الهيئة السعودية للتخصصات الصحية
Saudi Commission for Health Specialties

Trauma and Acute Surgery Fellowship

2022


بسم الله الرحمن الرحيم

PREFACE

- Curriculum represents a vital part in learning. In addition to informing fellows, trainers and training supervisors with goals and objectives of training, curriculum will have major impacts on programs planning, execution, and quality assurance of training outcomes.
- The Saudi Commission for Health Specialties (SCFHS) is the national regulatory body of postgraduate training programs across all health professions in Saudi Arabia.
- This manual is meant to serve as a guide for members of "Curriculum Development Committee" in their journey writing the curriculum of their specialty.
- Curriculum Development Committee (CDC) members should adhere to the proposed curriculum structure in this manual. The subject-matter content needs to be built by CDC.
- CDC will be required to set a blueprint of the curriculum content. CDC will be required to get that approved by the scientific council/committee of the program (whenever that is applicable).
- This manual will provide a pre-written sections and materials that is universally applicable for SCFHS programs, CDC members are advised to follow instructions to help in customizing content based on program needs.
- For any further support please do not hesitate to contact us at: Curricula@scfhs.org.sa

PREFACE

- The primary goal of this document is to enrich the training experience of postgraduate fellows by outlining the learning objectives to become independent and competent future practitioners.
- This curriculum may contain sections outlining some regulations of training; however, such regulations need to be sought from the "General Bylaws of Training in Postgraduate Programs" and "Executive Policies" published by the Saudi Commission for Health Specialties (SCFHS), which can be accessed online through the official SCFHS website.
- In the occasion of discrepancy in regulation statements, then the one stated in the most updated bylaws and executive policies will be the reference to apply.
- As this curriculum is subjected to periodic refinements, please refer to the electronic version posted online for the most updated edition at: www.scfhs.org.sa

I. CONTRIBUTORS

Curriculum Development Committee:
• DR. HEYTHEM ABDULLAH ALZAMEL • DR. KHALID ALBEDAH • DR. IBRAHIM ALBABTAIN • DR. WAIL A TASHKANDI
Reviewed and Approved by Specialty's Scientific Council Members:
• Dr. Saud AlRsheedi • Dr.Abduallah AlZahrani • Dr.Thameer Nouh • Dr.Smar AlHmoud • Dr.Abdulelah AlHamidi • Dr.Meshil AlShreef • Dr.Hamad AlQahtani • Dr.Yousef Abdulkreem • Dr.Bassem AlSharif • Dr.Saeed AlGhamdi • Dr.Khalid AlQahtani • Dr.Hessa Al Abuenyen
Curriculum Review Committee members:
• Dr .Ali Alyahya, MD, MME, FRCSC • Dr.Moawad AlOtaib, MBBS, ABFM, SBFM, MSc MedEDU
Approved by Head of Curriculum Review Committee:
• Dr.Ali Alyahya, MD, MME, FRCSC

II. COPYRIGHT STATEMENTS

We would also like to acknowledge that the CanMEDS framework is a copyright of the Royal College of Physicians and Surgeons of Canada, and many of the description's competencies have been acquired from their resources.

Correspondence: Saudi Commission for Health Specialties P.O. Box: 94656 Postal Code: 11614 Contact Center: 920019393

E-mail: Curricula@scfhs.org.sa

Website: www.scfhs.org.sa

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IV. INTRODUCTION

1. Context of Practice

The practice of General Surgery, over the past 30 years, has changed tremendously; with the adoption of new concepts and innovations. These factors have led to the Development of Trauma / Acute Care Surgery specialty. Which has been adopted by world-renowned Medical Centers and has led to the initiation of Trauma Centers and Trauma Training Programs. Advances in technological diagnostic tools, and therapeutic intervention, mandated the evolution of Acute Care Surgery Speciality; which was immediately adopted and incorporated into and led by Trauma Surgeons.

Year	Below 18 Years	19-30	31-40	41-50	Over 51
2018	4,230	9,028	8,204	5,493	3,624
2019	4,549	9,841	8,639	5,816	4,011
2020	3,202	7,596	6,527	7,596	3,202

According to WHO report; the total number of Deaths in Saudi Arabia, resulting from car accidents in 1 year, is more than 25000 deaths; almost 22% of total deaths(3). It is estimated that 30-40% of total hospital surgical admissions is related to emergency surgery.

Trauma surgeons (also called critical care and acute care surgeons) specialize in performing emergency surgeries on people who've had a critical injury or illness. Trauma surgery requires extensive knowledge of surgical procedures and how to manage different types of injuries. A trauma surgeon can help you pull through a critical injury or an acute illness.

Trauma surgeons are qualified to diagnose and surgically repair trauma caused by injuries and illness. They must quickly evaluate a person's condition and determine what type of operation; if necessary.

If you see a trauma surgeon, it's usually after you arrive at a hospital's emergency room. They come onto your care team if it's possible that you'll need surgery to treat your illness or injury.

Conditions a trauma surgeon might treat include:

Blunt trauma is any injury from a forceful impact. Common causes are motor vehicle crashes, falls, or assaults. Penetrating trauma is an injury from an object that pierces the skin and other tissues, including gunshot wounds, stab wounds, and farm equipment injuries.

Trauma care comprises four stages:

1) Immediate - Life support and identification of location and extent of injury - Follows the Advanced Trauma Life Support (ATLS) process - Provided at the scene of injury and in the Emergency Department.
2) Resuscitative Surgery - The surgery that is required to control haemorrhage and remove and/or control sources of infection.
3) Continued Care and Co-ordination of Specialty Treatment (recovery and reconstruction) - Overlaps with and then takes over from the Immediate Care Team Leader - Continues through the Resuscitative Surgery stage and recovery from that until the patient enters the Rehabilitation stage - Requires identification of all medical problems; management and/or referral for specialty management - Coordinates all inter-specialty treatment ensuring the correct treatments are given at the correct time.
4) Rehabilitation - Overlaps with the recovery phase and continues after all active medical issues are resolved until the patient has made as much physical and psychological progress as is possible towards restoration of their pre-injury lifestyle.

Immediate Care (stage 1) is included in the curricula for all surgical specialties through the need to meet learning outcomes similar to those of the ATLS course.

Rehabilitation care (stage 4), for the large part, lies outside the remit of surgical care.

The aim is to set the requirements to train surgeons in Resuscitative Surgery (stage 2) and in being the Major Trauma Consultant responsible for ongoing active medical treatment and the co-ordination of specialty care (stage 3). Certain aspects of these two roles are already included in surgical curricula, but the evolution of Major Trauma Centers now requires a steady flow of trainees with a special interest in major trauma and with skills beyond those taught within the existing curricula.

References;

1. American College of Surgeons; Committee on Trauma (COT)
2. History and development of trauma care in the United States; Clin Orthop Relat Res
3. 2000 May;(374):36-46 https://www.moh.gov.sa/en/Ministry/Statistics/Pages/Traffic-accidents.aspx

2. Goals and Responsibilities of Curriculum Implementation

Surgery is a dynamic and essential component of the health care delivery system. The curriculum will be driven by these principles:

1. The Surgical Fellowship training curriculum is oriented to the health needs of KSA community.
2. Study guides will be used to facilitate learning

3. The curriculum will provide surgical knowledge, skills, as well as attitudes that is needed in surgical practices.
4. Faculty will endeavor to deliver the curriculum to the TACS Fellows during their training utilizing the most effective means possible and will strive to incorporate new, effective approaches to teaching and learning which should be tailed up on problem-solving approaches
5. The curriculum will be "patient-focused" that trains students to be a surgical health care provider. This will involve teaching the Fellows on proper patient assessment and advanced oral and written communications skills.
6. The curriculum will promote and facilitate:
    a) Self-directed learning
    b) Active learning.
    c) Critical thinking, clinical reasoning.
7. The curriculum will apply several methods for formative and summative assessment to evaluate the student achievement and measure student SKILLS. The testing procedures will focus on the integration and application of principles, critical thinking, and problem solving e.g. (MCQ, OSCE, etc)
8. The curriculum and its content will be the responsibility of the faculty through the medium of the Curriculum Development Committee (CDC).
9. The CC will be responsible on reviewing the curriculum, editing it, assessing teaching methods, and measuring the outcomes for purpose of improvement
10. The curriculum will be responsive to changes required because of input from faculty, students, employers, and alumni.

This curriculum ultimately seeks to guide fellows to become *competent* in Trauma/Acute Care Surgery (TACS). Accordingly, this goal requires a significant amount of effort and coordination from all those involved in the

TACS Fellowship training. As *"adult-learners,"* the TACS fellows must be proactive, fully engaged, and exhibit the following:

- a careful understanding of learning objectives,
- self-directed learning,
- problem solving,
- an eagerness to apply learning by means of reflective practice from feedback and formative assessment,
- self-awareness and willingness to ask for support when needed.

The TACS Fellows will share responsibility in curriculum implementation.

The strategic direction of the Saudi Commission for Health Specialties (SCFHS) applies a recognized competency model of training governance to achieve the highest quality of training and the postgraduate programs are also required to cover the research and the evidence-based practice in their curriculum. The Specialty scientific (council/committee) will guarantee that the contents of this curriculum is constantly updated to match the highest standards in postgraduate education in the TACS Fellowship.

The training program is committed to providing high-quality accessible education to suit the needs of postgraduate students. This commitment to excellence embraces the individual development of each FELLOW within the broad canvass of life; intellectual, physical, social, and cultural.

The Trauma / Acute Care Surgery Fellowship Training Program will actively promote the attainment and maintenance of high international standards in its training, research, and services.

The philosophy of the Trauma / Acute Care Surgery Fellowship program is to provide a setting in which advanced, highly skilled, adult education can take place. The faculty provides the opportunity for the fellow to not only acquire an in-depth knowledge of critical care, trauma and emergency surgery, and advanced skills in critical care and operative techniques, but also to develop

both academically and professionally. This is most effectively achieved through an integrated two-year program that includes training in the management of emergency general surgery and trauma patients, and the training to enhance administrative, research, and educational skills.

We are committed to providing excellent clinical exposure, as well as directed, expert instruction, promoting self-directed education, and fostering the refinement of the fellow' scientific and academic pursuits. The educational program consists of a combination of mentorship with a graded increase in clinical, administrative, and educational responsibilities, didactic and Socratic instruction, hands-on experience, and self-education.

The educational philosophy and values of the Trauma / Acute Care Surgery Fellowship Training Program is committed to the following core values:

Academic Excellence: We strive to achieve excellence in teaching, scholarship, and health service to the public and professional communities.

Professionalism, Integrity, and Character: We aim to create an environment that instills professionalism, integrity, empathy, a high standard of ethical behavior, and the highest professional commitment to the patient, the community, and the employer.

A Caring Community: We endeavor to create a caring community characterized by mutual respect, patience, kindness, and generosity; and one that respects, values, and promotes the dignity and diversity of faculty and students.

A Culture of Service: We strive to create a culture that values and promotes service to our patients, community, and profession.

3. CURRICULUM UTILIZATION TO GAUGE PROFESSIONAL COMPETENCE

This curriculum is designed with function and utility in mind for surgical fellows, surgical faculty and any others who would benefit from clear sets of goals, along with knowledge and SKILLS objectives, delineated as expected accomplishments by learners.

The educational areas in this surgical fellow curriculum, for which competencies and instructional criteria exist, are the following:

- Integration of theory and practice
- Application of surgical skills
- Use of critical thinking
- Exercise of ethical judgment
- Use of appropriate communication
- Recognition of teaching responsibilities
- Development of management abilities
- Teaching and learning for a lifetime

4. The purposes and content of the curriculum

The Surgical Fellowship Training Program curriculum, which lasts 2 years, provides knowledge and experience to Fellows; enabling them to deliver high quality standards and services in surgical care. A fundamental goal of surgical education is to establish a solid foundation in the basic surgical sciences. An equally important goal is to ensure that the surgical fellow acquires a broader general knowledge, outside of surgery, for them to learn to function as professionals and informed citizens.

The program aims at acquiring knowledge, skill, and attitude in the field of surgical care, by using the organized framework from the Saudi Council for Health Services (SCFHS), and the CanMEDS.

Educational Objective

Curriculum Goals for Surgical Fellows

Our curriculum goals were structured as summary goals descriptive of the desired outcomes of surgical education. When competencies are viewed in conjunction with objective criteria, one has a combination of indicators of what is essential for fellow learning, and one can employ these essentials in implementing the instructional program.

The broad educational areas in our fellow curriculum, for which competencies and instructional criteria exist, are these:

- Integration of theory and practice
- Application of surgical skills
- Increasing expertise in care for elderly patients
- Use of critical thinking
- Exercise of ethical judgment
- Use of appropriate communication
- Recognition of teaching responsibilities
- Development of management abilities
- Teaching and learning for a lifetime

5. Expected Outcomes Expressed as Program Goals

It is important to consider that the educational areas and organizing principles listed above identify the content divisions that are critical for the comprehensive educational and professional preparation of a surgeon. We regard these goals and objectives as the competency-based structure of our

curriculum. A competency-based education program, anchored by this structure, creates an educational back-up system of knowledge, skills, and attitudes that are helpful in assuring the public that a program graduate is competent to practice.

When these learning objectives are met, the expected outcome is that core competencies can be performed acceptably. The competencies listed specify what the fellow *should know, be able to do, and an attitude about,* at the completion of a defined point during the fellowship training.

At the end of the training, the surgical fellow is expected to:

1. Demonstrate effective use of data, media, and other technologies too effectively and respond to communication for varied audiences.
2. Contribute to the advancement of surgery, through independent and collaborative presentations, research, and publications.
3. Demonstrate sensitivity, personal values, ethical principles and caring in professional and social context.
4. Demonstrate a basic understanding of cultural diversity and religious needs of patients and their families and provide surgical care in accordance with those needs.
5. Perform self-assess and satisfy learning needs on an ongoing basis.
6. Illustrate, value, and promote scholarly inquiry and outcomes assessment, clear reasoning, and the application of evidence-based practices as a means of improving the health outcomes of patients, especially the care of a rural underserved population
7. Demonstrate the development of mature, independent, life-long learning
8. Demonstrate effective leadership and involvement in professional and social endeavors.
9. List and evaluate patient data to properly assess patients and to determine the appropriate course of treatment.

10. Integrate basic and clinical knowledge to design, implement, monitor, evaluate and modify patient management; to prevent or resolve treatment-related problems.
11. Communicate and collaborate effectively with patients, peers, other health professionals and the public.
12. Retrieve, analyze, and interpret professional and scientific literature to provide information and education to patients, caregivers, health professionals, and the public.
13. Describe, integrate, and manage human, economic, scientific, and technological resources for the effective provision of surgical care.
14. Manage surgical disorders based on a thorough knowledge of basic and clinical science.
15. Demonstrate appropriate skill in those surgical techniques required of a qualified surgeon.
16. Use critical thinking when making decisions affecting the management of patients.
17. Provide cost-effective care to surgical patients and families within the community.

6. PROGRAM Competencies

The program requires its Fellows to obtain competence in the six areas listed below to the level expected of a surgeon. The TACS Fellowship will define the specific knowledge, skills, behaviors, attitudes, and provide educational experiences to demonstrate the following:

1. Patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Surgical Fellows must:
    a) Demonstrate manual dexterity appropriate for their training level.
    b) Be able to develop and execute patient care plans appropriate for fellow level.
2. Medical Knowledge about established and evolving clinical, and cognate (e.g., epidemiological, and social-behavioral) sciences, and the application of this knowledge to patient care. Fellows are expected to: critically evaluate and demonstrate knowledge of pertinent scientific information.
3. Practice-based learning and improvement that involves the investigation and evaluation of care for their patients, the appraisal and assimilation of scientific evidence, and improvements in patient care. Surgical Fellows are expected to:
    a) Critique personal practice outcomes.
    b) Demonstrate recognition of the importance of lifelong learning in surgical practice.
4. Interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and other health professionals. Surgical Fellows are expected to:

Communicate effectively with other health care professionals.

Counsel and educate patients and families.

Effectively document practice activities.

5. Professionalism, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to patients of diverse backgrounds. Surgical Fellows are expected to:
    a) Maintain high standards of ethical behavior.
    b) Demonstrate a commitment to continuity of patient care.
    c) Demonstrate sensitivity to age, gender and other health care professionals.
6. Systems-based practice, as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care:
    a) Practice high-quality, cost-effective patient care.

Demonstrate a knowledge of risk-benefit analysis.

Demonstrate an understanding of the role of different specialists and other health care professionals in overall patient management.

VI. Fellow Duties and Working Environment

Providing Fellows with a sound didactic and clinical education must be carefully planned and balanced with concerns for patient safety and fellow well-being. Each program must ensure that the learning objectives of the program are not compromised by excessive reliance on Fellows to fulfill service obligations. Didactic and clinical education must have priority in the allotment of Fellows' time and energy. Duty hour assignments must recognize that faculty and Fellows collectively have responsibility for the safety and welfare of patients.

A. Supervision of Fellows

1. All patient care must be supervised by qualified faculty. The program director must ensure, direct, and document adequate supervision of

Fellows always. Fellows must be provided with rapid, reliable systems for communicating with supervising faculty.

2. Faculty schedules must be arranged to provide Fellows with continuous supervision and consultation.
3. Faculty and Fellows must be educated to recognize the signs of fatigue and adopt and apply policies to prevent and counteract its potential negative effects.
4. The attending physician has both an ethical and a legal responsibility for the overall care of the individual patient and for the supervision of the fellow involved in the care of that patient. Although senior Fellows require less direction than junior Fellows, even the most senior must be supervised. A chain of command that emphasizes graded authority and increasing responsibility as experience is gained must be established. Judgments on this delegation of responsibility must be made by the attending surgeon who is ultimately responsible for the patient's care; such judgments shall be based on the attending surgeon=s direct observation and knowledge of each fellow's skills and ability.

V. ABBREVIATIONS USED IN THIS DOCUMENT

ABBREVIATION	DESCRIPTION
SCFHS	Saudi Commission for Health Specialties
TACS	Trauma / Acute Care Surgery
FY-(1)	Surgical Fellow in the 1ST year of Fellowship Training
FY-(2)	Surgical Fellow in the 2ND year of Fellowship Training
OSCE	Objective Structured Clinical Examination
OSPE	Objective Structured Practical Examination
Mini-CEX	Mini-Clinical Experience report
DOPS	Direct Observation of Procedural Skills report
CBD	Case-Based Discussion report
CBE	Competency-Based Education
CBKO	Competency-Based Knowledge Objectives
CBSO	Competency-Based Skills Objectives
ITER	In-Training Evaluation Report
COT	Consultation Observation Tool
FTC	Fellowship Training Committee
CDC	Curriculum Development Committee

Article 1: Definitions mentioned in this document are as follow:

COUNCIL; Is the Council for Post-Graduate Medical Training

TRAINING FACULTY; The consultants who are working at the training institution who are qualified to conduct medical training and to teach according to their particular field of specialty.

