Dated: September .2019

BIARGS- RCOG Robotic training Curriculum for Gynaecological surgical ATSM

Proposal

Gul Aug 2017, Version I

Gul Aug 2018 Version 2 (Approved by BIARGS Council), Submitted to RCOG

Gul/Elkington/Ind: June 2019 Version 3 (Consultation with RCOG)

Gul/ Elkington September 2019, Version 4: ATSM submission to RCOG

RE: Submission of proposal for BIARGS/RCOG Robotic training curriculum to be included in core surgical training module for O&G trainees. (ATSM Robotic assisted surgery)

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1. Introduction

Minimal access surgery should be the main surgical intervention offered to gynaecological patients in the present era. After initial reservations implementing minimal access surgery to replace open gynaecological surgery, MAS is now widely accepted with clear advantages to patients and service including enhanced recovery and decreased morbidity and mortality.

Despite laparoscopic basic and advanced surgical modules being well established, only around 40% of hysterectomies undertaken as a laparoscopic procedure in the UK with trainees attached to minimal access centres having the advantage of increased exposure. The British Society of Gynaecological Endoscopists (BSGE), are actively involved with the RCOG to help ensure all trainees have adequate training experience.

Technology is continuously evolving and progressing, such as 4k technology and 3D imaging, and patients rightly have increased knowledge and expectation. Surgical specialities are actively embracing these new technologies to improve patients' outcome and experience. As an adjunct to this, robotic technology is also rapidly progressing and being utilised with each region providing some robotic assisted surgery in gynaecology. There are numerous publications supporting robotic gynaecological surgery with better patients outcomes (less complication rate, less conversion rate and decreased length of stay), and initial high set up costs balanced by overall lower costs seen with decreased morbidity and enhanced recovery.

The training programme also supports the vision of RCOG training "to produce a specialist who has the skills, knowledge and attributes needed in the 21st century, meeting needs of the patient and service".

BIARGS is working in collaboration with SERGS (Society of European Robotic Gynaecological Surgery) to develop Advanced Skills Training Module (ATSM) Robotics assisted surgery programme for Gynaecology. Further procedural tasks will be developed in subspecialty of Gynaecological oncology, advanced Endometriosis and urogynaecology. The syllabus has been defined based on evidence after pilot work and Delphi projects in robotic training.

Gynaecology robotic society is quite keen to work with the RCOG curriculum working group to help development and integrate the robotic training programme in gynaecology core and advanced training module (ATSM).

A survey of O & G trainees in the Northwest region showed 64% of trainees want robotic training to be included in the RCOG Core curriculum. However due to no current established training programme for the trainee, none of the specialist registrars received directed robotic surgical training despite being allocated into theatre.

2. Summary of requirements for certification

Certification:
Robotic ATSM curriculum in gynaecology is developed to include essential training requirement for the specialist's technology tool and includes 15 core knowledge areas. Based on Capabilities in Practice (CiPs), key skills are supported with descriptive requirement of competence. Robotic specific assessment tools (GERES) is essential to assess specific skills in robotic surgery. Non-surgical training surgical skills (NOTSS) are essential assessment tools in robotic theatre. Other assessment tools will include work based assessment (WBAs) and OSATs will be used by trainee to demonstrate achievement of competence. Trainees will maintain BIARGS/RCOG Robotic training log book.

Supervising trainers closely observe the trainees for progression and review evidence (online modules, mandatory courses, log book, WBAs, NOTSS and surgical video) with trainee's self-assessment to confirm a global achievement of CiPs before supporting for RCOG accreditation of ATSM in robotic surgery.

3. Proposal for BIARGS/ RCOG Curriculum

BIARGS propose that the RCOG, which has a track record for innovation, include robotic assisted surgical training in the core surgical training of gynaecology. With worldwide experience and market competition it is expected that robotic surgery will become more and more widespread in the UK and it is essential our trainees are equipped with knowledge and skills required for being part of the current and future gynaecology surgical team.

