

Results from ERUS curriculum

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ERUS2014

The EAU Robotic Urology Section

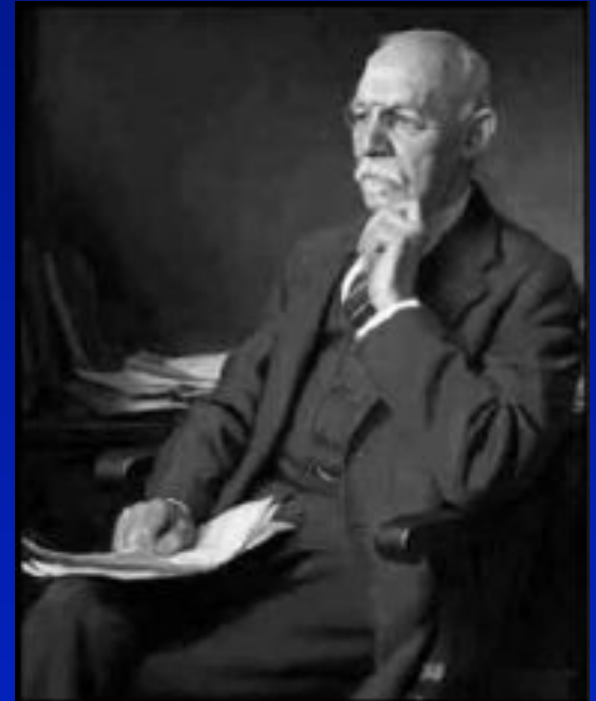
17-19 September, Amsterdam, The Netherlands



EVOLUTION OF SURGICAL TRAINING

The Halstedian concept
"see one, do one, teach one"
should evolve

The human body is not the ideal
training module



MODERN SURGICAL TRAINING

We need to develop
standardized and validated
training curricula
in minimally invasive surgery



Fundamental Skills of Robotic Surgery: A Multi-institutional Randomized Controlled Trial for Validation of a Simulation-based Curriculum

Andrew P. Stegemann, Kamran Ahmed, Johar R. Syed, Shabnam Rehman, Khurshid Ghani,

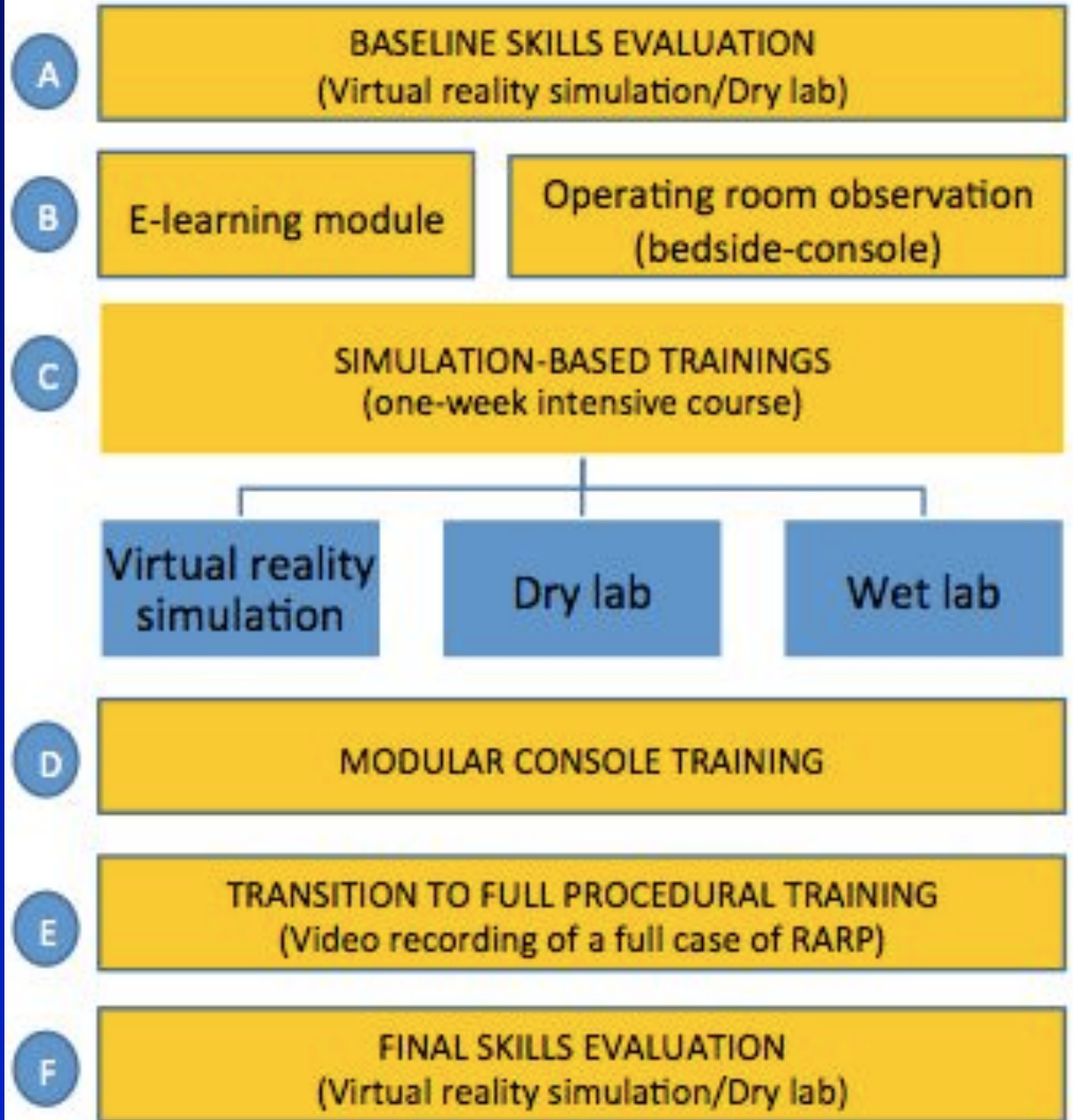
Fundamentals of robotic surgery: a course of basic robotic surgery skills based upon a 14-society consensus template of outcomes measures and curriculum development

Robotic surgery basic skills training: Evaluation of a pilot multidisciplinary simulation-based curriculum

Kirsten Foell, MD;^{} Antonio Finelli, MD, MSc, FRCSC;^{*} Kazuhiro Yasufuku, MD;[†] Marcus Q. Bernardini,*

