

COLLEGE OF SURGEONS OF EAST, CENTRAL & SOUTHERN AFRICA



Training Curriculum Fellowship in General Surgery - FCSgen(ECSA)

2017 Edition

COSECSA, PO Box 1009, Arusha, Tanzania
Tel(+ 255) 27 2549362; E-mail: info@cosecsa.org
Website: www.cosecsa.org

Contents

General Educational Objectives of the COSECSA training program	1
Competencies Expected from the COSECSA trainee	2
Training Methods used during the COSECSA residency program	4
Teaching- Learning Methods and Materials	4
1. Progressive apprenticeship:.....	4
2. Didactic Lectures:	4
3. Tutorials:	4
4. Seminars:.....	5
5. Management sessions and case presentations:.....	5
6. Clinical conferences:	5
7. Surgical audit, mortality and morbidity meetings:.....	5
8. Clinical-pathological conferences:.....	5
9. Radiology sessions:.....	5
10. Attachment to accessory specialties:	5
11. Surgical Skills laboratory:.....	5
12. Outpatient surgical clinics:	6
13. Surgical grand rounds and Specialty lectures	6
14. Teaching in the operating theater	6
15. Journal club	6
16. External Educational Conferences	6
17. Online curriculum	6
Record Keeping	7
Admission and Graduation Requirements	7
A) Admission requirements for the MCS training.....	7
Academic requirements:	7
Non-academic requirement	7
Proficiency in English	8
B) Admission requirements for the FCS training	8
Requirements for completion of the MCS training	8

A. Program requirements:.....	8
B. Courses and workshop requirements:.....	8
Requirements for completion of the FCS training.....	8
A. Program requirements:.....	9
Mandatory course.....	9
Optional courses.....	9
Operative Experience and skill requirements:.....	9
Research projects.....	9
COSECSA Trainee Assessment Strategies.....	10
General Regulations and guidelines of Qualification.....	11
2. Training requirements.....	11
2.1 Academic.....	11
2.2: Training posts.....	12
3. Log books.....	12
4. Application to sit for examinations.....	13
5. Examination format and Conduct.....	13
1. Moderate the written question papers.....	13
The FCS and MCS examination.....	14
The Part II exam.....	14
Title of proposed programme.....	1
Mission and vision of the General Surgery programme.....	1
Philosophy of programme.....	1
General Objectives.....	2
Specific Objectives.....	2
The scope of General surgery.....	3
Goal of programme.....	4
Graduate Profile.....	4
Course sequence and timing.....	6
1st and 2nd Year:.....	6
3rd to 5th Year:.....	7
Core General Surgery Rotations.....	7
1. Gastrointestinal Surgery:.....	8

Year – 1/2:.....	8
Year – 3/4/5:	10
2. Surgical Oncology:	11
Year 2 and 3	12
Year – 4/5:	13
3. Vascular Surgery:.....	14
Overall:	14
Year – 1/2:	14
Year – 2 and 3	15
Year – 4/5:	15
4. Trauma:	15
Year – 1/2:	16
Year – 2 and 3:	16
Year – 4/5:	17
5. Anaesthesia and critical Care:.....	17
Year – 1/2:	18
Year – 3/4/5.....	18
6. Breasts and Endocrine Surgery:	19
B. Subspecialty Rotations:	20
1. Pediatric Surgery:	20
Year – 1/2:	20
Year – 3/4/5.....	21
2. Neurosurgery:	22
3. Thoracic Surgery:	22
4. Plastic Surgery:.....	23
5. Urology:.....	24
6. Orthopaedic surgery:	25
8. Radiology:	26
C. Others: Tropical Surgical Diseases:	26
2. Hospital Management:.....	27
3. Legal Implications of Surgery and Ethical considerations (see appendix):	27
4. Research and evidence-based medicine:	27

LIST OF RECOMMENDED PROCEDURES BY YEAR OF PROGRAM	44
Summary of common procedures performed by General Surgery candidates and the top 25 procedures.....	48
Gynaecology and Obstetrics.....	48
Orthopaedics.....	48
Abdominal and General Surgery.....	48
Head and Neck/ENT.....	49
Urology.....	49
Vascular surgery.....	49
Plastic and reconstructive surgery.....	49
Neurosurgery.....	49
Others.....	49
Top 25 operations.....	50
4.4	Appendix 1 Core texts and journals
51	
Required Reading during Residency	51
Critical Care.....	51
Urology.....	52
Neurosurgery.....	52
Obstetrics and Gynaecology.....	52
Orthopaedics.....	52
Paediatric Surgery.....	52
Plastics and Reconstructive Surgery.....	52
Electronic resources.....	52

General Educational Objectives of the COSECSA training program

Educational strategies are developed to produce visual, oral, and hands-on learning opportunities. These strategies are based upon the principles of adult learning and include didactic lectures, teaching rounds, interactive online materials, reading assignments, simulation training, teaching rounds on the wards, and supervised practice in pre- and postoperative care as well as in the operating room, with increasing levels responsibility and autonomy. On completion of the COSECSA postgraduate training in Surgery, the trained surgeon is expected to develop the following;

1. Basic understanding of anatomy, physiology, biochemistry, pharmacology, pathology, oncology, radiology and microbiology as it applies to the practical practice of surgery
2. The ability to practice Surgery as a consultant without supervision. This means:
 - I. A good knowledge of the principles and theory of surgery
 - II. The ability to address the patient's surgical problem in a holistic manner in the community context.
 - III. The ability to determine the need for appropriate diagnostic modalities in a cost-effective way and to interpret the results in a patient-specific manner. These modalities include laboratory tests, radiological examinations (to include sonography and other more advanced modalities) and other diagnostic procedures.
 - IV. A fundamental knowledge of the principles of medicine and therapeutics to help the physician properly understand and manage o surgical patients.
 - V. An adequate knowledge of pre-, intra- and postoperative management of the patients with the intent of minimizing, expediently recognizing and properly treating co-morbidities and complications.
 - VI. A clear understanding of the risks involved in the operative procedures that he or she is competent to perform.
 - VII. The ability to perform common elective and emergent operative procedures in all systems of the body which are routinely within the purview of practitioners of general surgery.
 - VIII. Recognition of those conditions and procedures which are beyond the experience or ability of the surgeon so that they may be appropriately transferred for the required care.
3. The ability to cope with emergencies in other surgical specialties, including: Ophthalmology, Obstetrics and gynecology, Dentistry, Urology, Neurosurgery and others

4. The ability to give anesthesia and supervise anesthesiologists and anesthesia providers in giving anesthesia
5. The ability to teach surgery to medical students, residents and colleagues in nursing and medicine
6. The ability to undertake or participate in clinical research.
7. The resident should have basic understanding of:
 - Ward and department management
 - Management of the operating theatre, recovery area, central sterile supply and associated inventory.
 - Hospital management
 - Organization of the national medical services
 - The legal implication of doing Surgery
 - The legal implication of being an expert witness in the courts.
 - Basic principles of forensic pathology

Competencies Expected from the COSECSA trainee

Desired Competencies for COSECSA Residents include the areas of:

1. Patient Care
2. Medical Knowledge
3. Practice-based Learning and Improvement
4. Interpersonal and communication skills
5. Professionalism
6. Systems-based Practice

Progressive competency applies to each of the rotations and throughout residency training. It may be summarised as follows:

PATIENT CARE that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health of the whole person is the overall goal of each rotation.

OBJECTIVES in which the trainee will learn this goal:

1. Participation in the evaluation and diagnosis of patients in clinic
2. Participation in the preoperative preparation and postoperative care of patients
3. Participating and assisting in operative procedures in the operating theater and at the bedside.

MEDICAL KNOWLEDGE about established and evolving biomedical, clinical, and cognate (e.g. epidemiological and social-behavioral) sciences and the application of this knowledge to patient care. A detailed list of topics and procedures will be found in sections below.

OBJECTIVES in which the trainee will learn this goal:

1. Participation in direct patient care, rounds with consultants, and self-study with directed readings.
2. Attendance at educational conferences

PRACTICE-BASED LEARNING AND IMPROVEMENT that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, and improvements in patient care.

OBJECTIVES in which the trainee will learn this goal:

1. Participation in direct patient care, rounds with attendings, and self study.
2. Assist in the implementation of “pathways” or “protocols” to standardize and optimize the delivery of patient care

INTERPERSONAL AND COMMUNICATION SKILLS that result in effective information exchange and teamwork with patients, their families, and other professionals.

OBJECTIVES in which the trainee should learn:

1. Participate in communication with consulting services and referring physicians regarding the plan of care for shared patients.
2. Facilitate communication among health professionals including nursing and ancillary staff. Improve communication with patients by discussing their diagnoses and plan of care including critical care and end of life issues.
3. Provide patients and their families with written information regarding the above.

PROFESSIONALISM, as manifested through commitment to carrying out professional responsibilities, adherence to ethical principles and sensitivity to a diverse patient population.

OBJECTIVES in which trainees will learn this goal:

1. Evaluating patients in a timely manner
2. Maintaining continuity of patient care
3. Completing documentation in timely manner
4. Communicating with consultants in timely fashion
5. Interacting respectfully with colleagues, patients and families
6. Professional attire and attitude

SYSTEMS BASED PRACTICE as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care, and the ability to effectively utilize system resources to provide care that is of optimal value.

OBJECTIVES in which this will be taught:

1. Assisting in the development of “pathways” and “protocols” to standardize and optimize delivery of patient care for patients with that diagnosis
2. Understanding what makes a patient diverge from that pathway.

Training Methods used during the COSECSA residency program

Teaching- Learning Methods and Materials

Live patients and simulations shall be used for demonstrations and to develop knowledge and skills. Standard surgical textbooks, operative surgery books relevant to each surgical unit, reputable journals from the Internet or medical libraries shall be used as reference materials. LCD and overhead projectors, transparencies, computers, and other audiovisual aids shall be used for preparing and delivering presentations, lectures, tutorials, and sessions. The teaching-learning strategy is as follows:

1. Progressive apprenticeship:

This takes place under close supervision in the OPD, wards and operating theatre during the different attachments to units of the department of surgery. The trainee shall proceed from 1st-5th year residency program from closely supervised to a more independent work.

2. Didactic Lectures:

Lectures will be included in a limited scale, to cover certain fields, which could not easily be taught using other instructional means. These may be conducted in the form of guest lectures on special fields by honorary and visiting professors.

3. Tutorials:

Tutorials should be used during the first year to discuss general principles of surgery (See course details).

4. Seminars:

Residents prepare and present on assigned topics with a consultant surgeon as a convener, mainly during the Training Program in general principles of surgery.

5. Management sessions and case presentations:

During the 3rd– 5th year attachments, there will be sessions of presentations by residents on relevant clinical topics including operative techniques, live cases and current surgical literature followed by discussions moderated by consultants.

6. Clinical conferences:

Monthly clinical conferences shall be given on rotation by the different units. The conferences should be open for participation for all interested.

7. Surgical audit, mortality and morbidity meetings:

Meetings on clinical audit, morbidity and mortality will be held regularly on a monthly basis.

8. Clinical-pathological conferences:

In collaboration with the department of pathology, a monthly clinical-pathological conference shall be held regularly whenever applicable.

9. Radiology sessions:

Regular weekly discussion sessions on relevant X- ray films and other imaging studies shall be conducted in the radiology department whenever applicable.

10.Attachment to accessory specialties:

As outlined in year-by-year Program

11.Surgical Skills laboratory:

Residents are expected to attend specific simulated procedure and practical session organized by the surgical skills lab whenever available. This is expected to increase the residents' exposure and involvement in simulation and lab learning. Developing a simulation and skills lab curriculum will supplement learning outside of the wards and operating room.

12.Outpatient surgical clinics:

Residents shall be assigned to surgical clinics on rotation to see referred patients and their own surgical follow-ups. At least one faculty member is present to supervise these clinics.

13.Surgical grand rounds and Specialty lectures

The Program Director or assignee is responsible to organise this 60 minute conference each week to cover a topic in the curriculum in depth. Some programs may be assigned to senior level residents to improve their knowledge and presentation skills. These lectures are usually given as PowerPoint presentations.

