



TEHRAN UNIVERSITY
OF
MEDICAL SCIENCES



Doctor of Medicine (MD) Course

Core Curriculum and Essential training program

International Campus

Sept.2014- Feb.2018 entries

Table of Contents

| | |
|---|-----|
| - TUMS introduction | 2 |
| - Doctor of Medicine – MD course specification | 14 |
| - Basic Medical Sciences Core Syllabus | 26 |
| - Physiopathology stage (Clinical preparations) Core Syllabus | 83 |
| - Clinical Clerkship Core Syllabus | 136 |
| - Clinical Internship Core Syllabus | 242 |
| - Annexes | 410 |





TUMS

Tehran University of Medical Sciences
Faculty of medicine



Tehran University of Medical Sciences

TUMS

The history of the Tehran University of Medical Sciences goes back to the days of “Dar ul-Funun” School, being established In 1851 considering medicine as one of its modern educational pillars and main subjects.

The first group of graduates started practicing medicine in 1856. It finally separated from University of Tehran by parliamentary legislation in 1986, coming under the new Ministry of Health, Treatment, and Medical Education (MoH&ME).

Nowadays Tehran University of Medical Sciences is the largest (in terms of faculty staff, educational and therapeutic infrastructure) and most highly ranked medical university of Islamic republic of Iran. It was ranked the first among Iranian Medical Sciences Universities by the Ministry of Health for seven straight years.



National ranking

performed by National Ministry of Health and Medical Education (MoH&ME)

- 2017: National rank: 1

International Ranking of
Tehran University of Medical Sciences
in recent evaluations

CWTS Leiden latest Ranking

- assessment of time period 2014-2017: Rank 294 internationally
- assessment of time period 2014-2017: Rank 126 internationally in Biomedical and health sciences

U.S. News & World Report

- 2017: Medicine: 249
- 2017: Pharmacy & Pharmacology: 86

QS World University Rankings

- 2017: International rank: 251-300
- Medicine: 251
- Pharmacy & Pharmacology: 201
- Life Sciences and Medicine: 401

Academic Ranking of World Universities (ARWU/Shanghai Ranking)

- 2009: International rank : 402-501



TUMS Mission

As a member of the national health system and in accordance with the general policies made by the Ministry of Health and Medical Education, TUMS renders services to the population covered and is active in the following areas:

1. Rendering educational services within the scope of health sciences to extend the university's expertise to the community locally, nationally, and internationally to support health promotion, health maintenance, and the advancement of the health sciences. This is accomplished to serve the community by dissemination of knowledge through teaching and discovery of knowledge through research, to emphasize offering specialized and subspecialized courses, and Ph.D. programs for training manpower needed by other medical universities and health care and research centers.
2. Introducing healthcare-oriented science and technology through conducting fundamental, applied and developmental research for:
 - Solving health care problems at the regional and national levels,
 - Acquiring the technology for production of strategic medical and drug supplies to meet local needs and boost exports,
 - Designing and promoting new software, and educational methods appropriate for the needs of the society,
 - Providing for joint efforts with other organizations, institutions, and universities to identify and meet mutual needs, and render scientific and specialized services,
 - Developing appropriate structural and managerial models and procedures within the national health system,
 - Participating in publication of renowned scientific resources and contributing to the production of science at the national and international levels.
3. Rendering health care services
4. Supervising and inspecting health care centers and authorizing the issuance of license on health care services in the covered area on behalf of the concerned ministry.



TUMS Vision

The gist of the vision of TUMS is summarized as accomplishing the following in the coming decade:

- Promoting the university's academic status at the regional as well as the international level through acquiring the required capabilities in rendering higher educational services of the countries in the region,
- Increasing the university's role in production of science, research, and publication of scientific articles in the international journals, and meeting health needs of the society,
- Obtaining the required technology to produce the strategic medical supplies for the needs of the society,
- Improving health care standards of the covered population, and enhancing the quality and the diversity of the sub-specialized health care services,
- Playing effective roles in introducing new methods and comprehensive plans for environmental preservation.



The university has 11 schools, operates 16 teaching hospitals, is equipped with over 44 reference medical libraries, and publishes 58 journals, some in collaboration with academic societies.

Tehran University of Medical Sciences consists of the following schools:

- School of Medicine,
- School of Dentistry,
- School of Pharmacy,
- School of Public Health,
- School of Rehabilitation,
- School of Allied Medical Sciences,
- School of Nursing & Midwifery,
- School of Persian Medicine,
- School of Advanced Medical Technologies,
- School of Nutrition Sciences and Dietetics,
- Virtual School.

TUMS Institutes and Research Centers

Institutes:

- Endocrinology and Metabolism Research Institute (EMRI)
 - Endocrinology and Metabolism Clinical Sciences Research Institute:
 - Diabetes Research Centre
 - Osteoporosis Research Centre
 - Endocrinology and Metabolism Research Center
 - Endocrinology and Metabolism Molecular-Cellular Research Sciences:
 - Biosensor Research Centre
 - Metabolic Diseases Research Centre
 - Obesity and Eating Habit Research Centre
 - Endocrinology and Metabolism Population Sciences Research Institute:
 - Chronic Diseases Research Centre
 - Elderly Health research Center
 - Non-communicable Diseases Research Centre
- Institute for Environmental Research (IER)
 - Center for Water Quality Research (CWQR)
 - Center for Air Pollution Research (CAPR)
 - Center for Solid Waste Research (CSWR)
- Reducing High-risk Behaviors Research Institute (RHRBRI)
- Dentistry Sciences Research Institute (DSRI)
- Institute for Advanced Medical Technologies (IAMT)
- Family Health Research Institute (FHRI)
- Digestive Diseases Research Institute (DDRI)
- Pharmaceutical Sciences Research Institute (PSRI)
- Neurological Rehabilitation Research Institute (NRRI)



TUMS Research Centers

- Brain and Spinal Injury Research Center (BASIR)
- Sports Medicine Research Center (SMRC)
- Rheumatology Research Center (RRC)
- Immunology, Asthma and Allergy Research Center (IAARC)
- Sina Trauma and Surgery Research Center (STSRC)
- Psychiatry and Psychology Research Center (PPRC)
- Medical Ethics and History of Medicine Research Center (MEHMRC)
- Nursing and Midwifery Care Research Center (NMCRC)
- Research Center for Nuclear Medicine (RCNM)
- Urology Research Center (URC)
- Knowledge Utilization Research Center (KURC)
- Uro-Oncology Research Center (UORC)
- Research Center for Immunodeficiencies (RCID)
- Molecular Immunology Research Center (MIRC)
- Research Center of Quran, Hadith and Medicine (RCQHM)
- Medicinal Plants Research Center (MPRC)
- Toxicology and Poisoning Research Centre (TPRC)
- Nanotechnology Research Center (NRC)
- Center for Academic and Health Policy (CAHP)
- Pediatric Urology Research center (PURC)
- Advanced Diagnostic and Interventional Radiology Research Center (ADIRRC)
- Center for Educational Research in Medical Sciences (CERMS)
- Center for Research and Training in Skin Diseases and Leprosy (CRTSDL)
- Eye Research Center (ERC)
- Hematology, Oncology and Stem Cell Transplantation Research Center (HORCSCT)
- Iranian Tissue Bank (ITB) Research & Preparation Center
- Otorhinolaryngology Research Center (ORC)
- Skin and Stem Cell Research Center (SSCRC)
- Cancer Research Center, Cancer Institute of IR.Iran (CRC)
- Research Center for Rational Use of Drugs (RCRUD)
- Research Center for Immunodeficiencies (RCID)
- Breast Disease Research Center (BDRC)
- Thrombosis Hemostasis Research Center (THRC)
- Craniomaxillofacial Research Center (CMFRC)



In medical education domain, in order to acquire deep practical knowledge and skills, one of the most important aspects is the hands-on experience and practical training as an effective member of experienced care team; from which the medical students benefit the most.

Regarding this necessity, TUMS has a huge advantage in comparison with many other similar universities, as it has **16 teaching (Educational and Therapeutic) Hospitals** which cover a population of more than **3,000,000 people directly** and a **nationwide referral for more than 80 million** Iranian Population; providing TUMS students with ample and valuable opportunities to put their knowledge to practice in the field.



Tehran University of Medical Sciences affiliated Hospitals

4654 total number of teaching hospital active beds
affiliated to TUMS in 16 Hospitals

dedicated to rotations and educational purposes of TUMS students in all fields of Health sciences, including undergraduate Doctor of Medicine curriculum medical students.

| | Hospital Name | Activity Type | Care Type | Founding Year | Hospital Bed Occupancy Rate % (annual mean) | Number of Hospital Active Beds |
|---|---|-------------------------------|------------------------------------|----------------------|--|---------------------------------------|
| 1 | Sina Hospital Complex | Teaching & research* Hospital | General (specialty & subspecialty) | 1837 | 86.63 | 459 |
| 2 | AmirA'lam Hospital Complex | Teaching & research* Hospital | General *Otorhinolaryngology | 1913 | 72.31 | 227 |
| 3 | Children's Medical Center Hospital | Teaching Hospital | Pediatrics referral Center | 1968 | 94.68 | 348 |
| 4 | Imam Khomeini Hospital Complex | Teaching Hospital | General (specialty & subspecialty) | 1938 | | |
| 5 | VALI-E-ASR HOSPITAL | Teaching Hospital | General (specialty & subspecialty) | 1975 | 89.61 | 1104 |
| 6 | CANCER INSTITUTE | Teaching Hospital | Cancer referral center | 1949 | | |
| 7 | Baharloo Hospital | Teaching Hospital | General | 1940 | 85.47 | 294 |
| 8 | Bahrami Children's Hospital | Teaching Hospital | Pediatrics | 1955 | 76.66 | 131 |



| | Hospital Name | Activity Type | Care Type | Founding Year | Hospital Bed Occupancy Rate % (annual mean) | Number of Hospital Active Beds |
|--|-------------------------------|-------------------------------|------------------------------------|---------------|---|--------------------------------|
| 9 | Dr Shariati Hospital | Teaching & research* Hospital | General (specialty & subspecialty) | 1965 | 86.45 | 518 |
| 10 | Razi Hospital | Teaching & research* Hospital | Dermatology | 1934 | 51.41 | 69 |
| 11 | Roozbeh Hospital | Teaching & research* Hospital | Psychiatry and neurology | 1951 | 98.24 | 207 |
| 12 | Ziaecian Hospital | Teaching Hospital | General | 1989 | 82.28 | 144 |
| 13 | Farabi Eye Hospital | Teaching & research* Hospital | Ophthalmology | 1930 | 85.79 | 221 |
| 14 | Arash Women's Hospital | Teaching Hospital | Obstetrics & Gynecology | 1975 | 98.48 | 140 |
| 15 | Tehran Heart Center | Teaching & research* Hospital | Cardio Vascular Diseases | 2001 | 83.85 | 452 |
| 16 | Yas Hospital | Teaching Hospital | General *Obstetrics and Gynecology | 1918 | 70.5 | 250 |
| <i>total number of teaching hospital active beds</i> | | | | | | 4564 |



Education development center (EDC)

“Education development center (EDC) of Tehran University of Medical Sciences (TUMS)” was established in 1995 to enhance the quality of medical education through policymaking, planning, evaluation, and monitoring, and (in necessary cases) educational development activities at the faculty and university level.

For decades TUMS has had gained a reputation for medical educational excellence and is known for being demanding by its intensive and inclusive curricula, restrict education/evaluation standards, and top-ranked skilled faculty members. And still today, TUMS holds the role of being an exemplar nationally and internationally in the Region.



Since its establishment, for more than two decades, the education development center of TUMS is focused on its mission of “improving the quality of education and learning with the aim of training educated workforce for giving the highest quality health services to the public and patients”, through perpetual-ongoing reforms in curriculum and educational empowerment of faculty members and professors.

Tehran University of Medical Sciences and the “association of medical education in Europe” (AMEE) currently hold an active Collaboration agreement.

Based on the which, representatives of Tehran University of medical sciences are members of the BEME board and BEME review editorial committee (BREC) and actively collaborate and share success stories in the enhancement and educational optimization.

The EDC of TUMS believes that all educational environments at the university level, are the arena for the development of medical education. Therefore, we consider all faculty members, medical students, administrative staff, and TUMS graduates as colleagues to achieve our vision.



TUMS Doctor of Medicine – MD Course

specifications
timeline
stages
and core Syllabus topics



General specifications of the course

Course Name: **Doctor of Medicine - MD**

Course length: The minimum mandatory course length is 7.5 years.

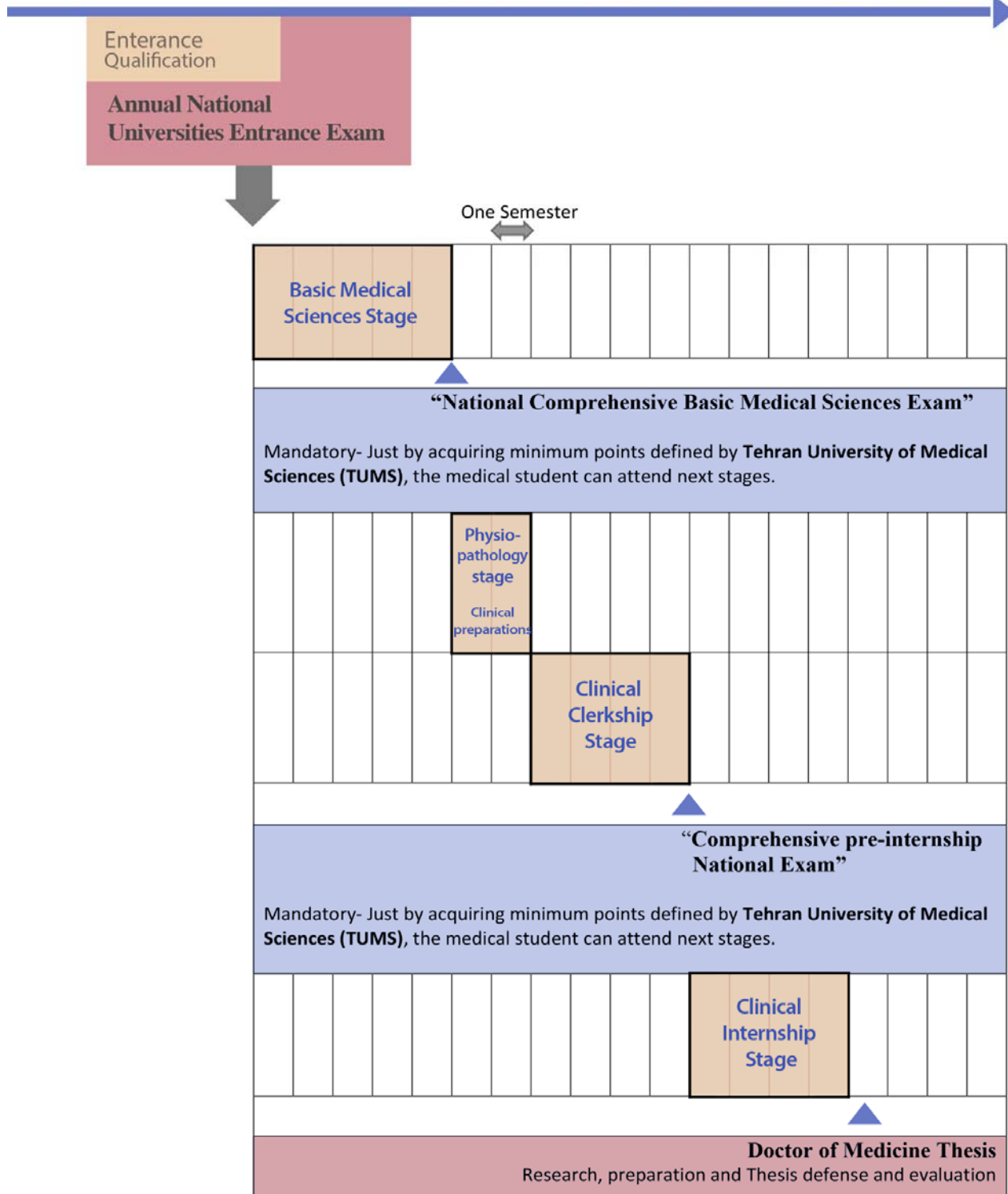
The form of the system and its regulations are based on the educational regulations of the general medical doctorate (undergraduate) course approved by the National High Council for Planning of health and Medical Sciences.

The general medicine training course by this Curriculum includes 4 main stages:

1. Basic Medical Sciences
2. Clinical preparations (Physiopathology stage)
3. Clinical Clerkship
4. Clinical Internship



Tehran University of Medical Sciences General Medical Doctorate Course Timeline



* Note: Time spans depicted above are core mandatory and minimum mandatory time spans. By elective and optional courses mentioned in the curriculum it can differ per student.

Total credits of the course: The total core quantity of credits in this course is 298.25, which is distributed as follows:

- Basic Medical Sciences Phase: 89.25 (for International Students)
- Fundamental of Clinical Medicine phase: 32.5
- Clinical Clerkship Phase: 102.5
- Clinical Internship Phase: 74.0

Total 298 .25 credits

— Compulsory core courses:

Compulsory courses include curriculum core contents that is mandatory for all general medical students to achieve the expected competencies of general practitioners.

Tehran university of medical sciences Faculty of Medicine and its affiliated Hospitals will provide the required conditions that ensures achieving the Objectives and goals stated in this document.



Compulsory core courses will be presented in all the four stages of the general medicine as follows:

1) The first stage
Basic Medical Sciences:

General courses: At least 16 credits out of 18 required credits before the comprehensive exam of basic medical sciences

Basic courses: All 89.25 credits required to pass from basic medical sciences credits before the comprehensive basic medical sciences exam.

- Entry to the second stage (clinical preparation stage) is subject to obtaining a passing score in the “National comprehensive basic sciences exam”.

2) Second stage
**Clinical preparations
(Physiopathology stage):**

Number of dedicated credits in the clinical preparation phase: 32.5 credits



3) The third stage **Clinical Clerkship:**

The minimum length of the Clinical Clerkship stage is **21 months**,

which can be divided into two sections Clinical Clerkship 1 (or student) and Clinical Clerkship 2(or Extern), depending on the faculty program.

Number of specific theoretical credits of the Clinical Clerkship stage (mandatory): 29 credits

Number of Practical Clinical Clerkship credits (mandatory)
63 credits- equivalent to 21 months

Number of theoretical credits floating between clinical preparation and Clinical Clerkship (mandatory): 7 credits

- At the end of the third stage, the student must obtain a passing score in the “**Comprehensive pre-internship National Exam**” to enter the internship stage.
- To participate in the comprehensive pre-internship exam, the student must complete all general courses, and all basic and specialized courses related to the stages successfully.



4) The fourth stage
Clinical Internship:

Clinical Internship rotations stage length: **21 months (minimum)**

Number of required internship credits: 74 credits

A student graduating from a medical course in order to become “doctor of medicine”, is subject to propose a thesis research topic based on priorities and university protocols, register it, perform the research and as final step of becoming Doctor of Medicine, present and successfully defend his Thesis.



—Elective courses:

Elective courses include non-compulsory program topics that allow both university and students to adapt to the needs of the society and healthcare system, the specific needs of the region, and interested topics based on selection of departments and students.

It holds the capability of presenting a variety of content and learning opportunities as a complement to facilitate achieving the expected tailored Objectives.

The total number of specialized elective credits during the general medicine course: 4 before Comprehensive pre-internship National Exam.

Number of dedicated specialized credits to be completed in the internship phase according to the university program and intern selection:

16 credits (after Comprehensive pre-internship National Exam)



Course Topics



| | SIPAD Code | Subject | Number of credits | | prerequisite | |
|----|------------|---|-------------------|---|--------------------------------------|------|
| | | | Credit (theory) | Credit (practical Clerkship Internship) | | |
| 1 | 1011137-38 | <i>Tissue, Development & Function</i> | 2.25 | 0.25 | | 2.50 |
| 2 | 1011133-34 | <i>Cell and Molecules</i> | 3.0 | 0.75 | | 3.75 |
| 3 | 1011095-93 | <i>Anatomy of limbs</i> | 1.5 | 1.5 | | 3.00 |
| 4 | 1011032 | <i>Medical Physics</i> | 2.0 | | | 2.00 |
| 5 | 1011013 | <i>Principles of Health Services</i> | 2.0 | | | 2.00 |
| 6 | 1011034 | <i>General English Language</i> | 3.0 | | | 3.00 |
| 7 | 1010002-04 | <i>Cardiovascular System</i> | 3.25 | 1.0 | | 4.25 |
| 8 | 1010003-05 | <i>Respiratory System</i> | 1.5 | 0.25 | | 1.75 |
| 9 | 1011029 | <i>Medical Genetic</i> | 2.0 | | | 2.00 |
| 10 | 1010006-07 | <i>Biochemistry</i> | 1.5 | 0.5 | <i>Cell and Molecules</i> | 2.00 |
| 11 | 1011017 | <i>Psychology</i> | 2.0 | | | 2.00 |
| 12 | 1011136 | <i>Family Health</i> | 2.0 | | | 2.00 |
| 13 | 1011004 | <i>Persian Language</i> | 3.0 | | | 3.00 |
| 14 | 1011014 | <i>Medical Terminology I</i> | 3.0 | | <i>General English Language</i> | 3.00 |
| 15 | 1010008-12 | <i>Gastrointestinal System</i> | 2.0 | 0.75 | | 2.75 |
| 16 | 1010009-13 | <i>Endocrine Systems</i> | 1.5 | 0.25 | | 1.75 |
| 17 | 1010010-26 | <i>Urinary System</i> | 1.5 | 0.25 | | 1.75 |
| 18 | 1010011-14 | <i>Reproductive System</i> | 1.25 | 0.5 | | 1.75 |
| 19 | 1011030 | <i>Nutrition</i> | 2.0 | | | 2.00 |
| 20 | 1011018 | <i>Principles of Epidemiology</i> | 2.0 | | <i>Principles of Health Services</i> | 2.00 |
| 21 | 1011033 | <i>Information Technology</i> | 2.0 | | | 2.00 |
| 22 | 8888888 | <i>Physical Training I</i> | 1.0 | | | 1.00 |
| 23 | 2111111 | <i>Devine Ethics</i> | 2.0 | | | 2.00 |
| 24 | 1111112 | <i>Introduction to religion I</i> | 2.0 | | | 2.00 |
| 25 | 1010023-24 | <i>Immunology</i> | 2.5 | 0.5 | | 3.00 |



| | | | | | | |
|----|------------|--|------|------|------------------------------|------|
| 26 | 1010016-22 | <i>Nervous System</i> | 2.75 | 0.5 | | 3.25 |
| 27 | 1010017-21 | <i>Special Senses</i> | 1.0 | 0.25 | | 1.25 |
| 28 | 1010015-18 | <i>Anatomy of Head and Neck</i> | 1.0 | 0.5 | | 1.50 |
| 29 | 1011023-25 | <i>Microbiology</i> | 3.0 | 1.0 | | 4.00 |
| 30 | 1011024 | <i>Virology</i> | 1.0 | | | 1.00 |
| 31 | 1011015 | <i>Medical Terminology II</i> | 3.0 | | <i>Medical Terminology I</i> | 3.00 |
| 32 | 9999999 | <i>Physical Training II</i> | 1.0 | | <i>Physical Training I</i> | 1.00 |
| 33 | 1111113 | <i>Introduction to religion II</i> | 2.0 | | | 2.00 |
| 34 | 1011027-98 | <i>Pathology</i> | 4.0 | 2.0 | | 6.00 |
| 35 | 1011028-99 | <i>Parasitology</i> | 3.0 | 1.0 | | 4.00 |
| 36 | 1111114 | <i>Devine Texts</i> | 2.0 | | | 2.00 |
| 37 | 1111111 | <i>Iran Revolution</i> | 2.0 | | | 2.00 |
| 38 | | <i>Physiopathology of Endocrine system</i> | 2.0 | | | 2.00 |
| 39 | | <i>Physiopathology of Digestive system</i> | 2.0 | | | 2.00 |
| 40 | | <i>Physiopathology of Cardiovascular system</i> | 2.0 | | | 2.00 |
| 41 | | <i>Physiopathology of Urinary System</i> | 2.0 | | | 2.00 |
| 42 | | <i>Communicational Skills</i> | 0.5 | 1.0 | | 1.50 |
| 43 | | <i>Fundamentals of Clinical practice (Semiology)</i> | 2.0 | 2.0 | | 4.00 |
| 44 | | <i>Pharmacology 1</i> | 2.0 | | | 2.00 |
| 45 | | <i>Advanced Pathology 1</i> | 2.0 | | | 2.00 |
| 46 | | <i>Patho-physiology of Blood System</i> | 2.0 | | | 2.00 |
| 47 | | <i>Patho-physiology of Respiratory System</i> | 2.0 | | | 2.00 |
| 48 | | <i>Pathophysiology of Rheumatologic Diseases</i> | 2.0 | | | 2.00 |
| 49 | | <i>Pharmacology 2</i> | 2.0 | 1.0 | | 3.00 |
| 50 | | <i>Advanced Pathology 2</i> | 2.0 | 2.0 | | 4.00 |
| 51 | | <i>Clinical Immunology 1</i> | 1.0 | | | 1.00 |
| 52 | | <i>Clinical Immunology 2</i> | 1.0 | | | 1.00 |
| 53 | | <i>Elective</i> | 1.5 | | | 1.5 |
| 54 | | <i>Statistics</i> | 2.0 | | | 2.0 |



| | | | | |
|----|---|-----|------|------|
| 55 | <i>Clinical Epidemiology</i> | 2.0 | | 2.0 |
| 56 | <i>Toxicology</i> | 1.0 | | 1.0 |
| 57 | <i>Forensic Medicine</i> | 2.0 | 1.0 | 3.0 |
| 58 | <i>Internal Medicine Clerkship</i> | | 12.0 | 12.0 |
| 59 | <i>General Surgery</i> | 6.0 | 6.0 | 12.0 |
| 60 | <i>Orthopedics</i> | 2.0 | | 2.0 |
| 61 | <i>Clerkship in Orthopedics</i> | | 3.0 | 3.0 |
| 62 | <i>Urology</i> | 1.0 | | 1.0 |
| 63 | <i>Neurosurgery</i> | 1.0 | | 1.0 |
| 64 | <i>Clerkship in Urology</i> | | | 1.0 |
| 65 | <i>Infectious Diseases</i> | 3.0 | 3.0 | 6.0 |
| 66 | <i>General Obstetrics</i> | 4.0 | | 4.0 |
| 67 | <i>Neurologic Diseases</i> | 2.0 | | 5.0 |
| 68 | <i>Psychiatry</i> | 2.0 | 3.0 | 5.0 |
| 69 | <i>General Obstetrics and Gynaecology</i> | | 6.0 | 6.0 |
| 70 | <i>Medical Rules</i> | 2.0 | | 2.0 |
| 71 | <i>Diseases of Pediatrics 1</i> | 3.0 | 9.0 | 12.0 |
| 72 | <i>Diseases of Pediatrics 2</i> | 3.0 | | 3.0 |
| 73 | <i>Eye Diseases</i> | | 3.0 | 3.0 |
| 74 | <i>Radiology</i> | | 3.0 | 3.0 |
| 75 | <i>Skin Disease</i> | | 3.0 | 3.0 |
| 76 | <i>Ear, Nose and Throat Diseases</i> | 3.0 | | 3.0 |
| 77 | <i>Health Training</i> | 2.0 | | 2.0 |
| 78 | <i>Computer</i> | 2.0 | | 2.0 |
| 79 | <i>Internal Infectious Disease</i> | | 16.0 | 16.0 |
| 80 | <i>Health Training</i> | | 4.0 | 4.0 |
| 81 | <i>Psychiatry</i> | | 4.0 | 4.0 |
| 82 | <i>Emergency Medicine</i> | | 4.0 | 4.0 |
| 83 | <i>Diseases of Pediatrics</i> | | 12.0 | 12.0 |
| 84 | <i>Orthopedics</i> | | 2.0 | 2.0 |



| | | | |
|----|--|-----|-----|
| 86 | <i>Ear, Nose and Throat Diseases</i> | 2.0 | 2.0 |
| 87 | <i>Surgery</i> | 8.0 | 8.0 |
| 88 | <i>General Obstetrics and Gynecology</i> | 4.0 | 4.0 |
| 89 | <i>Infectious Diseases</i> | 4.0 | 4.0 |
| 90 | <i>Skin Disease</i> | 2.0 | 2.0 |
| 91 | <i>Burn Injuries</i> | 2.0 | 2.0 |
| 92 | <i>Anesthesiology</i> | 2.0 | 2.0 |
| 93 | <i>Neurology</i> | 2.0 | 2.0 |
| 94 | <i>Thesis</i> | 6.0 | 6.0 |



The first stage

Basic Medical Sciences

Core Syllabus

COURSE NAME: Cell and Molecules Block

NUMBER OF CREDITS: 3.0 (theory) – 0.75 (practical)

COURSE TYPE: Theoretical and Practical

GENERAL AIMS and DESCRIPTION:

This is the first block of MD program in Tehran University of Medical Sciences. The Cellular and Molecular Biology Program fosters interactions among students and faculty, helping to broaden the students' appreciation of diverse research opportunities and to encourage interdisciplinary thinking in a highly collaborative atmosphere. This program has been an integrative force that aims to tie together the various disciplines of genetics, biochemistry, microbiology, immunology, cell biology and others. The goal is to train our students to examine scientific problems from many perspectives through individualized, flexible programs of coursework and research. The biochemical pathways of living organisms are studied with a focus on metabolic processes. Topics include pathways linking nutritional intake and energy yielding processes as well as the application of underlying. Broad content includes a study of the chemistry and reactions of constituents of living matter, including carbohydrates, lipids, proteins, nucleic acids, vitamins, coenzymes, and minerals. In addition, the chemistry and regulation of the reactions and processes of whole organisms will be examined including: endocrinology, enzymology, nutrition, intermediary metabolism and biochemical mechanisms involved in select disease states.

