

# BASIC LAPAROSCOPIC SKILLS AND LAPAROSCOPIC APPENDICECTOMY

## MODULE: GENERAL SURGERY

## TARGET: CT1 – ST4

## BACKGROUND:

Emergency appendicectomy is the most common abdominal general surgical operation performed on an emergent basis. It is generally expected that an ST3 level general surgical trainee would be able to perform this procedure with minimal supervision, yet there may be limited opportunities for more junior trainees to become proficient during their training, due to competition from other learners. It may be difficult to plan targeted clinical training in this procedure as cases are unplanned and there is inevitably considerable case variability within the surgical 'take'. This operation is one of the most frequent performed out of hours, despite significant risks associated with laparoscopic approach including pneumoperitoneum and risk of damage to other structures. Providing trainees the opportunity to learn depth perception, motor skills and the steps of this procedure within a simulated environment is important if patient safety is a high priority concern of the healthcare organisation.

## RELEVANT AREAS OF THE CURRICULUM

### Module 3

Principles of surgical endoscopy (laparoscopy)  
Patient safety

## INFORMATION FOR FACULTY

This skills simulation is about acquiring basic manipulation skills and gaining familiarity with the range of different graspers and the use of ratchet mechanisms. The learners will work sequentially through tasks the culmination of the session will be to perform a laparoscopic appendicectomy.

## LEARNING OBJECTIVES

Learners will gain familiarity with a range of different laparoscopic graspers and instruments.  
Learners will have the opportunity to use a Veress needle and understand the risks and benefits of open versus closed induction of pneumo-peritoneum.  
Learners will have the opportunity to gain familiarity with both 0 degree and 30 degree scopes  
Learners will have the opportunity to use an Endoloop and an Endoclip device  
Learners will understand the principles and steps of safe laparoscopic appendicectomy

## SCENE SETTING

Location: Skills laboratory  
NB. Need LOW tables as box trainers increase the height of table working.

Learners will work in pairs – one as camera holder the other as primary surgeon. They will then swap over.

Expected duration of scenario: 90 mins On-going faculty support and feedback

## EQUIPMENT AND CONSUMABLES

Fluffy balls about 1x1cm (available from craft shop)  
Small polystyrene balls (craft shop)  
Match-sticks  
Smarties (confectionary)  
Beads (available from craft shop)  
Foam shapes (from mail packaging)  
Brazil nuts  
Polo mints  
String  
Pipe cleaners  
Sugar cubes  
Non-sterile latex gloves  
Plastic bag tags – for sealing clinical waste bags  
Permanent marker pen  
2 gallipots per box trainer

Box trainer eg. Pharmabiotics BTS300 Body torso simulator £1,047 each PLUS  
Laparoscopic stack system eg. Storz (gas insufflation not required) ability to video record footage is desirable  
*Alternatively*  
Annex Art Laparoscopic simulator system – includes box trainer, light source, camera – will also need video monitor

Scopes – 30 degree AND 0 degree 10mm scopes  
Selection of laparoscopic ports – 2 x 12mm and 2 x 5mm  
Veress needle  
Selection of laparoscopic instruments – Endoclinch, Endograsp, Endodissect and Endoshears (or re-usable equivalents)  
Endoclipper  
Endoloops PDS or Vicryl x3 for each learner  
Selection of ports 12mm and 5mm – self reducing.  
Burt bag

Laparoscopic appendicectomy model – from Limbs and Things (Vermiform appendix) £58 each - suggest use Normal anatomy Part 50122 as otherwise dissection too complex.  
Soft tissue retaining set from Limbs and Things Part 50151 £44 – need one of these per box trainer.

## PARTICIPANT BRIEFING

Work through the various skills tasks in order. Think specifically about which instruments are best suited to which tasks. Try to work upon economy and efficiency of motion.

## FACULTY BRIEFING

### Introduction (15 mins)

Induction of pneumoperitoneum and port placement

Faculty to discuss why CO<sub>2</sub> is used for pneumoperitoneum. Discuss different methods of inducing the pneumoperitoneum.

Learners to use and handle Veress needle – discuss pros and cons of using this to induce the pneumoperitoneum.

Discuss port placement for lap appendix. Use 0 degree and 30 degree scopes to visualise the introduction of the ports – use the angulation of the scope to view the underside of the abdominal wall.