14.Teaching in the operating theater

Residents are expected to read prior to all cases in which they participate regardless of their level. According to their level, they should be appropriately involved in the operation. The faculty member should delegate increasing, graduated levels of responsibility to residents in order to optimize patient care and resident education.

15.Journal club

Journal club meetings are held either biweekly or monthly to review relevant surgical articles in the literature and teach residents how to analyze and critique research studies and reports and review articles. Other objectives are to familiarize residents with the most relevant surgical journals and to help them develop habits of reading surgical journals on their own.

16.External Educational Conferences

Educational conferences that are held by other surgical societies may be offered to residents. Educational and surgical conferences held by COSECSA and regional surgical societies will be offered to residents as decided upon by the site Program Director.

17.Online curriculum

The COSECSA e-learning online platform is called “School for Surgeons” and contains a wide variety of surgical training resources which are useful for all COSECSA candidates. This curriculum is a very important format for the delivery of the basic sciences and Basic of surgical principles course that needs to be covered during the first two years of the training (MCS years). Each year, case studies are also posted for MCS and FCS General Surgery. Candidates enrolled in these programmes must complete a minimum of 6 case studies, out of a total of 10. MCS candidates must also complete Surgery in Africa Journal club cases.

Record Keeping

Candidates are required to log all operations for the duration of their training period in the electronic logbook. In advance of the examinations, details from each candidate's electronic logbook will be made available to the Country Representatives and the COSECSA Examinations and Credentials Committee. At the examinations, details from each logbook will be provided to the relevant oral examiners. Only operative experience logged in the electronic logbook will be taken into account and candidates will not be allowed to sit for the examination if operative experience is not adequately recorded. At the August council meeting of each year, the Country Representatives will hand over to the Examinations and Credentials Committee Panel head, a copy of the Training post assessment form and Trainee assessment form. Proof of attendance at an approved Basic Surgical Skills course, Basic Surgical Science course and Critical Care or Trauma Course should be brought to the oral examination. The panel head reviews the operative case logs and required submissions to ensure a candidate has sufficient experience to sit for the exam.

Admission and Graduation Requirements

A) Admission requirements for the MCS training

Academic requirements:

- The candidate should be a holder of doctor of medicine degree from a recognized university.
- The candidate must be a registered practitioner by the Ministry of Health of the country with an active license to practice
- Foreign applicants must hold doctor of medicine degree and must produce their professional license and a letter of good standing from their local accreditation body.

Non-academic requirement

- Applicants must be in acceptable physical and mental health without any serious health conditions that would limit the ability to cope with the requirements of the training program and service. The college reserves the right to deny admission to unfit candidates as determined by the ECC.
- Should not be older than 40 years of age
- Female candidates are strongly encouraged and given special consideration.

Proficiency in English

The COSECSA curriculum is taught in English. English proficiency is also a requirement for training and graduation. This is to ensure that residents can take full advantage of the lectures and intra-operative instruction given by professors in the various surgical specialties, textbooks and journals written in English, web-based didactics in English, and international medical conferences, both during and after their training. From a practical viewpoint, the COSECSA examination is also in English.

B) Admission requirements for the FCS training

Successful completion of the MCS training

Successfully passing both the MCS Part I and Part II examination

Requirements for completion of the MCS training

The following are mandatory requirements for completion and to be legible for certification as an MCS

A. Program requirements:

- Completion of two years (24 months) of training with one month leave each year in a COSECSA accredited training institution
- A progressive assessment report from the two years of training
- Submission of a well-kept counter signed and approved log book with a minimum of 200 surgeries attended.
- Successful completion of all basic sciences and principles of surgery modules
- Completion of a minimum of 6 case studies, out of a total of 10 at SfS.
- Completion of the 6 Surgery in Africa modules
- Successful completion (PASS) of the both MCS examination

B. Courses and workshop requirements:

- Basic Surgical Skills course (During Year I)
- A certified trauma course (once during the two years).

Requirements for completion of the FCS training

The following are mandatory requirements for completion and to be legible for certification as an FCS

A. Program requirements:

- Completion of three years (36 months) or 4 years (48 months) of training with one month leave each year. The duration of training depends on
- Submission of a well-kept counter signed and approved e-log book with a minimum of 500 cases attended (including the MCS level log book)
- A progressive assessment report from the four or five years of training
- Completion of a minimum of 6 case studies, out of a total of 10 at SfS.
- Successful competition of (PASS) of both FCS exams

Mandatory course

- Research Methodology
- Non Operative Technical Skills for the Surgeon (Or similar leadership course)

Optional courses

- Basic laparoscopy course
- Basic endoscopy course
- Submission of a mandatory but non-thesis research paper completed at least three months prior to the Part II exam.

Operative Experience and skill requirements:

To sit for the final qualification examination at the FCS level, the resident must have been involved in a minimum of 500 major operative procedures, including at least 100 operative procedures in the final year of residency. The procedures must include operative experience in each of the content areas listed in the definition of each discipline of training. The list of procedures must be clearly documented in the individual logbooks of the residents. Residents must also indicate their level of responsibility for the procedures listed.

Research projects

The Program Director or other surgical faculty supervises each resident in one or more original research projects during the resident's five years of training. The resident develops his or her project, collects data, and under the supervision of his Program Director or other COSECSA faculty, prepares a presentation of his results to present at one or several surgical conferences, including the annual meetings of COSECSA. It is expected that the resident will present his or her research at least once at an international surgical conference, and that he or she will publish at least one article in a peer-reviewed scientific journal.

COSECSA Trainee Assessment Strategies

- A. During the MCS training (the first two years), each candidate is expected to complete one basic sciences module every two weeks. At the end of each module, each candidate is expected to complete MCQ questions and participate in case discussions. The compiled marks from each module (34 modules) will be used as progressive assessment.
- B. Each program director in each training site is expected to perform monthly progressive assessment of each candidate. A standardised assessment format is to be used.
- C. Residents are required to maintain a computerised case log consistent with the requirements of COSECSA. Candidates are required to record and enter all of their operative cases into the COSECSA electronic log-book. These case logs are evaluated by the Program Director on a yearly basis and adjustments are made in resident rotations to improve experience in weak areas.
- D. Residents to receive COSECSA accreditation will be required to take and pass both the MCS (Member of College of Surgeons) exam and the FCS (Fellow of the College of Surgeons) exam. These examinations are divided as Part I (120 MCQ questions) and Part II (Structured short, OSCE and Viva). The examination formats can be modified as decided by the ECC, ESRC and approved by council.
- E. Every six months the Program Director or designated faculty formally evaluates and counsels each resident. Areas covered in this evaluation include:
 - Attendance and punctuality
 - Professional appearance
 - Concern for patients
 - Interpersonal skills and initiative
 - Patient evaluation and history-taking skills
 - Physical examination skills
 - Clinical knowledge base
 - Completion of reading assignments
 - Monitoring and therapeutic skills
 - Procedural skills
 - Documentation
 - Work ethic
 - Respect for authority and discipline, including resident, faculty, and senior leadership levels of authority
 - Leadership ability.

General Regulations and guidelines of Qualification

The College of Surgeons of East Central and Southern Africa (COSECSA) awards Membership (MCS) and Fellowship (FCS) qualifications after a candidate has passed through the prescribed training program and examinations. Approved trainee surgeons shall be trained in hospitals that are accredited by COSECSA for training in the region with guidance and support provided by the College (See annex for accreditation guidelines and requirements).

The Fellowship examination leads to the qualification of Fellow of the College of Surgeons of East Central and Southern Africa, FCS GS (ECSA). This fellowship is recognition that the candidate has reached the level of knowledge, understanding and practice of surgery sufficient to practice independently at a consultant or specialist level. It should be recognised however that surgery is not a static art and fellows should continue to update knowledge and skills by means of research, conferences meetings and reading.

2. Training requirements

2.1 Academic

Candidates who apply for registration into the FCS program should have passed the membership examination of this College and possess the diploma MCS (ECSA). After qualification as an MCS, each candidate must complete three years (four years for Neurosurgery and Cardiothoracic Surgery) of training to be qualified to sit for the FCS exams. Exemption to this requirement to sit for the FCS examination may be given to:

1. those who have passed an equivalent examination as MMed (Surgery) or its equivalent in recognised universities of the constituent countries of COSECSA. Such candidates need to be discussed on individual basis and approved by the ECC.
2. Fellows of the Royal Colleges of Surgeons of England, Scotland, Edinburgh, Ireland, Australia, USA, WACS, CMSA or other equivalent colleges.

The basic surgical training examinations (or MCS) of these colleges and institutions may also be acceptable but each one will have to be reviewed by the Examination and Credentials Committee of the College before exemption can be given. Applicants with an MMed who wish to sit for the FCS examination must have spent equivalent period of training as MMED trainee to sit for the exams at the year of their graduating year. Otherwise, they need to spend at least one year at a COSECSA accredited hospital under a COSECSA accredited trainer after they receive their MMed degree.

2.2: Training posts

Candidates will have to spend 3 years of continuous training (4 years for neurosurgery and cardio-thoracic surgery) at accredited supervised training posts after qualifying as an MCS. Six months of the FCS years may be spent outside the region in a post that has been prospectively agreed with the Examination and Credentials Committee (ECC). This post may be in an elective unit. Candidates are reminded that it is in their interests to experience a wide spectrum of surgical disciplines.

Candidates are mandatorily required to participate in the school-for-surgeons e-learning during their MCS training to complete the 40 basic sciences modules and the case discussion. FCS candidates are also required to participate at the school-for-surgeons learning as final year of their training to be approved to sit for the FCS examination.

3. Log books

During the training period, candidates must keep an online logbook prospectively recording all their training experience. The COSECSA log book (available from the COSECSA website) should be available for inspection at any time by the COSECSA Country Representative (CR), program director or chairs of ECC and ESRC. Other online log books may be accepted, subject to prior approval by the ECC. Consolidation sheets should be compiled at the end of every post or annually for posts longer than one year, and a final consolidating sheet for the whole training period. The logbook should also contain details of all courses attended and the trainee and post assessment forms for the whole training period. For MMED candidates, a paper based logbook may be allowed. It is the duty of the CR and training program director to peruse the logbook in detail and make sure the candidate has fulfilled all the requirements to sit for the examinations.

The Examinations and Credentials Committee Panel heads, need to go through the consolidation sheet list together with copies of the Training post assessment form, Trainee assessment form and the final consolidation sheet of the past 3 or 4 years of training. This is a prerequisite for approval to sit for the examinations.

4. Application to sit for examinations

Candidates who are registered as trainees may sit the examination at the end of their third year of FCS training provided that they have completed 36 months of training by that time. This shall be 4 years (48 months) for neurosurgery and Cardiothoracic surgery. The deadline for application to sit for the examination is **March 31st** of the year of the examination. Candidates must complete the application online and pay the prescribed examination fee online. Upon confirmation of the registration by the CR and the COSECSA secretariat, the candidates will be informed about the precise times dates and places for the exams.

By applying to the examination, a candidate agrees to be bound by the rules and regulations of the College. If a candidate withdraws from an exam more than 6 weeks before the exam is due, then the fee can be transferred to the next exam date. Fees will not normally be returned if the candidate withdraws permanently, unless due to special circumstances as determined by the college.

Candidates must pass any examination within five years of their first attempt. After this, they will not be allowed to re-sit. A total of three attempts only will be allowed to pass the examinations (including the first exam).

5. Examination format and Conduct

The standards of examinations will be set by the COSECSA Court of Examiners drawn from members of the council of the college. A panel of examiners will be chosen by the examination and credentials committee from amongst Fellows of the College for each examination. A register of examiners will be kept by the chairman of the examination committee. An examination board will be constituted for each diet of examinations, comprising the chairman of the examination committee, members of the court of examiners, two members from each examination panel and at least one external examiner. The role of the external examiner(s) is to:

1. Moderate the written question papers
2. Assist with the examination of candidates
3. Provide external independent assessment of the examination
4. Report on the conduct of the examination to the examination committee

The FCS and MCS examination

The exam for both MCS and FCS trained comprises of Part I (written) and Part II (clinical/oral) components. A candidate must complete two years of MCS training to qualify for the MCS examination, and an FCS candidate must complete the prescribed duration of training as per the individual program syllabi. The Part I written exam:

The part I exam consists of two papers:

Each paper consists of 60-75 single best answer questions.