PILOT STUDY I 2013

3 months
Jun-Aug 2013



METHODS



ROBOTIC FELLOWSHIP LEARNING CURVE 12 WEEK TIMELINE

BASELINE ASSESMENT

SIMULATOR TEST
SKILL DRILLS TEST

ORSI INTENSIVE TRAINING

THEORETICAL EXAM
SIMULATOR
SKILL DRILLS

WET & DRY LAB
CADAVER TRAINING
LIVE-SURGERY

FINAL EVALUATION

FULL RARP
THEORETICAL AND
PRACTICAL EXAM



Participating fellows / institutions

F. Audenet A. Briganti M. Brown

V. De Marco M. Gan M. Janssen R. Navarro

M. Oderda R. Sanchez Salas E. Wit



SKILLS TESTS



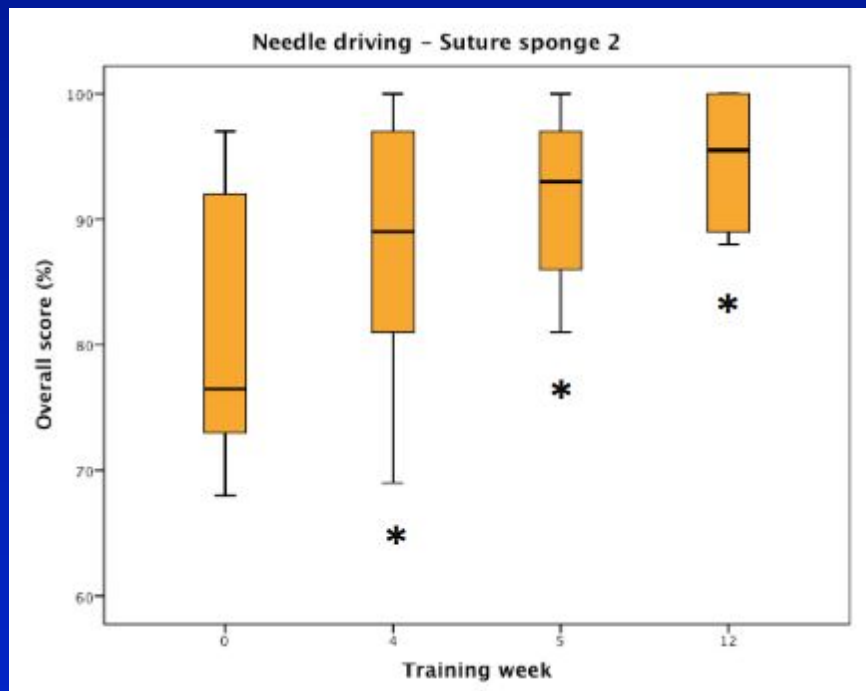
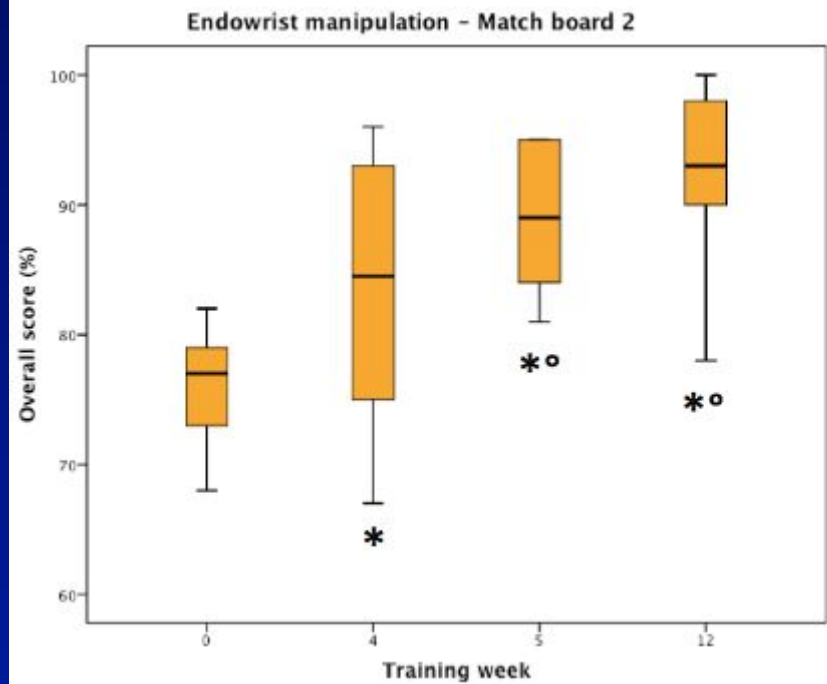
	EXERCISE	PLATFORM
1	Robotic docking	Skills drill
2	Ring rollercoaster 3 (endowrist use)	Skills drill
3	Ring rollercoaster 4 (endowrist use)	Skills drill
4	Running suture (suturing)	Skills drill
5	Ring walk 3 (camera/clutching)	Simulator
6	Match board 2 (endowrist use)	Simulator
7	Energy switch 2 (energy/dissection)	Simulator
8	Thread the rings (needle control)	Simulator
9	Suture sponge 2 (needle driving)	Simulator
10	Dots and needles 1 (needle driving)	Simulator
11	Tubes (needle driving)	Simulator
12	Interrupted suturing (suturing)	Simulator

Baseline

Week 4

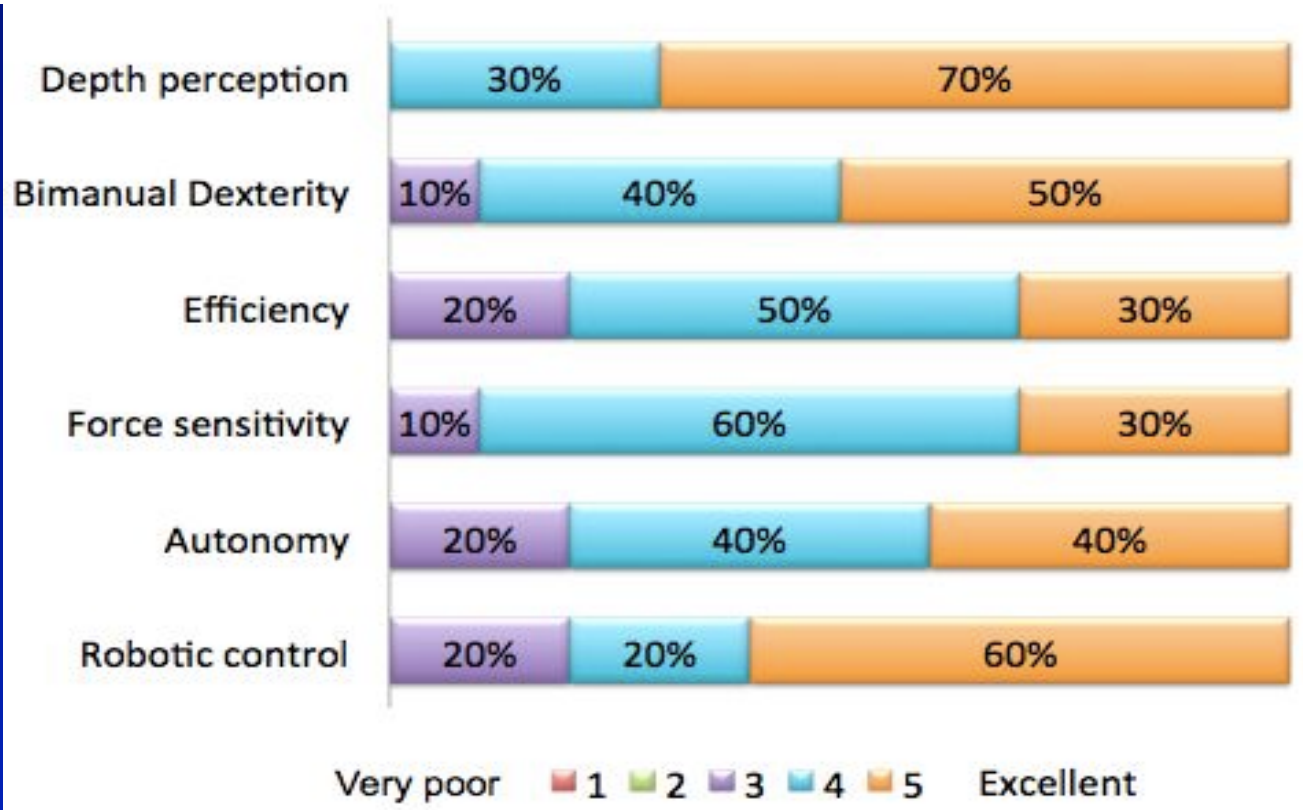
Week 5

Final



MENTOR ASSESSMENT

The Global Evaluation and Assessment of Robotic Skills (GEARS)



8/10 fellows are deemed able to perform a RARP alone

3/10 fellows are deemed able to perform a complex RARP alone

FULL RARP CASE ASSESSMENT

10/10 fellows submitted an unedited full RARP case

The videos were divided in 9 segments (surgical steps)

