



# Palestinian General Surgery Residency Program

## Training Syllabus

### January 2015



**USAID**  
FROM THE AMERICAN PEOPLE

يخوّر للإتفاء الصّحي والإتفامّي  
Juzoor for Health & Social Development



**IntraHealth**  
INTERNATIONAL  
Because Health Workers Save Lives.



# Table of Contents

Palestinian General Surgery Residency Program Training Syllabus.....	4
Foreward .....	5
Preface .....	6
Background .....	7
Acknowledgements.....	8
Introduction to this Syllabus .....	10
Organization of the Syllabus .....	10
Section 1: Skills Domains.....	12
Section 2: Overview of Syllabus .....	15
Years 1 - 2.5 – The Early Years .....	15
Years 2.5-5 – Specialization in General Surgery – The Later Years .....	16
The Palestinian General Surgery residency program at a glance .....	17
Section 3: Technical Content of Syllabus .....	27
THE EARLY YEARS (YEARS 1 - 2.5).....	27
Module 1: Basic Sciences .....	27
Module 2: Basic Surgical & Life Support Skills .....	28
Module 3: Common Surgical Conditions.....	29
Module 4: Patient care & follow up.....	31
Module 5: Peri-operative care .....	32
THE LATER YEARS (YEARS 2.5 – 5).....	35
Module 1: Basic Sciences .....	35
Module 2: Basic Surgical & Life Support Skills .....	35
Module 3: Common Surgical Conditions .....	35
Section 4: Organisation of the residency program .....	42
Section 5: Teaching and learning methods.....	42

Section 6: Assessment methods ..... 43

    Exams ..... 43

    Case Report diary ..... 43

    Logbook ..... 43

    Basic Surgical & Life Support Course outcomes ..... 43

    Multisource Feedback ..... 43

    Annual Report ..... 44

Section 7: Assessing the Syllabus and its Implementation ..... 44

Section 8: References ..... 45

# **Palestinian General Surgery Residency Program Training Syllabus**

**2015 Version**

The pages that follow represent the combined efforts, commitment and dedication of a group of professionals to review and revise the Palestinian General Surgery Residency Training Syllabus. The overall aim of this endeavor is to raise standards in General Surgery post-graduate medical education on a national level and meet the health needs of the population as relates to the specialty.

These efforts have been supported by the Palestinian Health Capacity Project (PHCP), funded by USAID and implemented by Intrahealth International and Juzoor for Health and Social Development.

The aim of this syllabus is to provide detailed technical content for use in the general surgery residency programs under the Palestinian National Residency Program. It is hoped that the enclosed information will enhance the uniformity and standardization of general surgery post-graduate medical education, according to evidence-based knowledge and practices, and ultimately contribute to improving the quality of surgical care provided to Palestinian patients.

Effective implementation of this syllabus is contingent upon the support of the Palestine Medical Council and clinical training institutions (Ministry of Health and NGOs) to ensure that sufficient resources (including but not limited to materials, equipment, human resources, management, supervision and monitoring) are available, and that residency program directors, clinical instructors and residents are oriented to the syllabus' content.

# Foreward

## Preface

In 2014, as a result of a series of inclusive discussions and consultative meetings held with the Palestine Medical Council (PMC), the Palestinian Ministry of Health (PMoH) and key stakeholders in the medical community, review of national medical residency programs emerged as a priority issue. In response, under the Palestinian Health Capacity Project (PCHP) funded by USAID, Juzoor for Health and Social Development and the Palestine Medical Council (PMC) coordinated to review and revise the general surgery residency training syllabus.

The revision process was done with the significant input and involvement of the Palestine Medical Council headed by his Excellency the Minister of Health, and has been enthusiastically supported by the Secretary General and the Surgery Scientific Committee (Scientific Committee), as well as the Palestinian Ministry of Health (PMoH) and other key stakeholders in the general surgery community. Review and elaboration of the residency training syllabus was done by local and international consultants according to international standards and competency frameworks and the latest evidence-based knowledge and practices. The Royal College of Surgeons Edinburgh supported the revision through advising on the structure and content of the syllabus, and sharing their rich professional expertise in the overall process. The Scientific Committee and key stakeholders in the surgical community played a major role in informing the content of the syllabus, providing feedback and suggestions, and ultimately endorsing the document.

The contents of this syllabus and further instructions related to the general surgery residency program may be clarified or expanded upon by the Palestine Medical Council, in accordance with their mandate, through issuance of specific written communication and periodic notices.

## Background

The Palestinian national residency program began in 2008 under the auspices of the Palestine Medical Council (PMC). Prior to the establishment of the national program, three Palestinian hospitals were accredited by the Jordanian Medical Council (JMC) as training centres. Al Makassed Hospital in Jerusalem was the only centre with a fully accredited residency in General Surgery for all training years, having held accreditation from the (JMC) since 1988. Physicians were eligible to obtain partial specialty recognition from the JMC for time spent in service at select West Bank hospitals, according to a system of 1 year of specialty recognition for 2 years of service in a surgical unit, up to a maximum of two years. The remaining years of specialty training needed to be completed in a fully recognized facility in either Jordan or in Al Makassed, in addition to successful completion of the Jordanian Board exam. The system of recognition by the JMC for training undertaken at Al Makassed or in select West Bank hospitals continued until 2008.

The Palestine Medical Council was formed in 1996 and its status as an independent scientific medical body was established by the Palestinian Legislative Council in Law Number (1) in the year 2006. The PMC offered the first Palestinian Board exam in November 2001 for six medical specialties (among them general surgery) and has offered exams in several specialties on a regular basis since then. The Council has the authority to arrange Board examinations to certify physicians in all specialties and sub-specialties, even those not offered in local residency programs. Law Number (1) established the authority of the PMC to (among other powers) set criteria for specialty medical training and be the sole body to certify physicians as specialists (this applied from 2006 onwards and did not change the status of specialists recognized prior to then by either the PMC or the JMC). Certification by the PMC is a basic requirement of specialist physician licensing.

In establishing the national residency programs, the PMC adopted the Arab Board of Health Specializations' accreditation criteria, including for the general surgery specialization. The Arab Board outlines the overall aims of general surgery residency training, specifies objectives per year of the 5 training years, and specifies certain skills the resident should acquire throughout training, including the minimum number of surgical procedures to be performed. It provides guidance on a variety of scientific and administrative issues such as examination and evaluation, scientific references, and accreditation principles for hospital training centers and requirements of program directors.

The below syllabus is intended to provide residents, clinical preceptors and the Palestine Medical Council with detailed technical content to assist in the implementation of the Palestinian General Surgery Residency Training program, in accordance with the Palestinian and Arab Board requirements.

## Acknowledgements

This syllabus could not have been developed without valuable contributions from several organizations, health professionals and experts who gave of their precious time and expertise.

The following organizations and individuals are hereby acknowledged for significant contribution to the preparation, writing and review of this syllabus:

### Organizations:

- The Palestine Medical Council, headed by his Excellency Dr. Jawad Awad, Minister of Health, for partnership with PHCP, and providing vision and leadership to guide this process
- The Palestinian Ministry of Health, for its partnership with PHCP, contribution and overall support for the revision process
- The Specialized Scientific Committee for General Surgery and Surgical Sub-specialties at the Palestine Medical Council, for actively participating at all stages of the revision process, providing feedback and suggestions on the content, and for being advocates for improving standards in post-graduate surgical education.
- Juzoor for Social and Health Development for overseeing the development of this training syllabus
- Intrahealth International
- The Palestinian Surgeons' Society
- Palestinian Ministry of Health training hospitals in general surgery: Hebron, Beit Jala, Rafidia, Tulkarem, Jenin, Palestine Medical Complex
- Al Makassed Hospital, Jerusalem
- Al Ahli Hospital, Hebron
- Augusta Victoria Hospital, Jerusalem
- An Najah University Hospital, Nablus
- The Royal College of Surgeons, Edinburgh

### Individuals:

- His Excellency Dr. Jawad Awad, Minister of Health, for his overall leadership of the health sector and commitment to improving the health of all Palestinians
- Dr. Suleiman Barqawi, Secretary General of the Palestine Medical Council, for his unfailing support and active engagement at all stages
- Dr. Mohammad Abu Ghali, Director General, MoH Hospital Directorate, for his support and contributions, and for ensuring MoH representation in this process
- Dr. Mohammad Louai Al-Mubaied, Consultant, for his significant contributions in developing the syllabus
- Dr. Fahmi Jubran, Consultant, for his significant contributions in developing the syllabus
- Dr. Ruth McKee, Consultant, for her significant contributions in developing the syllabus
- Dr. Omar Abdel Shafi, member, Surgery Scientific Committee, Palestine Medical Council
- Dr. Hamouda Al-Faqih, member, Surgery Scientific Committee, Palestine Medical Council
- Dr. Osama Attallah, member, Surgery Scientific Committee, Palestine Medical Council
- Dr. Mohammad Aref, member, Surgery Scientific Committee, Palestine Medical Council
- Dr. Walid Elian, member, Surgery Scientific Committee, Palestine Medical Council
- Dr. Haitham al Hassan, Al Makassed Hospital
- Dr. Salwa Najjab, Executive Director, Juzoor for Health and Social Development
- Dr. Umayyeh Khamash, Chief Health West Bank Program, UNRWA
- Ms. Stephanie M. Hansel, Technical Specialist Education and Credentialing, PHCP / Juzoor



- Numerous Palestinian surgeons from the MoH, private and NGO sectors who actively participated in discussion sessions and provided recommendations on the syllabus revision
- Medical and surgical residents who shared their experiences in the local residency programs and provided valuable perspectives that informed the revision process

## **Introduction to this Syllabus**

This document outlines the knowledge, attitudes, behaviors and skills that residents are expected to have acquired by the end of their specialty training in the General Surgery Palestinian National Residency Program. This syllabus provides a detailed guide for the content of general surgery residency training across all years of the program. The syllabus is intended for use by residents, instructors, training facilities, training program directors, the Medical Council, and others involved in surgery education.