The Written examinations will be held in any of the countries of the region. In exceptional circumstances the ECC may approve an examination site outside the region. The written examinations are held simultaneously on the first Wednesday of September, at a recognised examination centre with impartial invigilation. Candidates will be informed about their result within no later than the last day of September by the registrar of the college. Only candidates who pass the written exam will be invited to sit for the Part II exam.

Candidates are allowed only three attempts at the written examination to pass. Any candidates who fails to pass at the third attempt will be disqualified from the training program. Candidates who pass the written exam need to pass the clinical examination within two years of passing the written exam. If a candidate fails to succeed at the clinical examinations within two years of the written exam, he/she needs to repeat the written examination.

The Part II exam

The Part II MCS exam shall consist of 1) A Clinical (OSCE, Structured short or any appropriate examination format) and 2) An oral (Viva Voce) examination. These examinations will take place approximately 3 months after the part I examination, in a country and at a site designated by the college. The ECC reserves the right to modify or change the format of the examination as deemed necessary. However, such change will be communicated to all candidates and trainers ahead of time, and needs to be approved by council. Candidates have to pass the written examination to qualify for admission to the clinical and oral part of the examination. The chairman of the examination panel will endeavor to minimize the chance of a candidate being examined by an examiner who has been involved in the candidate's training or to whom the candidate is personally known. The panel of examiners of each FCS program will give the results to the examination board who will meet on the day of examination. The board will then approve the results on behalf of Council and publish them through the registrar.

For each candidate who fails the exam, the panel will allocate a Fellow of the College (usually a member of the panel) who will communicate with the candidate and offer advice as may be indicated. If a candidate fails his clinical and oral examination then he may attempt the clinical and oral examination for a maximum of 2 more years without having to rewrite the written examination.

Appeals against results must be made in writing to the Council within 30 days of the completion of the examination. The President of the College will then appoint an impartial committee to investigate the appeal, and require a written report to be filed by the Chairmen of the examinations panel and board. The Appeals committee will then take all considerations and its own findings into account and recommend a decision which will remain final and binding.

CURRICULUM FOR FELLOWSHIP IN GENERAL SURGERY COLLEGE OF SURGEONS OF EAST CENTRAL AND SOUTHERN AFRICA

Title of proposed programme

Fellowship in General surgery of the College of Surgeons of East Central and Southern Africa.

Mission and vision of the General Surgery programme

Be a leading organisation to increase accessibility of general surgical services to African populations by standardising and widening access to training, accreditation and life-long professional development.

Philosophy of programme

The programme aims to preparing students for a surgical career through a student centred programme inculcating critical thinking, desire for impeccable surgical goals, professionalism and research skill development.

General Objectives

The GS training program aims at achieving the following objectives:-

1. To train General Surgeons capable of practicing surgery independently, safely and competently at a specialist level, and able to teach and undertake clinical research.
2. To train General Surgeons with strong ethical foundation for the practice of surgery and life-long learning spirit.
3. To train General surgeons with ability and readiness to transfer knowledge, skill and ethical surgical practices to medical students and trainees in the field of surgery.

Specific Objectives

At the end of five years training program, the trainee will have acquired sufficient knowledge, skills and attitude in relevant aspects. He/She will be able to:

1. Understand relevant and applied human embryology, anatomy, physiology, biochemistry, pharmacology, pathology and microbiology as it applies to the practice of general surgery.
2. Acquire a good knowledge of the principles and scientific basis of Surgery.
3. Have adequate knowledge of pre-, intra- and postoperative management with the intent of minimizing, properly recognizing and treating of co-morbidities and complications.
4. Determine the need for appropriate cost effective diagnostic modalities and interpret the results in a patient-specific manner.
5. Clearly understand the risks in the operative procedures that he/she is to perform.
6. Practice Surgery at a specialist level without supervision.
7. Recognize conditions and procedures which are beyond the scope of a general surgeon and appropriately transfer for the required care.

8. Perform common elective and emergency operative procedures in all systems of the body within the scope of general surgery.
9. Cope with emergencies in General Surgery, Orthopaedics and Obstetric/Gynecology.
10. Administer anaesthesia and manage the course of anaesthesia and complications.
11. Teach surgery both to undergraduate and post graduate students.
12. Undertake or participate in clinical research and be committed to life-long learning.
13. Develop good communication skills with colleagues, patients and other relevant bodies.
14. Have basic understanding of department, ward, theatre and supply management.
15. Have basic understanding of the legal implication of surgery and being expert witness in the court.

The scope of General surgery

General surgery is a discipline that requires knowledge of and familiarity with a broad spectrum of diseases that may require surgical treatment. The depth of knowledge varies by disease category. In most areas, the general surgeon is expected to be competent in diagnosing and managing full spectrum of a surgical pathology.

However, since a detailed knowledge and experience is not generally gained to fully manage diseases of certain categories, the general surgeon shall be able to recognize and treat selected conditions within the category. The training in general surgery requires a wide range of experience in all the following core areas:

- Abdominal surgery
 - Upper and lower GI tract
 - Hepato-biliary, pancreatic and splenic surgery
 - The retro-peritoneum and its contents
 - The surgical pelvis

- General Thoracic surgery
- General Urology
- General Paediatric surgery
- Skin and Soft Tissue
- Vascular Surgery
- Endocrine System and the breast
- Trauma surgery and Burns
- Emergency Surgery

The certified general surgeon should additionally be familiar with diagnosis, management and operative techniques of selected diseases in specialized disciplines. These disciplines have training programs related to, but separate from general surgery. However, as a primary practitioner in many circumstances, the general surgeon is required to have experience during training in the following disciplines:

- Bariatric Surgery
- Critical Care and Anaesthesia in surgery
- Laparoscopic surgery
- Neurosurgery
- Oncology (including Head and Neck Surgery)
- Orthopedic surgery
- Obstetrics and Gynecology
- Otorhinolaryngology
- Radiology
- Reconstructive surgery

Goal of programme

- To prepare graduates to practice the highest level of surgery possible in a local setting.
- To develop in trainees a strong ethical, practical and administrative foundation for the practice of surgery.
- To train trainees to continue life-long learning after they graduate.

Graduate Profile

At the end of the program, the trainee will have achieved adequate knowledge and skills in pre, intra and postoperative management of surgical patients. He / She shall ethically and professionally be able to practice sound surgery safely and independently at a specialist level dealing with emergency or planned conditions as listed hereunder:

The trainee shall have exposure to and adequate and sound knowledge in:

- Basic sciences relevant and applicable to general surgery.
- Pathologic basis of general surgical and specialized diseases and their management.
- Obstetrics / gynecology to enable differentiate surgical from gynecological conditions.
- Congenital and acquired paediatric surgical conditions.
- Anaesthesia to understand anaesthetic agents, the composition and function of anaesthetic machines and simple ventilators; and have good understanding of the intensive care.
- Radiology to interpret common radiologic modalities of all systems and to make use of surgeon performed sonography.
- Basics of statistics and research methodology to enable him/her develop research protocol, collect and analyze data on clinical materials.
- Teaching residents, undergraduate medical students and other ward and theatre personnel to achieve adequate competence in organization and training surgical skills to various categories of health workers.
- Health management and administration to achieve satisfactory understanding of ward and hospital management, organization of medical services and supplies.
- Medico-legal aspects to understand legal implications of working as a surgeon and of being an expert witness in court.
- Communication skills for effective communication with patients, trainees, colleagues, the community and the media.

The trainee shall have adequate exposure to and acquired adequate skill in:

- Managing and operating emergency and elective general surgical conditions.
- Managing and operating emergency conditions of specialized disciplines.
- Diagnosing and treating common gynaecological conditions such as Caesarian section, emergency hysterectomy, diagnostic and therapeutic dilation and curettage.
- Administering general, spinal and regional anaesthesia.
- Managing head, maxillofacial and neck injuries.
- Exploring chest injuries, diagnostic and therapeutic bronchoscopy and oesophagoscopy.
- Performing abdominal procedures (See course details) confidently and efficiently.
- Performing general urological procedures (See course details).
- Performing common bone and joint surgery (See course details).
- Repairing injured vessels, with or without vein grafts and repair of nerves.

- Performing general endocrine procedures including thyroidectomy, breast surgery parotidectomy, oophorectomy and orchidectomy.
- Performing skin grafts, contracture release, skin tumor excision and managing burns.
- Performing general paediatric surgical procedures (See course details).
- Teaching residents, undergraduate medical students and other health personnel.

The trainee shall demonstrate and practice attitudes and values(See Appendix):

- Advocate sound surgical professionalism.
- Efficient and effective leadership of the surgical team and resources.
- Be a good surgical scholar.
- Promote teamwork spirit with colleagues and other health professionals.
- Show exemplary role in surgical ethics, behavior and personal dedication.
- Adhere to legal implications of working as a surgeon.

Course sequence and timing

1st and 2nd Year:

The first two years of residency program are designated as the MCS level training. These are allocated for teaching and learning on topics of basic sciences and general principles of Surgery. Residents will be fully attached for 2 years to integrated basic sciences and general principles of surgery training. They will sit for the MCS examination at the end of the second year.

The MCS rotation will be as follows:

- | | |
|--------------------------------|----------|
| • General Surgery: | 8 months |
| • Orthopaedics: | 4 months |
| • Anesthesia and Critical care | 3 months |
| • Trauma and Emergency: | 2 months |
| • Elective attachments | 5 months |
| • Vacation: | 2 month |

During the MCS training, the following mandatory lectures and courses need to be covered.

- Basic Surgical Skills Course
- Basic Trauma course
- A 2 year long integrated and Modular Basic Sciences training
- A 2 year long integrated and modular principles of surgery training

As indicate earlier, MCS trainees are expected to attend modules that cover basic sciences in Anatomy, Physiology and Pathology as an integrated modular format. Candidates are expected to cover. See Annex (basic sciences modules) for the detailed description of the modules.

3rd to 5th Year:

The three years are designated as FCS General Surgery proper. The trainee is expected to pass through the following attachments.

▪ Clinical attachments in General Surgery	18 months
▪ Urology	4 Months
▪ Paediatric Surgery	2 months
▪ Radiology	1 month
▪ Oncology	1 month
▪ Obstetric and Gynacology	1 month
▪ Neurosurgery	1 month
▪ Plastic and reconstructive surgery	1 month
▪ Thoracic surgery	1 month
▪ Otorhinolaryngology/Head and Neck	1 month
▪ Vacation	1 month per year
▪ Study leave (November of 5th year)	1 month
▪ FCS clinical exam (December of 5th Year)	1 Month

Core General Surgery Rotations

The core rotations include the areas of:

- Upper and lower GI tract
- Abdomen and its Contents
- Breast, Skin and Soft Tissue
- Burns and Emergency Surgery
- Endocrine System
- General thoracic,
- Hepato-biliary, pancreatic and splenic surgery
- Paediatric surgery
- Surgical Critical Care and anaesthesia
- Surgical Oncology (including Head and Neck Surgery)
- Trauma surgery
- Urology
- Vascular Surgery

These rotations may or may not be separate rotations (depending on the availability of rotation or specific outside rotations) but the trainee is responsible for understanding and mastery of the objectives of each.

