Guidelines

For

Competency Based Training Programme

in

FNB- Minimal Access Surgery

2021

NATIONAL BOARD OF EXAMINATIONS IN MEDICAL SCIENCES
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Table of Content

I. Preamble

The goal of the MAS Fellowship is to provide the fellow with the necessary training and education to be comfortable in the performance of a wide variety of minimally invasive access surgery procedures.

1. The fellow is exposed to the broad applications of minimally access surgery as outlined below.

2. The fellow will have opportunity to learn basics of clinical research.

3. The fellow will be provided with the necessary stimuli to pursue a successful career in MAS and to be able to set up a practice/join an academic career upon completion of the Fellowship.

II. Objectives

1. Demonstrate an understanding of the applications and risks of minimal access surgery (MAS).
2. To learn the indications, contraindications and limitations of MAS.
3. To demonstrate an understanding of the technical and physiologic principles of minimal access surgical techniques.
4. To master the tactile sensation, hand and eye co-ordination and the three dimensional depth perception while working in a three dimensional space.
5. Develop specific technical skills and demonstrate proficiency in performance of basic laparoscopic procedures and certain advanced minimal access procedures pertaining to General surgery.
6. Sterilization and maintenance of instruments and video equipment's, documentation, storage of data and presentation.
7. Anaesthesia in laparoscopic surgery.
8. Troubleshooting in MAS
9. Synthesize the principles of minimal access surgery into a practice philosophy conducive to the development and evaluation of future surgical techniques.
10. A knowledge of the basic sciences related to general surgery including relevant specialist applied anatomy.
11. An understanding of the particular requirements of day case surgery.
12. A knowledge of palliative care.
13. A knowledge of subjects such as medical ethics, health economics, medico-legal matters, risk management, medical statistics, information technology and health service management.
14. A knowledge and experience of clinical audit.
15. An understanding of research methods.
16. Knowledge and understanding of soft skills in day-to-day surgical practice
17. Communication skills

Expectations from all candidates

1. Demonstrate manual dexterity appropriate for their training level.
2. Critically evaluate and demonstrate knowledge of pertinent scientific information.

3. Practice-based learning and improvement that involve investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, and improvements in patient care
4. Present and review current literature at Journal Clubs.
5. Actively participate at local, regional and National seminars and conferences.
6. Maintain high standards of ethical behaviour.
7. Demonstrate sensitivity to age, race, gender, and culture of patients and other health care professionals.
8. Practice high-quality, cost-effective patient care.
9. Demonstrate knowledge of risk-benefit analysis.
10. Patient safety and hospital safety aspects of surgical training

III. Syllabus/Course Curriculum

The minimal access training program should include

1. **Soft Skill Development**

   i. To develop familiarization with equipment, Knotting and suturing Techniques, basic knowledge of instrumentation and Energy Sources and learning basic surgical procedures in lab.

   ii. Minimum of log book certified 8-10 hours'/month practice on Trainer in the Training Center in the beginning of the training for the first six months (the training should be continued throughout the duration of course with the type of training model differing based on the experience and exposure of the candidate - first 6 months/next 6 month and so on)

   iii. Thereafter suturing practice of total of 30 hours on any trainer which should be certified by the consultant with a log book.

2. **Presentation, Publications & Project Work**

   i. Under faculty guidance, presentations for local, regional & national and International conferences.

   ii. Essential requirements

   iii. Minimum two presentations per year State/ National conferences

   iv. Minimum two publications at least one should be original research work (Pubmed indexed / DOAJ /Embase based as per MCI requirement) or 4 presentations in National or 1 International Oral presentation will be treated equal to 3 National presentations

3. **Video Learning, Grand Rounds, Faculty Discussions**

   i. Review of recorded surgical procedures with Faculty input.

   ii. Recording and editing of Videos

   iii. Specific/specialized Surgery Grand Round/Clinical Case Conference, Journal Club and Round Table Discussions (at least 2 /week of 1 hour each), schedule should be available for the whole year with one faculty as moderator of the session

iv. Round table meets and seminars will routinely update the academic content of the programme. This will be supplemented with Clinical Learning, through outpatient clinics, ward rounds and presentations and operative experience in the form of assisting and being proctored over surgical procedures

v. Monthly Clinical Audit

4. **Sessions in Imaging Clinics**

i. Learning of Ultrasound, CT scan, MRI & Various Procedures

5. **Operative Sessions**

i. A Candidate is expected to maintain certified Log book indicating number of cases assisted or individually operated under the guidance of faculty or independently.

