



R E G U L A T I O N S
FOR ADMISSION TO THE FELLOWSHIP OF
THE COLLEGE OF SURGEONS OF SOUTH AFRICA
FCS(SA)

1.0 COMPONENTS

The examination comprises Primary, Intermediate and Final: The Final must be passed within six years of passing the Intermediate

PRIMARY The applied basic sciences relevant to surgery in general

INTERMEDIATE

- i) The principles of surgery in general
- ii) The principles of the surgical speciality disciplines

FINAL The theory and practise of general surgery including operative surgery and anatomy, physiology and pathology

2.0 PURPOSE OF ASSESSMENT

This qualification forms part of a process to accredit medical practitioners as specialists in General Surgery. The Health Professions Council of South Africa (HPCSA) stipulates the training requirements, including a minimum period of experiential learning. It is usual for the examination to be taken and passed prior to the completion of the required period of supervised learning specified by the HPCSA. The aim of this qualification is to meet the needs for formal examination certification, as well as to set standards, nationally, for such a qualification.

3.0 ADMISSION TO THE EXAMINATION

3.1 ADMISSION TO THE PRIMARY EXAMINATION

3.1.1 A candidate for the Primary examination must hold a post-internship qualification to practise medicine which has been registered or is registrable with the Health Professions Council of South Africa

3.1.2 The General Surgical Primary examination is used for candidates wishing to proceed to other surgical specialities. The rules of the other surgical speciality vary and it is incumbent on prospective candidates to check the appropriate college's regulations before applying for admission to the general surgical primary examination.

3.1.3 The candidate should have successfully completed the 3 day Basic Surgical Skills course or the Basic and Essential Surgical Skills Training (BESST) course prior to applying for the Primary Examination

3.2 ADMISSION TO THE INTERMEDIATE EXAMINATION

A candidate may be admitted to the Intermediate examination having

- 3.2.1 passed the Primary
- 3.2.2 completed not less than 12 months of approved training, as a registered medical practitioner, in surgery

Of the 12 months training called for, not less than 6 months must be spent in general surgery, not less than 3 months must be spent in ICU, and not less than 3 months in trauma/emergency surgery.

NOTE:

- 3.2.2.1 The Primary and Intermediate examinations may be attempted concurrently with the proviso that if the Primary is failed and the Intermediate passed, no credit will be given for passing the Intermediate which will have to be retaken
- 3.2.2.2 The CMSA Senate, through its Examinations and Credentials Committee, will review all applications for admission to the examination and may also review the professional and ethical standing of candidates

3.3 ADMISSION TO THE FINAL EXAMINATION

A candidate may be admitted to the Final examination having

- 3.3.1 passed the Primary and the Intermediate or the MMed Primary and Intermediate
- 3.3.2 produced evidence of having:
 - 3.3.2.1 been qualified to practise for a period of not less than four years (year of internship NOT to form part of this period)
 - 3.3.2.2 served a period of not less than 2½ years approved training in general surgery. This period may form part of the 4 years called for in 3.3.2.1 above and is additional to the training called for in paragraph 3.2.2
 - 3.3.2.3 undertaken and submitted a supervised research project, of a moderate size in the area of general surgery, to the university at which the candidate is registered for an MMed. It should be in the required format for an MMed of the training university department. The following may, depending on the university in question, be deemed to be of appropriate scope:
 - A dissertation on a hypothesis based research project or
 - One peer reviewed article as first author or
 - Two first author case report or
 - Presentation of two commentaries (one commentary may be a literature review or a detailed study of a condition, or a case of which the candidate has had personal experience. The other commentary must be based on original research done by the candidate. Commentaries should include the candidate's own conclusions, based on the literature search or research findings. Length of one commentary should be 2,000 – 3,000 words with adequate referencing.
 - 3.3.2.4 submitted a personal portfolio which details the individuals training and formative assessments in General Surgery or any other surgical discipline, gained while the candidate was in a training post approved and registered by the Medical and Dental Board of the Health Professions Council of South Africa, or in a comparable postgraduate training post in any other country

The portfolio must at least record:

 - Full details about the training institution(s) or hospital(s), specialist supervision (names, qualifications and addresses of consultants), and the training post (registered number, dates of employment in the post) must be provided
 - All events in the candidate's surgical training, with particular reference to formative assessment, operative experience, examination results and academic performance.
 - *Training posts held:* Candidates are required to list, in chronological order, the training posts held and courses attended, with supporting documentation.

- *Academic activities:* A record of all academic activities in which the candidate has been involved in each of the training posts ie publications and contributions to clinical and scientific meetings, courses and involvement in research projects.
- *Surgical operations:* A record of all surgical operations in which the candidate has been personally involved during tenure of the listed training posts.
The operation records should include all relevant information ie the date of the operation, the patients hospital number and age, the nature of the procedure and an indication of whether it was performed without supervision [NS] or under supervision by a qualified surgeon [S] or if the candidate acted as first assistant to a qualified surgeon [A]. Significant post-operative complications are to be recorded.
- *Minor surgical* procedures performed by the candidate are to be separately recorded under the heading “Minor Surgery” in the special pages provided.
- *Endoscopies:* All endoscopic procedures carried out by the candidate, either supervised or unsupervised, are to be recorded separately.
- *Consolidated experience:* At the end of each training period/rotation 3–6 months post, consolidate operative experience on the separate pages provided. Open and laparoscopic procedures should be detailed on separate sheets. The procedures performed should be listed in descending order based on the total number of procedures which have been performed (see example consolidation sheet (Page 12 of logbook). It should be signed by the supervising consultant and the HOD of Surgery at that institution.
- *Overall Consolidated Experience:* At the time of submission for the final fellowship examination an overall consolidation sheet reflecting the candidate’s total experience to date must be compiled. It should be signed by the Academic Head of the training programme.
- *Formative reports:* The candidate’s formative report for each training period should be included in the logbook. It should be signed by the supervising consultant and the HOD of Surgery at that institution.
- *Overall formative report:* The candidate’s overall formative report should be included in the logbook. It should be signed by the Academic Head of the training programme and be based on the candidate’s overall performance during training.
- *Research project:* The portfolio must contain the title of the research project and the date of submission of the project to the training institution. The Academic Head of the training programme must certify that the research project has been completed.
- *Format:* The logbook is available in word format and as an excel spread sheet. The Candidate may record and submit the details only in typed form or as a computer database file, provided it includes the required information in the format required and verification of authenticity (logbooks are obtainable on the CMSA website) candidate not being invited for the clinical part of the examination, regardless of the marks obtained in the written examination. No credit will be given for the marks obtained in the written examinations if the corrected portfolio is not received in time. It is recommended that all candidates entering into their registrar training form 1 January 2019 use the LogBox online portfolio. This is a free service and the app is available in both Apple and Android format. Please register at www.logbox.co.za¹²

- *Submission procedure: .../*

Rule changes from August 2016 Regulation ¹

² LogBox recommendation effective for new Registrars – 1 January 2019

- *Submission procedure:* The portfolio must be submitted three months prior to the written examination in order to reach the College of Surgeons timeously. The CMSA will inform candidates whose portfolios do not meet the above minimum requirements. These candidates may, at the discretion of the College of Surgeons be given the opportunity re-submit their portfolios after having addressed the deficiencies identified by the College of Surgeons at least 4 weeks before the clinical part of the examination. Failure to re-submit an acceptable portfolio before this date will result in the candidate not being invited for the clinical part of the examination, regardless of the marks obtained in the written examination. No credit will be given for the marks obtained in the written examinations if the corrected portfolio is not received in time.

4.0 SYLLABUS FOR THE PRIMARY EXAMINATION

Basic Sciences

4.1 Core knowledge of anatomy, physiology, principles of pathology, microbiology, principles of pharmacology and therapeutics, haematology and transfusion, critical appraisal of the literature, evidence based medicine, applied medical statistics, epidemiology, legal and ethical issues. This knowledge of the basic sciences is common to all surgical disciplines

4.2 SEE APPENDIX A FOR GUIDELINES – Effective March 2008

5.0 SYLLABUS FOR THE INTERMEDIATE EXAMINATION

5.1 Core knowledge of the principles of surgery in general and the principles of surgical specialty disciplines

5.2 SEE APPENDIX B FOR GUIDELINES – Effective March 2012

6.0 SYLLABUS FOR THE FINAL EXAMINATION

6.1 The theory and practise of general surgery, including operative surgery and the applied sciences

6.2 Surgical guidelines

6.3 SEE APPENDIX C FOR GUIDELINES

7.0 CONDUCT OF THE PRIMARY EXAMINATION

The College of Surgeons is constantly reviewing assessment methods to ensure the validity and reliability for their examinations.³

7.1 Two 3-hour papers of MCQs and/or short written questions on the basic sciences. The multiple choice questions may include multiple true false, choose the best option and extended matching questions

7.2 Marking regulation for the FCS(SA) Primary Examination:

- None to all the responses/detractors in a MCQ may be correct
- In order to pass the primary examination a candidate must achieve an average of 50% or more for both papers (sub-minimum of 40% for each paper)

³ Statement of assessment systems used.