The training programme is anticipated at four levels to mirror the current surgical competences. Level 1 will include observed competence, Level 2 for surgical assistant in robotic surgery and Level 3/4 as ATSM. **Level 1 and Level 2 will be optional competencies at this stage of implementation as all UK hospitals do not have the robotic assisted surgical option**. When trainees are attached to such hospitals where robotic surgery is provided, they may wish

to take the advantage of acquiring these competencies at Level 1 and Level 2 and obtain recognition for the training. Trainees within each region can be rotated to these hospitals to include their special interest. This will be similar to current training requests for laparoscopic surgery as not all hospitals in UK provide advanced gynaecology laparoscopic surgery or gynaecology oncology training.

Each level has targeted competencies which will complement the new proposed curriculum (Capabilities in Practice CiP) under consultation. Trainees will be expected to have a competence level according to their stage of career if assisting in robotic theatres.

4. Robotic surgical training, specific consideration

A. Pre-requisite

1. Team working
2. Anticipation
3. Increased cognitive work load
4. Efficiency

B. Educational objectives of trainee attending robotic theatre

1. Excellent opportunity to learn surgical anatomy
2. Learn surgical approach and principles in undertaking complex case
3. Develop leaderships skills as main bed side assistant surgeon
4. Learn and demonstrate situational awareness and human factor (NOTSS)
5. Assist in complex cases
6. Progress to ATSM
7.

C. Training material

1. Knowledge
2. Online Modules
3. Simulator training
4. Dry Lab
5. Wet lab
6. Mentoring
7. Direct supervision

D. Robotic assisted surgery training standards

1. Systematic and validated systems
2. Procedural training (didactic and skills)
3. Proctor assisted procedures
4. Virtual training
5. Vivo training

5. Level of Modular Robotic assisted training in Gynaecology

Level 1 (Observed competencies) Core logbook if opportunity available; STI/ST2 **= Second assistant** (Bottom end)

1. Trainee would be expected to have basic understanding of robotic surgery
2. Understand indications, complications and advantages of robotic surgery
3. Understand principles of patient selection
4. Understand principles of patient positioning, docking/undocking the robot
5. Understand importance of team working, NOTTS, situational awareness
6. Aware of other methods and resources available to improve knowledge (Online training, Simulator training, lab based training)
7. Uterine manipulation

Level 2 (- Able to undertake a skill under supervision (these will be main skills required for bed side first assistant surgical skills) Core logbook if opportunity available: **ST3/ST4/ST5 = First assistant**

1. Trainee would be expected to have more detailed knowledge of robotic surgery
2. Undertake online training module for robotic gynaecology surgery
3. Have competency based experience in laparoscopic basic training
4. Trainee will be competent to perform bed side (first assistant) surgical skills (as per level 2 laparoscopic competencies)
5. Simulator training, online module
6. Communication skills, situational awareness, NOTSS

Level 3 – Indirect supervision, competent to perform certain skills including console skills for medically or surgically appropriate cases. **This will be included in Robotic ATSM)**

Trainee will progress achieving competencies and self-directive learning throughout.

Use of web based modules
Simulator training
GEARS
NOTSS and other methods of assessment
Training log, audit and reflective practice

Level 4- Unsupervised, independently competent to perform certain skills including console skills for medically or surgically appropriate cases. **This will be included in Robotic ATSM)**

Trainee will progress achieving independent competencies and self-directive learning throughout.
Use of web based modules
Simulator training
GEARS
NOTSS and other methods of assessment
Training log, audit and reflective practice

6. Training Progression

Trainee would be signed off for Level 1 and Level 2 for First assistant and then progress to Level 3 and 4

Targeted competencies

1. Trainee will be expected to know their limitations and complexity of case.
2. Online and lab training
3. Understand and demonstrate communication skills, situational awareness, human factor
4. Able to undertake informed consent, write comprehensive operative notes and postoperative plan/Follow up
5. Understand and learn operative principles and surgical anatomy
6. Keep log of cases and audit complications, outcomes
7. Work towards proficiency
8. Involvement of senior colleagues in complex cases
9. Self-directive learning to improve knowledge