Residents should carefully review this syllabus and ensure that they are meeting the required competencies, gaining the necessary knowledge and acquiring the appropriate skills outlined in this document. As adult learners, it is expected that residents take responsibility for their own progress and actively seek out opportunities to learn and benefit from the knowledge and experience of peers, instructors, other health care professionals, and patients and their families. It is also expected that residents will engage in on-going self-reflection and self-evaluation and direct their own learning to continually challenge themselves to development as surgeons. Residents should encourage constructive feedback from their instructors, peers, other health care professionals, and patients and their families, as an opportunity to grow professionally and improve their practice.

Instructors in the General Surgery Residency program should be thoroughly familiar with the knowledge and procedures on which the syllabus is based, skilled in the practices described and have a positive attitude towards residents and their own work as educators. As mentors and teachers of the next generation of Palestinian surgeons, it is expected that instructors will model the same high standards in professional practice, attitudes and behavior as expected of their residents. Instructors have a responsibility to provide constructive feedback to residents that is timely, specific and assists learners in improving their performance. It is highly recommended that instructors attend an “Educating the Educators” or other relevant course to hone their teaching skills.

Training facilities and program director will find this syllabus useful to further develop materials and set the teaching schedule for each year of the General Surgery residency program. Other medical educators may find this syllabus useful as a model for adaptation in teaching programs in related or different specialties as well.

## ***Organization of the Syllabus***

The syllabus is divided into sections:

- Section 1: Skills Domains – this section outlines the skills domains that every General Surgeon should become competent in
- Section 2: Overview of the Syllabus – this section provides a concise overview of the syllabus and the residency program as a whole
- Section 3: Technical Content of Syllabus – this section provides the details per the technical modules (Modules 1-5) according to each segment of the residency period (the Early Years, years 1-2.5 and the Later Years, years 2.5 – 5).
- Section 4: Organization of the residency program

- Section 5: Teaching & Learning Methods – this section provides an overview of the teaching and learning methods employed to support delivery of the syllabus
- Section 6: Assessment Methods – provides an overview of the assessment methods that will be used in assessing residents' performance
- Section 7: Assessing the Syllabus and its Implementation – outlines the ways in which the implementation of this syllabus will be assessed
- Section 8: References – a list of the references upon which this syllabus is based is provided, as well as other useful references

## Section 1: Skills Domains

The Palestinian General Surgery residency program is based on the vision of the Palestinian General Surgeon as one who is a safe, competent and professional specialist providing excellent evidence-based patient care, and who contributes to promoting the profession of General Surgery. A Palestinian General Surgeon's care is provided in respectful collaboration with other healthcare professionals and is delivered through effective communication with patients and families, within the boundaries of the General Surgery specialty, within the Surgeon's own professional expertise, appropriate to the healthcare setting and the patient's preferences, and to the wider social context.

The below six skills domains were identified through stakeholder discussion and agreement and draw on international and local concepts of the skills that every General Surgeon needs to develop and reinforce throughout their training in order to provide safe, evidence-based patient care that leads to better outcomes. This framework outlines the domains all General Surgeons should become competent in; it provides an overall structure to the residency program to direct training towards producing General Surgeons who possess these skills and emulate these qualities in the daily practice of their profession. The skills domains are integrated throughout the training syllabus which further defines the specific knowledge, skills, attitudes and behaviors required in each specific domain and in each year of the program. These domains also form the basis of resident assessment and evaluation throughout training. The below skills domains have been adapted from the Royal College of Physicians and Surgeons Canada CanMEDS and the American College of Graduate Medical Education competency frameworks, and have been endorsed by key local stakeholders.

The skills domains are:

1. Surgical Specialty
2. Interpersonal & Communication skills
3. Team work & Inter-professional collaboration
4. Leadership Promotion
5. Teaching and Learning
6. Professionalism & Ethics

Skills Domain	Why is the skill domain important?	What is the skill domain and how is it developed?
<b>Surgical Specialty</b>	This is the central skill that integrates all of the other skills domains outlined in this framework. The surgeon applies his or her surgical knowledge, clinical and technical skills, and professional attitudes and behaviors to provide safe, patient-centered care.	The resident develops the knowledge, skills, attitudes and behaviours to provide patient-centered care that is medically appropriate, informed by scientific evidence, and effective for the prevention and treatment of health problems and the promotion of health. This requires skills in consultation; critical thinking and analysis;

		assessment, diagnostic and therapeutic (operating) skills; as well as in prioritizing professional duties. The Surgical Specialty domain is central to the function of physicians and draws on the competencies included in the domains of Interpersonal & Communication skills, Team work & Inter-professional collaboration, Leadership, Teaching and Learning, and Professionalism & Ethics.
<b>Interpersonal &amp; Communication skills</b>	To facilitate the doctor-patient relationship and interact with patients, family members, other care givers and other health professionals, the surgeon demonstrates excellent Interpersonal and communication skills.	The resident is expected to develop the knowledge, skills, attitudes and behaviors that allow him/her to effectively exchange information and collaborate with patients, their family, and other health professionals.
<b>Team work &amp; Inter-professional collaboration</b>	The surgeon values the input of his/her colleagues from various professions, is able to leverage their expertise, and is able to work appropriately and effectively within a multi-disciplinary healthcare team to achieve optimal patient care.	The resident is expected to develop the knowledge, skills, attitudes and behaviors that allow him/her to work in partnership with other professionals in a modern, multi-professional environment and prevent, negotiate, and resolve inter-professional conflicts. Thus, the resident both benefits from the expertise of other professionals, and shares his/her expertise with the team for the benefit of patients.
<b>Leadership Promotion</b>	The surgeon develops leadership abilities which include skills in management and effective resource allocation.	The resident is expected to develop knowledge, skills, attitudes and behaviors which promotes his/her leadership abilities, such as: setting priorities; managing his/her time with regards to patient care, department requirements, provision of outside services and personal

		life; and setting long-term goals.
<b>Teaching and Learning</b>	The surgeon is committed to the learning process as the primary focus of his/her residency years and to continuous education as a core element of his/her professional life at all stages. This skills domain concerns both the surgeon's own learning and his/her ability to teach others.	The resident is expected to develop the knowledge, skills, attitudes and behaviors that allow him/her to: maintain and enhance professional scientific activities through on-going, self-learning based on reflection and self-evaluation; critically appraise and adopt evidence-based technologies and techniques into his/her practice to improve patient care; and contribute to the creation, dissemination, application and translation of medical knowledge particularly in the field of surgery through involvement in research.
<b>Professionalism &amp; Ethics</b>	The surgeon is a professional and ethical practitioner. Medical professionalism and ethics are based on the principles of primacy of patient welfare, patient autonomy, and social justice. It involves commitment to the following: professional competence, honesty with patients, patient confidentiality, maintaining appropriate relations with patients, improving quality of care, improving access to care, just distribution of finite resources, scientific knowledge, maintaining trust by managing conflicts of interest, and professional responsibilities.	The resident is expected to develop the knowledge, attitudes, skills and behaviors to maintain high personal and professional standards that: demonstrate a commitment to the profession through active membership in professional groups, and through complying with laws and by laws of their country and profession; engenders the trust and respect of their patients and the public; and that reflects an understanding and application of ethical principles in their practice.

## Section 2: Overview of Syllabus

### *Years 1 - 2.5 – The Early Years*

The early years of surgical training focus on the acquisition of appropriate basic skills in patient care, both in and out of the operating theatre, as well as provide a strong foundation in the other “skills” with a particular emphasis on Interpersonal & Communication Skills and Professionalism & Ethics. The other “non-technical skills” are reflected in the syllabus of the early years but become more essential in later years.

The first year will be spent in general surgery. This should be followed by a period of rotation through subspecialties as outlined below.

Specialty rotations:

The resident will spend a total of 18 months in specialty rotations in both mandatory (15 months) and elective (3 months) rotations. Specialty rotations should be completed by the end of 2.5 years. The following specialty rotations are mandatory:

- Anesthesiology & ICU (3 months)
- Accident & Emergency (3 months)
- Neurosurgery (3 months)
- Urology (3 months)
- Thoracic (3 months)

The rotations to anesthesiology & ICU and accident & emergency will enable to resident to gain knowledge and skills in a wide variety of common surgical conditions, with particular emphasis on peri-operative care as described below. During this rotation it is expected that residents will be exposed to all surgical trauma cases irrespective of the specialty (including orthopedic traumas presenting in the emergency unit).

Pediatrics and plastic surgery are integrated into the general surgery program in the core syllabus, thus they are not considered as mandatory specialty rotations.

Three months may be spent in an elective specialty rotation of the resident’s choosing, based on his/her interest and the availability of specialty services in the teaching hospital.

In facilities where rotations to cardiothoracic surgery and neurosurgery specialties may not be possible, residents still need to provide evidence that they have gained the basic skills in these areas (ex: head injuries, chest drain insertion) through the logbook.