1. Gastrointestinal Surgery:

The gastrointestinal surgery addresses a wide variety of illnesses, including benign and malignant diseases of the gastrointestinal tract. The GI unit shall provide an environment that is conducive to learning via regular teaching sessions, conferences, regular clinics, and operative care. During the rotational assignments to the unit, the trainees shall:

- Develop a knowledge base of diseases of the abdominal cavity and pelvis, alimentary tract, and solid organs of the abdomen (liver, pancreas, spleen).
- Acquire skills in the management of simple and complex gastrointestinal disorders and recognize those diseases and conditions requiring surgery.
- Recognize complications of disease and operative procedures and have the knowledge and skill to appropriately manage those complications.
- Develop expertise in pre, intra and postoperative care as well as outpatient follow up of patients with gastrointestinal surgical diseases.
- Develop the ability to assess and manage the medical, social, emotional, psychological and economic components of chronic gastrointestinal disease.
- Develop the ability to arrange supportive care for ongoing problems associated with gastrointestinal disease.

The overall knowledge and skill competence in gastrointestinal surgery the trainees are expected to acquire at each level of training is detailed as follows:

Year – 1/2:

As a first year trainee attached to the GI unit, residents are expected to:

- Understand the basic anatomy and physiology of the GI tract
- Acquire basic knowledge of common GI surgical disorders and indications for operation.
- Develop judgment skills in the evaluation of patients and provision of surgical care
- Evaluate and manage surgical GI disorders and co-morbidities.
- Recognize and manage patients with an acute abdomen.

- Develop basic skills in peri-operative management under the supervision of the consultants and senior residents
- Develop basic technical operative skills such as knot tying, tissue dissection, operative exposure and assistance at operations.
- Develop skills in nutritional assessment and therapeutic intervention
- Perform non-complex procedures such as hernia repairs, hemorrhoidectomy
- Manage patient discharge process including outpatient and supportive home care in cooperation with nursing staff, social workers and other allied health personnel
- Develop good organizational work skills.
- Develop communication skills with patients, faculty, residents, nursing and paramedical personnel.
- Acquire experience in the following procedural skills:
 - Foley catheter insertion
 - Placement of central venous and arterial lines
 - Wound debridement
 - Basic knot tying
 - Basic surgical instrumentation

Year 2 :

During the second year, trainees are expected to demonstrate more detailed and expanded knowledge base, improved organizational and technical skills, and more advanced skills in post hospital care of surgical patient. In addition, they are expected to:

- Develop scientific knowledge and principles of gastrointestinal surgical diseases and their management
- Demonstrate knowledge of intestinal physiology and pathophysiology of surgical diseases of the bowel, including inflammatory bowel disease, colorectal neoplasia, and motility disorders of the intestine.
- Demonstrate knowledge on pathophysiology of anorectal disease including fistula, fissure, haemorrhoids, prolapses, incontinence and neoplasias.
- Develop more advanced technical skills, including performance of more complex hernia repairs, assist advanced open procedures and simple laparoscopic procedures when applicable.
- Have experience with endoscopic procedures including oesophago-gastro-duodenoscopy, anoscopy, proctoscopy, sigmoidoscopy, colonoscopy and assist with endoscopic procedures.
- Gain experience in pre- and post-operative intensive care management, including ventilator management and metabolic support.

- Improve decision-making and judgment in patient care regarding medical and surgical treatment.
- Gain experience in the following skill procedures:
 - Insertion of venous access ports
 - Inguinal herniorrhaphy
 - Appendicectomy
 - Simple GI procedures

Year – 3/4/5:

At this level, the trainees are expected to have adequate knowledge and skill on more complex diseases and operative procedures. He / She shall:

- Acquire knowledge on the pathophysiology of more complex disorders such as gastrointestinal bleedings and malignancies, portal hypertension, complex metabolic disorders associated with enteric fistulas, complicated hepatobiliary, pancreatic and splenic diseases.
- Demonstrate continued improvement in patient evaluation and management skills.
- Improve skill in patient care in consultation with the chief resident, attending Surgeons, and other medical and clinic personnel.
- Develop expertise in the management of complex patients and disease processes, including those in the ICU
- Develop technical skills to perform more complex operative procedures such as common bile duct exploration, complicated and recurrent hernia repair, colon resection and laparoscopic cholecystectomy, when applicable, under consultant supervision.
- Gain further proficiency in flexible endoscopic and laparoscopic procedures, when applicable, under supervision from a senior resident and attending surgeon.
- Assist and instruct junior residents in less complex operations and procedures
- Recognize patients with complex GI surgical disorders and organize and assist with planning social, emotional, and economic support.
- Demonstrate skills with planning discharge and multidisciplinary care for patients during and after hospitalization.
- Develop consultative skills, including the evaluation of patients in the emergency department and on other inpatient services, and demonstrate effective communication with physicians and services requesting such consultations
- Develop leadership and teaching skills in the direction of junior residents as well as medical students.
- Increase communication skills in managing the patients and reporting to the senior resident and attending surgeon.

- Acquire the attributes to be an independent general surgeon
- Manage all patients on the service in consultation and under the supervision of the attending surgeon.
- Demonstrate expertise in overall operative and outpatient management.
- Demonstrate judgment about the complexities of surgical diseases and deciding between operative intervention and non-operative treatment.
- Demonstrate advanced knowledge of the evaluation and management of common and unusual GI problems, including the management of complex problems such as complicated fistulas, failures of medical management, re-operations and timing of interventional procedures in pancreatic and biliary operations.
- Achieve a high degree of technical competence and performance in the operating room under stressful operative encounters.
- Perform advanced operative procedures such as abdominoperineal resection, anorectal reconstruction and procedures for prolapse under supervision of the attending Surgeon.
- Become exposed to and acquire understanding of therapeutic techniques including resection, stricturoplasty, pouch formation and management, stomas, endoscopic resection techniques, laparoscopy and combined treatment strategies when applicable
- Demonstrate skill in the management of severe complications of GI diseases such as ARDS, GI bleeding, tertiary peritonitis, and short bowel syndrome.
- Perform flexible endoscopic procedures such as OEGD with biopsy, colonoscopy and oesophageal dilation with supervision
- Develop the ability to evaluate advantages and disadvantages of minimally invasive surgery.
- Assist and instruct the junior residents in less complex operations with supervision from the attending Surgeon.
- Demonstrate the ability to communicate well with patients and families during the peri-operative period with supervision from the attending Surgeon.
- Possess good interpersonal skills to facilitate excellent patient care
- Practice cost effective surgery

2. Surgical Oncology:

Graduate medical education is based on the principle of progressively increasing levels of responsibility in patient care under supervision. The goal of a surgical oncology rotation is to provide an exceptional learning experience.

Residents shall acquire the knowledge, skills and attitudes appropriate for their level for the surgical care of the cancer patient.

In training sites where such a unit is non-existent, experience shall be gained by special institutional arrangements like in other specialized rotations. Overall, at each level of training, the competence in knowledge and skill which the trainee is expected to acquire is as follows:

Year – 1/2:

- Become cognizant of current theories of carcinogenesis including the genetic, immune, and environmental factors that can lead to the development of malignancy.
- Understand the prognosis, incidence and trends in common solid tumors.
- Demonstrate the ability to perform a directed history and physical examination for patients with a wide variety of cancer diagnoses
- Develop the ability to formulate an appropriate differential cancer diagnosis, and record an independent, written diagnosis for each cancer patient assigned.
- Develop the knowledge of selecting appropriate diagnostic modalities for workup
- Develop the ability to design an appropriate nutritional support program for a cancer patient both pre- and post- management (operative; radiotherapy; chemotherapy).
- Perform minor procedures under the supervision of the faculty or senior residents.
- Appreciate the economic and psychosocial impact of a cancer and the role of social services and community resources in the total management of the patient.

Year 2 and 3

- Become knowledgeable in the diagnosis and management of common oncologic problems, including the management of complications and nutritional needs.
- Develop an understanding of emerging theories of oncogenesis and their application to surgical care.
- Develop basic understanding of commonly used chemotherapeutic agents and radiation therapy
- Develop the ability to stage specific neoplasms and relate stage to survival
- Acquire a detailed knowledge of the surgical options and procedures for the management of all types of head and neck cancer, breast ma-

lignancies, colon and rectal tumors, melanoma, primary and metastatic liver tumors and sarcomas. This is done with a comprehensive understanding of anatomy and physiology

- Develop the ability to perform complex operative procedures under the supervision of the faculty Become familiar with current adjuvant chemotherapy protocols.
- Develop consultative skills, including the evaluation of patients in the emergency department and on other inpatient services, and demonstrate effective communication with physicians and services requesting consultations.
- Demonstrate responsibility in the completion of all medical records in an appropriate and timely manner including operative and clinic dictations.
- Gain experience in the following procedures:
 - Operative diagnosis & staging
 - Sentinel Node biopsy and node dissections (neck, axilla and groin)
 - Mastectomy and partial mastectomy
 - Gastric, small bowel and colon resection

Year – 4/5:

- Demonstrate knowledge on fundamental principles appropriate for their level including diagnosis, preoperative preparation, operative and postoperative care.
- Understand the role of surgery in the total care of patient with a wide variety of cancers
- Demonstrate the ability to provide comprehensive and independent management of surgical oncology patients under the direct supervision of the oncology unit.
- Develop the ability to recognize and manage all complications of procedures done for cure or palliation
- Develop the ability to appropriately counsel patients and families about procedures, prognosis, options and resources available to cope with the cancer diagnosis.
- Demonstrate responsibility in the completion of all medical records in an appropriate and timely manner including operative and follow up records.
- Understand and apply the multidisciplinary management approach to cancer patients
- Demonstrate appropriate professional interactions with other disciplines that treat the cancer patient
- Demonstrate the ability to critically assess new research findings as they apply to direct care of the patient.

- Assume teaching and scheduling responsibilities for the junior trainees and students
- Gain experience in the following procedures:
 - Adrenalectomy
 - Thyroidectomy
 - Parathyroidectomy
 - Extremity and retroperitoneal sarcoma resection and amputation
 - Abdominoperineal resection

3. Vascular Surgery:

The goal of experience in this area is to familiarize the trainees with the principles of surgical and pertinent medical management of vascular conditions. They shall also get the opportunity to develop clinical and technical skills. These goals shall be achieved by participating in daily rounds, operative session attendance and related reading. The trainees accomplish the following knowledge, skills and other attributes in general and for each specific year:

Overall:

- Acquire knowledge of the biology and genetic factors in occlusive and aneurysmal peripheral arterial disease.
- Acquire knowledge and management of venous and lymphatic disease.
- Acquire basic knowledge of non-invasive and invasive evaluation of vascular disease.
- Acquire knowledge of the coagulation system and its relationship to vascular disease.
- Develop skill in the management of anticoagulation and thrombolytic therapy.
- Acquire knowledge of risk factors and preventative measures for atherosclerosis.

Year – 1/2:

- Develop basic knowledge of the anatomy of blood vessels and pathophysiology of vascular disease.
- Develop basic knowledge of vascular diagnosis and management.
- Acquire basic skill in the care of uncomplicated vascular surgical patients including antibiotic indications and selection, IV fluid therapy and wound care in patients with vascular compromise
- Acquire and demonstrate basic surgical skills including dissection, vascular suture and operative techniques of amputation.

Year – 2 and 3

- Demonstrate basic knowledge of arterial and venous diseases and their management.
- Develop substantial knowledge of vascular anatomy.
- Develop and demonstrate the ability to insert percutaneous access devices.
- Develop the ability to interpret angiograms and use sonography for vein localization and determination of patency.
- Develop the ability to evaluation vascular surgical consults and emergencies, including expertise in vascular physical exam and expertise in the use of the hand-held Doppler
- Develop and demonstrate substantial expertise in the pre- and post-operative care of patients with uncomplicated vascular surgical problems.
- Demonstrate skills in vascular surgical techniques like anastomosis, patch graft and varicose vein surgery under supervision of the attending surgeon.

Year – 4/5:

- Acquire substantial knowledge of arterial and venous disease and their management.
- Acquire substantial ability to manage vascular surgical problems with supervision from the attending surgeon, including developing and implementing a diagnostic and therapeutic strategy for, abdominal aortic aneurysm, aorto-iliac occlusive disease atherosclerotic peripheral arterial disease Carotid artery stenosis and body tumors.
- Acquire substantial knowledge of indications and techniques for vascular operative procedures, including operations for above mentioned and other vascular problems.
- Demonstrate the ability to recognize complex vascular surgical problems such as infected grafts, prior vascular failures, and complex and extensive vascular disease that might require referral to a surgeon.