Each segment was assessed by 2 independent blind reviewers

	A. Bladder mobilization	
instrument use	1 dangerous 2 incompetent 3 safe 4 masterful NA	entering instruments blindly several attempts identifying anatomy no bleeding, instruments in sight
tissue handling	1 traumatic 2 laborious 3 safe 4 masterful NA	uncontrolled movements repeated attempts effective handling with some damage avoiding damage
errors	1 bleeding 2 minor bleeding 3 minimal bleeding 4 no bleeding NA	tissue avulsion, damage organs occasional bleeding, no damage minimal damage
end result	1 damage of organs 2 inadequately performed 3 sufficient 4 Masterful NA	bladder, prostate, bowel etc. urologist took over ready for the next step

FULL RARP CASE ASSESSMENT

Fellow	Bladder detachment	Endopelvic fascia incision	DVC ligation	Bladder neck incision	Dissection seminal vesicles	Dissection prostatic pedicles	Dissection NV bundles	Dissection apex	Urethro-vesical anastomosis	Mean
1	12.5	12.5	10,5	12	13,5	12,5	13	14	11	12.3
2	12	10	11	10	11	12	12	10	12.5	11,2
3	N/A	10	N/A	9.5	6	8	6.5	6	14.5	8,6
4	11	11	12	12	9.5	12	10.5	12	10	11.1
5	12	12.5	N/A	12	12.5	10	14	10.5	12	11.9
6	12	12	10	10	13.5	12	12.5	10	14	11.8
7	12	12.5	N/A	12	10	12	11	11	13.5	11.8
8	11.5	11	10.5	10.5	10	8.5	9.5	7	9.5	9,7
9	11.5	12	12	10.5	10.5	10	9.5	9	12	11.3
10	12	12.5	8.5	11	8	8	N/A	10.5	14.5	10.6

Exp 1	13	12.5	N/A	11.5	12	13.5	13	12	14.5	12.8
Exp 2	N/A	12	15	14	14	13.5	13.5	14	15.5	13.9

FULL RARP CASE ASSESSMENT

Surgical step	Total Score fellows (mean)	Total score <10 Fellows (No)	Total Score experts (mean)
Bladder detachment	11.8 (11-14)	--	13.5 (13-14)
Endopelvic fascia incision	11.6 (10-15)	--	12.5 (12-13)
Ligation dorsal vein complex	10.6 (8-12)	1	15 (14-16)
Bladder neck incision	11 (7-12)	1	12.8 (11-16)
Dissection of seminal vesicles	10.4 (7-13)	3	13 (10-16)
Dissection of prostatic pedicles	10.5 (7-15)	3	13.5 (11-16)
Dissection of neurovascular bundles	10.9 (5-16)	3	13.3 (11-16)
Dissection of apex /urethra	10 (5-14)	3	13 (8-16)
Urethro-vesical anastomosis	12.4 (9-16)	1	15 (13-16)

FELLOWS EVALUATIONS

What is your overall evaluation of this fellowship?

100%

Was this fellowship successful in improving your robotic skills?

30%

70%

Was this fellowship successful in improving your console exposure?

30%

70%

Would you recommend this fellowship to other colleagues?

10%

90%

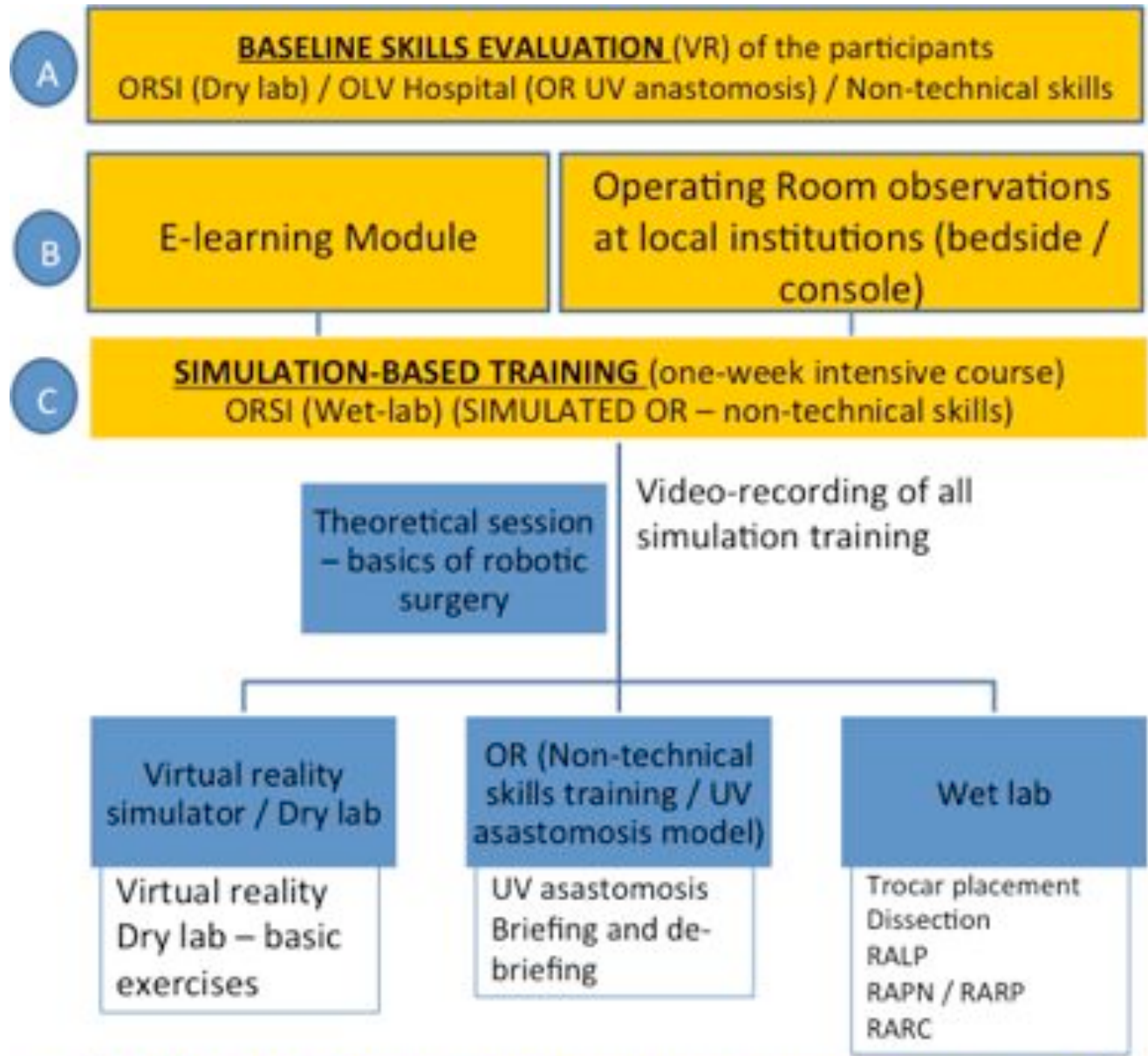
1: Very poor, not at all 2 3 4 5: Excellent, absolutely yes

PILOT STUDY II (2014)

