

# **University of Toronto**

## **Fourth Annual Endoscopic Simulation Course**

**June 23 – 30, 2014**

Allan Waters Family Simulation Centre  
Li Ka Shing Knowledge Institute  
St. Michael's Hospital

Endoscopic simulation labs  
Peters-Boyd Academy  
Sunnybrook Hospital

### **Course manual**

## **University of Toronto Endoscopic Simulation Course**

### **June 23 - 30, 2014**

This course manual will introduce you to the fourth iteration of the Endoscopic Simulation Course, hosted by the Division of Gastroenterology at the University of Toronto.

The endoscopic simulation course is a two-day course designed to teach you the basics of gastroscopy and colonoscopy through didactic lectures and one-on-one instruction on the EndoVR (CAE Healthcare) high-fidelity virtual reality endoscopic simulator. The course will be delivered at the end of the PGY1 academic year to provide the general surgery resident with the knowledge and technical skill set to begin these endoscopic procedures on patients in the following academic year. There will be supervised one-on-one sessions by academic gastroenterologists who will provide direct feedback on the simulator.

The course will take place over 2 days from Monday June 30 to Wednesday July 2, 2014 at the Allan Waters Family Patient Simulation Centre at the Li Ka Shing Knowledge Institute of St. Michael's Hospital (30 Bond Street) and at the Simulation Labs at Sunnybrook Hospital (2075 Bayview Avenue). At St. Michael's Hospital, the endoscopic simulation facility is located on the B1 level of LKSKI (located on the north side of Shuter St. across from the main hospital building). At Sunnybrook, the endoscopic simulators are housed at the Peters Boyd Academy of Medicine on the 3<sup>rd</sup> floor of the E-wing.

You will receive a detailed schedule by e-mail of activities. Please arrive promptly to the simulation lab at your assigned location (either St. Michael's Hospital or Sunnybrook) and time. The course will last 2 consecutive days and will be approximately 5-7 hours per day. You will be provided with individualized schedules on arrival. You are welcome to wear surgical scrubs or casual attire. Please bring your hospital ID badges and note-taking material as you see fit.

This iteration of the course is running concurrently with studies on transfer of endoscopic skills with an endoscopic simulation curriculum. Your participation in these studies is completely voluntary and will not impact your participation in our endoscopic course.

On the first day of course, you will be expected to complete a pre-test that assesses your baseline endoscopic knowledge and skills. The pre-test consists of a 30 minute multiple choice test to assess baseline knowledge, a 30 minute test on the Virtual Reality endoscopic simulator, as well as a 45 minute integrated scenario with the virtual reality endoscopic simulator and standardized patient. These tests will be repeated at the end of the course to assess your improvement in endoscopic knowledge and skill. After completion of the pre-test, residents will undergo two hours of a didactic learning session and a total of six hours of supervised practice time on the virtual reality endoscopic simulator over the course of two days. Note that evaluations completed as part of this course are solely for the purpose of feedback and research (voluntary). Your performance will have no bearing on evaluations for residency.

**Course directors:**

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**Faculty:**

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**Research assistants/Simulation Experts**

**Allan Waters Family Patient Simulation lab:**

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**The Peters-Boyd Academy of Medicine Endoscopic Simulation Lab:**

Mr. Michael Scaffidi [scaffidim@smh.ca](mailto:scaffidim@smh.ca)

**For urgent issues during course, send text message to Mr. Scaffidi at 416-807-3228**

## **COURSE LEARNING PLAN**

### **LEARNING OBJECTIVES**

#### **What you will learn to do:**

1. Integrate knowledge from core lectures on endoscopy knowledge and skills with practical endoscopic skills imparted in small-group sessions on virtual reality simulators, one-on-one endoscopic sessions with experts and unsupervised endoscopic practice, in order to safely perform a simulated gastroscopy and colonoscopy.
2. Translate this knowledge to an integrated endoscopic scenario encounter with a standardized patient and the virtual reality simulator.