## ***Years 2.5-5 – Specialization in General Surgery – The Later Years***

The second half of training is to be spent in general surgery. The aim is to achieve a surgeon who is able to manage common and straightforward conditions safely and independently and who demonstrates excellent non-technical skills that are essential to patient care. It is not expected that complete competence in major surgery will be gained by 5 years and the new specialist should be wise in referring difficult cases to more experienced or specialized surgeons.

During these years it is expected that all of the general surgery modules detailed will be revisited in more detail, as explained below.



## *The Palestinian General Surgery residency program at a glance*

Primary Skill Domain Emphasized	Module	Delivered through	Teaching methods	Years 1 - 2.5 Module Objectives	Year 1-2.5 Assessment	Years 2.5 - 5 Module Objectives	Year 2.5-5 Assessment
<b>Surgical Specialty; Teaching &amp; Learning</b>	1: Basic Sciences	All departments	Lecture series, Self-learning, Seminars, On-line courses, Surgical-Pathological conference, Surgical – Radiological conference	<p><u>In the domain of Surgical Specialty :</u> To gain knowledge of the basic science underlying the care of the surgical patient</p> <p><u>In non-technical skills domains:</u> To gain the knowledge, skills, attitudes and behaviors in the Teaching &amp; Learning domain appropriate to the Early Years, as describe below</p>	Board Part 1 exam (at end of Year 2, before start of Year 3)	<p><u>In the domain of Surgical Specialty:</u> To gain knowledge at an advanced and applied level to support the practical skills of the surgical expert</p> <p><u>In non-technical skills domains:</u> To gain more advanced knowledge, skills, attitudes and behaviors in the Teaching &amp; Learning domain appropriate to the Later Years, as described below</p>	Board Part 2 exam after satisfactory completion of year 5, with satisfactory structured Annual Report for year 5 and satisfactory Logbook.

<p style="text-align: center;"><b>Surgical Specialty; Teamwork &amp; Inter professional collaboration; Leadership; Teaching &amp; Learning</b></p>	<p>2: Basic Surgical &amp; Life Support Skills</p>	<p>Courses</p>	<p>Accredited Basic Surgical Skills course, Accredited Basic Life Support course, Accredited Advanced Trauma Life Support course</p>	<p><u>In the domain of Surgical Specialty :</u> To gain the skills which will form the essential foundation for operative surgery and the care of the patient who has a cardiorespiratory arrest.</p> <p><u>In non-technical skills domains:</u> To gain the knowledge, skills, attitudes and behaviors in the skills domains of Teamwork &amp; Interprofessional collaboration; Leadership; Teaching &amp; Learning, appropriate to the Early Years, as describe below</p>	<p>Knowledge &amp; practical skills exams in BSS AND BLS courses and in Annual report condition to Board exam entrance</p>	<p><u>In the domain of Surgical Specialty:</u> To gain the skills to safely and reliably manage the injured trauma patient.</p> <p><u>In non-technical skills domains:</u> To gain more advanced knowledge, skills, attitudes and behaviors in the skills domains of Teamwork &amp; Inter-professional collaboration; Leadership; Teaching &amp; Learning appropriate to the Later Years, as described below</p>	<p>ATLS course outcome  Annual Report - structured</p>
--	--	----------------	--	---	--	--	--

<p><b>Surgical Specialty, Interpersonal &amp; Communication Skills; Team work &amp; Inter-professional collaboration; Leadership; Teaching &amp; Learning; Professionalism &amp; Ethics</b></p>	<p>3: Common Surgical Conditions</p>	<p>General surgery but with rotations to other departments as described above during year 2 and 3.</p>	<p>Self-learning, Bed-side teaching, Rounds (presenting investigations, presenting real cases), Case-based studies, Problem-based learning, In-theatre surgical assisting</p> <p>Supervised operating</p>	<p><u>In the domain of Surgical Speciality:</u> To gain basic knowledge of common surgical conditions and the operations used to treat them. To acquire basic surgical skills specific to these operations to enable the resident to perform minor surgery and to assist and perform parts of major surgical procedures.</p> <p><u>In non-technical skills domains:</u> To gain the knowledge, skills, attitudes and behaviors in the skills domains of Interpersonal &amp; Communication Skills; Teamwork &amp; Inter-professional collaboration; Leadership; Teaching and Learning; and Professionalism &amp; Ethics appropriate to the Early Years, as described below</p>	<p>Case report diary</p> <p>Logbook</p> <p>BSS course outcome</p> <p>Operative Competency Assessment Tool (TBC)</p> <p>Annual report – structured</p>	<p><u>In the domain of Surgical Specialty:</u> To gain more advanced and detailed knowledge of common surgical conditions and the operations used to treat them.</p> <p>To acquire surgical skills specific to these operations to enable the resident to perform most common operations as listed below.</p> <p>To acquire the knowledge and skills to enable assessment and appropriate referral of cases requiring more specialist treatment.</p> <p><u>In non-technical skills domains:</u> To gain more advanced knowledge, skills, attitudes and behaviors in the skills domains of Interpersonal &amp; Communication Skills; Teamwork &amp; Inter-professional collaboration; Leadership; Teaching and Learning; and Professionalism &amp; Ethics, as described below</p>	<p>Case report diary</p> <p>Logbook</p> <p>Operative Competency Assessment Tool (TBC)</p> <p>Annual report – structured</p>
---	--------------------------------------	--	---	---	---	--	---

	4: Patient Care + Follow up	All departments	Self-learning Bed-side teaching, Rounds (presenting investigation, present), Case-based studies, Problem-based learning, Case-presentations, On-line courses	<p><u>In the domain of Surgical Specialty:</u> To demonstrate the relevant knowledge, skills, attitudes and behaviors in assessing the patient, planning surgery or conservative management and follow-up.</p> <p><u>In non-technical skills domains:</u> To gain the knowledge, skills, attitudes and behaviors in the skills domains of Interpersonal &amp; Communication Skills; Teamwork &amp; Inter-professional collaboration; Leadership; Teaching &amp; Learning; and Professionalism &amp; Ethics appropriate to the Early Years, as described below</p>	Case report diary  Annual report – structured	<p><u>In the domain of Surgical Specialty:</u> To demonstrate advanced and detailed knowledge, skills and attitudes to assess and manage the patient with the listed conditions, and propose appropriate surgical or non-surgical management (see below).</p> <p><u>In non-technical skills domains:</u> To gain more advanced knowledge, skills, attitudes and behaviors in the skills domains of Interpersonal &amp; Communication Skills; Teamwork &amp; Inter-professional collaboration; Leadership; Teaching &amp; Learning; and Professionalism &amp; Ethics, as described below</p>	Case report diary  Annual report – structured
	5: Peri-operative care	A+E and ITU rotation  + all other departments	Self-learning Bed-side teaching, Rounds (presenting investigation, present), Case-based studies,	<p><u>In the domain of Surgical Specialty:</u> To gain knowledge, skills and behaviors to enable safe pre, intra and post operative care</p> <p><u>In non-technical skills domains:</u> To gain the knowledge, skills, attitudes and behaviors in the skills domains</p>	BLS course outcome  Case report diary  Annual report –	<p><u>In the domain of Surgical Specialty:</u> To demonstrate more advanced and detailed knowledge and clinical skills to manage the patient with the listed conditions during the perioperative period (see</p>	ATLS course outcome  Case report diary  Annual report –

			Problem-based learning, Case-presentations	of Interpersonal & Communication Skills; Teamwork & Inter-professional collaboration; Leadership; Teaching & Learning; and Professionalism & Ethics appropriate to the Early Years, as described below	structured	below).  <u>In non-technical skills domains:</u> To gain more advanced knowledge, skills, attitudes and behaviors in the skills domains of Interpersonal & Communication Skills; Teamwork & Inter-professional collaboration; Leadership; Teaching & Learning; and Professionalism & Ethics, as describe below	structured
<b>Interpersonal &amp; Communication skills</b>	6: Communication Skills	All Departments	Communication Skills course in Year 1	To gain the knowledge, skills, attitudes and behaviors to communicate clearly and effectively with patients, their family members, and other healthcare providers.	MSF  Annual Report-structured	To develop the knowledge, skills, attitudes and behaviors to communicate complex and difficult information to patients, their family members, and other healthcare professionals.	MSF  Annual Report-structured

Professionalism & Ethics	7: Ethics	All departments	Lectures, small group discussions, moderated on line forums	To gain a foundational knowledge of ethical principles involved in the surgical care of patients and develop the values of patient centered care, impartiality, honesty and integrity.	MSF Annual Report-structured	To further develop the knowledge, skills, attitudes and behaviors that reflect an understanding and application of ethical reasoning and principles in the care of patients and in other aspects of the surgeon's professional practice.	MSF Annual Report-structured
--------------------------	-----------	-----------------	---	--	---------------------------------	--	---------------------------------

### Non-technical Skills Domains

The below chart outlines the objectives in each of the non-technical skills domains. It is intended as a guide to elaborate the knowledge, skills, attitudes and behaviors residents are expected to achieve in each portion of their training. It is expected that as the resident progresses throughout his/her residency program, s/he will gain more experience and reach more advanced levels of competence in each of the domains. Where noted, some objectives are considered foundational and the resident is expected to meet them in the Early Years of training, in order to build on them and reach more advanced objectives in the Later Years. For all skills domains, it should be understood that objectives in the Later Years do not replace the objectives of the Early Years, that is, residents should continue to meet the Early Years objectives while striving to meet the additional objectives mentioned in the Later Years. By the end of the training period, the resident is expected to have met all of the Early and Later Years objectives in the non-technical skills domains. It is recognized that some residents will have experiences and abilities which allow them to meet some of the Later Years objectives prior to year 2.5 of the residency program, and this can be noted by the supervisor in the Annual Reports.