### Task 1: Object transfer (10 mins)

Set up 2 gallipots in each box trainer – one filled with a variety of different shaped object (fluffy ball, foam shapes, beads, smarties etc.)

Task is to transfer the objects from one pot to another. Ask the learners to pick up with left hand, transfer to right hand in mid air and then deposit the object with right hand. This allows development of non-dominant hand skills.

Additional points – Get the learners to look at the different graspers – the difference in tips between a dissector eg. Maryland and a grasper eg. Johann. Difference between jaws of an Endodissect and Endograsp. Look at the ratchet mechanism – discuss when you might want the ratchet on / off. Look at which instruments have an attachment for diathermy.

### Task 2: Precision movements (10 mins)

Set up polo mints inside box trainer with string and pipe cleaners. Task is for the learners to thread the polo mints onto the pipe cleaner and onto the string.

Additional points – Learners to look at rotating wheel on the instruments and to use this to align and thread the polo mints onto the string

### Task 3: Cutting and counter traction (10 mins)

Take 2 non-sterile latex gloves and place one inside the other. Inflate both gloves together like a balloon so that one glove is inflated inside the other. Seal the air into the gloves by placing a plastic bag tag around the wrist part of the glove. With the permanent marker pen draw a circle onto the top glove. Place this inside the box trainer.

The task is for the learners to cut out the circle shape form the top glove without piercing the bottom glove. They should use left hand counter traction to achieve this task.

### Task 4: Depth perception and fine control (15 mins)

Place 10 sugar cubes inside the box trainer – the challenge is to make the highest tower – set this as a competition between learners.

7 sugar cubes on average is achievable.

### Task 5: Laparoscopic appendicectomy (40 mins)

Faculty to mount lap appendicectomy model onto soft tissue retainer and place into box trainer.

Faculty may need to explain steps of laparoscopic appendicectomy to learners before commencing this task depending upon seniority of the learners.