#### **Your performance will be successful when you:**

1. describe the various endoscopic modalities performed by the gastroenterologist
2. identify the indications for the following endoscopic procedures: gastroscopy, colonoscopy, flexible sigmoidoscopy, endoscopic retrograde cholangiopancreatography, endoscopy ultrasound
3. identify absolute contraindications for the above endoscopic procedures
4. identify alternatives to endoscopic procedures and the rationale for their use
5. describe the roles of the health care staff involved in endoscopic procedures, including the endoscopic nurse and other endoscopy staff
6. prepare an endoscope for use and identify the components of the endoscopic tower, including monitor, processor, light source, water bottle, suction and commonly used auxiliary devices
7. identify the location and use of the buttons, dials, channel(s), and locks of the endoscope
8. identify the specialized gastroscopes and colonoscopes including ultraslim gastroscopes, variable-stiffness colonoscopes, pediatric colonoscopes, therapeutic gastroscopes and dual-channel instruments
9. indicate the risks of gastroscopy, colonoscopy, flexible sigmoidoscopy and ERCP
10. perform an informed consent for gastroscopy, colonoscopy, flexible sigmoidoscopy and ERCP
11. indicate the components of an informed consent for endoscopic procedures
12. appropriately administer sedation for a simulated endoscopy with knowledge of the types of sedation medications, indications, and risks of sedation
13. identify the complications of gastroscopy and colonoscopy
14. indicate the components of pre-procedure and intra-procedure monitoring for gastroscopy and colonoscopy
15. perform a simulated gastroscopy including esophageal intubation, pyloric intubation, visualization of the retroperitoneal duodenum and retroflexion in the stomach, with identification of endoscopic landmarks

16. perform simulated endoscopic biopsies of the foregut with knowledge of the
17. identify the indication and procedure of performing a digital rectal examination prior to colonoscopy
18. perform a simulated colonoscopy including navigation of the rectum, recto-sigmoid junction, sigmoid colon, sigmoid-descending junction, descending colon, splenic flexure, transverse colon, hepatic flexure, ascending colon and cecum
19. perform retroflexion in the rectum
20. identify cecal landmarks including the appendiceal orifice and terminal ileal orifice
21. identify the importance of a bowel preparation during colonoscopy and grade the quality of a bowel preparation during a simulated endoscopy using commonly used grading schemes
22. demonstrate respect for a patient's privacy and dignity during endoscopic procedures
23. demonstrate good communication with the patient and endoscopic nurse during a simulated endoscopy
24. demonstrate the principle of torque-steering during colonoscopy
25. identify loop-formation during a simulated colonoscopy and perform strategies for loop removal
26. identify non-progression in simulated colonoscopy and correctly implement strategies to allow scope progression, including position change, loop removal and abdominal pressure
27. demonstrate cannulation of the terminal ileum in simulated colonoscopy
28. perform adequate suction of fluid during simulated colonoscopy
29. identify the strategies for polyp removal and the indications for colonic endoscopic mucosal resection of polyps
30. perform a simulated polypectomy of a small colonic polyp
31. identify the components of post-procedural monitoring and signs and symptoms of complication from endoscopy
32. correctly convey the results of an endoscopic procedure and an after-care plan to patients
33. correctly assemble the endoscopic bleeding cart
34. identify equipment commonly used for endoscopic hemostasis including injection catheters, endoclips, bipolar electrocautery ("gold" probe or BiCAP), thermal devices, argon plasma coagulation and cryotherapy (Polar Wand), Hemospray, Edlich tube and balloon tamponade tubes
35. describe the principles of emergency endoscopy, indications for emergency endoscopy
36. recognize failure of endoscopic hemostasis
37. describe indications for angiographic and surgical methods of controlling gastrointestinal bleeding
38. identify commonly seen endoscopic lesions of the foregut including esophageal strictures, esophageal varices, esophagitis, esophageal ulcers, gastric ulcers, gastric erosions, duodenal ulcers, Brunner's gland hyperplasia, celiac disease, gastric metaplasia of the duodenum

39. identify commonly seen endoscopic lesions of the hindgut including diverticulosis, strictures, rectal ulcers, hemorrhoids, colitis, polyps, carcinomas, terminal ileitis, and other lesions

**You will demonstrate your competence:**

1. by performance on a “post-test” consisting of an integrated scenario with a standardized patient
2. by performance on simulator-collected metrics including pain-scores, length of insertion, percentage of mucosa visualized

**Course components:**

1. Lectures (2 hours) including small-group sessions on gastroscopy and colonoscopy with the virtual reality simulator
2. Supervised one-on-one simulated endoscopy on the Accutouch with expert endoscopists (6 hours)