8.0 CONDUCT OF THE INTERMEDIATE EXAMINATION

The College of Surgeons is constantly reviewing assessment methods to ensure the validity and reliability for their examinations.

8.1 Two 3-hour papers consisting of MCQ questions on the principles of surgery in general and of surgical speciality disciplines respectively. The multiple choice questions may include, choose the best option and extended matching questions.

8.2 The performance examination will consist of two paper cases and an OSCE. All questions will be blueprinted.

8.3 Marking Regulations for the Intermediate examination:**8.3.1 The written examination**

For a candidate to pass the multiple-choice component they must achieve greater than or equal to 50% for each MCQ paper. To be invited to the performance examination a candidate must achieve a mark equal to or greater than 50% in MCQ Paper 1 as well as a mark equal to or greater than 50% for MCQ Paper 2.

8.3.2 The performance examination

The oral examination will consist of two paper cases and an OSCE.

One Paper case will be centred around the Principles of Surgery in General, and the second around Principles of Surgery and Surgical Specialities. There will be 20 OSCE questions. Ten questions will be based on Principles of Surgery in General, and the second ten will be based on Principles of Surgery and Surgical Specialities

8.3.3 The overall mark

A candidate's final mark will be calculated as follows per paper:

Paper 1:

MCQ paper 1	33.3% final mark
Paper case mark	33.3% final mark
OSCE mark	33.3% final mark

Paper 2:

MCQ paper 2	33.3% final mark
Paper case mark	33.3% final mark
OSCE mark	33.3% final mark

9 CONDUCT OF THE FINAL EXAMINATION

The College of Surgeons is constantly reviewing assessment methods to ensure the validity and reliability for their examinations.⁴

9.3 EFFECTIVE FROM FS 2023

Two 3-hour written papers comprising two single best answer (MCQ) papers.

9.4 Clinical, practical and oral examinations in the theory and practise of general surgery covering the whole spectrum of the syllabus (Appendices A-C) including general surgical principles, specifics in general surgery, operative surgery, surgical anatomy, physiology and surgical pathology

9.5 Marking Regulations for the final examination:

The final examination has written and oral components

9.5.1 The written examination

The written examination consists of 240 single best answer questions (MCQ's) divided into two papers of 120 single best answer questions in each paper. The overall mark will be calculated as a percentage out of 240. The pass mark is 50% or more. For a candidate to be invited to the clinical/oral examinations they must achieve a written mark of greater than or equal to 50%.

9.5.2 The clinical/oral examination

The clinical/oral examination comprises at least two physical clinical cases and two paper based cases, an OSCE (18 five minute stations), a viva voce in general surgery and surgical pathology and a viva voce in anatomy and operative surgery.

9.5.3.../

⁴ Statement of assessment systems used.

9.5.3 The overall mark

The overall mark consists of a clinical and a theoretical component

9.5.3.1 **The clinical component** is made up by the OSCE counting 20% of the overall mark and the patient based clinical cases, which are considered together and make up 30% of the overall mark.

9.5.3.2 **The theoretical component** is made up a general surgical and surgical pathology component and of an anatomy and operative surgery component. Each of these components is made up by the written paper and the viva voce in that section. Each written paper contributes 15% to the overall mark and each viva voce contributes 10%

9.5.3.3 The overall mark is made up of 4 sections:

- The clinical cases
- The OSCE
- The general surgical and surgical pathology theoretical component (paper plus viva voce)
- The anatomy and operative surgery theoretical component (paper and viva voce)

9.5.3.4 **A candidate will be considered to have passed if they have:**

- Passed each of the 4 sections listed above (9.3.3.3)
In order to pass a section the composite mark for that section must be $\geq 50\%$.
The composite mark in the sections is calculated as follows:
 - The clinical cases: The average mark obtained in all the clinical cases
 - The OSCE: The average mark obtained in all the stations of the OSCE
 - The general surgical and surgical pathology theoretical component: The paper accounts for 60% of this component while the viva voce accounts for 40%
 - The anatomy and operative surgery theoretical component: The paper accounts for 60% of this component while the viva voce accounts for 40%

A mark of $\geq 45\%$ but $< 50\%$ in one section – other than in the section comprising of the clinical cases – can be condoned if appropriately compensated in the other sections of the examination by a mark of $\geq 60\%$ in another section and provided that no other section has a composite mark of $\leq 50\%$. This decision to condone will be at the discretion of the examiners present taking into consideration the overall performance of the individual candidate and will be decided by a two thirds majority.⁵

NB! The composite mark for the clinical cases must always be $\geq 50\%$ in order for a candidate to pass.

- Have achieved an overall mark $\geq 50\%$.

9.5.4 Summary of the final examination

There are four sections to the examination:

- Clinical (two or more clinical cases). Each physical clinical case will contribute 10% each and each paper clinical case 5% each to the 30%
- OSCE
- General Surgery/Surgical Pathology (one paper and one viva)
- Surgical Anatomy/Operative Surgery (one paper and one viva)
- Must obtain 45% for one paper provided the candidate achieves 50% or more in the second papers to be invited to the orals
- Must get $\geq 50\%$ for the clinical cases combined
- $\geq 45\%$ but $< 50\%$ in any **one** section **can** be compensated (other than the clinical component)
- Must get $\geq 50\%$ overall mark

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10 CODE OF CONDUCT AND GUIDELINES FOR EXAMINATION CANDIDATES

All candidates entering the examinations conducted by the College of Surgeons are expected to familiarise themselves with the following document/s:

10.3 CMSA Code of Conduct for Examination Candidates:

[http://www.collegemedsa.ac.za/force_download.aspx?documentid=2192&name=Examination Code of Conduct](http://www.collegemedsa.ac.za/force_download.aspx?documentid=2192&name=Examination_Code_of_Conduct)

10.4 Guidelines for the FCS(SA) Part II Examination

11.0 ADMISSION AS A FELLOW

11.1 Only candidates who have completed training in a CMSA recognised registrar post may be awarded a fellowship if successful in the examination.

11.2 Candidates who have written the examination as a prerequisite from the HPCSA for inclusion on the specialist register are not eligible to be awarded a Fellowship but will be sent a letter confirming their success in the examinations

All other candidates will be asked to sign a declaration as below:

I, the undersigned,do solemnly and sincerely declare:

that while a member of the CMSA I will at all times do all within my power to promote the objects of the CMSA and to uphold the dignity of the CMSA and its members

that I will observe the provisions of the Memorandum & Articles of Association, By-laws, Regulations and Code of Ethics of the CMSA as in force from time to time

that I will obey every lawful summons issued by order of the Senate of the said CMSA, having no reasonable excuse to the contrary

and I make this solemn declaration faithfully promising to adhere to its terms

Signed at this day of

..... 20

Signature

Witness

(who must be a Founder, Associate Founder, Fellow, Member, Diplomat or Commissioner of Oaths)

11.3 A two third majority of members of the CMSA Senate present at the relevant meeting shall be necessary for the award to any candidate of a Fellowship

11.4 A Fellow shall be entitled to the appropriate form of certificate under the seal of the CMSA

11.5 In the event of a candidate not being awarded the Fellowship (after having passed the examination) the examination fee shall be refunded in full excluding HPCSA candidates who are not entitled to a Fellowship.

11.6 The first annual subscription is due one year after registration (statements are rendered annually)

APPENDIX A

1.0 AIMS, OBJECTIVES AND SYLLABUS FOR THE PRIMARY EXAMINATION IN GENERAL SURGERY

1.1 The aim of the examination is to ensure that successful candidates are competent to embark on a career in General Surgery or one of its subspecialties. The examination will help refresh existing knowledge and impart new knowledge and competencies to ensure better care of the surgical patient. The competencies required are in the cognitive, psychomotor and affective (interpersonal/attitudinal) domains

1.2 Competence is defined as knowledge, skills and attitudes in:

- medical expertise
- technical expertise
- judgement – clinical decision making
- communication
- collaboration and teamwork
- management and leadership
- health advocacy
- scholarship and teaching
- professionalism.