TRAINING INSTITUTION; Is the medical facility qualified to participate in the training programs that are recognized by the Council.

TRAINING SUPERVISOR; The Surgery Consultant in charge of supervising the Fellowship training program.

TRAINING YEAR; it is a 12 months period of continuous training.

FELLOW; Is the person who is registered for training in the surgery program.

PROMOTION; The advancement of the fellow from one training year to the following year in the program.

VI. PROGRAM ENTRY REQUIREMENTS

THE FELLOWSHIP IN TRAUMA / ACUTE CARE SURGERY IS A TWO-YEAR COMMITMENT.

ELIGIBILITY AND SELECTION

Eligibility of the applicants for Trauma / Acute Care Surgery Fellowship must meet the following requirements:

- Completion of approved general surgery residency training
- Is Board Certified in General Surgery by the Saudi Commission for Health Specialty (SCFHS)
- Must show established ability as a teacher of medical students and Residents
- Three (3) Recommendation letters from 3 Qualified Surgery consultants and who are Recognized by the SCFHS,
- The applicant is registered with the Saudi Commission for Health Specialty (SCFHS)

Submitted applications will be thoroughly reviewed and acknowledged. Invitation to interview in person will be based on the individual's qualifications and references. In addition to the requisite eligibility criteria, selection for the program will be based on favorable interviews with existing faculty and fellows, favorable completion of his current program, as well as the applicant's expressed interest in Trauma & Acute Care Surgery program.

VII. LEARNING AND COMPETENCIES

1. Introduction to Learning Outcomes & Competency-Based Education

Trauma / Acute Care Surgery (TACS) Fellowship Training Outcome Goals

These outcome abilities are established to ensure the TACS Fellows transitional growth throughout their surgical practice experience, resulting in professional competency and the ability to provide patient centered care by meeting the criteria of good science, professional skills, attitudes, behaviors, values, and evidence-based practice.

I. Conceptual Competence:

The TACS Fellow must demonstrate evidence-based knowledge of the theoretical foundations of the profession and apply them to their individual practice settings:

- Basic anatomy/ physiology
- Pathophysiology
- Principles of pharmacology
- Surgical Procedures and Treatment guidelines
- Principles of management and Health outcomes

II. Scientific Comprehension:

The Fellow must demonstrate comprehension of major scientific discoveries and use of the scientific method to help make these discoveries:

- Basic principles of study design.

- The application of statistical methodology to study design and the scientific literature.

III. Integrative (Practice-related) Competence:

The Fellow must be able to mend theory and abilities in the practice setting to enhance positive patient outcomes:

- Provide patient-centered surgical and medical care.
- Critically evaluate patient data, literature sources, disease states, and drug products.
- Provide specific, sound, evidence-based healthcare recommendations.
- Design, implement, and evaluate patient specific treatment regimens.
- Describe the fundamental concepts and practical considerations necessary to ensure the quality of care.
- Demonstrate techniques necessary to maintain the microbiological purity of sterile products and employ associated quality assurance strategies.
- Apply key business principles, including continuous quality improvement, in the management of the surgical services, personnel, and obtaining compensation.

IV. Critical Thinking and DECISION-MAKING Abilities:

The Fellow must examine issues rationally, logically, and coherently; and shall acquire, evaluate, and synthesize information and knowledge relevant to an identified problem; to make sound decisions in familiar context:

- Provide evidence-based support for arguments, recommendations, and solutions.
- Demonstrate the ability to make sound decisions given complex scenarios in a time-constrained environment.

V. Communication Skills and Abilities:

The TACS Fellow must:

- Demonstrate the ability to present ideas, plans, and data in appropriate written formats to communicate with various audiences successfully and effectively.
- Accurately document recommendations and interventions while assuring patient confidentiality.
- Effectively and efficiently perform patient interviews, medication histories, medication reconciliation, and identify drug-related issues and problems.
- Interact with physicians, nurses, and other healthcare professionals; to achieve positive patient outcomes.
- Interact with staff to develop and maintain a positive and productive work environment.
- Effectively present information to colleagues, healthcare practitioners, and the public, regarding disease management, drug therapy and related topics.

VI. Responsible use of professional values and ethical principles:

The Fellow must demonstrate sensitivity to personal values and ethical principles in professional and social contexts:

- Always exhibit professional behavior in congruence with the medical code of ethics.
- Describe strategies to work through ethical dilemmas in the provision of surgical care.
- Maintain professional competence through sound judgment, ethical behavior, adherence to legal guidelines and socioeconomic principles.
- Demonstrate values consistent with the provision of quality healthcare to all patient groups and populations.

VII. Social Awareness and Social Responsibility:

The Trauma / Acute Care Surgery Fellow must demonstrate an understanding of the strengths and challenges of cultural diversity and the historic responses of society in times of rapid change:

- Demonstrate awareness of key issues and debates in healthcare.
- Demonstrate cultural competence that includes awareness of the impact that cultural, social, and ethnic differences can play in the provision of healthcare and the workplace.

VIII. Professional Abilities and Habits:

The Fellow must effectively self-assess and satisfy learning and continuous professional development on an ongoing basis:

- Acquire new information to answer specific questions from patients, colleagues, or other healthcare professionals.
- Display self-directed learning, acquiring the necessary knowledge and skills to develop and maintain one's competence to provide optimal surgical care as a template for life-long learning and continued professional development.
- Demonstrate the ability to self-assess and take needed steps to achieve competence.
- Take an active role in professional and community organizations and promote advocacy for key healthcare and professional initiatives.
- Exhibit positive, professional, empathic attitudes and behaviors in all professional communications.
- Demonstrate awareness of and be able to analyze internal and external factors that influence surgical practice and healthcare polices; in an attempt to resolve practice-related problems.

IX. Group Interaction:

The Fellow must demonstrate effective interpersonal and intergroup behaviors in a variety of situations and circumstances:

- Demonstrate awareness of the roles of various healthcare professionals in multiple healthcare environments.
- Participate functionally in team efforts within surgical and healthcare groups.
- Discuss and remain open to differences of opinion and defend rational opinions that differ from those of other healthcare professionals.
- Direct and/or manage other personnel in a pharmacy or healthcare environment.
- Display habits of service to one's community and profession

X. PATHOPHYSIOLOGY OF THE SURGICAL PATIENT

The Trauma / Acute Care Surgery Fellow will develop clinical management strategies, considering the unique aspects of surgical pathophysiology.

Knowledge of disease processes will include the study of:

1. Mortality: leading causes of death for those 65 and older
2. Morbidity: leading causes of disability
3. Factors affecting altered disease presentation
4. Comorbidity: chronic diseases superimposed on acute disease

XI. Patient Outcomes

The Trauma / Acute Care Surgery Fellow will analyze and utilize their surgical data in systematic fashion. Analysis and utilization of surgical data will include:

1. Selecting, maintaining, and analyzing a patient outcome database
2. Comparing patient outcomes with local medical community and national standards
3. Initiating improvements in patient care based on patient outcome data

XII. PREOPERATIVE ASSESSMENT OF THE SURGICAL PATIENT

The Fellow will modify their approach to evaluation and diagnosis in a manner that is effective, efficient, and in accord with the needs and limitations of the individual. Factors to consider will include:

1. Developing attitudes toward and communicating with the patient.
2. Establishing lines of communication with health care team: physician, social worker

The Fellow will be prepared to obtain and utilize patient data for decision making prior to surgery. Full assessment of patient baseline data will include consideration of:

1. Functional capabilities: activities of daily living, mental and physiologic health
2. Psychosocial variables: cultural factors, social supports, and community relations
3. Considering risks to desired surgical outcomes: comorbidity, and social supports.

XIII. OPERATIVE MANAGEMENT OF THE SURGICAL PATIENT

The Trauma / Acute Care Surgery Fellow will monitor and act upon requirements of care to maintain patient stability. Monitoring of patient surgical needs will include:

1. Planning the selection and management of local, regional, and general anesthetics
2. Maintaining body temperature and metabolic homeostasis during surgery
3. Following Halsted's Principles during surgical intervention

XIV. PERIOPERATIVE CARE OF THE SURGICAL PATIENT

The Fellow will determine and act upon the continuing needs of the surgical patient based upon patient communication and interaction, patient data, and analysis of surgical outcome. Perioperative decisions will require:

- Management of complications; eg; sepsis, cardiac problems, diabetes, or renal failure.
- Determining need for prophylaxis for common complications (eg; DVT, PE)
- Sustaining patient homeostasis, ventilator support, fluid and antibiotic management.
- Management of; life sustaining, supportive care, extent of care issues

The Fellowship Training is guided by well-defined "*learning objectives*" that are driven by targeted "*learning outcomes*" for the TACS Fellowship program to serve specific specialty needs. Learning outcomes reflect the professional "*competencies*" and tasks that are aimed to be "*entrusted*" by fellows upon graduation. This will ensure that graduates will meet the expected demands of the healthcare system and patient care in relation to Trauma/Acute Care Surgery. *Competency-based education* (CBE) is an approach of "*adult-learning*" that is based on achieving *pre-defined, fine-grained, and well-paced* learning objectives that are driven from complex professional competencies.

Professional competencies related to healthcare are usually complex and contain a mixture of multiple learning domains (knowledge, skills, and attitude). Furthermore, CBE emphasizes the critical role of informed judgment of learner's competency progress, which is based on a staged and formative assessment that is driven from multiple workplace-based observations. The following are concepts to enhance the implementation of CBE in this curriculum:

- **Competency:** Competency is a cognitive construct assessing the potential to perform efficiently in each situation based on the standard of the profession. Professional roles (e.g., medical expert, health advocate, communicator, leader, scholar, collaborator, and professional) are used to define competency-role to make it mendable for learning and assessment.
- **Milestones**: Milestones are stages along the developmental journey throughout competency continuum. The Fellow, throughout their learning

journey, will be assisted to transform from being (novice/supervised) into (master/unsupervised) practitioners. These Milestones are expected to enhance learning process by pacing the training/assessment to match the developmental level of fellows.

- **Learning-Domains:** Efforts are directed to annotate the learning outcomes with the corresponding domain (K=Knowledge, S=Skills, and A=Attitude).
- **Content-area Categorization:** It is advisable to categorize the learning outcomes in broad content area related to the practice of profession. For example, diagnostic versus therapeutic, simple versus complex, urgent versus chronic, etc.
- **Fellows** are expected to progress from novice to mastery level in professional competencies. SCFHS has endorsed the CanMEDS to articulate professional competencies. This curriculum applies principles of competency–based medical education. CanMEDS is a globally accepted framework outlining competency roles. "CanMEDS 2015.

This reference is an example for the general outline of the CanMEDS competency (Frank JR, Snell L, Sherbino J, editors. CanMEDS 2015 Physician Competency Framework. Ottawa: Royal College of Physicians and Surgeons of Canada; 2015.

2. Program Duration

The Fellowship in Trauma / Acute Care Surgery is generally a two-year commitment.

A. Notes to Curriculum Outline

It is a requirement that over the 2-year fellowship, fellows participate in Acute Care Surgery call for no less than 12 months. Fellows are required to take 52-night calls in trauma and emergency surgery during the 2-year.

1. Flexibility in the timing of these rotations, and the structure of the 24-month training should be utilized to optimize the training of the fellow.

2. Rational for out-of-system rotations for key portions of the training must be based on educational value to the fellow.
3. Experience in elective surgery is an essential component of fellowship training.
4. An academic environment is mandatory, and fellows should be trained to teach others and conduct research in Acute Care Surgery.

3. Program Rotations

Required Clinical Rotation	Length
TRAUMA & ACUTE – CARE SURGERY FELLOWSHIP including:	
• Trauma Surgery	36 - Weeks
• Acute Care Surgery	36 - Weeks
• Trauma/Surgical Critical Care, (Trauma ICU / Surgical ICU)	8 - Weeks
• Thoracic Surgery	6 - Weeks
• Vascular Surgery	6 - Weeks
• Research	4 - Weeks
• Vacation	8 - Weeks
Total	104 WEEKS

(*Mandatory core rotation: Set of rotations that represent program core component and are mandatory to do.

1st YEAR FELLOWSHIP ROTATION	
Trauma Surgery	16 – Weeks
Acute Care Surgery	18 – Weeks
Thoracic Surgery	6 – Weeks
Vascular Surgery	6 – Weeks
Research	2 – Weeks
Annual Vacation	4 – Weeks
TOTAL	52 – Weeks

2nd YEAR of FELLOWSHIP ROTATION	
Trauma Surgery	20 – Weeks
Acute Care Surgery	18 – Weeks
Trauma/Surgical Critical Care, (Trauma ICU/Surgical ICU)	8 – Weeks
Research	2 – Weeks
Annual Vacation	4 – Weeks
TOTAL	52 – Weeks

4. Mapping of Learning Objectives and Competency Roles to Program Rotations:

The Trauma / Acute Care Surgery Fellow (TACS) must be committed to provide an exemplary quality of service to patients, performed in concert with educational activities to graduate as a well-rounded, knowledgeable, and highly qualified surgeon.

To accomplish these goals, the following objectives have been established by using the SMART Objectives; (SPECIFIC, MEASURABLE, ATTAINABLE, REALISTIC, TIMELY). The fellowship is a total of 2- years; during which he will rotate in the following specialties to achieve proper and adequate training to finally be a competent self-sufficient Trauma & Acute Care Surgeon.

1. Trauma Surgery;

Over 36 weeks the fellow will be exposed to Blunt and Penetrating Trauma and will also be expected to perform numerous Trauma Surgeries.

The specific surgeries are mentioned in the following pages.

They will be measured by means of a Log-Book in which all the surgeries are properly Documented.

2. Acute Care Surgery;

Over 36 weeks the fellow will be exposed to Emergency Surgeries through the ER, ICU, and ward and will also be expected to perform numerous Emergency Surgeries.

The specific surgeries are mentioned in the following pages.

They will be measured by means of a Log-Book in which all the surgeries are properly Documented.

3. Trauma/Surgical Critical Care;

The Fellow will be actively involved in the ICU, over a period of 8-weeks and this will take part during the 2nd year of the fellowship.

Demonstrate knowledge of the principles associated with the diagnosis and management of critically ill patients, including knowledge of simple and complex multiple organ system normalities and abnormalities.

Demonstrate the ability to appropriately diagnose and treat patients with interrelated system disorders in the intensive care unit.

4. Vascular Surgery;

This is a Six Week rotation in Vascular Surgery, which will be performed during the 1st year of the Fellowship.

The Fellow will demonstrate knowledge of the anatomy, physiology, and pathophysiology of the vascular system.

Demonstrate the ability to surgically manage the preoperative, operative, and postoperative care of patients with arterial, venous trauma and disease.

5. Thoracic Surgery;

This is a Six Week rotation in Vascular Surgery, which will be performed during the 1st year of the Fellowship.

The fellow should be able to demonstrate an understanding of the anatomy, physiology, and pathophysiology of thoracic conditions pertinent to TRAUMA surgery.

Effectively apply this understanding to the diagnosis, evaluation, and treatment of patients with thoracic problems who are to be managed by Trauma surgery.

BY THE END OF THE 2 YEAR FELLOWSHIP, THE FELLOW IS EXPECTED TO;

1. Acquire a solid foundation of fundamental surgical knowledge.
2. This is done through self-study, an organized Core Curriculum, Conferences in close association with faculty. An understanding of the etiology, pathogenesis, diagnosis, and management of surgical disorders is necessary for completion of the program.
3. Use sound surgical judgment, think rationally, and use the literature to solve problems.
4. Achieve a satisfactory level of critical skill prior to completion of the program.
5. The TACS Fellow should have excellent history and physical examination skills; should have appropriate diagnostic skills with an understanding of

the required investigations to be ordered and be able to develop a proper management plan.

6. Exhibit good technical skills commensurate with TACS Fellow level.
7. The TACS Fellow must maintain the highest moral and ethical values and demonstrate a mature attitude.
8. The Fellow should be trustworthy, conscientious and maintain a professional attitude both in demeanor and attitude. Being sensitive to the needs and feelings of others be it faculty, patients, family members or other TACS Fellows.
9. Acquire good teaching skills.
10. These goals are attained by a progressively graded clinical and operative experience. Within the limits of variability found in clinical practice an equivalent opportunity will be afforded each TACS Fellow, under the guidance and supervision of a qualified teaching staff, to develop the degree of mature surgical judgment and operative skill to render him or her prepared to provide surgical care to patients with a wide range of disorders. The teaching staff supervising the TACS Fellow will make the assessment of achieving this goal.

Operative Management Principles and Technical Procedure Requirements of Acute Care Surgery Fellowship.

Head and Neck

EXPOSURES/INCISIONS – ESSENTIAL **N=5**

Neck exploration

Collar incision

Sternocleidomastoid incision

Thoracic extension

Thoracic

EXPOSURES/INCISIONS - ESSENTIAL:

Thoracotomy N=10

Sternotomy N=10

Pericardiotomy N=3

(includes sub-xiphoid, transdiaphragmatic and transthoracic approaches)

Organ Management – Essential

Lung (N=20)

a. Operative evacuation of the pleural space N=5
b. Parenchymal procedures N=10
c. Bronchoscopy N=10

Diaphragm (N=5)

May include thoracoabdominal exposures for spine surgery

Cardiac (N=3)

Includes emergent or elective cases requiring cardiac suture or repair

Esophagus (N=2)

Includes elective resection

Intrathoracic great vessel injury (N=3)

Includes endovascular stenting of aortic and subclavian injuries

Organ Management – Desired

Elective or emergent tracheal or bronchial procedures (not tracheostomy)

Management of chest wall injuries (includes rib plating)

Operative management intrathoracic great vessel injury

Abdominal

Exposures/Incisions – Essential

Enteral access N=10

Laparotomy N=20

Diagnostic Laparoscopy N=15

Hepatic mobilization N=10

Damage control techniques N=10

Complex Laparoscopy N=10

(includes colectomy, lysis of adhesions, common bile duct exploration, Graham patch, hernia repair, enteral access)

ORGAN MANAGEMENT – ESSENTIAL

Liver (N=20)

Exposure & Evaluation in Damage Control Surgery

Management of hemorrhage N=3

Rexploration of hepatic wound

Hepatotomy

Partial hepatectomy

Spleen (N=20)

Exposure & Evaluation in Damage Control Surgery

Splenectomy Splenorrhaphy

Kidney (N=3)

Exploration Nephrectomy

Partial nephrectomy

Renal repair

Pancreas (N=20)

Exposure & Evaluation in Damage Control Surgery

Drainage Resection Repair

pancreatectomy

Stomach (N=20)

Exposure & Evaluation in Damage Control Surgery

Gastrectomy

Management gastric injury Management gastric ulcer

Duodenum (N=20)

Exposure & Evaluation in Damage Control Surgery

Management duodenal injury

Management duodenal ulcer

Small Intestine (N=30)

Enterectomy

Repair of injury

Lysis of adhesions

Management of volvulus/intussusception/internal hernia

Colon/Rectum (N=30)

Exposure & Evaluation in Damage Control Surgery

Colectomy

Colostomy reversal

Management rectal injury

Appendix (N=30)

Appendectomy

Anus (N=5)

Incision and drainage perirectal abscess

Exam under Anesthesia

Biliary system (N=25 exclusive of cholecystectomy)

Cholecystectomy with or without cholangiography

Common bile duct exploration	
Hepaticoenterostomy	
Bladder	(N=3)
Repair Cystectomy	
Ureter	(N=1)
Repair/stent	

Vascular

Exposures/Incisions – Essential

Left medial visceral rotation	N=10
Right medial visceral rotation	N=10
Infrarenal aorto-pelvic exposure	N=10
Brachial exposure	N=5
Femoral	N=5
Popliteal	N=2

Exposures/Incisions – Desired

Trap door incision	
Cervical extension from sternotomy	
Supraclavicular incision	
Infraclavicular incision	

Organ Management – Essential

Management of arterial disease for injury or occlusion	(N=10)
Repair of arteriotomy or venous injury	
Amputation of extremity	(N=10)
Fasciotomy	(N=5)

ALTERNATE MODALITIES:

Simulation, ATOM or ASSET courses may fulfill one requirement for the following: thoracotomy, sternotomy, diaphragm repair, cardiac repair, esophageal repair, thoracic vascular repair, bladder repair, ureter repair, left medial visceral rotation, right medial visceral rotation, infrarenal aorto-pelvic exposure, retrograde balloon occlusion of aorta.