6. **Rotation**

i. Training programme in MAS should be in a multidisciplinary centre of MAS to enable adequate exposure to the subspecialties in MAS.

ii. A candidate during his tenure of two years should have rotation in Gastroenterology (endoscopy-15 days) and 1-month bariatric surgery, if this is not available in the unit where the fellowship is being undertaken.

iii. If there are multiple units/departments in the Institute doing MAS, then a rotation policy should be there in units which are recognised by NBE for FNB training and rotation is required if units are engaged in a specific type of work. All these aspects of all-round exposure of the candidates to all aspects of MAS should be sorted out before applying for the FNB and at the time of inspection by the FNB appointed assessors.

iv. A candidate should be given an option of visiting any other center/ Institute in the country or outside the country (on his own expense) for exposure in a new area of MAS or where his exposure is less, for a period of 4 weeks in the entire two-year course.

v. Attendance for the entire course duration should be more than 80% which would be the criteria for giving exams Health related issues and inability to complete the term sanctioning would be at the discretionary of the NBE. Leave rules as applicable by NBE otherwise

IV. Portfolio Management

All candidates will maintain a PORTFOLIO

Two monthly review of following topics by faculty will include (RITA – Regular In training Assessment)

1. Log Book – Regular OT work & Lab Work
2. Presentations
3. On-going Publications
4. Number of hours spent on hands on practice
5. Summaries of case discussions and presentations.
6. Synopsis of publications.

Log book, presentation will be signed & evaluated on a time-to-time basis by respective faculties and would be kept as internal marks / assessment for final evaluation at the end of the course by the examiners

6 monthly formative assessment and promotion to the next level- For the final examination- the details of this to be provided by NBE and report to be sent to NBE

Minimal Access Surgery Modules

Anaesthetic considerations in MAS	
Troubleshooting in MAS	• Cause of Poor insufflations • Reason for excessive pressure for insufflation • Reasons for inadequate/too bright lighting • Reasons for loss of picture/poor quality pictures /fogging / haze • Reasons for flickering electrical interference • Reasons for inadequate cauterization/inadequate irrigation and suction • Administration

Module 1	**Basic and Advanced Laparoscopic Skills** **Anaesthetic considerations in MAS** **Troubleshooting in MAS** • Cause of Poor insufflations • Reason for excessive pressure for insufflation • Reasons for inadequate/too bright lighting • Reasons for loss of picture/poor quality pictures /fogging / haze • Reasons for flickering electrical interference • Reasons for inadequate cauterization/inadequate irrigation and suction • Administration • Setting up the laparoscopic surgery unit, quality control and assurance, creating protocol for management and organizing and coordinating of clinical meetings
Module 2	**Foregut and midgut** • Esophagus • Stomach and Duodenum • Small intestine • Bariatric Surgery
Module 3	**Hindgut** • Appendix • Large intestine and Rectum
Module 4	Hepatobiliary System
Module 5	**Solid Organ** • Adrenal Gland • Pancreas (Optional) • Kidney (Optional) • Spleen
Module 6	Abdominal Wall and groin hernias
Module 7	Thoracic (optional)
Module 8	Robotic (optional)

- Endoscopy exposure essential
- Bariatric surgery essential
- Thoracic surgery exposure desirable
- Robotics exposure desirable

(Exposure is desirable in at least one out of above two)

Each Module is organized into 3 Sections:

A. **Objectives**: description of the topics the Fellow must understand and the specific knowledge to be acquired.

B. **Content**: description of the specific areas of study necessary to achieve the unit objectives.

C. **Clinical Skills**: description of the clinical activities and technical skills that are to be mastered.

1. Module 1 – Advanced Laparoscopic Skills

Objectives	Upon completion of this module the fellow will be able to understand and describe the following: • Physiology of pneumoperitoneum. • Proper selection and placement of trocars in a safe and effective manner. • Proper positioning of patients for a given procedure with emphasis on safety and • protection of patient and personnel. • Proper placement of monitors and personnel to optimize operative approach. • Proper choice of instrumentation, equipment, and energy sources. • Troubleshooting of MIS equipment including monitors, insufflator, and recording equipment. • Safe use of Energy sources with understanding of advantages and limitations of each.
Content	• Physiology of pneumoperitoneum- description of effects on the following: • Renal function • Cardiovascular function • Pulmonary function