**Didactic lectures:**

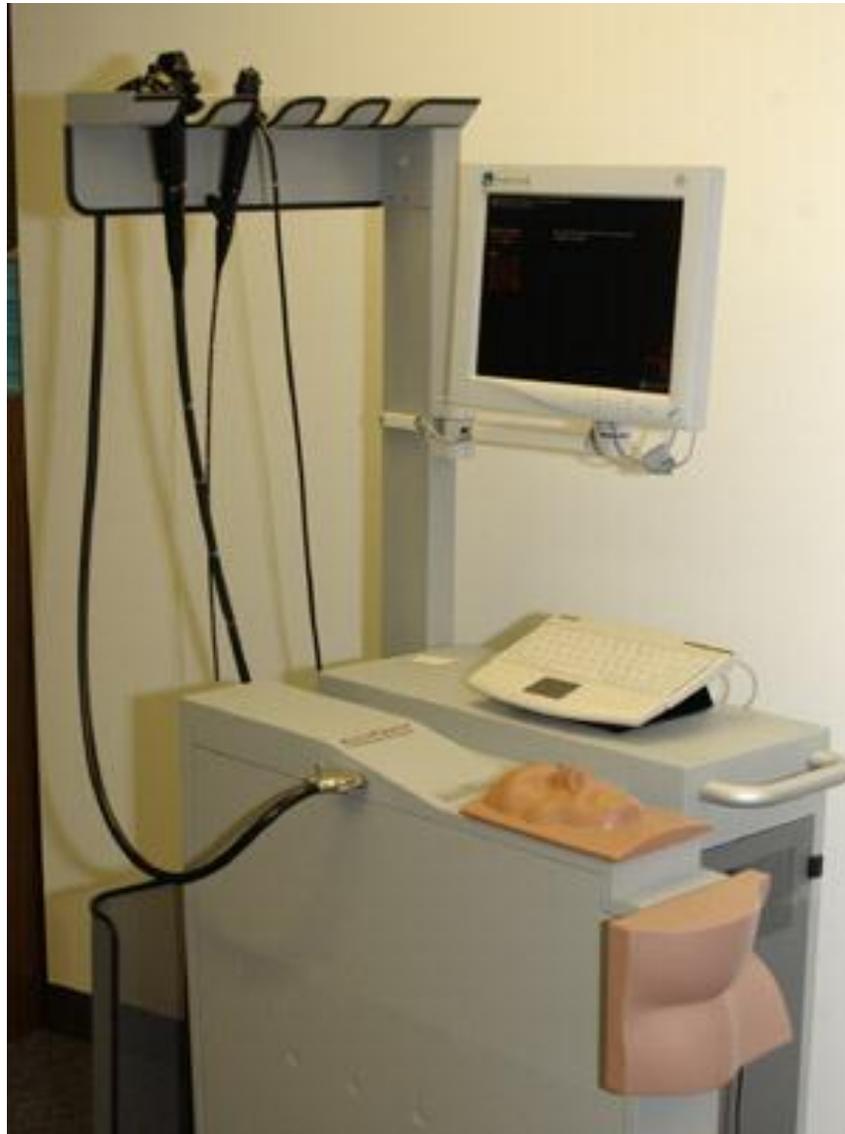
- A. Introduction to endoscopy (30 minutes)
  - (i) Description of basics of endoscopic procedures: gastroscopy, colonoscopy, flexible sigmoidoscopy, enteroscopy, ERCP and EUS
  - (ii) Fibre-optics, processors and scope handling, processing, and storage
  - (iii) Principles of sedation
  - (iv) Description of endoscope elements (buttons, dials, channel)
- B. Gastroscopy (30 minutes)
  - (i) Procedure indications, pre-procedure management
  - (ii) Risks of procedure, elements of consent, details of sedation
  - (iii) Intubation of esophagus – procedure
  - (iv) Visualization of stomach and retroflexion
  - (v) Pyloric intubation
  - (vi) Visualization of duodenal cap and post-bulbar duodenum
  - (vii) Endoscopic biopsies – technique
- C. Colonoscopy (30 minutes)
  - (i) Procedure indication
  - (ii) Risks of procedure, elements of consent, details of sedation
  - (iii) Review of contraindications
  - (iv) Pre-procedure and peri-procedure management – bowel preparation, maintenance of patient comfort, dignity and privacy, monitoring during procedure, communication with nurses and endoscopic assistants
  - (v) Perianal and digital rectal examination and endoscope insertion