4. Trauma:

In many occasions, the general surgeon deals with trauma victims. It is therefore crucial and mandatory for the trainees to acquire knowledge and skill in basic and advanced trauma management during rotations in general and other disciplines of surgery. In handling trauma of varying severity and complexity, surgical residents at all levels must demonstrate professionalism and communicate effectively with patients, attendants, consultant and rehabilitative services, and social work services.

The trauma experience addresses a wide variety of activities. Overall, while taking care of patients with severe trauma or those requiring critical care, the residents accomplish the following knowledge skills and other attributes:

- Develop a knowledge base of traumatic injuries and their management.
- Develop procedural skills in the ICU.
- Acquire skills in the management of simple and complex traumatic injuries and recognize those injuries and conditions requiring surgery.
- Recognize complications of injuries and operative procedures and have the knowledge and skill to appropriately manage complications.
- Develop expertise in the peri-operative and outpatient care of the patients with traumatic injury.
- Develop the ability to assess and manage the medical, social, emotional, psychological and economic components of traumatic injury.
- Develop the ability to arrange supportive care for ongoing problems associated with traumatic injuries.

The knowledge and skill competence the trainees are expected to acquire at each level of training is detailed as follows:

Year – 1/2:

- Complete ATLS training or equivalent COSECSA training .
- Understand the basic principles and management of resuscitation.
- Learn appropriate evaluation and diagnosis of acute injuries.
- Learn to review and interpret diagnostic results of trauma patients.
- Develop basic skills in peri-operative management under the supervision of the senior resident and attending surgeon.
- Learn inpatient management and disposition planning for trauma patients
- Manage the discharge process including outpatient and supportive medical and non-medical care at home.
- Develop good organizational work skills.
- Develop communication skills with patients, faculty, residents, nursing, and paramedical personnel.

Year – 2 and 3:

- Demonstration of more detailed and expanded knowledge base in Head and Neck Surgery.
- Improved organizational and technical skills, including insertion of chest tubes, central lines, cricothyroidotomy and tracheostomy, both open and percutaneous.
- Learn systematic approach to the critically injured trauma patient

- Improve decision-making and judgment in patient care regarding medical and surgical treatment.
- Gain experience in intensive care management, including principles of mechanical ventilation; fluid, metabolic and nutrition support.

Year – 4/5:

- Learn to organize and direct the trauma team.
- Manage all patients on the service with consultation and supervision of the attending senior staff.
- Learn to coordinate the initial evaluation and management of the trauma patient including those with complex and/or unusual conditions.
- Achieve a higher degree of technical competence and performance in the operating room under stressful operative encounters.
- Learn the operative techniques and perform advanced operative procedures indicated for the trauma patient with the supervision of the attending surgeon.
- Assist and instruct the junior residents in less complex operations with supervision from the attending Surgeon.
- Demonstrate expertise in overall preoperative and outpatient management.
- Demonstrate the ability to communicate well with patients and families during the peri-operative period with the supervision of the attending Surgeon.
- Practice cost effective medicine and Surgery.
- Process good interpersonal skills to facilitate excellent patient care.

5. Anaesthesia and critical Care:

Rotation to this unit is designed to provide a learning opportunity in surgical critical care. It shall provide structured training in basic anaesthetic principles, including operating room intubation and airway skills. In training sites where such a unit is non-existent, experience shall be gained by special arrangements like in other specialized rotations. Overall, the trainees are expected to acquire the following:

- Good understanding of anaesthetic agents.
- Full understanding of composition and function of anaesthetic machines (including flow-over techniques) and simple ventilators.
- Be able to give anaesthesia with endotracheal intubation and controlled ventilation.
- Have the ability to give spinal and regional anaesthesia
- Have a good understanding of intensive care of the post-operative patient.

The knowledge and skill competence the trainees are expected to acquire at each level of training is detailed as follows:

Year – 1/2:

- Learn the techniques of airway assessment and management, including endotracheal intubation under supervision; and demonstrate the ability to perform operative intubations.
- Perform central venous access including, femoral, and Internal/External jugular lines.
- Learn the principles of arterial blood gas interpretation, and the diagnosis and treatment of acid base disorders.
- Learn the basic modes of ventilatory support and how to choose between them.
- Familiarise oneself with anaesthetic equipment
- Learn the indications and common side effects of vasoactive medications
- Learn to recognize common arrhythmias and their treatment in the ICU.
- Develop a pattern for composing comprehensive progress notes on an ICU patient.
- Coordinate the transfer of an improved ICU patient.
- Communicate accurately and sensitively with family on a patient's status.
- Articulate the basic principles of medical ethics as pertains to end-of-life care, including advanced directives, living wills, do-not-resuscitate orders and brain death (See appendix).

Year – 3/4/5

- Be familiar with cardiotropic drugs used in the peri-operative support of the diseased or dysfunctional heart, including pressors, inotropes, and vasodilators.
- Understand the principles of anticoagulation management.
- Successfully manage the airway and ventilator support needs of a patient with pulmonary diseases including COPD, asthma, and ARDS.
- Articulate appropriate strategies for prevention of and treatment of ventilator associated pneumonia.
- Be able to diagnose and care for an acute peri-operative myocardial infarction in a cardiac surgery patient.
- Follow best care practices with regard to glucose management in a critically ill diabetic patients

6. Breasts and Endocrine Surgery:

The goal of this experience is to give the resident a concentrated exposure to the surgical and medical management of diseases of the breast and endocrine systems, including the thyroid, parathyroid, and adrenal glands. During the four-year training, the resident shall:

- Demonstrate sound knowledge on the anatomy and physiology of the organs.
- Demonstrate the ability to use and interpret imaging modalities including ultrasound and mammography.
- Demonstrate the ability to use and interpret CT, ultrasound, and radionuclide imaging studies of the endocrine organs
- Demonstrate knowledge of evaluation and treatment of benign diseases of the breast.
- Demonstrate understanding of the evaluation and treatment of breast cancer, including sentinel node biopsy, radiation therapy, chemotherapy, and hormonal therapy.
- Demonstrate knowledge of the physiology and pathophysiology of endocrine disease including that of the thyroid, parathyroid, and adrenal glands.
- Demonstrate understanding of the surgical and nonsurgical management of benign and malignant endocrine diseases including thyroid cancer, hyperparathyroidism, incidentalomas, and adrenal masses.

B. Subspecialty Rotations:

Subspecialty rotations in surgery are aimed at gaining exposure and experience in basic principles in the respective fields. The trainees shall also familiarize themselves with the basic skills that enables them manage emergency or semi-elective cases within the scope of the general surgeon. The subspecialty disciplines include Paediatric surgery, Neurosurgery, Thoracic surgery, Plastic Surgery, Urology surgery, Orthopaedics, Ophthalmology, Otorhinolaryngology, Obstetrics and gynecology and Dental surgery. In training sites where any of this unit is non-established, rotation shall be effected in other sites or by inviting experts in the field. The learning objectives during the rotation to each discipline detailed as follows.

1. Pediatric Surgery:

The pediatric surgery unit provides paediatric surgical care for patients up to 18 years of age. Because of some peculiarities, the evaluation and management of this group of patients requires different approach. The trainees shall therefore familiarize themselves with the knowledge and skill required to deal with surgical problems in this age group. The knowledge and skill the trainees are expected to acquire at each level of training is detailed as follows:

Year – 1/2:

- Demonstrate the ability to perform a directed history and physical for patients with a wide variety of pediatric diagnoses.
- Be able to manage these patients in the hospital including the provision of appropriate nutritional support.
- Demonstrate the ability to formulate an appropriate paediatric diagnosis, and record an independent, written diagnosis for each patient assigned.
- Be able to explain the prognosis, incidence and trends in management of common paediatric solid tumours.
- Demonstrate the ability to manage wounds (simple and complex) and colostomies and ileostomies.
- Be able to perform minor procedures on children under the supervision of the faculty and senior residents.
- Demonstrate awareness of the economic and psychosocial impact of a paediatric diagnosis and the role of social services and community resources in the management of the patient.

Year – 3/4/5

- Become knowledgeable in the diagnosis and management of common paediatric general surgical problems and complications
- Become familiar with choices of diagnostic investigation and their interpretation.
- Become familiar with the workup of the infant with congenital intestinal obstruction
- Demonstrate the ability to stage specific neoplasms and relate stage to survival
- Be able to explain in detail surgical options and procedures for the management of all types of paediatric tumours
- Be familiar with the repairs of cleft lip and palate, syndactyly and hypospadias.
- Demonstrate the ability to perform complex operative procedures under the supervision of a Senior Surgeon.
- Develop consultative skills, including the evaluation of patients in the emergency department and on other inpatient services, and demonstrate effective communication with physicians and services requesting consultations
- Promptly complete all medical records in an appropriate and timely manner including operative and discharge dictations.
- Gain experience (if case load permits) in the following procedures:
 - Operative and non-operative management of paediatric abdominal trauma
 - Herniorrhaphy , umbilical, ventral and inguinal
 - Laparotomy for congenital intestinal obstruction
 - Appendectomy, laparoscopic and open
 - Treatment of necrotizing enterocolitis with stomas and resections
 - Repair of abdominal wall defects
 - Surgical treatment of recurrent pneumothorax
 - Pull-through procedure for imperforate anus and Hirschsprung's disease
 - Thyroidectomy
 - Open gastrostomy, fundoplication and Ladd procedures
 - Nephrectomy/adrenalectomy for tumour
 - Tumour and node biopsy, abdominal and thoracic for staging and diagnosis
 - Repair of oesophageal atresia and tracheoesophageal fistula and diaphragmatic hernia

2. Neurosurgery:

The goals of the experience are to familiarize the resident with the principles of neurosurgical diseases and disorders and have the resident develop excellent clinical and technical skills. The residents will evaluate patients in the in-patient setting as well as the emergency department. In each of these areas, the trainee evaluates patients under the supervision of a senior surgeon or faculty member. He / She participates in neurosurgical operative and other procedures as appropriate. Overall, the trainee shall be able to:

- Learn the common problems of the central and peripheral nervous system, such as traumatic injuries, neoplasms, infectious and degenerative diseases
- Acquire the ability to perform a complete neurologic examination.
- Acquire knowledge of diagnostic procedures to evaluate diseases of the nervous system
- Obtain familiarity of surgical procedures carried out on patients with lesions affecting the nervous system.
- Acquire basic skills for the immediate treatment of patients with neurosurgical trauma.
- Become familiar with planning for the disposition of patients with acute and chronic neurosurgical trauma.
- Acquire understanding of the performance of a clinical brain death examination.
- Understand the changes, which result from trauma, to the peripheral nerves and principles of repair.

3. Thoracic Surgery:

The goal of this experience are to familiarize the Trainee the principles of thoracic surgery. The trainee needs to be familiar with the placement of incisions, how to open the thoracic cage and closure including standard thoracotomy incisions and sternotomy and to deal with the complications of surgery. The learning objectives during the rotation is detailed as follows.

- Acquire the technique of intercostals nerve blocks
- Acquire the technique of post operative field blocks
- Learn how to do standard thoracotomy using various levels and approaches
- Acquire the techniques of thoracotomy, thoracostomy, thoracocentesis and thoracoscopy.

- Learn the operative details of sternotomy including approach to retrosternal goiter, thymic tumours and superior mediastinal lesions
- Learn how to control intercostal vessels during Thoracotomy
- Learn the skills required for control of large vessel haemorrhage.
- Acquire the skills of performing pericardicentesis for traumatic pericardial haemorrhage (tamponade)
- Learn the timely and effective ways of managing tension pneumothorax and haemothorax
- Acquire the anatomical and surgical skills in doing a thoracoabdominal incision for abdominal and thoracic pathologies
- Learn the principles of various techniques used for oesophagectomy in cancer surgery
- Acquire the expertise of Oesophagoscopy, endoscopic dilatation, and stenting of oesophageal strictures of various aetiologies.
- Learn the various techniques of Oesophageal replacement (stomach, small bowel, colon)
- The principles of Pre-operative and Post operative management including airway access and ventilation

4. Plastic Surgery:

The goals of this experience are to familiarize the resident with the principles of plastic and reconstructive surgery and have the residents develop sound clinical and technical skills. Basic principles of wound closure and cosmesis, tissue reconstruction, and wound care will be emphasized. The learning objectives during the rotation to each discipline detailed as follows.