Training programme with will be supported with blended e-learning modules

7. Methods of assessment

1. Log book competencies
2. Online modules
3. Training E-portfolio
4. Work based assessment (OSATS, Mini-CEX, CBD)
5. Non-Technical Skills for Surgeons (NOTSS): Situation awareness, Decision making, Communication and teamwork, Leadership
6. Reflective practice

8 : **Capabilities in Practice (CiPs)**

CiP 1: The doctor is able to practice as a gynaecological Robotic Surgeon in MIS unit within a multidisciplinary team.								
Trainees / Advanced surgical practitioner should have assisted with laparoscopic cases before assisting with robotic cases.	Date:		Name: (Trainee)					Trainer:
Orientation & Preparation	Competence Level							
	Level 1		Level 2		Level 3		Level 4	
	Nurse	ST1/ST2	Nurse	ST3/ST4/ST5		ST6/ST7	ST6/ST7	CSST
	SECOND ASSISTANT (Bottom end)			FIRST ASSISTANT		ATSM	ATSM	
	Date	Signature	Date	Signature	Date	Signature	Date	Signature
Orientation of robotic theatre								
Demonstrate effective team working								
Demonstrate effective communication skills within theatre tram								
Demonstrate situational awareness								
Demonstrate importance of Human factor								
Sterile preparation of robot								
Bedside assistant (level 2)								
Reflective practice								

Knowledge	Competence Level							
	Level 1		Level 2		Level 3		Level 4	
	Date	Signature	Date	Signature	Date	Signature	Date	Signature
Completion of the online theoretical training package								
Understands mechanics of the Robotic assisted surgery								
Awareness of the ergonomics of robotic assistance								
Familiar with robotic components and instrumentation								
Awareness of other modalities, benefits and potential complications with robotic surgery								
Trainee is able to adjust the surgical robot's settings								
Awareness of the capital cost of the robotic system and life of robotic assisted instruments								
Knowledge of different docking positions and the indications								
Understanding of the use of electro diathermy in robotic surgery								
Understands reasons for arm clashing and methods of correction								
Knowledge of the potential complications of electro diathermy								
knowledge of principles of laparoscopy and robotic surgery								
Situational awareness								
Communication skills								

General knowledge /Surgical competence	Competence Level							
	Level 1		Level 2		Level 3			Level 4
	Date	Signature	Date	Signature	Date			Signature
Knowledge of abdominal and pelvic anatomy								
Aware principles of managing a critically ill surgical patient								
Online modules								
- Consoles								
- Docking								
- Instrument insertion								
- Instrument removal								
- Undocking								
Simulator training	Introduction		2 hours		30 hours			
Have completed robotic simulation training	Observation		Introduction		Advanced			
Satisfactory completion of wet lab training	Observation		Introduction		Advanced			

CiP 2: The doctor provides high quality perioperative and Robotic assisted gynaecological surgical care within a MIS unit.								
Robotic Assistant competence	Competence Level							
	Level 1		Level 2		Level 3		Level 4	
	Date	Signature	Date	Signature	Date			Signature
Knowledge of the operative room setup of the robotic system								
Aware of principles of the robotic system								
Be able to drape the Robot								
Be able to respond to system errors								
Able to drive the robot								
Knowledge of how to position patient for robotic surgery								
Undertake vaginal preparation for a robotic procedure								
Able to insert McCartney tube in vagina and uterine manipulator if required								
Be able to undertake vaginal preparation & insert a rectal probe if required								
Understand and demonstrate use of different methods of maintaining pneumoperitoneum								
Demonstrate understanding port placement								
Able to undertake port placement								
Be able to dock the robotic system								
Understand different docking positions and able to dock the robot								