- (vi) Torque steering
- (vii) Prevention of looping and loop reduction
- (viii) Transabdominal pressure and change in body position
  - (ix) Colonoscopic landmarks
  - (x) Reduction of common loops: alpha loops, reverse alpha loops and gamma loops
  - (xi) Terminal ileum intubation
  - (xii) Rectal retroflexion
- (xiii) Post-procedure management: communication of findings, therapeutic results, follow-up of findings

D. Endoscopic hemostasis (30 minutes)

- (i) Identification of common bleeding lesions
- (ii) Techniques for injection of epinephrine
- (iii) Electrocautery
- (iv) Endo-clips
- (v) Variceal ligation

**Figure 1:** The high-fidelity simulator, the EndoVR endoscopic simulator (CAE Healthcare, Montreal, Quebec) is a computerized combined haptic-visual virtual reality endoscopic simulator and will be used for the simulated endoscopy component of this course. The simulator is shown below:



APPENDIX B

HIGH FIDELITY VIRTUAL REALITY SIMULATOR



Video Monitor

Modified Colonoscope



Colonic Lumen of a  
Virtual Patient Depicted  
on Video Monitor

**Figure 2:** Virtual reality Colonoscopy Simulator (EndoVR System, CAE Healthcare, Montreal PQ) which models navigation through a colon, using a specialized colonoscope that is inserted into a computer-based module with a screen showing the colonic lumen of a virtual patient.

## APPENDIX C

### INTEGRATED SCENARIO



Source: Kneebone RL, Nestel D, Moorthy K, Taylor P, Bann S, Munz Y and Darzi A. Learning the skills of flexible sigmoidoscopy – the wider perspective. *Medical Education*; 2003;37(s1):50-58.

**APPENDIX D: JAG's Colonoscopy Summative DOPS Assessment Form**



**Joint Advisory Group  
on GI Endoscopy**

**Summative DOPS Assessment Form**  
Colonoscopy and Flexible Sigmoidoscopy

Colonoscopist

Trainer / Peer

Date (DD/MM/YYYY)

**Scale and Criteria Key**

- 4 Highly skilled performance
- 3 Competent and safe throughout procedure, no uncorrected errors
- 2 Some standards not yet met, aspects to be improved, some errors uncorrected
- 1 Accepted standards not yet met, frequent errors uncorrected
- n/a Not applicable
  - Major Criteria
  - Minor Criteria

Criteria	Score	Comments
<b>Assessment, consent, communication</b> <ul style="list-style-type: none"> <li>■ Obtains informed consent using a structured approach                             <ul style="list-style-type: none"> <li>○ Satisfactory procedural information</li> <li>○ Risk and complications explained</li> <li>○ Co-morbidity</li> <li>○ Sedation</li> <li>○ Opportunity for questions</li> </ul> </li> <li>■ Demonstrates respect for patient's views and dignity during the procedure</li> <li>■ Communicates clearly with patient, including outcome of procedure with appropriate management and follow up plan. Full endoscopy report.</li> </ul>		
<b>Safety and sedation</b> <ul style="list-style-type: none"> <li>■ Safe and secure IV access</li> <li>■ Gives appropriate dose of analgesia and sedation and ensures adequate oxygenation and monitoring of patient</li> <li>■ Demonstrates good communication with the nursing staff, including dosages and vital signs</li> </ul>		
<b>Endoscopic skills during insertion and procedure</b> <ul style="list-style-type: none"> <li>□ Checks endoscope function before intubation</li> <li>□ Performs PR</li> <li>■ Maintains luminal view / inserts in luminal direction</li> <li>■ Demonstrates awareness of patient's consciousness and pain during the procedure and takes appropriate action</li> <li>□ Uses torque steering and control knobs appropriately</li> <li>□ Uses distension, suction and lens washing appropriately</li> <li>■ Recognises and logically resolves loop formation</li> <li>□ Uses position change and abdominal pressure to aid luminal views</li> <li>□ Completes procedure in reasonable time</li> </ul>		
<b>Diagnostic and therapeutic ability</b> <ul style="list-style-type: none"> <li>■ Adequate mucosal visualisation</li> <li>■ Recognises caecal/desc. colon landmarks or incomplete examination</li> <li>■ Accurate identification and management of pathology</li> <li>■ Uses diathermy and therapeutic techniques appropriately and safely</li> <li>■ Recognises and manages complications appropriately</li> </ul>		

**Case Difficulty**

Extremely easy	Fairly easy	Average	Fairly difficult	Very challenging
1	2	3	4	5

**Learning objectives for next cases**

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Joint Advisory Group  
on GI Endoscopy

## Summative DOPS Assessor Declaration Colonoscopy and Flexible Sigmoidoscopy

This declaration is to be completed by the assessor to support the DOPS Criteria form (page one).