- Learn the common problems of the congenital deformities, trauma, infections and tumours of the skin and soft tissues.
- Learn the evaluation of patients with signs and symptoms involving the skin and soft tissues as well as craniofacial deformities and injuries.
- Acquire knowledge of diagnostic procedures to evaluate diseases of the skin, soft tissues and areas requiring reconstruction.
- Obtain familiarity of surgical procedures carried out on patients with lesions affecting the skin, soft tissues and areas requiring reconstruction.
- Acquire basic technical skills for the immediate treatment of patients with injuries to the skin, soft tissues and areas requiring immediate repair or reconstruction.
- Become familiar with planning for the disposition of patients with acute and chronic diseases of the skin, soft tissues and areas requiring reconstruction.
- Learn the principles of burns, their resuscitation, care and surgical management.

5. Urology:

The goals of this experience are to familiarize the resident with the principles of surgical and pertinent medical diseases in urology and have the residents develop excellent clinical and technical skills. Daily rounds, operating room procedures and targeted reading specifically addressing urologic diseases, shall achieve these goals. The trainees shall acquire the following knowledge, skills, and other attributes during the four-year training program:

- Demonstrate the ability to obtain an adequate urologic history
- Demonstrate the ability to perform adequate physical examination upon the genitourinary system - i.e. abdomen, pelvic exam in females, male external genitalia and prostate.
- Know the steps necessary to evaluate patients with UTI, haematuria and calculi.
- Familiarize with selection of appropriate urologic diagnostic approaches and interpretation of the results
- Demonstrate the ability to recognize common significant abnormalities in IV urography Be able to perform routine urethral catheterizations and dilations.
- Become familiar with the appropriate follow up and patient education for common urologic conditions.
- Be able to diagnose and manage renal colic, cystitis, prostatitis, and epididymitis.
- Acquire basic knowledge of the evaluation, diagnosis and management of urologic trauma
- Acquire knowledge of prostate, bladder, testicular, and kidney cancer including clinical presentation, diagnostic studies, therapeutic interventions, and staging.
- Be able to perform urologic procedures such as circumcisions, excision of condylomata, and biopsies, urethral dilatations and suprapubic cystostomy.
- Be able to work-up, discuss the treatment of urethral stricture and perform repair of simple strictures.
- Be able to remove a ureteral stone and bladder stone.
- Be able to perform open and endoscopic prostatectomy.

6. Orthopaedic surgery:

This rotation provides the trainee with the opportunity to learn the basic principles of care for the patient with musculoskeletal disease and injury. Principles of radiologic interpretation of extremity, pelvis, and spine films; management of non steroidal anti-inflammatory medications for arthritis and arthralgia and performance of a thorough musculoskeletal and joint exam should all be learned from this rotation. Techniques of casting, traction, and internal and external fixation should be learned. Overall, the trainees are expected to:

- Understand the basic principles of orthopaedics and traumatology
- Demonstrate good skill of history taking and examination of patients with orthopedic and trauma conditions
- Understand the pathophysiology of bone and joint congenital, infectious, traumatic conditions as well as benign and malignant tumours.
- Be able to diagnose and treat bone and soft tissue tumours of the extremities
- Be able to describe an extremity fracture over the phone to a senior resident or attending with accuracy and appropriate terminology.
- Be able to describe the elements of spinal fracture, which render it stable or unstable.
- Learn and practice stabilization of cervical vertebral injuries
- Be able to perform a thorough spinal examination for evidence of injury or instability
- Be able to articulate mechanisms of injury, which predict occult internal or vascular injury in the setting of extremity or cervical trauma Be able to undertake and interpret investigations relevant to specific patients.
- Be able to evaluate and management of an extremity compartment syndrome.
- Be able to articulate to a family the potential side effects of a non steroidal anti-inflammatory pain medication to be used after discharge.
- Be able to apply a stabilizing splint to an acutely injured and swollen extremity.
- Be able to place casts for long bone fractures.
- Be able to evaluate and appropriately surgically treat acute and chronic osteomyelitis and septic arthritis
- Be able to use traction for the definitive treatment of long bone fractures.
- Be able to place external fixators in appropriate cases.
- Be able to apply techniques of percutaneous pinning to appropriate fractures.
- Be able to place halo traction for unstable cervical spinal fractures.

- Be able to perform techniques of internal fixation to appropriate fractures.
- Be able to reduce shoulder, elbow, hip and ankle dislocations.
- Be familiar with the basic principles of hand surgery.
- Be able to recognize rickets, osteoporosis and other metabolic bone disorders
- Be able to direct physical therapists and nurses in the rehabilitation of orthopaedic patients

8. Radiology:

During the rotation to this unit, the residents shall be able to:

- Understand the operations and challenges of the X-ray department
- Have a basic understanding of the physics of x-ray and other diagnostic and therapeutic modalities to include radiography, sonography, radionuclides, computerized axial tomography, magnetic resonance imaging and other modalities.
- Appropriately order and interpret x-ray films of all systems and to make use of sonography.

C. Others: Tropical Surgical Diseases:

The trainee should be familiar with common parasitic and fungal diseases in the tropics – presentation, life-cycle, diagnosis and treatment. This would include:

- The surgical parasites: Hydatid Disease, schistosomiasis, amoebiasis, onchocerciasis, dracunculiasis, ascariasis,
- Tuberculosis and its complications indicating surgery.
- Ainhum (Dactylomyces spontanea)
- Typhoid fever and its complications (including extra intestinal)
- Bites and stings
- Sigmoid volvulus
- Kaposi's sarcoma
- Mycetoma, phycomycoses
- Cancrum oris
- HIV related surgical conditions
- Tropical pyomyositis
- Lymphoedema surgery, podoconiosis
- Tropical ulcer including Buruli's, atypical mycobacterium

2. Hospital Management:

A general surgeon, many a time, is expected to execute management and leadership activities in the department or the hospital he / she is working. This skill shall be gained by exposure to a course(s) in hospital management and or leadership. During this rotation, the trainee shall be able to:

- Understand basic personnel management principles.
- Read a basic hospital budget with the concepts of assets and liabilities
- Understand the relationship of the hospital to the parent organization.
- Understand the roles that persons in hospital management play.
- Understand the importance of equipment maintenance
- The importance of implementing an inventory system in the operating theatre

3. Legal Implications of Surgery and Ethical considerations (see appendix):

Understanding of the legal implications of surgery is vital for the practicing surgeon. Adequate knowledge in this area helps to protect self-right, right of the patients, the institution and the professional as well. The experience shall be gained by exposure to medico legal units and reading in the area. The trainee is generally expected to:

- Understand the rights of the patient and what informed consent means.
- Understand the relationship between the doctor and patient and what are the rights and responsibilities of each party.
- Develop the skill of being a legal witness in the court
- Understand the implications of being an expert witness.
- Define the area of expertise before testifying.

4. Research and evidence-based medicine:

The trainee shall gain the following experience in this area:

- Have a basic understanding in biostatistics and clinical epidemiology.
- Be able to design and implement a basic clinical research protocol including data analysis and be able to come to defensible conclusions.
- Understand the levels of evidence and be conversant with the use of meta-analysis and similar techniques.
- Be familiar with the existing evidence-based databases and use that familiarity in order to judge the validity of a clinical decision or treatment.

TOPICS	PRACTICAL PROCEDURES
1. GENERAL PRINCIPLES	
<ul style="list-style-type: none"> • The operation theatre and its team • Coagulation disorders and homeostasis • Haemolytic disorders of surgical importance • Immune response to trauma, infection and transplantation • Classification of surgical wounds, pathophysiology of wound healing, principles of wound management • Wound dehiscence, contracture, hypertrophic scars, keloids • Principles of asepsis and antisepsis • Sutures and ligatures • Basic principles of anastomosis • Antibiotic use in surgery • Fluid and electrolyte balance • Nutritional failure and nutritional support • Pain control in surgery 	<ul style="list-style-type: none"> • Skin preparation, local/ regional anaesthesia • Incision, repair, wound closure, dressings • Excision of benign skin and subcutis tumours • Drainage of abscess • Wound debridement • Aseptic techniques • Skills lab

2: CRITICAL CARE	
<ul style="list-style-type: none"> • Hypotension • Haemorrhage, haemorrhage and shock • Haemorrhagic and thrombotic disorders • Blood transfusion and blood component therapy • Septicaemia and the septic syndrome • Respiratory failure, respiratory arrest • Acute renal failure in surgical patients • Cardiac failure, myocardial ischaemia, cardiac arrhythmias, cardiac arrest • Multiple organ failure 	<ul style="list-style-type: none"> • Venesection • Venous Cannulation • Cut Down • Insertion of a Central venous line • ATLS • AV shunt • Resuscitation • Mangement of Septic shock
3: TRAUMA AND CRITICAL SURGICAL ILLNESS	

<ul style="list-style-type: none"> • Principles of pre-hospital care • Traumatic wounds • Burn management • Fractures and dislocations • Head injuries • Chest injuries: pneumothorax, haemothorax • Abdominal injuries • Genitourinary injuries • Trauma in children and pregnancy 	<ul style="list-style-type: none"> • Clinical assessment of critically ill or severely injured patients • ATLS • Monitoring of critically ill or severely injured patients • Resuscitation/Fluid balance • Fracture immobilization • GCS monitoring • Chest aspiration/tube insertion • Cut down • Paracentesis, DPL • Bladder catheterization • Cystostomy • Nasogastric tube insertion • Foetal monitoring /US of mother and child
--	---

4: PERIOPERATIVE MANAGEMENT	
<ul style="list-style-type: none"> • Assessment of risks and fitness for anaesthesia and surgery • Management of associated conditions : DM, hypertension, asthma, IHD, malnutrition, anaemia, jaundice, steroids, anticoagulant, immunosuppressant, psychotropics • General preparation of patient for surgery • Fluids and electrolytes- correction and maintenance • Premedication and sedation • Prophylaxis of thromboembolism • Principles of anaesthesia • Care and monitoring of the anaesthetized patient • Prevention of injuries to nerves and others • Pain control • Monitoring: ABC, fluids, electrolytes • Respiratory care: recognition and treatment of respiratory failure • Blood transfusion : indications, components, hazards, complications, plasma substitutes • Nutritional support • Perioperative complications, prevention, recognition, and management 	<ul style="list-style-type: none"> • Summary of the surgical diagnosis and then proposed procedure • Informed consent • Tourniquet use and precaution • Techniques of venous access
5: SURGICAL/CLINICAL ONCOLOGY	

<ul style="list-style-type: none"> • The applied basic sciences relevant to the understanding of the clinical behavior, diagnosis and treatment of cancer • Principles of molecular biology of cancer • Carcinogenesis, cancer genetics, premalignant states • Pathology, mechanism of invasion and metastasis, staging, diagnostic principles • Epidemiology of common cancers, cancer screening, cancer registry • Principles of cancer therapy (surgery, adjuvant therapy, radiotherapy) • Prevention of cancer • Terminal care of cancer patients- pain and symptom relief 	<ul style="list-style-type: none"> • Tutorials • Examination of a Cancer patient • Various routes of administering Chemotherapeutic agents. • Peripheral and central Venous access • Implanted portals. • IV administration of cytotoxics and monitoring • Practical approaches to pain management
--	---

<p>6. RESEARCH AND ETHICS</p>	
<ul style="list-style-type: none"> • Clinical audit and quality assurance • Statistics and computing in surgery • Principles of research and research methodology • Medico-legal ethics in surgery • Proposal writing • Surgical audit 	<ul style="list-style-type: none"> • Critical appraisal of the surgical literature • Informed consent • Publications
<p>7. NON-TRAUMA EMERGENCY SURGERY</p>	

