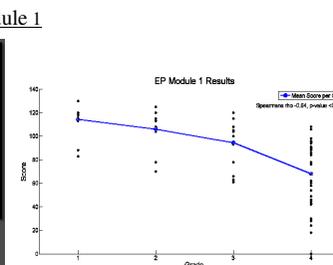
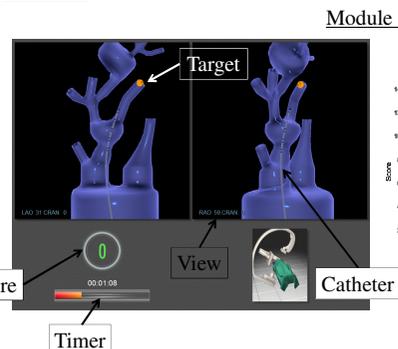
- Haptic feedback is delivered through the shaft



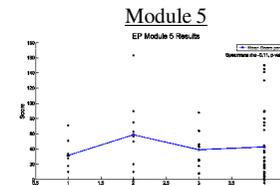
- The simulation comprises 5 basic EP modules
  - Simple 3-dimensional shape model
  - Complex 3-dimensional shape model
  - Beating 3-dimensional cardiac shell
  - 2 fluoroscopic models

- The fluoroscopic views are displayed by activating fluoroscopy pedals
- Biplane imaging is available in all the modules and was used for the evaluation
- In each module, the aim is to reach targets within the model and maintain a stable catheter tip position at those targets
- In the latter 3 modules targets are anatomical sites, such as the right ventricular apex and left inferior pulmonary vein
- Successful attainment of targets within a time limit is additive to a score for each attempt.
- Each participant completed the 5 simulator modules 3 times at the same sitting with scores recorded for each attempt.

## Results



- Performance was better with greater EP experience in all the modules other than module 5 which was not discriminatory
- In all of the modules, other than module 5, there was a significant difference between the scores between grade 4 subjects and those of the other grades ( $p < 0.05$ )
- Other than for grade 4, the scores between levels were generally not significantly different



## Methods

- 21 subjects from 9 different centres participated in the study
- Data was collected using simulators in 2 European sites.
- Participants' EP experience was graded from 1-4

EP Grade	Explanation
1	Expert >5 years
2	>2 years experience
3	1-2 years experience
4	Novice <1 year experience

- The simulator comprises a catheter handle (uni or bidirectional) and shaft fed into a port on the device, with catheter manipulation simulated on screen.

## Conclusions

- These results suggest that the simulator provides a reasonable simulation of catheter manipulation, though the modules in general and especially the fluoroscopy ones need further refinement to improve this.
- Currently at St Bartholomew's Hospital, novice EP fellows need to attain minimal grade 3 scores (equivalent to those who have completed 1 year of EP training) prior to being allowed to perform procedures on patients.
- The simulator at St Bartholomew's Hospital is open to trainees from all centers