Ultrasound

ORGAN MANAGEMENT – ESSENTIAL

FAST and/or E-FAST N=25

Thoracic ultrasound to assess cardiac function	N=5
Thoracic ultrasound guided drainage	N=5
Ultrasound guided central line insertion	N=5

Be able to describe an approach, based on evidence, for management of complicated peptic ulcer disease, including upper GI hemorrhage and perforation.

Knowledge of indications for surgery, timing of surgery, preparation of the patient, and appropriate surgical techniques.

Describe the indications for and techniques of:

- partial/total gastrectomy and reconstruction
- common bile duct exploration
- biliary-enteric anastomosis
- distal pancreatectomy
- pancreatic necrosectomy

Describe the indications, techniques & complications of stoma formation & closure.

Describe the options for Emergency Hernia repair, with & without mesh

Describe the anatomy, classification, and indications for neck dissection

Interprete CT Scans of the brain, chest, abdomen and pelvis independently.

Describe the anatomy and variations in the anatomy of the porta hepatitis.

Describe and perform techniques to mobilize and expose the head of the pancreas (including Kocher maneuver, portal vein dissection).

Perform an open incisional hernia repair with or without mesh.

Perform basic laparoscopic techniques, including:

- trocar insertion by the open technique in different locations of the abdomen
- simple suturing using laparoscopic instruments

Perform laparoscopic cholecystectomy, both electively and for acute cholecystitis.

Mobilize the right and left colon laparoscopically

Perform lysis of adhesions and run the small bowel by laparoscopy

Perform laparoscopic incisional hernia repair

Perform the following procedures:

- colonic resections and reconstructions, using sutured and stapled techniques, for Trauma and Acute Care Surgery (Peritonitis, Perforated Bowel)
- Gastric resection and reconstruction (gastrojejunostomy, Roux-en-Y)
- Small bowel and Large bowel resection; & Low anterior resection
- Standard ileostomy and colostomy formation and closure
- Biliary tract disease - common bile duct exploration; & biliary-enteric anastomosis
- Distal pancreatectomy
- Splenectomy

For Trauma / Acute Care Surgery Fellows a graded increase is expected for the assessment and management capabilities as well as operative skills.

In addition, familiarity with the principles and techniques of liver resection, pancreatectomy, and advanced laparoscopic procedures for splenectomy should be gained.

Describe the technique and perform a Roux-en-Y hepaticojejunostomy

Be able to perform mobilization of the liver to gain quick access to the retro hepatic cava, as may be necessary in cases of trauma.

Describe surgical management principles in the conduct of a difficult operation, where hemostasis and control of hepatic or pancreatic circulation are necessary.

Operative debridement and drainage of pancreatic abscess or infected necrosis

1. KNOWLEDGE (Cognitive) ALL

Know the physiologic basis for the pre-operative and postoperative management, and indications for surgery of the following:

- Assessment of the acute abdomen
- Biliary tract disease and Pancreatitis
- Hernia - inguinal, femoral, incisional and strangulated
- GI bleeding - upper and lower
- Jaundice
- Preparation for Surgery and Postoperative Care
- Wound Management and Healing
- Hemostasis & Blood Products Use
- Surgical Infections

TRAUMA SURGERY

Unit Objectives:

During the two-year fellowship they will rotate a total of 36 weeks in trauma surgery.

Demonstrate an understanding of the pathophysiology of shock.

Demonstrate an understanding of the mechanisms and pathophysiology of cardiopulmonary arrest.

Demonstrate the ability to manage the treatment of shock and cardiopulmonary arrest.

Demonstrate an understanding of the pathophysiologic effect of blunt and penetrating trauma.

Demonstrate the ability to effectively manage the surgical care of a patient with complex multisystem injuries.

Demonstrate knowledge of, and the ability to, manage a variety of healthcare services for trauma patients such as pre-hospital transportation, emergency department care, in-hospital care, and rehabilitation.

I. MEDICAL EXPERT

Relate and apply basic science knowledge to patient care in most cases.

Relate and apply a fund of clinical knowledge in a manner that enables resolution of common clinical situations on a consistent basis. This includes the ability to recognize Complex Multisystem Traumatic Blunt and Penetrating Injuries, determine acid-base status from arterial blood gases, classify shock and outline hemodynamic patterns,.

Accurately interpret the results of common lab and diagnostic tests.

Develop diagnostic plans that are appropriate and reflect current standards.

Make judgments that are usually complete and sound. Arrive at decisions appropriately with appropriate use of available information.

Demonstrate the ability to handles most common problems independently, while appropriately asking consultants for help with specific questions in more complex questions.

Develop an ability to immediately recognize acute life-threatening illness and institute immediate life sustaining supportive therapy.

Display appropriate leadership of the team, utilizing resources in an effective manner.

Demonstrate adequate knowledge of monitoring techniques for the critically ill patient to allow for appropriate management.

Consistently use appropriate preventative measures and apply knowledge in a prospective manner to anticipate potential problems and attempt to prevent them.

Demonstrate an ability to perform an appropriate consultation assessment to and answer a question or request from another health care provider.

Be able to present well-reasoned, well-documented assessments and recommendations in written and oral form in response to a request from another health care provider.

Demonstrate competency in performing essential procedures with appropriate skill and manual dexterity for level of training.

Carries out techniques correctly and efficiently with appropriate knowledge of indications and risks.

1) Competency Based Knowledge Objectives

- Describe the Peaks of Death in Trauma

- Discuss the use of sepsis severity scores, APACHE-II Score, TISS
- Classification of Injuries based on Fatality
- Types of injuries, Blunt and Penetrating Mechanisms and Anatomic Considerations.
- Describe the Scoring Systems for Trauma
    - Their benefits
    - Classification
- Describe Primary, Secondary and Tertiary Survey and Resuscitation in accordance to ATLS
- Describe Rapid Sequence Intubation (RSI)
    - Induction agents needed for RSI
    - Paralytic Agents used in RSI
- End Points of Resuscitation
- Trauma in Pediatrics; Difference between Pediatrics and Adults and their Management
- Trauma in Elderly and in Pregnancy
- FAST Scan, Indications, Scoring System Limitations and Contraindications
- Emergency Thoracotomy (EDI)
    - Definition, Indications, Techniques
    - What are the different Maneuvers that can be done:
        - Open Chest CPR
        - Pericardiotomy for Cardiac
        - Intra-Thoracic Vessel Control
        - Lung Hilum Clamp
        - Aortic Cross Clamping
        - Indications & Technique
- Describe the TETRAD of Dearth
- Hypothermia- Their Pathophysiology in Trauma
- Coagulopathy- Complications

- Acidosis- Prevention and treatment
- Hypervolemia/Hyperchloremia
- Demonstrate full understanding of the Principles of Damage Control Surgery (DCS)
    - Principles
    - Stages
    - Resuscitate (ICU)
- HEAD INJURIES IN GENERAL
    - Mechanism and Classification
    - Assessment
    - Initial Treatment
    - Controversial Managements
    - Definitive Treatment
- MAXILLOFACIAL INJURIES
    - Mechanism and Classification
        - LeForte Classification
        - Orbit Blowout
    - Assessment
    - Initial Treatment
    - Definitive Treatment
- PENETRATING NECK INJURIES (PNI)
    - Anatomy of Neck
    - Mechanism and Zones of Neck
    - Initial Assessment
        - Hard signs of Vascular Injury
        - Hard signs of Injury to Aerodigestive Tract
    - Initial Treatment
        - Unstable Patients
        - Stable Patients: Zone II
        - Stable Patients: Zone I & II

- Definitive Treatment
    - Principles
    - Incisions
    - Steps and Landmarks

- PRINCIPLES OF TRAUMA:

  Demonstrate an understanding of when and why Trauma patients dies:

- NECK BLOOD VESSEL INJURY
    - CAROTID ARTERY
        - Primary Repair
        - Debridement
        - When to Ligate
        - Temporary Shunting
        - Internal Jugular Vein
        - Sub Clavian Vessels
        - Vertebral Artery
- TRACHEAL AND LARYNGEAL INJURIES
    - Mechanism
    - Initial Assessment and Treatment
    - Definitive Treatment
- ESOPHAGEAL INJURIES
- THORACIC DUCT INJURY
- THORACIC INJURIES
    - General
    - Zones
    - Mechanism
    - Initial Assessment
    - Initial Treatment
    - Definitive Treatment
- CHEST WALL INJURIES
    - Rib fractures
    - External Symptoms
    - Scapula
    - Flail Chest
    - Pleural Space Injuries

        - Simple Pneumothorax (PTX)
        - Tension Pneumothorax (PTX)
        - Hemothorax
- PARENCHYMAL LUNG INJURIES
    - Types, Classifications, Mechanism, Assessment
    - Initial Treatment
    - Definitive Treatment
- MEDIASTINTINAL INJURIES
    - Cardiac Temporade
    - Cardiac (Blunt) Injury
    - Aortic Injury
    - Tracheobronchial Injury (TBI)
    - Esophageal Injury
        - General
        - Mechanism
        - Initial Assessment
        - Initial Treatment
        - Definitive Treatment
    - Trans-mediostinal GSW (Stab)
- DIAPHRAGMATIC INJURY
    - Anatomy/Physiology
    - Mechanism
    - Initial Assessment
- ABDOMINAL INJURIES
    - Principles of Abdominal Trauma Exploration
    - Damage Control Laparotomy
    - Stomach
- SMALL BOWEL
- COLON
    - Criteria for resection and colostomy

    - Criteria for Repair or Resection and Primary Anastomosis
    - Types of Colonic Diversion
- RECTAL INJURIES
- LIVER INJURY
    - Criteria for Non- Operative Management (NOM)
    - How to Control a Bleeding Liver
    - Juxtahepatic Venous Injuries
    - Gall Bladder Injuries
    - Portahepalis Injuries
    - Bile duct Injuries
- SPLENIC INJURY
    - Criteria for Non- Operative Management (NOM)
    - Complications
- DUODENAL INJURY
    - Complication
- PANCREATIC INJURY
    - Grading of Pancreatic Injury
    - Indications for Surgery
    - Definitive Treatment
    - Principles of Management
    - Treatment Based of Grade of Injury
    - Low I-II/ Moderate/ High
- Dual Disaster/ Pancreatic and Duodenading
    - General
    - Mechanism
    - Initial Assessment
    - Initial Treatment
    - Definitive Treatment
- Kidney

- General
- Mechanism
- Initial Assessment
- Initial Treatment
- Definitive Treatment

- BLADDER
  - General
  - Mechanism
  - Initial Assessment
  - Initial Treatment
  - Definitive Treatment
- URETERAL
  - General
  - Mechanism
  - Initial Assessment
  - Initial Treatment
  - Definitive Treatment
- PELVIC FRACTURE
  - General
  - Mechanism
  - Initial Assessment
  - Initial Treatment
  - Definitive Treatment
- RETROPERITONEAL HEMATOMA
  - General
  - Mechanism
  - Initial Assessment
  - Initial Treatment
  - Definitive Treatment
- ABDOMINAL COMPARTMENT SYNDROME (ACS)
  - General
  - Mechanism
  - Initial Assessment
  - Initial Treatment
  - Definitive Treatment
- Extremity Compartments (ECS)
  - General
  - Mechanism
  - Initial Assessment
  - Initial Treatment
  - Definitive Treatment

- HOW TO CLOSE AND OPEN ABDOMEN
- VASCULAR INJURIES
    - Blunt Carotid Art- REBOA
    - SubClavian- AORTEX
    - Descending Thoracic A- RENAL A
    - Chest Wale Bleeder- Iliac A
    - Venous

1. Review the anatomy, physiology, and pathology applicable to the general management of trauma patients, including:
    a. Central nervous system
    b. Musculoskeletal system
    c. Orthopaedics
    d. Ear, nose, and throat
2. Outline techniques of evaluation, resuscitation of trauma patients using ATLS protocol.
3. Specify the trauma services needed for initial evaluation and resuscitation.
4. Discuss wound care management in the emergency department and other settings.
5. Analyze pharmacological support for resuscitation of trauma patients.
6. Identify the management principles for a trauma patient in the intensive care unit.
7. Outline the factors associated with rehabilitation as they apply to early patient care.
8. Formulate a plan for rehabilitation to return the trauma patient to full functional life.
9. Discuss the indications for nutritional support for patients sustaining trauma.

10. Outline the indications for such basic surgical procedures as:
    a. Laparotomy
    b. Debridement of injured tissues
    c. Ultrasound
    d. Diagnostic peritoneal lavage (DPL)
    e. Thoracotomy / thoracostomy
    f. Hemorrhage control
11. Explain trauma preventive measures (e.g., use of helmets & seat belts).
12. Describe and explain the mechanics/ballistics associated with various wounding agents.
13. Discuss the management of associated medical conditions seen in the trauma patient such as diabetes, chronic obstructive pulmonary disease, hypertension & HIV.
14. Identify the indications for emergency operative procedures such as burr holes, cricothyrotomy, and resuscitative thoracotomy.
15. Define abdominal compartment syndrome.
16. Describe how to measure intra-abdominal pressures and develop a treatment plan
17. Define "Damage Control Surgery."
18. Describe the sequence of damage control surgery in the treatment of the trauma patient.
19. Analyze the transfer of a patient to an appropriate facility utilizing air medical services.
20. Discuss the availability and use of institutional and community support services for trauma patients such as social work, home health care, and rehabilitation.
21. Define shock, categorize it based upon type, and explain the etiology and pathophysiology of each type of shock:
    a. Cardiogenic
    b. Hypovolemic
    c. Distributive (septic, anaphylactic, neurogenic, and adrenal insufficiency mediated)

d. Obstructive (cardiac tamponade, tension pneumothorax, pulmonary embolus)

22. Summarize the clinical presentation and hemodynamic parameters associated with each type of shock using clinical terms, such as blood pressure and filling pressures.
23. Discuss the pathophysiology, including mechanism of arrest, for the following situations:
    a. Acute myocardial infarction
    b. Hypovolemic shock (blood loss, dehydration)
    c. Hemorrhagic shock (non-traumatic)
    d. Septic shock
    e. Hypothermia
    f. Penetrating or blunt trauma
        (1) Tension pneumothorax
        (2) Pericardial tamponade
        (3) Hemorrhagic shock
24. Summarize the indication and appropriate technique for cardiac support, and pressors.
25. Outline the signs and symptoms of acute airway obstruction and define appropriate intervention in adult and pediatric patients.
26. Explain the physiological impact of mechanically assisted ventilation on cardiovascular/respiratory system.
27. Analyze methods for initiating and maintaining ventilator/ weaning support.
28. Describe the role and indications (if any) for the following products in acute resuscitation:
    a. Recombinant activated Protein C
    b. Hespan and similar products
    c. Albumin

29. Assess the indications, guidelines, and complications of the following cardiovascular drugs:

    a) Dopamine & Dobutamine
    b) Phenylephrine
    c) Vasopressin
    d) Epinephrine & Norepinephrine
    e) Amrinone
    f) Nitroglycerine
    g) Diltiazem
    h) Esmolol

30. Describe the Classification of Different Organ Injuries and the Management of Each.

2. COMPETENCY-BASED SKILLS OBJECTIVES:

1. Coordinate EMS activities for initial trauma management to include instructional programs.
2. Manage penetrating wounds through understanding the injury potential of wounding mechanisms.
3. Provide management for pre-existing disease states in injured patients with appropriate consultation.
4. Perform all operative and management procedures for trauma to the chest, abdomen, extremities, and head with direct supervision.
5. Supervise the placement central lines, cricothyrotomy, Chest Tubes, and DPL by juniors.
6. Direct rehabilitation plans with appropriate consultation.
7. Organize hospital resources to provide services for trauma patients and direct patient flow in the emergency department, the operating room, and the intensive care unit. Provide appropriate referrals for vocation rehabilitation, nursing home services, and physical rehabilitation.
8. Triage multiple trauma victims.
9. Practice the principles of damage control surgery in severely injured patients.
10. Integrate the pathophysiology and surgical management of the following:

a. Aortic aneurysms
b. Aortic dissections
c. Trauma to heart and great vessels
d. Penetrating & Blunt

11. Manage mechanical ventilator parameters and initiate ventilator settings.
12. Manage flail chest (pneumothorax, hemothorax, obstructive shock states).
13. Diagnose cardiac arrest and rhythm disturbances
14. Apply closed chest cardiac massage (CPR) and perform closed chest defibrillation.
15. Perform venous access procedures; subclavian, jugular and femoral vein catheterizations and saphenous vein cutdown.
16. Determine the indication, dosage, contraindications, and method of administration of the following:
    a. Morphine
    b. Lidocaine and Procainamide
    c. Propranolol and Labetalol
    d. Atropine
    e. Diltiazem
    f. Epinephrine and norepinephrine
    g. Dopamine and dobutamine
    h. Amrinone
    i. Nitroglycerin and nitroprusside
    j. Furosemide, Mannitol, Diamox
    k. Sodium bicarbonate
    l. Calcium
17. Estimate volume requirements in acute trauma, and institute replacement therapy.
18. Control external blood loss.
19. Manage cardiogenic, septic, and hemorrhagic shock.

II. COMMUNICATOR

Interprofessional Relationships; demonstrate an ability to work well with other services, using appropriate communication skills, resulting in a constructive environment.