**Skills Domain: Interpersonal & Communication Skills**

*Objectives in the Early Years (Years 1 – 2.5)*

*Objectives in the Later Years (Years 2.5 – 5) - building on the Early Years objectives, and additionally:*

Knowledge:

- Know the basic elements of good communication and interviewing techniques

Skills:

- Develop rapport & trust with patients and family members through active listening
- Elicit and synthesize relevant information from patients
- Convey effective oral and written information about a medical encounter (documentation in patient files, writing medical reports)

Attitudes:

- Appreciate the importance of respect, empathy and compassion in effective communication with patients, family members and other healthcare providers

Behaviors:

- Display respect for patients', their family members' and other healthcare providers' beliefs, concerns, expectations

Knowledge:

- Know advanced elements of communication and interviewing techniques

Skills:

- Convey information and explanations to patients and families, and other professional colleagues of different educational, socioeconomic and cultural backgrounds
- Conduct health promotion with patients and their families
- Effectively address challenging communication (delivering bad news, addressing anger, dealing with conflict)

Attitudes:

(same as Early Years)

Behaviors:

- Consistently display appropriate communication with patients, family members and other healthcare providers

**Domain: Teamwork & Inter-professional Collaboration**

*Objectives in the Early Years (Years 1 – 2.5)*

*Objectives in the Later Years (Years 2.5 – 5)*

Knowledge:

- Know one's own role and responsibilities and the roles and responsibilities of other professionals in the health care team

Skills:

Knowledge:

(same as Early Years)

Skills:

- Effectively resolve inter-professional conflicts

<ul style="list-style-type: none"> <li>•Work effectively with others to assess, plan, provide and integrate care for patients</li> <li>•Effectively work with other health professionals to prevent and negotiate inter-professional conflict</li> </ul> <p><u>Attitudes:</u></p> <ul style="list-style-type: none"> <li>•Recognize the benefit of collaboration and team work</li> <li>•Respect all colleagues and members of the healthcare team - their diversity of roles, responsibilities, knowledge and competences in relation to own</li> </ul> <p><u>Behaviors:</u></p> <ul style="list-style-type: none"> <li>•Participate productively in inter-professional team meetings</li> </ul>	<p><u>Attitudes:</u> (same as Early Years)</p> <p><u>Behaviors:</u></p> <ul style="list-style-type: none"> <li>•Act in a consultative role toward other physicians and health professionals</li> <li>•Encourage and support other members of the health care team</li> </ul>
---	--

**Domain: Leadership Promotion**

<p><i>Objectives in the Early Years (Years 1 – 2.5)</i></p>	<p><i>Objectives in the Later Years (Years 2.5 – 5)</i></p>
<p><u>Knowledge:</u></p> <ul style="list-style-type: none"> <li>•Know how to arrange elements of health care delivery (ex: on-call schedules)</li> </ul> <p><u>Skills:</u></p> <ul style="list-style-type: none"> <li>•Prioritize and effectively execute tasks with colleagues</li> </ul> <p><u>Attitudes:</u></p> <ul style="list-style-type: none"> <li>•Appreciate the importance of time management</li> <li>•Recognize the importance of just allocation of healthcare resources, balancing effectiveness, efficiency and access with optimal patient care</li> </ul> <p><u>Behaviors:</u></p> <ul style="list-style-type: none"> <li>•Set prioritize and manage time to balance patient care, educational activities, other activities and personal life</li> </ul>	<p><u>Knowledge:</u> (same as Early Years)</p> <p><u>Skills:</u></p> <ul style="list-style-type: none"> <li>•Be able to effectively and appropriately delegate tasks to members of the health care team</li> <li>•Chair/lead meetings and other activities</li> <li>•Lead or implement a change in health care</li> <li>•Help other members of the health care team develop their skills</li> </ul> <p><u>Attitudes:</u> (same as Early Years)</p> <p><u>Behaviors:</u></p> <ul style="list-style-type: none"> <li>•Apply evidence to make responsible and justifiable decisions for cost-appropriate care</li> </ul>



**Domain: Teaching & Learning**

*Objectives in the Early Years (Years 1 – 2.5)*

Knowledge:

- Know the principles of critical appraisal

Skills:

- Gain skills in retrieving and critically appraising evidence to inform the provision of optimal patient care

Attitudes:

- Appreciate the importance of continuous education

Behaviors:

- Set personal learning and improvement goals to enhance care provided to patients
- Identify and participate in continuous education activities

*Objectives in the Later Years (Years 2.5 – 5)*

Knowledge:

- Summarize current evidence regarding major diagnostic and treatment actions in General Surgery
- Know and describe the principles of learning relevant to medical education

Skills:

- Gain advanced skills in retrieving and critically appraising evidence to inform the provision of optimal patient care
- Demonstrate an effective lecture or presentation
- Facilitate the learning of patients, families, students, residents and other health professionals as appropriate

Attitudes:

- Value the need for continuous improvement in clinical practice based on new knowledge

Behaviors:

- Identify strengths, deficiencies and limits in one's own knowledge and expertise
- Systematically analyze practice, using quality improvement methods, and implement changes with the goal of practice improvement
- Accept and integrate constructive feedback from others about their own practice
- Provide supportive and effective feedback to others

**Domain: Professionalism & Ethics**

*Objectives in the Early Years (Years 1 – 2.5)*

Knowledge:

*Objectives in the Later Years (Years 2.5 – 5)*

Knowledge:

- Recognize ethical issues encountered in practice
- Develop a foundational understanding of basic concepts in ethics as relates to the surgical care of patients

Skills:

- Appropriately manage conflict in professional practice

Attitudes:

- Be responsive to patient needs that supersedes self-interest
- Respect patient privacy and autonomy

Behaviors:

- Exhibit appropriate professional behaviors in practice including honesty, integrity, commitment, compassion, respect for others and altruism
- Fulfill the regulatory and legal obligations of current practice
- Demonstrate accountability to professional regulatory bodies and to the public
- Recognize and respond to others' unprofessional behaviors in practice
- Recognize other professionals in need and respond appropriately

- Developing a deeper understanding of basic concepts in ethics as relates to the surgical care of patients
- Develop an understanding of concepts in ethics that relate to the health care system and wider community

Skills:

- Apply critical thinking and analysis in the discussion and application of ethical principals during clinical decision making processes

Attitudes:

(same as in Early Years)

Behaviors:

- Demonstrate a commitment to delivering the highest quality of care and maintaining competence throughout his/her career

## Section 3: Technical Content of Syllabus

### *THE EARLY YEARS (YEARS 1 - 2.5)*

#### **Module 1: Basic Sciences**

##### Element: Applied anatomy

- Development and embryology
- Gross and microscopic anatomy of the organs and other structures
- Surface anatomy
- Imaging anatomy

This will include anatomy of thorax, abdomen, pelvis, perineum, limbs, spine, head and neck as appropriate for surgical operations.

##### Element: Physiology

General physiological principles including:

- Homeostasis
- Thermoregulation
- Metabolic pathways and abnormalities
- Blood loss and hypovolaemic shock
- Sepsis and septic shock
- Fluid balance and fluid replacement therapy & Electrolyte disturbances
- Acid base balance
- Bleeding and coagulation
- Nutrition & Metabolism

This will include the physiology of specific organ systems relevant to surgical care including the cardiovascular, respiratory, gastrointestinal, urinary, endocrine and neurological systems

##### Element: Pharmacology

- The pharmacology and safe prescribing of drugs used in the treatment of surgical diseases including analgesics, antibiotics, cardiovascular drugs, antiepileptic, anticoagulants, respiratory drugs, renal drugs, drugs used for the management of endocrine disorders (including diabetes) and local anaesthetics.
- The principles of general anaesthesia
- The principles of drugs used in the treatment of common malignancies
- Can describe the effects and potential for harm of alcohol and other drugs including common presentations, wide range of acute and long term presentations (e.g. trauma, depression, hypertension etc.), the range of interventions, treatments and prognoses for use of alcohol and other drugs

##### Element: Pathology

General pathological principles including:

- Inflammation
- Wound healing
- Cellular injury
- Tissue death including necrosis and apoptosis
- Vascular disorders

- Disorders of growth, differentiation and morphogenesis
- Surgical immunology
- Surgical haematology
- Surgical biochemistry
- Pathology of neoplasia
- Classification of tumours
- Tumour development and growth including metastasis
- Principles of staging and grading of cancers
- Principles of cancer therapy including surgery, radiotherapy, chemotherapy, immunotherapy and hormone therapy
- Principles of cancer registration
- Principles of cancer screening
- The pathology of specific organ systems relevant to surgical care including cardiovascular pathology, respiratory pathology, gastrointestinal pathology, genitourinary disease, breast, exocrine and endocrine pathology, central and peripheral, neurological systems, skin, lymphoreticular and musculoskeletal systems

#### Element: Microbiology

- Surgically important micro organisms including blood borne viruses
- Soft tissue infections including cellulitis, abscesses, necrotising fasciitis, gangrene
- Sources of infection
- Sepsis and septic shock
- Asepsis and antisepsis
- Principles of disinfection and sterilisation
- Antibiotics including prophylaxis and resistance
- Principles of high risk patient management
- Hospital acquired infections and infection control

#### Element: Imaging

- Principles of diagnostic and interventional imaging including x-rays, ultrasound, CT, MRI. PET, radiounucleotide scanning

## **Module 2: Basic Surgical & Life Support Skills**

#### Element: Basic Surgical Skills

- Principles of safe surgery – sterility and microbiology
- Local anaesthesia agents
- Surgical wounds, classification and management principles
- Preparation of the surgeon for surgery, Effective and safe hand washing, gloving and gowning
- Preparation of a patient for surgery, achieving a sterile field
- Administration of local anaesthesia
- Incision of skin and subcutaneous tissue
- Closure of skin and subcutaneous tissue
- Knot tying
- Haemostasis
- Tissue retraction
- Use of drains
- Tissue handling

- Skill as assistant

Element: Basic Life Support (certification to be renewed every 2 years)

- basic steps of CPR for adults
- the sequence for 1-rescuer CPR
- the differences between adult, child and infant CPR
- the importance of early defibrillation
- the steps common to the operation of all AEDs
- signs of choking
- the chain of survival in different life support situations
- Opening the air way
- Complete sequence for 2-rescuer CPR
- Proper way of using AED
- Proper way to relieve choking in the responsive and unresponsive victim (adults, children & infants)
- Use of recovery positions

### Module 3: Common Surgical Conditions

This module covers common surgical conditions which will be encountered in general surgery and some subspecialties. These topics will be addressed in the first two and a half years of training and then the general surgery conditions will be revisited in the later years at a more advanced level. This module lists the conditions and operations while module 4 and 5 gives a more general list of the assessment and follow-up and the peri-operative knowledge and skills needed for every surgical patient.