1.3 Areas of competence that will be assessed in the FCS(SA) Primary examination will include:

- Clinically relevant anatomy and applied embryology
- Appreciation of three dimensional and cross sectional relevant anatomy
- Clinically relevant human physiology
- Pathophysiology in surgical patients
- General pathology principles and mechanisms of disease
- The genetic basis of disease
- Oncological principles in surgery
- Immunology
- Principles of microbiology relevant to general surgical practice
- Asepsis and antisepsis
- Pharmacological principles relevant to surgery
- Pharmacology of drugs commonly used in surgery
- Blood constituents, clotting mechanisms and blood product transfusion principles
- Fluid requirements and fluid management in the surgical patient
- Acid–base problems in the surgical patient
- Applied medical statistics
- Critical appraisal of the literature
- Evidence based literature
- Searching the literature
- Informed consent
- HPCSA regulations pertaining to surgical practice
- Basic clinical skills
- Basic procedural skills
- Counseling of patients and relatives
- Safety in the operating room
- Principles of audit
- Principles of patient documentation
- Principles of continuity of care
- The content of the Basic Surgical Skills course manual
- Learning in medicine is a continual process. Although general and specific objectives have been set, any aspect of medicine that is deemed to be surgically relevant may be included in the assessment

- As a guide, the Specialty of Surgery (General Surgery) covers the following areas:
 - Alimentary tract
 - The abdomen and its contents
 - Breast, skin and soft tissue
 - Endocrine system
 - Head and neck surgery
 - Vascular surgery
 - Paediatric surgery
 - Trauma surgery/burns
 - Surgical critical care
 - Surgical oncology

2.0 SPECIFIC/LEARNING OBJECTIVES

2.1 Clinically relevant anatomy and applied embryology:

- 2.1.1 Detailed knowledge of anatomy is required. Clinically relevant anatomy should be concentrated on. The anatomy of the whole body should be known in some detail. It is expected however that the candidate should concentrate on the anatomy, surface anatomy, applied anatomy and embryology of:
- Those structures commonly affected by disease encountered by the general surgeon
 - Those anatomical structures and their anatomical relationships which are important in general surgical operations
- 2.1.2 Anatomical variations are common and often pose challenges to the practising surgeons. The anatomical variations that impact on presentation of disease and /or surgical exposure should be known in detail, as should the embryological basis of the variation
- 2.1.3 The embryological origin of organs should be known. Emphasis will be placed on common anatomical variations/abnormalities that have an embryological origin
- 2.1.4 The following areas of applied gross anatomy should be concentrated on:
- Brain and skull with emphasis on areas affected by trauma and space occupying lesions
 - The cranial nerves
 - The face
 - Bony structures of the sinuses, orbit, jaw
 - The tongue and pharynx
 - Salivary glands
 - The neck
 - The chest
 - The mediastinum
 - The thoracic inlet and outlet, the brachial plexus
 - The axilla
 - The muscles of the neck and back
 - The peripheral vascular system
 - The lymphatic system
 - The heart
 - The diaphragm
 - The abdominal wall
 - The abdominal contents
 - The retroperitoneum
 - The pelvis (its contents and foramina, the pelvic floor)
 - The pelvic bones
 - The anus and continence mechanisms
 - The peripheral nervous system
 - The autonomic nervous system
 - The spine
 - The spinal cord and its neuroanatomy
 - The cubital fossa

- The popliteal fossa
- The gluteal area
- The perineum
- Female genitalia (internal and external)
- Male genitalia
- The extremities. Emphasis to be placed on vital structures (nerves, blood vessels), major muscle groups, compartments, vital structures in the joints, relationship of vital structures to bones
- The hand, with emphasis on vital structures, function and areas prone to infection

2.2 **Appreciation of three dimensional and cross sectional relevant anatomy:**

2.2.1 Current imaging with CT and MRI is cross sectional, but more and more axial and saggital scanning is being performed. In addition, three dimensional reconstruction is common. The candidate would be expected to be able to identify normal anatomical structures in such images

2.3 **Clinically relevant human physiology:**

2.3.1 Candidates should have detailed knowledge of:

- Homeostasis, thermodynamics, positive and negative feedback
- Fluid and electrolyte and acid-base physiology and pathophysiology
- Body water compartments
- Composition, osmotic activity and oncotic pressure of body fluids
- Water and electrolyte exchange
- Mechanisms of osmoregulation and volume regulation
- Buffer systems and mechanisms of acid-base haemostasis
- The haemopoietic system
- Lung function and respiratory exchange and oxygen transport. Control of respiration and breathing. Ventilatory response to exercise. Measuring lung function. Ventilation perfusion ratios, control of pulmonary circulation
- Oxygen transport:
- Renal function: control systems with respect to microanatomy, autoregulation, regulation of GFR, renal tubular function (in health and disease), the effect of diuretics, the effect of obstruction at various points, bladder function and control (in health and disease)
- Adrenal function
- Function of the GIT in digestion, motility and transit, absorption
- The secretions of the GIT
- Hepatic function
- Nutrition:

The interrelationship between fat, carbohydrate and protein metabolism and changes with under and over nutrition. The role of trace elements and vitamins in nutrition. The nutritional impact of surgery and injury

- Cardiac function, electrophysiology and circulation
- Physiology of the peripheral vascular system and microvasculature
- Physiology of the splanchnic, hepatic circulation
- Placental and fetal circulation
- Control of blood pressure
- The endothelium
- The extracellular space and lymph systems
- The cardiovascular response to exercise and stress
- The role of Nitric Oxide

- Neurophysiology:
Cell membrane excitability, intercellular signaling, somatic and autonomic nervous systems, cerebral function, the functional role of the basal ganglia, limbic system, hypothalamus brainstem and reticular activating system, reflex controls, spinal neurophysiology,
the cortex (and its role in speech, sensory perception and motor control), the cerebellum (and its role in fine motor coordination), the cranial nerves
- The CSF and blood brain barrier
- Endocrine function (pituitary, thyroid, parathyroid, adrenal medulla and cortex, pancreas, kidney, sex hormones)
- The regulation of body function in response to exercise, trauma, starvation, sepsis and stress of surgery
- Paracrine and autocrine function
- The different physiology of the neonate, child, the pregnant woman and the elderly must be understood

2.4 Pathophysiology in Surgical Patients

2.4.1 It is expected that the candidate will have a clear understanding of normal human physiology and recognise how this may be altered by pathological processes, surgery or anaesthesia. Correlation between physiological changes and physical signs or symptoms elicited in patients should be clearly understood. For example, there should be a clear understanding of the physiological changes that:

- ensue in a patient following prolonged vomiting or diarrhoea,
- occur in renal function after surgery
- prevail in a patient with a perforated duodenal ulcer
- occur during and after major surgery
- occur with deep obstructive jaundice
- affect fluid balance in the surgical patient

2.4.2 The pathophysiological effects of insult to the neonate, child, the pregnant woman and the aged must be understood

2.4.3 Interpretation of laboratory results in a clinical scenario eg

- Fluid, electrolyte and acid base disturbances and their identification
- Acid base abnormalities
- Haemostasis

2.5 General Pathology Principles and Mechanisms of Disease

2.5.1 Candidates should demonstrate an understanding of the general pathological mechanisms (degenerative, reactive and neoplastic) underlying common disease. This will include knowledge of aetiology, pathogenesis, epidemiology, investigation and natural history. Areas to be concentrated on are:

- General pathological phenomena including cell injury, adaptation and death, inflammation, apoptosis, cell death, degenerations including atherosclerosis, pigmentation and calculus formation, alterations of growth, differentiation and function of cells and of age
- The effects of aging on the body
- Tissue response to injury including the adaptive reactions of the body to injury. This includes an understanding of important morphological manifestations, pathophysiology of important disease states (eg major organ failure either single or combined, shock, sepsis, disseminated intravascular coagulation), biochemical mechanisms and manifestations where these factors are important in the understanding of pathogenesis, natural history
- The processes of wound healing and tissue inflammation (acute and chronic)
- The principles of cellular events and resulting in local and systemic inflammatory responses. This includes knowledge of the common cytokines and other mediators of inflammation

- Common and important issues.../

- Common and important issues in systemic pathology are examinable in so far as:
 - (i) a given lesion exemplifies a basic pathological process, eg anaphylaxis as an example of hypersensitivity reactions, myocardial infarction in atherosclerosis, colorectal carcinoma as an example of neoplasia,
or
 - (ii) disorders of a given system are likely to be encountered in surgical practice, eg post-operative pneumonia
 - Knowledge of laboratory medicine
- 2.6 **The Genetic Basis of Disease (Genetics and Molecular Biology)**
- 2.6.1 Structure of DNA and RNA, the cell cycle, the generation of genetic abnormalities
 - 2.6.2 Mendelian genetics
 - 2.6.3 Cytogenetics including basics of laboratory techniques for detection of cytogenetic abnormalities
 - 2.6.4 Specific conditions are examinable in so far as they illustrate important principles or are common or important disorders
- 2.7 **Oncological Principles in Surgery**
- 2.7.1 An understanding of Cancer biology is essential. The following specific aspects pertaining to oncology should be known in detail:
 - Cells and tissues of origin
 - Reproductive, growth (proliferative) patterns and host interaction
 - Mechanisms of invasion and metastasis
 - Molecular biological, genetic and inherited characteristics
 - Geographic racial and cultural (population) factors
 - Mechanisms and types of chemical, physical and microbial carcinogenesis
 - Distinctive pathological (macroscopic, histological and immunochemical) features which aid diagnosis
 - The application of the above to common cancers in children and adults
 - Principles of oncological surgery
 - Basic mechanisms of action of current common chemotherapeutic agents
- 2.8 **Immunology:**
- 2.8.1 Basic Immunology including:
 - non-specific defence mechanisms, the complement system, the major histocompatibility complex
 - the cells of the immune system, their functions, their interactions, cell subsets, cell surface markers and receptors structure, function, genetics of secretory products of cells involved in the immune response including immunoglobulins, interleukins, various other factors activation and control of the normal immune response
 - Immunity infection including bacteria, viruses, fungi and protozoa
 - Abnormal Immunological Responses including hypersensitivity, autoimmune disorders and immunodeficiency disorders
 - Diagnostic Immunology including the basic principles (not detailed) of commonly used immunological tests, their applications and their limitations
 - Immunology pertaining to blood product transfusion
- 2.9 **Transplantation:**
- Define and differentiate autografts, allografts and xenografts
 - Understand the role of major histocompatibility complex in clinical transplantation