References

1. **Junqueira's Basic Histology.** McGraw-Hill Medical 2010; 12th edition, chapters 1, 2, 3
2. **Guyton and Hall Textbook of Medical Physiology.** Saunders 2011, 12th edition, chapters 4 & 5
3. Cohen B.J. **Medical terminology: an illustrated guide.** Walter Kluwer/Lippincott Williams & Wilkins 2008. 5th edition
4. Devlin T.M. **Textbook of Biochemistry with Clinical Correlation.** John Wiley & Sons 2010; 7th edition
5. Murray R. Et al. **Harpers Illustrated Biochemistry.** McGraw-Hill Medical 2009; 28th edition
6. **Ganong's Review of Medical Physiology.** McGraw-Hill Medical 2009; 23rd edition



Cell and Molecules (theory) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|--|-------------|
| <i>Introduction to Cell & Molecule</i> | 2 |
| <i>Water and buffer</i> | 2 |
| <i>Introduction to Histology</i> | 2 |
| <i>Cell</i> | 4 |
| <i>Amino acid Structure & Classification</i> | 2 |
| <i>Amino acids & proteins classification</i> | 2 |
| <i>Amino acids & proteins functions</i> | 2 |
| <i>Amino acids & proteins Hemoglobin</i> | 2 |
| <i>Carbohydrates Mono- & Di- Saccharides</i> | 2 |
| <i>Carbohydrates Glycoconjugates</i> | 2 |
| <i>Lipids & Lipoproteins Structure</i> | 4 |
| <i>Enzymes</i> | 6 |
| <i>Vitamins & Coenzymes</i> | 2 |
| <i>Water Soluble Vitamins</i> | 2 |
| <i>Fat soluble vitamins</i> | 2 |
| <i>Amino Acids Structure</i> | 2 |
| <i>DNA Replication</i> | 2 |
| <i>Molecular biology Transcription</i> | 2 |
| <i>Molecular biology Translation</i> | 2 |
| <i>Molecular biology Repair mechanisms</i> | 2 |
| <i>Molecular biology Regulation of gene expression</i> | 2 |
| <i>Membrane performances</i> | 4 |
| <i>Membrane Potential (Voltage)</i> | 4 |
| Total hrs. | 58 |

Cell and Molecules (practical) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|--------------------------|-------------|
| <i>Titration</i> | 2 |
| <i>Carbohydrates</i> | 2 |
| <i>AminoAcides</i> | 2 |
| <i>Enzymes</i> | 2 |
| <i>Spectrophotometer</i> | 2 |
| <i>DNA Extraction</i> | 2 |
| <i>Chromatography</i> | 2 |
| <i>FlamePhotometry</i> | 2 |
| <i>Osiose</i> | 2 |
| Total hrs. | 18 |

COURSE NAME: Tissue, Development & Function Block
NUMBER OF CREDITS: 2.25 (theory) – 0.25 (practical)
COURSE TYPE: Theoretical and Practical



GENERAL AIMS and DESCRIPTION:

This is a lecture and laboratory course that examines the microanatomy of cells, tissues and organs. Lectures illustrate the microstructure of major tissues and organs in relation to their function. Laboratory exercises use the light microscope to study these components and make use of slides and electron micrographs for review and discussion. This lab-oriented program presents the molecular biology and histology of normal cells, tissues and organ systems at various developmental functional stages. Students learn how individual cell functions interact with one another and how such interactions are accomplished from the tissue levels to the organ levels. The course introduces molecular and control systems and prepares students for an understanding of normal (homeostasis) systems and pathological conditions. In addition, students learn how molecular building blocks are utilized for growth and differentiation, wound healing and tissue repair, defence mechanisms and transfer of hereditary characters.

References

1. **Junqueira's Basic Histology.** McGraw-Hill Medical 2010; 12th edition; chapters 4-10 and 12-13 and 18
2. **Langman's Medical Embryology.** Lippincott Williams & Wilkins 2012, 12th edition; chapters 2-9, pages 10-129
3. **Guyton and Hall Textbook of Medical Physiology.** Saunders 2011, 12th edition, chapters 6, 7, 8
4. **Ganong's Review of Medical Physiology.** McGraw-Hill Medical 2009; 23rd edition



Tissue, Development & Function (theory) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|--|-------------|
| <i>Epithelial Tissue</i> | 2 |
| <i>Connective Tissue</i> | 2 |
| <i>Types of Connective & Adipose Tissue</i> | 2 |
| <i>Cartilage Tissue & Joints</i> | 2 |
| <i>Osseous Tissue & Ossification</i> | 2 |
| <i>Blood & Hematopoiesis</i> | 2 |
| <i>Muscular Tissue</i> | 2 |
| <i>Nervous Tissue</i> | 4 |
| <i>Definition for Neurotransmission& Neurotransmitters</i> | 2 |
| <i>Cell Signaling</i> | 2 |
| <i>Skin</i> | 2 |
| <i>Introduction to Embryology</i> | 2 |
| <i>Gametogenesis</i> | 2 |
| <i>Ovulation & Fertilization</i> | 2 |
| <i>Embryonic Period</i> | 2 |
| <i>1st & 2nd Weeks of Embryonic Period</i> | 2 |
| <i>3rd Weeks of Embryonic Period</i> | 2 |
| <i>Fetal Period</i> | 2 |
| <i>Placenta & Fetal Membranes</i> | 2 |
| <i>Congenital Malformations</i> | 2 |
| <i>Contraction of Skeletal Muscle</i> | 2 |
| <i>Excitation of Skeletal Muscle</i> | 2 |
| <i>Contraction of Smooth Muscle</i> | 2 |
| <i>Neuromuscular Transmission</i> | 2 |
| Total hrs. | 50 |

Tissue, Development & Function (practical) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|--|-------------|
| <i>Microscopes</i> | 2 |
| <i>Epithelial Tissue</i> | 2 |
| <i>Connective & Osseous Tissue</i> | 2 |
| <i>Blood smears and cell differentiation</i> | 2 |
| <i>Cartilage Tissue</i> | 2 |
| <i>Muscular Tissue</i> | 2 |
| <i>Nervous Tissue</i> | 2 |
| <i>Skin</i> | 2 |
| Total hrs. | 16 |



COURSE NAME: Cardiovascular System Block
NUMBER OF CREDITS: 3.25 (theory) – 1.0 (practical)
COURSE TYPE: Theoretical and Practical

GENERAL AIMS and DESCRIPTION:

This course provides instruction into the mechanisms of operation of the human cardiovascular system. Emphasis is placed on the integration of relevant principles from anatomy, physiology, biochemistry, pathology, pharmacology and microbiology with respect to the behavior of the normal circulation and its responses to the stress of injury and disease. Both expert-directed and student-directed methodologies will be employed in this module and a select set of clinical cases will be used to guide instruction. Circulatory systems will present students with an integrated approach to the key supply chain and waste management systems of the body. Students will follow the movement of oxygen from the environment to the tissues, and movement of waste products of metabolism along the opposite path, examining the coordinated roles of the lungs, heart and kidney in the control and regulation of these processes. Introduction to anatomy, histology and pharmacology content will be incorporated into the course.

References

1. Drake R.L. **Gray's Anatomy for Students**. Churchill Livingstone 2010; 2nd edition. pp 58-243 excluding: 101-106, 128-130, 137-139, 159-176
2. **Junqueira's Basic Histology**. McGraw-Hill Medical 2010; 12th edition. Chapters 11 & 14
3. **Langman's Medical Embryology**. Lippincott Williams & Wilkins 2012; 12th edition. Chapter 13, pp: 162- 201.
4. **Medical physiology, Guyton and hall**. Saunders 2011, 12th edition. Chapters 9-12, Chapters 14-19, Chapter 20 (exception: methods for measuring cardiac output up to end) Chapter 21 (exception: ischemic heart disease up to end) Chapter 23 Chapter 23 Chapter 23
5. Snell R.S. **Clinical Anatomy by Systems**. Lippincott Williams & Wilkins 2006 ,Chapters 4 and 5 Pages 94-95 Page 271 (Thoracic duct) Page 609 (Phrenic nerve) Pages 569-571 (Vagus nerve)
6. Snell R.S. **Clinical Anatomy by Regions** 2008; 8th edition.
7. **Ganong's Review of Medical Physiology**. McGraw-Hill Medical 2010; 23rd edition. Chapters 5, 30-34
8. **Berne & Levy**. Medical physiology. 2008. 8th edition. Chapters 15-19

Cardiovascular System (theory) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Vertebral Column, Ribs & Sternum</i> | 2 |
| <i>Back</i> | 2 |
| <i>Thoracic Wall</i> | 2 |
| <i>Mediastinum & Heart</i> | 2 |
| <i>Heart</i> | 2 |
| <i>Superior & Posterior Mediastinum</i> | 4 |
| <i>Overview of Cardiovascular system</i> | 2 |
| <i>Histology of Circulatory System</i> | 2 |
| <i>Histology of Lymphatic & Immune System</i> | 4 |
| <i>Embryology of the Heart</i> | 2 |
| <i>Embryology of Vessels</i> | 2 |
| <i>Physiology of RBCs /WBCs and Plts</i> | 6 |
| <i>Action Potentials in Cardiac Muscle, Cardiac Cycle</i> | 2 |



| | |
|---|----|
| <i>Electrocardiogram</i> | 2 |
| <i>Blood Pressure, Heart Sounds</i> | 2 |
| <i>“Volume-Pressure Diagram” During the Cardiac Cycle</i> | 2 |
| <i>Physics Principles of Circulatory System</i> | 4 |
| <i>Control of Excitation and Conduction in the Heart</i> | 2 |
| <i>of Circulatory System</i> | 2 |
| <i>Vessels of Circulatory System</i> | 2 |
| <i>Circulatory System of Lymph & Capillaries</i> | 2 |
| <i>Central Cardiovascular Control</i> | 2 |
| <i>Special Circulatory</i> | 2 |
| <i>Total hrs.</i> | 56 |

Cardiovascular System (practical) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Histology of Heart, Lymph & Capillaries Arteries</i> | 4 |
| <i>Cell blood Count (RBC/WBC)</i> | 4 |
| <i>Hematocrits and Coagulation tests</i> | 2 |
| <i>Electrocardiogram</i> | 2 |
| <i>Blood Pressure, Heart Sounds</i> | 2 |
| <i>Osteology</i> | 4 |
| <i>Anatomy of Back</i> | 4 |
| <i>Thoracic Wall</i> | 2 |
| <i>Mediastinum & Heart</i> | 4 |
| <i>Superior & Posterior Mediastinum</i> | 2 |
| <i>Total hrs.</i> | 30 |



COURSE NAME: Respiratory System Block
NUMBER OF CREDITS: 1.5 (theory) – 0.25 (practical)
COURSE TYPE: Theoretical and Practical

GENERAL AIMS and DESCRIPTION:

This block integrates the basic sciences into a study of the pulmonary system in both health and disease. Each of the basic science topics is incorporated into an integrated body of knowledge utilizing both didactic and self-directed learning methods, and clinical models.

References

1. **Drake R.L. Gray's Anatomy for Students.** Churchill Livingstone 2010; 2nd edition. pages 159-175
2. **Junqueira's Basic Histology.** McGraw-Hill Medical 2010; 12th edition, pages 298-315
3. **Langman's Medical Embryology.** Lippincott Williams & Wilkins 2012, 12th edition. pages 201-2071
4. **Guyton and Hall Medical physiology,** 12th edition, 2011, chapters 37-41.
5. **Ganong's Review of medical physiology,** 2010, 23rd edition, section VII, chapters 35-37.
6. **Berne & Levy physiology,** 2010, 6th edition, section 5, chapters 20-25
7. **Snell R.S. Clinical Anatomy by Systems.** Lippincott Williams & Wilkins 2006
8. **Snell R.S. Clinical Anatomy by Regions** 2008; 8th edition

Respiratory System (theory) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Nasal Cavity</i> | <i>2</i> |
| <i>Pharynx & Larynx</i> | <i>2</i> |
| <i>Lung & Pleura</i> | <i>2</i> |
| <i>Histology of Respiratory System</i> | <i>2</i> |
| <i>Pulmonary Ventilation</i> | <i>2</i> |
| <i>Embryology of Respiratory System</i> | <i>2</i> |
| <i>Pulmonary Volumes and Capacities</i> | <i>2</i> |
| <i>Pulmonary circulation</i> | <i>2</i> |
| <i>Physical Principles of Gas Exchange</i> | <i>2</i> |
| <i>Transport of O₂ and CO₂ in Blood and Tissue Fluids</i> | <i>2</i> |
| <i>Regulation of Respiration</i> | <i>2</i> |
| <i>Total hrs.</i> | <i>22</i> |

Respiratory System (practical) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Histology of Respiratory system</i> | <i>2</i> |
| <i>Spirometry</i> | <i>2</i> |
| <i>Nasal Cavity, Pharynx & Larynx</i> | <i>2</i> |
| <i>Lung & Pleura</i> | <i>2</i> |
| <i>Applied Anatomy</i> | <i>2</i> |
| <i>Total hrs.</i> | <i>10</i> |



COURSE NAME: Anatomy of upper & Lower Limbs
NUMBER OF CREDITS: 1.5 (theory) – 1.5 (practical)
COURSE TYPE: Theoretical and Practical

GENERAL AIMS

Anatomy of the Limbs explores the principles of biomechanics: specifically levers, torques, force vectors and center of gravity, as related to the human body. The unit explores, in detail, the functional anatomy of the upper and lower limb and their associated girdles. Applications of anatomical and biomechanical principles in analysis of upper and lower limb function and dysfunction will also be covered.

this course will teach you what we know about anatomy of different parts of human body and how it relates to development, various injuries and disorders; you'll get a chance to work with prosected human cadaveric specimens and medical images such as MRI scans; course will increase your practical skills, improve your problem-solving and image interpretation skills, and help you understand why fundamental anatomy and imaging are important to understanding human health & disease; this course will focus on the anatomy of the back, upper & lower limbs, thorax and abdomen;

References

1. **Junqueira's Basic Histology.** McGraw-Hill Medical 2010; 12th edition; chapters 4-10 and 12-13 & 18
2. **Langman's Medical Embryology.** Lippincott Williams & Wilkins 2012, 12th edition; chapters 2-9, pages 10-129
3. Snell R.S. **Clinical Anatomy by Systems.** Lippincott Williams & Wilkins 2006
4. Snell R.S. **Clinical Anatomy by Regions** 2008; 8th edition
5. Drake R.L. **Gray's Anatomy for Students.** Churchill Livingstone 2010; 2nd edition. □ Chapter 1, pages 4-53, □ Chapter 7, pages 650-791, □ Chapter 6, pages 512-647



Anatomy of Limbs (theory) subjects

| Session Title | Hrs. |
|---|-------------|
| <i>Introduction to Anatomical Sciences</i> | 2 |
| <i>Osteology of Upper limb</i> | 4 |
| <i>Shoulder Region</i> | 2 |
| <i>Axillary Cavity & Ant. Compartment of Arm</i> | 2 |
| <i>Post. Compartment of Arm & Cubital Fossa</i> | 2 |
| <i>Forearm</i> | 2 |
| <i>Hand</i> | 2 |
| <i>Joints, Clinical & Surface Anatomy Of Upper Limb</i> | 2 |
| <i>Osteology of Lower Limb</i> | 2 |
| <i>Ant.& Med. Compartments of Thigh</i> | 2 |
| <i>Luteal Region & Post. Compartment of Thigh</i> | 2 |
| <i>Popliteal Fossa & Post. Compartment of Calf</i> | 2 |
| <i>Foot</i> | 2 |
| <i>Ant. & Lat. Compartment of Calf</i> | 2 |
| <i>Joints, Clinical & Surface Anatomy of Lower Limb</i> | 2 |
| Total hrs. | 30 |

Anatomy of Limbs (practical) subjects

| Session Title | Hrs. |
|--|-------------|
| <i>Intro. to dissection ethics & professionalism</i> | 2 |
| <i>Osteology of Upper limb</i> | 2 |
| <i>Axilla wall</i> | 2 |
| <i>The contents of axilla and the anterior arm</i> | 2 |
| <i>Triceps and cubital</i> | 2 |
| <i>The anterior compartment of the forearm</i> | 2 |
| <i>Posterior compartment of the forearm and dorsum of the hand</i> | 2 |
| <i>Palm</i> | 2 |
| <i>Surface Anatomy and clinical and joints</i> | 2 |
| <i>Ant.& Med. Compartments of Thig</i> | 2 |
| <i>Gluteal and thigh</i> | 2 |
| <i>Popliteal and posterior tibia</i> | 2 |
| <i>Anterior and outside leg and back foot</i> | 2 |
| <i>Metatarsus</i> | 2 |
| Total hrs. | 28 |



COURSE NAME: Clinical Biochemistry
NUMBER OF CREDITS: 1.5 (theory) – 0.5 (practical)
COURSE TYPE: Theoretical and Practical

GENERAL AIMS and DESCRIPTION:

Topics include pathways linking nutritional intake and energy yielding processes as well as the application of underlying. Broad content includes a study of the chemistry and reactions of constituents of living matter, the chemistry and regulation of the reactions and processes of whole organisms will be examined including: endocrinology, enzymology, nutrition, intermediary metabolism and biochemical mechanisms involved in select disease states.

References

1. **Junqueira's Basic Histology.** McGraw-Hill Medical 2010; 12th edition, chapters 1, 2, 3
2. **Guyton and Hall Textbook of Medical Physiology.** Saunders 2011, 12th edition, chapters 4 & 5
3. Cohen B.J. **Medical terminology: an illustrated guide.** Walter Kluwer/Lippincott Williams & Wilkins 2008. 5th edition
4. Devlin T.M. **Textbook of Biochemistry with Clinical Correlation.** John Wiley & Sons 2010; 7th edition
5. Murray R. et al. **Harpers Illustrated Biochemistry.** McGraw-Hill Medical 2009; 28th edition
6. **Ganong's Review of Medical Physiology.** McGraw-Hill Medical 2009; 23rd edition

Clinical Biochemistry (theory) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Metabolism of carbohydrates</i> | 6 |
| <i>Metabolism of amino acids & other nitrogen compounds</i> | 4 |
| <i>Metabolism of non-protein nitrogen compounds</i> | 4 |
| <i>Clinical Enzymology</i> | 2 |
| <i>Metabolism of lipids & lipoproteins</i> | 6 |
| <i>Oxidative phosphorylation</i> | 2 |
| <i>Total hrs.</i> | 24 |

Clinical Biochemistry (practical) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|--------------------------|-------------|
| <i>Titration</i> | 2 |
| <i>Carbohydrates</i> | 2 |
| <i>AminoAcides</i> | 2 |
| <i>Enzymes</i> | 2 |
| <i>Spectrophotometer</i> | 2 |
| <i>DNA Extraction</i> | 2 |
| <i>Chromatography</i> | 2 |
| <i>FlamePhotometry</i> | 2 |
| <i>Osmose</i> | 2 |
| <i>Total hrs.</i> | 18 |



COURSE NAME: Gastrointestinal System Block
NUMBER OF CREDITS: 2.0 (theory) – 0.75 (practical)
COURSE TYPE: Theoretical and Practical



GENERAL AIMS and DESCRIPTION:

This required system-based block integrates the basic sciences into the study of the gastrointestinal system and metabolism in both health and disease. Each of the basic science topics is incorporated into an integrated body of knowledge utilizing both didactic and self-directed learning methods, and clinical models.

References

1. Drake R.L. **Gray's Anatomy for Students**. Churchill Livingstone 2010; 2nd edition. Chapter 4, pages 246-355 and 366-381, chapter 5, pages 439-441, chapter 8, pages 1030-1060 and 985-998
2. **Junqueira's Basic Histology**. McGraw-Hill Medical 2010; 12th edition, Chapters 15-16, pages 249-297
3. **Langman's Medical Embryology**. Lippincott Williams & Wilkins 2009, 11th edition, chapter 15, pages 208-231
4. **Guyton and Hall Textbook of Medical Physiology**. Elsevier 2016, 13th edition, chapters 63-64-65-66

Gastrointestinal System (theory) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|--|-------------|
| <i>Anatomy of Oral Cavity, Pharynx & Esophagus</i> | 2 |
| <i>Histology of Oral Cavity</i> | 2 |
| <i>Histology of Salivary Glands & General Structure of Digestive Tract</i> | 2 |
| <i>Abdominal Wall- regions & Inguinal Canal</i> | 4 |
| <i>Peritoneal Cavity & Abdominal Viscera</i> | 2 |
| <i>Abdominal Digestive Tract</i> | 2 |
| <i>Digestive Tract in Pelvis</i> | 2 |
| <i>Microanatomy of Digestive Tract</i> | 2 |
| <i>Histology of Accessory Glands of Digestive System</i> | 2 |
| <i>Vessels & Nerves of Digestive System</i> | 2 |
| <i>Embryology of Foregut</i> | 2 |
| <i>Embryology of Midgut & Hindgut</i> | 2 |
| <i>General Principles of GI System</i> | 2 |
| <i>Gastric Secretion & Salivary and Esophagus Secretions</i> | 2 |
| <i>Pancreatic, Small and Large Secretions</i> | 2 |
| <i>Bile Secretion, Gall Bladder and Liver Functions</i> | 2 |
| <i>GI Motility, Digestion and Absorption</i> | 2 |
| Total hrs. | 38 |



Gastrointestinal System (practical) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|--|-------------|
| <i>Histology of Oral Cavity, Pharynx & Esophagus</i> | 2 |
| <i>Histology of Digestive Tract (Stomach, duodenum, Jejunum Ileum)</i> | 2 |
| <i>Histology of Digestive Tract in Pelvis</i> | 2 |
| <i>Anatomy of Oral Cavity, Pharynx & Esophagus</i> | 2 |
| <i>Abdominal Wall- regions & Inguinal Canal</i> | 4 |
| <i>Peritoneal Cavity & Abdominal Viscera</i> | 2 |
| <i>Abdominal Digestive Tract</i> | 2 |
| <i>Anatomy of Digestive Tract in Pelvis</i> | 2 |
| <i>Mesenteric and Inferacolin vessels</i> | 2 |
| <i>Total hrs.</i> | 20 |



COURSE NAME: Endocrine System Block
NUMBER OF CREDITS: 1.5 (theory) – 0.25 (practical)
COURSE TYPE: Theoretical and Practical

GENERAL AIMS and DESCRIPTION:

This block integrates the basic sciences into a study of the endocrine and reproductive systems in both health and disease. Each of the basic science topics is incorporated into an integrated body of knowledge utilizing both didactic and self-directed learning methods, and clinical models.

References

1. **Guyton and Hall Textbook of Medical Physiology.** Saunders 2011, 12th edition, □chapter 27, page 339 chapter 28, pages 345-348 and 353-357, chapters 74-79
2. **Junqueira's Basic Histology.** McGraw-Hill Medical 2010; 12th edition, chapter 20, pages 348-370
3. **Langman's Medical Embryology.** Lippincott Williams & Wilkins 2009, 11th edition, chapter 17, pages 274-275 and 267-268, chapter 18, pages 303-304 and 316-317

Endocrine System (theory) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Anatomy, Histology & Embryology of Hypothalamus & Pituitary Gland</i> | 2 |
| <i>Anatomy, Histology & Embryology of Thyroid, Parathyroid, Adrenal Glands & Pancreatic Islands</i> | 2 |
| <i>Introduction to Physiology of Endocrine System</i> | 2 |
| <i>Biochemical Principles of Hormones</i> | 2 |
| <i>Hypothalamus and Posterior Pituitary</i> | 2 |
| <i>Anterior Pituitary</i> | 2 |
| <i>Insulin, Glucagon, and Diabetes Mellitus</i> | 2 |
| <i>Thyroid Metabolic Hormones</i> | 2 |
| <i>Adrenocortical Hormones</i> | 2 |
| <i>Parathyroid Hormone, Calcitonin, Vitamin D and Bone</i> | 2 |
| <i>Biochemistry of Hypothalamus & Pituitary Gland</i> | 2 |
| <i>Biochemistry of Thyroid Hormones</i> | 2 |
| <i>Thyroid Metabolic Hormones</i> | 2 |
| <i>Biochemistry of Parathyroid Hormones & Regulation Mechanism of Ca²⁺</i> | 2 |
| Total hrs. | 28 |

Endocrine System (practical) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Microscopic structure of Endocrine system Glands</i> | 2 |
| <i>Macroscopic structure of Endocrine system Glands</i> | 2 |
| <i>Body Mass Index Calculation</i> | 2 |
| Total hrs. | 6 |



COURSE NAME: Reproductive System Block
NUMBER OF CREDITS: 1.25 (theory) – 0.5 (practical)
COURSE TYPE: Theoretical and Practical

GENERAL AIMS and DESCRIPTION:

In the reproductive system block, students will learn how to explain the cellular and anatomical components of reproduction and early development. These components include the development of the reproductive track, development of gametes, fertilization, and formation of the germ layers, development of the embryonic environment, and endocrinology of the system. Students will learn the behaviors, attitudes and psycho-social factors that accompany the physical changes of puberty during normal development, as well as some of the psychiatric disorders that may emerge and disrupt normal development during this period. Students will also become familiar with psychosocial treatments for pre and postpartum psychiatric disorders. Finally, students will critically evaluate basic and clinical research in the field.

References

1. Drake R.L. **Gray's Anatomy for Students**. Churchill Livingstone 2010; 2nd edition. Chapter 5, pages 448-496
2. **Junqueira's Basic Histology**. McGraw-Hill Medical 2010; 12th edition, chapters 21-22, pages 371-411, chapter 18, pages 316-331.
3. **Langman's Medical Embryology**. Lippincott Williams & Wilkins 2009, 11th edition, chapter 16, pages 243-259, chapter 21, pages 339-344
4. **Guyton and Hall Textbook of Medical Physiology**. Saunders 2011, 12th edition, chapters 80-83

Reproductive System (theory) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Anatomy of Male Reproductive System</i> | 2 |
| <i>Histology of Male Reproductive System</i> | 2 |
| <i>Anatomy of Female Reproductive System & Breast</i> | 2 |
| <i>Histology of Female Reproductive System & Breast</i> | 2 |
| <i>Embryology of Reproductive System</i> | 4 |
| <i>Perineum & Radiological Anatomy of Reproductive System</i> | 2 |
| <i>Sex Differentiation</i> | 2 |
| <i>Male Reproductive Physiology</i> | 2 |
| <i>Female Reproductive Physiology</i> | 2 |
| <i>Biochemistry of Reproductive System</i> | 2 |
| Total hrs. | 22 |

Reproductive System (practical) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Testicle, Epididymis and Prostate gland</i> | 2 |
| <i>Ovary, Ovary fallopian tube and Uterus</i> | 2 |
| <i>Anatomy of Male reproductive system</i> | 4 |
| <i>Anatomy of Female reproductive system</i> | 4 |
| <i>Perineum & Radiological Anatomy of Reproductive System</i> | 4 |
| Total hrs. | 16 |



COURSE NAME: Urinary System Block

NUMBER OF CREDITS: 1.5 (theory) – 0.25 (practical)

COURSE TYPE: Theoretical and Practical

This required system based block integrates the basic sciences into a study of the urinary tract and renal system in both health and disease. Each of the basic science topics is incorporated into an integrated body of knowledge utilizing both didactic and self-directed learning methods, and clinical models.

References

1. **Drake R.L. Gray's Anatomy for Students.** Churchill Livingstone 2010; 2nd edition. pages 355-366, □pages 421-438, pages 441-447, □pages 462-477
2. **Junqueira's Basic Histology.** McGraw-Hill Medical 2010; 12th edition, chapter 19 pages: 332-347
3. **Langman's Medical Embryology.** Lippincott Williams & Wilkins 2009, 11th edition, chapter 16 pages: 232- 242
4. **Guyton and Hall Textbook of Medical Physiology.** Saunders 2011, 12th edition, chapters 25-31 pages: 285-409

Urinary System (theory) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Pelvic Osteology</i> | 2 |
| <i>Pelvic Diaphragm</i> | 2 |
| <i>Pelvic Circulatory & Nervous System</i> | 2 |
| <i>Anatomy of Urinary System</i> | 2 |
| <i>Histology of Urinary System</i> | 2 |
| <i>Embryology of Urinary System</i> | 2 |
| <i>Structure and function of biological water</i> | 4 |
| <i>Electrolytes</i> | 2 |
| <i>Blood PH. & Mechanism of PH regulation</i> | 2 |
| <i>Principles of ABG</i> | 2 |
| <i>Renal Basic Mechanisms, Reabsorption and Secretion</i> | 2 |
| <i>Renal and Nephron Functions</i> | 2 |
| <i>Clearance and Auto regulation</i> | 2 |
| <i>Urine Concentrating Ability</i> | 2 |
| <i>Control of Blood Volume and Acid-Base Balance</i> | 2 |
| Total hrs. | 30 |

Urinary System (practical) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|--|-------------|
| <i>Microscopic Structure of Urinary System</i> | 2 |
| <i>Anatomy of Urinary System</i> | 2 |
| <i>Pelvic Osteology</i> | 2 |
| <i>Pelvic Circulatory & Nervous System</i> | 2 |
| Total hrs. | 8 |



COURSE NAME: Anatomy of Head and Neck
NUMBER OF CREDITS: 1.0 (theory) – 0.5 (practical)
COURSE TYPE: Theoretical and Practical

GENERAL AIMS and DESCRIPTION:

Identify key events and stages in development of major nervous system structures. Summarize the main structures and functions within the major divisions of the normal nervous system: the brain, spinal cord and peripheral nervous system. Describe how regional nervous system structures interact to perform specific functions. Locate nervous system dysfunction based on common neurological syndromes. Synthesize vascular anatomy and neuroanatomy to locate dysfunction in ischemic stroke syndromes. Exhibit critical thinking, effective communication, problem solving and interpersonal skills to contribute to a high-performance team. Provide constructive feedback to peers and use peer feedback to identify and improve strengths and limitations in skills and attitudes.