Knowledge and patient care of presenting signs/symptoms & conditions (see details below). At minimum resident is expected to observe & assist in the surgical management of listed conditions, as well as consult with other members of the health care team

Elements: Knowledge		Clinical skills
Surgical System and symptoms	To include the following conditions	By end of Year 2, resident should be competent (perform under supervision or at end alone*) in the following procedures:
1 - Gastrointestinal <ul style="list-style-type: none"> <li>•Abdominal pain</li> <li>•Abdominal swelling</li> <li>•Change in bowel habit</li> <li>•Gastrointestinal haemorrhage</li> <li>•Rectal bleeding</li> <li>•Dysphagia</li> <li>•Dyspepsia</li> <li>•Jaundice</li> </ul>	<ul style="list-style-type: none"> <li>•Appendicitis</li> <li>•Gastrointestinal malignancy</li> <li>•Inflammatory bowel disease</li> <li>•Diverticular disease</li> <li>•Intestinal obstruction</li> <li>•Adhesions</li> <li>•Abdominal hernias</li> <li>•Peritonitis</li> <li>•Intestinal perforation</li> <li>•Benign oesophageal disease</li> <li>•Peptic ulcer disease</li> <li>•Benign and malignant hepatic,</li> </ul>	Induction of pneumoperitoneum for laparoscopy and port placement  Open and close midline laparotomy incision*  Appendicectomy*  Inguinal hernia repair*  Abdominal wall hernia repair  Closure of perforated DU*

	<p>gall bladder and pancreatic disease</p> <ul style="list-style-type: none"> <li>●Haemorrhoids and perianal disease</li> <li>●Abdominal wall stomata</li> </ul>	<p>Rigid sigmoidoscopy*</p> <p>Perianal abscess, anal fissure, haemorrhoid surgery</p>
<p>2- Breast disease</p> <ul style="list-style-type: none"> <li>●Breast lumps and nipple discharge</li> <li>●Acute Breast pain</li> </ul>	<ul style="list-style-type: none"> <li>●Benign and malignant breast lumps</li> <li>●Mastitis and breast abscess</li> </ul>	<p>Breast lump excision*</p> <p>Breast abscess drainage</p> <p>Needle biopsy including Fine needle aspiration and Trucut biopsy</p>
<p>3 - Peripheral vascular disease</p> <ul style="list-style-type: none"> <li>●Chronic and acute limb ischaemia</li> <li>●Aneurysmal disease</li> <li>●Transient ischaemic attacks</li> <li>●Varicose veins</li> <li>●Leg ulceration</li> </ul>	<ul style="list-style-type: none"> <li>●Atherosclerotic arterial disease</li> <li>●Embolic and thrombotic arterial disease</li> <li>●Venous insufficiency</li> <li>●Diabetic ulceration</li> </ul>	<p>Central venous line insertion*</p> <p>Radial artery catheterization</p> <p>Venous cut down</p> <p>Varicose vein surgery</p>
<p>4 - Cardiovascular and pulmonary disease</p> <ul style="list-style-type: none"> <li>●Chest pain</li> <li>●Dyspnoea</li> <li>●Fatiguability</li> <li>●Cyanosis</li> <li>●Lower limb edema</li> </ul>	<ul style="list-style-type: none"> <li>●Coronary heart disease</li> <li>●Bronchial carcinoma</li> <li>●Obstructive airways disease</li> <li>●Space occupying lesions of the chest</li> </ul>	<p>Chest tube insertion</p>
<p>5 - Genitourinary disease</p> <ul style="list-style-type: none"> <li>●Loin pain</li> <li>●Haematuria</li> <li>●Lower urinary tract symptoms</li> <li>●Urinary retention</li> <li>●Renal failure</li> <li>●Scrotal swellings</li> <li>●Testicular pain</li> </ul>	<ul style="list-style-type: none"> <li>●Genitourinary malignancy</li> <li>●Urinary calculus disease</li> <li>●Urinary tract infection</li> <li>●Benign prostatic hyperplasia</li> <li>●Obstructive uropathy</li> </ul>	<p>Suprapubic catheter insertion*</p> <p>Hydrocele*</p> <p>Cystoscopy*</p> <p>Undescended testis surgery</p>
<p>6 - Gynaecological disease</p> <ul style="list-style-type: none"> <li>●Vaginal bleeding</li> <li>●Lower abdominal pain</li> <li>●Vaginal discharge</li> </ul>	<ul style="list-style-type: none"> <li>●Pelvic inflammatory disease</li> <li>●Ectopic pregnancy</li> <li>●Complicated ovarian masses</li> </ul>	
<p>7 – Trauma (in Accident &amp; Emergency unit)</p> <ul style="list-style-type: none"> <li>●Traumatic limb and joint pain and deformity</li> <li>●Chronic limb and joint pain and deformity</li> <li>●Back pain</li> </ul>	<ul style="list-style-type: none"> <li>●Simple fractures and joint dislocations</li> <li>●Fractures around the hip and ankle</li> <li>●Basic principles of Degenerative joint disease</li> <li>●Basic principles of inflammatory joint disease including bone and joint</li> </ul>	<p>Management of fracture</p> <p>Debridement of wounds*</p> <p>Application of plaster of Paris</p> <p>Application of Traction</p> <p>Reduction of dislocated joints</p>

	<p>infection</p> <ul style="list-style-type: none"> <li>•Compartment syndrome</li> <li>•Spinal nerve root entrapment and spinal cord compression</li> <li>•Metastatic bone cancer</li> <li>•Common peripheral neuropathies and nerve injuries</li> </ul>	<p>To include:</p> <p>Colles fracture reduction*</p> <p>Traction for hip and femoral fracture*</p> <p>Reduction of dislocated shoulder, hip, finger*</p> <p>Extensor tendon repair</p>
<p>8 - Disease of the Skin, Head and Neck</p> <ul style="list-style-type: none"> <li>•Lumps in the neck</li> <li>•Epistaxis</li> <li>•Upper airway obstruction</li> </ul>	<ul style="list-style-type: none"> <li>•Benign and malignant skin lesions</li> <li>•Benign and malignant lesions of the mouth and tongue</li> </ul>	<p>Abscess drainage*</p> <p>Excision biopsy of benign skin or subcutaneous lesions *</p> <p>In growing toenail – avulsion / wedge resection / phenolisation*</p> <p>Excision biopsy malignant skin lesion</p> <p>Lymph node biopsy</p>
<p>9 - Neurology and Neurosurgery</p> <ul style="list-style-type: none"> <li>•Headache</li> <li>•Facial pain</li> <li>•Coma</li> </ul>	<ul style="list-style-type: none"> <li>•Space occupying lesions from bleeding and tumor</li> </ul>	<p>Emergency burr hole</p>
<p>10 - Endocrine</p> <ul style="list-style-type: none"> <li>•Lumps in the neck</li> <li>•Acute endocrine crises</li> </ul>	<ul style="list-style-type: none"> <li>•Thyroid and parathyroid disease</li> <li>•Adrenal gland disease</li> <li>•Diabetes</li> </ul>	
<p>11 - Plastic Surgery</p> <ul style="list-style-type: none"> <li>•Skin loss</li> <li>•Deformity</li> </ul>	<ul style="list-style-type: none"> <li>•Principles of amputation</li> <li>•Burn</li> <li>•Skin graft (flaps)</li> <li>•Pressure sores</li> </ul>	<p>Debridement of wounds*</p> <p>Ongoing wound care</p> <p>Split skin graft*</p> <p>Dressing for burns</p>
<p>12 – Paediatric Surgery</p>	<ul style="list-style-type: none"> <li>•Differences from adults – physiology, pathology and treatment principles.</li> <li>•Child abuse and legal aspects of consent in children</li> <li>•The basics of common neonatal problems</li> <li>•Acute abdominal pain in children</li> <li>•Groin surgery in children</li> <li>•Trauma in children</li> </ul>	<p>Venous access in babies and children*</p> <p>Appendicectomy (*over 5 years)</p> <p>Groin exploration for hernia and hydrocele</p> <p>Undescended testis</p> <p>Minor skin surgery</p> <p>Wound debridement</p> <p>Common fracture management</p>

## Module 4: Patient care & follow up

### Element: Knowledge

The knowledge relevant to this section will be variable from patient to patient and is covered within the rest of the syllabus – see common surgical conditions (Module 3).