Learners will use Endoclips on appendicular artery

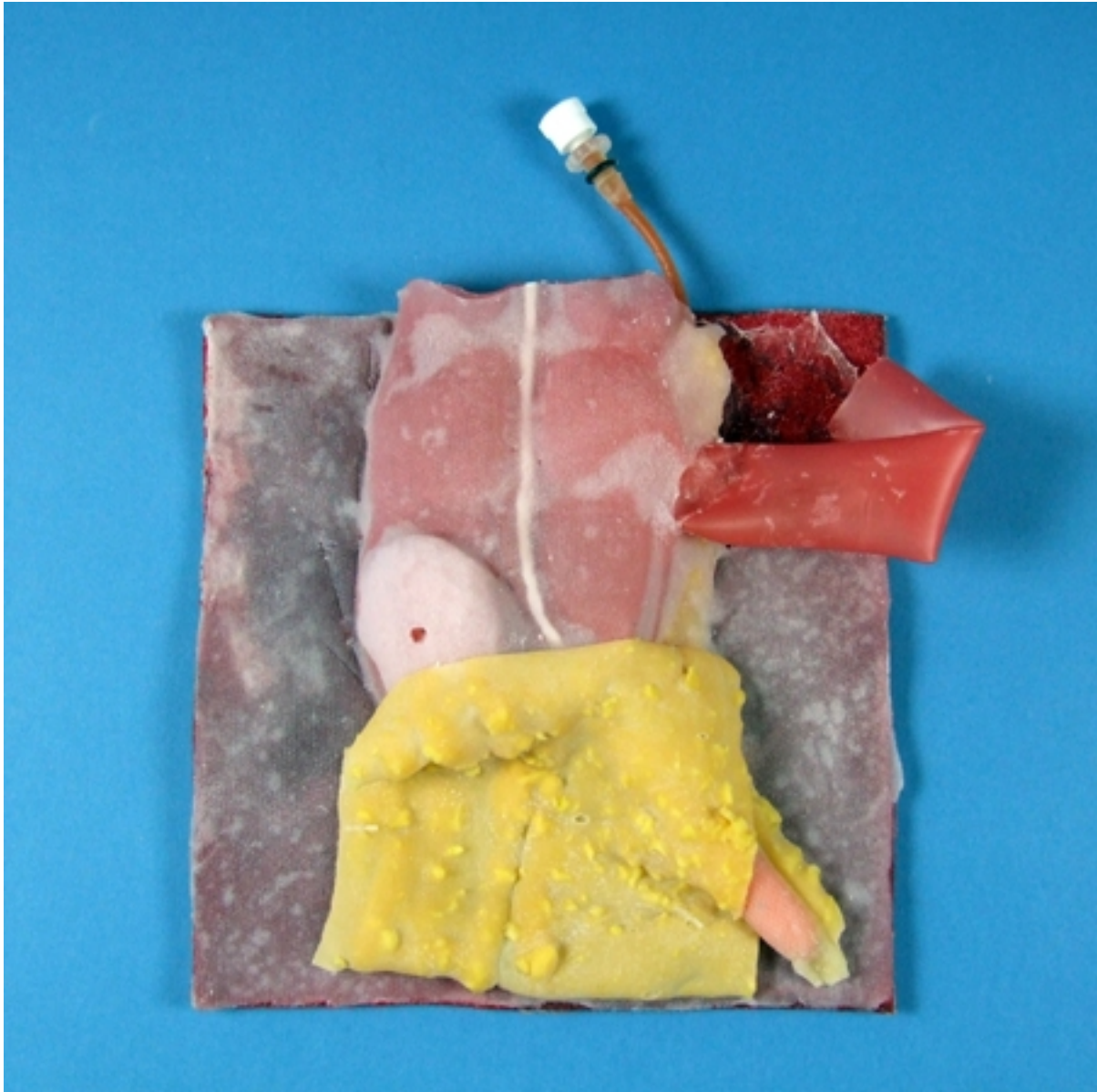
Learners will use Endoloops on appendix

A Burt bag may be used for appendix retrieval.

**ADDITIONAL INFORMATION**

## Limbs and Things Laparoscopic Appendicectomy model

This model had green liquid inside appendix so that if there is a leak from the appendix stump the learner will become aware. The appendicular artery contains red liquid 'blood' this may be attached to a blood pump via the luer lock connection.

**DEBRIEFING****DEBRIEFING RESOURCES**

There is a PBA for laparoscopic appendicectomy that may be used in modified form during this simulation.

General Surgery PBA: Appendicectomy		
Trainee:	Assessor:	Date:
Assessor's Position*:	Email (institutional):	GMC No:
Duration of procedure (mins):	Duration of assessment period (mins):	Hospital:
Operation more difficult than usual? Yes / No (If yes, state reason)		<input type="checkbox"/> Tick this box if this PBA was performed in a <b>Simulated setting</b> .

\* Assessors are normally consultants (senior trainees may be assessors depending upon their training level and the complexity of the procedure)

**IMPORTANT:** The trainee should explain what he/she intends to do throughout the procedure. The Assessor should provide verbal prompts if required, and intervene if patient safety is at risk.

**Rating:**

**N** = Not observed or not appropriate

**D** = Development required

**S** = Satisfactory standard for CCT (no prompting or intervention required)

Competencies and Definitions		Rating N/D/S	Comments
<b>I. Consent</b>			
C1	Demonstrates sound knowledge of indications and contraindications including alternatives to surgery		
C2	Demonstrates awareness of sequelae of operative or non operative management		
C3	Demonstrates sound knowledge of complications of surgery		
C4	Explains the procedure to the patient / relatives / carers and checks understanding		
C5	Explains likely outcome and time to recovery and checks understanding		
<b>II. Pre operation planning</b>			
PL1	Demonstrates recognition of anatomical and pathological abnormalities (and relevant co-morbidities) and selects appropriate operative strategies / techniques to deal with these		
PL2	Demonstrates ability to make reasoned choice of appropriate equipment, materials or devices (if any) taking into account appropriate investigations e.g. x-rays		
PL3	Checks materials, equipment and device requirements with operating room staff		
PL4	Ensures the operation site is marked where applicable		
PL5	Checks patient records, personally reviews investigations		
<b>III. Pre operative preparation</b>			
PR1	Checks in theatre that consent has been obtained		
PR2	Gives effective briefing to theatre team		
PR3	Ensures proper and safe positioning of the patient on the operating table		
PR4	Demonstrates careful skin preparation		
PR5	Demonstrates careful draping of the patient's operative field		
PR6	Ensures general equipment and materials are deployed safely (e.g. catheter, diathermy)		
PR7	Ensures appropriate drugs administered		
PR8	Arranges for and deploys specialist supporting equipment (e.g. laparoscopic stack, image intensifiers) effectively		
<b>IV. Exposure and closure</b>			
E1	Demonstrates knowledge of optimum skin incision / portal / access		
E2	Achieves an adequate exposure through purposeful dissection in correct tissue planes and identifies all structures correctly		
E3	Completes a sound wound repair where appropriate		