References

1. **Langman's Medical Embryology.** Lippincott Williams & Wilkins 2021, 11th edition, chapter 17, pages 260-286, Chapter 10, pages 133-142, Chapter 19, pages 321-328, Chapter 20, pages 329-338

Anatomy of Head and Neck (theory) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Overview of Skull & Osteology</i> | 8 |
| <i>Sinuses & Fontanelles</i> | 2 |
| <i>Carotid Triangle</i> | 2 |
| <i>Posterior Triangle</i> | 2 |
| <i>Suprahyoid & Prevertebral Region</i> | 2 |
| <i>Infracarotid Region</i> | 2 |
| <i>Face (Muscles, Parotid Gland)</i> | 2 |
| <i>Scalp, Temporal & Infratemporal Region</i> | 2 |
| <i>Oral & Nasal Cavity</i> | 2 |
| <i>Pharynx, Lymph Nodes of Head & Neck</i> | 2 |
| <i>Embryology of Head and Neck</i> | 2 |
| Total hrs. | 28 |

Anatomy of Head and Neck (practical) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|--|-------------|
| <i>Skull Osteology</i> | 6 |
| <i>Carotid Triangle</i> | 2 |
| <i>Posterior Triangle</i> | 2 |
| <i>Face (Muscles, Parotid Gland)</i> | 2 |
| <i>Temporal & Infratemporal Region</i> | 2 |
| <i>Applied Anatomy of head and Neck</i> | 4 |
| Total hrs. | 18 |



COURSE NAME: Nervous System Block
NUMBER OF CREDITS: 2.75 (theory) – 0.5 (practical)
COURSE TYPE: Theoretical and Practical

GENERAL AIMS and DESCRIPTION:

This required system-based block integrates the basic sciences into a study of neuroscience and behavior in both health and disease. Each of the basic science topics is incorporated into an integrated body of knowledge covering neuroanatomy, neurophysiology, neurological correlations, neuropharmacology, neuropathology, human behavior and psychiatry, utilizing both didactic and self-directed learning methods and clinical models.

References

1. **Snell Clinical neuroanatomy**
2. **Junqueira's Basic Histology**. McGraw-Hill Medical 2010; 12th edition,
3. □□chapter 9, pages 152-158
4. **Langman's Medical Embryology**. Lippincott Williams & Wilkins 2012, 12th edition,
5. □□chapter 18, pages 287-320
6. **Guyton and Hall Textbook of Medical Physiology**. Saunders 2011, 12th edition, Chapters 45-48, Chapters 54-60

Nervous System (practical) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Anatomy of the vertebral canal and spinal cord</i> | 2 |
| <i>Spinal cord and spinal nerves</i> | 2 |
| <i>Autonomic nervous system and the body dermatome</i> | 2 |
| <i>Brainstem and cerebellum</i> | 2 |
| <i>Dyansfal and the cerebral hemispheres</i> | 2 |
| <i>Vessels and membranes of the brain and cranial nerves</i> | 2 |
| <i>Applied anatomy of the brain vessels, blinds and sinus Cranial venous</i> | 2 |
| <i>Histology of the spinal cord, cerebellum, cerebral cortex and nerve tissue</i> | 2 |
| <i>Investigating the neural reflex</i> | 2 |
| <i>Two-point discrimination</i> | 2 |
| <i>Total hrs.</i> | 20 |



Nervous System (theory) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|--|-------------|
| <i>Division of the nervous system & spinal cord appearance</i> | 2 |
| <i>The internal structure of the spinal cord</i> | 2 |
| <i>Medulla oblongata</i> | 2 |
| <i>Pons</i> | 2 |
| <i>Midbrain</i> | 2 |
| <i>Cerebellum</i> | 2 |
| <i>Diencephalon</i> | 2 |
| <i>Cerebral hemispheres</i> | 2 |
| <i>The cerebral hemispheres and basal Nuclei</i> | 2 |
| <i>Limbic system and reticular formation</i> | 2 |
| <i>Vessels and Meninges</i> | 2 |
| <i>The structure of cranial nerves</i> | 2 |
| <i>Embryology of Nervous system</i> | 2 |
| <i>Radiological and clinical anatomy of brain and spinal cord</i> | 2 |
| <i>Organization of Nervous System</i> | 2 |
| <i>Somatic Sensations: Tactile and Position Senses</i> | 2 |
| <i>Sensory Receptors, Neuronal Circuits for Processing Information</i> | 2 |
| <i>Somatic Sensations: Pain and Thermal Sensations</i> | 2 |
| <i>Motor Functions of the Spinal Cord</i> | 2 |
| <i>Cortical and Brain Stem Control of Motor Function</i> | 2 |
| <i>The Cerebellum</i> | 2 |
| <i>Basal Ganglia</i> | 2 |
| <i>The Autonomic Nervous System</i> | 2 |
| <i>Cerebral Cortex, Learning, and Memory</i> | 2 |
| <i>Sleep and Brain Waves</i> | 2 |
| <i>The Limbic System</i> | 2 |
| <i>Total hrs.</i> | 52 |



COURSE NAME: Special Senses System Block
NUMBER OF CREDITS: 1.0 (theory) – 0.25 (practical)
COURSE TYPE: Theoretical and Practical

GENERAL AIMS and DESCRIPTION:

The most important concepts and common disorders in dermatology, otolaryngology and ophthalmology are discussed during a three-week period. The skills in the performance of proper procedures for diagnosis and treatment of minor and urgent disorders are acquired. Emphasis is placed on the recognition of manifestations of common systemic disorders.

References

1. **Junqueira's Basic Histology.** McGraw-Hill Medical 2010; 12th edition
Chapter 23, pages 412-438
2. **Langman's Medical Embryology.** Lippincott Williams & Wilkins 2021, 11th edition
Chapter 19, pages 321-328
Chapter 20, pages 329-338
3. **Guyton and Hall Textbook of Medical Physiology.** Saunders 2011, 12th edition
Chapters 49 & 50: pages 597-621
Chapters 50 & 51: 609-632
Chapter 52 & 53
Chapter 55: pages 674-678

Special Senses (theory) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Macroscopic structure of the eyes</i> | 2 |
| <i>Macroscopic structure of ears</i> | 2 |
| <i>Microscopic structure of eyes and ears</i> | 2 |
| <i>Embryology (Development) of eyes and ears</i> | 2 |
| <i>The Eye: Optics of Vision</i> | 2 |
| <i>The Eye: Neural Function of the Retina and Central Neurophysiology of Vision</i> | 2 |
| <i>The Sense of Hearing</i> | 2 |
| <i>Vestibular Sensations and the Chemical Senses—Taste and Smell</i> | 2 |
| Total hrs. | 16 |

Special Senses (practical) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|--|-------------|
| <i>Anatomy of the eye and contents the eye</i> | 4 |
| <i>Anatomy of the ear and contents the eye</i> | 2 |
| <i>Applied anatomy of the eye and ear</i> | 2 |
| <i>Histology of the eye and ear</i> | 2 |
| <i>Ophthalmoscopy, otoscopy and perimetry</i> | 2 |
| Total hrs. | 12 |



COURSE NAME: Medical Microbiology

NUMBER OF CREDITS: 3.0 (theory) – 1.0 (practical)

COURSE TYPE: Theoretical and Practical

GENERAL AIMS

1. Learning the principles of microbiology, including the structural and physiological properties of microorganisms and their roles in diseases and the methods to control them.
2. Classification of pathogens
3. Treatment of bacterial diseases
4. Familiarizing students with the structure of microorganisms, staining, lam preparation

LEARNING OUTCOMES

Students must:

1. Know microbial and physiological principles
2. Know the methods and problems of microorganism classification
3. Know pathogenic and epidemiological mechanisms
4. Know antiseptic effect mechanisms
5. Know control methods the mechanisms of antibiotic effects
6. know the methods to determine the effect mechanisms of antibiotics
7. Be able to explain the relationship between dosage, parasite and the drug.
8. Know protection methods while working with microorganisms
9. Know methods to work with microorganisms, microscope use and microscopic and macroscopic identification of microorganisms
10. Be able to do cell culture and perform identification experiments
11. Perform antibiogram tests and know and examine antibiotic effects
12. Know microbiology lab equipment
13. Know staining methods
14. Be able to prepare culture medium
15. Know microorganism identification methods

References

1. **ZINSSER MICROBIOLOGY.** 13th Edition. Reviewed by Ernest Jawetz.



Microbiology (practical) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Laboratory Safety, Sterilization, and Culture media</i> | 2 |
| <i>Specimen Collection, Bacterial Identification and staining</i> | 2 |
| <i>Bacterial Cultivation</i> | 2 |
| <i>Antimicrobial Susceptibility Testing</i> | 2 |
| <i>laboratory identification of Staphylococci</i> | 2 |
| <i>laboratory identification of Neisseria and Moraxella catarrhalis</i> | 2 |
| <i>lab. identification of Streptococcus, Enterococcus, and Other Catalase Negative, Gram-Positive Cocci</i> | 2 |
| <i>lab. identification of Corynebacterium, and Similar Organisms</i> | 2 |
| <i>lab. identification of Bacillus and Similar Organisms</i> | 2 |
| <i>laboratory identification of Enterobacteriaceae and Pseudomonas</i> | 2 |
| <i>laboratory identification of Mycobacterium</i> | 2 |
| <i>laboratory identification of Vibrio</i> | 2 |
| <i>Review</i> | 2 |
| <i>Total hrs.</i> | 26 |

Microbiology (theory) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|--|-------------|
| <i>Bacterial Classification, Microbial Cell Structure and Function</i> | 2 |
| <i>Commensal and Pathogenic Microbial Flora in Humans</i> | 2 |
| <i>Bacterial Metabolism and Microbial Growth</i> | 2 |
| <i>Microbial Growth, Environmental Effects on Microbial Growth</i> | 2 |
| <i>Bacterial Genetics</i> | 2 |
| <i>Antibiotics</i> | 2 |
| <i>Sterilization, Disinfection, and Antisepsis</i> | 2 |
| <i>Staphylococcus and Related Gram-Positive Cocci</i> | 2 |
| <i>Streptococcus, Enterococcus and Other Gram-Positive Cocci</i> | 2 |
| <i>Neisseria and Related Genera</i> | 2 |
| <i>Corynebacterium, Listeria and Erysipelothrix</i> | 2 |
| <i>Spore-forming Gram-Positive Bacteria (Bacillus)</i> | 2 |
| <i>Clostridium</i> | 2 |
| <i>Mycobacterium</i> | 2 |
| <i>Mycobacterium, Nocardia and Related Bacteria</i> | 3 |
| <i>Pseudomonas, Related Bacteria</i> | 2 |
| <i>Enterobacteriaceae (Klebsiella, Escherichia, Proteus)</i> | 3 |
| <i>Acinetobacter, Haemophilus and Related Bacteria</i> | 2 |
| <i>Enterobacteriaceae (Salmonella, Yersinia, Shigella)</i> | 3 |
| <i>Bordetella, Francisella, Brucella and Legionella</i> | 2 |
| <i>Vibrio, Campylobacter and Helicobacter</i> | 2 |
| <i>Treponema, Borrelia and Leptospira</i> | 2 |
| <i>Chlamydia, Mycoplasma</i> | 2 |
| <i>Rickettsia, Orientia, Chlamydia, Chlamydoghila, Mycoplasma and Ureaplasma</i> | 2 |
| <i>Total hrs.</i> | 51 |



COURSE NAME: Medical Virology

NUMBER OF CREDITS: 1.0 (theory)

COURSE TYPE: Theoretical

GENERAL AIMS

- 1- Familiarity with the general science of medical virology
 - 2- Understanding the structure, characteristics, and proliferation of pathogenic viruses concerning clinical phenomena (symptoms, pathology, incidence, and epidemiology) of viral infections in humans.
 - 3- Knowledge of methods of diagnosis and application of virological methods in understanding clinical and epidemiological phenomena regarding viral infections
- General goals 70

This course is intended to provide an overview of medical virology, understanding the characteristics of pathogenic viruses, diagnosis methods, and epidemiology of viral infections in Iran.

References

ZINSSER MICROBIOLOGY. 13th Edition. Reviewed by Ernest Jawetz.

| <i>Session Title</i> | <i>Hrs.</i> |
|--|-------------|
| <i>Significance of Viral diseases, History Structure of Viruses Classification of Viruses Replication of viruses, and viral pathogenesis</i> | 2 |
| <i>Control of Viral infections: Antiviral agents, interferon, Viral vaccines, Diagnosis of viral infections, and viral nosocomial infections</i> | 2 |
| <i>Parvoviridae, Papovaviruses, Adenoviridae, Poxviridae, and Herpesviridae family (HSV-1&2)</i> | 2 |
| <i>Herpesviridae family, (HHV-1 thru 8), Hepatitis viruses (B-D) Hepatitis viruses (C), Hepatitis viruses (A-E)</i> | 2 |
| <i>Picornaviridae (polio coxsackie Echo & paraechoviruses) Caliciviruses (Norovirus), Togaviridae, (Rubella virus)</i> | 2 |
| <i>Flaviviridae (Dengue, Zika, and Yellow Fever viruses), Retroviridae (HIV-1 & 2 – HTLV)</i> | 2 |
| <i>Paramyxoviridae (Metapneumovirus, Parainfluenza Measles Respiratory Syncytial Virus Orthomyxoviridae (Influenza viruses (A. B)</i> | 2 |
| <i>Rabdoviridae (Rabies virus), Viruses and Human Cancer (HPV/ EBV/ HBV/HCV)</i> | 2 |
| <i>Total hrs.</i> | 18 |



COURSE NAME: Immunology

NUMBER OF CREDITS: 2.5 (theory) – 0.5 (practical)

COURSE TYPE: Theoretical and Practical

GENERAL AIMS

Familiarizing students with the science of immunology and its use in understanding, preventing, diagnosis and treatment of disease.

The functions of the immune system and body defense mechanisms, different body organs which have significant roles in the functions of the immune system and the different types of immunity in body will be covered. Moreover, in practical the aim is familiarizing students with different lab equipment and diagnostic testing kits and their use.

At the end of this course, the student should be immersed in the science of immunology, members, the molecules and cells involved in the immune system and understand the different mechanisms of the immune system in dealing with foreign agents. Also, how the immune system responds to various diseases, including infectious diseases, autoimmune, cancer, transplant, and understanding the immune mechanisms in identifying and diagnosing various diseases.

Skills:

Medical students should know how to perform diagnostic methods of immunity and serology and their application in diagnosing various diseases, analyzing immunological and serological tests (in terms of positive and negative), and performing various immunological and serological tests such as agglutination test, perspiration, hemolysis, etc.

The practical part of the immunology course is designed to acquaint medical students with **common serological diagnostic methods** for diagnosing infectious diseases (parasitic, bacterial, viral, and fungal, blood groups, autoimmune diseases, serotyping, etc.) Students will also learn basic **essential laboratory test methods** in this course, and **perform serology tests** in the laboratory, and **interpret the tests' results**. They will also become familiar with more specialized tests and their application in diagnosing diseases.

LEARNING OUTCOMES

Students must:

1. Know pathogens and immunologic mechanism of diseases
2. Know resistance against diseases
3. Know lab diagnosis methods
4. Know immunologic substances used to cure diseases



Immunology (theory) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Introduction to Immunology</i> | 2 |
| <i>Cells and organs of the Immune system</i> | 2 |
| <i>Antigens</i> | 2 |
| <i>Antibodies</i> | 2 |
| <i>Complement System</i> | 2 |
| <i>Antigen-Antibody Interactions</i> | 2 |
| <i>Cytokines</i> | 2 |
| <i>Major Histocompatibility Complex(MHC) and Antigen presentation</i> | 2 |
| <i>Innate Immunity and Inflammation</i> | 2 |
| <i>Genetic basis of antigen receptors diversity</i> | 2 |
| <i>Development and activation of B lymphocytes (Humoral Immunity)</i> | 2 |
| <i>Development and activation of T lymphocytes (Cell mediated Immunity)</i> | 2 |
| <i>Mechanisms and Classification of Hypersensitivity</i> | 2 |
| <i>Immunology of Infectious diseases</i> | 2 |
| <i>Mucosal Immunity</i> | 2 |
| <i>Immunohematology</i> | 2 |
| <i>Immunodeficiency</i> | 2 |
| <i>Mechanisms of Autoimmunity</i> | 2 |
| <i>Immune responses to Tumors</i> | 2 |
| <i>Vaccines and Vaccination</i> | 2 |
| <i>Transplantation Immunology and Immunopharmacology</i> | 2 |
| <i>Immunologic Tolerance</i> | 2 |
| Total hrs. | 44 |

Immunology (practical) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Introduction (Check in, syllabus, preliminary session)</i> | 2 |
| <i>Hemagglutination Reactions</i> | 2 |
| <i>Agglutination Reactions</i> | 2 |
| <i>Neutralization Reactions</i> | 2 |
| <i>Immunoprecipitation- Reactions</i> | 2 |
| <i>Elisa, Radioimmunoassay</i> | 2 |
| <i>IF, Flowcytometry</i> | 2 |
| <i>Cell Isolation Techniques, Lymphocytotoxicity</i> | 2 |
| <i>Molecular Tests</i> | 2 |
| Total hrs. | 18 |



COURSE NAME: Medical Genetics

NUMBER OF CREDITS: 2.0 (theory)

COURSE TYPE: Theoretical

GENERAL AIMS

The increasing impact of genetics in healthcare and the development of newer sophisticated technologies require close collaboration between research scientists, clinical laboratory scientists and clinicians to deliver a high quality service to patients. The Medical Genetics course covers basic concepts of genetically disorders and the clinical genetics service, including risk analysis and application of modern genetic and genomic technologies in medical genetics research and in diagnostics and population screening.

LEARNING OUTCOMES

Students must:

1. Know the History and Significance of Medical Genetics in the clinic.
2. Know the Genetics of Metabolic, Neurologic and Musculoskeletal Disorders.
3. Know Population Genetics and Medicine.
4. Know Modern Molecular Medicine- Gene Therapy.

References

1. *Human Genetics from Molecules to Medicine. (1ed) 2012. Christian P Schaaf, Johannes Zschocke. Lorraine Potocki, Wolters Klumer, Lippincott Williams & Wikins, Baltimore, Maryland*
2. *Elsevier's Integrated Review Genetics, (2ed), 2012, Linda R. Adkison, Elsevier Saunders Philadelphia, Pennsylvania*



Medical genetics (theory) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>History and Introduction to Medical Genetics</i> | 2 |
| <i>Molecular Genetics, Gene Mutation and Applications</i> | 2 |
| <i>Modes of Monogenic Inheritance</i> | 2 |
| <i>Chromosomes in the Cell G-Banding and karyotyping</i> | 2 |
| <i>Genetics of Neurologic Disorders</i> | 2 |
| <i>Cancer Genetics</i> | 2 |
| <i>Genetics of Metabolic Disorder and Newborn Screening</i> | 2 |
| <i>Genetics of Hematologic Disorders</i> | 2 |
| <i>Genetics of Musculoskeletal & Cardiovascular Disorders</i> | 2 |
| <i>Principles of Genetic Counseling</i> | 2 |
| <i>Genetics of Renal, Gastrointestinal, and Hepatic Disorders</i> | 2 |
| <i>Genetic Engineering and its applications in Medicine</i> | 2 |
| <i>Disorders of sexual differentiation and development</i> | 2 |
| <i>Population Genetics and Medicine</i> | 2 |
| <i>Diagnostic approach for a child with multiple Anomalies or Dysmorphic features</i> | 2 |
| <i>Modern Molecular Medicine-Gene Therapy</i> | 2 |
| <i>Individualized Medicine</i> | 2 |
| <i>Total hrs.</i> | 34 |



COURSE NAME: Principles of Public Health

NUMBER OF CREDITS: 2.0 (theory)

COURSE TYPE: Theoretical

GENERAL AIMS

In this course, the student should be acquainted with the general concepts and History of health in Iran and the world and know the health systems globally. They should understand the concepts of health and disease and recognize the threats to health and the transition of health systems globally and in Iran. They have to learn the concept of health for all and levels of prevention and be able to apply primary health care and manage and assess risk based on levels of prevention. They should know the role of national and transnational organizations in health development. Students should learn the basic concepts of health education and health promotion, establish health system communication, and educate clients in health services. Students should learn sustainable development goals and recognize the role of social factors affecting health to use them in patient management. Students should understand the importance of environmental and occupational health and recognize their role in promoting population health. Students must be familiar with food hygiene and nutrition in health and apply its principles in related areas. Students should understand the importance of oral hygiene and become familiar with health technology assessment. Students should know the immunization program and be able to guide its implementation.

Lesson Description

In this course, the student is introduced to the basic principles and foundations of health to work as a physician in maintaining and promoting the health of the individual and the population

- 1-health (definitions, spectrums and dimensions)
- 2-health education, health promotions and preventions.
- 3-social determinants of health
- 4-public health foundations
- 5-environmental health (introduction, water safety, water born disease, climate, Air pollution)
- 6-health system in IR Iran (definitions, objectives and functions)
- 7-Health care planning
- 8-levels for health care (historical evolution)
- 9- Immunization against Major Infectious Diseases.
- 10-general health care on mothers and children's
- 11-healthy life style and behaviors
- 12-Occupational health
- 13-medicine as profession (professional medical duties)
- 14- Principles and methods for preventing occupational diseases.
- 15-national and International health agensis.
- 16-quality and safety in health care delivery
- 17-health status in Iran and the world.



COURSE NAME: Epidemiology
NUMBER OF CREDITS: 2.0 (theory)
COURSE TYPE: Theoretical

GENERAL AIMS

In this course, the student gets acquainted with the basic principles and foundations of epidemiology to work as a physician by recognizing the epidemiological features of diseases and their indicators and rates in maintaining and promoting the health of the individual and the population.

- 1-definition of epidemiology, encounter ecologic with diseases
- 2- common terms in epidemiology
- 3-factors of physics diseases, chemical and biologic
- 4-host factors
- 5-environmental factors of physiochemical, biological and social
- 6-epidemics and prevention.
- 7-general and types of epidemiological studies
- 8-epidemiology and control the diseases that can be prevented by vaccine

Educational partners international E.P.I: (6 hours)

- 1-vaccine, making, maintenance and usage
- 2-how to make and manage a center of vaccination
- 3-how to evaluate the practical E.P.I program

Epidemiology and controlling Diarrheal disease (5 hours)

- 1-definition, importance, epidemiology and pathology of Diarrheal disease
- 2-definition and types of Dehydration and the recognition of its degree
- 3-Diarrheal treatment with considering the prevention and treatment of dehydration
- 4-preventing and controlling Diarrheal disease and health education, health food, improvement of environment and struggle with fly.

Other major diseases (4 hours)

- 1-General information about other common infectious diseases in Iran (Tuberculosis - Malta Malaria –Malaria)
- 2-General on some of the specific diseases in Iran (Rabies and leprosy ...)
- 3-Epidemiology and control of no communicable diseases (cancers, rheumatism, and cardiovascular diseases, Events and poisonings and ...)

LEARNING OUTCOMES

Students must:

1. Know the basic principles of epidemiology and health care.
2. Know the level of health care services.
3. Know the health care system compartments and understand the role of the pharmacist in the system.



COURSE NAME: Psychology
NUMBER OF CREDITS: 2.0 (theory)
COURSE TYPE: Theoretical

GENERAL AIMS

Knowing the basic principles of psychology, different sense and thought processes is central to building a more effective relationship between the pharmacist and the patient and therefore this course will increase the knowledge of the pharmacist and familiarizing students with the principles of psychology and learning methods, thought process and perception

LEARNING OUTCOMES

Students must:

1. Know the relationship between psychology and human mind and soul.
2. Know the principles of psychology.
3. Be able to explain different sense stages.
4. Know learning methods and thought processes.
5. Know human motivation.
6. Know psychological health.
7. Know the physiological principles of psychology.

References

1. **Atkinson & Hilgard's Introduction to Psychology**-Last Edition

General Psychology(theory) subjects

| <i>Session Title</i> | <i>Hrs.</i> |
|---|-------------|
| <i>Nature of Psychology</i> | <i>4</i> |
| <i>Neurobiological basis of Psychology</i> | <i>4</i> |
| <i>Factors in Psychological Development</i> | <i>2</i> |
| <i>Perception</i> | <i>2</i> |
| <i>State of Consciousness</i> | <i>2</i> |
| <i>Learning</i> | <i>2</i> |
| <i>Motivation and Emotion</i> | <i>2</i> |
| <i>Personality</i> | <i>2</i> |
| <i>Conflict and Stress</i> | <i>2</i> |
| <i>Abnormal psychology</i> | <i>4</i> |
| <i>Methods of Therapy</i> | <i>4</i> |
| <i>Course review</i> | <i>2</i> |
| Total hrs. | 32 |



COURSE NAME: Parasitology / Mycology

NUMBER OF CREDITS: 2.0+1.0 (theory) – 1.0 (practical)

COURSE TYPE: Theoretical and Practical

A) Parasitology

It is expected that the student will be familiar with the parasitic causes of diseases at the end of this course. Recognize important pathogenic parasites within protozoan and worm groups. Students should know the morphology, life cycles, transmission routes, reservoirs, hosts, the roles of arthropods as biological and mechanical carriers in transmission, the specific pathogenesis and clinical signs of each one of them. They should know the geographical spread of each parasitic infection, their incidence and prevalence, especially in different parts of Iran. Also, they need to know the methods of prevention and control of each parasitic disease.

GENERAL AIMS

In this course, students will know the etiological factors, life cycle, pathogenesis, transmission, sampling methods, requesting the needed laboratory tests for diagnosis, methods of prevention, and control of parasitic diseases (mentioning their clinical cases) are familiar.

B) Mycology

At the end of this course, the student is expected to identify important pathogenic fungi. Recognize fungal agents that cause diseases. They should know the geographical distribution of each fungal infection and the status of their incidence and prevalence, especially in different parts of Iran. Diseases caused by important fungi should be detected using a slide. Also, they need to know the methods of prevention and control of each fungal disease and explain it.

GENERAL AIMS

In this course, students are introduced to the etiological factors of fungal diseases. They will learn the transmission method of each fungal pathogen and its prognosis. Laboratory diagnosis and request for the type of test and familiarity with the principles of treatment using effective and common drugs in the country and familiarity with methods of prevention and control of these diseases are the main educational items in the course of medical mycology.

Theoretical (43 hours)

1. Protozoa (11 hours)

Malaria parasites of humans (*Plasmodium vivax*, *Plasmodium malariae*) *Toxoplasma gondii*, *Sarcocystis*, *Isospora hominis*, flagellates blood and tissues *Leishmania tropica*, *donovani* and *brasiliensis* and trypanosome briefly), flagellates gastrointestinal and genitourinary (*Giardia lamblia* and other flagellates of the digestive system and *Trichomonas vaginalis*), ciliophora (*Balantidium coli*) - amebae (*Amoeba* spp.) - living damage and other digestive amoebae) – pneumocystis



2. Helminthology (15 hours)

Trematodes (Fasciola, Dictyostelium, Schistosomes and other pathogens) Patches (Tetails, Echinococcus and Hydatid Cyst, Hymenolipse, Diphilopotrim and Dipilidium) Symptoms (Ascaris, Axialis, Trichococeple, hookworms, Trichostrongylus, stroganuloidus, pyok, trichin, fillers and migratory larvae)

3. Arthropod (8 hours)

Lice (Pedigo Deluxe Hermannus and FetriusPubissa) cimex, lectularius and tribatomas Fleas (Gonzapopalacnopsis and bagestoni, polksirinens, dosozpocilusfasciatus and centenosofuscanis), flies (Muscadumyscica and sorbiantaobnus and gazizops) - myiases - anopheles carriers of malaria in Iran - colexes, aedes and teobaldia - phlebotomes carrying disease in Iran - colicoidises and simuloids - mites (ernietudorustoulouse and lachusensis, arcaspericusus, hialomorphsbpisfalus, scabbard sarcidis) - household beetles and some inseminates of essenophyllite.

4. Fungi (9 hours)

Saprophytic fungi (Penicillium, Aspergillus, mcurium, Cladosporium, ascorporalaripipis, avezarium, streptomyoscystrottora) Causes of surface fungal diseases (malaria, muconcea, aspergillus, penicillium, mucocandides) The causes of cutaneous fungal diseases (octotrexes, endotheres, favors, milium, arthrospores,

microspores, trichophytones and epidermophyton) causes of subcutaneous fungal diseases (mycototictinomyoma, myastoma) causes of mucosal fungal diseases (Candida albicans and other candidates) causes of visceral fungal diseases (Cryptococcus, neoformense, histoplasmacapsulatum, types of aspergillois and Nocardiaastroids)

B. Practical (51 hours)

This lesson is conducted in accordance with the faculty facilities and observing the following issues.

1. Protozoology

In this section, the methods of laboratory diagnosis of protozoal diseases and the practical value of each of them, and blood, tissue and stool testing techniques, sample collection methods, laboratory tests, staining and microscopic testing are presented.

2. Helminthology

In this section, the methods of laboratory diagnosis of helminth diseases, faecal and urinary testing techniques, the morphological study of each helminth and egg and larvae and their intermediate host are trained.

3. Entomology

In this section, the biology and morphological diagnosis of the important arthropod in terms of the transmission of the disease and ways to combat them are presented.

4. Mycology

In this section, methods of laboratory diagnosis of fungal diseases, sampling, direct testing and macroscopic culture of saprophytic and pathogenic fungi are presented.

References

1. **Paniker's Text Book of Medical Parasitology** 7th Edition Chapter 1 to 24.