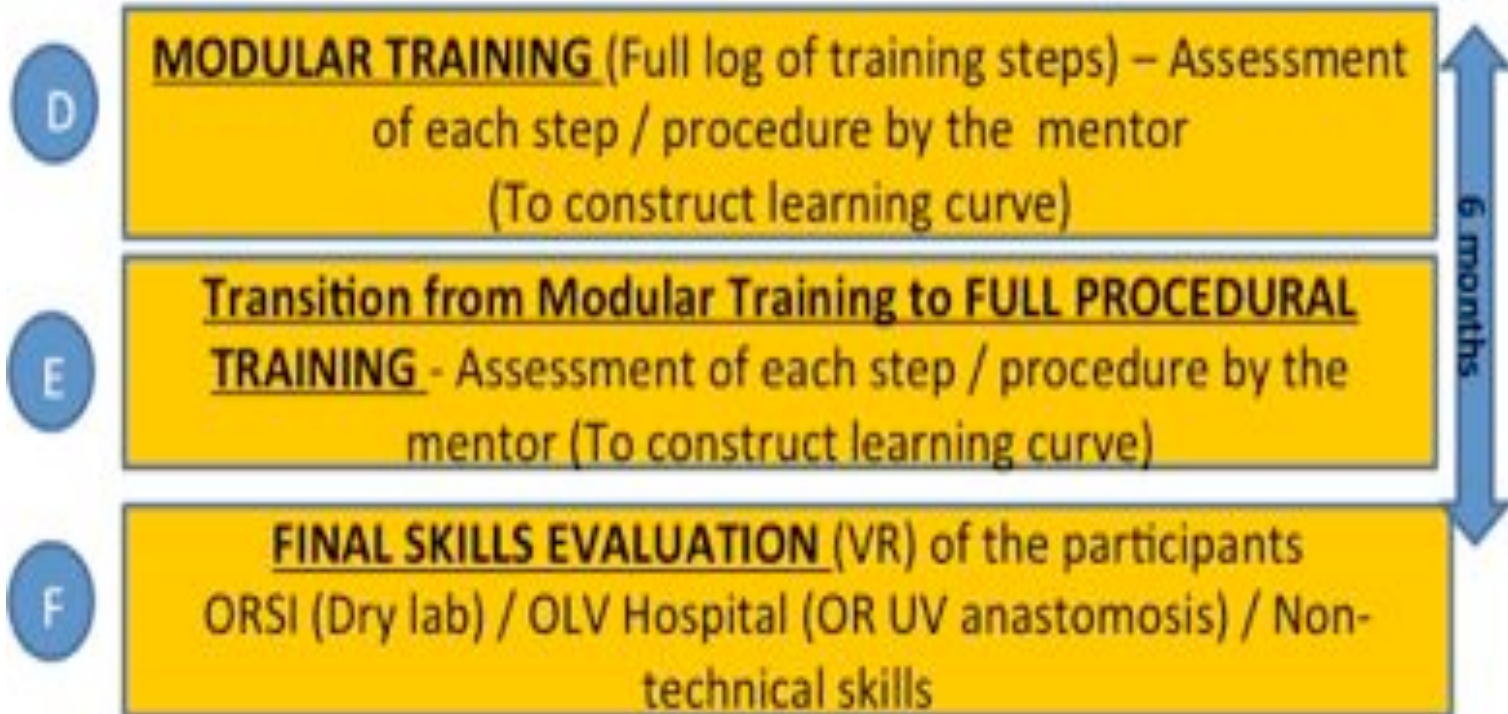
- Longer training period (6 mos vs. 3 mos)
- Higher number of participants (16 vs. 10 fellows)
- Strict requisites for selection of centres
- Minimal requirements for modular training
- Specific training + initial and final assessment of non-technical skills in a simulated OR environment



Study flow chart



Study flow chart



- Bladder detachment: 20 cases
- Endopelvic fascia incision (if performed): 20 cases
- Bladder neck incision: 15 cases
- Section of vasa and preparation of SVs: 15 cases
- Dissection of the posterior plane: 10 cases
- Dissection of the prostatic pedicles: 10 cases
- Dissection of neurovascular bundles: 5 cases
- Ligation of Santorini plexus (if performed): 10 cases
- Apical dissection: 10 cases
- Urethro-vesical anastomosis: 15 cases

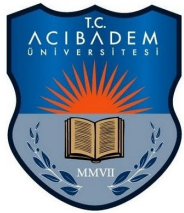
- Da vinci skills simulator (Matchboard 2, Energy switch 2, Ring walk 3, Suture sponge 2, Tubes)
- Global Evaluative Assessment of Robotic Surgery (GEARS)
- Non-Technical Skills for Surgeons (NOTSS) System
- Revised Non-technical skills (NOTECHS) scale
- Anastomosis score
- RARP checklist
- RARP procedure-specific scoring scale for video assessment