	• Abdominal wall and Diaphragm • Laparoscopic equipment i) Monitor ii) Telescopes iii) Light cable iv) Light Sources v) Endocamera vi) Insufflator vii) Operating Table- standard, split leg viii) Trocar choices- bladed, bladeless, optical • Energy Sources i) Monopolar cautery ii) Bipolar cautery iii) Ultrasonic dissector
Clinical Skills	• Demonstrate the following: i) Laparoscopic exposure of all intra-abdominal areas, including use of retractors. ii) Proper tissue handling and use of two-handed surgical technique iii) Intracorporeal and extracorporeal laparoscopic suturing iv) Endoscopic stapling v) Intracorporeal anastomosis- linear and circular vi) Laparoscopic adhesiolysis vii) Laparoscopic running of bowel viii) Placement and fixation of prosthetic materials ix) Use and interpretation of intraoperative ultrasound (O) x) Use and interpretation of intraoperative endoscopy (O)

2. **Module 2 – Foregut and Midgut**
   Esophagus stomach and duodenum and small Intestine

Objectives	• Upon completion of this module, the Fellow will have a comprehensive understanding of the embryology, anatomy, and physiology of the Esophagus stomach and duodenum and small Intestine. The fellow will have

	expertise in the investigation and treatment of the disorders of esophagus stomach and duodenum and small intestine with a focus on minimally invasive approaches.
Content	• Embryology, anatomy, and physiology of the thoracic and abdominal esophagus and the gastroesophageal junction, stomach and duodenum and small intestine. • Physiologic and radiographic tests used in the evaluation and treatment of the disorders of the esophagus, stomach and duodenum, and small intestine. i) Esophageal manometry ii) Barium/Gastrografin swallow/ Upper gastrointestinal series iii) Gastric emptying studies iv) Computed tomography/ Magnetic resonance imaging v) pH studies and impedance • Endoscopic procedures i) Esophagogastroduodenoscopy ii) Endoscopic ultrasound (O) • Benign and malignant structural and functional disorders of esophagus, stomach and duodenum and small intestine. • Morbid obesity and its management (O)
Clinical Skills	• Identify and recognize the anatomic structures • Understand the salient features of the physiologic studies and interpret them. i) Esophageal manometry ii) Barium/Gastrografin swallow/ Upper gastrointestinal series iii) Gastric emptying and reflux studies iv) Computed tomography/ Magnetic resonance imaging v) pH studies • Describe the indication for and perform esophagogastroduodenoscopy, with biopsy (O)

	• Describe the indication for endoscopic ultrasound and interpret reports. • Describe the indications, options and potential complications of various surgical disorders of esophagus, stomach and duodenum and small intestine and procedures related to morbid obesity. • Should have seen or assisted minimally invasive procedures such as: i) Laparoscopic Heller myotomy ii) Laparoscopic hiatal hernia repair iii) Laparoscopic Fundoplication and Collis gastroplasty iv) Laparoscopic repair for perforated peptic ulcer disease (Graham patch) v) Palliative intestinal bypass for unresectable or intractable duodenal or pyloric disease vi) Laparoscopic feeding jejeunostomy vii) Small bowel resection with anastomosis viii) Laparoscopic Bariatric procedures ix) Sleeve gastrectomy x) Roux-en-Y gastric Bypass and other bariatric procedures

3. **Module 3- Hindgut**
   Appendix Colon and Rectum

Objectives	• Upon completion of this module, the Fellow will have a comprehensive understanding of the embryology, anatomy, and physiology of the Appendix Colon and Rectum. The fellow will have expertise in the investigation and treatment of the disorders of Appendix Colon and Rectum with a focus on minimally invasive approaches.
Content	• Embryology, physiology, and anatomy of the Appendix Colon and Rectum • Physiologic and radiographic tests used in evaluation of Appendix Colon and Rectum. • disorders.