Be able to maintain a clear image by cleaning/changing the camera								
Be able to insert, change and remove robotic instruments								
Be able to understand reason for clashing and adjust the arm positions								
Have understanding of the appropriate use of assistant port								
Demonstrates of use of suction and maintaining clear operative field								
Able to introduce and present loaded needle								
Able to cut the suture with laparoscopic scissors								
Safe retrieval of needle								
Demonstrate understanding of communication with scrub team and needle/swab count								
Demonstrate introduction and retrieval of surgical swabs from assistant port								
Demonstrate introduction and retrieval of retraction swab (endo-rector)								
Demonstrate introduction and retrieval of specimen bag								
Be able to perform clip application as directed by console surgeon								
Be able to perform laparoscopic adhesiolysis (3 cases- level 4)								
Undocking and port closure (3 cases – level 4)								
Be able to close incisions and port sites closure								
Be able to perform an emergency undocking procedure								
Demonstrate understanding of specimen handling and histology/cytology requests								
Demonstrate skills of communication with recovery and ward staff								

Online modules							
- Vessel sealer							
- Diathermy							
- Needle driver							
Robot console simulation							
Demonstrate camera control and set up visual field							
Demonstrate multi-arm control of the robotic instruments							
Demonstrate hand-eye instrument coordination							
Demonstrate wrist articulation							
Demonstrate clutching of the robotic instruments							
Demonstrate atraumatic tissue handling							
safe tissue cutting with the robotic system							
Maintain safety of operative field							
Demonstrate blunt dissection with the robotic system							
Demonstrate micro dissection with the robotic system							
Use of diathermy and colpotomy							
Demonstrate plan for surgical specimen retrieval methods							
Demonstrate use of needle driving with the robotic system							
Demonstrate knot tying with the robotic system							
Demonstrate suture handling with the robotic system							
Demonstrate continuous and interrupted suturing with the robotic system							
Understand the potential risks and ability to make appropriate operative decisions							
Be able to manage surgical complications (bowel/urinary/vascular injuries)							

Demonstrate effective communication with anaesthetic , theatre team and console surgeon								

9: Procedural tasks

Procedural tasks	Competence Level							
	Level 1		Level 2		Level 3		Level 4	
	Date	Signature	Date	Signature	Date	Signature	Date	Signature
Sealing and dividing round ligaments								
Identifying ureters and sealing and dividing ovarian vessels								
Incising vesicouterine peritoneum and developing vesicovaginal space								
Sealing and dividing uterine vessels								
Performing colpotomy								
Suturing vaginal cuff								
Robot assisted hysterectomy (5 cases level 4)								
Robot assisted BSO (5 cases level 4)								

10: Training Resources

Training Modules								
Online module								
Basic local training								
Simulator training								
Dry Lab								
Wet lab (Animal / Cadaver training)								
Didactic Training								
Case observation								
Surgical Video Observation								
Competence based training (Level 1 to 4)								
Procedural Training								
Ist assistant sign off								
ST6/7/ATSM								
Audit of cases								
OSATS								
DOPS								
CBD								
NOTSS								
Reflective practice								
Annual update								

11: Assessment Tools

Objective Structured Assessment of Technical Skills (OSATS)

Assessment of procedure	Performs well Independent	Needs help	Not Proficient
Docking/Undocking			
Optics			
Clear inspection			
Movements			
Appropriate use of assistants			
General technical assessment			
Time, motion, planning			
Appropriate instrument in use			
Relation with surgical team			
Attitude / Insight			

Non-Technical Skills for Surgeons (NOTSS)

This is based on Situation awareness, Decision making, Communication, Team working and Leadership are essential in robotic theatre.

Categories	Characteristics	Score (1-4): Feedback
Situation Awareness	Gathering information , Understanding information, Projecting and anticipating	
Decision Making	Considering options, selecting opting, Implementing and reviewing	
Communication and Teamwork	Exchange of information, establish shared learning, Co-ordinate team	
Leadership	Setting and maintaining standards, coping under pressure, supporting others	

Global Evaluative Assessment of Robotic Skills (GEARS)