Communication with other allied health professionals; demonstrate an ability to communicate well with other members of the health care team. Specifically, able to provide a clear outline of the plan for patient care.

Communication with Patients; demonstrate an ability to consistently achieve good rapport with patients and gain patient respect and confidence, and to clearly explain diagnosis and treatment options in an understandable fashion.

Communication with Families; demonstrate an ability to gain the respect and confidence of family members, create a supportive and helpful environment, and to deliver information to families in a humane manner that is understandable and encourages discussion.

Written communication & Documentation; demonstrate an ability to write records/reports that are usually complete, orderly, systematic, generally support management, and allow a physician unfamiliar with the patient to identify the relevant daily issues.

III. COLLABORATOR

Demonstrate abilities to become an active member of the Trauma team who can work well with other team members.

Demonstrate an ability to give and follow appropriate instructions with nurses and allied staff, and to develop rapport, resulting in a constructive working environment.

Deal effectively with issues and achieve good results even in difficult situations without antagonizing others.

IV. MANAGER

Participate in bed management issues and enable efficient care of the critically ill patient by using investigations appropriately.

Effectively organize work in such a way that priorities are established, and that coordination occurs with the other members of the team ensuring total, acute, and continuing care of patients.

V. HEALTH ADVOCATE

Educate the families of critically ill patients on the lifestyle and health issues that have led to the illnesses of their family members.

VI. SCHOLAR

Fellows should be able to demonstrate their scholarly approach to medical practice in the following areas during participation on patient rounds, teaching sessions, and journal clubs:

Self-education skills; demonstrate up-to-date knowledge in major clinically applicable developments.

Display effective skills in continuing education.

Demonstrate an ability to identify gaps in knowledge and develop a strategy to fill the gaps.

Critical Appraisal of the Medical Literature.

Demonstrate ability to locate and judge the strength of the evidence in the literature.

Able to pose an appropriate patient-related question, execute a systematic search for evidence, and critically evaluate medical literature to optimize clinical decision making

Scientific Interest;

Participates in the scientific activities offered in the program.

Contributes actively to discussion and teaching. Incorporates a spirit of scientific enquiry and use of evidence into clinical decision-making.

VII. PROFESSIONAL

Fellows will be able to demonstrate their professionalism in the following ways;

Integrity and honesty; demonstrate an honest, straightforward approach that is respectful of others, and deserves the respect of others.

Responsibility and self-discipline; Dependable, reliable, honest, and forthright in all information and facts; prompt, appropriate follow-up of patients.

Bioethics;. Performs in an ethical manner with other health care professionals, patients, and families.

Self-Assessment; demonstrates appropriate awareness of own limitations; seeks assistance and feedback to overcome for limitations and accepts advice graciously.

Receptiveness to Feedback Responds constructively to new suggestions and ideas.

ACUTE CARE SURGERY

UNIT OBJECTIVES:

During the two-year fellowship they will rotate a total of 36 weeks in Acute Care surgery.

The fellow will not undergo this Consecutively; however, he will rotate over the two-year fellowship period.

Demonstrate an understanding of the anatomy, physiology, pathophysiology, and presentation of diseases of the abdominal cavity and pelvis.

Demonstrate the ability to formulate and implement a diagnostic and treatment plan for diseases of the abdomen and pelvis that are amenable to surgical intervention.

Demonstrate knowledge of the anatomy, physiology, and pathophysiology of the liver, biliary tract, and pancreas.

Manage disease and injury of the liver, biliary tract, and pancreas amenable to surgical intervention.

1. Objectives – Acute Care Surgery Service

A. Knowledge of Basic Sciences

a) Anatomy of the anterior abdominal wall with respect to ventral, umbilical, inguinal, incisional, and femoral hernia.

b) Anatomy of the superficial, deep, and central venous system in the upper and lower limbs, neck, chest, and abdomen.

c) Anatomy of the arterial circulation in upper and lower limbs, neck, chest, and abdomen.

d) Physiology of the cardiac, respiratory, renal, gastrointestinal, hepatobiliary, pancreatic, immune, and vascular systems.

e) Pathology of common inflammatory conditions:

1. Esophagitis
2. Gastritis
3. Peptic ulcer disease
4. Inflammatory bowel disease
5. Appendicitis
6. Diverticulitis
7. Cholecystitis
8. Pancreatitis

B. Knowledge of clinical sciences:

diagnosis, understanding of the pathophysiology, investigations, and management of the following conditions.

a) Shock: hypovolemic, septic, anaphylactic, cardiogenic, and neurogenic.

b) Pneumothorax; simple and tension.

c) Common arrhythmias: supraventricular tachycardia, atrial fibrillation, ventricular tachycardia, and ventricular fibrillation.

d) Acute respiratory failure.

e) Acute renal failure.

f) Electrolyte disorders: hyper/hypokalemia, Natremia, Calcemia, etc.

g) Acid-base disturbances:

h) Adverse drug and blood product reactions.

i) Bowel obstruction: foregut, midgut, and hindgut.

j) Peritonitis secondary to perforated viscus, acute cholecystitis, acute appendicitis, acute diverticulitis, and bowel ischemia.

k) Pancreatitis

l) Jaundice: obstructive and complicated by cholangitis.

m) Gastrointestinal hemorrhage: foregut, midgut, and hindgut.

n) Soft tissue infections including cellulitis, necrotizing fasciitis and abscess.

o) Deep venous thrombosis including pulmonary embolism.

C. Skills

a) The interpretation of common laboratory/radiologic tests including liver function tests, cardiac enzymes and troponin, blood gas, ECG, chest X-ray, abdominal series.

b) The legible written recording of consultation reports, preop and postop notes, progress notes, summary, and discharge notes in a clear and comprehensive fashion.

c) The detection, investigation, and treatment of common & serious postoperative complications such as atelectasis, pneumonia, respiratory failure, acute MI, CHF, arrhythmias, acute renal failure, urinary retention, DVT, PE, bleeding, ileus, bowel obstruction, anastomotic leakage, wound infection and postop confusion/ delirium.

d) The clinical judgement to know one's limitations in any situation.

e) Satisfactory verbal communication skills to communicate effectively in any situation for the purpose of professional intercourse, presentations and teaching amongst colleagues, more senior fellows, staff surgeons, medical students, nurses and allied health care personnel.

f) Critical analysis of current literature and discussing at Surgical Grand Rounds

D. Attitudes

a) A commitment to lifelong learning by reading textbooks and journals, discussion of difficult/ complex cases with colleagues, attendance at rounds and involvement in teaching and research.

b) Emphasis on honesty including full disclosure of iatrogenic complications and mistakes, responsibility, collegial/collaborative interprofessional relationships with nurses and allied health care workers.

c) Sensitivity to age, gender, socio-economic status, cultural and religious differences on the perception of illness, outcome and treatment by the

patient and their family.

d) An appreciation for the medico-legal aspects of detailed legible documentation, informed consent, delegated acts, refusal of treatment and complications occurring in the context of a training environment.

e) An understanding of the importance of cost-effective management of available resources in the current healthcare industry.

2. COMPETENCY-BASED SKILLS OBJECTIVES:

1. Treat wound complications such as infections and evisceration. Use retention sutures appropriately.
2. Assist with thoracoabdominal and retroperitoneal exposures.
3. Perform laparotomy for acute abdomen, demonstrating a systematic approach for determination of the etiology of the process via a systematic abdominal exploration and appropriate measures for its management (e.g., acute appendicitis, small bowel obstruction, perforated peptic ulcer.
4. Perform more complex laparotomies involving diffuse peritonitis in the septic patient (e.g., gangrenous or severely inflamed gallbladder, perforated diverticulitis requiring resection).
5. Provide appropriate surgical drainage for any intra-abdominal abscess.
6. Serve as an effective surgical team leader.

At the end of the rotation, the fellow should be able to:

I. MEDICAL EXPERT

Relate and apply basic science knowledge to patient care in most cases.

Relate and apply a fund of clinical knowledge in a manner that enables resolution of common clinical situations on a consistent basis.

Accurately interpret the results of common lab and diagnostic tests.

Develop diagnostic plans that are appropriate and reflect current standards.

Outline a therapeutic plan

Make judgments that are usually complete and sound. Arrive at decisions appropriately with appropriate use of available information.

Demonstrate the ability to handles most common problems independently, while appropriately asking consultants for help with specific questions in more complex questions.

Develop an ability to immediately recognize acute life-threatening illness and institute immediate life sustaining supportive therapy.

Display appropriate leadership of the team, utilizing resources in an effective manner.

Demonstrate adequate knowledge of monitoring techniques for the critically ill patient to allow for appropriate management.

Consistently use appropriate preventative measures and apply knowledge in a prospective manner to anticipate potential problems and attempt to prevent them.

Demonstrate an ability to perform an appropriate consultation assessment to and answer a question or request from another health care provider.

Be able to present well-reasoned, well-documented assessments and recommendations in written and oral form in response to a request from another health care provider.

Demonstrate competency in performing essential procedures with appropriate skill and manual dexterity for level of training.

Carries out techniques correctly and efficiently with appropriate knowledge of indications and risks.

II. COMMUNICATOR

Interprofessional Relationships; demonstrate an ability to work well with other services, using appropriate communication skills, resulting in a constructive environment.

Communication with other allied health professionals; demonstrate an ability to communicate well with other members of the health care team. Specifically, able to provide a clear outline of the plan for patient care.

Communication with Patients; demonstrate an ability to consistently achieve good rapport with patients and gain patient respect and confidence, and to clearly explain diagnosis and treatment options in an understandable fashion.

Communication with Families; demonstrate an ability to gain the respect and confidence of family members, create a supportive and helpful environment, and to deliver information to families in a humane manner that is understandable and encourages discussion.

Written communication & Documentation; demonstrate an ability to write records/reports that are usually complete, orderly, systematic, generally support management, and allow a physician unfamiliar with the patient to identify the relevant daily issues.

III. COLLABORATOR

Demonstrate abilities to become an active member of the Acute Care Surgery team who can work well with other team members.

Demonstrate an ability to give and follow appropriate instructions with nurses and allied staff, and to develop rapport, resulting in a constructive working environment.

Deal effectively with issues and achieve good results even in difficult situations without antagonizing others.

IV. MANAGER

Participate in bed management issues and enable efficient care of the critically ill patient by using investigations appropriately.

Effectively organize work in such a way that priorities are established, and that coordination occurs with the other members of the team ensuring total, acute, and continuing care of patients.

V. HEALTH ADVOCATE

Educate the families of critically ill patients on the lifestyle and health issues that have led to the illnesses of their family members.

VI. SCHOLAR

Fellows should be able to demonstrate their scholarly approach to medical practice in the following areas during participation on patient rounds, teaching sessions, and journal clubs:

Self-education skills; demonstrate up-to-date knowledge in major clinically applicable developments.

Display effective skills in continuing education.

Demonstrate an ability to identify gaps in knowledge and develop a strategy to fill the gaps.

Critical Appraisal of the Medical Literature.

Demonstrate ability to locate and judge the strength of the evidence in the literature.

Able to pose an appropriate patient-related question, execute a systematic search for evidence, and critically evaluate medical literature to optimize clinical decision making

Scientific Interest;

Participates in the scientific activities offered in the program.

Contributes actively to discussion and teaching. Incorporates a spirit of scientific enquiry and use of evidence into clinical decision-making.

VII. PROFESSIONAL

Fellows will be able to demonstrate their professionalism in the following ways;

Integrity and honesty; demonstrate an honest, straightforward approach that is respectful of others, and deserves the respect of others.

Responsibility and self-discipline; Dependable, reliable, honest, and forthright in all information and facts; prompt, appropriate follow-up of patients.

Bioethics;. Performs in an ethical manner with other health care professionals, patients, and families.

Self-Assessment; demonstrates appropriate awareness of own limitations; seeks assistance and feedback to overcome for limitations and accepts advice graciously.

Receptiveness to Feedback Responds constructively to new suggestions and ideas.

SURGICAL CRITICAL CARE

UNIT OBJECTIVES:

This is a two-month rotation in surgical critical care, which will be performed during the Second Year of the Fellowship

Demonstrate knowledge of the principles associated with the diagnosis and management of critically ill patients, including knowledge of simple and complex multiple organ system normalities and abnormalities.

Demonstrate the ability to appropriately diagnose and treat patients with interrelated system disorders in the intensive care unit.

Over the course of their training in Trauma Critical Care, each fellow should gain a working knowledge of applied clinical physiology and homeostasis, be able to recognize derangements of pathophysiology, and to treat single and multiple organ failure.

Develop a sound understanding of the basic and applied physiology, pathophysiology, and pharmacology relevant to management of the critically ill.

They are expected to have mastered the fundamental aspects of technical procedures commonly used in the treatment of critically ill patients.

A graded level of responsibility will be given to the fellow as he or she gains more Critical Care experience, and a progressively greater depth of knowledge will be expected.

On completion of fellowship training, the fellow should have achieved proficiency in the recognition and initial management of problems commonly encountered in the intensive care unit.

This proficiency includes, but is not limited to, acute respiratory failure, hemodynamic instability, sepsis, acute renal failure, overdoses and poisonings, acute neurologic insults, acute electrolyte and endocrine emergencies, and coagulation disorders.

Emphasis will be placed on the ability to recognize, investigate, and stabilize acute critical illness.

The fellow should demonstrate the ability to collect and synthesize relevant data, to formulate an appropriate differential diagnosis, and offer an initial investigational and management plan.

At the end of the rotation, the fellow should be able to:

I. MEDICAL EXPERT

Relate and apply basic science knowledge to patient care in most cases.

Relate and apply a fund of clinical knowledge in a manner that enables resolution of common clinical situations on a consistent basis. This includes the ability to recognize common rhythm disturbances, determine acid-base status from arterial blood gases, provide ventilator setting parameters, classify shock and outline hemodynamic patterns, use inotropes and vasopressors correctly, and recognize and manage acute renal failure, compartment syndrome.

Accurately interpret the results of common lab and diagnostic tests.

Develop diagnostic plans that are appropriate and reflect current standards.

Outline a therapeutic plan in conjunction with the ICU fellow or attending physician.

Make judgments that are usually complete and sound. Arrive at decisions appropriately with appropriate use of available information.

Demonstrate the ability to handles most common problems independently, while appropriately asking consultants for help with specific questions in more complex questions.

Develop an ability to immediately recognize acute life-threatening illness and institute immediate life sustaining supportive therapy. Display appropriate leadership of the team, utilizing resources in an effective manner.

Demonstrate adequate knowledge of monitoring techniques for the critically ill patient to allow for appropriate management.

Consistently use appropriate preventative measures and apply knowledge in a prospective manner to anticipate potential problems and attempt to prevent them.

Demonstrate an ability to perform an appropriate consultation assessment to and answer a question or request from another health care provider.

Be able to present well-reasoned, well-documented assessments and recommendations in written and oral form in response to a request from another health care provider.

Demonstrate competency in performing essential procedures with appropriate skill and manual dexterity for level of training.

Carries out techniques correctly and efficiently with appropriate knowledge of indications and risks.

II. COMMUNICATOR

Interprofessional Relationships; demonstrate an ability to work well with other services, using appropriate communication skills, resulting in a constructive environment.

Communication with other allied health professionals; demonstrate an ability to communicate well with other members of the health care team. Specifically, able to provide a clear outline of the plan for patient care.

Communication with Patients; demonstrate an ability to consistently achieve good rapport with patients and gain patient respect and confidence, and to clearly explain diagnosis and treatment options in an understandable fashion. Develop communication skills with patients on a ventilator.

Communication with Families; demonstrate an ability to gain the respect and confidence of family members, create a supportive and helpful environment, and to deliver information to families in a humane manner that is understandable and encourages discussion.

Written communication & Documentation; demonstrate an ability to write records/reports that are usually complete, orderly, systematic, generally support management, and allow a physician unfamiliar with the patient to identify the relevant daily issues.

III. COLLABORATOR

Demonstrate abilities to become an active member of the Intensive Care Unit team who can work well with other team members.

Demonstrate an ability to give and follow appropriate instructions with nurses and allied staff, and to develop rapport, resulting in a constructive working environment.

Deal effectively with issues and achieve good results even in difficult situations without antagonizing others.

IV. MANAGER

Participate in bed management issues and enable efficient care of the critically ill patient by using investigations appropriately.

Effectively organize work in such a way that priorities are established, and that coordination occurs with the other members of the team ensuring total, acute, and continuing care of patients.

V. HEALTH ADVOCATE

Educate the families of critically ill patients on the lifestyle and health issues that have led to the illnesses of their family members.

VI. SCHOLAR

Fellows should be able to demonstrate their scholarly approach to medical practice in the following areas during participation on patient rounds, teaching sessions, and journal clubs:

Self-education skills; demonstrate up-to-date knowledge in major clinically applicable developments.

Display effective skills in continuing education. Demonstrate an ability to identify gaps in knowledge and develop a strategy to fill the gaps.

Critical Appraisal of the Medical Literature.

Demonstrate ability to locate and judge the strength of the evidence in the literature.

Able to pose an appropriate patient-related question, execute a systematic search for evidence, and critically evaluate medical literature to optimize clinical decision making

Scientific Interest;

Participates in the scientific activities offered in the program.

Contributes actively to discussion and teaching. Able to add to and elevate the level of discussion. Incorporates a spirit of scientific enquiry and use of evidence into clinical decision-making.

VII. PROFESSIONAL

Fellows will be able to demonstrate their professionalism in the following ways;

Integrity and honesty; demonstrate an honest, straightforward approach that is respectful of others, and deserves the respect of others.

Responsibility and self-discipline; Dependable, reliable, honest, and forthright in all information and facts; prompt, appropriate follow-up of patients.

Bioethics;. Performs in an ethical manner with other health care professionals, patients, and families.

Self-Assessment; demonstrates appropriate awareness of own limitations; seeks assistance and feedback to overcome for limitations and accepts advice graciously.

Receptiveness to Feedback Responds constructively to new suggestions and ideas.