COURSE NAME: Medical Physics
NUMBER OF CREDITS: 2.0 (theory)
COURSE TYPE: Theoretical

Objectives

1. 1- Familiarity of medical students with the basics and physical bases of imaging methods and measuring changes
2. Anatomical and physiological in vivo
3. 2- Familiarity with how to choose common diagnostic imaging methods in patients
4. 3- Familiarity with how to analyze and interpret changes caused by diseases using diagnostic devices

In this course, the students get acquainted with the physics and general concepts of diagnostic methods and related devices so that in the following stages of education, they can understand the algorithms for selecting and requesting diagnostic methods, especially imaging for patients; and to recognize differences in noise and visual errors from disease and pathological changes, after receiving the results or images of patients.

LEARNING OUTCOMES

Students must:

5. Know the optic physics: -the importance and properties of the visible light. Ultraviolet rays, infrared rays and its medical expenses.
6. Know the Physical examination of the eye, diagnosis and treatment of fractal abnormalities in the eye. -astigmatism and the ways for correction. -retinal properties, FOV, sharpness, ophthalmoscopy. -camera, proximity, prominence recognition.
7. Know the ultrasound waves and its medical expenses. -ultrasound production and properties.
8. Know the high frequency currents application in medicine. The effects of electric current on the body and the way of protection.
9. Know the Nuclear Medicine and physical foundation of radiology and radiotherapy



Core Syllabus:

1- physics, Optics, and vision:

- Importance and properties of visible light, infrared and ultraviolet rays, and their medical uses
- Physical study of the eye to diagnose and correct spherical abnormalities
- Fundamentals of the physics of astigmatism and ways to correct it
- Fundamentals of physics of retina, visual field, visual acuity, detection of colors, and ophthalmoscopy
- Basics of physics regarding binocular vision, hyperopia, Understanding the protrusion of objects
- Fundamentals of physics regarding the common lens equipment used in medicine
- practical program

2- Ultrasound waves and their medical uses

- Production and properties of ultrasound waves
- Chemical and biological properties of ultrasound waves
- Application of ultrasound waves in medicine
- Fundamentals of physics of common ultrasound equipment in medicine

3- Applications of frequency currents in medicine

- Production and properties of high-frequency currents
- Physiological properties and application of high-frequency currents in medicine (electrotherapy, heat therapy)
- The adverse effects of electricity on the body and ways of protection
- Basics of Magnetic Resonance Imaging (MRI) (Image Formation Mechanism)
- Different contrasts on MRI
- Basics of physics of common equipment of high-frequency currents used in medicine

4- Nuclear medicine

- Atom structure and nuclear energy
- Radioactivity and its properties (ionizing rays)
- Natural radioactivity
- Neutrons of artificial radioactivity
- Radioactivity detection and measurement
- Isotopic molecules and their medical applications
- Uses of radioisotopes in diagnosis and treatment
- Practical program

5- Physical foundations of radiology and radiotherapy

- The nature and properties of X-rays in diagnosis and treatment
- X-ray generators / X-ray absorption and measurement
- Radiobiology / Protection and principles of X-ray and gamma radiation dosimetry
- Practical program

6- Applications of robotics in medicine



COURSE NAME: General Principles of Nutrition

NUMBER OF CREDITS: 2.0 (theory)

COURSE TYPE: Theoretical



GENERAL AIMS

In this lesson, the student becomes familiar with general concepts, learns the nutritional properties of energy and food groups, and learns the general principles of nutrition in pregnant and lactating mothers, children, and the elderly to make nutritional assessments accordingly.

LEARNING OUTCOMES

Students must:

1. Know the Role and Importance of Nutrition
2. Know the Nutrients and their original sources
3. Know the Nutrients and their original sources
4. Know the Understanding the regional culture, traditions, and habits of nutrition and its relation with the nutritional status of individuals and communities and organizing nutritional program
5. Know the Nutrition of susceptible groups
6. Know the Methods of assessment of nutritional status
7. Know the diseases resulting from malnutrition and preventing them
8. Know the Safety of nutritional materials
9. Know the Toxicity of nutritional materials

Core Syllabus:

- 1-General nutrition and health and nutritional recommendations
- 2- Food groups
- 3- Carbohydrates (sugar sweets, dietary fiber, the nutritional importance of carbohydrates, and the need for carbohydrates)
- 4- Fats (nutritional importance of fats and the need for fats)
- 5- Proteins (Complete and incomplete proteins, quality of proteins, nitrogen balance, and the need for proteins)
- 6- Energy
- 7- Fat-soluble vitamins (food sources, deficiency, and poisoning)
- 8- Water-soluble vitamins (food sources, deficiency)
- 9- Minerals and water (food resources, deficiency)



- 10- Obesity and general malnutrition (diseases caused by malnutrition)
- 11- Nutrition in pregnant and lactating mothers
- 12- Nutrition in children
- 13- Nutrition of the elderly
- 14- Assessment of nutrition status
- 15- Principles of diet management

COURSE NAME: Medical Terminology 1

NUMBER OF CREDITS: 3.0 (theory)

COURSE TYPE: Theoretical

GENERAL AIMS

At the end of this course, the student should read and understand English medical texts. Understand academic and medical terms and vocabulary, talk about mental medicine topics, and understand what others say about medical topics quickly. Also, understand the importance of English in teaching activities at a given time and in collaboration with the group. (As an attitude goal)

Due to the growing need for medical students and graduates to reading medical books and articles to increase and update their medical knowledge and conduct research in various topics related to this field, this course tries to increase the ability and skill of students to read and understand medical texts. For this purpose, most of the class time (about two-thirds) is devoted to teaching techniques related to reading and understanding the text. Students' need to speak English in real (face-to-face) and virtual environments are considered in this course. For this reason, part of the class time is dedicated to practicing listening and speaking techniques. In this regard, language classes should be held to the detriment of English. In addition, each student will be required to speak at least 5 minutes to the detriment of English in class.

This course intended from this books

References

1. **Saunders, Guyton 1979**, physiologic of the human body
2. **Cohen Medical Terminology**, 8th Edition. by Barbara J. Cohen BA MEd (Author), Ann DePetris RN BSN MSA (Author)



COURSE NAME: Medical Terminology 2

NUMBER OF CREDITS: 3.0 (theory)

COURSE TYPE: Theoretical

Prerequisite: Termnology1

GENERAL AIMS

At the end of the second specialized language course, medical students should easily read and understand medical texts in English with a higher level of difficulty and specialized language. Understand and use more academic terms and vocabulary, talk more fluently about medical topics, and better understand medical discourse. Students also need to apply language skills in group activities (focusing on medical topics).

#In this course (continuing and completing the objectives of the specialized language course, students' abilities to read, speak and listen are discussed. So that students can easily search for the concepts they need from specialized English sources and present their findings in English.

This course heavier than Termnology1 and it is taught from practical courses of some universities

References

1. **Saunders, Guyton 1979**, physiologic of the human body
2. **Cohen Medical Terminology**, 8th Edition. by Barbara J. Cohen BA MEd (Author), Ann DePetris RN BSN MSA (Author)



COURSE NAME: General Pathology
NUMBER OF CREDITS: 4.0 (theory), 2.0 (practical)
COURSE TYPE: Theoretical, Practical

Core syllabus of General pathology:

- General pathology and cell damage
- Pathology of inflammation. Tissue repair and hemodynamic disorders
- Pathology of human immune system disorders
- Neoplastic pathology
- Pathology of genetic disorders and childhood diseases
- Pathology of peripheral diseases. Nutritional and infectious
- Practical pathology
- Clinical pathology
- Advanced pathology
- Cardiovascular
- Respiratory machine
- Kidneys and upper urinary tract
- digestive system
- Liver and bile ducts
- The genital system, lower urinary tracts, and breast
- Blood diseases. And endocrine glands
- Skin, soft tissue, bones, and joints
- Central nervous system

A) General pathology and cell damage

In this course, the student should be familiar with the concepts of pathology, pathological manifestations of cell damage. Recognize cell death well enough to use them to diagnose the clinical phenomena of hemodynamic disorders. Immune disorders in the human body. Tumor. Genetic disorders. Environmental Diseases »Malnutrition 3 Infectious diseases

In this lesson, the process of cell damage, inflammation, cell death, and tissue repair are taught.

General pathology (1 hour)

- Definition of pathology
- History of pathology
- Definition of the disease
- Important points of a disease (definition. etiology, clinical signs, etc.)
- Pathogenic mechanisms in the human body
- Defensive mechanisms of the human body in various diseases



- Methods of diagnosing diseases
- The role of the laboratory in the diagnosis, treatment, and follow-up of diseases

Cell damage. Cell death and adaptation (8 hours)

- Cellular and tissue responses to harmful factors
- Cellular and tissue adaptation (hypertrophy - hyperplasia - atrophy - metaplasia)
- Cell damage and cellular and tissue death: causes, factors, tissue changes and examples of it (types of necrosis and apoptosis)
- intracellular and tissue accumulations (calcium deposition, accumulation of fat, protein, glycogen and pigments and amyloidosis)
- The aging process
- Clinically important tips for cellular damage, causes, factors, and examples

B) Pathology of inflammation. Tissue repair and hemodynamic disorders

In this course, the student should know the inflammation and tissue repair changes to use them in the clinical phenomena of hemodynamic disorders, immune disorders, tumors, genetic disorders, environmental diseases, malnutrition, and infection.

Lesson Description

In this lesson, inflammatory changes and tissue repair processes are taught.

In this course, based on cell damage and cell death, inflammation and tissue repair are taught.

Essential content

Inflammation and tissue repair (6 hours)

- General and important points about inflammation and inflammatory phenomena in the human body
- Types of inflammation and its taxonomy
- Tissue changes during inflammation
- Inflammation mechanism
- Effects and consequences of various types of inflammation in the human body
- Tissue repair, its mechanism, results, and its importance
- Important clinical points related to inflammation and tissue repair and examples of them

Hemodynamics (4 hours)

- General and important points about blood circulation and fluids in the body
- Hyperemia
- Edema
- Bleeding
- Hemostasis
- Thrombus
- Embolism
- Infarction
- Shock
- Clinically important points related to each of the hemodynamic disorders and examples of them

Pathology education can be integrated into independent educational packages while observing the titles, content, and educational hours approved in the organized educational program of the university.

C) Pathology of human immune system disorders

In this lesson, based on the process of cell damage, cell death, inflammation, and tissue repair, and the pathological manifestations of hemodynamic disorders, immune disorders are taught in the human body.

Immune disorders in the human body

- General knowledge of the immune system and how it works, its monitoring and care of the human body



- Injuries caused by dysfunction of the immune system
- Hypersensitivity, causes, types, and damages caused by it
- Autoimmunity, causes, types, and damages caused by it
- Impaired immune system (immunodeficiency), causes, types, and injuries
- Tissue transplantation, definition, types, and mechanisms of graft rejection
- Amyloidosis
- Important clinical tips and examples related to any of the disorders of the human immune system

Pathology of neoplasia

10 hours

Basic Science / Clinical Introduction

In this course, the student should be familiar with tumors and neoplastic changes.

Pathology of inflammation and tissue repair

process of cell damage, cell death, inflammation, and tissue repair, pathological manifestations of hemodynamic disorders and immune disorders in the human body; Tumors and neoplastic changes.

- How to name tumors
- Characteristics of benign and malignant neoplasms
- Different stages of carcinogenesis and hallmarks
- Etiology of cancers
- Host response to tumor
- Clinical perspectives on neoplasms

Pathology education can be integrated into independent educational packages by observing the preservation of the titles, content, and educational hours approved in the organized University's educational program.

D) Pathology of genetic disorders and childhood diseases

General Objectives

In this course, the student should understand the pathology of genetic disorders and childhood diseases.

Lesson Description

In this lesson, genetic disorders and childhood diseases are taught.

Essential content

- The nature of genetic disorders in humans
- Mendelian disorders
- Multigene diseases
- Cytogenetic diseases
- Single gene diseases with atypical inheritance
- Childhood diseases, including congenital anomalies
- Perinatal Infections
- Respiratory Distress Syndrome (RDS)
- Sudden Infant Death Syndrome
- Fetal hydrops
- Tumor and tumor-like lesions in children
- Molecular diagnosis of genetic diseases

Pathology training can be integrated into independent training packages while retaining the university curriculum's approved content titles and training hours.

E) Pathology of nutritional and infectious environmental diseases

In this course, the student must study the pathology of environmental diseases, understand malnutrition and infection.

In this course, genetic disorders, environmental diseases, malnutrition, and infections are taught.



Environmental diseases and malnutrition (4 hours)

- Harmful and toxic physical and chemical agents
- Environmental pollutants
- tobacco
- alcohol
- Abuse of drugs
- Injury by physical damages
- Nutritional diseases (including malnutrition, vitamin deficiency, obesity, overeating, and anorexia nervosa)

Infectious diseases (2 hours)

- General principles of microbial pathogenesis
- Specific techniques for identifying infectious agents
- New and emerging infectious agents
- Bioterrorism agents
- Mechanism of viral and bacterial damage
- Germs escape from the immune system
- The extent of the inflammatory response to infectious agents

Pathology education can be organized and integrated into independent educational packages while preserving the titles, content, and educational hours approved in the university curriculum.

Practical pathology

General Objectives:

- Familiarity with the pathology laboratory, its working methods, reception and preparation of samples, and archiving
- Identify the types of samples tested and sampling methods and sample evaluation in the pathology laboratory
- Knowing the correct way to submit different types of clinical samples to the pathology laboratory
- Ability of the clinical physician to communicate with the laboratory

Core Syllabus and Essential contents:

This lesson includes the basics, the correct general processes and methods of clinical work related to the pathology laboratory and identifying the main types of clinical specimens.

- Familiarity with the pathology laboratory, how it works, reception and preparation of samples, and archiving
- Sampling methods and evaluation of samples in the pathology laboratory
- The correct way to send all types of clinical samples to the pathology laboratory and the clinical physician's relationship with the laboratory
- Identify, describing and differentiate following tissue samples, including following slides:
 - 1- Squamous metaplasia
 - 2- Acute purulent inflammation with caseous necrosis
 - 3- Chronic non-specific inflammation
 - 4- Granulomatous inflammation with caseous necrosis (tuberculosis)
 - 5- Coagulation necrosis
 - 6- Fat accumulation in the liver
 - 7- Accumulation of melatonin
 - 8- Calcium deposition
 - 9- Xanthelasma (aggregation)



- 10- Wound and granulomatous tissue
 - 11- Scar or keloid
 - 12- Tissue hyperemia
 - 13- Thrombus
 - 14- Infarction
 - 15- Allergic inflammation
 - 16- Amyloid deposition
 - 17- adenomas
 - 18- Papilloma
 - 19- Osteochondroma
 - 20- Lipoma
 - 21- Adenocarcinoma
 - 22- Squamous cell carcinoma
 - 23- Sarcoma
 - 24- Lymphoma
 - 25- Teratoma (three layers of the fetus)
 - 26- Plasmacytoma
 - 27- Polyps
 - 28- Dysplasia and carcinoma in situ
 - 29- Metastasis
 - 30- Cystic lesions
 - 31- Hydatid cyst
 - 32- Pap smear
 - 33- An immunohistochemical sample
 - 34- A cytology sample
- 35- parasitic disease (Aspergillus, Mucor mycosis, Leishmaniasis, etc.)



COURSE NAME: Introduction to Religion I & II

NUMBER OF CREDITS: 4.0 (theory) (in two courses)

COURSE TYPE: Theoretical

GENERAL AIMS

The attempt to introduce the true and scientific knowledge of three great and divine religions: Judaism, Christianity and Islam, and the proof of the legitimacy of the religion of Islam as well as the religion of the Ahlul-Bayt (as).

COURSE DESCRIPTION

First reviewing the preliminary discussion of generalities and definitions such as religion and its definition or law and its definition, prophets and their holy books. In addition, history of religions such as Judaism, Christianity and Islam will be discussed. Finally, it provides a brief overview of the content of these religions, issues such as the concept of God, the Day of Judgment, the monotheism (توحید), justice (عدل), Prophecy (نبوت), divine leadership (امامت), and the Day of Judgment (معاد) holy books and predictions about the final prophet.

CONTENT

1. Definition of the lexical and terminology of religion
2. Why should he believe in religion? What are the benefits and functions of religion?
3. Psychological functions of religion / Cognitive functions of religion
4. Ethical and social functions of religion
5. What Prophets are the Prophets?
6. . Introducing divine religions (Christianity, Judaism, Islam)
7. The revelation of the first revelation
8. Non-public propaganda as well as public publicity of religion
9. The story of Hadith Yum Eldar According to the famous historian, Tabari
10. Immigration to Medina and the Adventures of the Layla Almabit and Fazilat (Text in Persian) Amir al-Momenin Ali (AS)
11. Which religion is true and right?
12. What is the meaning of religious pluralism? Is this thinking correct and correct?
13. What is the Quran's comment on religious pluralism?
14. Why do we say that the religion of Islam is the most complete religion and religion is right?
15. If everyone is required to follow the religion of Islam, what is the duty of followers of other religions? Are they rescued or not?
16. What is basically the criterion of a true religion? What indicators make us deny a religion and the other religion?

ASSESSMENT METHOD

1. Class Participation & Group work 50%
2. Final exam (written) 50%



COURSE NAME: Islamic Revolution of Iran

NUMBER OF CREDITS: 2.0 (theory)

COURSE TYPE: Theoretical

GENERAL AIMS

This course explores the making of the Iranian Revolution of 1978-79 and the subsequent establishment of the Islamic Republic. Framed in a comparative perspective, it explains the cultural and political peculiarities that shaped the Islamist outcome of the Revolution This course provides an in depth introduction to the modern history of Iran with a focus on the cultural and political factors that culminated in the 1979 revolution.

ASSESSMENT METHOD

1. Class Participation 30%
2. Assignment 20%
3. presentation 50%

COURSE NAME: Divine Texts

NUMBER OF CREDITS: 2.0 (theory)

COURSE TYPE: Theoretical

GENERAL AIMS

Acquaintance with ancient conceptions of the divine in various contexts. This course serves as an introduction to the revelation of God and our response of faith. We explore the transmission of revelation and the dynamism of the adventure of faith. This course promotes personal reflection and holistic formation in participants.

ASSESSMENT METHOD

1. Class Participation 50%
2. presentation 50%



COURSE NAME: Divine Ethics
NUMBER OF CREDITS: 2.0 (theory)
COURSE TYPE: Theoretical

GENERAL AIMS

The attempt to introduce the true and scientific knowledge of three great and divine religions: Judaism, Christianity and Islam, and the proof of the legitimacy of the religion of Islam as well as the religion of the Ahlul-Bayt (as).

COURSE DESCRIPTION

This course is designed to familiarize students with the principles and concepts of Divine ethics in the field of moral virtues and vices, virtues and in order to avoid Moral vices. The belief that what's moral and what's immoral is commanded by the divine the theory asserts that what is moral is determined by what God commands, and that for a person to be moral is to follow his commands. Followers of both monotheistic and polytheistic religions in ancient and modern times have often accepted the importance of God's commands in establishing morality.

The theory asserts that good actions are morally good as a result of their being commanded by God, and many religious believers subscribe to some form of divine command theory.

CONTENT

- 1- The issue of ethic.
- 2- The literal and technical meaning of ethic
- 3- Characteristics in our soul
- 4- The sciences of Ethics. What is the definition?
- 5- The importance of ethics implementation
- 6- The moral manners of learning/Teaching
- 7- The ethic of criticizing
- 8- Ethics of Life and Working
- 9- Caring about the affairs and problems of the people
- 10- Knowing the good and evil properly
- 11- What is the Quran's comment on Ethics?

ASSESSMENT METHOD

1. Class Participation & Group work 50%
2. Final exam (written) 50%



COURSE NAME: Physical Training I

NUMBER OF CREDITS: 1.0 (practical)

COURSE TYPE: Practical

GENERAL AIMS

Physical education is an important part of pedagogy which eases the growth process in all dimensions of human via movement and exercise (generally, the purposes of physical education are met in movement) and it helps developing the interested talents. Broadly speaking, training and developing the body is done through physical movement and watching moral characteristics.

CONTENT

- 1- physical fitness and its ingredients
- 2- How to develop some factors of physical fitness?
- 3- Chapter three: Understanding energy mechanism
- 4- Immunity and hygiene in sports
- 5- Knowing the correct daily movements

ASSESSMENT METHOD

1. Class Participation
2. Physical assessment test



COURSE NAME: Physical Training II

NUMBER OF CREDITS: 1.0 (practical)

COURSE TYPE: Practical

PREREQUISITES: Physical Training I

GENERAL AIMS

Teaching and practice in more advanced level one of the field of sport for International students

CONTENT (type of Sport)

- 1- Fixed Targets Shooting
- 2- Badminton
- 3- Futsal (Indoor Football)
- 4- Basketball

ASSESSMENT METHOD

1. Class Participation

Physical assessment test

COURSE NAME: General English Language

NUMBER OF CREDITS: 3.0 (theory)

COURSE TYPE: Theoretical

Those students who obtain an English proficiency test result such as IELTS or TOFEL can be exempt from taking this course based on their overall score and International College of TUMS decision. Otherwise, the students should cover English course at above- mentioned college.



COURSE NAME: General Persian Language

NUMBER OF CREDITS: 3.0 (theory)

COURSE TYPE: Theoretical

Those students who knew Farsi and pass the TUMS International college placement test can be exempt from taking this course based on their overall score and International College of TUMS decision. Otherwise, the students should cover Farsi course at above- mentioned college.

Basic Persian Writing: in this course, students will learn the Persian language alphabet and learn how to read, write and pronounce the Persian words.

Persian Paragraph Writing: in this course, students will be familiarized with the structure of a Persian paragraph and will practice writing different types of paragraphs in Persian.

Persian Essay Writing: this course will familiarize students with the process and structure of writing essays in Persian. Students will practice developing and writing different types of essays in Persian.

As in the case of Persian Free Discussion classes, attending these writing courses is optional.

COURSE DESCRIPTION

- The student has to be able to ask the patient about identification data in Persian (Age, gender, job, marital Status).
- The student has to be able to ask in Persian about the patient's main complaint that causes him to refer to the hospital or to the doctor's office.
- The student has to be able to duly express the most common disorders in Persian
- The student has to be able to ask about the most common complaints of the common disorders in Persian.
- The student has to be able to ask in Persian about 7 aspects of each clinical symptom as the main complaints of the patient (including: locus, quality, quantity or intensity, onset, duration & frequency, conditions of symptom exposure, intensive or palliative factors.
- The student has to be able to ask about Accompanied (Associated) Manifestations in Persian.
- The student has to be able to ask about the past history of the common disorders in Persian.
- The student has to be able to ask about the patient's childhood diseases in Persian.
- The student has to be able to ask about the patient's previous surgeries and their cause and time in Persian.
- The student has to be able to ask about the patient about the consumption of Cigarette, alcohol and narcotic drugs in Persian.
- The student has to be able to ask in Persian about the patient's family history of common disorders.

ASSESSMENT METHOD

Presenting Teamwork



2nd Stage:
physiopathology Courses
(Clinical preparations)
Doctor of medicine Curriculum

*** Semiology course according to the TUMS curriculum is a combination of theory and practical teaching, in which practical physical examination skills are taught and reviewed in Skill lab of Tehran University of medical sciences.**

It consists of 25 hours theory and 172 hours practical training alongside physiopathology of each block and system.

**** Public health field rotation in a three weeks field activity as an “active member of primary health care (PHC) provision”, in Healthcare units across Tehran and neighboring county, affiliated with Tehran University of Medical Sciences.**

2-2-1- Semiology and pathophysiology are taught after completing basic science courses and in the third year.

2-2-2- Semiology and pathophysiology courses include gastrointestinal, cardiovascular (each one for four weeks), endocrinology and metabolism, kidney, hematology, rheumatology, and respiratory systems (each lasting three weeks) combined with pharmacology, specific pathology, and semiology, which are taught for six months as follows:



A - The mornings of the first two weeks of training are assigned to introduce semiology lessons.

B - After that, the students receive semiology training in clinical wards, once a week in the morning, and undergo the pathophysiology course up to 12 hours weekly.

C - During six months of specific pathology and pharmacology courses taught independently.

It is recommended that these courses be taught simultaneously or after the physiopathology of the relevant system. The order of division of pathology and pharmacology units is the responsibility of the medical school.

2-2-3- At the end of teaching one or two topics in pathophysiology, an exam will be taken. Those who do not get a passing score in the exam will try another exam of those topics at the end of the semester. The re-exam score will be the final score of those topics. If the students do not pass the re-exam, they will be obliged to repeat the topic at the end of the course.

2-2-4- The specific pathology, pharmacology, and semiology exams will be held at the end of 6 months together. The decision on midterm exams is up to the respective professors.

2-2-5- Passing all subjects of semiology and physiopathology is necessary for starting the clinical stage. Under extraordinary circumstances, the medical school may allow students who have failed in one of their physiopathology courses to enter the clinical stage. The student must pass the failed exam within a maximum of one semester, and in case of failure, is obliged to repeat the classes of that course.

2-2-6- The maximum time allowed for completion of the second phase is a year and a half.

2-2-7- Before starting the internship, the students should take a three-week healthcare clerkship in the PHC department units affiliated with TUMS.



3rd Stage:

Clinical Clerkship

Doctor of medicine Curriculum

A: Clinical courses and rotations

| Number | course name | Duration of course | credits equivalent. | Clinical departments included |
|--------|-------------------|--------------------|---------------------|---|
| 1 | Internal medicine | 6 months | 18 | Internal medicine (general internal medicine wards), Neurology, Infectious diseases |

Descriptions:

- 1- The division of course length between different departments is based on the internal planning of the faculty.
- 2- The time allocated to the internal medicine general department, should not be less than 3 months and the time allocated to other departments should not exceed one month in clerkship stage of the medical students.

| Number | course name | Duration of course | credits equivalent. | Clinical departments included |
|--------|-------------|--------------------|---------------------|--|
| 2 | Surgery | 4 Months | 12 | General surgery, Urology, Orthopedics. |

Descriptions:

- 1- Adjusting the course length between different departments is based on the internal planning of the faculty.
- 2- The time of general surgery should not be less than 2 months and the time of other wards should not be more than one month in clerkship stage of the medical students.

Further Clinical Rotations in clinical clerkship

| Number | course name | Duration of course | credits equivalent. | Clinical departments included |
|--------|---------------------------|--------------------|---------------------|--|
| 3 | Pediatrics | 3 months | 9 | *In the first 8 months of the clerkship stage, students must take the surgery course and four months of the internal course. |
| 4 | Gynecology and Obstetrics | 2 months | 6 | |
| 5 | Ophthalmology ** | 1 month | 3 | |

| Number | course name | Duration of course | credits equivalent. | Clinical departments included |
|---------------|--------------------|---------------------------|----------------------------|--|
| 6 | ENT | 1 month | 3 | the remainder of the internal course and other departments will follow after these 8 initial months, it is emphasized that the main general internal medicine should be a part of these four months of the internal course. |
| 7 | Psychiatry | 1 month | 3 | |
| 8 | Radiology | 1 month | 3 | |
| 9 | Dermatology | 1 month | 3 | |
| | | | | |
| sum | | 21 Months | 60 credits | |



B: Theoretical courses
in medical clerkship stage

| Course code | Course Name | credits equivalent | Hours | | |
|-------------|--|--------------------|------------|-----------|------------|
| | | | Theory | practical | sum |
| 14-4 | Public health 4 Medical statistics and Research Methodology | 2 | 34 | | 34 |
| 1 | Infectious diseases * | 3 | 51 | | 51 |
| 2 | Neurological diseases** | 2 | 34 | | 34 |
| 3 | Surgical diseases * | 10 | 170 | | 170 |
| 4 | Gynecology and Obstetrics* | 4 | 68 | | 68 |
| 5 | Children's diseases ** | 6 | 102 | | 102 |
| 7 | Psychiatry and Mental disorders ** | 2 | 34 | | 34 |
| 68 | Forensic medicine and poisoning *** | 2 | 34 | | 34 |
| 14- 5 | Public Health (5) Epidemiology of Common Diseases *** | 2 | 34 | | 34 |
| 44 | Medical Ethics | 2 | 34 | | 34 |
| sum | | 35 | 595 | | 595 |

* Medical statistics and research methodology session are to be held in the afternoons of the first four months of clinical training.



**** Theoretical courses of ENT, neuropsychology and radiology can be taught in the mornings (in groups) in the relevant clinical sections or in the afternoons collectively for all students.**

**** Theoretical courses of neurosurgery, obstetrics and gynecologists, pediatrics and Psychiatry and Mental disorders are taught in the afternoons of the first 16 months of clinical education.**

- forensic medicine and epidemiological medicine courses are held in the afternoons of the last four months of clinical education.



4th Stage:

Clinical Internship

Doctor of medicine Curriculum

| Number | Course Name | Duration of course (minimum mandatory) | Equivalent credits | Clinical departments included |
|--------|-------------------|---|--------------------|---|
| 1 | Internal medicine | 4 Months | 16 | Internal medicine department including general internal medicine wards Intensive care unit (ICU) and internal medicine specialty departments Coronary care Unit (CCU) |
| 2 | Surgery | 3 months | 12 | General surgery department, Intensive Care Unit Emergency/trauma ward orthopedics department, neurosurgery department. |

Descriptions:

1. The division of course length between different departments is based on the internal planning of TUMS faculty of medicine.
2. The above-mentioned rotation times are core mandatory minimum time for each rotation.



general surgery should not be less than 2 months and the time of by other surgery rotation wards one month.

| | | | | |
|------------|-----------------------------|---|-------------------|---|
| 3 | Pediatrics | 3 months | 12 | <p>*TUMS faculty of medicine and affiliated hospitals are mandated to cover all the rotations in this curriculum and the internal and surgical subspecialty departments, with active participation of medical interns as active member of care team, throughout the whole year.</p> <p>*The duration of each selected rotation is at least one month.</p> |
| 4 | Gynecology and Obstetrics | 2 months | 8 | |
| 5 | Emergency medicine | 1 month | 4 | |
| 6 | Public Health filed service | 1 month | 4 | |
| 7 | ENT (Ear, nose and throat) | <p>Minimum 4 months of elective and optional rotations is mandatory</p> | 12 | |
| | Ophthalmology | | | |
| | Psychology | | | |
| | Neurology | | | |
| | Dermatology | | | |
| | infectious diseases | | | |
| Sum | | 18 months | 68 credits | |

To obtain the medical doctorate, interns must submit an approved and successfully defended doctoral research dissertation in medical sciences.