Element: Clinical Skills

- Surgical history and examination (elective and emergency)
- Construct a differential diagnosis
- Plan investigations
- Clinical decision making
- Team working and planning
- Case work up and evaluation; risk management
- Appropriate prescribing
- Taking consent for basic and intermediate level intervention; emergency and elective
- Written clinical communication skills in documenting care accurately
- Interactive clinical communication skills: patients
- Interactive clinical communication skills: colleagues
- Active participation in clinical audit events

## **Module 5: Peri-operative care**

Element: Knowledge

1 - Preoperative assessment and management, using applied basic science in module

- Risk factors for surgery and scoring systems
- Pre-medication and other preoperative prescribing
- Thromboprophylaxis and antibiotic prophylaxis
- Principles of day surgery

2 - Intraoperative care:

- Safety in theatre including patient positioning and avoidance of nerve injuries
- Sharps safety
- Diathermy, laser use
- Infection risks
- Tourniquet use including indications, effects and complications
- Principles of local, regional and general anaesthesia
- Principles of invasive and non-invasive monitoring
- Surgery in hepatitis and HIV carriers
- Fluid balance and homeostasis

3 – Post operative care, using applied basic science in module 1:

- Post-operative monitoring
- Pathophysiology of blood loss
- Pathophysiology of sepsis including SIRS and shock
- Multi-organ dysfunction syndrome
- Post-operative complications in general and specific to the operation performed
- Methods of postoperative analgesia



- 4 - To assess and plan nutritional management
- Effects of malnutrition, both excess and depletion
  - Metabolic response to injury
  - Methods of screening and assessment of nutritional status
  - Methods of enteral and parenteral nutrition
- 5 - Haemostasis and Blood Products:
- Pathology of impaired haemostasis e.g. haemophilia, liver disease, massive haemorrhage
  - Components of blood
  - Alternatives to use of blood products
  - Principles of administration of blood products
  - Patient safety with respect to blood products
- 6 - Coagulation, deep vein thrombosis and embolism:
- Effect of surgery and trauma on coagulation
  - Tests for thrombophilia and other disorders of coagulation
  - Methods of investigation for suspected thromboembolic disease
  - Principles of treatment of venous thrombosis and pulmonary embolism including anticoagulation
  - Role of V/Q scanning, CTpulmonary angiography, D-dimer and thrombolysis
  - Place of pulmonary embolectomy
  - Risk classification and management of DVT
- 7 - Antibiotics:
- Principles of prophylaxis and treatment
  - Principles of sterile procedures and infection control
- 8 - Metabolic and endocrine disorders in relation perioperative management
- Pathophysiology of thyroid hormone excess and deficiency and associated risks from surgery
  - Causes and effects of hypercalcaemia and hypocalcaemia
  - Complications of corticosteroid therapy
  - Causes and consequences of Steroid insufficiency
  - Complications of diabetes mellitus
  - Causes and effects of hyponatraemia
  - Causes and effects of hyperkalaemia and hypokalaemia

#### Element: Clinical Skills

- 1 - Pre-operative assessment and management:
- History and examination of a patient from a medical and surgical standpoint
  - Interpretation of pre-operative investigations
  - Management of co morbidity
  - Resuscitation
  - Appropriate preoperative prescribing including premedication
- 2 - Intra-operative care:
- Safe conduct of intraoperative care
  - Correct patient positioning

- Avoidance of nerve injuries
- Management of sharps injuries
- Prevention of diathermy injury
- Prevention of venous thrombosis
- Sterile procedures

### 3 - Post-operative care:

- Writing of operation records
- Assessment and monitoring of patient's condition
- Post-operative analgesia
- Fluid and electrolyte management
- Detection of impending organ failure
- Initial management of organ failure
- Principles and indications for Dialysis
- Recognition, prevention and treatment of post-operative complications including infection control
- Developing appropriate post-operative care plans

### 4 - Haemostasis and Blood Products:

- Recognition of conditions likely to lead to the diathesis
- Recognition of abnormal bleeding during surgery
- Appropriate use of blood products
- Management of the complications of blood product transfusion

### 5 - Coagulation, deep vein thrombosis and embolism

- Recognition of patients at risk
- Awareness and diagnosis of pulmonary embolism and DVT
- Role of duplex scanning, venography and d-dimer measurement
- Initiate and monitor treatment of venous thrombosis and pulmonary embolism
- Initiation of prophylaxis

### 6 - Antibiotics:

- Appropriate prescription of antibiotics

### 7 - Assess and plan preoperative nutritional management

- Arrange access to suitable artificial nutritional support, including Dietary supplements, Enteral nutrition and Parenteral nutrition

### 8 - Metabolic and endocrine disorders

- History and examination in patients with endocrine and electrolyte disorders
- Investigation and management of thyrotoxicosis and hypothyroidism
- Investigation and management of hypercalcaemia and hypocalcaemia
- Peri-operative management of patients on steroid therapy
- Peri-operative management of diabetic patients
- Investigation and management of hyponatraemia
- Investigation and management of hyperkalaemia and hypokalaemia

## ***THE LATER YEARS (YEARS 2.5 – 5)***

### **Module 1: Basic Sciences**

The subjects covered in Basic Sciences, Patient Assessment and Management and perioperative care are not repeated in detail as they have been listed under year 1-2.5 above. It is expected that the more senior resident will be able to support his/her more advanced practice in care of the common conditions by more advanced knowledge and skills in basic science, and general patient care.

### **Module 2: Basic Surgical & Life Support Skills**

Building on the Basic Life Support training completed in Years 1 – 2.5, in the later years of his/her residency, the resident should complete an accredited Advanced Trauma Life Support course in order to be able to:

- Demonstrate the concepts and principles of the primary and secondary patient assessments.
- Establish management priorities in a trauma situation.
- Initiate primary and secondary management necessary within the golden hour for the emergency management of acute life threatening conditions.
- In a given simulated clinical and surgical skills practicum, demonstrate a range of skills, which are often required in the initial assessment and treatment of patients with multiple injuries

### **Module 3: Common Surgical Conditions**

This module covers common surgical conditions which will be encountered in general surgery and some subspecialties. These topics have been addressed at a basic level in the first two and a half years of training and in the later years they will be revisited at a more advanced level. This module lists the conditions and operations while module 4 and 5 gives a more general list of the assessment and follow-up and the peri-operative knowledge and skills needed for every surgical patient.



## Surgical knowledge and procedures Years 2.5 – 5

The following is taken from the Arab Board requirements; any updates to procedures or numbers issued by the Arab Board should be incorporated into this teaching syllabus.

Element : knowledge		Element: clinical skill		
Surgical System and symptoms	To include the following conditions	resident should be competent (perform under supervision or at end of year 5 alone**) in the following procedures:	Current numbers indep	Current numbers supervised /assisting
1 - Gastrointestinal <ul style="list-style-type: none"> <li>•Abdominal pain</li> <li>•Abdominal swelling</li> <li>•Change in bowel habit</li> <li>•Gastrointestinal haemorrhage</li> <li>•Rectal bleeding</li> <li>•Dysphagia</li> <li>•Dyspepsia</li> <li>•Jaundice</li> </ul>	<ul style="list-style-type: none"> <li>•Appendicitis</li> <li>•Gastrointestinal malignancy</li> <li>•Inflammatory bowel disease</li> <li>•Diverticular disease</li> <li>•Intestinal obstruction</li> <li>•Adhesions</li> <li>•Abdominal hernias</li> <li>•Peritonitis</li> <li>•Intestinal perforation</li> <li>•Benign oesophageal disease</li> <li>•Peptic ulcer disease</li> <li>•Benign and malignant hepatic, gall bladder and pancreatic disease</li> <li>•Haemorrhoids and perianal disease</li> <li>•Abdominal wall stomata</li> </ul>	Induction of pneumoperitoneum for laparoscopy and port placement		
		Open and close midline laparotomy incision*		
		Appendicectomy*	25	
		Inguinal hernia repair*	25	Any Number (AN)
		Abdominal wall hernia repair(incisional)	5	5
		Laparoscopic inguinal hernia repair		
		Upper GI surgery incl DU, V+D, gastrectomy, antireflux	AN	AN
		Closure of perforated DU*		
		OG resection	AN	AN
		Cholecystectomy lap	20	10
		Cholecystectomy open		3-5
		Cholecystostomy, CBD exploration, biliary bypass	AN	AN
		Liver surgery biopsy abscess hydatid resection	2	2
		Splenectomy	AN	AN
		Pancreatic surgery distal pancreatectomy debridement pseudocyst whipple	AN	2
Exploratory laparotomy	5	AN		

		Paracentesis		AN
		Bowel resection	Small + large bowel 15	15
		Colectomy	See above	
		Formation of stoma		AN
		Closure of stoma		AN
		Rigid sigmoidoscopy*		AN
		Perianal abscess, anal fissure, haemorrhoid	20	AN
		Pilonidal surgery	10	AN
		Rectal resections		AN
2- Breast disease •Breast lumps and nipple discharge •Acute Breast pain	•Benign and malignant breast lumps •Mastitis and breast abscess	Breast lump excision*	10	5
		Breast abscess drainage		AN
		Needle biopsy including Fine needle aspiration and Trucut biopsy	5	
		Mastectomy	5	5
		Axillary Node dissection		AN
		Image guided breast biopsy		AN
3 - Peripheral vascular disease •Chronic and acute limb	•Atherosclerotic arterial disease •Embolitic and thrombotic arterial disease	Central venous line insertion*	AN	
		Radial artery catheterization		AN