2.10 Principles of Microbiology Relevant to General Surgical Practice

An understanding and knowledge of infectious agents (viruses, bacteria, fungi, protozoa and sub-viral particles eg prions) in surgical disease processes and of the developing microbial resistance to current antimicrobials is essential

- Pathogenesis of infection
- Host defence mechanisms and microbial virulence:
 - The normal microbial flora of the body and its role in health and disease
 - Surgically relevant bacterial, viral, fungal and parasitic infections;
 - infection following surgery, eg wound infection, septicaemia
 - infections with surgical implications, eg peritonitis, anaerobic soft tissue infections, AIDS
 - The principles of antimicrobial agents and their scientific use in the therapy and prevention (prophylaxis) of infection
 - Sterilisation and disinfection
 - Laboratory medicine aspects of infectious diseases, eg principles behind blood culture techniques, interpretation of gram stains, antimicrobial susceptibility techniques

2.11 Principles of Pharmacology and Therapeutics in General Surgery

- Pharmacological principles relevant to surgery and Pharmacology of drugs commonly used in surgery
- The following *principles* are to be covered in detail:
- Pharmacodynamics and pharmacokinetics of major drug groups
- The pharmacodynamics includes the mechanism of action of a drug, particularly where it may be important in understanding its use and/or its side-effects, whereas the pharmacokinetics include factors such as bioavailability (particularly to emphasise difference in routes of administration), plasma protein binding, clearance (metabolism if relevant) etc. The clinical application of pharmacodynamics and pharmacokinetics in route of administration, dosage and dosing schedules, the effect of disease states on drugs, the effect of the drug on the patient, and potential clinically relevant drug interactions
- The changes in the neonate, child and elderly that effect pharmacodynamics and pharmacokinetics
- The above principles pertaining to the following drug groups should be emphasized:
 - Pain killers
 - Diuretics
 - Inotropes, vasoconstrictors, vasodilators, anti arrhythmics
 - Immune modulators including steroids and anti-inflammatories
 - Antimicrobials
 - Drugs affecting the GIT eg those affecting gastric acid secretion, gut motility, stool transit time
 - Drugs affecting haemostasis eg Heparin, Warfarin, Fractionated Heparin, Thrombolytics
 - Anaesthetic drugs (Inhalational, oral, and intravenous)
 - Local anaesthetics
 - Drugs affecting glucose metabolism eg insulin, oral hypoglycaemics
 - Cytotoxics, Anti-oestrogens eg Tamoxifen
 - Thyroxin and anti-thyroid drugs

2.12 Haematology and Transfusions

- The following aspects should be known in detail:
 - The origin and differentiation of haematopoietic cells
 - Anaemias of acute and chronic blood loss. Basic investigations to differentiate various causes of anaemia eg types and mechanisms of haemolysis, anaemias caused by substrate deficiency
 - Mechanisms of haemostasis. Tests of haemostasis and their clinical application
 - Abnormal haemostasis
 - Bleeding disorders, congenital and acquired
 - Disseminated intravascular haemostasis
 - Origin, differentiation and proliferations of white cells particularly lymphomas
 - Blood products, components and substitutes

2.13 Asepsis and Antisepsis

- Blood constituents, clotting mechanisms and blood product transfusion principles
- Fluid requirements and fluid management in the surgical patient

2.14 Critical Appraisal of the Literature, evidence Based Medicine and Searching the Literature

- With the explosion of available medical literature, the candidate should understand the key concepts of Evidence Based Medicine (EBM), levels of evidence and how to effectively and efficiently search the literature

2.15 Legal and Ethical Issues

- Candidates should know the ethical and legal principles relating to:
 - Informed consent
 - Confidentiality and access to health records
 - Filling out a death certificate
 - Medico-legal post mortems
 - Obtaining permission for autopsy
 - Withholding resuscitative measures
 - Organ donation
 - Brain death
- HPCSA regulations pertaining to surgical practice including issues of professional misconduct

2.16 Applied Medical Statistics, Biostatistics, Epidemiology

- The candidate should:
 - Understand the principles of biostatistics and research design and commonly used statistical tests and terminology as necessary to critically appraise the clinical and experimental surgical literature
 - Understand the principles of biostatistics and epidemiology applicable to the use of diagnostic tests, screening and disease prevention programmes, patterns of disease (eg trauma, cancer), risk assessment, scoring systems (eg physiologic and anatomic scoring of trauma, neurologic function etc), prediction of outcome etc
 - Identify the meaning and appropriate usage of commonly used terms, including sensitivity, specificity, positive predictive value, negative predictive value, false positive, false negative, confidence limits, standard deviation, retrospective, prospective, intention to treat, power, randomised trial, control, blind, double blind, relative risk reduction, number needed to treat, meta analysis, systematic review
 - Identify types 1 and 2 statistical errors and the factors influencing them
 - Identify the requirements for the appropriate usage of common statistical comparison, including t test, chi-square, ANOVA, correlation, regression, non parametric testing”

2.17 The Basic Surgical Skills Course

- It is expected that all candidates have successfully completed the Basic Surgical Skills course that is run under the Aegis of the Colleges of Medicine of South Africa under license from the Royal College of Surgeons of England
- The following are examinable:
 - Asepsis and antisepsis
 - Safety in theatre
 - The principles of anastomosis
 - Suture materials and needles
 - The principles of debridement
 - Diathermy principles and safety
 - Basic principles of laparoscopy

2.18 **Suggested texts for the FCS(SA) Primary:**

- Raferty AT, Delbridge MS. *Basic Science for the MRCS*. Churchill Livingstone, Elsevier Science, 2006. ISBN-13 978-0-443-10109-0
 - Raferty AT. *Applied Basic Science for Basic Surgical Training*. Churchill Livingstone, 2000. ISBN 0 443 06143 2
 - Winscow TDV, Campbell MJ. *Statistics at Square One 10th Edition*. BMJ Books, 2002. ISBN 10 : 0 72791552 5
 - Basic Surgical Skills Manual; Third edition
- The above texts are highly recommended and cover almost the entire syllabus of the FCS Primary. It is expected, however, that the following texts be used as references for a deeper understanding of the basic sciences
- **Anatomy:**
 - Snell, Richard S. *Clinical Anatomy*. 7th Edition. Lippincott Williams and Wilkins, Philadelphia, 2004
 - McMinn R.M.H., *Last's Anatomy, Regional and Applied*, 9th Ed., 1998 (Reprinted 2003) Churchill Livingstone
 - Abrahams PH, Marks SC, Hutchings RT. *Mc Minns Color Atlas of Human Anatomy*. CV Mosby 2003 ISBN 0723432120
 - **Physiology:**
 - Ganong W.F *Review of Medical Physiology*, 21th Ed., 2005, Lange Mc Graw-Hill or
 - Guyton, AC, Hall JE. *Text Book of Medical Physiology*, 11th Ed. Elsevier. 2000
 - **Pathology:**
 - McPhee SJ, Lingappa, VR, Ganong WF. *Pathophysiology of Disease. An introduction to clinical medicine*. Fourth Edition Lange Medical Books/ McGraw-Hill 2003
 - Really Essential Medical Immunology: *Ivan Roitt & Arthur Rabson*
 - Cotran, Ramzi S. Joint authors/editors: Robbins, Stanley L. Kumar. V, Tucker. *C Robbins pathologic basis of disease*. 3rd ed. Philadelphia: London: Saunders, c1999

APPENDIX B

GUIDELINES FOR CANDIDATES ENTERING THE FCS(SA) INTERMEDIATE EXAMINATION

FCS(SA) Intermediate Objectives

Overall objectives

The candidate is required to know and understand the principles of surgery in general and the principles of the major specialities of surgery. It is expected that the candidate will have the theoretical knowledge and practical skills to deal with:

- all aspects pertinent to the resuscitation and emergency treatment of life threatening surgical conditions in both adults and children.
- all aspects of patient care relevant to the peri-operative period, including intensive care support,

General Learning Outcomes

- Demonstrate understanding of the principles and practical application of supportive surgical care including emergency care.
- Demonstrate understanding of the principles and practical application of care related to the other surgical specialities with particular focus on emergency care. These specialities are Orthopaedics, Urology, Plastic Surgery, Cardiothoracic Surgery, Paediatric Surgery, Neurosurgery, Ophthalmology, Otorhinolaryngology and Obstetrics and Gynaecology including emergency care.
- Demonstrate knowledge of relevant clinical anatomy, physiology and pathophysiology behind the general principles and interpretation and application of commonly used diagnostic tests and imaging modalities.
- Demonstrate understanding of applied pathophysiology relevant to peri-operative care of the surgical patient including organ support in critical illness.