- f arteries, Intravenous development, Cardiovascular malformations
- 5 - Endoblast evolution: gastrointestinal tract development (formation of gastrointestinal tract, Pancreas development, Cloaca evolution), anorectal abnormalities
 - 6- Evolution of face and nose »Evolution of palate, Evolution of teeth
 - 7- Evolution of ectoblast: Evolution of the primary neural tube, Nervous system abnormalities
 - 8- Evolution of the autoimmune system: Evolution of the sympathetic and parasympathetic systems
 - 9- Evolution of sensory organs: formation of sensory, placodes, Eye evolution, Evolution of the ear, Evolution of the olfactory system
 - 10- Evolution of secretory glands



The Second stage

Physiopathology stage
Clinical preparations stage

Core Syllabus



Semiology

Clinical History taking and physical examination

Type: Theoretical-Practical

Credits: 4

Training hours: 25 hours Theoretical + 172 hours Practical
Skill lab

The following courses are organized into two theoretical courses and two practical courses. It is recommended that theoretical training and the practical be provided simultaneously if possible.

- Clinical History taking and physical examination (theoretical)
- Clinical History taking and physical examination (practical)

At the end of this course, the student should be able to:

- 1- Explain the importance and algorithmic steps of establishing a constructive professional relationship with the patient and apply it in practice.
- 2- Explain the role and position of Clinical History taking and clinical examination in clinical reasoning and patient care decision-making.
- 3- Explain the relationship between the stages of Clinical History taking and clinical examination with the stages of clinical reasoning (data collection, assessment, and decision making).
- 4- Explain the general principles of Clinical History taking in special circumstances (patients with special problems, the elderly, children, and the disabled).
- 5- Explain the principles and rules of documenting the Clinical History and patient's medical profile



6- Explain the general principles of a medical brief and complete introduction of the patient and its applications.

General goals and objectives:

- 1- The role and place of patient Clinical History in decision making in practice
- 2- Principles of clinical reasoning (data collection, assessment, decision making)
- 3- General principles of Clinical History taking
- 4- General principles of communication skills
- 5- General principles of Clinical History taking in special circumstances:
 - Patients with eye and vision problems
 - Patients with ear, nose, and throat problems and deafness
 - Patients with skin problems
 - Patients with musculoskeletal problems
 - Patients with neurological problems
 - patients with physical injury problems
 - mentally-ill patients
- 6- general principles of Clinical History taking in special circumstances
 - elderly
 - infants
 - children
 - disabled people
- 7- General principles of documentation of Clinical History (Hx writing, complete patient note & brief)
- 8- General principles of patient introduction (presentation, brief and complete)

In this lesson, the students must achieve the required education goals by attending the classroom sessions, clinical skills learning center (skill lab), attending workshops, by means of teamwork, and personal practice.

The learning activities of this course should be a balanced combination of theoretical training, individual study, group discussion, and other learning assignments.

It is recommended that the practical part of this course be presented simultaneously with the theoretical part and through practice in small groups in the TUMS Clinical Skills Learning



Center or Controlled Clinical Environments, under the direct supervision of faculty members or trained instructors.

Timing and combining these activities and the areas required for each activity (including the Skill Lab classroom and the clinical areas) is determined in the Study Guide following the standards.

* Due to the different conditions of education in different subjects, it is necessary for the learning guide to be compiled and made available to the students by the medical school according to the expected equivalence document of the graduates of the general medicine doctorate course and considering the standards announced by the secretariat of the General Medical Education Council of the Ministry of Health and Medical Education.

** It is necessary to determine, announce and implement the methods and program of education and student evaluation based on appropriate scientific principles by the department. Approval of the program, supervision of the implementation, and evaluation of the program is the responsibility of the medical school.

Core Syllabus

- Basic Clinical history and clinical Examinations
- Semiology and Clinical History of **Cardiovascular Diseases** and Physical Examinations of **Cardiovascular system**
- Semiology and Clinical History of **Pulmonary Diseases** and carry Physical Examinations
- Semiology and Clinical History of **Endocrine and Metabolic Diseases** and Physical Examination of the **Thyroid**
- Semiology and Clinical History of **neurological diseases** and physical examination of **nerves**
- Semiology and Clinical History of **head and neck diseases** and physical examination of **the head and neck**
- Semiology and Clinical History of **Musculoskeletal diseases** and physical examination of **joints**



- Semiology and Clinical History of **Hematologic diseases** and physical examination of **lymph nodes and spleen**
- Semiology and Clinical History of **Gastrointestinal diseases** and physical examination of the **abdomen**.

Basic history and clinical examinations

- Health history structure and goals
- Health history components
- Comprehensive clinical history of adults
- Date and time of the Clinical History
- Identity and identification
- Confidentiality
- Chief Complaint
Present illness
- Medication's history
- Allergies and intolerabilities (Medications and food)
Past medical History
- Family History
- Social and Personal context History
- Review of Systems

Physical examinations and general algorithmic approaches

- general comprehensive Physical examination
- Specific Examinations (in each system and organ)
*core essential organ specific examinations and signs are listed in MoH&ME Semiology booklet

A) Describe and apply the following:

1. The role and place of clinical examination in clinical reasoning
2. General principles of physical examination
3. General principles of examinations related to vital signs



4. General principles of examinations related to the patient's appearance and skin findings

General appearance

Skin manifestations

5. General principles of head and neck examinations

6. General principles of ophthalmologic examination

7. General principles of ENT examinations

8. General principles of cardiac examinations: normal, murmurs

9. General principles of respiratory examinations

10. General principles of abdominal and rectal examination

11. General principles of joint and muscle examinations and rheumatology

12. principles breast examination

13. General principles of gynecological and obstetric examinations

14. General principles of urological examination

B) Recognize and observe

cultural, ethical, and religious considerations about examinations of specific areas of the body.

At the end of this course, the student should be able to:

Perform the physical examinations of the following devices and organs on the model

or the standardized patient:

1. Measure and record vital signs

2. Examinations of the patient's appearance and skin findings

general appearance

skin manifestations

3. Head and neck examinations

4. Ophthalmologic examination

5. Ear, nose, and throat examinations

6. Cardiac examinations: normal, murmurs

7. Respiratory system examinations

8. Abdominal examination

and rectal examination

9. Joint, muscle, and rheumatologic examinations

10. Breast examination



11. Obstetrics and gynecology examinations

12. Urological examinations

(Recognize and observe cultural, ethical, and religious considerations about examinations of specific areas of the body.)



Systemic pathology

Course Type: Theoretical-Practical

Credits: 6

Prerequisite: general pathology

Training hours:

68 hours Theoretical- 68 hours

Practical

Pathology of the Cardiovascular System

In this course, the student should be familiar with common diseases and tumors of the cardiovascular system and diagnose the patient's disease based on his knowledge.

General objectives

In this course, the etiology of pathogenesis and clinical manifestations of common diseases and cardiovascular tumors are taught.

Core Syllabus

- 1- Structure and function of blood vessels
- 2- Vascular tumors and types of vasculitis
- 3- Atherosclerosis
- 4- Clinical consequences of atherosclerosis
- 5- Aneurysms
- 6- Ischemic heart disease and congestive heart failure
- 7- Endocarditis, myocarditis, and pericarditis



8- Cardiac tumors

Essential slides of the practical section:

- 1- cardiac **Myoma**
- 2- One of the common types of **hemangioma**
- 3- One of the common types of **vasculitis**
- 4- **Atherosclerosis**

Pathology of the Respiratory System

In this course, the student should be familiar with common diseases and tumors of the respiratory system and diagnose the patient's disease based on his knowledge.

General goals

In this course, the etiology, pathogenesis, morphology, clinical manifestations of common respiratory diseases and respiratory tumors are taught.

Core Syllabus

- atelectasis
- Acute lung injury
- Obstructive lung diseases
- Chronic interstitial diseases
- Vascular diseases
- Lung infections
- Lung tumors
- Pleural lesions
- Upper respiratory tract lesions

Essential slides of the practical section:

Lung:

- 1- Lung **tuberculosis**
- 2- **Hydatid cyst**



3- **Small cell carcinoma**

4- Other lung carcinomas such as **adenocarcinoma or SCC**

Nasal:

1- **Nasal polyp**

2- A fungal lesion such as **Aspergillus or Mucormycosis**

Pathology of the kidneys and urinary tract

In this course, the student should be familiar with common diseases and tumors of the kidneys and urinary tract and diagnose the patient's disease based on his knowledge.

General goals

In this course, the etiology, pathogenesis, morphology, clinical manifestations of common kidney and urogenital diseases and tumors are taught.

Lesson description

- 1- Clinical manifestations of kidney diseases
- 2- Glomerular disease and its mechanism
- 3- Nephrotic syndrome
- 4- Nephritic syndrome
- 5- IgA Nephropathy
- 6- Hereditary nephritis
- 7- Rapidly progressing glomerulonephritis
- 8- Tubular diseases - insomnia
- 9- Interstitial tubular nephritis
- 10- Kidney vascular diseases (malignant arteriovenous arteriosclerosis)
- 11- Chronic kidney disease
- 12- Cystic kidney diseases
- 13- Tumors



Essential slides of the practical section:

- 1- Chronic pyelonephritis
- 2- One of the types of glomerulonephritis
- 2- Kidney amyloidosis
- 4- Kidney carcinoma
- 5- Nephroblastoma

Pathology of Gastrointestinal disorders

In this course, the student should be familiar with common diseases and tumors of the gastrointestinal tract and diagnose the patient's disease based on his knowledge.

General goals

In this course, the etiology, pathogenesis, morphology, and clinical manifestations of common gastrointestinal diseases and tumors are taught.

Lesson description

- 1- Lesions of the oral cavity
leukoplakia, benign and malignant tumors,
Benign and malignant lesions of the salivary glands
- 2- Esophagus
esophageal varices, esophagitis, Esophageal reflux,
Barrett's esophagus, esophageal tumors
- 3- Stomach
Inflammatory diseases of the stomach, Neoplastic diseases
- 4- small and large intestine
Hirschsprung, Diarrheal Diseases, Colon Polyps, Colon Tumors
- 5- Appendicitis



Essential slides of the practical section:

Salivary gland:

- 1- Pleomorphic adenoma
- 2- Cystic adenoid carcinoma

Esophagus: SCC

Stomach:

- 1- A type of gastritis, preferably with *Helicobacter pylori* infection
- 2- Common gastric adenocarcinoma
- 3- Carcinoma with Signet Ring
- 4- GIST

Intestine:

- 1- Celiac disease
- 2- One of the IBD types
- 3- Colon adenomatous polyp
- 4- Intestinal carcinoma
- 5- Intestinal carcinoid
- 6- Intestinal lymphoma

Pathology of liver and biliary ducts diseases

In this course, the student should be familiar with common diseases and tumors of the liver and bile ducts and diagnose the patients' disease based on his knowledge.

In this lesson, the etiology, pathogenesis, morphology, and clinical manifestations of common diseases and tumors of the liver and bile ducts are taught.

Core Syllabus

- 1- Liver failure
- 2- Jaundice and cholestasis
- 3- Cirrhosis
- 4- Portal hypertension
- 5- Acute and chronic hepatitis



- 6- Viral hepatitis
- 7- Alcoholic and non-alcoholic fatty liver
- 8- Cholestatic diseases (PBC, PSC)
- 9- Hereditary metabolic diseases
- 10- Hepatic abscess
- 11- Tumors and nodules of the liver
- 12- Gallbladder diseases
- 13- Gallbladder cancer
- 14- Exocrine lesions of pancreas
pancreatitis, pancreatic neoplasms

Essential slides of the practical section:

- 1- One of the types of hepatitis
- 2- Fat accumulation
- 3- Cirrhosis
- 4- Hepatocellular carcinoma
- 5- Metastasis to the liver

Pathology of the genital tract, lower urinary tract, and breast

In this course, the student should be familiar with common diseases and tumors of the male genital tract, lower urinary tract, and female genitalia. Students should be able to diagnose the patient's disease based on their knowledge.

General goals

In this course, the etiology, pathogenesis, morphology, and clinical manifestations of common diseases and tumors of the **male genital tract and lower urinary tract, female genitalia, and breast** are taught.



Lesson description

1- Male genitalia and lower urinary tract (2 hours)

- Penis (inflammatory lesions, neoplasms)
- Scrotum, testes, and epididymis
- Prostate
- Ureter, bladder, and urethra
- Pathology of sexually transmitted diseases

2- Female genitalia (6 hours)

- Vulva
inflammatory lesions, non-neoplastic lesions, tumors
- Vagina
Inflammatory lesions of the vagina, malignant tumors, SCC, Adenocarcinoma, Botryoid sarcoma
- Cervix
inflammatory lesions of the cervix, cervical neoplasia, Invasive cervical cancer, endocervical polyp
- Uterine body
endometritis, Adenomyosis, Endometriosis, AUB, Proliferative lesions of the endometrium and myometrium, Endometrial hyperplasia, Endometrial carcinoma, Endometrial polyps, Leiomyoma, Leiomyosarcoma
- Ovaries
follicular and ovarian cysts, Polycystic ovaries, Ovarian tumors, Superficial epithelial tumors, Serous tumors, Mucinous tumors, Endometrioid tumors
- Pregnancy diseases
inflammation and placental infections, Ectopic pregnancy, Trophoblastic disease
- Pre-eclampsia/Eclampsia

3- Breast diseases (2 hours)

- Fibrocystic changes



- Inflammatory processes
- Tumors
- Breast lesions in men

Essential slides of the practical pathology session:

Bladder:

- 1- TCC

Testicular:

- 1- Testicular atrophy
- 2- Seminoma
- 2- non-seminoma tumor

Prostate:

- 1- Prostate hyperplasia
- 2- Prostate adenocarcinoma

Uterus and placenta:

- 1- Endometrial hyperplasia
- 2- Uterine myoma
- 3- Uterine adenocarcinoma
- 4- Hydatiform mole

Cervix:

- 1- Inflammation with squamous metaplasia
- 2- Cervical dysplasia
- 3- Cervical polyp
- 4- SCC
- 5- Pap smear

Ovary:

- 1- Serous and mucinosis cysts
- 2- One of the types of ovarian carcinoma
- 3- Ovarian teratoma

Breast:

- 1- fibrocystic disease
- 2- fibroadenoma
- 3- the typical type of ductal carcinoma



4- the typical type of lobular carcinoma

Pathology of hematologic and endocrine disorders

In this course, the student should be familiar with common diseases and tumors of the endocrine and breast systems and diagnose the disease in dealing with the patient based on his knowledge.

General goals

In this course, the etiology, pathogenesis, morphology, and the clinical manifestations of common diseases and tumors of the endocrine and mammary glands are taught.

Lesson description

1- Endocrinology pathologies

(6 hours)

- 1- Pituitary gland
- 2- Thyroid
- 3- Parathyroid gland
- 4- Endocrine pancreas
- 5- Adrenal cortex
- 6- Adrenal medulla

2- Hematologic diseases

(6 hours)

- 1- Erythrocyte disorders
iron deficiency anemia. Vitamin deficiency anemia, megaloblastic anemia
Aplastic anemia, Anemias associated with bone marrow disease, Hemolytic anemias,
Thalassemia minor and major, Sickle cell anemia
- 2- white blood cell disorders
- 3- disorders related to spleen and thymus
splenomegaly, benign and malignant lesions of thymus



Essential slides of the practical part:

Thyroid:

- 1- Nodular goiter
- 2- Hashimoto's disease
- 3- Thyroid adenoma
- 4- Papillary carcinoma
- 5- Medullary carcinoma

Adrenal:

- 1- pheochromocytoma
- 2- neuroblastoma

Lymph node:

- 1- Tuberculosis
- 2- One of the types of Hodgkin's lymphoma
- 3- One of the types of non-Hodgkin's lymphoma

Bone marrow:

- 1- One of the types of acute leukemia
- 2- One of the types of chronic leukemia
- 2- Multiple myomas

Peripheral blood smear

normal and anormal variations and disorders

Pathology of skin diseases and musculoskeletal system

1. Acute and chronic inflammatory dermatosis, vesiculobullous diseases, pemphigus, pemphigoid, herpetic dermatitis, benign and malignant skin lesions

2- Bone diseases

- Congenital disorders of bone and cartilage
- Acquired bone diseases
- Osteomyelitis
- Bone tumors

3- Joint diseases

- Arthritis
- Joint tumors and quasi-tumor lesions



- 4- Soft tissue diseases
- Soft tissue tumors and their types

Essential slides of the practical part:

dermatology:

- 1- One of the common inflammatory diseases such as lichen planus or psoriasis
- 2- A vesicular lesion like pemphigus
- 3- Warts
- 4- Seborrheic keratosis
- 5- Melanocytic nevus
- 6- Melanoma
- 7- BCC
- 8- SCC

Bone:

- 1- Chondroma and Chondrosarcoma
- 2- Osteochondroma
- 3- Osteosarcoma
- 4- Ewing Sarcoma

Soft tissue:

- 1-One of the types of benign tumors such as lipoma or fibroma
- 2- Schwannoma
- 3- Fibromatosis
- 4- One of the typical types of sarcomas

Pathology of the central and peripheral nervous system

In this course, the student should be familiar with common diseases and tumors of the central and peripheral nervous system

General goals

This course teaches the pathology of morphology and clinical manifestations of common diseases and tumors of the central and peripheral nervous system.

Lesson description

- 1- Nervous system damage



- 2- Cerebrovascular disease
- 3- Nervous system infections
- 4- Primary myelin disease
- 5- Neurodegenerative diseases
- 6- Tumors
- 7- Familial tumor syndromes
- 8- Peripheral nerve disorders
- 10- Nerve and muscle function injury
- 11- Benign and malignant tumors of peripheral nerves
- 12- Skeletal muscle disorders

Essential slides of the practical section:

- 1- Astrocytoma
- 2- Meningioma
- 3- Ependymoma



Medical Pharmacology

Type: Theoretical-Practical

Credits: 4

Prerequisite: Immunology

Training hours: 60 hours Theoretical + 17 hours Practical

At the end of this course, the student should acquire knowledge and understanding of each of the basic concepts of pharmacology and relate these concepts to the pharmacological effects of drugs and the use of specific drugs in systems pharmacology.

In this course, the student will be introduced to the basics and concepts of pharmacology, including the kinetics and dynamics of drugs. As an introduction to the pharmacology of systems, they will be introduced to the drugs of the autonomic system.

Pharmacology principles

Principal Definitions in Pharmacology,

Information sources in pharmacology and pharmaceutical information,

Nature and characteristics of drugs (molecular size and weight, drug junctions),

Principles of pharmacodynamics (receptors and other drug binding sites),

principles of pharmacokinetics (familiarity with absorption, distribution, metabolism, and disposal),

the process of production and approval of new drugs
(safety and efficacy, animal experiments,
clinical trials, drug exclusiveness,
new drugs rules and regulations)



Pharmacokinetics:

Effective drug concentration,
distribution volume, clearance, half-life,
bioavailability, drug excretion,
rational regimen for prescribing drugs,
therapeutic range, dosage adjustment in cases of excretion disorders,
metabolism of drugs (types, indicators of determining the speed of metabolism),
the correct method of consumption and comparison between solid and liquid drug forms,
(injectable products, inhaled products),
topical products (skin, eye, nose, ear, rectal, and vaginal)

Pharmacodynamics:

Definition of the receptor and the effector of the drug,
the nature of the receptors, other drug sites,
interactions of drugs with the receptors,
classification of drugs based on their effect on receptors,
definition and comparison of drugs regarding intrinsic activity and affinity,
Quantitative comparison criteria (ED50, potency, efficacy),
graded dose-response curves,
definition and comparison of agonists, antagonists, partial agonists, inverse agonists,
Competitive and non-competitive antagonists,
pharmacological antagonists, chemical and physiological antagonists,
quantal dose-response curves, Criteria for comparing the safety of drugs (LD50, TD50, therapeutic index, certain safety factors),
receptors modifications,
interpersonal changes and types of this change in response to medication,
acceptance of treatment (adherence, compliance, and concordance),
tolerance and tachyphylaxis,
therapeutic effects and adverse drugs reactions (side effects, toxicity, idiosyncrasy, accumulation, tolerance, allergy),
pharmacogenetics and pharmacovigilance

* All definitions, concepts, and comparisons will be explained with examples of medications.



Basics of the autonomous nervous system:

Comparison of autonomic system with sensory and motor nerves, classification of autonomic nerves (neural ganglia, preganglionic and postganglionic fibers), message transmission in cholinergic and adrenergic nerves (storage, release, and termination of the effect), general mechanisms of action of drugs affecting the production, storage, release, and termination of the effect of parasympathetic and sympathetic systems, types of cholinergic and adrenergic receptors and their distribution and function in different tissues, stimulation of parasympathetic and sympathetic systems on body organs and their interactions, locations and the modifications of the autonomic nervous system, accompanying or auxiliary transmitters (co-transmitters), details of the function of the autonomic cardiovascular nerves in regulating mean arterial pressure, in the eye, and in the intestine (as the important examples)

Cholinergic receptor stimulants and anticholinesterases:

Classification of cholinergic drugs (cholinomimetics), main clinical applications of direct-acting parasympathetic drugs (such as bethanechol and pilocarpine), indirect-acting cholinergic drugs including clinical applications, adverse effects, and toxicity, precautions, and differences of these drugs (such as Edrophonium, Physostigmine, Tacrine, Rivastigmine, etc.), available pharmaceutical products from this group of drugs.

Antagonists of muscarinic receptors and nicotine cholinergic receptors:

Category, clinical applications, adverse effects, and toxicity, precautions, differences of these drugs, pharmaceutical products from this group of drugs

Sympathomimetic drugs:

Classification, clinical applications, adverse effects, toxicity, precautions differences between these drugs, and pharmaceutical products available from this group of drugs

Sympathetic receptor blockers:

Classification, clinical applications, adverse effects, toxicity, precautions, differences between these drugs, and pharmaceutical products available from this group of drugs



Pharmacology of Cardiovascular and respiratory systems

10 hours

The student should be able to:

- 1- Name the drug groups used in common diseases of the cardiovascular system and lungs (according to the course topic) and pharmacological properties (method of absorption, distribution, metabolism, excretion, and the effects of the drug on various organs of the body) in the case of top drugs, or describe the high-consumption medications of each group
- 2- Pay attention to the serious effects and important side effects of the drugs used in common diseases of the cardiovascular system
- 3- Considering the speed of scientific developments and the findings of clinical trials on introducing new drugs and determining the uses or side effects of cardiovascular and respiratory drugs, note the importance of reading the latest guidelines and evidence for use before prescribing these drugs

In this course, students will become familiar with drug groups used in common diseases of the cardiovascular system and lungs, and become familiar with the pharmacokinetic and pharmacodynamic properties of these drugs, and observe examples of changes in guidelines for the use of these drugs resulting from the new evidence in clinical trials.

Drug groups used in hypertension and widely used drugs from each group:

- Vasodilators and treatment of angina
- Effective drugs in heart failure
- Antiarrhythmic drugs
- Diuretics (Carbonic anhydrase inhibitors, thiazides, diuretics affecting the Henle loop, other)
- Drugs used in the treatment of hyperlipidemia
- Bronchodilators and other drugs used in asthma, allergic rhinitis, cough



C) Pharmacology of antimicrobial drugs

10 hours

The student should be able to:

1- Name the drug groups affecting infectious diseases (according to the course title) and the pharmacological characteristics (method of absorption, distribution, metabolism, excretion, and effects of the drug on different organs of the body) in the case of leading or widely used drugs from each group.

2-Pay attention to the dangerous effects and important side effects of drugs effective on infectious diseases

3- Considering the pace of scientific developments and the findings of clinical trials on introducing new drugs and determining the uses or side effects of drugs affecting infectious agents, pay attention to the importance of studying the latest guidelines and evidence on consumption before prescribing these drugs.

In this course, the students will be introduced to "drug groups affecting infectious diseases" and the pharmacokinetic and pharmacodynamic properties of these drugs. They will see examples of changes in the guidelines for using these drugs due to new evidence in clinical trials.

- Penicillins and cephalosporins
- Aminoglycosides
- Sulfonamides and Trimethoprim
- Fluoroquinolones
- Chloramphenicol and tetracyclines, and macrolides
- Antimycobacterial drugs
- Antiviral drugs
- Anti-protozoan and anti-worm drugs
- Miscellaneous drugs and topical disinfectants

Antimicrobial resistance

principals

algorithmic approach to management of resistant bacterial strains

applied clinical assessments



General considerations in practice

Indications and contraindications of newly-developed antibiotics administration

D) Pharmacology of Blood Gastroenterology and Rheumatology

10 hours

The student must read at the end of this lesson:

1- Name the drug groups in common diseases of the gastrointestinal tract, blood, and connective tissue (according to the course topic) and describe the pharmacological properties (absorption, metabolism, excretion, and the effects of the drug on different organs of the body) in the case of the leading or most widely used drugs of each group

2- Pay attention to the serious effects and important side effects of drugs used in common diseases of the gastrointestinal tract, blood, and connective tissue

3- Considering the speed of scientific developments and the findings of clinical trials on introducing new drugs and determining the uses or side effects of gastrointestinal drugs, hematology, and rheumatology, note the importance of studying the latest guidelines and evidence for use before prescribing these drugs

In this course, students will become familiar with drug groups used in common diseases of the gastrointestinal tract, blood, and connective tissue and the pharmacokinetic and pharmacodynamic properties of these drugs and see examples of changes in the guidelines for the use of these drugs due to new evidence in clinical trials.

- Drugs used in the treatment of peptic diseases
- Gastrointestinal stimulants, effective drugs in the treatment of constipation, antidiarrheal drugs
- Antiemetic drugs
- Drugs used in blood coagulation disorders
- drugs for anemia
- General concepts of chemotherapy
- Non-steroidal anti-inflammatory drugs (NSAIDs), anti-rheumatic drugs, non-opioid analgesics, and anti-gout drugs



Endocrine Pharmacology

Clinical preparations for internships
Basic principles of medical pharmacology
Theoretical
4 hours

The student should be able to:

1- Name the drug groups affecting the endocrine system (according to the course topic) and the pharmacological characteristics (method of absorption, distribution, metabolism, excretion, and effects of the drug on different organs of the body) in the case of top-leading or high-consumption drugs from each group.

2- Pay attention to the serious effects and important side effects of drugs affecting the endocrine system

3- Considering the speed of scientific developments and the findings of clinical trials on introducing new drugs and determining the uses or side effects of drugs affecting the endocarp device, pay attention to the importance of studying the latest guidelines and evidence on consumption before prescribing these drugs.

In this course, students will become familiar with drug groups affecting the endocrine system. They will become familiar with these drugs' pharmacokinetics and pharmacodynamic properties and observe examples of changes in the guidelines for the use of these drugs resulting from new evidence in clinical trials.

- Hypothalamic and pituitary hormones (analogs and antagonists)
- Thyroid hormone and antithyroid drugs
- Relevant corticosteroids and antagonists
- Sex hormone-related drugs, hormonal contraceptives
- Pancreatic hormones and anti-diabetic drugs
- Drugs affecting bone mineral homeostasis

E) Pharmacology of neuropsychiatric drugs

4 hours

The student should be able to:

1- Name the groups of drugs affecting the nervous system (according to the course topic) and the pharmacological characteristics (method of absorption, distribution of metabolism,



excretion, and effects of the drug on different organs of the body) in the case of leading or high-consumption drugs from each group.

2- Pay attention to the serious effects and important side effects of drugs affecting the nervous system.

3- Considering the pace of scientific developments and the findings of clinical trials regarding the introduction of new drugs , their applications, and side effects of drugs affecting the nervous system, pay attention to the importance of reading the latest guidelines and evidence about using them before prescribing these drugs.

In this course, students will become familiar with drug groups affecting the nervous system. They will also become familiar with the pharmacokinetic and pharmacodynamic properties of these drugs and see examples of changes in the guidelines for using these drugs as a result of new evidence in clinical trials.