Goh AC, et al. J Urol 2012;187:247-52

Yule S et al. World J Surg. 2008 Apr;32(4):548-56

Sevdalis N et al. Am J Surg. 2008 Aug;196(2):184-90

Participating institutions



Fundació Puigvert



Guy's and St Thomas' **NHS**
NHS Foundation Trust



L'INSTITUT
MUTUALISTE
MONTSOURIS



University College London Hospitals **NHS**
NHS Foundation Trust



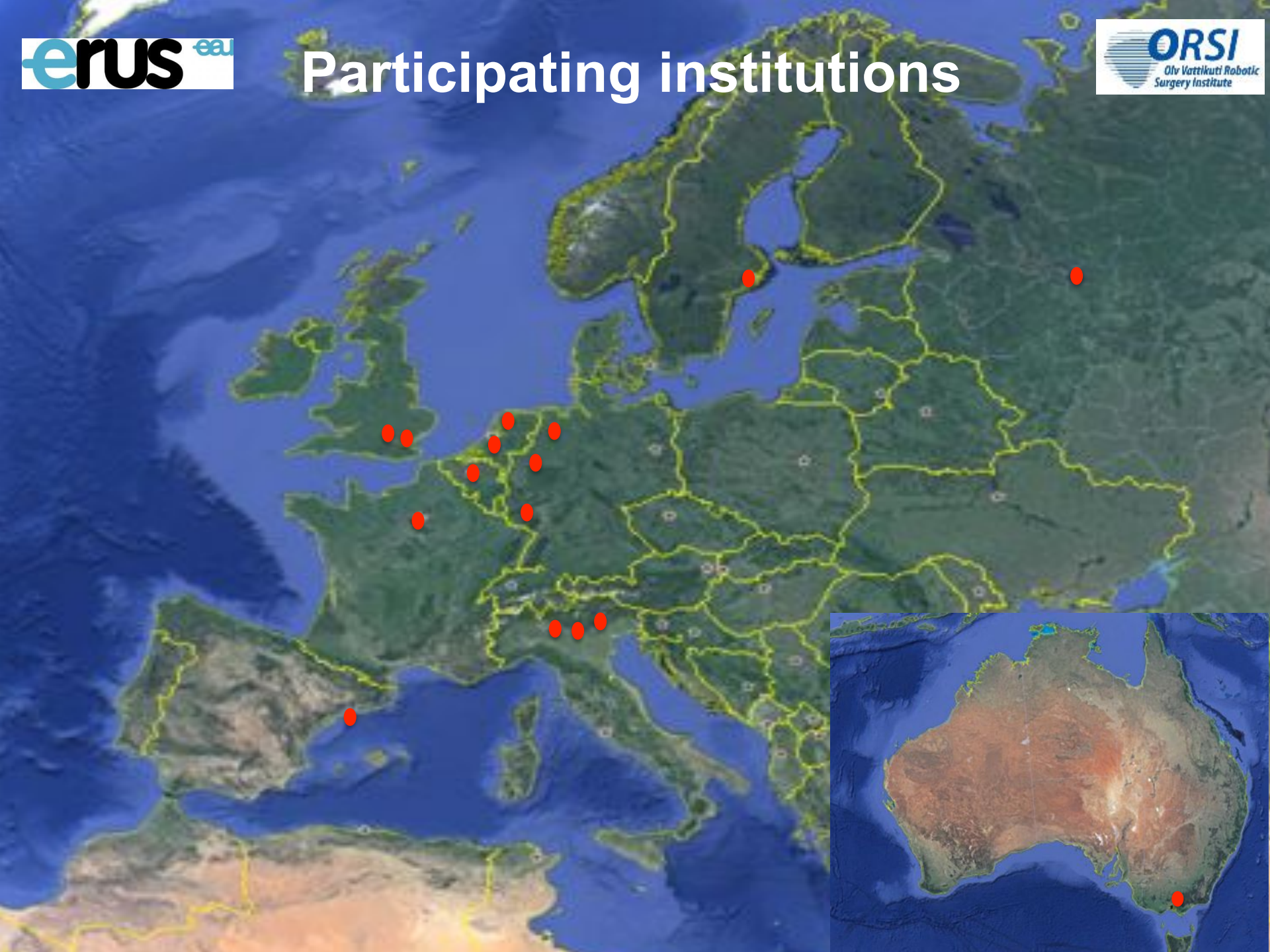
Rijnstate



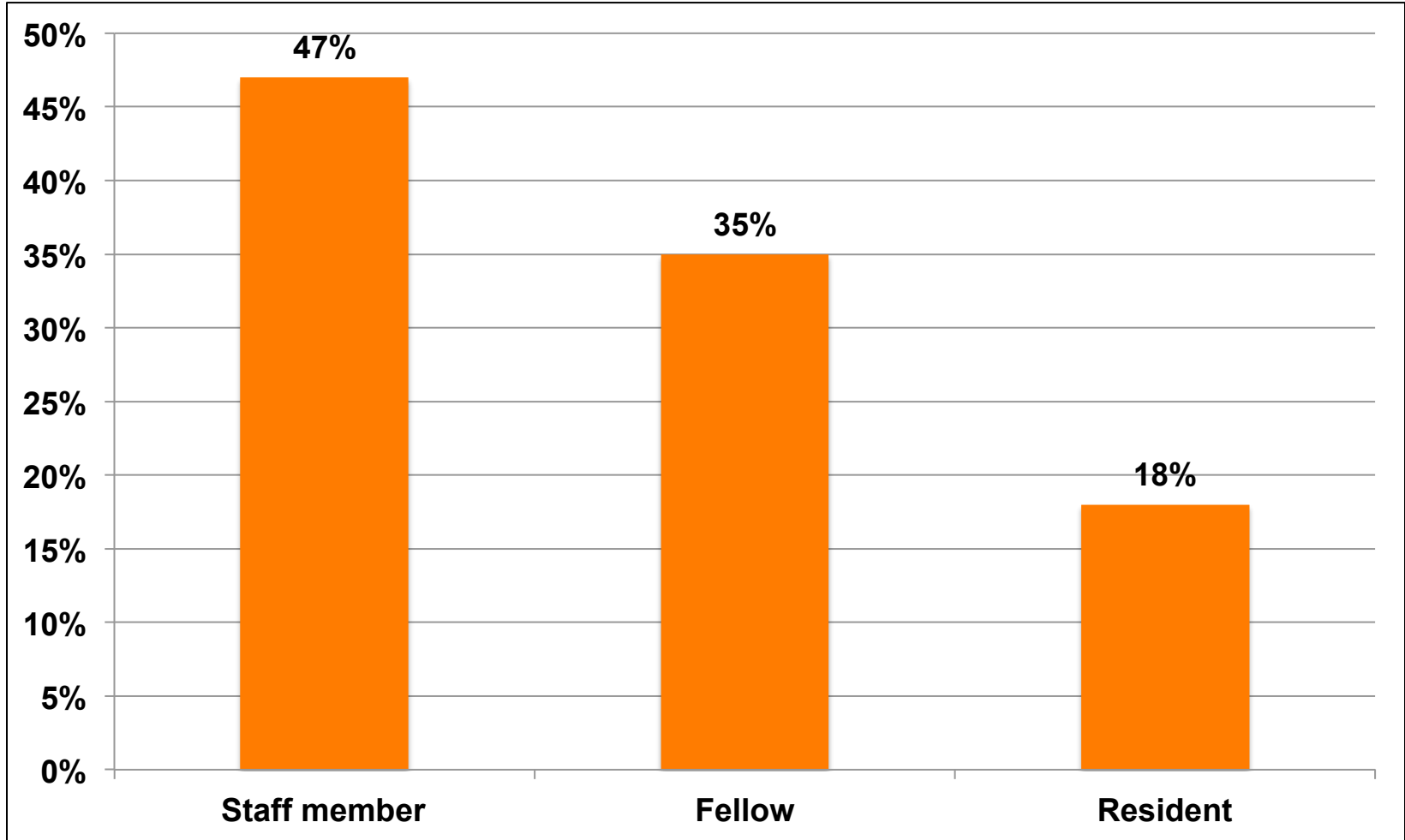
UKS



Participating institutions