<ul style="list-style-type: none"> • Acute abdomen • Biliary tract emergencies • Foreign body aspiration/ swallow • Gastrointestinal bleeding • Appendicitis and right iliac fossa pain • Abdominal pain in children • Peritonitis • Intestinal obstruction, ischaemia • Strangulated hernia • Genitourinary, • Gynaecological emergencies • Ischaemic limb 	<ul style="list-style-type: none"> • Exploratory laparotomy • Cholecystectomy • Bronchoscopy / Oesophagoscopy • Operations for GI bleeding including partial gastrectomy • UGI endoscopy for bleeding • Appendectomy/ • Closure of perforated PUD • Laparotomy for intestinal obstruction • Herniorrhaphy • Bowel resection • Colostomy, ileostomy • Suprapubic cystostomy • Scrotal exploration, paraphimosis release • Salpingectomy / Hysterectomy • Amputation • Doppler US
<p>8. Anesthesia and intensive care</p>	

<ul style="list-style-type: none"> • General Anaesthesia • Intravenous neurolept anaesthesia • Regional anaesthesia • Local anaesthesia • Bier`s block • Ketamine 	<ul style="list-style-type: none"> • Resuscitation and haemodynamic support • Airway access / Cardiopulmonary resuscitation • Endotracheal intubation • General anaesthesia • Central venous line insertion • Techniques of LA • Regional Blocks/Bier`s • Spinal Block
<p>9.Gynecology</p>	
<ul style="list-style-type: none"> • Obstructed labour, foetal distress • Ovarian tumour • Ruptured ectopic pregnancy • Ruptured uterus, giant fibroids • Obstetric fistulae 	<ul style="list-style-type: none"> • Caeserean section • Dilatation and curettage • O o p h o r e c t o m y , salpingectomy • Hysterectomy • VVF Repair
<p>10. TRAUMA SURGERY</p>	

<ul style="list-style-type: none"> • Assessment of the multiply injured patient • Chest injuries, respiratory failure, pulmonary oedema, shock lung, ARDS, pulmonary embolism, cardiac tamponade • Abdominal injuries, rectal injuries • Vascular injuries • Neck injuries • Burn • Gunshot and blast injuries • Compartment syndromes • Abdominal injuries • Genitourinary injuries • Fractures: pathophysiology of healing, principles of management, and complications • Head injuries, complications, and management 	<ul style="list-style-type: none"> • Tracheostomy • Cricothyroidotomy • Thoracotomy / Thoracocentesis • Chest tubes • Laparotomy/Paracentesis • Neck stabilisation • Escharotomy, escharectomy • Exploration, revision, debridement • Fasciotomy • Splenectomy • Suprapubic catheterisation • Fractures: reduction and fixation • Amputation • POP application • External fixation • Internal fixation • Burr holes • Elevation of depressed skull
<p>11. SURGICAL SEPSIS</p>	

<ul style="list-style-type: none"> • Abscess and superficial sepsis • Pyomyositis, necrotizing fasciitis • Abdominal sepsis • Empyema and thoracic sepsis • Intracranial sepsis • Hepatitis and HIV in surgery 	<ul style="list-style-type: none"> • Abscess drainage • Fasciotomy • Laparotomy • T h o r a c o s t o m y / Thoracotomy • Burr holes, craniotomy,LP
<p>12. GASTROINTESTINAL SURGERY</p>	

<ul style="list-style-type: none"> • Neoplasms of the upper GI tract • Gallstone disease • Jaundice • Portal hypertension • Gastroesophageal reflux disease • Hiatus hernia • Peptic ulcer disease and its complications • Upper GI hemorrhage • Gastric carcinoma • Pancreatic diseases • Colorectal neoplasms • IBD, sigmoid volvulus • Diverticular disease • Hydatid disease • Irritable bowel syndrome • Haemorrhoids, anal fissure, perianal fistula and abscesses • Lower GI hemorrhage • Colostomy, ileostomy complications • Tuberculosis of the gastrointestinal tract 	<ul style="list-style-type: none"> • UGI endoscopy • Cholecystectomy • CBD exploration • Bilio-enteric bypass • ERCP • Vagotomy and drainage procedures • Fundoplication • Endoscopic banding/ Sclerotherapy • Gastrectomy • Pancreatectomy • Splenectomy • Colectomy • Haemorrhoidectomy • Sphincterotomy • Fistulotomy • AP resection • Colostomy/Ileostomy closure • Anorectosigmoidoscopy, colonoscopy
<p>13. HEAD AND NECK SURGERY</p>	

<ul style="list-style-type: none"> • Neck masses: differential diagnosis and treatment • Pleomorphic adenoma • Salivary gland tumours • Lymphangioma • Branchial cysts • Thyroglossal duct cysts and fistula • Infections: Ludwig's angina, periodontal abscesses • Oropharyngeal and mandibular tumours 	<ul style="list-style-type: none"> • Parotidectomy • Excision • Neck dissection • Branchial cyst excision • Cystectomy, • Incision drainage • Oropharyngeal access • Tracheostomy
<p>14. CHEST SURGERY</p>	
<ul style="list-style-type: none"> • Empyema, TB, bronchiectasis, constrictive pericarditis • Lung abscess • Lung cancer • Hydatid disease 	<ul style="list-style-type: none"> • Bronchoscopy • Thoracocentesis • Insertion of a chest tube • Thoracostomy • Thoracotomy • Decortication, cystectomy, lobectomy, pneumonectomy • Pericardiocentesis
<p>15. ENDOCRINE SURGERY</p>	

<ul style="list-style-type: none"> • The thyroid: goiter, cancer • The parathyroid: disorders of calcium metabolism, hyper/hypoparathyroidism • The adrenal cortex and medulla: Cushing's syndrome, Con's syndrome • Pheochromocytoma, MEN syndromes • Carcinoid syndrome • Endocrine causes of secondary hypertension 	<ul style="list-style-type: none"> • Thyroidectomy • Parathyroidectomy • Adrenalectomy • Bronchoscopy • Appendicectomy • Oophorectomy
<p>16. BREAST SURGERY</p>	
<ul style="list-style-type: none"> • Benign diseases of the breast and management • Cancer of the breast: pathology, mammography, ultrasonography, ER/PR, surgical therapy, adjuvant therapy (chemotherapy, radiotherapy, hormonal therapy) • Cosmetic surgery 	<ul style="list-style-type: none"> • Drainage of abscess • Excision of lump • FNA, trucut biopsy • Mastectomy, BCT • Axillary dissection • Sentinel node biopsy • Administering chemotherapy • Mamoplasty
<p>17. HERNIA SURGERY</p>	
<ul style="list-style-type: none"> • Anatomy • Internal hernias • External hernias 	<ul style="list-style-type: none"> • Herniotomy • Herniorrhaphy
<p>18. PAEDIATRIC SURGERY</p>	

<ul style="list-style-type: none"> • Undescended testis • Scrotal masses, testicular tumors • Infantile pyloric stenosis • Wilm's tumour, Neuroblastoma • Appendicitis • Congenital anomalies: genitourinary, abdominal wall, anorectum, gastrointestinal 	<ul style="list-style-type: none"> • Orchidopexy • Orchiectomy • Ramstedt's procedure • Nephrectomy • Appendicectomy • Circumcision • Hydrocelectomy • Varicocelectomy • Vasectomy • Repair abdominal wall
<p>19. UROLOGICAL SURGERY</p>	
<ul style="list-style-type: none"> • Upper urinary obstruction • Lower urinary obstruction • Infections • Genitourinary tuberculosis • Stone disease • Urethral stricture • Neoplasms • Genital diseases • BPH, prostate cancer • Chronic renal failure • End stage renal failure 	<ul style="list-style-type: none"> • Nephro, uretero, and cystolithotomy • Cystoscopy • Cystectomy • Urethro, pyeloplasty • Bouginage • Nephrectomy • Uretero-sigmoidostomy • Prostatectomy • AV Shunts • Renal transplantation
<p>20. Lymphoreticular system surgery</p>	

<ul style="list-style-type: none"> • The spleen: splenomegaly, hypersplenism, splenectomy and complication • Lymphoedema • Surgery in the immune deficient patient 	<ul style="list-style-type: none"> • Splenectomy • Bone marrow biopsy
21. VASCULAR SURGERY	
<ul style="list-style-type: none"> • Venous thrombosis and embolism • Chronic venous insufficiency • Varicose veins • Atherosclerosis • Ischaemic limb • Aneurysms • Hyper / hypocoagulable states • Mesenteric ischaemia • Investigations: angiography, MRI, CT, Doppler ultrasound 	<ul style="list-style-type: none"> • Varicose vein stripping • Formation of AV shunts • Thrombo-embolism • Femoro-popliteal or femoro-femoral bypass • Vascular repair anastomosis • Aortic aneurysm repair • Doppler US • On table angiography • Sympathectomy
22. ORTHOPEDICS AND TRAUMA SURGERY	

<ul style="list-style-type: none"> • Bone and joint infections: osteomyelitis, arthritis • Congenital conditions • Metabolic and degenerative diseases • Neoplasms of bone, joints and soft tissues • Postpolio surgical conditions • Surgery in Leprosy • Fractures • Rehabilitation following trauma 	<ul style="list-style-type: none"> • Sequesterectomy • Tendon transfer • Amputations • Arthrotomy • Arthrodesis • Girdlestone procedure • Fracture-dislocation reductions • POP, skin and skeletal traction • Nerve and tendon repair
<p>23. PLASTIC AND RECONSTRUCTIVE SURGERY</p>	
<ul style="list-style-type: none"> • Principles and techniques • Congenital malformation: cleft lip, cleft palate, hypospadias • Skin tumors: basal and squamous cell carcinoma, melanoma • Sarcomas • Surgical management of burn • Basic principles of hand surgery 	<ul style="list-style-type: none"> • Cheiloplasty • Excision of skin lesion/ tumour • Release of contractures • Reconstructions • Flaps • Skin grafts • Dissection of groin • Tendon repair
<p>24. NEUROSURGERY</p>	

<ul style="list-style-type: none"> • Peripheral nerve injuries • Head injury • CNS tumours • Spinal injury 	<ul style="list-style-type: none"> • Nerve repair • Burr holes • Elevation of depressed skull fracture • Craniotomy • Spinal immobilisation
<p>25. MISCELLANEOUS TOPICS</p>	
<ul style="list-style-type: none"> • Use of diathermy • Bowel anastomosis • Obstetric and gynaecologic emergencies • Laparoscopic surgery principles 	<ul style="list-style-type: none"> • Diagnostic laparoscopy • L a p a r o s c o p i c cholecystectomy • L a p a r o s c o p i c adhesiolysis • Thoracoscopy • Caesarian section, ruptured ectopic pregnancy procedure • Enucleation of eye ball <p>Anesthesia use: LA, nerve block, spinal, ketamine, GA</p>