Drugs affecting the nervous system:

- Antiepileptic drugs
- General anesthetics
- Topical anesthetics
- Skeletal muscle relaxants
- Effective drugs in Parkinson's and other movement disorders
- Narcotic/opioid drugs

Psychiatric medications:

- Sedatives
- hypnotics
- Antipsychotic drugs and lithium
- Antidepressants



Physiopathology stage Systemic courses
Preclinical preparation stage





Tehran University of Medical Sciences

Faculty of medicine

Pediatric department

**Curriculum-
pathophysiology course
Clinical Preparation Course**



**Planning committee of
pathophysiology course (Clinical Preparation) Course
Committee members:**

1. Dr. Emadi, vice –president of internal medicine faculty of education department
2. Dr. Safavi, Faculty member of internal medicine education department- Imam Khomeini Hospital & Amir Alam Hospital
3. Dr. Rahpour, faculty member of pharmacology education department
4. Dr. Jahanzad, Director of pathology education department
5. Dr. Ejtemaei Mehr , director of pharmacology education department
6. . Mrs. Mahjoub, faculty member of education department-pathology
7. Dr. Manoucher Amini, Faculty member of internal medicine education department- Shariati hospital, & Sina hospital
8. Dr. Najafzadeh , faculty member of internal medicine education department- Imam Khomeini Hospital & Amir Alam Hospital
9. Dr. Afshari, compiling authority of case discussions
10. Dr. Labaf, head of clinical skills center of the internal medicine faculty
11. Mirzazadeh , director of faculty of education development & manager of basic clinical practice office
12. Mrs. Dr. Tahereh Naseripour , office of education development faculty – Research expert

Pathophysiology committee

Members of the committee:

1. Dr. Khalvat, Director of education department, Internal medicine, Imam Khomeini Hospital & Amir Alam and supervisor of internal medicine pathobiology Rheumatology departments of Imam Khomeini hospital & Amir Alam Hospital
2. Dr. Akbarian, director of internal medicine education department, Dr. Shariati hospital, & Sina Hospital
3. Dr. Sharifian, internal medicine, supervisor of pathophysiology & blood diseases, Imam Khomeini Hospital & Amir Alam Hospital
4. Dr. Bahar, internal medicine, supervisor of pathophysiology & blood diseases, Dr. Shariati hospital & Sina hospital
5. Dr. Naji, internal medicine department, supervisor of pathophysiology and rheumatology, Dr. Shariati hospital & Sina hospital
6. Dr. Pajouhi , internal medicine department, oncology & metabolism, Dr. Shariati hospital & Sina hospital

7. Dr. Nakhjavani, internal medicine department , supervisor of pathophysiology of oncology diseases & metabolism- Imam Khomeini hospital & Amir Alam hospital
8. Dr. Kamal Hedayat, supervisor of cardiovascular pathobiology – Dr. Shariati hospital
9. Dr. Rahmani, supervisor of cardiovascular pathobiology- Imam Khomeini (Rah) hospital
10. Dr. Nasiri Tousi, internal medicine department supervisor of pathophysiology of digestive diseases- Imam Khomeini hospital & Amir Alam hospital
11. Dr. Bagheri, internal medicine department supervisor of pathophysiology of digestive diseases-Dr. Shariati hospital& Sina hospital
12. Mrs. Dr. Sadadi, internal medicine department supervisor of renal pathophysiology – Dr. Shariati hospital, &Sina hospital
13. Dr. Seifi, internal medicine department supervisor of renal pathophysiology- Imam Khomeini hospital & Amir Alam hospital
14. Dr. Dafavi, representative of basic clinical practice, planning committee
15. Najafi Zadeh, representative of basic clinical practice, planning committee
16. Dr. Manouchehr Amini, representative of basic clinical practice, planning committee
17. Dr. Afshari, representative of basic clinical practice, planning committee and supervisor of case discussions
18. Dr. Mirza Zadeh, education development manager of the faculty and director of clinical practice office
19. Mrs. Dr. Tahereh Naseripour , office of education development faculty – Research expert



Basics of clinical practice curriculum

General Objective:

The general objective of basics of clinical course is to prepare medical students to enter the clinical course. The course includes pathology, pathophysiology, clinical presentations, principles of basic clinical skills, including: communication skills, physical examination and attaining case history skills, diagnosis and disease prevention, basics of treatment pharmacology and general treatment principles of adults' critical and common diseases. Although there are extensive topics for discussion, but the course is more focused on the topics related to commonly critical diseases which the internal medicine practitioners are faced, and medical students must necessarily know them when they are entered to the clinical course. The course underscores student's clinical reflection empowerment through utilization of mechanisms of diseases, effectiveness mechanism of the drugs, and patients 'care principles.

Scopes of education:

It is expected that the student be competent and qualified enough at the end of related courses to the organ –system of pulmonary disease, cardiovascular diseases, hepatitis and digestive diseases, concerning rheumatology, blood, renal , oncology and metabolism diseases.

Knowledge:

1. To recognize the damaged tissues of organ- or the above mentioned systems related to the disease.
2. To comprehend why and how pathogenic factors impact on the natural organs.
3. To perceive the definitions and to know terminology of the diseases
4. To recognize clinical epidemiology of each organ or system
5. To perceive main clinical presentations of the above mentioned organs or systems
6. To comprehend diagnosis principles , to prevent main disorders of related organs or systems , and prevent them
7. To recognize basics of pharmacological treatment or the organs and systems

Skill:

1. To be competent and qualified enough to attain comprehensive case history, to do examination properly, and orderly, by respecting principles of communication with adult subjects , to record them and represent them as well
2. To be competent and qualified enough to analyze a clinical issue based on the basic sciences and pathophysiology so that he or she takes a proper diagnosis decision and effective patient's care.

Attitude:

1. To perceive how knowledge of basic sciences and disease pathophysiology is significant in the analysis of clinical issues for diagnosis of the disease and to develop a true treatment plan.
 2. To recognize significance of different dimensions of medical sciences and to know how it is necessary for different disciplines to properly cooperate and care the patient.
 3. To admit how much important right communication is, how to communicate with patient, and how the effective communication may strengthen relations of patient and the practitioner, and how treatment results are improved.
 4. To respect patient and to perceive that practitioner's focus on patient's needs and expectation strengthens his or her relation to the patient.
 5. To comprehend that how important patient's case history, punctual and proper care are, and must know and try to improve his or her competencies in this regard.
- Note: Pharmacological, pathology, basics of attaining patient's case history related to other systems, such as nerve and skin are represented henceforth.

Scopes of education, content, and nine courses:

Each one of the named subgroup committees define the scopes compatible with general objectives of the course.

Teaching method:

Regarding to the teaching role in curriculum quality improvement, the third stage of basic clinical practice course has specially focused on the curriculum improvement:

1. Although lecturing is the main topic of education, but the main scope is that the students benefit and gain more knowledge from their professors, and their better comprehension of scientific resources.
2. To strengthen their interactive lecturing in this regard, accordingly, the clinical practice office cooperates with the related teaching departments, and the education development office of the faculty to facilitate knowledge.



transfer among the faculty members regarding desirable lecturing process and promotion of faculty members' competencies in this regard.

3. Due to the fact that, strengthening the competency and qualifications of problem solving are the defined objectives of the course, meetings for case discussions must be held. Although it is limited in some courses, however number of case discussions must be increased to the formal planning. Planning system must at least include common clinical presentations, consequently, there is a coherent reflection framework for dealing with common diseases.
4. Teaching of main case history attainment method, not only lecturing and multimedia facilities are utilized but also impatient subject in the clinics undergo case history attainment process.
5. Teaching of examination skills includes utilization of multimedia , lecturing, classmate's examination and impatient examinations in the clinic
6. Teaching of communication skills includes teaching of small groups (discussion and negotiation, film analysis) interview with standardized patients and interview with impatient subjects in clinics.
7. Due to the meaningfulness of the clinical dealing processes, for the best learning of clinical skills, getting case history, clinical examination and communication, increased cases of clinical dealings, (Patients' presence at clinical wards coordinated with related departments) are emphasized more. Thus, we arranged the planning process so that students could attend rotationally at the clinics in the morning or in the afternoon.

Evaluation method

Student's evaluation

1. Student's main assessment method includes final term examinations. There is a different between internal medicine students' examination of Imam Khomeini and Amir Alam hospitals; Shariati and Sina hospitals, therefore, we decided that the faculty members develop common questionnaires for the two groups at the end of each term. It is possible due to the same references for both groups.
2. Although multiple choice questions are used for the examination but the questionnaires may include matching questions, as well as short answer explanatory questions. For the first performance of the program the mentioned cases include 30% of the total questions.
3. OSCE test is utilized for the evaluation of clinical skills, getting patient's case history and communication skills.



4. To recognize competency and qualification of case history and examination record, the students' must evaluate case history attainment.
5. The students' competency in problem solving is evaluated by using at least 20 % of the final course questions, high taxonomy questions are asked to evaluate students' competencies in the analysis of the clinical issues.
6. Due to the differently referred viewpoint accomplishment of roll call supported , and there were two main suggestions for implementation guidelines.
 - a) In some meetings , attendants' are asked a number of quizzes
 - b) Scores of the absent students are reduced the internal medicine education faculty, in this case, the department of medical education faculty is coordinated .

Course and faculty members' evaluations:

1. Enrolled individual in each course , the course and faculty members' performances are analyzed by implementation of the survey forms, the students' must answer some questions written on the survey forms.
2. A faculty member of the related department holds a meeting where the students or their representatives are attended. The students' put their ideas about the quality of education and the issues. At the end of a meeting held for case discussion, the students mention their viewpoint. For pharmacology and pathology, the students put their ideas on the quality of education at the end of each term. The education departments' report the decisions taken in the meetings and give their feedback and disseminate the information to the basics of clinical practice office.
3. At the end of each complete basic clinical practice course,(the two semesters), the survey forms are used and centralized meetings are held for analysis of the students detailed ideas.
4. Performances of each group of students and obtained scores of different lessons are compared with those of the previous courses.
5. Faculty members of the education departments are involved in the questioner development process of each course , the developed questionnaires are evaluated then, and the evaluation analysis feedbacks are reported to the questionnaire developers.



6. The obtained evaluation results scores and different methods of evaluations are reported to the concerning departments.
7. Basic clinical practice office, evaluates performances analyses them and sends the evaluation and analysis feedbacks to the education departments.
8. The obtained evaluation results are just utilized for constructive scopes and promotion of the faculty members and so forth.

Method of information transfer

1. A guidance manual is issued and distributed among the students to properly recognize objectives of the course, teaching methods and their evaluation system.
2. Basic clinical practice office launched a website for proper information transfer and the students collect their needed information through the website.
3. When the reference is presented, then the students do not need pamphlets, then, they are leaded toward the main resources for their studies, notably, the basic clinical students' level and compatibility of the resources with the students needs and expectations are defined based on the priorities.
4. We decided to formulate a learning handbook and to define authentic references for different lessons, both Harrison's manual of medicine and Seal's essential handbook were offered for more and less important topics respectively. However the handbooks must be compatible with students' level , scopes of the course and the lessons.
5. Proper resources for the students' study and their more comprehension are introduced.

Course Management

1. The manager coordinates involved education departments in basic clinical practice , decides on course review, if necessary, the planning committee of basic clinical practice is a subset of the internal medicine planning committee as well.
2. The committee liaise with all involved education departments and faculty of clinical skills.
3. A faculty member of each education department is designated as a supervisor, he or she coordinates with the departments for the students' evaluation and liaise with the basic clinical practice office, departments and wards.
4. Basic clinical practice office directs administration affairs and current affairs within faculty of internal medicine education department.



5. As for , internal medicine education departments of Imam Khomeini, Amir Alam, Shariati and Sina hospitals are involved in basic clinical practice course, and due to the necessity of general compatibility with the scopes, education and evaluation methods among different courses, the pathophysiology committee is established and managers of education departments , supervisors of different education departments as well as representatives of education departments of cardiovascular diseases and the representatives of planning department of basic clinical practice course manage the mentioned processes.
6. The education department and the education groups supervise on the teaching contents of basic clinical practice. Meanwhile, basic clinical practice planning committee supervises on each course, and lessons of pathophysiology, and cardiovascular diseases are supervised by the committee of pathophysiology.

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Physiopathology stage Systemic courses

Number of credits: 14

Unit Type: Theoretical

238 hours

Prerequisite: Semiology and physical examination

Syllabus:

The purpose of these courses is to acquaint the medical student with the **physiopathological foundations, clinical manifestations, diseases and their contributing factors in an analytical-practical way**. In this section, all information related to diseases is taught based on physiopathology.

Pathophysiology courses include gastrointestinal, cardiology, endocrinology and metabolism, hematology, respiratory, kidneys, and rheumatic disorders.

The internal medicine resources used for the parts of the above books include **Harrison textbook of internal medicine, Cecil textbook of internal medicine, and relevant pathophysiology books recommended by the TUMS professors and faculty members** in each rotation.

For other parts, the resources listed in the appendix of this document will be used under the supervision of the relevant professors.

Core mandatory Syllabus of training courses are briefly written on the following pages, and the detailed description of the courses can be found in the complement annexed booklet.



Gastrointestinal diseases

Pathophysiology course

(40 hours)

Core Syllabus

1- Esophagus:

anatomy and histology, physiology
the mechanism of action of swallowing, upper and lower esophageal sphincters,
the principles of the physiopathology of esophageal symptoms
dysphagia,
odynophagia,
regurgitation
the pathophysiology of diagnosis and treatment of esophagitis,
diffuse esophageal spasm,
and changes in collagen diseases and scleroderma

2- Stomach and duodenum:

anatomy and histology, physiology the mechanism of stomach movement and
emptying phases, mechanisms of secretions in the stomach,
the pathophysiology, diagnosis and treatment of peptic ulcers and duodenal
ulcers,
Benign and malignant changes, alarm signs, preventions and approach
gastritis,
drug-induced ulcers,
and Zollinger–Ellison syndrome

3- Small intestine:



anatomy and histology, physiology
the movements of the intestine, the mechanism of absorption of water, electrolytes, proteins, lipids, carbohydrates, vitamins, iron, calcium, and phosphorus
pathophysiology, diagnosis and treatment of malabsorption syndrome
dyspepsia syndromes,
causes of malabsorption and maldigestion and their differentiation,
intestinal parasites,
diarrhea, and its mechanism, types of diarrhea (osmotic, secretory, mixed, and hypermobility),
Benign and malignant Tumors,
tuberculosis, Whipple,
lymphangiectasia,
Crohn's disease,
closed-loop or microbial growth syndrome,
protein-losing enteropathy

4- Colon:

anatomy, histology, physiology
defecation mechanism, colonic movements, water and salt absorption, rectal sphincters
the pathophysiology of diarrhea,
pain and tenesmus, mucus diarrhea and a variety of dysentery,
diagnostic approaches, rectorrhagia,
Benign and malignant Tumors,
polyps and polyposis syndromes,
diverticulitis,
ulcerative colitis and Crohn's disease,
Amoeba, tuberculosis, infectious colitis,
and irritable bowel syndrome

5- Liver

anatomy and histology physiology
the role of the liver in the metabolism of carbohydrates, proteins, and fats;
the mechanisms and processes of bile secretion
pathophysiology, the diagnosis and treatment of gallstones,
metabolism, and the pathogenesis of side-effects of medications in the liver,

pathophysiology of jaundice,
pathophysiology and diagnostic methods of hepatomegaly,
abscesses,
Benign and malignant Tumors,
Fatty liver changes and stagings
Hepatitis

algorithmic approach to raised liver function tests
and hepatic cirrhosis

6- Pancreas:

Anatomy and histology,
physiology of the exocrine secretion of pancreas,
pathophysiology, diagnosis and treatment of acute and chronic pancreatitis,
fibrocystic changes in the pancreas

Cardiovascular diseases

Pathophysiology course

(40 hours)

Core Syllabus

- 1- Anatomy, physiology, the electrical activity of heart, cardiac circulation and activity phases, Correlation of electrical activity and physical cardiac activity cardiac nerves, the metabolic regulation of myocardium (In Brief)-
2 hours
- 2- The clinical manifestations of cardiac diseases, based on physiopathology and clinical examination of patients heart disease
4 hours
- 3- Chest pain, dyspnea, and its types, palpitations, edema, syncope, cyanosis, the assessment of patients' general condition, the examination of arteries, measuring the blood pressure, Cardiac physical examination, observation, touching, examination of the veins, cardiac auscultation, examination of normal and abnormal heart sounds based on physiology and physiopathology, types of murmurs and their mechanism
8 hours



4- Para-clinical evaluations in the diagnosis of cardiovascular diseases
(except electrocardiography)

4
hour
s

Radiography
Echocardiography
Vectorcardiography
Exercise and stress Test
Holter monitorings of rhythm and arterial pressure
Nuclear Cardiology

4- Principles of normal heart electrophysiology - 3 hours

Concepts of electric wave generation and propagation, rhythm and conduction disorders - blocks - hypertrophies and pacemaker (Briefly)

5- Rheumatic fever 2 hours

Cause - Physiopathology - Symptoms - Diagnosis - Differential diagnosis - Treatment - Prognosis - Prevention

6- Valve heart disease 4 hours

Stenosis and insufficiency of mitral valves, aortic valves, tricuspid, the pulmonary artery - Causes - Physiopathology - Diagnosis - Differential diagnosis - Treatment - Prognosis - Prevention

7- Congenital heart disease : 3 hours

Cardiac embryology, fetal circulation, changes in the blood circulation of the fetus after birth, causes congenital disease, pathophysiology, differential diagnosis, prognosis, treatment, prevention of common types of congenital heart disease (including the atrial septal defect, intraventricular defect, patent ductus arteriosus, Tetralogy of Fallot)

8- Increased arterial blood pressure - 3 hours

Causes - Physiopathology - Diagnosis - Differential diagnosis - Emergencies - Treatment - Prognosis - Prevention

9- Decreased arterial blood pressure, shock, syncope, causes, pathophysiology, diagnosis, differential diagnosis, treatment, prognosis, prevention - 1 hour

10- Coronary artery diseases -

4 hours

Causes of atherosclerosis, risk factors, myocardial metabolism, coronary blood circulation and regulatory factors, the pathogenesis of ischemia, angina pectoris and its types,



myocardial infarction, diagnosis, differential diagnosis, complications of treatment, prognosis, prevention

12- Heart muscle diseases - 2 hours

Myocarditis - Cardiomyopathies - Causes - Types - Physiopathology - Diagnosis - Differential diagnosis - Treatment - Prognosis and prevention

12- Heart failure, its types, and emergencies - 3 hours

Causes - Physiopathology - Diagnosis - Differential diagnosis - Treatment - Prognosis and prevention

13 -Pericardial diseases 1 hour

Acute pericarditis - chronic pericarditis and its types - Physiopathology - diagnosis - differential diagnosis - treatment - prognosis - prevention

14- Infectious endocarditis 1 hour

Causes - Physiopathology - Symptoms and signs - Diagnosis - Differential diagnosis - Treatment - Prognosis - Prevention

15- Increased arterial pressure in lungs and heart- 2 hours

Primary and secondary hypertension, pulmonary embolism, pulmonary infarction, causes, pathophysiology, diagnosis, differential diagnosis, treatment, prognosis, prevention

16- Heart and lung resuscitation - 1 hour

17- Arterial diseases 1 hour

Large arteries of their branches: aortitis - Leriche syndrome - Takayasu - aneurysm and aortic dissection

Small arteries: Buerger disease - vasculitis - embolism

Causes - Physiopathology - Diagnosis - Differential diagnosis - Treatment - Prognosis - Prevention

18- Diseases of the veins

Large Veins - Peripheral Veins - Thrombophlebitis - Phlebothrombosis - Varicose Veins - Causes - Physiopathology - Diagnosis - Differential Diagnosis - Treatment - Prognosis - Prevention



Endocrine diseases and metabolism

(32 hours)

Course Title : 3-51

- | | |
|--|----------|
| 1- General endocrinology - | 1 hour |
| 2- Physiology of the hypothalamus and anterior pituitary - | 1 hour |
| 3- Disorders of growth hormone: etiology, the physiopathology of the signs, principles of tests for the diagnosis and treatment of over-and-under secretion of growth hormone | - 1 hour |
| 4- Pathophysiology, diagnosis, and treatment of hypopituitarism - | 1 hour |
| 5- The etiology, pathophysiology, signs, symptoms, principles of diagnostic tests for hyperprolactinemia, diagnosis, treatment of tumors of the pituitary - | 1 hour |
| 6- Posterior pituitary gland: Physiology and regulation of ADH secretion, etiology, pathophysiology, signs, symptoms, principles of tests for the diagnosis and treatment of diabetes insipidus and inappropriate secretion of ADH | - 1 hour |
| 7- Metabolism and regulation of calcium and phosphorus, metabolism and the effects of vitamin D | |
| 8- The etiology, pathophysiology, signs, symptoms, the principles of diagnostic tests for hyperglycemia; the diagnosis and treatment of hyperparathyroidism | |
| 9- The etiology, pathophysiology, signs, symptoms, the principles of diagnostic tests and treatment for hypercalcemia; the diagnosis and treatment of hypoparathyroidism and osteomalacia | |
| 10- Synthesis, secretion, mechanism, regulation of secretion, physiology of thyroid hormones | 1 hour |
| 11- Thyroid function tests - | 1 hour |
| 12- Classification of thyroid diseases, pathophysiology, diagnosis, and treatment of simple and endemic goiters - | 1 hour |
| 13- Hyperthyroidism: etiology, pathophysiology, symptoms, Graves' disease, pathophysiology, signs of nonthyroidal Graves' disease, differences of toxic goiter and Basedow's disease; the diagnosis and treatment of hyperthyroidism | 2 hour |
| 14- Hypothyroidism: Etiology, pathophysiology, symptoms, tests, diagnosis, and treatment of hypothyroidism, cretinism - | 1 hour |
| 15- Carbohydrates Metabolism, mechanisms regulating energy and metabolism, body functions after eating food, starvation metabolism - | 1 hour |
| 16- Chemical structure, mechanism of regulation of secretion and peripheral effects of insulin, regulation of blood sugar, anti-insulin hormones - | 1 hour |
| 17- Various causes of disturbances in the metabolism of sugar, diabetes mellitus (prevalence, pathogenesis, etiology, classification, pathophysiology, signs, symptoms, and principles of diagnostic tests) - | 1 hour |



- 18- Acute diabetic syndromes: etiology, physiopathology, symptoms, principles of diagnostic tests, and treatment of diabetic ketoacidosis and hyperosmolar coma - 1 hour
- 19- Physiopathology of complications of diabetes: microangiopathy, macroangiopathy, neuropathy, and the skin complications
- 20- Control of diabetes with diet, oral medications, and insulin - 1 hour
- 21- Hypoglycemia: causes, classification, symptom, physiopathology, differential diagnosis, principles of diagnostic tests, and treatment - 1 hour
- 22- Synthesis, secretion, mechanism, regulation of secretion, physiology of cortical adrenal hormones, principles of diagnostic tests - 1 hour
- 23- The etiology, physiopathology, signs, symptoms, diagnosis, and treatment of hyperactive adrenal cortex - 1 hour
- 24- The etiology, physiopathology, signs, symptoms, diagnosis, and treatment of suppressed adrenal cortex - 1 hour
- 25- Metabolism and the physiological effects of catecholamines, pseudo-transporters, associations with the psychiatric and neurological diseases, associations with blood pressure and antihypertensive drugs; endocrine, symptoms, pathophysiology, diagnosis, and treatment of pheochromocytoma - 1 hour
- 26- Pathophysiology of the male reproductive endocrine system: embryology, development of the embryo and abnormalities of developing fetus, physiology of gonadotropic hormones and androgens, and their disorders - 1 hour
- 27- The etiology, pathophysiology, signs, symptoms, the principles of diagnostic tests for deficiency - 1 hour
- 28- The endocrinological examination of amenorrhea - 1 hour
- 29- Hirsutism and virilism - 1 hour
- 30- Hyperlipidemias - 1 hour
- 31- Obesity - 1 hour

Hematologic disorders

Course Title : (32 hours) 4-51

1- Physiology of hematopoietic-lymphatic system: primordial and progenitor cells of blood and lymphatic cells, the structure of bone marrow, the mechanisms of proliferation and differentiation of blood cells in the bone marrow, regulation of hematopoiesis, hematopoietic growth factors - 1 hour

2- Red blood cell indices (MCD-HCHC-MCH-MGV), the morphological classification of anemia, the use of peripheral blood smear, and bone marrow aspiration, bone marrow biopsy - 1 hour

3- Pathophysiology of anemia: the mechanisms causing the symptoms of anemia, the compensatory mechanisms of the body in anemia, the classification of anemia in terms of pathophysiological and clinical signs in general - 1 hour

4- Metabolism of iron and iron deficiency anemia, anemia of chronic diseases, the metabolism of iron, the development of anemia, iron deficiency, clinical signs and symptoms of anemia, hematology, and treatment of iron deficiency anemia, refractory anemia, erythropoiesis, sideroblastic anemia, hemosiderosis, hemochromatosis - 2 hour

5- Megaloblastic anemias: Metabolism of nucleoproteins, vitamins B12, and folic acid; etiology, classification, the mechanisms of symptoms developing during megaloblastic anemia - clinical and hematological symptoms and their treatment - 1 hour

6- Bone marrow failure and pancytopenias: complete aplasia, pure aplasia of each one of the cell types, causes, symptoms, clinical hematology, and treatment - 1 hour

7- Secondary anemia: pathophysiology of chronic infections anemia, chronic kidney disease, chronic liver disease, endocrine disorders, collagen diseases, myelogenous cancers anemia, anemia of pregnancy - 1 hour

8- Pathophysiology hemolysis, hemolytic anemia, and hypersplenism: Overview of hemolysis, intrinsic and extrinsic causes, clinical signs and symptoms, the treatment of hemolytic anemia, hereditary, autoimmune, enzymopathy, hemoglobinuria (paroxysmal nocturnal hemoglobinuria, etc.), hemoglobinopathies (thalassemia, sickle cell, etc.) - 5 hours

9- Pathophysiology of white blood cells, white: physiology of white blood cells, quantitative and qualitative changes in different conditions - 1 hour



- 10- Leukemia (acute and chronic): causes, classification, pathophysiology, symptoms, clinical and hematological signs, the treatment of acute and chronic leukemia, erythroleukemia, and other types - 3 hours
- 11- Bone marrow transplantation: aplastic anemia, malignant hematological diseases, and other types - 1 hour
- 12- Myeloproliferative disease: pathophysiology, symptoms, clinical and hematology signs, the diagnosis and treatment of polycythemia (primary and secondary), fibrosis, and primary and secondary thrombocythemia - 1 hour
- 13- Lymphomas: classification, pathophysiology, symptoms, clinical and hematology signs, the treatment of Hodgkin's disease, non-Hodgkin's lymphoma, Burkitt's lymphoma, and mycosis fungoides - 2 hours
- 14- Plasma cell and immunoglobulins dyscrasia: classification, pathophysiology, symptoms, clinical and hematology signs, the treatment of multiple myeloma, macroglobulinemia, and heavy chain diseases - 1 hour
- 15- Hemostasis: Physiology of hemostasis - 1 hour
- 16- Bleeding diseases (vascular and platelet): physiopathology, clinical and laboratory signs, symptoms, the treatment of hereditary and acquired types, vascular purpura, thrombocytopenic purpura - 2 hour
- 17- Bleeding diseases (disturbances of coagulation): pathophysiology. symptoms, clinical and laboratory signs, the treatment of congenital types such as hemophilia, acquired types such as fibrinolysis, DIC, Anticoagulants - 2 hours
- 18- Immunohematology: blood groups, blood products and their use cases, transfusion complications, and some general points about hemolytic diseases in newborns - 2 hours
- 19- The kinetics of tumors and paraneoplastic syndromes: Overview of the kinetics of tumors and the mechanisms causing paraneoplastic syndromes, overview of chemotherapy of tumors, the emergencies related to oncology patients
- 3 hours



Respiratory diseases

Course Title: (32 hours) 5-51

- 1- A review of the anatomy of the respiratory system - 1 hour
- 2- Review the specific semiology of the respiratory system, mechanisms of normal and abnormal breathing sounds, and the laboratory diagnostic methods - 3 hours
- 3- Ventilation and perfusion, gas exchange, and breathing control - 3 hours
- 4- Acid-base balance - 2 hours
- 5- Physiopathology, symptoms, diagnosis, and the treatment of allergic rhinitis and asthma - 2 hours
- 6- Physiopathology, symptoms, diagnosis, and the treatment of obstructive pulmonary diseases (tracheitis, simple and chronic bronchitis , emphysema) - 2 hours
- 7- Physiopathology, symptoms, diagnosis, and the treatment of interstitial lung diseases (allergies, occupational, granulomatous, vasculitis, etc.) - 2 hours
- 8- Physiopathology, symptoms, diagnosis, and the treatment of pulmonary embolism and infarction - 1 hour
- 9- Lung defense mechanisms and physiopathology, symptoms, diagnosis, and the treatment of non-tuberculous lung infections (viral, bacterial , fungal, etc.) - 3 hours
- 10- Physiopathology, symptoms, diagnosis, and the treatment of lung abscess and bronchiectasis - 1 hour
- 11- Pathophysiology, symptoms, diagnosis, and the treatment of lung tuberculosis - 4 hours
- 12- Physiopathology of fluid accumulation, pleural amoebiasis, pneumothorax, and neoplasms, pleural disorders - 2 hours
- 13- Lung tumors - 2 hours
- 14- Physiopathology, symptoms, diagnosis, and the treatment ARDS and acute and chronic pulmonary insufficiency - 2 hours



15- Pulmonary manifestations of systemic diseases - 1 hour

16- Miscellaneous diseases (optional) - 1 hour

Kidney and renal diseases

Course Title: (32 hours
) 51-6

1- Anatomy, histology, and physiology of the kidney, renal blood flow, and glomerular filtration
, the autonomous regulating factors of glomerular filtration and renal blood flow, the effects of vasoconstrictor substances
on renal blood flow; transport of sodium, potassium, water, hydrogen, and other substances
; renin-angiotensin system; the effects of kidney on the regulation of calcium, phosphorus,
and vitamin D - 2 hour

2- Physiopathology, signs, and symptoms of kidney disease:

Hematuria, proteinuria, dysuria, polyuria, oliguria, and edema - 2 hours

3- Laboratory diagnostic methods in kidney diseases - 2 hours

4- Etiology, pathophysiology, symptoms, diagnosis, and the treatment of acute glomerulonephritis and acute renal failure

5- Etiology, pathophysiology, diagnosis, and the treatment of chronic kidney failure and uremia - 2 hours

6 -Etiology, pathophysiology, diagnosis, and the treatment of kidney and urinary tract infections; and interstitial nephritis - 2 hours

7- Etiology, pathophysiology, diagnosis, and the treatment of nephrotic syndrome -2 hours

8- Primary hypertension and renal hypertension - 2 hours

9- Kidney and collagen diseases - 2 hours

10- Kidney and systemic diseases - 2 hours



- 11- Kidney and pregnancy, kidney and drugs - 2 hours
- 12- Kidneys, water and electrolytes - 2 hours
- 13- Acid-base disorders -2 hours
- 14- Congenital kidney disease and kidney tumors - 2 hours
- 15- Etiology, pathophysiology, diagnosis, and the treatment of kidney stones and obstructive nephropathy - 2 hours
- 16- Dialysis and kidney transplantation - 2 hours



Rheumatic diseases

Course Title: (32 hours) 51-7

Overview and introduction of connective tissue - classification of rheumatic diseases - 1 hour

Physiology, structure, and biomechanics of joints - synovial fluid - 1 hour

Immunology and inflammation in the joint diseases - 4 hours

Physiopathology, symptoms, diagnosis, and the treatment of degenerative joint diseases - 2 hours

Physiopathology, symptoms, diagnosis, and the treatment of inflammatory joint diseases and collagenosis, including:

Rheumatic fever, rheumatoid arthritis, systemic lupus erythematosus, scleroderma, polymyositis, vasculitis, seronegative spondyloarthropathies (ankylosing spondylitis - Reiter syndrome, psoriatic arthritis, inflammatory bowel disease arthritis), periodic rheumatism - 12 hours

Physiopathology, symptoms, diagnosis, and the treatment of joint metabolic diseases (pseudogout, alkaptonuria, and hemochromatosis) - 2 hours

Physiopathology, symptoms, diagnosis, and the treatment of joint infections, and purulent and tuberculous spondylitis - 2 hours

Physiopathology, symptoms, diagnosis, and the treatment of nonarticular rheumatism (including fibrositis, tendonitis, bursitis, carpal tunnel syndrome) -2 hours

Methods of laboratory diagnosis and analysis of synovial fluid - 1 hour

Technique and indications of intra-articular and extra-articular injections - 1 hour

Principles of pharmacotherapy in rheumatic diseases - 2 hours

Principles of rehabilitation in rheumatic diseases - 2 hours



The third stage

Clinical Clerkship

Core Syllabus and clinical rotations



The third stage

Clinical Clerkship:

The minimum length of the Clinical Clerkship stage is **21 months**, which can be divided into two sections Clinical Clerkship1 (or student) and Clinical Clerkship2 (or Extern).