COMPETENCY-BASED KNOWLEDGE OBJECTIVES:

SECTION ONE: GENERAL PATHOPHYSIOLOGY--BODY AS A WHOLE

1. Distinguish between the major characteristics of septic shock and hypovolemic shock:
    a. Summarize initial evaluation and presentation
    b. Analyze therapeutic options
2. Explain the concepts of tissue oxygen supply and demand.
3. Demonstrate the ability to:
    a. Calculate oxygen delivery and consumption
    b. Analyze the effect of cardiac output and varying preload/afterload to oxygen delivery
    c. Analyze the contributions of hemoglobin and percent of saturation on oxygen delivery
4. Outline the nutritional and metabolic components for patient with specific disease states.
5. Describe the concept of the Systemic Inflammatory Response Syndrome (SIRS).
6. Describe prophylactic measures routinely used in critical care such as:

a. DVT and GI bleeding prophylaxis, including neutralizing, inhibitory and surface agents
b. Prophylactic antibiotics (demonstrate differences between prophylactic, empiric, and therapeutic uses)

7. Outline the indications and methods for providing nutritional support:
   a. Discuss indications, selection of formulations, route of administration of parenteral versus enteral forms of nutrition
   b. Explain complications of parenteral and enteral routes of feeding as well as select methods to avoid the complications
   c. Interpret findings associated with abnormalities in levels of serum electrolytes, trace elements, and vitamins in critically ill patient receiving parenteral feedings.
   d. Estimate protein calorie requirements for patients of varying degrees of illness and be able to analyze adequacy of nutritional support.
8. Outline the principles of postoperative fever with respect to causes, empiric diagnostic modalities, and specific therapy.
9. Review the management and diagram a plan for the care of the critically ill surgical patient with multiple medical problems such as:
   a. Cardiac dysrhythmias
   b. Pulmonary insufficiency from airway, bellows (pump), or parenchymal problems
   c. Acute/chronic renal failure with hemodynamic instability or need of specific fluid therapy (TPN), renal replacement therapy, high output GI fistulas
   d. Hemodynamic instability in the face of acute/chronic renal or pulmonary insufficiency

SECTION TWO: AIRWAY-RESPIRATION

1) Demonstrate an understanding of the mechanics of ventilatory support and the clinical of mechanical ventilation:
    a. Demonstrate ventilator management
    b. Differentiate modes of ventilation
    c. Explain weaning
    d. Evaluate weaning parameters
2) Describe the commonly used indications for initiation of ventilation support, including:
    a. Indications and commonly acceptable values for initiation of mechanical ventilation
    b. Evaluation of lung parenchymal characteristics (arterial blood gases and chest x-ray)
    c. Analysis of commonly used pulmonary values (e.g., tidal volume [Vt], maximum ventilatory volume [MVV], compliance static and dynamic, functional residual capacity [FRC], PEEP, auto PEEP, airway pressures)
    d. Indications and commonly acceptable values for weaning from mechanical ventilation
3) Analyze and compare the principles of ventilator mechanics, including modes of ventilation, triggering mechanisms.
4) Describe the pathophysiology of acute lung injury (ALI, with spectrum from mild to severe ALI,) and management of long-term ventilator-dependent patient to include:
    a. Pneumonias (aspiration or nosocomial)
    b. Acute renal failure and Cardiac failure
    c. Prevention of malnutrition or restitution of body stores
    d. SIRS, MODS-Multiple Organ Dysfunction Syndrome & MSOF-Multi-System Organ Failure
    e. Sepsis

f. Physical therapy (maintenance of muscle mass & function, prevention of contractions)

5) Analyze the pros and cons of use of the following drugs to improve respiratory function:
   a. Bronchodilators
   b. Membrane stabilizing agents (eg: steroids)
   c. Diuretics
   d. Venodilators
   e. Analgesics and sedatives
   f. Mucolytics

COMPETENCY-BASED SKILLS OBJECTIVES:

1. Provide initial evaluation and management of the critically ill postoperative patient.
2. Perform the following procedures:
   a. Orotracheal and nasotracheal intubation
   b. Central venous and pulmonary artery catheter insertion
   c. Placement of tube thoracotomy
   d. Cricothyrotomy
   e. Pericardiocentesis
3. Manage critically ill patients in the intensive care unit:
   a. Determine need for ventilation and select appropriate initial ventilator settings
   b. Determine need for ongoing ICU management
   c. Identify antibiotic therapy distinguishing between prophylactic, empiric, and therapeutic uses
4. Direct all surgical management of patients in the ICU, including taking direct responsibility for admission and discharge.
5. Manage invasive monitoring catheters, interpret the data obtained, and manipulate the hemodynamic variables toward calculated goals.

6. Manage the following situations:
    a. Multiple organ system failure: providing support for failing, failed, or normal organs
    b. Life threatening surgical infections (e.g., ascending cholangitis, gangrene)
    c. Hypovolemic shock
    d. Renal and Liver failure
7. Manage the nutritional and metabolic components of the patient's illness.

VASCULAR SURGERY

UNIT OBJECTIVES:

This is a Six Week rotation in Vascular Surgery, which will be performed during the Second Year of the Fellowship

Demonstrate knowledge of the anatomy, physiology, and pathophysiology of the vascular system,

Demonstrate the ability to surgically manage the preoperative, operative, and postoperative care of patients with arterial, venous trauma and disease.

COMPETENCY-BASED KNOWLEDGE OBJECTIVES:

1. Identify and describe vascular anatomy and regional anatomy related to vascular disease.
2. Differentiate between the different vascular operative approaches to include:
    a. Incisions and exposure
    b. Handling of vascular tissues
    c. Emergency vascular surgery
3. Illustrate the operative exposure of the major vessels, including:
    a) Aortic arch
    b) Subclavian Artery, Proximal & Distal
    c) Carotid artery
    d) Descending Thoracic Aorta
    e) Abdominal Aorta, and its Major Branches
    f) Inferior Vena Cava (IVC)
    g) Femoral artery
    h) Popliteal artery
4. Categorize the prevention and management of operative and postoperative complications, including ischemic bowel, and extremity ischemia.

5. Outline procedures for managing vascular surgical emergencies such as acute tissue ischemia or major hemorrhage (traumatic).

COMPETENCY-BASED SKILLS OBJECTIVES:

1. Demonstrate the appropriate incisions and exposure of:
    a. Abdominal aorta and its branches
    b. Portal venous system
    c. Peripheral arterial system
    d. Carotid arterial system
2. Obtain vascular control of major vessels
    a. Aorta
    b. Vena cava
3. Demonstrate ability to manage graft and suture materials.
4. Perform selected operative procedures or selected parts of the following operative procedures under supervision:
    a. Aortic aneurysm repair
    b. Carotid endarterectomy
    c. Aorto-iliac occlusive disease
    d. Femoral popliteal occlusive disease
    e. Peripheral vascular trauma
5. Discuss and demonstrate the role of adjunctive measures in operative procedures including angioplasty, and thrombolytic therapy.
6. Use proper advanced techniques in managing patients with a variety of vascular disorders such as:
    a. Ruptured aortic aneurysm
    b. Central vascular trauma

c. Supra-renal aortic aneurysm

d. Renovascular hypertension

7. Manage complications of common major vascular procedures such as:
    a. Aortic reconstruction
    b. Lower extremity vascular reconstruction
8. Manage Ischaemic Limbs
    a. Angioplasty
    b. Above / Below Knee Amputation
    c. Reperfusion Injuries

At the end of the VASCULAR SURGERY rotation, the fellow should be able to:

I. MEDICAL EXPERT

Relate and apply basic science knowledge to patient care in most cases.

Relate and apply a fund of clinical knowledge in a manner that enables resolution of common clinical situations on a consistent basis. This includes the ability to recognize common rhythm disturbances, classify shock and outline hemodynamic patterns, use inotropes and vasopressors correctly, compartment syndrome.

Accurately interpret the results of common lab and diagnostic tests.

Develop diagnostic plans that are appropriate and reflect current standards.

Outline a therapeutic plan in conjunction.

Make judgments that are usually complete and sound.

Arrive at decisions appropriately with appropriate use of available information.

Demonstrate the ability to handles most common problems independently, while appropriately asking consultants for help with specific questions in more complex questions.

Develop an ability to immediately recognize acute life-threatening illness and institute immediate life sustaining supportive therapy.

Demonstrate an ability to perform an appropriate consultation assessment to and answer a question or request from another health care provider.

Be able to present well-reasoned, well-documented assessments and recommendations in written and oral form in response to a request from another health care provider.

Demonstrate competency in performing essential procedures with appropriate skill and manual dexterity for level of training.

Carries out techniques correctly and efficiently with appropriate knowledge of indications and risks.

II. COMMUNICATOR

Interprofessional Relationships; demonstrate an ability to work well with other services, using appropriate communication skills, resulting in a constructive environment.

Communication with other allied health professionals; demonstrate an ability to communicate well with other members of the health care team. Specifically, able to provide a clear outline of the plan for patient care.

Communication with Patients; demonstrate an ability to consistently achieve good rapport with patients and gain patient respect and confidence, and to clearly explain diagnosis and treatment options in an understandable fashion.

Communication with Families; demonstrate an ability to gain the respect and confidence of family members, create a supportive and helpful environment, and to deliver information to families in a humane manner that is understandable and encourages discussion.

Written communication & Documentation; demonstrate an ability to write records/reports that are usually complete, orderly, systematic, generally support management, and allow a physician unfamiliar with the patient to identify the relevant daily issues.

III. COLLABORATOR

Demonstrate abilities to become an active member of the Vascular Surgery team who can work well with other team members.

Demonstrate an ability to give and follow appropriate instructions with nurses and allied staff, and to develop rapport, resulting in a constructive working environment.

Deal effectively with issues and achieve good results even in difficult situations without antagonizing others.

IV. MANAGER

Participate in bed management issues and enable efficient care of the critically ill patient by using investigations appropriately.

Effectively organize work in such a way that priorities are established, and that coordination occurs with the other members of the team ensuring total, acute, and continuing care of patients.

V. HEALTH ADVOCATE

Educate the families of critically ill patients on the lifestyle and health issues that have led to the illnesses of their family members.

VI. SCHOLAR

Fellows should be able to demonstrate their scholarly approach to medical practice in the following areas during participation on patient rounds, teaching sessions, and journal clubs:

Self-education skills; demonstrate up-to-date knowledge in major clinically applicable developments.

Display effective skills in continuing education.

Demonstrate an ability to identify gaps in knowledge and develop a strategy to fill the gaps.

Critical Appraisal of the Medical Literature.

Demonstrate ability to locate and judge the strength of the evidence in the literature.

Able to pose an appropriate patient-related question, execute a systematic search for evidence, and critically evaluate medical literature to optimize clinical decision making

Scientific Interest;

Participates in the scientific activities offered in the program.

Contributes actively to discussion and teaching. Able to add to and elevate the level of discussion. Incorporates a spirit of scientific enquiry and use of evidence into clinical decision-making.

VII. PROFESSIONAL

Fellows will be able to demonstrate their professionalism in the following ways;

Integrity and honesty; demonstrate an honest, straightforward approach that is respectful of others, and deserves the respect of others.

Responsibility and self-discipline; Dependable, reliable, honest, and forthright in all information and facts; prompt, appropriate follow-up of patients.

Bioethics;.Performs in an ethical manner with other health care professionals, patients, and families.

Self-Assessment; demonstrates appropriate awareness of own limitations; seeks assistance and feedback to overcome for limitations and accepts advice graciously.

Receptiveness to Feedback Responds constructively to new suggestions and ideas.

THORACIC SURGERY

UNIT OBJECTIVES:

This is a Six Week rotation in Thoracic Surgery, which will be performed during the Second Year of the Fellowship

Demonstrate an understanding of the anatomy, physiology, and pathophysiology of thoracic conditions pertinent to TRAUMA surgery.

Effectively apply this understanding to the diagnosis, evaluation, and treatment of patients with thoracic problems who are to be managed by Trauma surgery.

COMPETENCY-BASED KNOWLEDGE OBJECTIVES:

1. Describe thoracic anatomy and physiology, including anatomic and functional relationships:
    a. Chest wall (including spine)
    b. Accessory muscles of respiration
    c. Diaphragm
    d. Mediastinum
    e. Trachea, & bronchi
    f. Lungs
    g. Esophagus
    h. Heart and pericardium
    i. Great vessels and their branches
    j. Peripheral nerves (vagus, phrenic)
    k. Azygous and Hemiazygous veins

2. Summarize the modalities listed below, stating their indications and limitations in thoracic surgical procedures:
    a. Endoscopy/thoracoscopy
    b. Arteriography
    c. CT, MRI, and (PET)
    d. Nuclear medicine
    e. Ventilatory methods
    f. Tracheostomy
    g. Intubation and vent support
    h. Central venous catheters
    i. Thoracostomy tubes
    j. Stents (esophageal, tracheal)
3. Discuss the following conditions, choose, and justify the appropriate diagnostic and therapeutic modalities:
    a. Pneumothorax
    b. Hydrothorax and hemothorax
    c. Pulmonary infiltrates or masses
    d. Abnormal cardiac silhouettes
    e. Pleural effusions
    f. Fractures (sternum, ribs, scapulae)
    g. Mediastinal masses
    h. Infectious processes
    i. Reactive processes (esophageal)
4. Discuss and justify the indications for the following procedures:
    a. Needle aspiration
    b. Chest tube placement
    c. Mediastinoscopy
    d. Thoracoscopy

e. Median sternotomy
f. Mediastinotomy
g. Thoracotomy
h. Bilateral thoracotomy
i. Stent use
j. Bronchoscopy

5. Recommend when to use such diagnostic and therapeutic procedures as:
   a. Bronchoscopy/ esophagoscopy
   b. Thoracoscopy/VATS
   c. Median sternotomy (Chamberlain & book procedures)
   d. Pericardiocentesis
   e. Pulmonary resection
6. Identify indications for the following therapeutic modalities; justify/critique their use:
   a. Extra corporeal membrane oxygenation
   b. Intra-aortic balloon pump (IABP)
   c. High frequency jet ventilation
   d. Alveolar (pulmonary) lavage
7. Illustrate the various types of incisions used in thoracic surgery for:
   a. Apical resections
   b. Pneumonectomy
   c. Esophagectomy
   d. Mediastinal procedures
   e. Tracheal/bronchial procedures
   f. Diaphragmatic operations
8. Discuss the general diagnostic and operative approaches to treating blunt and penetrating trauma to the thorax and its contents.
9. Describe specific surgical management of trauma to the thorax and its

10. contents:
    a. Neck
    b. Esophagus
    c. Nerves
    d. Mediastinum
    e. Bony thorax
    f. Diaphragm
    g. Vessels
    h. Trachea/lungs
    i. Heart
11. Describe the diagnosis and discuss therapy of such surgical complications as:
    a. Esophageal leak/stenosis/obstruction
    b. Loculated hemothorax
    c. Postoperative bleeding
    d. Empyema
    e. Air leaks
    f. Bronchial obstructions
12. Select and specify diagnostic and therapeutic maneuvers to manage problem areas following thoracic surgery:
    a. Cardiovascular & pulmonary complications
    b. Renal failure
    c. Liver failure
    d. Diabetes mellitus
    e. Malnutrition
    f. Metabolic dysfunction
    g. Immune system suppression

COMPETENCY-BASED SKILLS OBJECTIVES:

1. Evaluate thoracic pathophysiology; order and interpret appropriate tests.
2. Diagnose and provide initial management of fractures of ribs, clavicle, sternum, scapulae, and spine.
3. Evaluate patients for thoracic surgery about risk factors, candidacy for surgical resection, pulmonary function studies, and possible postoperative disability.
4. Manage general thoracic perioperative procedures.
5. Use data obtained from diagnostic and therapeutic procedures to assess and plan treatment for thoracic pathology.
6. Perform bronchoscopy, esophagoscopy, nasotracheal, and orotracheal intubation, including double lumen tubes.
7. Manage empyemas surgically.
8. Perform and/or supervise all thoracic diagnostic and therapeutic endoscopic procedures.
9. Resect ribs, treat empyema cavities, perform pleural and lung biopsies.
10. Manage thoracic trauma.
11. Manage thoracic aortic aneurysms and dissections.
12. Direct complex ventilator-dependent patient management.
13. Perform lung resections, rib resections, mediastinoscopies, and mediastinotomies.
14. Provide medical and surgical management of infectious processes in the thorax.
15. Perform and/or supervise pacemaker/defibrillator selection and placement.
16. Manage all pharmacotherapeutics associated with thoracic surgery.
17. Treat medical conditions associated with thoracic surgical procedures.

At the end of the rotation, the fellow should be able to:

I. MEDICAL EXPERT

Relate and apply basic science knowledge to patient care in most cases.

Relate and apply a fund of clinical knowledge in a manner that enables resolution of common clinical situations on a consistent basis.

Accurately interpret the results of common lab and diagnostic tests.

Develop diagnostic plans that are appropriate and reflect current standards.

Outline a therapeutic plan in conjunction

Make judgments that are usually complete and sound.

Arrive at decisions appropriately with appropriate use of available information.

Demonstrate the ability to handles most common problems independently, while appropriately asking consultants for help with specific questions in more complex questions.

Develop an ability to immediately recognize acute life-threatening illness and institute immediate life sustaining supportive therapy.

Display appropriate leadership of the team, utilizing resources in an effective manner.

Demonstrate adequate knowledge of monitoring techniques for the critically ill patient to allow for appropriate management.

Consistently use appropriate preventative measures and apply knowledge in a prospective manner to anticipate potential problems and attempt to prevent them.

Demonstrate an ability to perform an appropriate consultation assessment to and answer a question or request from another health care provider.

Be able to present well-reasoned, well-documented assessments and recommendations in written and oral form in response to a request from another health care provider.

Demonstrate competency in performing essential procedures with appropriate skill and manual dexterity for level of training.

Carries out techniques correctly and efficiently with appropriate knowledge of indications and risks.

II. COMMUNICATOR

Interprofessional Relationships; demonstrate an ability to work well with other services, using appropriate communication skills, resulting in a constructive environment.

Communication with other allied health professionals; demonstrate an ability to communicate well with other members of the health care team.

Specifically, able to provide a clear outline of the plan for patient care.

Communication with Patients; demonstrate an ability to consistently achieve good rapport with patients and gain patient respect and confidence, and to clearly explain diagnosis and treatment options in an understandable fashion.

Communication with Families; demonstrate an ability to gain the respect and confidence of family members, create a supportive and helpful environment, and to deliver information to families in a humane manner that is understandable and encourages discussion.

Written communication & Documentation; demonstrate an ability to write records/reports that are usually complete, orderly, systematic, generally support management, and allow a physician unfamiliar with the patient to identify the relevant daily issues.

III. COLLABORATOR

Demonstrate abilities to become an active member of the Thoracic Surgery team who can work well with other team members.

Demonstrate an ability to give and follow appropriate instructions with nurses and allied staff, and to develop rapport, resulting in a constructive working environment.

Deal effectively with issues and achieve good results even in difficult situations without antagonizing others.

IV. MANAGER

Participate in bed management issues and enable efficient care of the critically ill patient by using investigations appropriately.

Effectively organize work in such a way that priorities are established, and that coordination occurs with the other members of the team ensuring total, acute, and continuing care of patients.

V. HEALTH ADVOCATE

Educate the families of critically ill patients on the lifestyle and health issues that have led to the illnesses of their family members.

VI. SCHOLAR

Fellows should be able to demonstrate their scholarly approach to medical practice in the following areas during participation on patient rounds, teaching sessions, and journal clubs:

Self-education skills; demonstrate up-to-date knowledge in major clinically applicable developments.

Display effective skills in continuing education. Demonstrate an ability to identify gaps in knowledge and develop a strategy to fill the gaps.