### DOPS STANDARDS

#### Major domains

- I declare that the candidate received a Grade 3 or Grade 4 on all 14 major domains
- I declare that there are no Grade 1 or Grade 2 scores in any of the 14 major domains.

#### Minor domains

- I declare that the candidate received **no more than six** Grade 2 scores across all four DOPS Criteria forms in any of the six minor domains
- I declare that there are no Grade 1 scores in any of the six minor domains.

### CONFIDENTIAL - EXPERT GLOBAL EVALUATION

In order to help with setting standards and validating the process, please give your expert global assessment **independent** of the above grading. In other words, do you personally judge that the candidate is ready to become an independent endoscopist in the area of colonoscopy / flexible sigmoidoscopy (delete as appropriate)?

Please check one of the two boxes below.

- The candidate **should** be certified for colonoscopy / flexible sigmoidoscopy (delete as appropriate)
- The candidate **should not yet** be certified for colonoscopy / flexible sigmoidoscopy (delete as appropriate)

### ASSESSOR SIGN OFF

I certify that \_\_\_\_\_ GMC no \_\_\_\_\_

- Meets the DOPS criteria outlined on page one
- Meets the minimum DOPS standards above

Assessor

GMC number

### ASSESSOR REQUIREMENT

#### Upper GI Endoscopy, Flexible Sigmoidoscopy and Colonoscopy

When a trainee is considered by the trainer to be ready to sit the DOPS assessments, those assessments (four observed case judgments) can be carried out in any combination of ways that fulfil the following criteria

1. Minimum of two assessors
2. Minimum of two cases
3. Minimum of four DOPS (observations and judgments)
4. Within a month
5. No assessor is the current primary endoscopic trainer

All DOPS must meet the criteria, if one does not, then the DOPS process (four observed case judgments) must start again.

So this could result in the four DOPS being completed as below (or a variation of the below):

- as a 2 x 2 process simultaneously = 2 assessors over 2 cases
- as a 2 x 2 process sequentially = 2 assessors over 4 cases
- as a 2 x 1 x 1 process = 3 assessors over 4 cases
- as a 1 x 1 x 1 x 1 process = 4 assessors over 4 cases

#### Advanced therapeutics, emergencies, or low-volume specialist procedures

The relative infrequency of some of these procedures, or the urgent nature of them, or the rarity of trainers (eg. in EUS) may mean that it is impractical to exclude the trainee's primary endoscopic trainer as an eventual assessor, criterion five above. This is therefore not a criteria for these procedures currently. The JAG will issue further guidance on assessment of these modalities in the near future. In the meantime, we strongly advise trainees to have a DOPS completed on all therapeutic procedures.

**APPENDIX E**

**INTEGRATED SCENARIO GLOBAL RATING FORM**

Expert evaluator \_\_\_\_\_

Participant # \_\_\_\_\_

A.		Below expectations for starting clinical duty			Borderline for starting clinical duty	Meets expectations for starting clinical duty	Above expectations for starting clinical duty			Unable to comment
		1	2	3		4	5	6	7	
1	Introduction/establish rapport	1	2	3		4	5	6	7	
2	Explanation of intervention including patient's consent to proceed	1	2	3		4	5	6	7	
3	Assessment of patient's and parent's needs before procedure	1	2	3		4	5	6	7	
4	Preparation for procedure	1	2	3		4	5	6	7	
5	Technical performance of procedure	1	2	3		4	5	6	7	
6	Maintenance of asepsis	1	2	3		4	5	6	7	
7	Awareness of patient's and parent's needs during procedure	1	2	3		4	5	6	7	
8	Closure of the procedure including explanation of follow-up care	1	2	3		4	5	6	7	
9	Clinical safety	1	2	3		4	5	6	7	
10	Professionalism	1	2	3		4	5	6	7	
11	Overall ability to perform the procedure (including technical and professional skills)	1	2	3		4	5	6	7	

B. How would you rate the candidate's performance (circle one)

Incompetent

Borderline

Competent