Clinical Clerkship consists of

- A. Clinical training
applied Training by **attending hospital clinical departments in clinical rotations**

- B. Theoretical courses program
in accompaniment with **theoretical sessions of related Subjects' training.**

Syllabus of Clinical training in rotations will be reviewed further in this document.

Similarities of Clerkship and Internship rotations go back to the role of medical student in practices.

In Clerkship rotations observing the approach to disorders and Patient management is emphasized. In internship rotations active participation as a member of care providing team is pivotal.

Syllabus of theoretical training in clerkship rotations is as follows:



A clinical daily activity plan for medical students in clerkship rotation is as follows:

- 7.5 to 8 AM:
Patients' visit updates and reviews by students
- 8 To 9 AM
Morning Report :
the introduction of the patients admitted to the ward in the night before
and review of clinical history, physical examinations and first clinical step
taken in presence of whole clinical department team including faculty
members, Professors, residents, Interns and medical students in clerkship
rotations.
- 9 Up to 12 AM:
educational visits and rounds on patients' bedside, with the participation of
professors, assistants , interns and medical students
- 12 to 1 PM:
Midday off hour
- 1 to 2 pm
Hospital training conferences (CPC , Conference of mortality and morbidity
(Grand round, etc.)
- Followed by:
Theoretical courses sessions



Internal Medicine clerkship Rotations

for medical students- Clerkship stage

Course duration: 6 months

Number of credits : 18

Internal Medicine clerkship consists of rotations in:

**Internal medicine general departments,
Dermatology,
Neurology,
and infectious diseases.**

Syllabus of clinical and theoretical training will come further in the Curriculum along with clinical departments rotations.



The curriculum of the clerkship of internal medicine is prepared based on the consensus of the faculty members of universities of medical sciences and vast inquiry from experts of medical education in the universities of medical sciences and deputy of health affiliated to ministry of health and medical education.

Obviously curricular communication with the students, faculty members, educational authorities, and other members of the medical school and university and providing appropriate educational environment is of a considerable importance.

At the end, we bring to your notice that the secretariat of the council for undergraduate medical education welcomes all suggestions and viewpoints of the connoisseurs of universities of medical sciences regarding improvement of the curriculum of undergraduate medical education.

Secretariat of council for undergraduate medical education

This documented was endorsed in the 3rd Meeting of the Council for Undergraduate Medical Education.

- **Length of the course:**
90 days mandatory core program in general internal medicine department
- **Effective teaching hours during the course:** 480 hrs.
- Timing of the lecture-based courses and clinical rotations is generally determined according to the educational program of the clerkship course . All medical students are required to attend in the hospital ward at least since 7:30 AM to 2:00 PM each day and 5 days per week.

The expected outcome

a- knowledge

The student must have enough knowledge of epidemiology, etiology, pathogenesis, pathology, clinical manifestations, clinical history, influence of potential physical and psychological factors on the patient in the domain of common medical diseases.



b- Skill

- 1- At the end of the course, the student must be able to take clinical history and do accurate and thorough physical examination and prepare the problem list of appropriate differential diagnoses.
- 2- At the end of the course, the student must find the appropriate approach to the principal complaints and signs of medical diseases.
- 3- At the end of the course, the student must be able to perform the clinical diagnostic procedures at least on the model.
- 4- At the end of the course, the student must be able to interpret common laboratory and radiological tests in the domain of internal medicine.
- 5- At the end of the course, the student must be able to write progress note correctly.

c- Attitude

In order to deliver the best medical care, the student must be able to communicate to the patient, his/her family and accompanying person(s), other physicians and health personnel in an appropriate, effective, and empathetic way.

The relationship between the student and the patient must be compassionate and empathetic to build trust. For this purpose:

- a- The student must spend time to listen to the patient and accompanying person(s) and through this besides establishing a humane relationship, record and analyze the clinical history and findings for diagnosis and treatment of the disease and inform the patient and accompanying person(s) about the patient's condition, possible risks of different techniques, and necessary preventive measures.
- b- The student must consider the influence of factors like age, sex, education, religious- cultural and socioeconomic background on establishing the relationship with the patient and accompanying person(s) and understand the patient's status with this regard.
- c- The student must know the importance of research in internal medicine and the process of planning for a research work, executive parts and method of analysis of the results, and, in turn, participate in the research in clinical and basic sciences



. The criteria and methodology for determining the core content:

- a- prevalence of the disease
- b- valid international sources and references
- c- to have an impact on the community health
- d- to be preventable and included in screening program
- e- to be included in the national and regional international programs of the ministry of health
- f- to be related to the role of graduates in the health system in the future

The content to be taught to yield the stated outcomes:

| number | content |
|--------|--|
| 1. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with increased creatinine |
| 2. | Ability to interpret acid-base disturbances in ABG |
| 3. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with common electrolyte imbalances |
| 4. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with proteinuria and hematuria |



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|-----|---|
| 5. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with hypertension |
| 6. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with dysuria |
| 7. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with anemia and approach to it |
| 8. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with thrombocytopenia |
| 9. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with the bleeding signs and symptoms related to the coagulation system |
| 10. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with increased and decreased leukocyte |
| 11. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with lymphadenopathy |
| 12. | Ability to take history and perform physical examination and to consider a diagnostic plan for the patient with splenomegaly and hepatomegaly and approach to them |

| | |
|-----|--|
| 13. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with fever and FUO (fever of unknown origin) |
| 14. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with thyroid enlargement |

| | |
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| 15. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with musculoskeletal pain |
| 16. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with diabetes mellitus |
| 17. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with low back pain |
| 18. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with arthralgia |
| 19. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with dyspnea |
| 20. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with hemoptysis |
| 21. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with pleuritis and pleural effusion |
| 22. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with acute and chronic cough |
| 23. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with deep vein thrombosis |
| 24. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with GI bleeding |

| | |
|-----|---|
| 25. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with abdominal pain |
| 26. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with dyspepsia |
| 27. | Ability for history taking and physical examination and suggesting a diagnostic |
| | plan for the patient with constipation |
| 28. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with diarrhea |
| 29. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with vomiting |
| 30. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with icterus or abnormal liver function tests |
| 31. | Ability for history taking and physical examination and suggesting a diagnostic plan for the patient with ascites |

Skills and abilities

that a student must obtain in the internal medical ward:

| | |
|---|--|
| 1 | Thorough history taking and accurate physical examination |
| 2 | Methodologic of writing the clinical course and daily recording |
| 3 | ABG taking (at least on the model) |
| 4 | Insertion of endotracheal tube (at least on the model) |
| 5 | Cardiovascular resuscitation (on the model) |
| 6 | Differentiation of normal EKG from abnormal one |
| 7 | Insertion of nasogastric tube and gastric lavage |
| 8 | Ability to prepare and exam urine sample under microscope |
| 9 | Ability for analysis of urine by means of urinary test tapes |



| | |
|----|---|
| 10 | Ability for performing and analyzing CBC (Cell blood Count) |
| 11 | Ability to exam the stool for OB&OP |
| 12 | Ability to gram stain of sputum, urine, and ascitic, pleural, synovial , and cerebrospinal fluid |
| 13 | Ability to do lumbar puncture (at least on the model) |
| 14 | Ability to do knee joint synovial fluid puncture (at least on the model) |
| 15 | Ability to do pleural fluid puncture (at least on the model) |
| 16 | Ability to do ascitic fluid puncture (at least on the model) |
| 17 | Ability to do ophthalmoscopy |
| 18 | Ability to interpret ECG |
| 19 | Ability to interpret CXR (Chest x-Ray) |

| | |
|----|--|
| 20 | Ability to interpret simple Abdominal Radiography |
|----|--|

Teaching and learning method:

Medical schools are required to apply the most appropriate educational strategies and teaching and learning methods for each of the above-mentioned contents according to the subject and within the limits of available educational facilities. Some of these methods are noted below:

Role playing, role model, video presentation, small group discussion, bedside- teaching, procedural skill teaching, task- based teaching, case- based teaching, etc.

Formative assessment of knowledge, skill, and attitude and feedback technique during the course (Timing and frequency of assessments must be stated.)

- Formative and summative assessments must be done during and at the end of the course, respectively.

Assessment is required to target the knowledge, skill, and attitude. Assessment tools must be valid and reliable

For instance, some assessment tools are mentioned below:

- 1-Logbook, 2- DOPS, 3- Mini CEX, 4- OSCE,
- 5-CBD (case based discussion),
- 6- descriptive written examination and MCQ,
- 7- oral examination, 8- global rating form

11- Curricular communication

- The curriculum must be available to the learners, faculty members, and educational and executive authorities of medical school or university at the beginning of the course and reachable at the university website.



12- Curricular management

- For implementation of the program, the necessary preparations including faculty member education must be considered.
- Continuous monitoring of the program by deputy of undergraduate medical education is necessary.
- Department chair must report the result of the program evaluation to the medical school in regular intervals
- Dean of the medical school is required to resolve the problems regarding implementation of the program with joint work of the authorities of the faculty.

12- Principal examination resources:

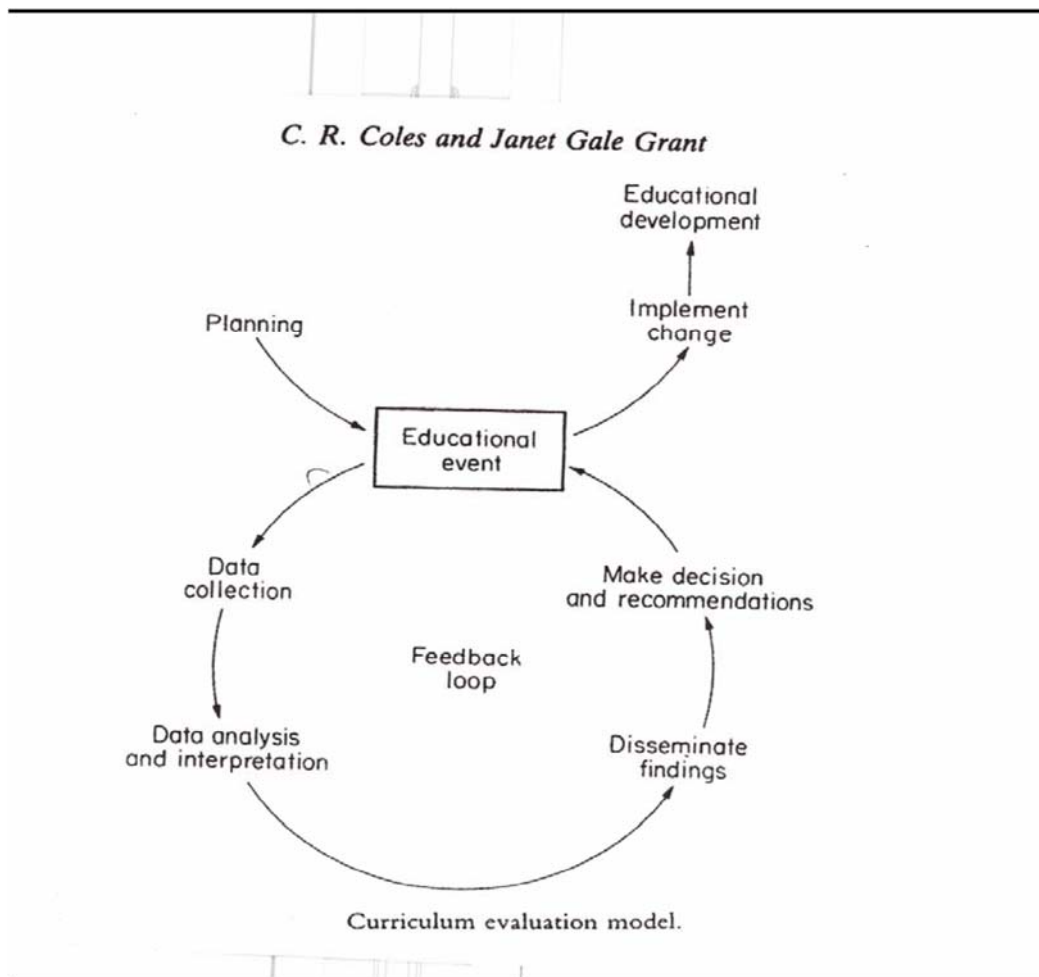
Principal examination resources are the same as the comprehensive (pre-internship) examination, including:

- 1- Kasper DL, et al. **Cecil Essentials of Medicine**/Latest edition. W.B. Saunders
- 2- Braunwald Eugene, et al. **Harrison's Principles of Internal Medicine**. Latest edition. Mc Grawhill;

13- Curriculum evaluation

- For each course, the curricular program must be evaluated by the educational department and under supervision of the medical school, according to the following model. The results must be considered for quality improvement of the educational program in the future courses:





Educational department is required to submit the written report of the program evaluation to the medical school in regular intervals and also a copy of the report and actions taken to the members of the evaluation unit of secretariat of the council for undergraduate medical education in order to improve and ameliorate the program.

Trainees' competencies and qualifications at the end of Internal medicine clerkship course

Hereby expected competencies at the end of internal medicine clinical rotation clerkship course is mentioned in detail.

subsequently **more improved competencies in skills and more independence** is expected in Internship clinical rotations

Competencies include:

1. Clinical skills
2. Communication skills
3. Patient's care (prognosis, treatment, rehabilitation)
4. Health promotion and disease prevention
5. Personal development
6. Professionalism and medical ethics
7. Decision making skills, reasoning and problem solving skills
8. Health system and practitioner's role

Definitions

1. Clinical skills

At the end term of the internal medicine clerkship course trainee must be competent and qualified in a wide range of clinical skills including taking patient's case history and his or accomplishing her clinical examination, recording and presenting medical information , performing procedures and laboratory tests based on the defined standards.

2. Communication skills

At the end term of the internal medicine clerkship course trainee must be competent and qualified in effective communication process with patient and his or her coworker. Moreover, he or she must demonstrate his or her competency and qualification in oral and written communication process.

3. Patient's care (Diagnosis, treatment and rehabilitation)

The trainee must have a general view toward patient at the end of internal medicine clerkship , he or she must competently provide a list where patient's issues and differential diagnoses are recorded, he or she must chose a proper diagnosis method, and must define a healthcare program to achieve the specified objectives in dealing with patient's issues. He or she must know specific conditions when a patient needs consultation and he or she must be presented to other specialty or subspecialty practitioners.

3. Health promotion and disease prevention

At the end of internal medicine clerkship course, the trainee must be linked to coworkers and directors involved in health delivery services to promote personal and communal health, he or she must be competent enough to asses and evaluate health conditions, to identify risk factors, and prognosis determinants. As a team member, he or she must be qualified to decide on promoting primordial and secondary prevention methods as expected for interventions.

4. Personal development

At the end of internal medicine clerkship course, the trainee must realize the importance of personal development , including self-care promotion , he or she must appreciate mental, psychological, socioeconomic occupational qualifications, also non-medical sciences that affect on personal and professional life, such as self-knowledge, change psychology, leadership and management principles and informatics , also he or she must know how they are enforced.

5. Professionalism and medical ethics



At the end of internal medicine clerkship course, the trainee must believe that Allah, the almighty is the only healer , patients must just rely on Allah for their cure . also, all of us know that we practitioners only facilitate healthcare to successfully help and assist patients , all of us appreciate and respect and we are adhered to professionalism and medical ethics. We practitioners adhere to oath and guidelines of medical ethics which are rooted in Islamic teaching, we understand that piety is the base of adherence to professionalism and medical ethics. Also we practitioners must competently identify ethical issues of medicine and we should be qualified to adhere legal and moral requirements , we should respect cultures and beliefs of the interested people and we must analyze these issues to take proper decision.

6.Decision making , reasoning and problem solving skills

At the end of internal medicine clerkship course, the trainee must capably deal with issues, identify their dimensions, he and she must be competent and qualified in collecting information related to the best available resources for assessment and evaluation, he or she must identify different solutions for evaluation and assessment, he or she must capably estimate possible consequences, to realize how to decide during uncertainty . he or she must capably merge the capacity and qualification with priorities, accepted values by health service providers and related community as well as cost effectiveness.

7.Health system and practitioner's role

At the end of internal medicine clerkship course, the trainee must identify and realize his or her role in health system as a doctor, teacher, investigator, and director and leader, he or she must know how health services and leadership should be realized.

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1. Clinical skills

At the end term of the internal medicine clerkship course trainee must be competent and qualified in a wide range of clinical skills including taking patient's case history and his or accomplishing her clinical examination, recording and presenting medical information , performing procedures and laboratory tests based on the defined standards.

| Subset | Competencies at the end term of internal medicine clerkship | Expected competencies at the end of internal medicine clerkship course | Supervisor |
|---|--|--|------------------------------|
| Getting patient's medical history, case history, and patient's history from his/her accompanies | Taking comprehensive e medical history | Independent | Internal medicine department |
| | Taking comprehensive e medical history in geriatric /elderly patient | Independent | Internal medicine department |

| | | | |
|--|--|---|------------------------------|
| | Taking chief-complaint-based medical history in a specific situation | Independent | Internal medicine department |
| Competent at clinical examination | Elderlies' general and comprehensive examinations , respecting patient's privacy and canonical limits | Independent | Internal medicine department |
| | Examination of patient's mental status | Independent | Internal medicine department |
| | Clinical examination by focusing on Chief complaint and allocating priorities in emergency and non-emergency cases | Emergency: Perform under Supervision in clerkship rotations- Independent in Internship Non-emergency: Independent | Internal medicine department |

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|---|---|--|------------------------------|
| <ul style="list-style-type: none"> Information documentation and dissemination <p>Trainee must be capable to correctly record information and data related to inpatient and outpatient, his or her oral or written information must be transferred and disseminated properly at the end of internal medicine clerkship, including:</p> | Documentation in patient's profile (Including initial findings) | Independent | Internal medicine department |
| | Clinical progress Note | Independent | Internal medicine department |
| | Write down medical orders and clinical summary | Perform under Supervision in clerkship rotations-Independent in Internship | Internal medicine department |
| | Writing down Counseling Notes | Perform under Supervision in clerkship rotations-Independent in Internship | Internal medicine department |
| | Writing down discharge and referral documents | Perform under Supervision in clerkship rotations-Independent in Internship | Internal medicine department |



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|---|---|--|------------------------------|
| | explaining in patients narrative about procedures & Procedures documentations | Perform under Supervision in clerkship rotations- Independent in Internship (mandatory for the procedures that the medical trainee is competent enough to do) | Internal medicine department |
| | Writing down death certificate | Perform under Supervision in clerkship rotations- Independent in Internship | Internal medicine department |
| Competent enough to practically perform following procedures: | | | |
| Internal medicine trainee must be competent and qualified enough to enforce ordinary clinical procedures, he or she must notify | Intravenous blood sampling Peripheral efficient Intravenous access | Independent | Internal medicine department |



| | | | |
|--|---|--|-------------------------------------|
| <p>the related patient on the side effects and limitations, while he or she is directly</p> <p>Performing under Supervision of superiors in clerkship rotations- Independent in Internship in the administration process of the procedures.</p> <p>Core procedures of internal medicine are:</p> | <p>Blood sampling for culture</p> | <p>Independent</p> | <p>Internal medicine department</p> |
| | <p>Glucometer application , and giving instructions to patient on how to use it</p> | <p>Perform under Supervision in clerkship rotations- Independent in Internship</p> | <p>Internal medicine department</p> |
| | <p>Arterial blood samples to measure arterial blood gas ABG</p> <p>From extremities and femoral</p> | <p>Perform under Supervision in clerkship rotations- Independent in Internship</p> | <p>Internal medicine department</p> |
| | <p>Insulin injection and giving instructions to patient on how to use</p> | <p>Independent</p> | <p>Internal medicine department</p> |
| | <p>Injections:</p> <p>intravenous /subcutaneous /intramuscular /intra dermal</p> | <p>Independent</p> | <p>Internal medicine department</p> |



| | | | |
|--|--|--|---|
| | Cardiac defibrillation | Active observer | Department of cardiology and anesthesiology |
| | Narcosynthesis | Perform under Supervision in clerkship rotations-Independent in Internship | Department of cardiology and anesthesiology |
| | abdominal paracentesis | Perform under Supervision in clerkship rotations-Independent in Internship | Internal medicine department |
| | Knee joint fluid aspiration | Perform under Supervision in clerkship rotations-Independent in Internship | Internal medicine department |
| | Inhaler usage and giving instructions to patient on how to use the inhaler | Independent | Internal medicine department |



| | | | |
|---|---|-----------------|--|
| | Using hemodynamic monitoring devices | Active observer | Department of internal medicine and cardiology |
| | Inserting the gastric tube through the nose | Active observer | Internal medicine department |
| <p>Graduated university student must be competent in utilization of the following procedures:</p> | | | |
| | Primary usage of the ventilator | Active observer | Department of Internal medicine and anesthesiology |
| | External cardiac pacemaker insertion | Active observer | Department of internal medicine and cardiology |



| | | | |
|---|---|------------------------|---|
| <p>Basic laboratory tests and diagnosis</p> <p>At the final term of internal medicine clerkship, the trainee must be competent and qualified for laboratory test and ordinary diagnosis while he or she is Perform under Supervision of superiors in clerkship rotations- Independent in Internship, he or she must know the limitations, and primary interpretations :</p> | <p>Sampling for proper test method (Blood, urine, pharynx, sputum)</p> | <p>Independent</p> | <p>Infectious disease department and Internal medicine department</p> |
| | <p>Tuberculin test</p> | <p>Independent</p> | <p>Infectious disease department and Internal medicine department</p> |
| | <p>Electrocardiography</p> | <p>Independent</p> | <p>Department of internal medicine and cardiology</p> |
| | <p>peripheral blood smear</p> | <p>Independent</p> | <p>Department of internal medicine</p> |
| | <p>Blood flow and coagulation test</p> | <p>Active observer</p> | <p>Department of internal medicine</p> |

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Communication skills

At the end term of the internal medicine clerkship course trainee must be competent and qualified in effective communication process with patient and his or her coworker. Moreover, he or she must demonstrate his or her competency and qualification in oral and written communication process.

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| subset | Competencies | Expected level after final term of internal medicine clerkship course | Supervisor |
|--|--|---|--|
| Basic interpersonal communication skills | Effective interpersonal communication skills (Including active listening, sympathy, effective expression, non-verbal , verbal, visual communication and so forth) | Independent | Related clinical department with cooperation of Internal medicine department and psychiatry department |
| Effective communication with patient, his/her accompany and his/her family members | Effective communication with patient, accompany and his or her family members (by emphasizing on systematic information collection and competency in responsiveness to the common questions and primary teaching | Independent | Related clinical department with cooperation of Internal medicine department |

| | | | |
|--|---|---|--|
| Effective communication with patient, his/her accompany and his/her family members | Communication with coworkers, medical staff, and state organization Specially in verbal and written form | Perform under Supervision in clerkship rotations- Independent in Internship | Related clinical department with cooperation of Internal medicine department |
| | Competent and qualified enough to write down effective scientific texts buy utilization of educational assistance systems | Independent | Related clinical department with cooperation of Internal medicine department |

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3. Health promotion and disease prevention

At the end of internal medicine clerkship course, the trainee must be linked to coworkers and directors involved in health delivery services to promote personal and communal health, he or she must be competent enough to assess and evaluate health conditions, to identify risk factors, and prognosis determinants. As a team member, he or she must be qualified to decide on promoting primordial and secondary prevention methods as expected for interventions. Meanwhile, the internal medicine trainee is expected to be capable and qualified enough to perform visit, to examine, to prescribe medicine and nutrition, to consult and to involve in the delivery of health services during acute and chronic emergency situations whenever a patient is affiliated with **common diseases**.