	i) Contrast enema- barium or gastrograffin ii) Defecography iii) Computed tomography/MRI iv) Sigmoidoscopy/Colonoscopy v) Anal Manometry vi) Endorectal ultrasound • Benign and malignant disorders of the Appendix Colon and Rectum: epidemiology, etiology, pathophysiology, diagnosis and management.
Clinical Skills	• Identify and recognize the structures associated with the Appendix Colon and Rectum. • Interpret the significance of the reports and images pertaining to the disorders of Appendix Colon and Rectum. • Describe the indications, options and potential complications of minimally invasive procedures done for the disorders of the appendix, colon and rectum. • Should have seen or assisted minimally invasive procedures such as i) Laparoscopic appendectomy ii) Laparoscopic ileocolic and colonic resections with or without anastomosis. iii) Laparoscopic APR/Anterior resection iv) Laparoscopic rectopexy

4. Module 4 - The Hepatobiliary System
Liver, gall bladder and biliary tree

Objectives	• Upon completion of this module, the Fellow will have a comprehensive understanding of the embryology, anatomy, and physiology of the liver, gall bladder and biliary tree. • The fellow will have expertise in the investigation and treatment of the surgical disorders of liver, gall bladder and biliary tree, with a focus on minimally invasive approaches.

Content	• Embryology, physiology, and anatomy of the liver, gall bladder and biliary tree • Physiologic tests used in evaluation of disorders of liver, gall bladder and biliary tree. i) Biochemical studies ii) Tumor markers • Radiographic tests used in evaluation of disorders of liver, gall bladder and biliary tree i) Ultrasound ii) Computed tomography iii) Magnetic resonance imaging iv) Angiography v) PET scanning vi) HIDA scan vii) ERCP viii) PTC • Benign and malignant surgical disorders of the liver, gall bladder and biliary tree: etiology, pathophysiology, diagnosis and management.
Clinical Skills	• Identify and recognize the structures associated with the liver, gall bladder and biliary tree. • Interpret the significance of the reports and images from the following physiologic and radiographic studies of the liver, gall bladder and biliary tree: i) USG ii) HIDA scan iii) EUS iv) ERCP v) Percutaneous and Intraoprative cholangiography vi) Computed tomography vii) Magnetic resonance imaging viii) PET scan ix) Angiography • Describe the indications, options and potential complications of minimally invasive procedures done for the disorders of the liver, gall bladder and biliary tree.

	• Should have seen or assisted minimally invasive procedures such as i) Laparoscopic cholecystectomy ii) Laparoscopic cholangiogram iii) Laparoscopic intraoperative ultrasound iv) Laparoscopic common bile duct exploration v) Laparoscopic surgery for hydatid cyst

5. **Module – 5 Solid Organ**
Adrenal Gland, Pancreas, Kidney, Spleen

Objectives	• Upon completion of this module, the Fellow will have a comprehensive understanding of the embryology, anatomy, and physiology of the adrenal gland, Pancreas, Kidney, Spleen. The fellow will have expertise in the investigation and treatment of large intestinal disorders, with a focus on minimally invasive approaches.
Content	• Embryology, physiology, and anatomy of the adrenal gland with particularattention to blood supply. • Physiologic tests used in evaluation of disorders of adrenal, Pancreas, Kidney, Spleen, Liver. i) Biochemical studies ii) Hormone level studies iii) 24 hour urine studies iv) Haematologic studies • Radiographic test used in evaluation of adrenal, Pancreas, Kidney, Spleen, Liver disorders. i) Computed tomography ii) Magnetic resonance imaging iii) Selective venous hormonal sampling iv) MIBG scan v) PET scan vi) Intraoperative ultrasound vii) Renal scans • Embryology, physiology, and anatomy of the adrenal, Pancreas, Kidney, Spleen and

	related structures. • Benign and malignant functional and non-functional surgical disorders pertaining to adrenal, Pancreas, Kidney, Spleen: Adrenal mass: Etiology, Pathophysiology, Diagnosis, Treatment
Clinical Skills	• Identify and recognize the structures associated with the adrenal gland, Pancreas, Kidney, Spleen • Interpret the significance of the reports and radiographic studies of the adrenal, pancreas, kidney, spleen: • Describe the indications, options and potential complications of minimally invasive procedures done for the surgical disorders of the adrenal gland, Pancreas, Kidney, Spleen • Should have seen or assisted minimally invasive procedures such as i) Laparoscopic adrenalectomy ii) Laparoscopic nephrectomy iii) Laparoscopic splenectomy iv) Laparoscopic cystogastrostomy