<p>ischaemia</p> <ul style="list-style-type: none"> <li>•Aneurysmal disease</li> <li>•Transient ischaemic attacks</li> <li>•Varicose veins</li> <li>•Leg ulceration</li> </ul>	<ul style="list-style-type: none"> <li>•Venous insufficiency</li> <li>•Diabetic ulceration</li> </ul>	Venous cut down		AN
		Varicose vein surgery		10
		Amputation - digit	10	
		Major amputation		
		Arterial embolectomy		AN
		Arterial bypass		AN
<p>4 - Cardiovascular and pulmonary disease</p> <ul style="list-style-type: none"> <li>•Chest pain</li> <li>•Dyspnea</li> <li>•Fatiguability</li> <li>•Cyanosis</li> <li>•Lower limb edema</li> </ul>	<ul style="list-style-type: none"> <li>•Coronary heart disease</li> <li>•Bronchial carcinoma</li> <li>•Obstructive airways disease</li> <li>•Space occupying lesions of the chest</li> </ul>	Chest drain insertion	8	
		Thoracotomy	AN	
<p>5 - Genitourinary disease</p> <ul style="list-style-type: none"> <li>•Loin pain</li> <li>•Haematuria</li> <li>•Lower urinary tract symptoms</li> <li>•Urinary retention</li> <li>•Renal failure</li> <li>•Scrotal swellings</li> <li>•Testicular pain</li> </ul>	<ul style="list-style-type: none"> <li>•Genitourinary malignancy</li> <li>•Urinary calculus disease</li> <li>•Urinary tract infection</li> <li>•Benign prostatic hyperplasia</li> <li>•Obstructive uropathy</li> </ul>	Suprapubic catheter insertion*		AN
		Circumcision	20	AN
		Hydrocele*		
		Cystoscopy*		AN
		Undescended testis surgery	10	AN
<p>6 - Gynecological disease</p> <ul style="list-style-type: none"> <li>•Vaginal bleeding</li> <li>•Lower abdominal pain</li> <li>•Vaginal discharge</li> </ul>	<ul style="list-style-type: none"> <li>•Pelvic inflammatory disease</li> <li>•Ectopic pregnancy</li> <li>•Complicated ovarian masses</li> </ul>			
<p>7 –Trauma (in Accident and Emergency Unit)</p> <ul style="list-style-type: none"> <li>•Traumatic limb and joint pain and deformity</li> <li>•Chronic limb and joint pain and deformity</li> </ul>	<ul style="list-style-type: none"> <li>•Simple fractures and joint dislocations</li> <li>•Fractures around the hip and ankle</li> <li>•Basic principles of Degenerative joint disease</li> </ul>	<p>Management of fracture</p> <p>Debridement of wounds*</p> <p>Application of plaster of Paris</p> <p>Application of Traction</p>		

<ul style="list-style-type: none"> <li>•Back pain</li> </ul>	<ul style="list-style-type: none"> <li>•Basic principles of inflammatory joint disease including bone and joint infection</li> <li>•Compartment syndrome</li> <li>•Spinal nerve root entrapment and spinal cord compression</li> <li>•Metastatic bone cancer</li> <li>•Common peripheral neuropathies and nerve injuries</li> </ul>	<p>Reduction of dislocated joints</p> <p>Colles fracture reduction*</p> <p>Traction for hip and femoral fracture*</p> <p>Reduction of dislocated Shoulder, Hip, Finger*</p> <p>Extensor tendon repair</p>		
<p>8 - Disease of the Skin, Head and Neck</p> <ul style="list-style-type: none"> <li>•Lumps in the neck</li> <li>•Epistaxis</li> <li>•Upper airway obstruction</li> </ul>	<ul style="list-style-type: none"> <li>•Benign and malignant skin lesions</li> <li>•Benign and malignant lesions of the mouth and tongue</li> </ul>	Abscess drainage		AN
		Excision biopsy of benign skin or subcutaneous lesions		AN
		Excision biopsy malignant skin lesion		AN
		Tracheostomy	10	10
		Lymph node biopsy		
	In growing toenail – avulsion / wedge resection / phenolisation*			
<p>9 - Neurology and Neurosurgery</p> <ul style="list-style-type: none"> <li>•Headache</li> <li>•Facial pain</li> <li>•Coma</li> </ul>	<ul style="list-style-type: none"> <li>•Space occupying lesions from bleeding and tumor</li> </ul>	emergency burr hole		AN
<p>10 - Endocrine</p> <ul style="list-style-type: none"> <li>•Lumps in the neck</li> <li>•Acute endocrine crises</li> </ul>	<ul style="list-style-type: none"> <li>•Thyroid and parathyroid disease</li> <li>•Adrenal gland disease</li> <li>•Diabetes</li> </ul>	Thyroidectomy	5	10
		Parathyroidectomy	AN	
<p>11 - Plastic Surgery</p> <ul style="list-style-type: none"> <li>•Skin loss</li> <li>•Deformity</li> </ul>	<ul style="list-style-type: none"> <li>•Principles of amputation</li> <li>•Burn</li> <li>•Skin graft (flaps)</li> <li>•Pressure sores</li> </ul>	Debridement of wounds*		
		Ongoing wound care		
		split skin graft*	10	AN
		Dressing for burns		



12 – Paediatric Surgery	<ul style="list-style-type: none"> <li>•Differences from adults – physiology, pathology and treatment principles.</li> <li>•Child abuse and legal aspects of consent in children</li> <li>•The basics of common neonatal problems</li> <li>•Acute abdominal pain in children</li> <li>•Groin surgery in children</li> <li>•Trauma in children</li> <li>•Hypertrophic Pyloric stenosis</li> </ul>	Venous access in babies and children*		AN
		Appendicectomy (*over 5 years)		
		Groin exploration for hernia and hydrocele		
		Undescended testis		
		Minor skin surgery		
		Wound debridement		
		Intussusception		
		Pyloromyotomy		

## **Section 4: Organisation of the residency program**

The overall supervision of the general surgical residency programme is by the Palestine Medical Council (PMC). Further guidance on the organization of the residency program will be issued by the Palestine Medical Council and will be included in Appendices and/or by letter from the PMC.

## **Section 5: Teaching and learning methods**

Teaching and learning should be by a variety of methods, in accordance with the requirements of the Arab Board of Health Specializations as mentioned in the general surgery training program guidelines.

It is essential that the resident is self motivated to learn. Acquiring and reading appropriate text books, on line resources such as websites, courses and webinars, and observation of more senior staff should all contribute to personal learning. It is useful to keep a list of cases seen so that the presentation and management can be researched for further learning and theatre learning will be enhanced by the resident having learned the operative details prior to coming to the theatre list.

There should be many local, less formal opportunities for learning – bedside discussion and teaching, ward rounds, outpatient clinics and theatre lists should be used to gain knowledge from the more senior surgeons about the cases seen. Other staff will also be an important resource – other medical disciplines such as physicians, anaesthetists, radiologists and pathologists have specialist knowledge of their aspects of patient care and the resident should be willing to learn from others informally during the course of daily work. Local small group meetings such as radiology and pathology meetings with clinicians and multidisciplinary team meetings for care (such as cancer care) can provide more learning options. Surgical departments should try to hold clinical education meetings with discussion of cases, mortality meetings and audit meetings. It can be excellent learning for the resident to prepare for teaching more junior staff or nursing staff on a surgical topic.

Some courses will be compulsory – Basic Surgical Skills and Basic Life Support in Year 1 and Advanced Trauma Life Support before the end of Year 5. It may be possible for other courses to be arranged and the resident is encouraged to identify other relevant courses and attend them.

## **Section 6: Assessment methods**

Exams provide assessment of knowledge but clinical skills require assessment in the workplace thus assessment by the consultants and specialists in the local hospital will be important in this regard. Non clinical skills are difficult to assess objectively but the multisource feedback will be used to assist in this assessment in addition to specific comment on each “skill” in the Annual report.

### ***Exams***

Part 1 Palestinian Surgical Board exam – taken at the end of year 2; satisfactory completion of BSS and BLS needed for entry to the exam. The Board part 1 should be passed before the start of year 3. The exam is Multiple Choice Question (MCQ) format and covers Applied Basic Science.

Part 2 Palestinian Surgical Board exam – taken after Year 5, reports showing satisfactory completion of years 1-5 of training and a satisfactory logbook needed for entry to the exam.

a)MCQ covering relevant areas of general surgery as detailed in the syllabus

b) Oral and clinical exam

Promotional/progress exams are taken to confirm progress at year 1-2 and year 3-4 – these are MCQ exams set by the Palestine Medical Council and administered by the responsible body.

### ***Case Report diary***

Each resident should write up at least 1 case per quarter (minimum of 20 cases by end of Year 5) in a diary to be submitted to the resident’s consultant trainer for signature. The cases should cover different conditions and be cases in which the resident has been personally involved in the patient’s care. The Case Report should include description of history, examination, investigations, treatment and subsequent progress together with a short (<500 words) commentary on the case. The Case Report Diary with the proper authorized signatures should be submitted along with the logbook to the Medical Council at the end of the residency period as a condition of successful completion of training program.

### ***Logbook***

Each resident should keep a logbook of operations and other procedures detailing date of birth; operation; date; and whether the resident was operating independently; supervised or teaching a more junior doctor. The consultant or specialist trainer should sign the logbook weekly. A format for the logbook will be provided by the PMC.