FCS(SA) INTERMEDIATE PAPER I: PRINCIPLES OF SURGERY IN GENERAL

General Objectives

The candidates required to know and understand the principles of surgery in general. It is expected that the candidate will have the theoretical knowledge and practical skills to deal with:

- all aspects pertinent to the resuscitation and emergency treatment of life threatening surgical conditions in both adults and children.
- all aspects of patient care relevant to the peri-operative period, including intensive care support.

1.0 A: SUPPORT IN CRITICAL ILLNESS :

1.1 General objectives

Understand the anatomical, physiological and pathophysiology principles involved in the practical provision of major organ support for the critically ill surgical patient relating to the following topics:

1.2 Support of oxygenation and ventilation

Understand the anatomical and practical principles involved in airway management in relation to the following headings.

- Simple measures
- Endo-tracheal intubation
- Intubation of the difficult airway
- Surgical airways

Understand lung physiology and pathophysiology as applicable to mechanical ventilation with particular reference to the following topics.

- Lung functions
- Peri-operative evaluation of lung function
- Lung volumes and capacities
- Problems with the alveolo-capillary interface
- The interpretation of blood gas analysis

Understand the physiology behind oxygenation in the ventilated patient with particular reference to the following topics

- Hypoxia and hypoxaemia
- $DO_2 / VO_2 / SvO_2$
- Oxygen consumption in critical illness
- Oxygen therapy / PEEP / CPAP

Understand the principles behind the practical provision of mechanical ventilation under the following headings

- Indications for ventilation
- Non-invasive ventilation
- Modes of ventilation
- Lung protective ventilation
- Alveolar recruitment
- Weaning measures and protocols
- Lung mechanics and monitoring

Understand the mechanism and management of pulmonary aspiration syndromes and infections.

Understand the pathophysiology and management of acute lung injuries under the following headings

- Inflammatory
- Infective
- Ventilator associated

1.3 **Support of the circulation systems**

Understand the classification, patho-physiology, clinical presentation and treatment of shock under the following headings

- Hypo-volaemic / haemorrhagic shock
- Cardiogenic shock (cardiac and extra-cardiac)
- Septic / redistributive shock
- Anaphylactic / allergic shock
- Neurogenic shock and the difference to spinal shock
- Free oxygen radicals and reperfusion injuries
- Lactic acidosis
- Endpoints of resuscitation

Understand the pharmacology and practical use of cardiovascular drugs in critical illness under the following categories

- Inotropic agents
- Anti dysrhythmic agents
- Vasodilators
- Vasopressors

Understand the pathophysiology and practical principles involved in managing acute cardiac disturbances under the following headings

- ECG interpretation
- Cardiac arrest
- Cardiopulmonary resuscitation
- Defibrillation
- Electric and mechanical support of the failing heart
- Cardiac dysrhythmias. Interpretation of the ECG
- Hypertensive crisis

1.4 Monitoring Devices

Understand the principles, application, interpretation, and complications of the following devices used in monitoring patients with critical illness

- Pulse oximetry
- Arterial, central venous and Swan Ganz catheters
- Endotracheal cuff pressure
- Capnography, calorimetry and metabolic monitoring
- Tonometry
- Thrombo-elastography
- Oesophageal Sonar

1.5 Temperature Control of the Patient

Understand the mechanisms of thermal loss and the principles and practical application of preventative and restorative treatment measures.

- Hypothermia
- Hyperthermia including malignant hyperpyrexia

1.6 Inflammatory Syndromes and Organ dysfunction

Know and understand the definitions, underlying pathophysiology and management of inflammatory syndromes and organ dysfunction under the following headings.

- SIRS Systemic Inflammatory Response Syndrome
- CARS Compensated Anti-inflammatory Response Syndrome
- MARS Mixed Anti-inflammatory Response Syndrome
- MODS Multiple Organ Dysfunction Syndrome
- MOF Multiple Organ Failure
- Scoring systems

1.7 Intra-abdominal Hypertension

Understand the pathophysiology and practical management of raised intra-abdominal pressure under the following headings

- Measurement of Intra-abdominal pressure
- Abdominal Compartment Syndrome
- Content containment techniques

1.8 Transport of the critically ill patient

Understand the principles and practical aspects of the transfer of critically ill patients.

1.9 Endocrine and Metabolic aspects of critical illnesses

Understand the physiological and pathophysiological principles involved in endocrine and metabolic abnormalities and their practical application in the treatment of these conditions.

- Endocrine
 - Glycaemic control
 - Diabetes Insipidus
 - Adreno-cortical Insufficiency
 - Thyroid Storm
 - Adrenergic crisis
- Metabolic
 - Acid Base disturbances
 - Hyperkalaemia
 - Hypercalcaemia

1.10 Nutritional aspects of critical illnesses

Understand the physiological and pathophysiology principles involved in the practical provision of nutritional support both enteral and parenteral of the critically ill patient under the following headings

- Nutrient provision
- Access
- Complications

1.11 Renal Failure

Understand the physiological and pathophysiological principles involved in the diagnosis and supportive management of renal failure under the following headings

- Acute renal failure
- Myoglobinanaemia and myoglobinuria
- Haemodialysis
- Peritoneal dialysis
- Ultrafiltration

2.0 B: PERI - OPERATIVE CARE:**2.1 General objective**

Understand the principles involved and their practical application in the provision of perioperative surgical care under the following topics.

2.2 Co-morbidity risk

Understand the principles of assessment of general and disease specific co-morbidity risk and the optimisation of patients for procedures or surgery under the following headings.

- Cardiac
- Pulmonary
- Hepatic
- Renal
- Endocrine
- Obesity
- Age
- Medications

2.3 Abnormalities of homeostasis

Understand the physiological reasons underlying the principles of assessment and management of abnormalities of homeostasis related to the following

- Metabolic response to injury
- Fluid and electrolyte therapy
- Acid base balance

2.4 Haemostatic disorders

Understand the anatomical, physiological and pathophysiological principles involved in haemostasis and their practical application in the treatment of haemostatic disorders.

- Laboratory Investigations
- Component Therapy
- Thrombosis and Thrombo-Embolism
- Deep Venous Thrombosis
- Pulmonary Embolism
- Haemostatic Failure and DIC
- Anticoagulant Therapy
- Thrombolytic Therapy

2.5 Surgical Nutrition

Understand the principles of nutritional assessment, the recognition of nutritional deficiency and the practical provision of nutritional support in the surgical patient related to the following

- Assessment of nutritional status.
- Indications for nutritional support.
- Calculation of nutrient requirements.
- Parenteral and enteral nutrition
- Access
- Provision
- Complications
- Metabolic related
- Delivery related

2.6 Endocrine conditions

Understand the pathophysiology and the principles of diagnosis and management of endocrine emergency conditions and the management of endocrine conditions in relation to surgery under the following headings.

- Hyper and hypothyroidism
- Hypercalcaemia
- Steroid therapy
- Hypo and hyper adrenal function
- Hypo and hyperglycaemia
- Diabetic keto-acidosis

2.7 Imaging

Understand the principles of imaging techniques, their application and interpretation included in the emergency care situation under the following headings.

- Chest radiography
- Ultra sound
- Duplex Doppler
- Computerised axial tomography
- Magnetic resonance imaging
- Isotope scanning

2.8 Pharmacology

Understand the pharmacology of commonly used drugs in surgical practice and the principles of their appropriate use.

- Drugs used for sedation and analgesia
- Antibiotics
- Steroids
- NSAIDS

2.9 Infection and Antimicrobials

Understand the principles of the prevention and treatment of infection under the following headings

- Asepsis and sterile technique
- Surgical technique
- Prophylactic antibiotics
- Therapeutic antibiotics

2.10 Blood transfusion

Understand the principles governing the use of blood and blood products and their practical application under the following headings.

- Blood groups and cross matching.
- Indications for transfusion.
- Transfusion reactions
- Massive transfusion

2.11 Intra-Operative Care

Understand the principles involved in the practical and safe application of intra-operative surgical care relating to the following topics

- Aseptic and antiseptic techniques
- Hazards and precautions in operating theatres
- Energy and imaging devices used in theatre.
- Diathermy
- Unipolar
- Monopolar
- Harmonic scalpel
- Laser

2.12 Post-operative complications

Understand the mechanisms of postoperative complications and the principles of prevention and management in relation to the following topics.

- Haemorrhage
- Fever
- Post operative confusion
- Respiratory distress
- Cardiac dysfunction
- Urinary tract complications
- Surgical site infection

FCS INTERMEDIATE PAPER 2 - PRINCIPLES OF THE SURGICAL SPECIALITIES**General objectives**

The candidate is required to know and understand the principles of the major specialities of surgery. It is expected that the candidate will have the theoretical knowledge and practical skills to deal with:

- all aspects pertinent to the resuscitation and emergency treatment of acute surgical conditions in both adults and children
- all aspects of patient care related to the surgical specialities pertinent to the management of the surgical patient in the peri-operative period, including the intensive care unit.