6. Module 6- The Abdominal Wall/groin hernias

Objectives	• Upon completion of this module, the Fellow will have a comprehensive understanding of the embryology, anatomy, and physiology of the abdominal wall hernias. The fellow will have expertise in the investigation and treatment ofabdominal wall hernias with a focus on minimally invasive approaches.
Content	• Embryology and anatomy of the abdominal wall and groin. • Radiographic test used in evaluation of abdominal wall and groin hernias. i) Computed tomography ii) Magnetic resonance imaging • Etiology, Diagnosis, classification, investigations and treatment of abdominal

	wall and groin hernias including use of graft materials.
Clinical Skills	• Identify and recognize the structures associated with the abdominal wall • Interpret the images and significance of reports from the following radiographic studies of the abdominal wall. • Describe the characteristics and indications for use of the prosthetic grafts/ meshes in abdominal wall and groin hernia • Describe the indications, limitations, options and potential complications of minimally invasive procedures done for abdominal wall and groin hernia: • Should have seen or assisted minimally invasive procedures such as i) Laparoscopic inguinal hernia repair-TEP (Totally extraperitoneal hernia repair)-TAPP(Transabdominal preperitoneal hernia repair) ii) Laparoscopic ventral hernia repair iii) Be familiar with newer minimal access surgeries for ventral hernias such as eTEP, component separation, MILOS

7. Module 7: Thoracic module

Objectives	• Upon completion of this module, the Fellow will have a comprehensive understanding of the embryology, anatomy, and physiology of thoracic wall, cavity and mediastinal structures. The fellow will have exposure of non-cardiac general thoracic surgery with a focus on minimally invasive approaches.
Content	• Embryology, anatomy, and physiology of the thoracic structures including mediastinum. • Physiologic and radiographic tests used in the evaluation and treatment of the patients with disorders of the thorax.

	i) Pulmonary function tests ii) Chest Radiographs iii) Computed tomography/ Magnetic resonance imaging iv) Barium/Gastrograffin swallow/ Upper gastrointestinal series • Endoscopic procedures i) Bronchscopy • Benign and malignant structural and functional disorders of lungs, pleura, thymus, anterior and posterior mediastinum, thoracic esophagus and diaphragm. • Management of post operative problems specific to thoracic surgery such as pleural space problems, BPF, lung entrapment etc.
Clinical Skills	• Identify and recognize the thoracic anatomic structures • Understand the salient features of PFT and interpret them • Understand the salient features of the Radiological studies and interpret them. • Describe the indications, options and potential applications of MAS in the management of non-cardiac surgical disorders of thorax. • Should have seen or assisted minimally invasive procedures such as i) VATS lung biopsy ii) VATS pleural biopsy iii) VATS excision of small peripheral lung nodules iv) Thoracic sympathectomy

8. Module 8- Robotic Surgery

Objectives	• Upon completion of this unit, the Fellow will have a comprehensive understanding of the principles on which the robot works and its applications in general surgery.
Content	• Principles of robotic surgery including acquiring knowledge of the robotic set up

	and special procedures like draping, machine set up etc. • Understand and learn the technical aspects of robot functioning • Preoperative and intra op planning of surgery of a patient undergoing robotic surgery
Clinical skills	• Understand the indication and advantages of robot assisted surgery • Learn the contraindications of robotic surgery • Learn the principles of robotic surgery like port placement, console set up, robotic arm placement • Learn the principle differences from laparoscopic surgery • Assist in various surgeries conducted with robotic assistance