Critical Appraisal of the Medical Literature.

Demonstrate ability to locate and judge the strength of the evidence in the literature.

Able to pose an appropriate patient-related question, execute a systematic search for evidence, and critically evaluate medical literature to optimize clinical decision making

Scientific Interest;

Participates in the scientific activities offered in the program.

Contributes actively to discussion and teaching. Able to add to and elevate the level of discussion. Incorporates a spirit of scientific enquiry and use of evidence into clinical decision-making.

VII. PROFESSIONAL

Fellows will be able to demonstrate their professionalism in the following ways;

Integrity and honesty; demonstrate an honest, straightforward approach that is respectful of others, and deserves the respect of others.

Responsibility and self-discipline; Dependable, reliable, honest, and forthright in all information and facts; prompt, appropriate follow-up of patients.

Bioethics; Performs in an ethical manner with other health care professionals, patients, and families.

Self-Assessment; demonstrates appropriate awareness of own limitations; seeks assistance and feedback to overcome for limitations and accepts advice graciously.

Receptiveness to Feedback Responds constructively to new suggestions and ideas.

VIII. CONTINUUM OF LEARNING

This includes learning that should take place in each key stage of progression within the specialty. Fellows are reminded of the fact of life-long Continuous Professional Development (CPD). Fellows should keep in mind the necessity of CPD for every healthcare provider in order to meet the demand of their vital profession. The following table states how the role is progressively expected to develop throughout junior, senior and consultant levels of practice.

SubSpecialty General Practice	F1 (Junior Level)	F2 (Senior Level)	Consultant sub specialist
Sub- specialty Non-practicing	Dependent/supervised practice	Dependent/supervised practice	Independent practice/provide supervision
Obtain basic health science and foundational level to core discipline knowledge	Obtain fundamental knowledge related to core clinical problems of the specialty	Apply knowledge to provide appropriate clinical care related to core clinical problems of the specialty	Acquire advanced and up-to-date knowledge related to core clinical problems of the specialty
Internship to the practice of discipline	Apply clinical skills such as physical examination and practical procedures related to the core presenting problems and procedures of the specialty	Analyze and interpret the findings from clinical skills to develop appropriate differential diagnoses and management plan for the patient	Compare and evaluate challenging, contradictory findings and develop expanded differential diagnoses and management plan

IX. TEACHING METHODS

The teaching process in fellowship training is based mainly on the principles of adult learning theory. The fellows are expected to be aware of the importance of learning and to having active roles in the content and the process of their own learning. The training implements the adult learning concept in each feature of the activities where the fellow is responsible for their own learning requirements. Formal training time would include the following four teaching activities:

- Program Specific Learning Activities
- Universal topics
- General Learning Opportunities
- Simulation

Program-Specific Learning Activities:

EDUCATIONAL ACTIVITIES

- Weekly, focused didactic sessions between surgical faculty and Fellows are critical, especially regarding expectations in the basic sciences. At the center of these sessions are specific reading assignments, discussed in classic give-and-take format designed to debrief the fellow in selected areas.
- Teaching rounds will occur at least weekly and will include detailed discussions of specific anatomy and physiology. Team learning, where Fellows work together on problem solving and interactive presentation activities in evidence-based medicine.

- Discussions of clinical scenarios and Morbidity and Mortality conferences are an efficient way to stimulate and encourage fellow involvement, preventing a passive fellow role.
- A structured reading program, including Selected Readings, and SESAP Reviews, in addition to the periodicals; in journal clubs and case review sessions.
- Anatomic & physiologic considerations are taught with patients, and discussion.
- Objective structured clinical examination (OSCE) use allows practice and direct feedback in addition to more accurate SKILLS evaluation on skills achievement.
- Fellows should participate in team learning, which is mandatory.
- In addition to the academic conference schedule, special educational programs are offered throughout the academic year including:
- vascular anatomy lab
- visiting professors
- mock oral examination reviews and workshops

LEARNING OPPORTUNITIES:

Activity	Description	Frequency	Venue
Morbidity & Mortality Meeting (M&M)	Active cases educational discussion	Monthly	Hospital
Journal Club	Articles discussion	Weekly	Hospital
Conferences		Yearly	Local/International
Scientific Membership	Scientific Societies	Yearly	National/International
Clinical Teaching	Case/topic discussion	Weekly	Hospital

Program-specific activities are educational activities that are specifically designed and intended for fellows' teaching during their training time. The fellows are required to attend these activities and non-compliance can subject fellows to disciplinary actions. Program Director supports these activities by providing protected time for fellows to attend them and allow fellows to participate in such activities.

A) Program Academic Half-Day:

Every week, 4 hours of formal training time (commonly referred to as *academic half-day*) will be reserved. A formal teaching time is an activity that is planned in advanced with assigned tutor(s), time slots, and venue. Formal teaching time excludes bedside teaching, clinic postings etc. The academic half-day covers the core TACS topics which are determined and approved by the specialty's scientific council aligned with the specialty-defined competencies and teaching methods. These topics will ensure that important clinical problems of the specialty are well-taught. They will be conducted as lectures in interactive, case-based discussion format. The learning objectives of each topic will be clearly defined. There should be an active involvement of the fellows in the development and delivery of these topics, under faculty supervision; the involvement might be in the form of delivery, content development or research to name a few. The fellow's supervisor will make sure that the discussion of each topic is stratified into three categories of the learning domains: knowledge, skill, and attitude whenever applicable (see appendix-D for table of top knowledge topic and procedure list).

The academic half-day table as shown in Appendix B

B) Practice-Based Learning:

Training exposures during bedside, lab., O.R., and other work-related activities which include courses and workshops (e.g., simulations, standardized patients, and bedside teaching) represent excellent

opportunities for learning. Fellows are expected to build their capacity based on self-directed learning.

Each fellow needs to maintain a logbook documenting the procedures performed under supervision and performed independently. There is a minimum number of procedures to be performed before training completion and the minimum number needed to maintain competency after certification.

C) Morning Report:

The Morning report is a case-based teaching session. The goal of the morning report is to teach efficient handover strategies, case presentation skills, to allow discussion of the management of interesting cases, and enhance problem-solving and multidisciplinary team skills.

1.1 Universal Topics

Universal topics are educational activities that are developed by the SCFHS and are intended for all specialties. Priority will be given to topics that have these qualities:

- High value
- Interdisciplinary and integrated
- Require expertise that might be beyond the availability of the local clinical training sites

Universal topics has been developed by the SCFHS and are available under e-learning via a personalized access for each fellow (to access the online modules). Each universal topic will have a self-assessment at the end of the module. As indicated in the "executive policies of formative assessment and annual promotion", universal topics are a mandatory component of the criteria for the annual promotion of fellows from their current level of training to the subsequent level. Universal topics will be distributed over the whole 2-year period of fellowship training.

See appendix A for Universal Topics

Table for Universal Topics distributed over training years

Training Year	*Modules*		Topics name	
	Number	Name	Number	Name
FY-1	Module-1	Introduction	Topic-1	Safe drug prescribing
			Topic-2	Hospital acquired infections
			Topic-3	Sepsis; SIRS; DIVC
			Topic-4	Antibiotic stewardship
			Topic-5	Blood transfusion
FY-1 & 2	Module-2	Medical / Surgical Emergencies	Topic-6	Management of acute chest pain.
			Topic-7	Management of altered sensorium
			Topic-8	Management of hypotension and hypertension
			Topic-9	Management of upper GI bleeding
			Topic-10	Management of lower GI bleeding
FY-1	Module-3	Acute Care	Topic-11	Pre-operative assessment
			Topic-12	Post-operative care
			Topic-13	Acute pain management
			Topic-14	Chronic pain management
			Topic-15	Management of fluid in the hospitalized patient
			Topic-16	Management of electrolyte imbalances
FY-2	Module-4	Diabetes and Metabolic Disorders	Topic-17	Management of diabetic complications
			Topic-18	Comorbidities of obesity
	Module-5	Ethics and Healthcare	Topic-19	Occupational hazards of HCW
			Topic-20	Ethical issues: treatment refusal; patient autonomy
			Topic-21	Role of doctors in death and dying

1.2 General Learning Opportunities:

Formal training time should be supplemented by other practice-based learning (PBL) such as:

- Journal Club**
- Grand rounds**
- Involvement in quality improvement committees and meetings
- Continuous professional development (CPD) activities relevant to the specialty (conferences and workshops)
- Morbidity and Mortality (M&M) **

The M&M conference offers fellows an opportunity to discuss patient cases where adverse effects have occurred through errors or complications. The goal of this resource is to refocus the content of morbidity and mortality and transform it into a platform for teaching patient safety principles and emphasizing error reduction strategies.

1.3 Simulation:

Medical simulation involves creating an artificial clinical scenario for fellows to learn from. This process has educational advantages like learning and practicing how to deal with rare and/or high-risk clinical scenarios and rare procedures while practicing in a controlled standardized environment with immediate effective feedback that has a big impact on knowledge, skills, and attitude.

The use of simulation in postgraduate training programs is currently a necessity especially with the use of competency-based curricula. Current programs are looking to graduate skilled, competent, and independent physicians while maintaining the focus on quality and patient safety.

The Fellow is expected to be ATLS Certified, prior to starting his Fellowship; as it is a PreRequisite.

The TACS Fellow will be required to successfully complete the ATOM Course, during the FIRST Year of his Fellowship.

SIMULATION & WORKSHOP

Course	Objectives	Duration	Timing

Advanced Trauma Operative Management (ATOM)*	• Describe the proper operative technique for dealing with trauma injury.
	• Identify traumatic injuries and develop a management plan to surgically repair the injuries.
	• At the completion of the course, the Fellow will be able to demonstrate:
	  ○ Increased self-efficacy in the management of traumatic injuries
	  ○ Increased knowledge in the management of penetrating injuries
		1 Day	FY1

Advanced Surgical Skills Exposure in Trauma (ASSET)*	• Demonstrate knowledge of anatomical exposures for the injured & acutely ill surgical patients. • Demonstrate technical ability to expose important structures that may require acute surgical intervention to save life or limb. • Gain confidence in performing anatomic exposures independently. • Ability to independently perform anatomical exposure	1 Day	FY1
Basic Endovascular Skills for Trauma (BEST)*	• Indications for REBOA • Access and closure of common femoral artery • Tools required for REBOA • Technique of REBOA	1 Day	FY1

Course	Objectives	Duration	Timing
Fundamental Critical Care Support (FCCS)**	• Recognition & Assessment of the Seriously Ill Patient • Airway Management • Cardiopulmonary/Cerebral Resuscitation • Diagnosis & Management of Acute Respiratory Failure • Mechanical Ventilation • Monitoring Oxygen Balance and Acid-Base Status • Diagnosis and Management of Shock • Neurologic Support • Life-Threatening Infections: Diagnosis and Antimicrobial Therapy Selection • Management of Life-Threatening Electrolyte and Metabolic Disturbances • Critical Care in Pregnancy • Ethics in Critical Care Medicine • Surgery in Critical Care	2 Days	FY1
Basic Of Ultrasound and E-FASST***	- Learn basic of Ultrasound Machine and Physics - E-FAST Techniques, acquisition and interpretation	1 Day	FY1

* American College of Surgeons Modules

** Society of Critical Care Medicine Modules

*** Saudi General Surgery Society/Saudi Critical Care Society

X. ASSESSMENT AND EVALUATION

1. Purpose of Assessment

Assessment plays a vital role in the success of postgraduate training. Assessment will guide fellows and trainers to achieve defined standards, learning outcomes, and competencies. On the other hand, assessment provides feedback to learners and faculty regarding curriculum development and implementation, teaching methods, and quality of the learning environment. Reliable and valid assessment is essential to assess curriculum alignment in respect to its objectives, learning methods, and assessment tools. Finally, assessment assure patients and the public that health professionals are safe and competent to practise.

Assessment can serve the following purposes:

a. **Assessment for learning:** Trainers will use information from fellows' performance to inform their learning for improvement. It enables the educators to use information about fellows' knowledge, understanding and skills to provide feedback to fellows about learning and how to improve.

b. **Assessment as learning** involves fellows in the learning process while enabling them to monitor their own progress. Fellows use self-assessment and the educators' feedback to reflect on their progression. It develops and supports fellows' metacognitive skills. Assessment as learning is crucial in helping residents/fellows become lifelong learners.

c. **Assessment of learning** used to demonstrate achievement of fellows' learning. This is graded assessment and usually counts towards the fellows' end-of-training degree.

d. **Feedback and evaluation** as assessment outcomes will represent quality metrics that can improve the learning experience.

Miller's Pyramid of Assessment provides a framework for assessing the fellows' clinical competencies which acts as a guide for the trainers to select the assessment methods to target different clinical competencies including "knows," "knows how," "shows how," and "does" (check the -checklist- Appendix A).

For the sake of organization, assessment will be further classified into two main categories: Formative and Summative.

2. Formative Assessment

2.1 General Principles

The TACS Fellows, should strive to seek, and develop their performance based on, feedback throughout their journey of competency from "novice" to "mastery" levels. Formative assessment is the component of assessment that distributed throughout the academic year aiming primarily to provide fellows with effective feedback.

Every four weeks, for at least 1 hour, fellows will meet with their mentors, to review performance reports (e.g., ITER, e-portfolio, etc). Input from the overall formative assessment tools will be utilized at the end of the year to determine whether individual fellows will be promoted to subsequent training level.

According to the executive policy on formative assessment (available online: www.scfhs.org), formative assessment will have the following features which will be used based on the Miller's pyramid (check the -checklist *appendix A-)*:

a. Multisource:
b. Comprehensive: covering all learning domains (knowledge, skills, & attitude).
c. Relevant: focusing on workplace-based observations.

d. Competency milestone-oriented: reflecting fellow's expected competencies that match fellow's developmental level.

The methodology used to achieve a broad, reliable and valid evaluation on the competency of each FELLOW includes:

1. The rotation evaluation forms
2. Grand Rounds presentation and other conference presentations
3. The Surgery In-Training examination
4. The Mock Oral Board examination for FELLOWs
5. The quality and timeliness of record keeping
6. Conference attendance

Fellows should play an active role seeking feedback during their training and mentors are to provide timely and formative assessment. The SCFHS will provide an e-portfolio system to enhance communication and analysis of data from formative assessment.

Trainers and fellows are to follow the recommendations of the scientific council regarding the updated forms, frequency, distribution, and deadlines related to the implementation of evaluation forms.

OPERATIVE EXPERIENCE

The Operative Experience Table below outlines the cases is to be completed by FELLOWs in their Training.

TACS Surgical Operative Skills Curriculum

The TACS Surgical Skills Curriculum for the Trauma Fellowship was developed to include three phases.

Phase 1 addresses the basic surgical skills.

Phase 2 addresses advanced skills and procedures, and

Phase 3 addresses team-based skills.

Phase 1: Basic/Core Skills and Tasks

- Advanced Laparoscopy Skills
- Advanced Tissue Handling:
- Airway Management
- Asepsis & Instrument Identification
- Central Line Insertion & Arterial Lines
- Chest Tube Insertion & Thoracentesis
- Hand Sewn GI Anastomosis
- Inguinal Anatomy
- Knot Tying
- Laparotomy Opening and Closure
- Stapled Gastrointestinal Anastomosis
- Surgical Biopsy
- Suturing
- Tissue Handling & Dissection
- Wound Closure
- Vascular Anastomosis

Phase 2: Advanced Procedures

- Gastric Resection
- Laparoscopic Appendectomy
- Laparoscopic Inguinal Hernia Repair
- Laparoscopic Right Colon Resection
- Laparoscopic Sigmoid Resection
- Laparoscopic Ventral Hernia Repair
- Laparoscopic Incisional Hernia Repair
- Laparoscopic / Open Bile Duct Exploration
- Laparoscopic / Open Cholecystectomy
- Laparoscopic / Open Splenectomy
- Open Inguinal / Femoral Hernia Repair
- Open Right Colon Resection

Phase 3: Team-based Skills

- Laparoscopic Crisis
- Laparoscopic Troubleshooting
- Postoperative Hypotension
- Postoperative MI (Cardiogenic Shock)
- Postoperative Pulmonary Embolus
- Preoperative Briefing
- Retained Sponge on Postop X-ray

Operative Assessment & Evaluation of Trauma/Acute Care Surgery Fellows

Please Refer to Appendix-G

2.2 Formative Assessment Tools

Learning Domain	Formative Assessment Tools	Important details (e.g., frequency , specifications related to the tool)
Knowledge	- Structured Oral Exam (SOE) - Annual Written Progress Test (Local or International) - Structured Academic Activities - Case-Based Discussion (CBD)	SOE is performed twice a year (every 6 Months) The Written Progress Exam is Performed at the End of each Fellowship Year The Structured Academic Activity is Performed weekly and for 3-4 hours CBD is Performed on a Monthly Basis
Skills	- OSCE: Objective structured clinical examination - Logbook	The OSCE is Performed at the End of each Fellowship Year The Logbook is used from the start of the fellowship; inorder to document all surgical

Learning Domain	Formative Assessment Tools	Important details (e.g., frequency , specifications related to the tool)
	- DOPS: Direct Observation for Procedural Skills - Research Activities	procedures performed and assisted by the Fellow DOPS is performed weekly within the operating room and the ER This is to be initiated from the start of the fellowship and should be completed by the end of the Fellowship
Attitude	- ITER: In-Training Evaluation Report	This is to be Completed at the end of each Fellowship Year

The Evaluation of each component will be based on the following equation:

Percentage	< 50%	50-59.4%	60-69.4%	>70%
Description	Clear Fail	Borderline Fail	Borderline Pass	Clear Pass

To achieve unconditioned promotion, the candidate must score a minimum of "borderline pass" in all used formative assessment tools

The program director can still recommend the promotion of candidates if the above is not met in some situations:

- In case the candidate scored "borderline failure" in one or two components at maximum, and these scores should not belong to the same area of assessment (for example: both borderline failures should not belong both to skills)
- The candidate must have passed all other components and has scored a minimum of clear pass in at least two components.

3. Summative Assessment

3.1 General Principles

Summative assessment is the component of assessment that aims primarily to make informed decisions on fellows' competency. In comparison to the formative one, summative assessment does not aim to provide constructive feedback.

For further details on this section please refer to the General Bylaws of Training in Postgraduate Programs and General Assessment Bylaws (available online: www.scfhs.org).

To be eligible to sit for the final exams, fellows will be granted "Certification of Training Completion" upon successful completion of all training rotations.

3.2 Final In-training Evaluation Report (FITER)

In addition to approval of completion for the clinical requirements (logbook) by the supervising committee, a FITER will be completed by the program director for each TACS Fellow at the end of the final year of training. This report will be the basis for obtaining the Certificate of TACS Training Program Completion, as well as the qualification to sit for the Final TACS Exam.