3.0 GENERAL SURGERY**3.1 Abdominal conditions**

Understand the pathophysiology and the principles of diagnosis and management of abdominal emergency conditions due to

- Intra-peritoneal inflammation (localised or generalised)
- Retroperitoneal inflammation
- Obstruction of a hollow organ
- Haemorrhage (intra-peritoneal or intraluminal)
- Trauma (blunt or penetrating)
- Obstetric and gynaecological diseases
 - Ectopic pregnancy
 - Pelvic inflammatory disease
 - Ovarian torsion
 - Vaginal bleeding
- Medical conditions simulating acute abdominal emergencies

3.2 Wound Healing

Understand the principles of wound healing and the treatment of wounds including:

- Classification and types of wound
- Techniques of excision and debridement
- Wound management and dressings
- Suture materials
- Mechanical staplers
- Closure of incised wounds
- Bites
- Tetanus and gas gangrene prophylaxis

3.3 Neurosurgery

Understand the principles of the pathophysiology assessment and emergency management of acute neurosurgical conditions in relation to the following.

- Conscious level assessment (Glasgow Coma Score)
- Coma
- Head injuries
- Raised intracranial pressure
- Prevention of secondary brain injury
- Decompression of extradural haematoma
- Brain Death
- Acute spinal cord injury
- Infection of the central nervous system
- Fluid and electrolyte abnormalities

3.4 Ear, Nose and Throat Surgery

Understand the principles of treatment of the following ENT emergency conditions

- Trauma: Penetrating and blunt
 - Pharynx
 - Larynx
 - Trachea
 - Cervical Oesophagus
- Upper airway obstruction
- Ingestion of caustic agents
- Foreign bodies in the upper airway or oesophagus

3.5 Ophthalmology

Understand the principles of treatment of the following ocular emergency conditions

- Ocular trauma
- Intra-orbital bleeding
- Peri-orbital infections with threatening blindness

3.6 Maxillo-Facial Surgery

Understand the principles of diagnosis and treatment of the following maxilla-facial emergency conditions.

- Facial fractures (blunt and penetrating)
 - Recognition in relation to airway compromise
- Head and neck infections
 - Management
 - Microbiology

3.7 Orthopaedic Surgery

Understand the principles of diagnosis, assessment and the practical emergency management of the following common orthopaedic conditions emergency

- Osteomyelitis and acute septic arthritis
- Limb fractures and joint dislocations
 - Classification of fractures and dislocations
 - Splintage and immobilisation
 - Neurovascular deficits
- Hand injuries and infections
- Pelvic fractures

3.8 Spinal injuries

Understand the principles of diagnosis, assessment and the practical emergency management of spinal injuries under the following headings

- Mechanism of injury
- Radiological recognition of cervical and thoraco-lumbar
 - Fractures
 - Dislocations
 - Fracture dislocations
 - Assessment of instability and neurological deficits
- Principles of treatment
- The application of Halo and Cone calliper
- The “plegic” patient
 - Neuro-physiology of the spinal cord injury
 - Haemodynamic changes
 - Acute resuscitation
 - Neuro-pathology of the spinal cord
 - Complete / incomplete lesions
 - Anterior cord syndrome
 - Central cord syndrome
 - Prevention of complications

3.9 Urology

Understand the principles of diagnosis and management of the following urological emergencies:

- Genito-urinary trauma
- Urinary tract infections
- Scrotal emergencies
- Haematuria
- Acute retention of urine
- Urinary catheter management

3.10 Cardiothoracic Surgery

Understand the pathophysiology and the principles of diagnosis and management of the following conditions:

- Trachea and bronchus injury and rupture
- Foreign bodies in the trachea, bronchus and oesophagus
 - Techniques of removal
 - Types of anaesthetic required
- Non-penetrating chest trauma
- Penetrating wounds of the thorax
- Management of pleural collections
 - Simple pneumothorax
 - Open pneumothorax
 - Tension pneumothorax
 - Haemothorax
 - Massive haemothorax
- Tube thoracostomy
- Management of acute broncho pleural fistulae
- Penetrating wounds of the thorax inlet
- Penetrating wounds of the heart
- Cardiac tamponade
- Aorta: dissection and rupture
- Rib fractures: single, multiple and segmental
- Diaphragmatic injury

- Injuries of the oesophagus
 - traumatic
 - spontaneous
 - iatrogenic
- Pleural and pulmonary infection
 - Post-pneumonic empyema
 - Tuberculous empyema
 - Chronic broncho-pleural fistula
 - Lung abscess

3.11 Vascular Surgery

Understand the pathophysiology, principles of diagnosis and emergency management of acute vascular emergencies

- Haemorrhage control
- Arterial and venous trauma (penetrating or blunt)
- Acute arterial embolism
- Acute arterial thrombosis
- Complicated aneurysms
- Acute thrombophlebitis
- Deep vein thrombosis
- Compartment syndrome
- Mangled extremity
- Reperfusion syndrome

3.12 Paediatric Surgery

Understand the physiology, pathophysiology and principles of the diagnosis and practical management of paediatric patients (neonates and children) in relationship to emergency surgical conditions under the following headings.

- Physiological differences between neonates and children and adults in respect of the following
 - Haematological parameters
 - Respiratory function
 - Cardio-vascular physiology
 - Jaundice
- Peri-operative management of the paediatric patient in respect of the following.
 - Transport of neonates and children
 - Venous access
 - Fluid and electrolyte management
 - Blood and blood product usage
 - Pain management
 - Renal failure
- Assessment and emergency management of the following surgical conditions
 - Blunt and penetrating abdominal and thoracic trauma
 - Strangulated inguinal hernias
 - Oesophageal foreign bodies
 - Burns
- Recognition and institution of appropriate supportive care for the following specific neonatal conditions
 - Oesophageal atresia and oesophago-tracheal fistulae
 - Bochdaleck hernia
 - Exomphalos
 - Intestinal obstruction
 - Anus imperforatum

3.13 Plastic Surgery

Understand the principles of plastic surgery and their practical application under the following headings

- Wound and wound healing
 - Pathophysiology
 - Classification and types of wound
 - Techniques of excision and debridement
 - Closure of incised wounds
 - Suture materials
 - Principles of wound cover
 - Split skin grafts
 - Local flaps
 - Free flaps
 - Management of the open wound
 - Dressings and modern aids to wound healing
- Thermal Injury
 - Understand the mechanisms of thermal injury and their management through all phases of treatment under the following headings
 - Mechanisms
 - Thermal: hot / cold
 - Electric: high and low tension
 - Chemical: acid and alkaline
 - Resuscitation
 - Inhalational burns
 - Burns degree and area assessments size assessment
 - Management of the burn wound
 - Rehabilitation
- Soft tissue injury:
 - Understand the pathophysiology of local and systemic effect of soft tissue injury and its treatment under the following headings
 - Compartment syndrome
 - Rhabdomyolysis
 - Reno protective strategies
 - Reperfusion injury
 - Degloving injury

3.14 Techniques

Understand the anatomical details and be technically competent to perform the following procedures.

- Airway maintenance
 - Bag mask ventilation
 - Endotracheal intubation
 - Surgical cricothyroidotomy
 - Tracheostomy
- Intra-vascular access
- Tube thoracostomy
- Nasogastric tube placement
- Bladder catheterisation
- Embolectomy
- Limb fasciotomy
- Emergency burr holes

SUGGESTED READING FOR THE FCS(SA) INTERMEDIATE EXAMINATION

In preparation for the FCS(SA) Intermediate examination, the postgraduate student's reading should not be limited to the suggested texts. Much of the information necessary for the examination will be acquired during training on the wards, intensive care and trauma units.

The following texts contain the basic material and approach necessary for both of the FCS(SA) Intermediate papers:

The Handbook of Surgical Intensive Care. Lysterly HK, Gaynor JW, Mosby Yearbook.

The ICU Book. Marino PL. William and Wilkens

Handbook of Trauma for Southern Africa. Nicol & Steyn. Oxford

Oh TE. Intensive Care Manual. 3rd ed. Sydney: Butterworths, 1996

Intensive Care Manual. Oh TE, Butterworth Heineman

Trunkey, Lewis. Current Therapy of Trauma. 2nd ed. BC Dekker, 1999

Schwartz SI, Shires GT. Principles of Surgery. 7th ed. New York; London: McGraw-Hill, Health Professions Division, 1997

Christopher. F. Davis-Christopher Textbook of Surgery: The Biological Basis of Modern Surgical Practice: Sabiston Textbook of Surgery:. 16th ed. Philadelphia; London: WB Saunders, 2000

Principles of Surgical Patient Care 2nd Edition. Mieny CJ, Mennen U, New Africa Education.

Review of Medical Physiology. Ganong WF, Appelton & Lange.

Intensive Care Medicine. Irwin and Rippe

Surgical Intensive Care. Barie FS, Shires GT, Library Congress Cataloging in Publication Data.