E4	Protects the wound with dressings, splints and drains where appropriate		
<b>V. Intra operative technique: global (G) and task-specific items (T)</b>			
IT1(G)	Follows an agreed, logical sequence or protocol for the procedure		
IT2(G)	Consistently handles tissue well with minimal damage		
IT3(G)	Controls bleeding promptly by an appropriate method		
IT4(G)	Demonstrates a sound technique of knots and sutures/staples		
IT5(G)	Uses instruments appropriately and safely		
IT6(G)	Proceeds at appropriate pace with economy of movement		
IT7(G)	Anticipates and responds appropriately to variation e.g. anatomy		
IT8(G)	Deals calmly and effectively with unexpected events/complications		
IT9(G)	Uses assistant(s) to the best advantage at all times		
IT10(G)	Communicates clearly and consistently with the scrub team		
IT11(G)	Communicates clearly and consistently with the anaesthetist		
IT12(T)	Performs exploration of the right iliac fossa in a logical fashion		
IT13(T)	Mobilises appendix safely		
IT14(T)	Achieves secure haemostasis of mesoappendix then divides this safely		
IT15(T)	Divides the appendix safely with appendix stump secured		
IT16(T)	Examines the omentum, terminal ileum and pelvic organs when the appendix is found to be macroscopically normal		
IT17(T)	Manages intraperitoneal contamination at end of procedure appropriately		
<b>VI. Post operative management</b>			
PM1	Ensures the patient is transferred safely from the operating table to bed		
PM2	Constructs a clear operation note		
PM3	Records clear and appropriate post operative instructions		
PM4	Deals with specimens. Labels and orientates specimens appropriately		

**Global Summary**

Level at which completed elements of the PBA were performed on this occasion	Tick as appropriate
Level 0 Insufficient evidence observed to support a summary judgement	
Level 1 Unable to perform the procedure, or part observed, under supervision	
Level 2 Able to perform the procedure, or part observed, under supervision	
Level 3 Able to perform the procedure with minimum supervision (needed occasional help)	
Level 4 Competant to perform the procedure unsupervised (could deal with complications that arose)	

Comments by Assessor (including strengths and areas for development):	
Comments by Trainee:	
Trainee Signature:	Assessor Signature:

Assessor training?                     No  
     Written  
     Web/CD  
     Workshop

Time taken for feedback                ..... mins



**SURGERY > TECHNICAL SCENARIO 4 > LAPAROSCOPIC APPENDICECTOMY****INFORMATION FOR PARTICIPANTS**

This skills simulation has introduced you to the instruments and techniques of laparoscopic surgery. Further practice is now required to improve economy of movement and efficiency as well as to experience real tissue handling.

**KEY POINTS**

Correct port placement is essential to adequate access.

Use appropriate instruments for the task – think about instrument design and which would be best utilised.

Consider using the ratchet to aid retraction.

2 clips or Endoloops on the tissue that will remain in the patient rather than the part that will be excised.

**RELEVANCE TO THE CURRICULUM****Module 3**

Principles of surgical endoscopy (laparoscopy)

Patient safety

## PARTICIPANT REFLECTION

What have you learned from this experience? (Please try and list 3 things)

How will you be able to put into practice what you have learned?

Which skills were your particular strengths?

Which were your weaker skills where you need further practice?



**PARTICIPANT FEEDBACK**

Date of training session:.....

Learner level:.....

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
I found this simulation useful					
I understand more about the simulation subject					
I have more confidence to deal with this condition					
The material covered was relevant to me					

Please write down one thing you have learned today, and that you will use in your clinical practice.

How could this scenario be improved for future participants? This is especially important if you have ticked anything in the disagree/strongly disagree box.

**FACULTY DEBRIEF – TO BE COMPLETED BY FACULTY TEAM**

What went particularly well during this scenario?

What did not go well, or as well as planned?

Why didn't it go well?

How could the scenario be improved for future participants?