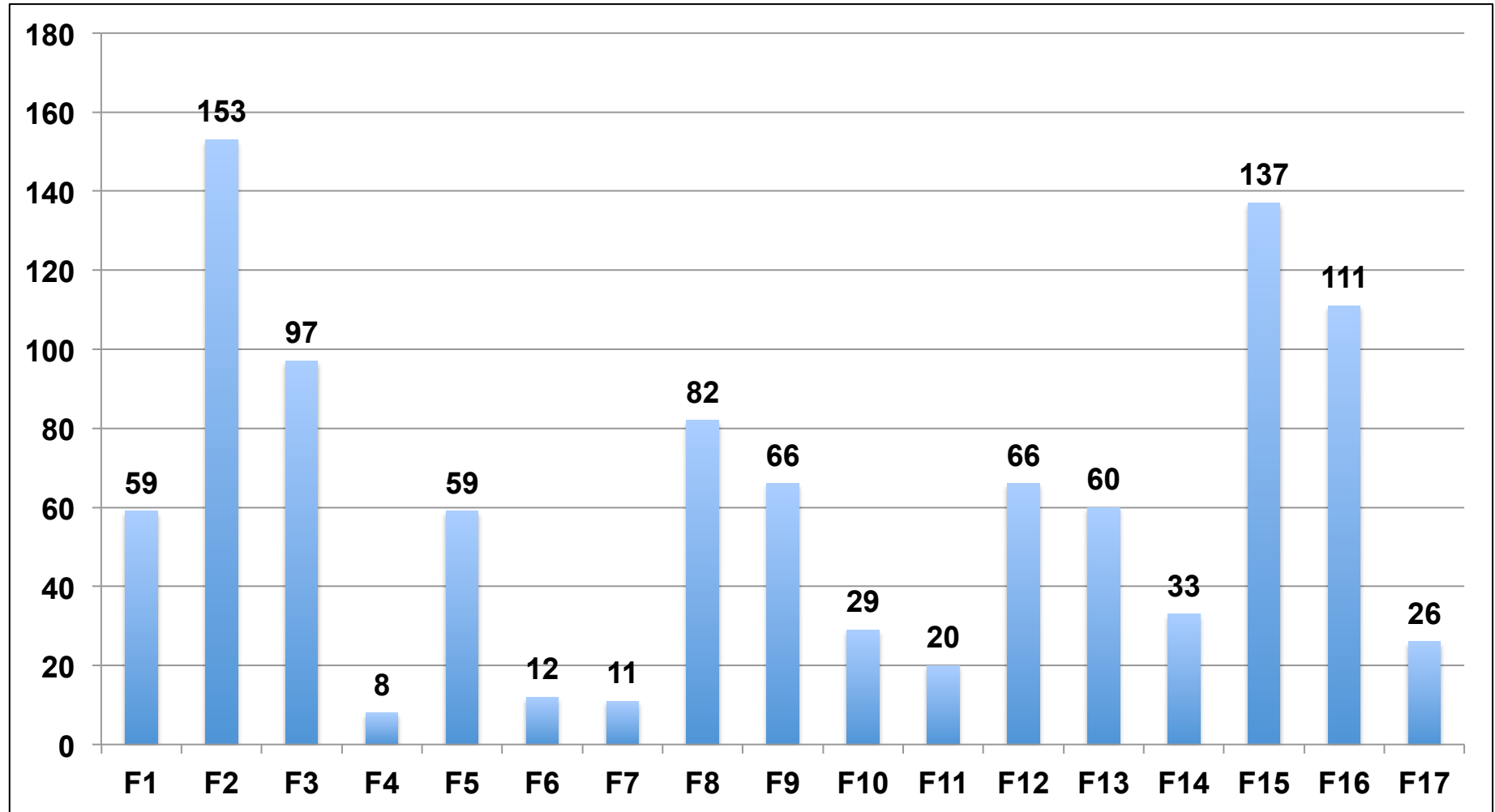
Academic position



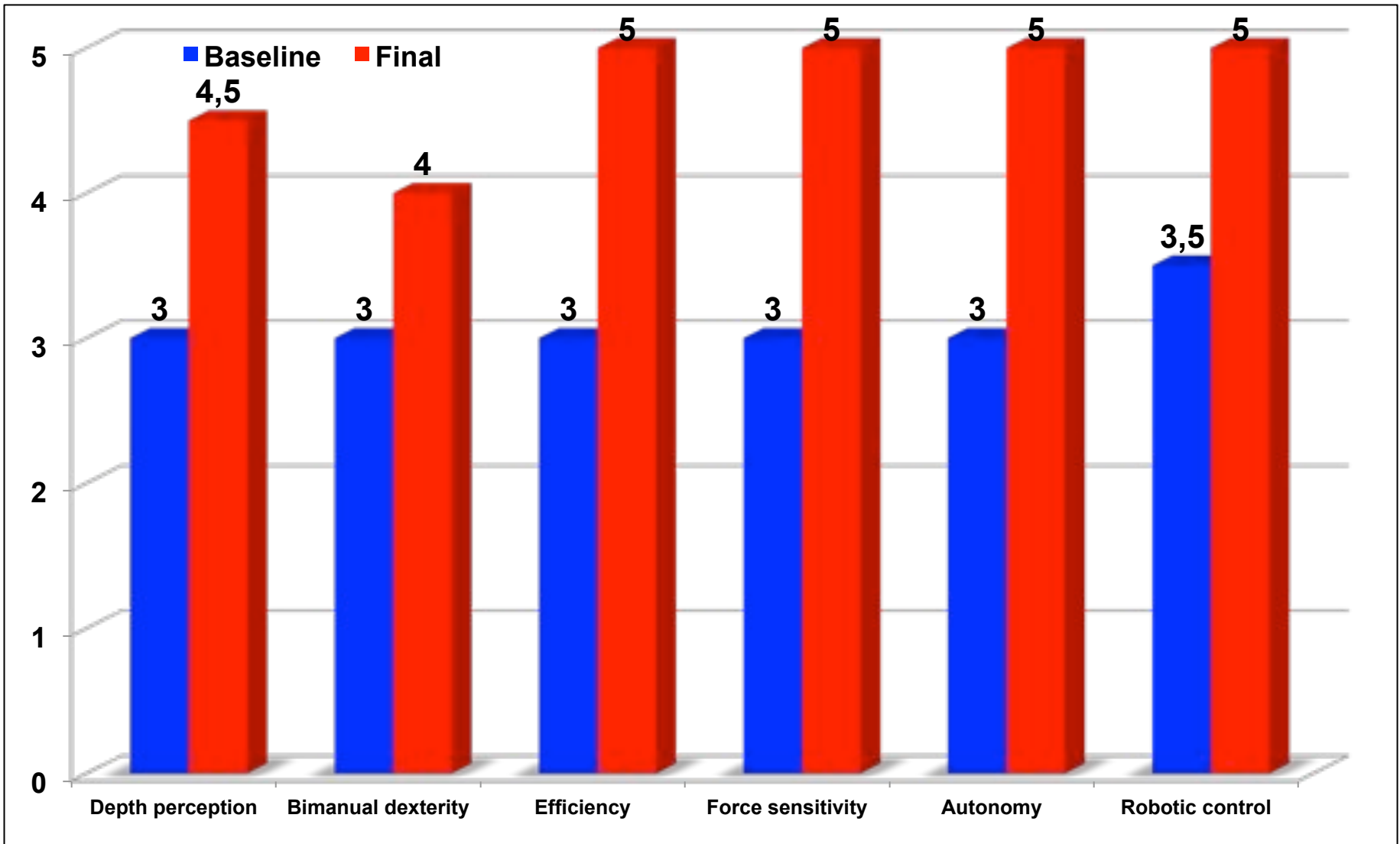
Prior involvement with robotic surgery

- Median involvement 12 mo (IQR 2 – 33)
- Median involvement in table assistance 10 mo (IQR 2 – 33)
- Median involvement in table assistance 50 case (IQR 12 – 200)
- No involvement at console for 10 guys
- Minimal involvement at console for the other 7 (median 6 mo and 10 cases, mainly bladder detachment, endopelvic fascia incision, bladder incision)