ATLS Manual American College of Surgeons 4th Edition

Paediatric Workbook First Edition Ed. JH Becker

Published Van Schaik Pretoria 2006

APPENDIX C

SURGICAL GUIDELINES FOR CANDIDATES ENTERING FOR THE FCS(SA) FINAL EXAMINATION

1.0 AIMS, OBJECTIVES AND SYLLABUS FOR THE FINAL EXAMINATION IN GENERAL SURGERY

- Be able to fulfil the role of a specialist general surgeon in the medical and academic communities, and in society at large.
- Be able to manage all conditions commonly occurring in general surgery.

1.1 Principle learning outcomes

- Be able to take a comprehensive history and do a complete physical examination on a patient.
- Be able to present findings, a diagnosis, differential diagnosis and management plan.
- Be able to prioritise problems, plan cost-effective and safe investigation and rational management.
- Be able to demonstrate insight into preventative strategies and prognosis.
- Be able to interpret and integrate the results of relevant special investigations into a differential diagnosis and management plan.
- Be competent to include in the management the relevant aspects of pathophysiology, pharmacology, genetics or other relevant areas in which a competent specialist surgeon would be expected to be knowledgeable.
- Demonstrate competence in managing patients with conditions which do not clearly fall within the field of one of the sub-specialities, and in co-ordinating and overseeing the management of patients with multiple conditions.
- Be able to judge when to seek the help of a subspecialist.
- Be able to act as the patient's advocate, advisor and guide within the discipline of General Surgery.
- Be able to demonstrate the cognitive, psychomotor and affective (interpersonal/attitudinal) competencies to manage general surgical patients

1.2 Critical Cross-Field and Personal Outcomes

- Be able to critically appraise the state of current knowledge with respect to important health issues;
- Be able to work as a team member, wherever this is important for the achievement of health goals;
- Demonstrate good leadership skills where these may be required for the candidate's future professional work situation;
- Demonstrate good analytical skills;
- Demonstrate an appropriate level of professional knowledge;
- Be able to make health-related decisions in a rational way;
- Be able to solve health-related problems effectively;
- Be able to communicate effectively using written and oral methods
- Be able to use science and technology responsibly and ethically;
- Be able to demonstrate good interpretative skills
- Be technically competent to perform operations expected of a general surgeon as defined in this syllabus.
- Be able to assess one's own personal strengths and weaknesses
- Be able to commit to a life of continual professional development
- Be able to act consistently within levels of competence and professional norms.
- Be knowledgeable and be able to integrate into the overall management of the surgical patient all aspects of the primary and intermediate syllabi.

NOTE

The evolution of surgical subspecialty disciplines viz Vascular Surgery, Paediatric Surgery, Critical Care, Surgical Gastroenterology and Trauma Surgery has altered the scope of what is expected in the speciality of general surgery. Candidates are expected to have a good knowledge of the spectrum of surgery performed in these subspecialty disciplines and what is amenable to surgery but the technical expertise stops short of those detailed in the subspecialty requirements. The syllabus is detailed below to define the level of understanding expected in the management of surgical conditions and the operations where competency is expected as a general surgeon.

Know and understand the physiology and pathophysiology of the principles of diagnosis and management including the anatomy relevant to the surgical treatment of the following systems organs or disease processes

1.3 Endocrine Surgery

- The thyroid and parathyroid glands
- Adrenal medulla and cortex
- Pituitary disease
- APUD tumour
- Neuro-endocrine tumours of the gastrointestinal tract

1.4 Gastro-Intestinal Surgery

- Benign and malignant diseases of the oesophagus
- Gastro-oesophageal reflux disease
- Peptic ulcer disease and its complications
- Foregut haemorrhage
- Diseases of the liver and biliary tree
 - Biliary calculus disease
 - Acute and chronic cholecystitis
 - Liver tumours
 - Obstructive jaundice
 - Portal hypertension
- Diseases of the pancreas
 - Acute and chronic pancreatitis
 - Peri-pancreatic fluid collections
 - Pancreatic cystic lesions
 - Pancreatic tumours
- Small Bowel Diseases
 - Appendicitis
 - Intestinal obstruction
 - Intestinal perforation and fistula
 - Radiation enteritis
- Diseases of the colon and rectum
 - Diverticular disease
 - Inflammatory bowel disease
 - Cancer
 - Large bowel obstruction and pseudo-obstruction
 - Lower gastro-intestinal bleeding
- Perianal conditions
 - Abscess
 - Fissure
 - Fistula in ano
 - Haemorrhoids
 - Anal malignancies
- Peritonitis and other diseases of the peritoneal cavity

1.5 Head and Neck Pathology

- Cervical lymphadenopathy
- Midline and lateral neck masses fistula and sinuses
- Salivary gland diseases
- Head and neck and oral cancer

1.6 Trauma Surgery

- Head injury
- Facial fractures
- Spinal injuries
- Extremity injuries
- Burns
- Polytrauma
- Blunt and penetrating trauma
 - Abdomen
 - Chest
 - Heart
 - Pelvis retroperitoneal injuries
 - Urinary tract
 - Solid organs
 - Hollow organs
 - Vascular tree

1.7 Vascular Surgery

- Venous Thrombosis
 - Superficial venous disease including varicose veins
 - Deep venous disease valvular insufficiency
- Lymphatic disease
- Diabetic infections
- Diabetic foot
- Aneurysms
- Aneurysm rupture
- Chronic arterial insufficiency
 - Aortoiliac disease
 - Distal disease
- Extracranial cerebrovascular disease
- Renovascular visceral arterial diseases
- Vasospastic / collagen vascular diseases
- Prosthetic infection
- Investigations
- Endovascular techniques and applications
- Imaging of the vascular tree
- Compartment syndromes and fasciotomy
- Arterial and venous developmental anomalies
- Vasospastic disorders

1.8 Surgical Oncology

Understand the principle of surgical oncology and the role of the surgeon and surgery in a multidisciplinary management of these patients.

- Head and neck and oral cancer
- Breast cancer
- Oesophageal cancer
- Gastric cancer
- Liver cancer
- Pancreatic cancer
- Large bowel cancer
- Soft tissue tumours including the fibromatoses
- Lymphomas and myeloproliferative and haematological diseases
- Malignant skin diseases
- Melanoma
- SCC
- BCC

1.9 Paediatric Surgery

Know and understand in detail the diagnosis, investigation, supportive management and definitive surgical management of the following conditions which are considered within the scope of the general surgeon to treat in children over two years.

- Lymph node enlargements and abscesses
- Blunt and penetrating traumas
- Burns
- Peritonitis
 - Primary secondary
 - Appendicitis
 - Meckel's diverticulitis
- Gastrointestinal tract
 - Obstruction in infants and children
 - Band
 - Intussusception
 - Malrotation
 - Hernia
- Acute abdominal pain
- Constipation
- Foreign bodies in airways, oesophagus, intestinal tract and children
- Surgical conditions of the penis foreskin and external genitalia

Know and understand in detail the diagnosis investigation and emergency management and the principles of definitive surgical management of the following conditions which require referral for definitive treatment to a paediatric surgeon.

- Neonatal conditions
 - OA/TOF complex (oesophageal atresia)
 - ARM complex (anorectal malformation)
 - CIA (congenital intestinal aganglionosis)
 - Congenital small bowel intestinal obstructions
 - Exomphalos, gastroschisis complex
 - Biliary atresia
 - "Difficult" surgery in the under 2-year-old's
 - Neonatal hernias
 - Branchial fistula
 - Cystic hygroma
- Solid tumour malignancies of the neonate, infant and child
- Infant and childhood conditions
 - Caustic ingestion
 - Hypertrophic pyloric stenosis
 - Extrahepatic bile duct abnormalities
 - Gastro-oesophageal reflux
 - Rectal prolapse
 - Skin and soft tissue lesions
 - Haemartomata
 - Lymphangioma, artery and vein (AVM)
 - Haemangiomas
 - Neurofibromata
- Adult related disease when encountered in the child
 - Peptic ulcer
 - Inflammatory bowel disease etc
 - Gastrointestinal bleeding
- Access surgery
 - Peritoneal dialysis catheters
 - Broviac/Hickman catheters

1.10 GENERAL

1.10.1 **Peritonitis**

Know and understand in detail the pathogenesis of primary, secondary and tertiary peritonitis, its supportive care and surgical treatment.

1.10.2 **Breast Disease**

Know and understand the pathogenesis pathology and treatment of inflammatory breast conditions

- Lactational breast abscess
- Non-lactational breast abscess

Know and understand the concept of ANDI and its clinical application in the management of benign breast disease

Know and understand the mechanisms of mastalgia and the details of treatment.