Please Refer to Appendix - F

3.3 Certification of Training Completion

In order to be eligible to sit for final specialty examinations, each fellow is required to obtain "*Certification of Training Completion*". Based on the General Bylaws of Training in Postgraduate Programs and executive policy (please refer to www.scfhs.org) fellows will be granted "Certification of Training-Completion" once the following criteria are fulfilled:

a. Successful completion of all training rotations.

b. Completion of training requirements (e.g., logbook, research) as outlined in FITER.

c. Clearance from the SCFHS training affairs, that ensure compliance with tuitions payment and completion of universal topics.

d. Passing the first part examination.

"Certification of Training Completion" will be issued and approved by the supervisory committee or its equivalent according to the SCFHS policies.

3.4 Final Specialty Examinations

The final TACS examination is the summative assessment component that grants fellows the specialty's certification.

It has two elements:

a) **FINAL WRITTEN EXAM:** in order to be eligible for this exam, fellows are required to have obtained "Certification of Training Completion". **THIS WILL BE COMPRISED OF 100 MCQ QUESTIONS;** that will take place at the end of the year

b) **FINAL CLINICAL/PRACTICAL EXAM:** Fellows will be required to pass the final written exam in order to be eligible to sit for the final clinical/practical exam.

   i. THIS WILL BE COMPRISED OF 2-3 Short Cases, each case 10 minutes with 2 Examiners and standardized patients and set Exam Questions

   ii. 2 Oral Exam Stations; each station is comprised of 2 Examiners

   iii. 2 Radiology Stations

Blueprint Outlines: The content of the following table is for demonstration only, please refer to the most updated version published on the SCFHS website.

Blueprint of the final written and clinical/practical exams are shown in the following table:

Example of Written Exam Blueprint *

Contents						
Categories	Sections	Proportions	Medical science	Diagnosis	Management	Investigations
TRAUMA 35%	Resuscitation	5%	1	1	2	1
	Trauma Complications	5%	1	2	1	1
	Extremity Trauma	2%	0	1	1	0
	Transfusion Medicine	3%	1	1	1	0
	Blunt/Penetrating Thoraco-Abdominal Trauma	10%	2	3	3	2
	Neck Trauma	5%	0	2	2	1
	Vascular Trauma	5%	0	2	2	1
ACUTE CARE SURGERY 35 %	Acute Surgical Biliary Diseases	5%	0	2	2	1
	Perforated Viscus / Peritonitis Primary, Secondary and Tertiary	10%	2	3	3	2
	Acute Surgical Abdomen	15%	3	5	5	2
	Bowel Ischemia	5%	1	1	2	1
SURGICAL CRITICAL CARE 10%	Supportive Care	1%	1	0	0	0
	Mechanical Ventilation	2 %	0	0	2	0
	Sepsis	5 %	0	2	2	1

Contents						
Categories	Sections	Proportions	Medical science	Diagnosis	Management	Investigations
	Fluids & Electrolytes	2 %	0	1	1	0
THORACIC SURGERY 7.5 %	Pneumo/HemoThorax	2 %	0	1	1	0
	Esophageal Injury	1 %	0	0	1	0
	Lung Injury	2 %	0	1	1	0
	Thoracotomy	2.5 %	0	1	1.5	0
VASCULAR SURGERY7 .5 %	Vascular Trauma	5 %	0	2	2	1
	REBOA	1 %	1	0	0	0
	Vascular Surgical Management	1.5 %	0	1	0.5	0
RESEARCH 5 %	Research, ethics, professionalism, and patient safety	5 %	3	0	2	0
	Total	100%	28	20	31	21

Example of Final Clinical Exam Blueprint

		DIMENSIONS OF CARE				
		Health Promotion & Illness Prevention 1±1 Station(s)	Acute 5±1 Station(s)	Chronic 3±1 Station(s)	Psychological Aspects 1±1 Station(s)	# Station(s)
DOMAINS FOR INTEGRATED CLINICAL ENCOUNTER	Patient Care 7±1 Station(s)	1	4	2		7
	Patient Safety & Procedural Skills 1±1 Station(s)		1			1
	Communication & Interpersonal Skills 2±1 Station(s)			1	1	2
	Professional Behaviors 0±1 Station(s)					0
	Total Stations	1	5	3	1	10

*Main blueprint framework adapted from Medical Council of Canada Blueprint Project

For further details on final exams, please refer to the General Bylaws of Training in Postgraduate Programs and General Assessment Bylaws (available online: www.scfhs.org).

Learning Domain	Summative Assessment Tools	Passing Score
Knowledge	- Final Written Examination	At least borderline pass in each tool in accordance with the standard setting method used by the executive administration of assessment
Skills	- Objective Structured Clinical Examinations (OSCE) - Structured Oral Examinations (SOE)	At least borderline pass in each tool in accordance with the standard setting method used by the executive administration of assessment
Attitude	FITER: In-Training Evaluation Report	Successfully pass FITER

XI. PROGRAM AND COURSE EVALUATION

The SCFHS will apply variable measures to evaluate the implementation of this curriculum. Training outcomes of this program will undergo the quality assurance framework endorsed by the Central Training Committee at the SCFHS.

Fellow assessment (both formative and summative) results will be analyzed and mapped to curriculum content.

Other indicators that will be incorporated are:

- Report of the annual fellows' satisfaction survey.
- Reports from fellows' evaluation of faculty members.
- Reports from fellows' evaluation of rotations.
- Reports from the annual survey of program directors.
- Data available from program accreditations.
- Reports from direct communications with fellows and residents.

Goal-Based Evaluation; the achievement of intended milestones will be evaluated at the end of each stage to assess the progress of the curriculum delivery, and any deficiencies will be addressed in the following stage utilizing the time devoted for fellow-selected topics and professional session.

In addition to subject-matter opinion, best practices from benchmarked international programs, the SCFHS will apply a robust method to ensure that this curriculum will utilize all the data that will be available during the time of revising this curriculum in the future.

XII. POLICIES AND PROCEDURES

This curriculum represents the means and materials and outlines the learning objectives with which fellows and trainers will interact for the purpose of achieving the identified educational outcomes.

The SCFHS has a full set of "General Bylaws of Training in Postgraduate Programs" and "Executive Policies" (published on the official SCFHS website) that regulate all training-related processes.

The general bylaws of training, assessment, and accreditation as well as executive policies on admission, registration, formative assessment and promotion, examination, fellows' representation and support, duty hours, and leaves are examples of regulations that need to be implemented.

Under this curriculum, fellows, trainers, and supervisors must comply with the most updated bylaws and policies, which can be accessed online (via the official SCFHS website).

XIII. APPENDICES

A. Universal Topics Modules
B. Examples of an Academic Half-Day Table
C. Example of research rotation objective
D. Top Conditions and Procedures to be Performed
E. Operative Assessment & Evaluation of Trauma/Acute Care Surgery Fellows
F. FITER Evaluation
G. References

APPENDIX - A

Universal Topics

Intent:

These are high value, interdisciplinary topics of outmost importance to the fellow. The reason for delivering the topics centrally is to ensure that every fellow receives high quality teaching and develops essential core knowledge. These topics are common to all specialties.

Topics included here meet one or more of the following criteria:

- Impactful: these are topics that are common or life-threatening
- Interdisciplinary: hence topics that are difficult to teach by a single discipline
- Orphan: topics that are poorly represented in the undergraduate curriculum
- Practical: topics that fellows will encounter in hospital practice

Development and Delivery:

The Core topics will be delivered centrally by the Commission through the e-learning platform. A set of preliminary learning objectives, for each topic is developed.

These topics will be didactic in nature with focus on practical aspects of care and will have more content heavy as compared to workshops and other face-to-face interactive session.

The duration of each topic is 1.30 hours.

Assessment:

The topics will be delivered in a modular fashion. At the end of each Learning Unit there will be on-line formative assessment. After completion of all topics there will be a combined summative assessment in the form of context rich MCQ. All fellows must attain minimum competency in the summative assessment. Alternatively, these topics can be assessed in a summative manner along with specialty examination.

Some ideas: may include case studies, high quality images, worked examples of prescribing drugs in disease states, and internet resources.

Module 1: Introduction

1. Safe drug prescribing
2. Hospital acquired infections
3. Sepsis; SIRS; DIVC
4. Antibiotic stewardship
5. Blood transfusion

Safe drug prescribing:

At the end of the Learning Unit, you should be able to

a) Recognize importance of safe drug prescribing in the healthcare

b) Describe the various Adverse Drug Reactions with examples of commonly prescribed drugs that can cause such reactions

c) Apply principles of drug-drug interactions, drug-disease interactions, and drug-food interactions into common situations

d) Apply principles of prescribing drugs in special situations such as renal failure and liver failure

e) Apply principles of prescribing drugs in elderly, pediatrics age group, and in pregnancy and lactation

f) Promote evidence-based cost-effective prescribing

g) Discuss ethical and legal framework governing safe-drug prescribing in Saudi Arabia

Hospital Acquired Infections (HAI):

At the end of the Learning Unit, you should be able to

a) Discuss the epidemiology of HAI with special reference to HAI in Saudi Arabia

b) Recognize HAI as one of the major emerging threats in healthcare

c) Identify the common sources and set-ups of HAI

d) Describe the risk factors of common HAIs such as ventilator associated pneumonia, MRSA, CLABSI, Vancomycin Resistant Enterococcus (VRE)

e) Identify the role of healthcare workers in the prevention of HAI

f) Determine appropriate pharmacological (e.g., selected antibiotic) and non-pharmacological (e.g., removal of indwelling catheter) measures in the treatment of HAI

g) Propose a plan to prevent HAI in the workplace

Sepsis, SIRS, DIVC: At the end of the Learning Unit, you should be able to

a) Explain the pathogenesis of sepsis, SIRS, and DIVC

b) Identify patient-related and non-patient related predisposing factors of sepsis, SIRS, and DIVC

c) Recognize a patient at risk of developing sepsis, SIRS, and DIVC

d) Describe the complications of sepsis, SIRS, and DIVC

e) Apply the principles of management of patients with sepsis, SIRS, and DIVC

f) Describe the prognosis of sepsis, SIRS, and DIVC

Antibiotic Stewardship:

At the end of the Learning Unit, you should be able to:

a) Recognize antibiotic resistance as one of the most pressing public health threats globally

b) Describe the mechanism of antibiotic resistance

c) Determine the appropriate and inappropriate use of antibiotics

d) Develop a plan for safe and proper antibiotic usage plan including right indications, duration, types of antibiotics, and discontinuation.

e) Appraise of the local guidelines in the prevention of antibiotic resistance

Blood Transfusion:

At the end of the Learning Unit, you should be able to:

a) Review the different components of blood products available for transfusion

b) Recognize the indications and contraindications of blood product transfusion

c) Discuss the benefits, risks, and alternative to transfusion

d) Undertake consent for specific blood product transfusion

e) Perform steps necessary for safe transfusion

f) Develop understanding of special precautions and procedures necessary during massive transfusions

g) Recognize transfusion associated reactions and provide immediate management

Module 2: Medical and Surgical Emergencies

1. Management of acute chest pain
2. Management of altered sensorium
3. Management of hypotension and hypertension
4. Management of upper GI bleeding
5. Management of lower GI bleeding

For all the above; following learning outcomes apply.

At the end of the Learning Unit, you should be able to:

a) Triage and categorize patients

b) Identify patients who need prompt medical and surgical attention

c) Generate preliminary diagnoses-based history and physical examination

d) Order and interpret urgent investigations

e) Provide appropriate immediate management to patients

f) Refer the patients to next level of care, if needed

Module 3: Acute Care

1. Pre-operative assessment
2. Post-operative care
3. Acute pain management
4. Management of fluid in the hospitalized patient
5. Management of electrolyte imbalances

Pre-Operative Assessment:

At the end of the Learning Unit, you should be able to:

a) Describe the basic principles of pre-operative assessment

b) Preform pre-operative assessment in uncomplicated patient with special emphasis on

i. General health assessment
ii. Cardiorespiratory assessment
iii. Medications and medical device assessment
iv. Drug allergy
v. Pain relief needs

c) Categorize patients according to risks

Post-Operative Care:

At the end of the Learning Unit, you should be able to:

a) Devise a post-operative care plan including monitoring of vitals, pain management, fluid management, medications, and laboratory investigations
b) Hand-over the patients properly to appropriate facilities
c) Describe the process of post-operative recovery in a patient
d) Identify common post-operative complications
e) Monitor patients for possible post-operative complications
f) Institute immediate management for post-operative complications

Acute Pain Management:

At the end of the Learning Unit, you should be able to:

a) Review the physiological basis of pain perception
b) Proactively identify patients who might be in acute pain
c) Assess a patient with acute pain
d) Apply various pharmacological and non-pharmacological modalities available for acute pain management
e) Provide adequate pain relief for uncomplicated patients with acute pain
f) Identify and refer patients with acute pain who can be benefitted from specialized pain services

Management of Fluid in Hospitalized Patients:

At the end of the Learning Unit, you should be able to:

a) Review physiological basis of water balance in the body

b) Assess a patient for his/her hydration status

c) Recognize a patient with over and under hydration

d) Order fluid therapy (oral as well as intravenous) for a hospitalized patient

e) Monitor fluid status and response to therapy through history, physical examination and selected laboratory investigations

Management of Acid-Base Electrolyte Imbalances:

At the end of the Learning Unit, you should be able to:

a) Review physiological basis of electrolyte and acid-base balance in the body

b) Identify diseases and conditions that are likely to cause or associated with acid/base and electrolyte imbalances

c) Correct electrolyte and acid-base imbalances

d) Perform careful calculations, checks, and other safety measures while correcting acid-base and electrolyte imbalances

e) Monitor response to therapy through history, physical examination and selected laboratory investigations

Module 4: Diabetes and Metabolic Disorders

1. Management of diabetic complications
2. Comorbidities of obesity

Management of Diabetic Complications:

At the end of the Learning Unit, you should be able to:

a) Describe the pathogenesis of important complications of Type 2 diabetes mellitus

b) Screen patients for such complications

c) Provide preventive measures for such complications

d) Treat such complications

e) Counsel patients and families with special emphasis on prevention

Comorbidities of Obesity:

At the end of the Learning Unit, you should be able to:

a) Screen patients for presence of common and important comorbidities of obesity

b) Manage obesity related comorbidities

c) Provide dietary and life-style advice for prevention and management of obesity

Module 5: Ethics and Healthcare

1. Occupational hazards of HCW
2. Ethical issues: treatment refusal; patient autonomy
3. Role of doctors in death and dying

Occupation Hazards of Health Care Workers (HCW):

At the end of the Learning Unit, you should be able to:

a) Recognize common sources and risk factors of occupational hazards among the HCW

b) Describe common occupational hazards in the workplace

c) Develop familiarity with legal and regulatory frameworks governing occupational hazards among the HCW

d) Develop a proactive attitude to promote workplace safety

e) Protect yourself and colleagues against potential occupational hazards in the workplace

Ethical issues: treatment refusal; patient autonomy:

At the end of the Learning Unit, you should be able to:

a) Predict situations where a patient or family is likely to decline prescribed treatment
b) Describe the concept of 'rational adult' in the context of patient autonomy and treatment refusal
c) Analyze key ethical, moral, and regulatory dilemmas in treatment refusal
d) Recognize the importance of patient autonomy in the decision-making process
e) Counsel patients and families declining medical treatment in the light of best interest of patients

Role of Doctors in Death and Dying:

At the end of the Learning Unit, you should be able to:

a) Recognize the important role a doctor can play during a dying process
b) Provide emotional as well as physical care to a dying patient and family
c) Provide appropriate pain management in a dying patient
d) Identify suitable patients and refer to patient to palliative care services

APPENDIX - B

The following is a table with example topics that illustrate the half-day activities as it spans over the course of one year (or cycle of teaching if more than one year is required to cover all the topics).

Academic week	Section	Date	Time	Sessions	presenters
1	TACS		13:00-14:00	welcoming to the program	Program director
			14:00-16:00	Leadership and Decision Making	
2	Acute Care Surgery		13:00-16:00	Damage Control Surgery	
3	Trauma		13:00-16:00	Trauma System	
4	Critical Care		13:00-16:00	Shock Approach	
5	Acute Care Surgery		13:00-16:00	Complicated clostridium difficile Colitis	
6	Trauma		13:00-16:00	Traumatic Esophageal Injury	
7	Critical Care		13:00-16:00	Difficult Airway/Mechanical Ventilation	
8	Acute Care Surgery		13:00-16:00	Post Bariatric Surgeries Complications	
9	Trauma		13:00-16:00	Traumatic Duodenal Injuries	
10	Critical Care		13:00-16:00	Resuscitation /Fluid Responsiveness/Vaso Active Drugs	
11	Acute Care Surgery		13:00-16:00	Necrotizing Fascitis	
12	Trauma		13:00-16:00	Traumatic Brain Injury	
13	Critical Care		13:00-16:00	Blood Transfusion and Reversal of Anti Coagulation/Antidotes	

Academic week	Section	Date	Time	Sessions	presenters
14	Acute Care Surgery		13:00-16:00	Enterocutaneous/Entero Atmospheric Fistulae	
15	Trauma		13:00-16:00	Blunt Cardiac Injury	
16	Acute Care Surgery		13:00-16:00	Bowel Ischemia /Ischemic Colitis	
17	Acute Care Surgery		13:00-16:00	Abdominal Compartment Syndrome/Open Abdomen	
18	Trauma		13:00-16:00	Traumatic Aorta injuries	
19	Critical Care		13:00-16:00	Sepsis/Distributive Shock	
20	Acute Care Surgery		13:00-16:00	Small & Large Bowel Obstruction	
21	Trauma		13:00-16:00	Sternal/Rib Fracture	
22	Critical Care		13:00-16:00	Hypovolemic Shock/Damage Control Resuscitation	
23	Acute Care Surgery		13:00-16:00	Complex & complicated hernias /Loss of Domain	
24	Trauma		13:00-16:00	Pelvic Vascular Injuries	
25	Critical Care		13:00-16:00	Nutrition:Entral/Parentral	
26	Acute Care Surgery		13:00-16:00	Perforated Peptic Ulcer	
27	Trauma		13:00-16:00	Pulmonary Parenchymal Injury	

Academic week	Section	Date	Time	Sessions	presenters
28	Critical Care		13:00-16:00	Obstructive Shock/Cardiogenic Shock	
29	Acute Care Surgery		13:00-16:00	Esophageal Perforation	
30	Trauma		13:00-16:00	Liver Injuries	
31	Critical Care		13:00-16:00	ARDS updates	
32	Acute Care Surgery		13:00-16:00	TracheoBronchial Injury	
33	Trauma		13:00-16:00	Diaphragmatic Injury	
34	Critical Care		13:00-16:00	Hypertensive Emergency/stroke/intra cranial Bleed/Cerebral Perfusion Pressure	
35	Acute Care Surgery		13:00-16:00	Difficult Stoma /dealing with Complications	
36	Trauma		13:00-16:00	Pancreatic Injuries	
37	Trauma		13:00-16:00	RetroPeritoneal Hemorrhage, Zones of Retroperitoneum	
38	Acute Care Surgery		13:00-16:00	Amputations /Acute Extremity Compartment Syndrome	
39	Trauma		13:00-16:00	REBOA	
42	Trauma		13:00-16:00	Bowel Injuries	
44	Acute Care Surgery		13:00-16:00	Persistent Pneumothorax/Retained Hemothorax	

Academic week	Section	Date	Time	Sessions	presenters
45	Trauma		13:00-16:00	Neck Injuries	
46	Critical Care		13:00-16:00	Pulmonary Embolism/DVT Updates Prophylaxis and Management	
47	Acute Care Surgery		13:00-16:00	Complicated Cholycystitis/Cholangitis	
48	Trauma		13:00-16:00	Abdominal Aortic Injury	
49	Critical Care		13:00-16:00	Fluids/Electrolytes/Acid Base	
50	Acute Care Surgery		13:00-16:00	Complicated Pancreatitis/Necrotizing Pancreatitis	

APPENDIX - C

2.2.6 RESEARCH ROTATION

Number of rotation WEEKS	First Year	Second Year	Total
	2	2	4- WEEKS

MEDICAL EXPERT

Goals:

- Demonstrate an understanding of the basic principles of research design, methodology, data analysis, and clinical epidemiology.
- To familiarize themselves with the ethical requirements of research and demonstrate an understanding of responsible use of informed consent.
- To practice appropriate methods for writing research proposals, manuscripts, data collection, and result analysis and discussion.