Fellows activities during Pilot study II

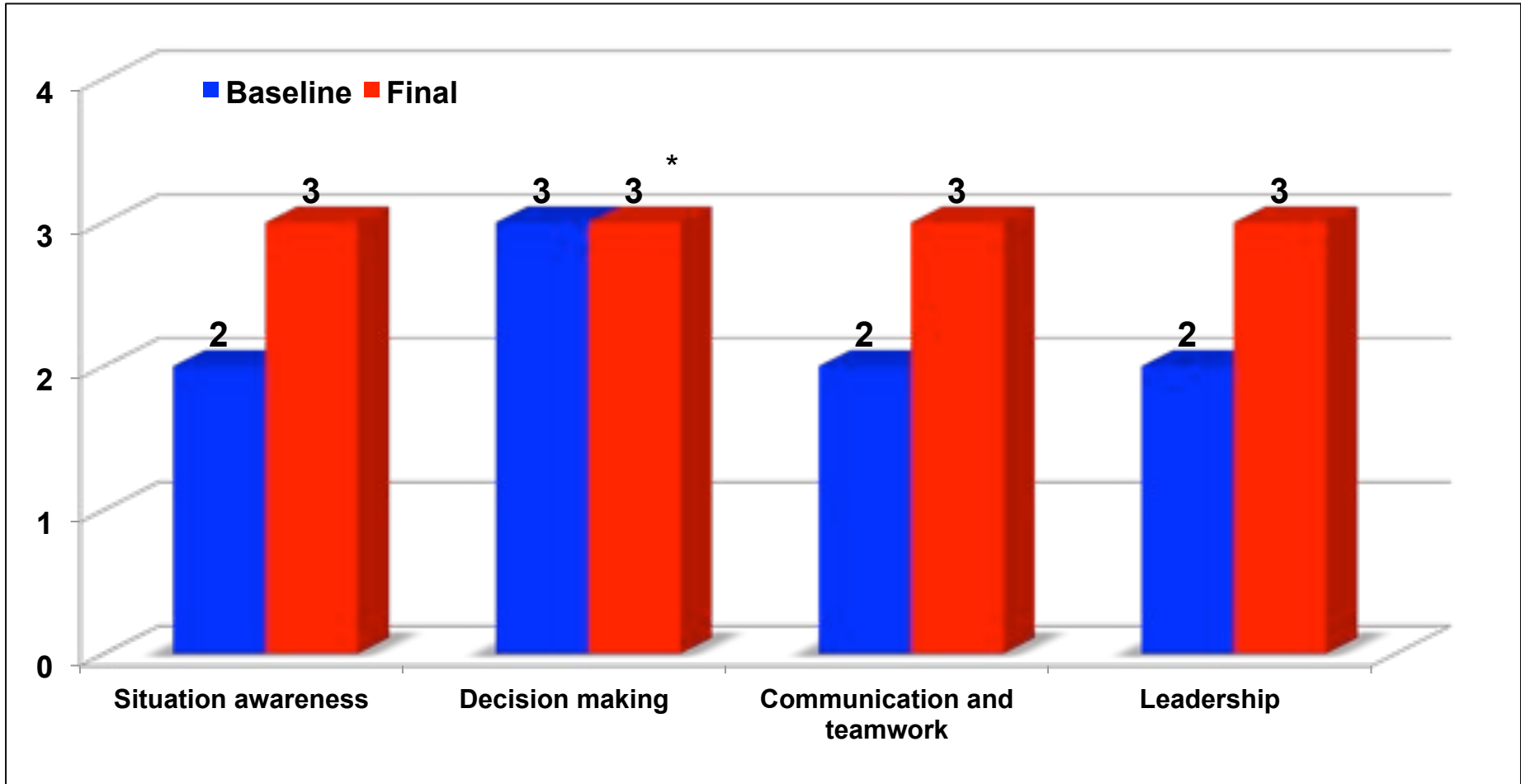


>1000 sessions recorded



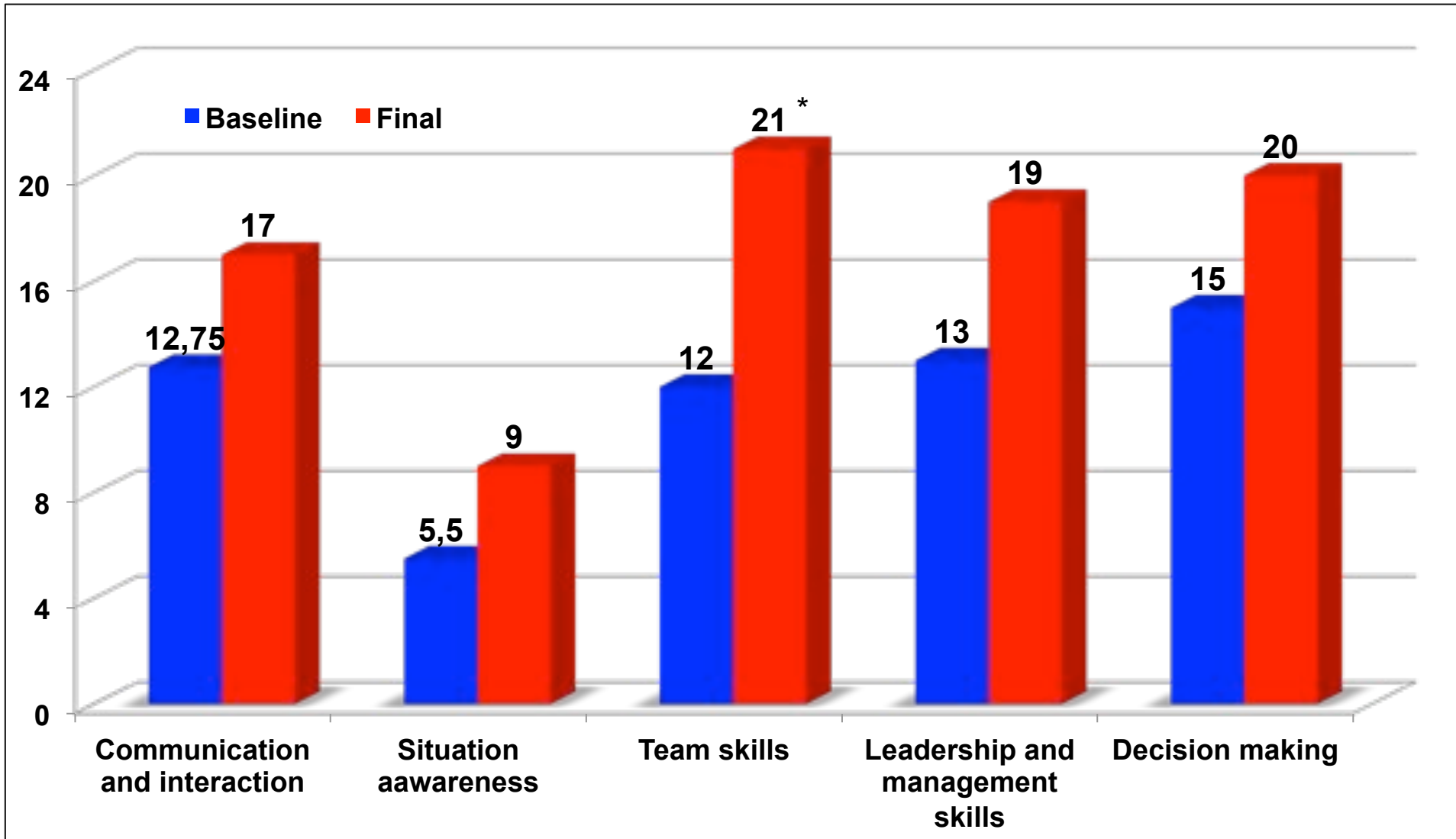
All p values < 0.05

NOTSS median scores



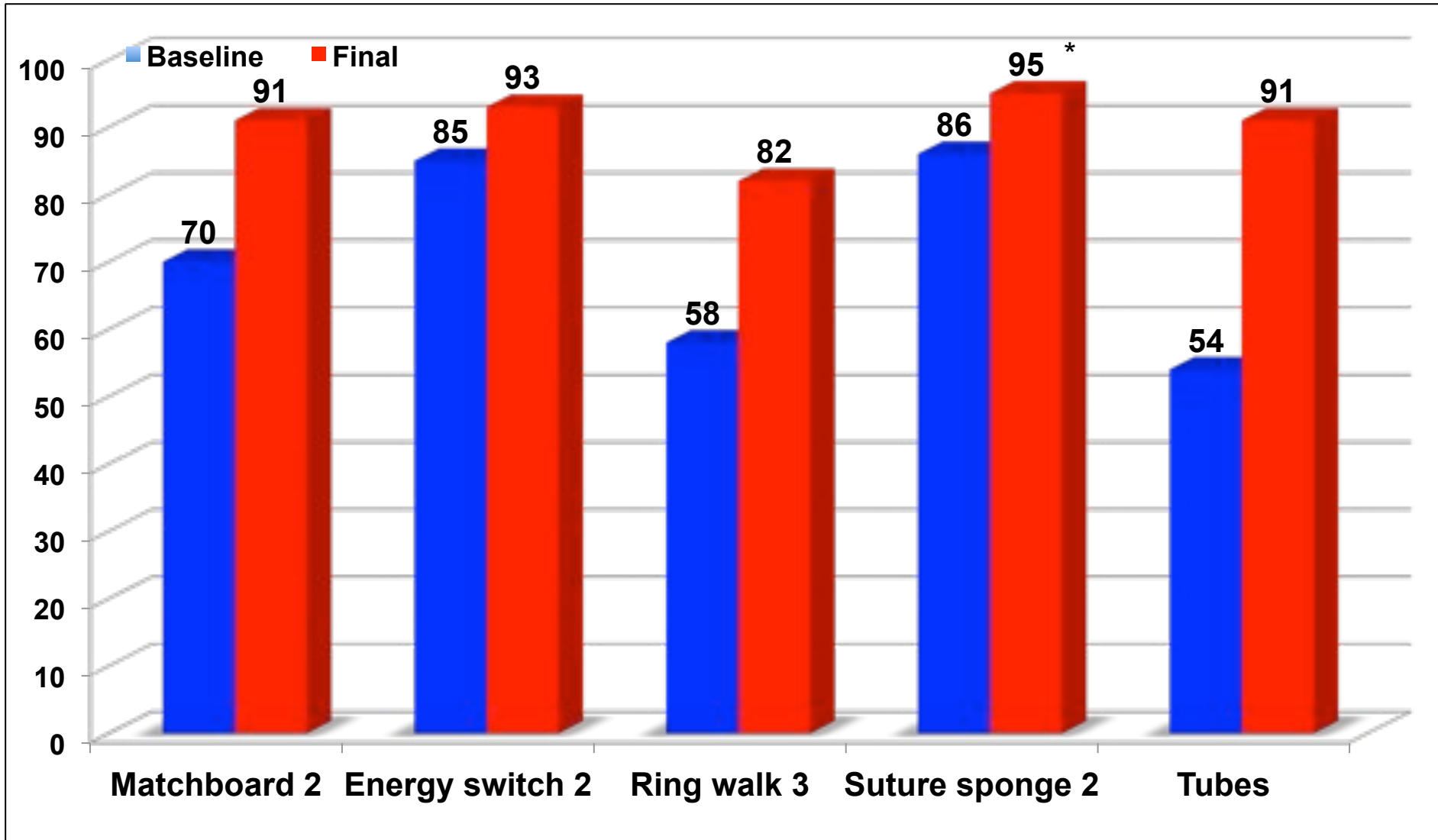
* p value 0.05
Other p values < 0.05

NOTECHS median scores

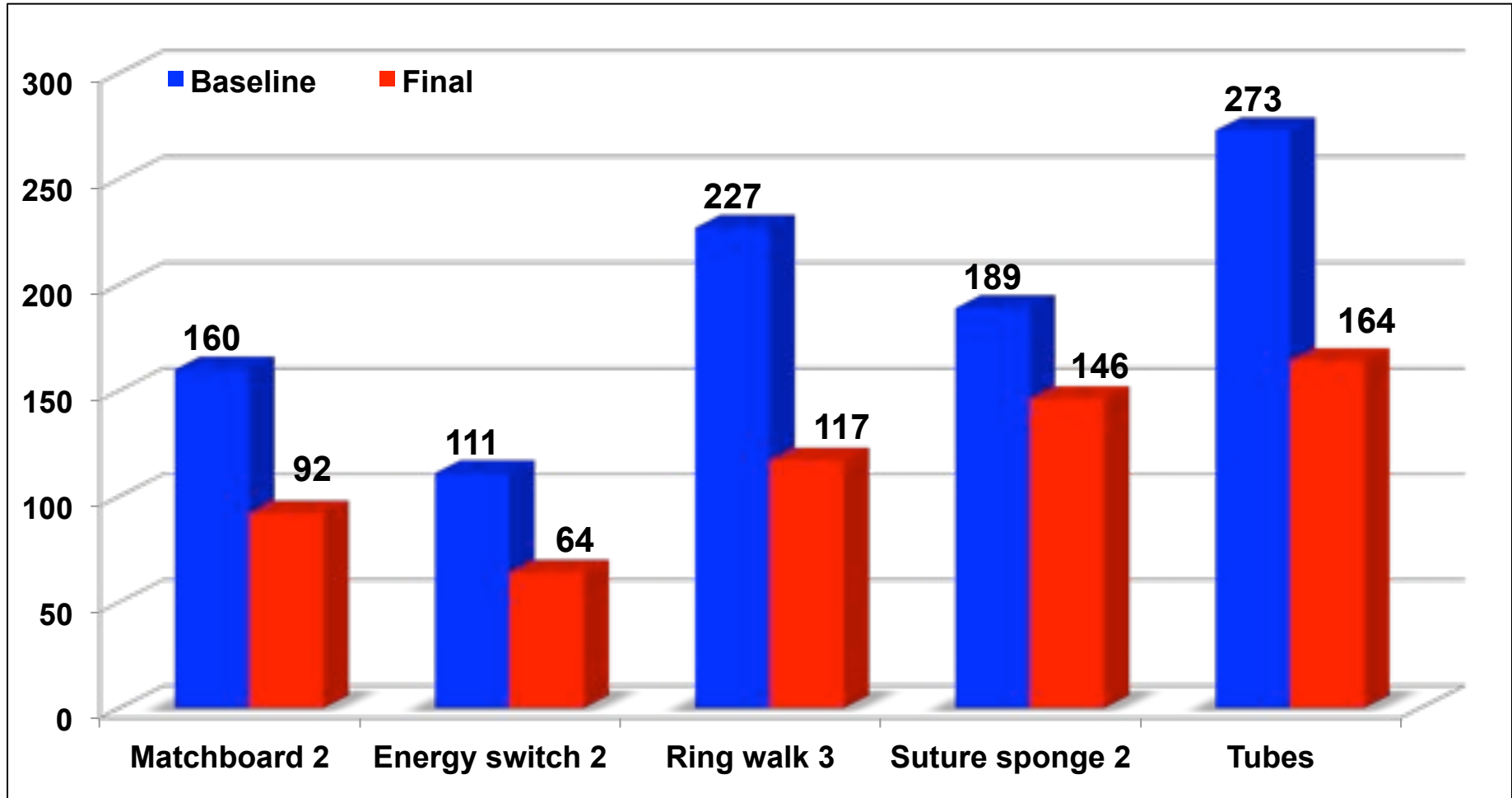


* p value <0.05

dVSS median overall scores



* p value 0.05
Other p values < 0.05



All p values < 0.05

Scores RARP full case

Fellows	Bladder detachment	Endopelvic fascia	DVC	Bladder Neck	Vasa and SV	Pedicles	NVBs	Apex	Anastomosis	Mean score
1	9	11	8,5	7	10	11	9,5	<u>7</u>	10,5	9,3
2	14,5	16	14	12	10,5	13,5	11,5	<u>14</u>	14	13,3
3	10	11,5	12,5	14,5	8,5	8,5	9	<u>6</u>	9,5	10
4	11,5	13	15	14,5	12,5	15,5	13	<u>12</u>	13,5	13,3
5	-	10	10	14,5	8,5	11	9,5	<u>12</u>	9,5	10,6
6	13,5	13	13,5	15	11,5	11,5	7,5	<u>12</u>	12	12,2
7	12,5	12,5	12,5	12,5	9	12	9,5	<u>12</u>	12,5	11,7
8	11	11,5	12	13,5	9	11	10,5	<u>12</u>	15,5	11,8