V. Recommended Text Books and Journals

Books

1. Mastery of Endoscopic and Laparoscopic Surgery. Nathaniel Soper, Lee Swanstrom, Steve Eubanks.
2. Laparoscopic Surgery of the Abdomen. Bruce MacFadyen, Maurice Arregui, Steve Eubanks, Doulgas Olsen.
3. Laparoscopic Surgery: Principles and Procedures. Daniel B. Jones
4. Laparoscopic Abdominal Surgery by John. N.Graber
5. Complication of Laparoscopic surgery by Robert W.Bailey
6. Atlas of surgical endoscopy by Jeffrey L.Ponsky.
7. Laparoscopic Bilary Surgery second edition by ALFRED CUSCHIERYE GEORGE BERCI
8. Tips & Techniques in Laparoscopic Surgery by Jean Louis Dulucq
9. Laparoscopic Cholecystectomy difficult cases and creative solutions by Avran Coopaman
10. Gastro International Endoscopy clinics of North America by Jacques Van Down MD
11. Laparoscopic Urologic Surgery by Leonard G.Gomella
12. Laparoscopic Surgery by Ballantyne
13. Bileduct and Bile Duct Stones by George Berci
14. Obesity Bariatric Surgery by Dulouq
15. Surgical Laparoscopy by Karl A.Zucker
16. Laparoscopic C Surgery Atlas for General Surgery by Garyc Vitale Josephs Sanfillo Jacques Pesissat
17. Laparoscopic Surgery by Eddie Joe Reddict
18. Operative Strategies in Laparoscopic Surgery by Edward .H.Phillips

19. Laparoscopic Cholecystectomy problem & solution BY David C Dunn
20. Current Techniques in Laparoscopy by David E Brooks
21. Principles of Surgery by Shwartz'S
22. Atlas of Laparoscopic Surgery by Theodoren.Pappas Edward. G.Chekan
23. Mastery of Surgery by Robert J.Baker
24. Bailey and Love's short practice of surgery 25TH edition by Norman S Williams
25. Schiff's Diseases of the Liver 10TH Edition VOL1& by Eugene R.Schiff
26. Text book of Surgery 18TH EDITION for modern surgical practice by Sabiston
27. Atlas of General Surgery by Sir Devid Carter VOLUME 1&2
28. SRB'S Manual of Surgery 3RD edition by Sriram Bhat M
29. Atlas of Biliary tract surgery by John L. Cameron
30. Mastery of surgery by Josef E Fischer Volume 1&2
31. Maingot's Abdominal Operations 11TH edition by Michael J. Zinner
32. Hamilton Bailey's emergency surgery 13TH edition by Brian W Ellis and Simon Paterson-Brown
33. 33.Text book of Operative general surgery ninth edition by margaret Farquarson and Brenden Moran
34. An Atlas of Gastroenterology by Cyrus R.Kapadia MD
35. Atlas of Colonoscopy by Helmut Messmann
36. Liver A Complete book on Hepato Pancreato Biliary Diseases by Stpehanos Hadziannis
37. Essential Surgical Practice by Butterworth Heinemann
38. Operation surgery by Charcle Rob
39. Pancreas Second edition by Hans Beger
40. Surgery of Pancreatic Tumours by Shailesh V Shrikhande
41. The Washington manual of surgery Fifth edition
42. General and vascular surgery by Jamal J.Hoballah

43. Pancreatitis: Advances in Pathobiology, Diagnosis and Treatment by R.W.Ammann
44. The Ascrs manual of Colon and Rectal Surgery by Devid E. Beck
45. Manual of Surgery by Schwartz's by Charles Brunicardi
46. Manual on Clinical Surgery by S.Das 5TH Edition
47. Netter's Gastroenterology 2ND edition by Martin H Floch
48. French's Index of Surgical Differential Diagnosis by Herold Ellis
49. Diseases of the Pancreas current surgical Therapy by Hans G Beger

Journals

INTERNATIONAL JOURNALS:

1. The International College of Surgeons
2. ELSA American Journal
3. The Journal of the Royal College of Surgeons of Edinburgh
4. The Surgeon: The Journal of the Royal College of Surgeons of Edinburgh and Ireland
5. The Journal of Colon and Rectal Surgeons of India
6. Sages Journal Grand Rounds
7. British Journal of Surgery
8. International Surgery Official Journal
9. Surgical endoscopy
10. Annals of laparoscopic and endoscopic surgery
11. Journal of laparoendoscopic and advanced surgical techniques and videoscopy

National Journals:

1. Indian Journal of Surgery
2. Journal of IAGES
3. Medical Journal Armed Forces India