LIST OF RECOMMENDED PROCEDURES BY YEAR OF PROGRAM

FIRST YEAR	SECOND YEAR
<ul style="list-style-type: none"> • Excision of skin lesions 	<ul style="list-style-type: none"> • Removal of deep foreign body
<ul style="list-style-type: none"> • Incision and drainage of abscess 	<ul style="list-style-type: none"> • Fasciotomy / escharotomy
<ul style="list-style-type: none"> • Removal of superficial foreign body 	<ul style="list-style-type: none"> • Insertion central venous line
<ul style="list-style-type: none"> • Debridement of degloved wound 	<ul style="list-style-type: none"> • External cardiac massage, defibrillation
<ul style="list-style-type: none"> • Suturing complex laceration 	<ul style="list-style-type: none"> • Arterial sampling
<ul style="list-style-type: none"> • Insertion of intercostal drain 	<ul style="list-style-type: none"> • Intercostal and brachial nerve blocks
<ul style="list-style-type: none"> • Lumbar puncture 	<ul style="list-style-type: none"> • Tracheostomy
<ul style="list-style-type: none"> • Excision of breast lump 	<ul style="list-style-type: none"> • Endotracheal intubation
<ul style="list-style-type: none"> • Appendectomy 	<ul style="list-style-type: none"> • Orchidectomy
<ul style="list-style-type: none"> • Epigastric herniorrhaphy 	<ul style="list-style-type: none"> • Vasectomy
<ul style="list-style-type: none"> • Proctoscopy and rectal biopsy 	<ul style="list-style-type: none"> • Below-knee amputation
<ul style="list-style-type: none"> • Insertion of traction Steinmann pin 	<ul style="list-style-type: none"> • Inguinal herniorrhaphy
<ul style="list-style-type: none"> • Manipulation of fractures 	<ul style="list-style-type: none"> • Umbilical herniorrhaphy
<ul style="list-style-type: none"> • Application of POP 	<ul style="list-style-type: none"> • Closure of perforated duodenal ulcer
<ul style="list-style-type: none"> • Circumcision 	<ul style="list-style-type: none"> • Closure of perforated peptic ulcer, open
<ul style="list-style-type: none"> • Suprapubic cystostomy 	<ul style="list-style-type: none"> • Laparotomy for small bowel obstruction

<ul style="list-style-type: none"> • Urethral catheterization 	<ul style="list-style-type: none"> • Laparotomy for large bowel obstruction
<ul style="list-style-type: none"> • Lymph node biopsy 	<ul style="list-style-type: none"> • Drainage of ano-rectal sepsis
<ul style="list-style-type: none"> • Reduction of paraphimosis 	<ul style="list-style-type: none"> • Exploration of scrotum
<ul style="list-style-type: none"> • Treatment of breast abscess 	<ul style="list-style-type: none"> • Cardio-pulmonary resuscitation
<ul style="list-style-type: none"> • Hydrocelectomies 	<ul style="list-style-type: none"> • Outpatient haemorrhoid treatment
<ul style="list-style-type: none"> • Epididymal cyst excision 	<ul style="list-style-type: none"> • Digital block
<ul style="list-style-type: none"> • Surgery for varicocele 	<ul style="list-style-type: none"> • Axillary block
<ul style="list-style-type: none"> • Control of venous bleeding 	<ul style="list-style-type: none"> • Spinal anaesthesia
<ul style="list-style-type: none"> • Closed reduction 	<ul style="list-style-type: none"> • Use of ketamine
<ul style="list-style-type: none"> • Fracture manipulation and splinting 	<ul style="list-style-type: none"> • Administration of general anaesthesia
<ul style="list-style-type: none"> • Skin and skeletal traction 	<ul style="list-style-type: none"> • Internal cardiac massage
<ul style="list-style-type: none"> • Use of local anesthesia 	

THIRD YEAR	
<ul style="list-style-type: none"> • Skin grafting 	<ul style="list-style-type: none"> • Haemorrhoidectomy
<ul style="list-style-type: none"> • Simple mastectomy 	<ul style="list-style-type: none"> • Uncomplicated fistula in anal procedure
<ul style="list-style-type: none"> • Mastectomy for gynaecomastia 	<ul style="list-style-type: none"> • Right hemicolectomy
<ul style="list-style-type: none"> • Long saphenous ligation and stripping 	<ul style="list-style-type: none"> • Left hemicolectomy
<ul style="list-style-type: none"> • Lower segment Caesarean section 	<ul style="list-style-type: none"> • Sub-total colectomy

• Tendon repair	• Closure of colostomy
• Carpal tunnel release	• Split and full thickness skin grafting
• Application of external fixator	• Block dissection of axilla and groin
• Above-knee amputation	• Surgery for soft tissue tumors including sarcomas
• Sigmoidoscopy	• Thyroid lobectomy
• Upper GI endoscopy	• Submandibular salivary gland excision
• Emergency hernia repair	• Surgery for all abdominal hernia
• Salpingectomy	• Open fracture debridement and Ex-Fix
• Small bowel resection	• Nerve repair
• Ileostomy	• Flexor and extensor tendon repair
• Laparotomy for perforated colon	• Surgical approaches to the joints
• Hartmann's operation	• Arthrotomy for abscess drainage
• Colostomy	• Emergency head injury management: closed and open
• Splenectomy for trauma	• Surgery for ruptured ectopic pregnancy
• Laparotomy for abdominal injury	• Cystoscopy
• Laparotomy for sepsis	• Nephrectomy
• Burr holes and craniotomy for trauma	• Pyelolithotomy
• Splenectomy	• Prostatectomy

FOURTH YEAR AND FIFTH YEAR	
• Lateral anal sphincterotomy	• Procedures for rectal prolapse
• Operations for GI bleeding	• Retrosternal goiter
• Emergency cholecystectomy	• Thyroglossal cystectomy
• Laparotomy for post operative complications	• Ramstedt's procedure (pyloromyotomy)
• Emergency thoracotomy	• Axillary dissection
• Thoracotomy for sepsis	• Repair of children's hernia
• Laparoscopic cholecystectomy	• Vascular suture/ anastomosis
• Conversion to open cholecystectomy	• Closed and open port insertion
• Exploration of common bile duct	• Diagnostic laparoscopy
• Biliary bypass	• Laparoscopic biopsy
• Gastrectomy	• Thoracotomy
• Rectal injuries	• Rib resection

Summary of common procedures performed by General Surgery candidates and the top 25 procedures.

Gynaecology and Obstetrics

- Caeserean section
- Hysterectomy (Open)
- Surgery for ectopic pregnancy

Orthopaedics

- Fasciotomy
- Escharotomy
- Amputation
- POP application
- External fixation
- Fracture-dislocation reductions
- Nerve and tendon repair
- Arthrotomy
- Sequesterectomy

Abdominal and General Surgery

- Endoscopy
- Cholecystectomy
- CBD exploration
- Bilio-enteric bypass
- Vagotomy and drainage procedures
- Gastrectomy
- Splenectomy/splenorrhaphy
- Hemorrhoidectomy
- Sphincterotomy
- Fistulotomy and fistulectomy
- Colo-rectal resections
- Creation of a stoma
- Colostomy reversal
- Tracheostomy
- Hernia surgery
- Emergency Laparotomy
- Small bowel resection
- Tube Thoracostomy
- Thoracotomy for trauma
- Thyroidectomy
- Simple Mastectomy
- Radical mastectomy with Axillary dissection

Head and Neck/ENT

- Tonsillectomy
- Parotidectomy
- Salivary gland resection
- Dental wiring

Urology

- Circumcision
- Hydrocelectomy
- Varicocelectomy
- Vasectomy
- Orchidopexy
- Nephro, uretero, and cystolithotomy
- Cystoscopy
- Prostatectomy (Open)
- Bouginage
- Nephrectomy

Vascular surgery

- Vascular anastomosis, repair
- Varicose vein stripping

Plastic and reconstructive surgery

- Skin grafts
- Release of contractures
- Excision of skin lesion/tumor
- Dissection of groin

Neurosurgery

- Nerve repair
- Burr holes
- Craniotomy/Craniectomy
- Elevation of depressed skull fracture

Others

- Diagnostic laparoscopy
- Laparoscopic cholecystectomy
- Laparoscopic appendectomy
- Other laparoscopic
- Bronchoscopy
- Anesthesia use: LA, nerveblock, spinal, ketamine, GA
- Ramstedt's procedure

Top 25 operations

1. Thyroidectomy: all types
2. Colon resection: all types
3. Mastectomy with or without axillary dissections
4. Hernial repair procedures: all types
5. Wound management including debridement
6. Endoscopy: all types
7. Open Prostatectomy
8. Renal explorations including nephrectomy
9. Cystotomy and catheterisation
10. Caesarean section
11. Biliary-Enteric bypass
12. Cholecystectomy
13. CBD exploration
14. Perianal surgery for fissures, haemorrhoids and abscess
15. Creation and closure of intestinal stoma
16. External/internal fixation for trauma
17. Closed fracture management
18. Skin grafts and excision of skin tumors
19. Thoracotomy
20. Laparotomy for acute abdomen
21. Gastric resection
22. Gastrojejunostomy with or without vagotomy
23. Esophagectomy: all types
24. Paediatrics hernia/hydrocele repair
25. Burr hole and craniotomy

4.4 Appendix 1 Core texts and journals

Required Reading during Residency

-Surgical textbook covering the principles of general surgery (to cover at least one of the following every two years)

- Schwartz's principles of surgery. Brunicaudi, F Charles; Andersen, Dana K; Billiar, Timothy R; Dunn, David L; Hunter, John G. McGraw-Hill Education / Medical; 10 edition (July 16, 2014). ISBN-13: 978-0071796750 . [Book]
- Sabiston textbook of surgery: the biological basis of modern surgical practice. Courtney M., Townsend Jr., R. Daniel Beauchamp. Saunders; 19th edition (February 23, 2012), 19th ed. ISBN-13: 978-1437715606. [Book]
- Greenfield's surgery: scientific principles and practice. Mulholland, Michael W. Lippincott Williams & Wilkins; Sixth edition (December 23, 2016). ISBN-13: 978-1469890012. [Book]
- Bailey & Love's short practice of surgery. Norman S. Williams, Christopher J. K. Bulstrode, P. Ronan O'Connell. Hodder Arnold; 26th Revised edition edition (February 22, 2013). ISBN-13: 978-1444121285. [Book]
- Current surgical therapy. Cameron JL. Elsevier; 12 edition (December 29, 2016). ISBN-13: 978-0323376914. [Book]
- Surgical Atlas (at least one of the following)
- Fischer's Mastery of Surgery. Josef E. Fischer, Daniel B. Jones, Frank B. Pomposelli, Gilbert R. Upchurch Jr. Lippincott Williams & Wilkins; Sixth edition (December 20, 2011). ISBN-13: 978-1608317400
- Zollinger's atlas of surgical operations. Zollinger RM, Ellison EC. McGraw-Hill Education / Medical; 10 edition (April 25, 2016). ISBN-13: 978-0071797559. [Book]
- Chassin's operative strategy in general surgery: An expositive atlas. Scott-Conner CE. Springer; 4th edition (November 19, 2013). ISBN-13: 978-1461413929. [Book].

Critical Care

- Critical Care Handbook for Global Surgery. Available as PDF on COSECSA website. <http://www.ssethio.org/notes/class11/621072038969829888.pdf>
- Marino's the ICU Book. Marino PL. Lippincott Williams & Wilkins; 4 edition (October 28, 2013). ISBN-13: 978-1451121186

Urology

- Campbell-Walsh Urology. W. Scott McDougal, Alan J. Wein, Louis R. Kavoussi, Alan W. Partin, Craig A. Peters. Elsevier; 2 edition (December 15, 2015). ISBN-13: 978-0323328302. [Book]

Neurosurgery

- Essential Neurosurgery 3rd Edition by [Andrew H. Kaye](#) (Author) Blackwell Publishing 2005 ISBN-13: 978-1405116411 ISBN-10: 1405116412

Obstetrics and Gynaecology

- Te Linde's operative gynecology. Jones, H.W. and Rock, J.A., 2015. Lippincott Williams and Wilkins; 11th edition edition (1 Aug. 2015) . ISBN-13: 978-1451177367. [Book]

Orthopaedics

- Campbell's Operative Orthopaedics, 12th Edition 4-Volume Set
- Authors: S. Terry Canale & James H. Beaty Elsevier [UPCOMING EDITION – ISBN: 9780323374620](#)

Paediatric Surgery

- Paediatric Surgery: A Comprehensive Text for Africa. Ameh E, Bickler S, Lakhoo K, Nwomeh B, Poenaru D. Global HELP. PDF available at: http://global-help.org/products/paediatric_surgery_a_comprehensive_text_for_africa/

Plastics and Reconstructive Surgery

- Principles of Reconstructive Surgery in Africa. PAACS Publication. Ed: L Carter. 2013.

Electronic resources

www.facs.org/education/essentials.pdf ,
www.iscp.ac.uk,
Critical Care Handbook for Global Surgery,
<http://www.ptolemy.ca/sia.htm>,