A.	Depth perception				
	1	2	3	4	5
	Overshooting		Some overshooting		Accurately directs
B.	**Bimanual dexterity**				
	1	2	3	4	5
	Uses only one hand		Suboptimal interaction between hands		Uses both hands in complementary way for exposure
C.	**Efficiency**				
	1	2	3	4	5
	Inefficient efforts		Slow but planned moves		Fluid progression
D.	**Force sensitivity**				
	1	2	3	4	5
	Rough moves, tears tissue		Handles tissues reasonably well		Applies appropriate tension
E.	**Autonomy**				
	1	2	3	4	5
	Unable to complete the task		Completes the task with moderate guidance		Independent without prompting
F.	**Robotic control**				
	1	2	3	4	5
	Consistently does not optimize view		Sometimes suboptimal		Controls camera and instruments

12: Example of Procedural tasks (Step wise)

Hysterectomy Module (Ref: SERGS)

		Lowest level of difficulty				Highest level of difficulty
		1	2	3	4	
1	Positioning					
2	Port placement					
3	Docking					
4	Ovarian ligaments					
5	Bladder peritoneum					
6	Uterine pedicle					
7	Colpotomy					
8	Removal of uterus					
9	Vault suturing					
10	Removal of instruments Undocking					
11	Suturing					

13: Surgical Coaching in Theatre

1. Performance analysis
2. Video debriefing
3. Simplification/Standardization
4. Feedback
5. Cognitive aids
6. Behaviour modelling
7. Enhance performance
8. Reduce errors
9. Skills assessment

Proposed Robotic BIARGS/RCOG Training curriculum

1. Bottom end assistant
2. First assistant
3. ATSM
4. Specialist training in subspecialty

14: Surgical training in robotics for experienced Gynaecologist

- 18-20 cases over 3 months
- Expected to have safe surgical skills in Gynaecology
- Main core surgical training
- Port placement
- Correct use of arms
- Use of instruments
- Lack of tactile feedback
- Patient positioning

Assessment/Progression
1. Minimum requirement in skill
2. Minimum requirement in volume
3. Quality assessment
4. Objective evaluation
5. Registration with registered body

15: GMC Generic Professional Capabilities

Mapping to GPCs

Domain 1: Professional values and behaviours

Domain 2: Professional skills

- o Practical skills
- o Communication and interpersonal skills
- o Dealing with complexity and uncertainty

Domain 3: Professional knowledge

- • Professional requirements
- • National legislative structure
- • The health service and healthcare system in the four countries

Domain 5: Capabilities in leadership and team working

Domain 6: Capabilities in patient safety and quality improvement

Domain 8: Capabilities in education and training

Domain 9: Capabilities in research and scholarship

Learning outcomes: Mapping of Robotic assisted surgery assessments to CiPs

CIP	Online Modules	OSATS	Mini-CEX	CbD/ GEARS	NOTSS	TO1/ TO2	Reflective practice
1: The doctor is able to practice as a gynaecological Robotic surgeon within multidisciplinary team.	Online Modules Simulator training certification	Simulator Task based	Yes	Yes	Yes	Yes	Yes
2: The doctor provides high quality perioperative surgical care in gynaecology	Log book Audit Project Training courses	Yes	Yes	Yes	Yes	Yes	Yes

	Name: Trainee:									
	Name: Trainer :									
	Institute:									
	Level of training:									
	Date:									

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On Behalf of BIARGS Council

Nahid gul

Miss Nahid Gul FRCOG
Chair of BIARGS Educational training portfolio subgroup
Consultant Gynaecological Pelvic Surgeon
Wirral University Teaching Hospital
Email: nahidgul@nhs.net

President	Immediate Past President	Vice President	Honorary Secretary & Treasurer
Mr Nick Elkington Consultant Obstetrician & Gynaecologist Frimley Park Hospital Contact: nick.elkington@nhs.net	Mr Thomas Ind Consultant Gynaecological Surgeon & Oncologist The Royal Marsden Hospital Contact: thomasind@thomasind.co.uk	Marielle Nobenhuis Consultant Gynaecological Surgeon and Oncologist The Royal Marsden Hospital Contact: marielle.nobbenhuis@rmh.nhs.uk	*Miss Nahid Gul FRCOG Chair of BIARGS Educational training portfolio subgroup Consultant Gynaecological Pelvic Surgeon. WUTH Contact: nahidgul@nhs.net*