- To demonstrate awareness of the current research topics in TACS using available medical informatics systems.
- To skillfully present scientific presentations and participate in public discussions.

Training Methods

- The fellow must choose a supervisor to help in accessing the essential resources that will allow appropriate utilization of research skills and periodically discuss the progress.
- The fellow must finish the research proposal by the end of first 6 month and should be accepted by the institutional review board.
- Oral abstract of the study results should be presented at specified time point (e.g., end of final year before entering final exam), on the Specialty Research Day.
- The research paper should be sent at least 2 weeks before the Specialty's Research Day.
- It is highly desirable for fellows to work on presenting the research results at national and/or international meetings and aim to publish their work in indexed journals.

Evaluation

- Attendance at designated courses/lectures/workshops will be monitored and incorporated into the annual evaluation score.
- Panel scoring of the research abstract presentation will be conducted at the end of the pre-specified point year, on the Specialty's Research Day. This will count as the rotation score for that month.

COMMUNICATOR

- Demonstrate skills in conveying and discussing scientific research to scientific communities through posters, abstracts, and other scientific communication modalities.

- Communicate and collaborate effectively with research supervisor to conduct the research.

COLLABORATOR

- Identify, consult, and collaborate with appropriate experts, research institutions, and/or organizational bodies to facilitate the conduction research.

LEADER

- Identify an area of research interest and a research supervisor.
- Utilize available resources and regularly meet with identified research mentor.
- Utilize time effectively to optimize professional performance.

HEALTH ADVOCATE

- Recognize the contributions of scientific research in improving health of patients.

SCHOLAR

- Pose appropriate research questions, recognize, and identify gaps in knowledge around this question, and formulate appropriate study design to answer it.
- Carry out the research as outlined in the proposal.
- Collect and analyze data utilizing appropriate methods.
- Prepare abstracts and manuscripts suitable for publication in peer-reviewed journals and/or international scientific meetings.
- Identify research limitations and areas for further research.

PROFESSIONAL

- Uphold ethical and professional expectations of research consistent with institutional review board guidelines, including maintenance of meticulous data and conduct of ethically research.

- Demonstrate personal responsibility for setting research goals and working with supervisor to set and achieve research timeline objectives.
- Appropriately attribute authorship and contributions when publishing research
- Disclose potential financial conflicts of interest (including speaker fees etc.) as appropriate when engaging in and disseminating research results.

APPENDIX - D

(All the following sessions are 4 hours in length with 1:5 instructor to learner ratio)

Theme	Fellows Level	Objectives	Simulation Modality / Challenges
Communication / Patient Advocacy	FY-1	- Demonstrate appropriate communication skills to address medical errors. - Apply correct steps for medical error disclosure to colleagues & staff - Demonstrate leadership skills in dealing with complication in emergency - Demonstrate appropriate communication skills to address conflict - Apply correct steps in escalation conflict - Debrief team member/ staff on conflict event - Apply correct steps in taking consent in a timely manner - Demonstrate appropriate communication skills in taking consent - Differentiate the types of consent (implied, expressed, informed)	High Fidelity Simulation (Commercial), Standardized Patients

Theme	Fellows Level	Objectives	Simulation Modality / Challenges
Resuscitation	FY-2	- Perform REBOA - Perform central venous access through the subclavian vein - Perform resuscitative thoracotomy - Prepare treating team and equipment for extracorporeal membrane oxygenation - Perform Ultrasound-guided central venous access through the femoral vein - Perform Veno-Venous access for extracorporeal membrane oxygenation - Perform Veno-arterial access for extracorporeal membrane oxygenation - Select appropriate mode/parameters of extracorporeal membrane oxygenation - Demonstrate adequate CRM skills (e.g., communication, leadership, role clarity, situational awareness, shared mental model)	High Fidelity Simulation (Commercial) Need Model for Thoracotomy
Airway / US	FY-1	- Recognize the indications and contraindications for Rapid sequence Intubation - Perform ultrasound to identify endotracheal tube placement - Insert Laryngeal Mask Airway appropriately - Perform transtracheal jet ventilation - Perform cricothyroidotomy with different techniques	High Fidelity Simulation, Task Trainers, SPs Need Model for Pericardiocentesis

Theme	Fellows Level	Objectives	Simulation Modality / Challenges
		- Perform focused biliary ultrasound in patients with RUQ pain - Perform Ultrasound-Guided Pericardiocentesis - Perform endotracheal intubation in trauma patients - Perform Oropharyngeal & Nasopharyngeal airway insertion in trauma patients - - Perform LMA insertion in pediatric patients	
Surgical Skills	FY-1	- Perform Extended Focused Assessment with Sonography in Trauma (E-FAST) - Perform escharotomy of the upper limbs, lower limbs, torso, neck - Perform incision and evacuation of thrombosed external hemorrhoids - Perform removal of motorcycle helmet in trauma patient - - Recognize the anatomical landmarks for, and perform Nerve Blocks	Animal labs, Task Trainers (commercial and locally made)

APPENDIX - E

OPERATIVE ASSESSMENT & EVALUATION OF TRAUMA/ACUTE CARE SurgERY FELLOWS

CONSENT	1	2	3	4	5
Has knowledge of indications and alternatives to surgery					
Awareness of sequelae of operative & non operative management					
Sound knowledge of complications of surgery					
Explain the procedure to the patient / relatives and check understanding					
Explain likely outcome and time recovery and check understanding					
Check in theatre that consent has been obtained					
PRE OPERATIVE PLANNING	**1**	**2**	**3**	**4**	**5**
Recognize anatomical and pathological abnormalities					
Select appropriate operative strategies to deal with these abnormalities.					
Check materials, equipment, and device requirements with OR staff.					
Check patient records, personally review investigations.					
PRE OPERATIVE PREPARATION	**1**	**2**	**3**	**4**	**5**
Give effective briefing to theatre team					
Ensure proper and safe positioning of the patient					

on the operating table					
Ensure the operation site is marked where applicable.					
Ensure proper skin preparation and draping of the patient's operative field					
EXPOSURE AND CLOSURE	**1**	**2**	**3**	**4**	**5**
Optimum skin incision					
Adequate operative exposure and correct dissection in tissue planes.					
Identifies structures correctly					
Complete a sound wound closure					
Protect the wound with dressings and drains where appropriate					
INTRA OPERATIVE TECHNIQUE	**1**	**2**	**3**	**4**	**5**
Follow an agreed, logical sequence or protocol for the procedure					
Consistently handle tissue well with minimal damage					
Control bleeding promptly by an appropriate method					
Use a sound technique of knots and sutures/staples					
Use instruments appropriately and safely					
Anticipate and responds appropriately to variation e.g., anatomy					
Deals calmly and effectively with unexpected events/complications					

Use assistant(s) to the best advantage at all times					
Communicate clearly and consistently with the team					
Communicate clearly and consistently with the anesthetist					
POST OPERATIVE MANAGEMENT	**1**	**2**	**3**	**4**	**5**
Ensure the patient is transferred safely from the OR table to bed					
Construct a clear operative note					
Record clear and appropriate post operative instructions					

APPENDIX – F

Fellows Name			
Registration No.		HOSPITAL:	
Level of Training	☐ FY-1 ☐ FY-2	TEAM (Consultant)	
Rotation	☐ Trauma Surg. ☐ Acute Care Surg. ☐ ICU ☐ Vascular ☐ Thoracic Surg.		
Rotation Period	From: To:		

A rationale must be provided to support ratings with asterisks.		EXPECTATIONS				
		Poor	Below Average	Average	Above Average	Excellent
I. MEDICAL EXPERT						
a.	Applies basic behavioral and clinical knowledge to rapidly assess and manage patients with acute and/or undifferentiated illness or injury, ranging from minor to life-threatening presentations					
b.	Triages and sets appropriate priorities when dealing with single or multiple ill or injured patients					
c.	Elicits a relevant, concise history that is accurate to context and preferences. Performs a focused, accurate physical examination that is relevant to General Surgery practice					
d.	Generates well organized differential diagnoses that are compatible with known clinical information and that Include likely conditions and uncommon but serious conditions					
e.	Demonstrates effective clinical problem solving, judgment and appropriate use of presumptive management to address patient problems even In the presence of diagnostic uncertainty					
f.	Implements an effective, appropriate and time management plan in collaboration with a patient and his/her defined family unit including consultation requests and follow-up arrangements					
g.	Uses appropriate measures for protection of health care providers					
h,	Demonstrates overall proficient, safe and appropriate performance of common diagnostic &					

A rationale must be provided to support ratings with asterisks.		EXPECTATIONS				
		Poor	Below Average	Average	Above Average	Excellent
	therapeutic procedural skills with due attention to minimizing patient discomfort and complications					
i.	Describes the indications, contraindications. methods and complications of important but uncommon procedures used in the practice of Trauma/Acute Care Surgery					
j.	Understands and consistently practices appropriate infection control precautions in the performance of medical procedures					
k.	Effectively performs a consultation from another health care professional					
l.	Demonstrates an understanding of the principles of emergency preparedness & disaster management					
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the specific objectives and give specific examples wherever possible.						
II. PROCEDURES & CLINICAL SKILLS						
Demonstrates the ability to perform diagnostic and therapeutic procedures described in the Medical Expert section of the Objectives of Training In Trauma/Acute Care Surgery document.						
a.	Minor diagnostic procedures relevant to the practice of Trauma/Acute Care Surgery					
b.	Diagnostic procedures relevant to all age groups and to the critically ill patient (e.g. DPL)					
c.	Targeted Emergency Department ultrasound examinations (e.g. FAST Scan)					

A rationale must be provided to support ratings with asterisks.		EXPECTATIONS				
		Poor	Below Average	Average	Above Average	Excellent
d.	Basic and advanced airway management					
e.	Therapeutic procedures for the critically ill patient (e.g. Chest Tube)					
f.	Peripheral and central vascular access and line insertion/monitoring					
g.	Therapeutic procedures relevant to the daily practice of Trauma/Acute Care Surgery					
i,	Care and techniques of simple and complex wound repair					
j.	Foreign body extraction from soft tissue (e.g. removal of foreign body from skin tissues)					
k.	Definitive interventions for soft tissue infections (e.g. I & D abscess)					
Overall is proficient in clinical and procedures skills. Minimizes risks and discomforts to the patient.						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the specific objectives and give specific examples wherever possible.						
III. COMMUNICATOR						
a.	Effectively facilitates a clinical encounter with a patient, their family and relevant health professionals that is characterized by trust, respect, and shared decision-making					

A rationale must be provided to support ratings with asterisks.		EXPECTATIONS				
		Poor	Below Average	Average	Above Average	Excellent
b.	Demonstrates attentiveness to and respect for the effects of patient characteristics on decision-making, including but not limited to age, gender, cultural background, expectations an illness					
c.	Effectively addresses specific communication challenges such as obtaining informed consent, delivering bad news, or maladaptive emotions and team-based care and crisis situations					
d.	Maintains appropriate records of clinical encounters and plans including appropriate consultation reports to referring professionals					
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings.						
IV. COLLABORATOR						
a.	Works effectively in a multidisciplinary team and practicing team ethics, including confidentiality, appropriate resource allocation, respect for individuals and professionalism					
b.	Optimizes and expedites patient care through effective delegation and/or coordination of the activities of multiple consulting services and/or health care professionals					
c.	Demonstrates leadership in a multidisciplinary team					

A rationale must be provided to support ratings with asterisks.		EXPECTATIONS				
		Poor	Below Average	Average	Above Average	Excellent
d.	Responds positively to requests for help or advice, including but not limited to those from learners, other physicians and health care professionals					
e.	Works with other professionals to prevent conflicts and employs collaborative negotiation to resolve conflicts that do occur					
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings.						
V. MANAGERIAL SKILLS						
1.	Applies evidence to deliver cost-appropriate care, balancing effectiveness, efficiency, and access with optimal patient care					
2.	participates in systematic evaluation and improvement, such as patient safety initiatives and physician performance review					
3.	Demonstrates the fundamental knowledge and skills needed to provide medical leadership to an Trauma/Acute Care Surgery Services system					
4.	Addresses emergency department demands through development of patient care protocols, and specific strategies to manage Trauma/Acute Care Surgery crowding					
5.	Facilitates management of unexpected surges in patient numbers and/or acuity including those associated with real or simulated disasters					

A rationale must be provided to support ratings with asterisks.		EXPECTATIONS				
		Poor	Below Average	Average	Above Average	Excellent
6.	Addresses medical misadventure and complaints from patients, family members and colleagues					
7.	Manages clinical, academic, administrative, and personal responsibilities in the context of a group of emergency physicians					
8.	Sets priorities and manages time to balance patient care, practice requirements, outside activities and personal life					
9.	Serves in administration and leadership roles as appropriate, including participating in meetings, scheduling tasks, and implementing change					
VI.	HEALTH ADVOCATE					
a.	Identifies the health needs of individual patients and identifies opportunities for advocacy, health promotion and disease prevention					
b.	Describes the practice communities that serve including vulnerable Populations; identifies opportunity unities for advocacy, health promotion and disease prevention in those communities; and responds appropriately					
c.	Considers competing interests between the communities served and other populations and between their role as a health advocate for a patient or community and that of a manager					
d.	Identifies points of influence in the health care system, recognizes the role of public policy, and understands the role of the medical profession in advocating collectively for health & patient safety					

A rationale must be provided to support ratings with asterisks.		EXPECTATIONS				
		Poor	Below Average	Average	Above Average	Excellent
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings.						
VII. SCHOLARLY ACTIVITIES						
a.	Demonstrates the principles of maintenance of competence and personal knowledge management systems					
b.	Effectively and critically appraises evidence to address a clinical question and integrates conclusions into clinical care					
c.	Teaches effectively, efficiently and respectfully at the bedside					
d.	Designs and delivers effective lectures or presentations					
e.	Poses scholarly questions, conducts a systematic search for evidence, and selects and applies appropriate methods to address the questions					
f.	Adheres to the principles of research and education ethics					
Comments: Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the specific objectives and give specific examples wherever possible.						
VIII. PROFESSIONALISM						
a.	Exhibits appropriate professional behaviors in practice, including but not limited to: honesty, integrity, commitment, compassion, respect and altruism					

A rationale must be provided to support ratings with asterisks.		EXPECTATIONS				
		Poor	Below Average	Average	Above Average	Excellent
b.	Recognizes and appropriately responds to ethical issues and conflicts of interest encountered in practice					
c.	Recognizes the principles and limits of patient confidentiality as defined by professional practice standards and the law					
d.	Fulfills the regulatory and legal obligations required of current practice and demonstrates accountability to professional regulatory bodies					
e.	Participates in peer review and recognizes and responds to others' unprofessional behaviors in practice					
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings.						

Name of Evaluator . DR. . Signature .....

Date

Official Use

Total Score ---------- x 20 = ...%

No of Evaluated Items

Name: Dr. Signature: .....

Date: .....

Director, Trauma Surgery Fellowship Training Program

Fellow Signature (That he saw the evaluation form): ..... Date: .....

REFERENCE

Glover Takahashi S, Abbott C, Oswald A, Frank JR. Can MEDS Teaching and Assessment Tools Guide. Ottawa: Royal College of Physicians and Surgeons of Canada; 2015.

APPENDIX - G

There are a number of surgical textbooks currently available. Each textbook is written in a different format and may not be suitable for every FELLOW. Each FELLOW should have a minimum of four types of surgical books: Two large texts or reference books, a pocket book (to be read on the wards, at outpatients or in theatre), and a self-assessment book. The following are some of the more popular books available and used by FELLOW currently.

Textbooks:

Manual of Definitive Surgical Trauma Care; by Kenneth Broffard

Atlas of Surgical Techniques in Trauma; by Demetrios Demetriades

ATOM (Advanced Trauma Operative Management); Surgical Strategies for Penetrating Trauma, 2nd Edition. By Lenworth M. Jacobs, M.D.; Stephen S. Luk, M.D.

Current Therapy of Trauma and Surgical Critical Care, 2nd Edition; by Juan A. Asensio, MD, FACS & Donald D. Trunkey, MD, FACS

Top Knife; by Kenneth Mattox

Essential Emergency Trauma

Clinical Surgery; by Cuschieri,

Essential Surgery; Burkitt, Quick, Deakin Churchill Livingstone

Principles and Practices of Surgery

Atlas of Abdominal Wall Reconstruction; by Micheal J. Rosen

Manual of Complex Wall Reconstruction

Pocket Books:

The Trauma Manual: Trauma and Acute Care Surgery (5th Edition); by Andrew B. Peitzman

Surgery; Churchill Livingstone

Self-assessment book:

Surgical Recall; by Blackbourne

Surgical Short Cases & Surgical MCQ's

APPENDIX – H

REFERENCES

1) Glover Takahashi S, Abbott C, Oswald A, Frank JR. Can MEDS Teaching and Assessment Tools Guide. Ottawa: Royal College of Physicians and Surgeons of Canada; 2015.
2) Curricula@scfhs.org.sa
3) Website: www.scfhs.org.sa ; Saudi Commission for Health Specialties P.O. Box: 94656 Postal Code: 11614 Contact Center: 920019393
4) American College of Surgeons; Committee on Trauma (COT)
5) History and development of trauma care in the United States; Clin Orthop Relat Res ; 2000 May;(374):36-46
6) https://www.moh.gov.sa/en/Ministry/Statistics/Pages/Traffic-accidents.aspx