### ***Basic Surgical & Life Support Course outcomes***

The Basic Surgical Skills, Basic Life Support and Advanced Trauma Life Support courses have their own assessment methods (depending on the course this includes a written exam and practical or skills-based scenarios to demonstrate competency). Certificates will be proof of successful completion of these courses.

### ***Multisource Feedback***

The Multisource Feedback (MSF) tool is used to collect colleagues’ opinions on the resident’s clinical performance and professional behavior. The MSF should be conducted yearly for each resident and placed in his/her file. The consultant

who supervises the resident's training will collect anonymous MSF from the resident's colleagues. Colleagues are those who have observed the resident in the clinical setting and include: nurses (1 working in the operating theatre; 1 in the ward) Consultant Anesthesiologist, Radiologist, fellow resident (peer) and the Consultants who are involved in teaching the resident. The Palestine Medical Council will provide further guidance on the MSF methodology and tool to the training institutions in writing. The MSF form will be provided in an annex to this syllabus.

### ***Annual Report***

At the end of each year the consultant who supervises the resident's training should write an Annual Report to be submitted to the Medical Council and put in the file of the resident in the training hospital. The consultant should discuss the Annual Report with the resident each year.

The Medical Council has developed a form for the Annual Report which should be used. It is available in the Arabic guidelines for the general surgery residency program (see Annex 1).

The Surgery Scientific Committee of the Medical Council will conduct interviews with each resident enrolled in the General Surgery residency training program at the end of Year 2 and Year 4. These interviews will allow the resident and Committee to review the resident's training progress together, reviewing the annual reports, exam outcomes, case report diary contents, logbook, courses completed and multisource feedback. It will give the chance for the resident and Committee to discuss progress toward achieving the objectives of the technical and non-technical skills domains, as well as set goals for the next year. Finally, it is hoped that these interviews will provide opportunity for open and constructive dialogue on individuals' progress, feedback on the implementation of the revised syllabus, and ongoing evaluation of the residency program on the whole.

## **Section 7: Assessing the Syllabus and its Implementation**

Technical clarifications and minor revisions to this syllabus may be issued periodically by the Palestine Medical Council. Every 5 years the Surgical Scientific Committee of the Medical Council will initiate a comprehensive review of the syllabus' technical content, involving local stakeholders and possibly external experts. Updates to the syllabus will be made in line with the latest scientific information and evidence-based updates in the field, as well as any updates to the Arab Board guidelines.

On-going assessment of the program will be done by the Surgical Scientific Committee following the interviews with residents in years 2 & 4 of training. The information gathered in these interviews will allow the Committee to summarize trends based on residents' experiences, identify strengths and areas for improvement, and identify actions to follow up.

The Surgical Scientific Committee will also conduct a yearly meeting with stakeholders from the teaching institutions to get their comments and feedback on strengths of the program and challenges, and take appropriate action.

## Section 8: References

Technical content for this syllabus was adapted primarily from the Intercollegiate Surgical Curriculum Programme (ISCP) of the Royal College of Surgeons, UK and the Curriculum Outline for General Surgery Residency 2014 – 2015 of the Surgical Council on Resident Education (SCORE), US.

Links to these curricula can be found online at:

**ISCP** <https://www.iscp.ac.uk/Default.aspx>

**SCORE** <http://www.absurgery.org/xfer/curriculumoutline2014-15.pdf>

The non-technical skills domains were adapted from the CanMEDS framework of the Royal College of Physicians and Surgeons, Canada and the competencies outlined in the Outcome Project of the American Council on Graduate Medical Education (ACGME).

More information about these competency frameworks can be found at:

**CanMEDS** <http://www.royalcollege.ca/portal/page/portal/rc/canmeds>

**ACGME Outcome Project** <http://www.acgme.org/acgmeweb/Portals/0/PDFs/SlideDecks/SLIDEDECK-FDMilestones2013.pptx>

### List of Basic Textbooks:

Anatomy: Regional and Applied by R.J. Last (Churchill Livingstone Publisher)

Atlas of Anatomy by Grant

Atlas of Radiologic Anatomy by L. Wicke, Urban and Schwarzenberg.

Embryology by I. Langham (William & Wilkins Publisher)

Gray's Anatomy

Anatomy by B. Anson & C. Vay (Saunders)

Anatomie Humaine Rouvier

Review of Medical Physiology by W. Ganong (Lange Publisher)

Medical Physiology by A. Guyton (W.B. Saunders)

Clinical Pharmacology by Lawrence

Surgical Physiology by Ledingham and C. MacKay (Churchill Livingstone Publisher)

The Pharmacological basis of therapeutics by Goodman and Gilman (Macmillan Publisher)

General Pathology by J. Walte and M. Israel (Churchill Livingstone Publisher)

Surgical Pathology by Ackermann (Mosbit)

Traite'd' Anatomie Pathologique Par Cabanne

Principles of Surgery by Shwarz (McGraw Hill Book Co.)

Christopher's Textbook of Surgery by Sabision et al (W.B. Saunders and Co.)

Surgery: Scientific Principles and Practice; Greenfield

Maphry of Surgery (Nyhus)

Clinical Surgery (Cushers)

Oxford Textbook of Surgery

Atlas of Surgical Operations by B. Zollinger (Macmillan Publisher)

Operative Surgery by C. Robb and R. Smith (Butterworths Publisher)

Encyclopedie Medico – Chirurgicale. Techniques Chirurgicales

Nouveau Traite de Techniques Chirurgicales – Masson

Current Surgical Diagnosis and Treatment by E. Dunithy and Way

Baileys Emergency Surgery by H. Dudley

Early Diagnosis of Acute Abdomen by Z. Cope

Physical Signs in Clinical Surgery by H. Bailey

Physical Diagnosis in Surgery by N. Browse

Textbook of Surgery – Salisbury

Surgery of Colon and Rectum Goligher

**Ethics resources:**

Beauchamp, T. L., & Childress, J. F. (2009). Principles of biomedical ethics (6th ed., pp. 38-39). New York, NY: Oxford University Press.

**Professionalism and Ethics Handbook for Residents, Saudi Commission for Health Specialties**

<http://www.scfhs.org.sa/MESPS/TrainingProgs/EduMatActiv/Documents/Ethics%20handbook%20for%20residents.pdf>

De Bord, J., Burke, W., & Dudzinski, D., (2013) .Confidentiality  
<https://depts.washington.edu/bioethx/topics/confiden.html>.

Judson, K., & Harris, c., (2006). Law And Ethics for medical careers. New York, NY: McGraw-Hill Comp.

**Other useful websites:**

**Palestine Medical Council** <http://www.pmc.ps/ar/>

**Arab Board of Health Specialization** <http://arab-board.org/ar>

**Royal College of Surgeons, Edinburgh** <http://www.rcsed.ac.uk/>

**Accreditation Council for Graduate Medical Education (ACGME)** <http://www.acgme.org/acgmeweb/>  
The General Surgery Milestone Project <http://acgme.org/acgmeweb/Portals/0/PDFs/Milestones/SurgeryMilestones.pdf>

**American College of Surgeons (ACS)** <http://www.facs.org/>  
Clinical Guidelines and Other Educational Products  
<https://web4.facs.org/ebusiness/ProductCatalog/ProductCategory.aspx?ID=5>  
Content of Qualifying Board Exam <http://home.absurgery.org/xfer/GS-QE.pdf>  
Education and Self-Assessment Program (SESAP) <https://web4.facs.org/ebusiness/ProductCatalog/product.aspx?ID=467>  
Resident Objective Structures Clinical Exam <https://web4.facs.org/ebusiness/ProductCatalog/product.aspx?ID=124>

**American Board of Surgery (ABS)** [www.absurgery.org](http://www.absurgery.org)

**American Academy of Orthopedic Surgeons (AAOS)** <http://www.aaos.org>  
Clinical Practice Guidelines <http://www.aaos.org/research/guidelines/guide.asp>  
Tutorial <http://www5.aaos.org/oko/or/main.cfm>

**American Board of Orthopaedic Surgery (ABOS)** <http://www.abos.org>  
Tutorials  
<https://www.abos.org/downloadpart1.html>  
<http://search.barnesandnoble.com/Orthopaedic-Key-Review-Concepts/Kingsley-R-Chin/e/9780781774383>

**American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS)** <http://www.entnet.org>  
Clinical Practice Guidelines <http://www.entnet.org/Practice/clinicalPracticeguidelines.cfm>  
Home Study Course <http://www.entnet.org/mktplace/homeStudyCourse.cfm>

**American Pediatric Surgical Association (APSA)** <http://www.eapsa.org>  
Clinical Practice Guidelines <http://www.guideline.gov/search/search.aspx?term=pediatric+surgery>  
Tutorial <http://www.eapsa.org/source/onlineexam/welcome.cfm>  
Swiss [http://kco.unibe.ch/daten\\_e/startmenue/login.html](http://kco.unibe.ch/daten_e/startmenue/login.html)

**American Urologic Association (AUA)** <http://www.auanet.org/content/homepage/homepage.cfm>  
Clinical Guidelines <http://www.auanet.org/content/guidelines-and-quality-care/clinical-guidelines.cfm>  
Tutorial <http://measurementresearch.com/testing/tutorial.shtml>

"This syllabus is made possible by the support of the American people through the United States Agency for International Development (USAID). The contents of this manual are the sole responsibility of IntraHealth and Juzoor and do not necessarily reflect the views of USAID or the United States Government."