9	-	11	11,5	16	15	12	13,5	<u>11</u>	12	12,7
10	11,5	15,5	14	13	10,5	14,5	13,5	<u>13</u>	12,5	13,1
11	15	14,5	14	9	7	10	9,5	<u>11</u>	10,5	11,2
12	13	12,5	13,5	10	13	13	11,5	<u>12</u>	12	12,3
13	9	-	8,5	11	7	11,5	9	<u>9</u>	10	9,4
14	12	11,5	-	13,5	7,5	-	-	<u>12</u>	10	11,1
15	10	13	15,5	14	11	8,5	10,5	<u>12</u>	13	11,9
16	13	12,5	15	15,5	8,5	10	12,5	<u>12</u>	11,5	12,3

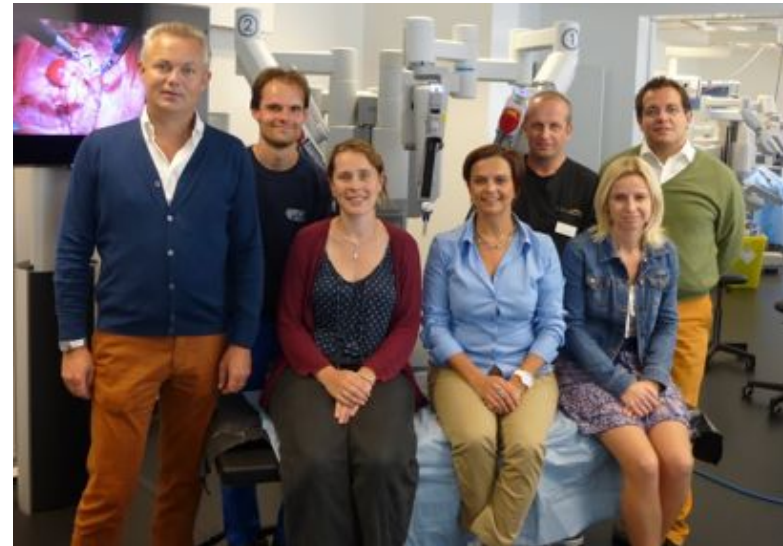
range 4-16; ≥ 10 was considered safe

- The curriculum was effective in improving technical and non-technical skills of the fellows as assessed by most of the validated questionnaires adopted
- Major improvements in dVSS parameters were demonstrated
- Review of the RARP full case demonstrated that RARP was performed in a safe way by most of the fellows (87%)
- The 2 only “insufficient” fellows were young residents
- Further predictive analysis to come (unlikely to identify predictors due to the small sample size)

Acknowledgements



Fantastic friends involved



Video reviewers