1.10.3 **Hernias**

Know and understand in detail the pathogenesis, diagnosis and anatomy relevant to surgical treatment of both complicated and uncomplicated hernias of

- The abdominal wall
- The groin and scrotum
- Other sites

1.10.4 **Benign Skin Tumours**

Know and understand the differentiation of benign from malignant skin disease and know the principles and details of excision of these

1.10.5 **Tropical and parasitic diseases**

Know and understand the clinical presentation, diagnosis and management including surgical treatment of the following tropical and infective diseases

- Amoebiasis
- Tuberculosis
- Typhoid
- Liver abscess
- Helminthic infections
- Hydatid disease
- Shistosomiasis
- Other parasitic diseases which present with surgical manifestations

1.10.6 **Morbid Obesity**

Know and understand the pathophysiology and the principles of the multidisciplinary management of morbid obesity

Know and understand the rationale for and the principles of the common operations used in bariatric surgery

1.10.7 **Neurovascular conditions**

Know and understand the pathophysiology and the principles of the surgical management of chronic neurovascular conditions and their surgical treatment

- Thoracic outlet syndrome
- Chronic regional pain syndrome

1.10.8 **Organ Transplantation**

Know and understand the indications for and the principles of the harvesting and transplanting of solid organs.

1.10.9 **Cardiothoracic Surgery**

Know and understand the principles of the diagnosis and management of these common thoracic conditions and their surgical management

- **Trauma**
 - Lung
 - Chest wall
 - Heart and great vessels
 - Diaphragm
- **Empyemia thoracis**

1.10.10 Gynaecological and Urological Aspects of General Surgery

Know and understand the principles of the diagnosis and management of these common gynaecological conditions and their surgical management

- Pelvic inflammatory disease
- Ectopic pregnancy
- Ovarian torsion
- Torsion of the testes
- Appendicitis in pregnancy

2.0 OPERATION AND PROCEDURE REQUIREMENTS**OPERATIONS A CANDIDATE SHOULD BE COMPETENT TO PERFORM**

Understand the anatomical details and be technically competent to perform the following operations in adults.

2.1 Vascular Surgery

- Varicose vein surgery
- Foot amputations
- Above and below knee amputations
- Fasciotomy
- Exposure for vascular control of the major arteries
- Vascular repairs
 - End to end vascular repair
 - Interposition vein graft
- Vascular access for dialysis and parenteral therapy
- Skin grafting

2.2 Endocrine and head and neck surgery

- Thyroid lobectomy
- Total thyroidectomy
- Open adrenalectomy
- Superficial parotidectomy
- Submandibular gland excision

2.3 Trauma

- Laparotomy blunt and penetrating trauma
 - Damage Control
 - Primary repair and partial resection of hollow visceral injury
 - Splenectomy
 - Colostomy
 - Cholecystectomy
 - Distal pancreatectomy
 - Intraperitoneal bladder repair
 - Spatulated ureteric repair

2.4 Colorectal and Small Bowel

- Segmental colon resections
- Abdominoperineal resection
- Adhesiolysis
- Small bowel resection
- Appendectomy
- Laparoscopic appendectomy
- Perianal conditions
 - Perianal abscess drainage
 - Haemorrhoidectomy
 - Fistulectomy
 - Lateral sphincterotomy

2.5 Biliary and Pancreas

- Cholecystectomy
- Laparoscopic cholecystectomy
- Common bile duct exploration
- Choledochoduodenostomy
- Cholecystjejunostomy
- Distal pancreatectomy
- Pancreatic ductal drainage procedures
- Pancreatic-enteric cyst drainage procedures

2.6 Gastric

- Truncal vagotomy
- Partial gastrectomy
 - Gastroduodenal restoration of continuity
 - Gastrojejunal restoration of continuity
- Gastrojejunostomy
- Construction of Roux en y loop
- Pyloroplasty

2.7 Thoracic Surgery

- Thoracotomy for trauma
- Rib resection for empyema
- Bronchoscopy
- Thoracoscopic sympathectomy

2.8 Paediatric Surgery

Know and understand the anatomical details and be technically competent to perform the following operations and procedures in children over two years old.

- Peritonitis
- Appendicitis
- Appendicular abscess
- Groin and abdominal wall hernias in the
- Orchidopexy for maldescended testes in the groin
- Laparotomy for trauma
- Circumcision
- Colostomy
- Venous access
- Pyloromyotomy
- Bronchoscopy
- Oesophagoscopy

2.9 Laparoscopic Surgery

Know and understand the principles involved in laparoscopic and thoracoscopic surgery and the details of coelomic cavity entry.

2.10 Flexible endoscopy

Know and understand the principles involved in flexible endoscopy and be technically competent to perform diagnostic upper endoscopy and sigmoidoscopy.

3.0 OPERATIONS THE CANDIDATE SHOULD KNOW IN PRINCIPLE.

Know and understand the anatomical details and principles of the technical steps involved in performing the following operations:

3.1 Endocrine and head and neck operations

- Laparoscopic adrenalectomy
- Parathyroidectomy
- Radical neck dissection
- Total parotidectomy

3.2 Colorectal Operations

- Low anterior resection
- Pouch anal anastomosis
- Operations for rectal prolapse
- Sphincter repair

3.3 Oesophageal Operations

- Total oesophagectomy
- Total gastrectomy
- Oesophageal resection and colonic interposition
- Hellers myotomy

3.4 Biliary Pancreas and Liver Operations

- Bile duct resection
- Bile duct reconstruction
- Pancreaticoduodenectomy
- Pancreatic combined resection/ductal drainage procedures
- Liver resection
- Hepaticojejunostomy

3.5 Vascular operations

- Aneurysm repair
- Suprarenal aneurysm repair
- Thoracoabdominal aneurysms
- Endovascular procedures
- Carotid endarterectomy
- Distal femoropopliteal bypass
- Aortoiliac bypass
- Cervical rib resection

4.0 SUGGESTED READING FOR THE FCS(SA) FINAL EXAMINATION**4.1 General Surgery**

- Maingot's Abdominal Operations s Jr, Stanley W. Ashley 11th edition McGraw Hill, 2006, 1310 pages. ISBN [10] 007144176X [13] 9780071441766
- Mastery of Surgery, 2 Volume Set by Josef E Fischer, Kirby I Bland, Mark P Callery, Patrick Clagett Daniel B Jones 5th ed. Publishers Lippincott Williams & Wilkins 2006, 2448pages. ISBN-10: 0781771658 ISBN-13: 9780781771658
- Surgical Anatomy and Technique by John E. Skandalakis , Panajiotis N. Skandalakis , Lee J. Skandalakis, John Skandalakis. Springer; 2nd ed. 2000, 767 pages ISBN-10: 0387987525 ISBN-13: 978-0387987521
- The Oxford Textbook of Surgery by Peter J. Morris (Editor), William C. Wood (Editor) Publisher: Oxford University Press; 2nd Rev Ed edition, 3602 pages (2000) ISBN-10: 0192628844 ISBN-13: 978-0192628848
- Current Surgical Therapy by John L. Cameron Publisher: Mosby; 8th edition 2004, 1344 pages, ISBN-10: 0323025196 ISBN-13: 978-0323025195
- Schwartz's Principles of Surgery, 8/e by F. Charles Brunicaudi , Dana K. Andersen, Timothy R. Billiar , David L. Dunn , John G. Hunter , Raphael E. Pollock. McGraw-Hill Professional; 8 edition 2004, 2000 pages ISBN-10: 0071410902 ISBN-13: 978-0071410908
- Sabiston Textbook of Surgery by Courtney M. Townsend, R. Daniel Beauchamp, B. Mark Evers , Kenneth Mattox Saunders; 17 edition 2004,2388 pages ISBN-10: 0721604099 ISBN-13: 978-0721604091

4.2 Paediatric surgery:

- Ashcraft, KW; Holder, TM. Pediatric surgery. 2nd ed. Publishers: WB Saunders Co, 1993
- Spitz L, Coran AG, Eds.; Rob and Smith Operative Surgery, Pediatric Surgery. 5th ed. London: Chapman and Hall 1995, Spitz, L; Coran, AG.
- Ravitch, MM et al. Pediatric surgery. 3rd ed. Chicago; London: Year Book Medical Publishers, c1979
- Rickham PP; Soper, RT; Stauffer, UG. Synopsis of Pediatric Surgery. Georg Thieme Publishers, Stuttgart ISBN3133877011
- Jones' clinical pediatric surgery : diagnosis and management / 5th ed. Alan Arthur Woodward, John M. Hutson Published Blackwell Publishing 1999 ISBN 0867930128 320 pages
- Leape, LL. Patient care in pediatric surgery. Little, Brown patient care series, c1987

4.3 Vascular Surgery

- Rutherford's Textbook on Vascular Surgery, 5th ed Robert B. Rutherford, MD, FRCS(Glasg), 2266 pages , Philadelphia, Pa, WB Saunders Co, 2000. ISBN 0-7216-8078
- Haimovici's Vascular Surgery, Henry Haimovici, Enrico Ascher Published Blackwell Publishing 2004 1316 pages ISBN 0632044586

4.4 Laparoscopic Surgery

- Laparoscopic Surgery of the Abdomen. Bruce V. MacFadyen, Maurice E. Arregui, Steve Eubanks , Douglas O. Olsen , Jeffrey H. Peters , Nathaniel J. Soper , Lee L. Swanstrom , Steven D. Wexner Springer; 1 edition 2003, 576 pages ISBN-10: 0387984682 ISBN-13: 978-0387984681

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