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| Subset | Competencies | Expected competency level | Authority |
|--|---|---------------------------|------------------------------|
| General principles of patient's healthcare | <ol style="list-style-type: none"> 1. Trainee must competently differentiate emergency case against non-emergency and actively cooperate with the related teamwork for patient's proper healthcare. 2. As a team member of the healthcare must appropriately care his or her patient. 3. He or she must qualifiedly take patient's examination and case -history, enlist the differentiated issues, to relate them to a pathogen and an etiology. 4. He or she must be competent enough to perform clinical tasks based on approved or rejected differential diagnoses, laboratory tests, and imaging systems. 5. He or she must be qualified enough and capably interpret laboratory test results, imaging methods, and clinical diagnoses related to common clinical presentations, and common diseases. | Independent | Internal medicine department |



| Subset | Competencies | Expected competency level | Authority |
|--------|--|---------------------------|-----------|
| | <p>6. He or she must competently and correctly interpret patient's obtained information through the most possible diagnosis.</p> <p>7. He or she must offer a proper healthcare schedule for drugs, operation, nutrition and psychological issues based on patient's diagnosed disease or based on the defined scopes.</p> <p>8. He or she must competently define patient's care schedule by focusing on the following factors:</p> <ul style="list-style-type: none"> • Must pay attention to patient's all physical, mental and intellectual issues • Must pay attention to emergent cases that patient is faced and his or her threatening risk factor • Must pay attention to proportion of available costs based on his or her work conditions • Must focus on side effects of the treatment methods • He or she must respect patient's religious beliefs, ideas, concerns, tendencies, and expectations. • He or she must adhere to professionalism and medical ethics <p>1. Trainee must capably differentiate inpatient requirement against outpatient ones.</p> <p>2. Must know limitations of the treatment, and causes of patient's presentation and consultation.</p> | | |



| Subset | Competencies | Expected competency level | Authority |
|-------------------|---|---------------------------|---|
| | 3. Trainee must focus on patient's disease progress and must be qualified to define a schedule for patient's care. | | |
| Drug prescription | <p>Trainee must competently observe prescription principles whenever the visited patient needs to consume drug by focusing on following factors for drug of choice or proper dose:</p> <ul style="list-style-type: none"> • Patient's age and gender • General conditions and related diseases • Pharmaceutics and mechanism of drug effect • The most appropriate method for drug consumption , side effects, clinical and paraclinic interferences due to drug consumption • Cost of drug and its accessibility based on patient's lifestyle and living conditions | Independent | Internal medicine department |
| Nutrition | <ol style="list-style-type: none"> 1. Trainee must competently offer necessary recommendations for patient's nutrition. 2. He or she must know how nutrition and disease are related to perform corrective actions. | Independent | Internal medicine department cooperating with |

| Subset | Competencies | Expected competency level | Authority |
|----------------------------|--|---|---|
| | <p>3. He must be qualified enough to distinguish and diagnose malnutrition and increased risk of disease or decreased response to treatment.</p> <p>4. Trainee must be competent enough to distinguish and diagnose specific trophic prescriptions.</p> <p>5. Trainee must be qualified enough to realize and diagnose</p> <p>6. Trainee must be competent enough to detect conventional drugs interactions with nutritional habits of the patients and common diseases.</p> | | nutrition ward |
| Supportive actions | He or she must especially take measures to reduce patient's protests on pain through diagnosis, therapy and relief | Independent | Internal medicine department cooperating with the traditional medicine department |
| Patient's rehabilitation | Trainee must necessarily notify the patient about primary rehabilitation and common diseases | Perform under Supervision in clerkship rotations- Independent in Internship | Internal medicine |
| Complementary medicine and | Trainee must necessarily learn national complementary and traditional medicine | Active observer | Internal medicine |



| Subset | Competencies | Expected competency level | Authority |
|----------------------|--------------|---------------------------|---|
| traditional medicine | | | department cooperating with the traditional medicine department |



4. Health promotion and disease prevention

At the end of internal medicine clerkship course, the trainee must be linked to coworkers and directors involved in health delivery services to promote personal and communal health, he or she must be competent enough to assess and evaluate health conditions, to identify risk factors, and prognosis determinants. As a team member, he or she must be qualified to decide on promoting primordial and secondary prevention methods as expected for interventions.

| Subset | Competencies | Expected competency level at the end term of internal medicine clerkship course | Authority |
|---|---|---|---|
| Assessment of health status | He or she must be competent to define patient's current and ideal status and the visited individual or community | Independent | Related specialty department , in cooperation with internal medicine department |
| Implementation and realization of risk factors of health | <ol style="list-style-type: none"> 1. He or she must identify and realize risk factors of visited individual or community (such as smoking, risky behaviors, environmental, economic and social factors) 2. He or she must identify and realize health interventions to reduce risk impacts on the visited subject or community which includes primary disease preventions, (preventing first level risk factors.) | Independent | Related specialty department , in cooperation with internal medicine department |
| Implementation and realization of guidelines of health promotion based on early diagnosis and timely treatment | <ol style="list-style-type: none"> 1. To properly identify and realize the second level health interventions (Screening) 2. To properly identify and realize secondary health preventions in relatives of the afflicted people. | Independent | Related specialty department , in cooperation with internal medicine department |

| Subset | Competencies | Expected competency level at the end term of internal medicine clerkship course | Authority |
|--------|---|---|-----------|
| | 3. To properly identify and realize health interventions for controlling common diseases including: <ul style="list-style-type: none"> • Infectious diseases • Accidents • Cardiovascular diseases • Cancers • Issues of mental health | | |



5. Personal development

At the end of internal medicine clerkship course, the trainee must realize the importance of personal development , including self-care promotion , he or she must appreciate mental, psychological, socioeconomic occupational qualifications, also non-medical sciences that affect on personal and professional life, such as self-knowledge, change psychology, leadership and management principles and informatics , also he or she must know how they are enforced.

| Subset | Competencies | Expected competency level at the end term of internal medicine clerkship | Authority |
|--|--|--|---|
| physical | Principles of healthy lifestyle , including physical exercises, proper nutrition, and avoidance of risky behaviors | Independent | Related specialty department , in cooperation with internal medicine department |
| Psychological skills for personal promotion | <ol style="list-style-type: none"> 1. He or she must utilize psychological skills for personal promotion, (specifically he or she must promote self-awareness skills, decisiveness, self-assurance, rage management, excitement and stress, time management, lead life, targeting and planning) 2. He or she must utilize intellectual and religious teachings to promote , peace , mental potency, positive attitude, motivation and hope 3. He or she must be capable to realize his or her educational needs and improve his or her competencies and qualifications by utilizing proper methods.(Lifelong learning). | Independent | Related specialty department , in cooperation with internal medicine department |
| Social, economic and occupational competencies in | <ol style="list-style-type: none"> 1. He or she must be capable to knowingly choose a short-term and long-term career path. | Independent | Related specialty department , in |

| | | | |
|---|--|-------------|---|
| choosing a career path to improve his or her economic status | 2. He or she must be competent and qualified to respect medical ethics , and must implement principles of economic management to improve her or his economic status. | | cooperation with internal medicine department |
| Information technology | <ol style="list-style-type: none"> 1. He must competently use information technology skills including Windows, e-mail, web-search, typing principles, Word, Excel, PowerPoint and SPSS software for statistical analysis. 2. He or she must be competent in utilization of electronic medical documentations (books and magazines). 3. He must capably use patients' profile documentations, record the file via electronic system for his/her utilization. | Independent | Related specialty department , in cooperation with internal medicine department |
| Others | <ol style="list-style-type: none"> 1. He or she must be capable to utilize English language at an acceptable level 2. He or she must know how to save and record his or her medical documentations (on log book and portfolio.) | Independent | Related specialty department , in cooperation with internal medicine department |

6. Professionalism and medical ethics

At the end of internal medicine clerkship course, the trainee must believe that Allah, the almighty is the only healer , patients must just rely on Allah for their cure . also, all of us know that we practitioners only facilitate healthcare to successfully help and assist patients , all of us appreciate and respect and we are adhered to professionalism and medical ethics. We practitioners adhere to oath and guidelines of medical ethics which are rooted in Islamic teaching, we understand that piety is the base of adherence to professionalism and medical ethics. Also we practitioners must competently identify ethical issues of medicine and we should be qualified to adhere medical code of ethics and medical law, we should respect cultures and beliefs of the interested people and we must analyze these issues to take proper decision.

| subset | Competencies | Expected competency level after end term of internal medicine clerkship course | Supervisor |
|---|--|--|---|
| | Competent at professionalism, philanthropy, respect, deontology, career excellence, justice, honesty and righteousness | Independent | Related clinical department and cooperation with internal medicine department |
| <p>Medical law and regulations</p> | <ol style="list-style-type: none"> 1. Must be familiar with medical law stand professionalism and criteria (know how to issue death certificate, patients' obligatory report, prescription, obligatory hospitalization and so forth) and must necessarily respect them. 2. He or she must adhere to the regulations and professional | Perform under Supervision in clerkship rotations- Independent in Internship | Related clinical department and cooperation with internal medicine department |

| | | | |
|---|---|--------------------|--|
| | <p>duties relegated by health system service delivery or related ward.</p> <p>3. Must be accountable to supervising authorities of the health system.</p> | | |
| <p>Reasoning and moral decision making</p> | <p>1. He or she must know basic ethical concepts in medicine to utilize them in moral reasoning.</p> | <p>Independent</p> | <p>Related clinical department and cooperation with internal medicine department</p> |

7. Decision making, reasoning and problem-solving skills

At the end of internal medicine clerkship course, the trainee must capably deal with issues, identify their dimensions, he and she must be competent and qualified in collecting information related to the best available resources for assessment and evaluation, he or she must identify different solutions for evaluation and assessment, he or she must capably estimate possible consequences, to realize how to decide during uncertainty . he or she must capably merge the capacity and qualification with priorities, accepted values by health service providers and related community as well as cost effectiveness.

| Subset | competencies | Expected competency level at the end of internal medicine clerkship course | Supervisor |
|------------------------------------|--|---|---|
| Critical thinking | <ol style="list-style-type: none"> 1. Must be capable to assess presentations and related thinking elements based on thinking standards with respecting intellectual traits. 2. Must consider reasoning errors (sophistry) and cognition errors with logical reasoning. | Perform under Supervision in clerkship rotations- Independent in Internship | Cooperation of related specialty department with internal medicine department |
| Problem solving¹ | <ul style="list-style-type: none"> • Must competently identify and analyze problems and propose solutions. | Perform under Supervision in clerkship rotations- Independent in Internship | Cooperation of related specialty department with internal medicine department |
| Evidence based medicine | <ol style="list-style-type: none"> 1. Must competently identify available electronic and non-electronic resources to extract authentic evidences through investigation. 2. Must capably utilize secondary evidences, reference books, algorithms, and guidelines. 3. Must consider evidence based medical limitations in daily accomplishments. | Perform under Supervision in clerkship rotations- Independent in Internship | Cooperation of related specialty department with internal medicine department |

¹ Problem solving

8. Health system and practitioner's role

At the end of internal medicine clerkship course, the trainee must identify and realize his or her role in health system as a doctor, teacher, investigator, and director and leader, he or she must know how health services and leadership should be realized.

| Subset | Competencies | Expected level at the end of internal medicine clerkship course | Supervisor |
|--|---|--|---|
| PHC/ secondary and tertiary healthcare service delivery | <ol style="list-style-type: none"> 1. To recognize Iranian health system and the components 2. To become familiar with best practices and health systems internationally 3. To know how to implement practically Guidelines and manuals of Iranian health system | Perform under Supervision in clerkship rotations- Independent in Internship | Cooperation of related specialty department with internal medicine department |
| Instructor/ mentor/ Teacher | <ol style="list-style-type: none"> 1. To teach well healthy lifestyle to client and his or her family | Perform under Supervision in clerkship rotations- Independent in Internship | Cooperation of related specialty department with internal medicine department |
| Investigator | <ol style="list-style-type: none"> 1. As a member of health team cooperate in health investigations and health service delivery | Perform under Supervision in clerkship rotations- Independent in Internship | Cooperation of related specialty department with internal medicine department |

| | | | |
|--|--|--|---|
| Director of health service delivery | 1. To analyze how health services are delivered and distributed, also to analyze unit resources. | Perform under Supervision in clerkship rotations- Independent in Internship | Cooperation of related specialty department with internal medicine department |
| Health leader | 1. To identify methods of health promotion and support (Such as cooperation with people and intersectoral cooperation). 2. To identify required methods for health promotion of key stakeholders. | Perform under Supervision in clerkship rotations- Independent in Internship | Cooperation of related specialty department with internal medicine department |

#



Internal medicine **clerkship** rotation curriculum
TUMS core curriculum-Annex2

Internal medicine department

Knowledge domain

Mandatory clinical presentations

- Education and learning of core contents that follows should cover coherent approach to the Symptoms, signs, or Diseases, including **Pathophysiology, algorithmic diagnostic approach, clinical assessment and approach algorithms, management and Therapies.**
- The following minimal competencies are to be achieved during clerkship rotation. Mandatory syllabus for Internship stage is mentioned in other chapters of the curriculum.

| Common clinical presentations | Authority Education Body |
|--|---|
| <ul style="list-style-type: none"> ▪ Anorexia ▪ Weakness/Fatigue ▪ Checkup order (Screening protocols) ▪ Health suggestions for different age groups ▪ Including diet, exercise, mental health, risky behaviors ,and specific habits such as smoking, alcohol consume, etc. | <p>Internal medicine-General</p> |



| | |
|--|---|
| <ul style="list-style-type: none"> ▪ Improvement of lifestyle (weight , blood pressure, blood sugar, and blood cholesterol) | |
| <ul style="list-style-type: none"> ▪ Indigestion ▪ Vomit ▪ Jaundice ▪ Abdominal distention ▪ Abdominal pain ▪ Constipation ▪ Dysphagia ▪ Gastrointestinal Bleeding | Internal medicine Gastroenterology |
| <ul style="list-style-type: none"> ▪ Anemia ▪ Abnormal bleeding (hemostasis disorders) ▪ Enlarged lymph nodes and spleen ▪ (Lymadenopaties and Splenomegaly) | Internal medicine hematology |
| <ul style="list-style-type: none"> ▪ Backache ▪ Neck pain ▪ Arthritis/ Joint pain ▪ Muscle pain/Weakness | Internal medicine Rheumatology |
| <ul style="list-style-type: none"> ▪ High Blood Cholesterol ▪ Abnormal Blood Sugar ▪ Disruption of thyroid function test | Internal medicine Oncology |

| | |
|--|---|
| <ul style="list-style-type: none"> ▪ Cough/Phlegm/ Hemoptysis ▪ Cyanosis ▪ Shortness of breath/Wheezing/Respiratory Distress | Internal Medicine pulmonary |
| <ul style="list-style-type: none"> ▪ Edema ▪ Pain with Urination/Frequent Urination ▪ Polyuria/ Nocturia ▪ Hematuria ▪ dehydration / hypovolemia ▪ high blood pressure | Internal Medicine Nephrology |
| <ul style="list-style-type: none"> ▪ Hypertension ▪ Chest pain ▪ Heart palpitation ▪ Syncope/Faint | Internal medicine Cardiology |

Internal medicine department

— **Knowledge domain**

common diseases at internal medicine department

Essential and mandatory Syllabus

Education and learning of core contents that follows should cover coherent approach to the Symptoms, signs, or Diseases, including

Pathophysiology, algorithmic diagnostic approach, clinical assessment and approach algorithms, management and Therapies.

| <p>Outpatient Core Syllabus</p> <p>Common disease at clinic</p> | <p>Inpatient Core Syllabus</p> <p>Common diseases at ward</p> | <p>Authority</p> |
|---|--|---|
| <ul style="list-style-type: none"> ▪ Colds, respiratory infections, ▪ screening tests, ▪ referral system, ▪ anemia, megaloblastic anemia ▪ impaired liver function, ▪ weight loss, ▪ fever, ▪ abdominal pain, dyspepsia, ▪ diabetes, ▪ asthma, cough, | <ul style="list-style-type: none"> ▪ DVT, ▪ CHF, ▪ COPD, ▪ GIB, ▪ FUO ▪ PTE ▪ UTI ▪ Pneumonia, asthma, dyspnea, ▪ edema and ascites, ▪ pancytopenia, | <p>Internal medicine - General ward and outpatient clinics</p> |



| | | |
|--|--|---|
| <ul style="list-style-type: none"> ▪ backache, ▪ syncope, ▪ impaired thyroid function | <ul style="list-style-type: none"> ▪ acute and chronic renal failure, ▪ electrolyte imbalances, ▪ sepsis, ▪ anemia, ▪ oral intolerance, ▪ mass in the chest, ▪ jaundice, chronic diarrhea | |
| <ul style="list-style-type: none"> ▪ IBS, ▪ PUD, ▪ IBD ▪ Reflux, ▪ gastrointestinal cancer, ▪ hepatitis, ▪ dysphagia, dyspepsia, ▪ gallstones | <ul style="list-style-type: none"> ▪ Gallstones, ▪ cirrhosis & its complications, ▪ gastrointestinal bleeding, ▪ gastrointestinal cancer, ▪ peptic ulcer, ▪ pancreatitis ▪ IBD | Internal medicine Gastroenterology |
| <ul style="list-style-type: none"> ▪ Back pain, ▪ neck pain, pelvic pain, ▪ osteoarthritis, ▪ peri-arthritis, ▪ monoarthritic and polyarthritic, ▪ osteoporosis, ▪ bone pain, | <ul style="list-style-type: none"> ○ Vasculitis, ○ SLE, ○ myositis, ○ scleroderma, ○ rheumatoid arthritis | Internal medicine Rheumatology |

| | | |
|---|---|--|
| <ul style="list-style-type: none"> ▪ gout arthritis, ▪ Discopathy | | |
| <ul style="list-style-type: none"> ▪ Hypothyroidism, ▪ hyperthyroidism, ▪ diabetes mellitus, typed i and ii ▪ insulin therapy management, follow-up, and evaluations ▪ obesity | <ul style="list-style-type: none"> ▪ Hirsutism, ▪ Gonadal disorder, ▪ hypothyroidism, ▪ hyperthyroidism, ▪ diabetes mellitus, typed i and ii ▪ DKA diagnosis and management ▪ hypertension | Internal medicine Endocrinology |
| <ul style="list-style-type: none"> ▪ Pneumonia, ▪ asthma, ▪ COPD, ▪ PTE, ▪ lung cancer, ▪ tuberculosis ▪ Cough, ▪ allergy | <ul style="list-style-type: none"> ▪ Pneumonia, ▪ asthma, ▪ COPD, ▪ PTE, ▪ lung cancer, ▪ tuberculosis ▪ Hemoptysis, ▪ respiratory failure ▪ PAH | Internal medicine Pulmonary |
| <ul style="list-style-type: none"> ▪ Nephrolithiasis, ▪ flank pain | <ul style="list-style-type: none"> ▪ Electrolyte disturbances ▪ Dialysis indications | Internal medicine Nephrology |
| | | Internal medicine Cardiology |

| | | |
|---|---|---|
| <ul style="list-style-type: none"> ▪ Chest pain, ▪ Palpitations and arrhythmia, ▪ Syncope | <ul style="list-style-type: none"> ▪ Valvular abnormalities , ▪ AF, ▪ ACS | |
| <ul style="list-style-type: none"> ▪ Thalassemia, ▪ Iron deficiency anemia ▪ Anemia approach | <ul style="list-style-type: none"> ▪ Thalassemia major ▪ Anemia approach ▪ Hereditary and acquired aplastic anemia | Internal medicine hematology |

Note: Common clinical presentation authority is just designated for formal teaching of the department, also, teaching may take place in other Clinical wards too.



Surgery clerkship Rotation

for medical students- Clerkship stage

Course duration: 4 months

Number of credits : 12 (10+2 credits)

Surgery clerkship consists of rotations in:

General surgery department,
urology department,
and **orthopedics department.**

Syllabus of **clinical training** will come further in the Curriculum along with clinical departments rotations.

Syllabus of **theoretical training** in surgical diseases for medical students in clerkship rotation is as follows:

Number of credits: 10

Course type: theoretical

Prerequisite : None



Course Title :

Theoretical Surgical disorders- for medical students in clerkship rotation

170 hours

1 -fluids and electrolytes in operated patients
composition of natural fluids and electrolytes
Fluid and electrolytes needed for pre and post op patients
factors Which caused changes in the needs.

2 hours

2 - abnormal fluid body shifts, fluid loss and increase the volume of fluids and electrolytes the body

1 hour

3 -The balance of acid and base
acidosis and alkalosis (metabolic and respiratory)

1 hour

4 -The importance of nutrition in patients with surgery and intravenous nutrition

2 hours

5 -Hemostasis and bleeding
surgical evaluation of patients operated in terms of bleeding
anticoagulation

1 hour

6 -Blood transfusion
Packcell/ Platelets/ other routine transfusions

1 hour



| | |
|--------------------------------|---------|
| 7 -Hemorrhagic shock | 2 hours |
| 8 -Shock, gram negative | 1 hour |
| 9 -General surgical infections | 2 hours |

Thorax Surgery 9 hours

| | |
|---|---------|
| 1 -General thorax Surgery | 1 hour |
| 2 - thorax Trauma (including high velocity and war lesions) | 2 hours |
| 3 -Hydatid cyst | 1 hour |
| 4 -Diaphragm diseases | 1 hour |
| 5 -Mediastinal tumors | 1 hour |
| 6 -Lung cancers | 1 hour |
| 7 -Cardiac surgery | 1 hour |
| 8 -Large vascular surgery | 1 hour |



Surgery and Gastroenterology Diseases

39 hours

| | |
|--|---------|
| 1 -Esophagus | 4 hours |
| ۲ -Stomach and duodenum | 4 hours |
| 3 -Pancreas | 2 hours |
| 4 -Gall bladder and bile ducts | 3 hours |
| 5 -Liver disease | 3 hours |
| 6 -Intestinal obstruction | 2 hours |
| 7 -Small intestinal surgical disorders | 1 hour |
| 8 - Large intestinal surgical disorders | 2 hours |
| 9 -Rectum and anus surgery diseases | 2 hours |
| 10 -Tumors of the Colon | 2 hours |
| 11 -Appendicitis | 2 hours |
| 12 – Peritoneum and peritoneal Cavity peritonitis (including TB peritonitis), acute perforation of visceral organs, | |



| | |
|---|----------|
| hernias | 3 hours |
| 13 -Spleen diseases | 1 hour |
| 14 -Portal hypertension | 2 hours |
| 15 -Gastrointestinal bleeding | 2 hours |
| 16 - abdominal Trauma abdominal bleeding blunt trauma penetrating trauma | 4 hours |
| Surgery and Endocrinology | 5 hours |
| 1 - thyroid and parathyroid | 4 hours |
| 2 - adrenal glands Diseases | 1 hour |
| Other surgeries | 15 hours |
| 1 -facial and jaw Malformations | 2 hours |



| | |
|--|---------|
| 2 -Tumors of the head and neck (salivary glands, etc.) | 2 hours |
| 3 - breast Tumors, benign and malignant | 4 hours |
| 4 – surgery of larynx and pharynx | 3 hours |
| 5 -Soft tissue skin tumors | 3 hours |
| 6 -Head and neck trauma | 1 hour |
| 7 -Burns | 4 hours |

Surgery and Nervous system 12 hours

| | |
|---|---------|
| 1 -Head Trauma management, evaluation and types of bleedings | 2 hours |
| 2 - spinal cord Trauma management, evaluation and types of bleedings | 1 hour |
| 3 -vascular disorders and arterial7venous Lesions of the brain | 1 hour |
| 4 -Congenital diseases of the brain and spinal cord | 2 hours |
| 5 -Brain tumors | 2 hours |
| 6 -Herniated disc | 1 hour |
| 7 -Spinal tumors | 1 hour |



8 -Neuroradiology 1 hour

Genitourinary system surgery 14 hours

1 -Examination of the patient and examination of the urinary tract 1 hour

2 -Genitourinary Tumors 4 hours

3 -urolithiasis 1 hour

4 -obstructions and stenosis of Genitourinary 1 hour

5 - urinary tract Infections 2 hours

6 - Genitourinary Abnormalities 1 hour

7 -Urethritis 1 hour

8 -Scrotal diseases 1 hour

9 - Urology Emergency 1 hour

10 - Genitourinary Trauma 1 hour



Pediatric Surgery

9 hours

- | | |
|--|--------|
| 1 -Vomiting in the first months of life | 1 hour |
| 2 -Abdominal pain in children | 1 hour |
| 3 -Obstruction and other duodenal intestinal disorders | 1 hour |
| 4 -Hirschsprung | 1 hour |
| 5 - Wilms Tumor | 1 hour |
| 6 -Neuroblastoma | 1 hour |
| 7 -Pediatric surgery emergencies | 1 hour |
| 8 - common Surgeries in children | 1 hour |
| 9 -Time of surgery in pediatric surgery | 1 hour |



Vascular surgery

14 hours

| | |
|--|---------|
| 1 -Aortoiliac vascular | 1 hour |
| ۲ - femoropopliteal vascular | 1 hour |
| 3 - visceral arteries and veins | 1 hour |
| 4 -intracranial vascular disorders | 1 hour |
| 5 -Aneurysms of the aorta and peripheral visceral aneurysms | 2 hours |
| 6 -Burger disease | 1 hour |
| 7 -Angio-spastic diseases | 1 hour |
| 8 -Arterial embolism | 1 hour |
| 9 -Vascular trauma including penetrating and high velocity trauma | 2 hours |
| 10 – varicose, Diseases of peripheral venous and lymphatic system, chronic venous failure, acute thrombophlebitis, pulmonary embolism, obstruction of superior vena cava | 2 hours |
| 11 - Thoracic outlet syndrome | 1 hour |



Anesthesia

11 hours

1 -Evaluation of patients before the operation

General examination to determine risk in patients with cardiovascular diseases, diabetes and pregnancy, premedications in anesthesia, sensitivity to medications, NPO protocols

2 hours

2 - preoperative respiratory test to determine the risk of surgery

management of complications, respiratory failure, chronic tobacco consumption, smoking history evaluation, sputum tests, clinical risk assessment

2 hours

3 – anesthesia clinical applications:

A anesthesia in surgical procedures

mechanism of the effect of medications
stages of anesthesia

2 hours

B. activities in respiratory care unit,
neurosurgery patients

2 hours

C. pain management

pathophysiology and study in the pain management
practical application and everyday pain management

1 hour

4 -intoxications, adults' respiratory suffer syndrome,

Aspiration

Respiratory complications after the surgery



2hours

5 - cardiopulmonary Resuscitation
basic and advanced

2 hours

Orthopedics surgery:

29 hours

1-Examination of joints and bones
and examine the patient in terms of orthopedic

2 hours

2 -Definition of fracture
classification of fracture
signs of clinical definition of dislocation
investigate fracture in emergency

2 hours

3 -Mechanisms to improve healing and recovery of bone, tendon and ligament injuries
delayed healing of fractures- bone welding
bone grafts

1 hour

4 -open fracture

Early management

Proper management of wound on an open fracture

Approach to open fracture and fractures limb

1 hour



| | |
|---|--------|
| 5 -Complications of fractures fat embolism, gas gangrene, tetanus, osteomyelitis, ischemic syndrome | 1 hour |
| 6 -Fracture and dislocation of the wrist, fracture in the bones of the forearm | 1 hour |
| 7 -Fractured arm and shoulder and dislocation of the shoulder | 1 hour |
| 8 -Fractures and dislocations of the vertebrae | 1 hour |
| 9 -Pelvic fractures | 1 hour |
| 10 -Fractures and dislocations joint and bone of the hip | 1 hour |
| 11 -Fractures, dislocations, and ligament injuries of the knee | 1 hour |
| 12 -Fracture and dislocation of the wrist, foot, tibia, and fibula | 1 hour |
| 13 -Types of amputation and related procedures and indications | 1 hour |
| 14 -The cause and mechanism of infections in bone, joint, osteomyelitis, acute and chronic purulent arthritis | 1 hour |
| 15 -TB bone and joint syphilis, bones and joints (infections, fungal chopped) | 1 hour |
| 16 -Congenital dislocation of the hip joint | 1 hour |
| 17 -Club foot metatarsus varus congenital Hallux valgus/varus | 1 hour |



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| 18 -Other congenital abnormalities of bone and joint Sprengel, Syndactyly, Macroductyly, etc. | 1 hour |
| 19 -Tumors of skeletal and nonskeletal origin | 1 hour |
| 20 - progressive Myositis ossificans, muscular tumors | 1 hour |
| 21 - compartment Syndrome (anterior and posterior) carpal tunnel Syndrome 1 hour | |
| 22 -Poliomyelitis - cerebral palsy | 1 hour |
| 23 -Orthopedics in other musculoskeletal diseases | 2 hours |
| 24 -Aseptic necrosis of hip in children hip joint osteoarthritis in adults (aseptic necrosis of femur head and epiphysis slip) | 2 hours |
| 25 - dissecans osteochondritis, congenital patellar dislocation | 1 hour |
| 26 - Shoulder muscular and tendon Lesions, frozen shoulder, painful arc, tennis and golf Elbow | 1 hour |



Pediatrics diseases rotation

for medical students- Clerkship stage

Course duration: 3 months

Number of credits :

- Applied clinical: 9
- Theoretical: 6

Clinical Syllabus comes further in the clinical curriculum chapters

Theoretical Sessions

102 hours

Prerequisite: None



Syllabus of Pediatrics diseases clerkship theoretical sessions

| | |
|--|---------|
| 1 -Normal Neonate | 2 hours |
| 2 - Premature C Small-for-Gestational-Age (SGA) and LGA | 1 hour |
| 3 -Caring steps for a normal newborn | 1 hour |
| 4 -Caring steps and management of a preterm newborn | 1 hour |
| 5 - Neonatal Asphyxia, neonate breathing problems, complications resulting from oxygen therapy | 2 hours |
| 6 -Infantile and neonatal Resuscitation | 1 hour |
| 7 -Pathophysiology, etiology, and treatment of infantile jaundice | 3 hours |
| 8 -Growth and developmental disorders – from fetal stage to adolescence | 3 hours |
| 9 -Nutrition (food and vitamins) in infants and children | 2 hours |
| 10 -Maternal breast feeding | 1 hour |
| 11 -Alternative Feeding infants and children (including special feeding protocols) | 2 hours |
| 12 -Malnutrition | 2 hours |



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| 13 -Chronic Diarrhea Malabsorption syndromes | 2 hours |
| 14 – Avitaminosis | 1 hour |
| 15 -Public Health and Preventive Medicine in children | 4 hours |
| 16 -Infantile infectious diseases | 2 hours |
| 17 -Intrauterine infections | 1 hour |
| 18 -Diarrhea , vomiting and dehydration with emphasis on prevention | 3 hours |
| 19 -fluid and electrolytes with special attention to treatment with ORS | 2 hour |
| 20 - common genetic and metabolic Diseases | 2 hours |
| 21 -Specific issues of the nervous and muscular system in infants and children Floppiness/hypotonia – Floppy infant Syndrome | 2 hours |
| 22 -Meningitis and encephalitis | 2 hours |
| 23 -Seizures in infants and children | 1 hour |
| 24 -Tuberculosis | 2 hours |
| 25 -Bordetella Pertussis | 1 hour |
| 26 -Diphtheria | 1 hour |



| | |
|---|---------|
| 27 -Tetanus | 1 hour |
| 28 -Polio, its prevention and national eradication protocol | 1 hour |
| 29 -Measles | 1 hour |
| 30 -Rubeola, Chicken Pox and Other acute diseases with skin rash in children (other than measles) | 1 hour |
| 31 -Mumps | 1 hour |
| 32 -Hepatitis : Causes and effects of the infants and children | 1 hour |
| 33 -Typhoid | 1 hour |
| 34 -Brucellosis | 1 hour |
| 35 -Urinary tract infections | 1 hour |
| 36 -Common parasitic diseases in children | 2 hours |
| 37 -Upper Respiratory tract Infections | 2 hours |
| 38 - Lower Respiratory tract Infections | 3 hours |
| 39 -Asthma | 2 hour |
| 40 -Acute glomerulonephritis and acute nephrotic syndrome | 1 hour |



41 -Common abnormalities in Cardiovascular system
including Congenital Cardiac Syndromes
Congenital Heart Defects (CHDs)

- Atrial Septal Defect /Ventricular Septal Defect
- Coarctation of the Aorta
- Truncus Arteriosus
- Hypoplastic Left Heart Syndrome
- Pulmonary Atresia/ Tricuspid Atresia
- Tetralogy of Fallot

Infantile cardiac failure 3 hours

42 -Rheumatism acute joint 1 hour

43 -Juvenile arthritis rheumatoid
Systemic lupus erythematosus (SLE) 1 hour

44 -Acute Osteomyelitis, Cellulitis 1 hour

45 -Acute arthritis 1 hour

46 -Allergy in children and infants
Food intolerances
Pharmaceuticals and medications indications and contraindication 1 hour

47 – common dermatologic diseases in infants and children 1 hour

48 -Diabetes in children and infants 2

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|---|---------|
| 49 -Hypothyroidism in infants and children Screening national neonatal protocols and early clinical manifestations | 1 hour |
| 50 -Disorders of the metabolism of calcium and vitamin D in neonates and infants with rickets, Hypocalcemia | 2 hours |
| 51 -Genitourinary disorders of infants and neonates with emphasis on ambiguous Genitalia, | 1 hour |
| 52 -Hematologic disorders, with emphasis on Hemophilia its diagnosis and management | 1 hour |
| 53 -Heart failure in infants and children | 1 hour |
| 54 -Anemia in infants and children algorithmic approach to diagnosis and management | 2 hours |
| 55 -Shock and coma | 1 hour |
| 56 -Emergencies, poisonings, and their prevention principles | 1 hour |
| 57 -Common malignant Diseases in infants and children Including newborn screenings and alarm signs | 2 hours |
| 58 -Common psychological and behavioral disorders in children problems in the education of children, psychological evaluations of children and approach to mental retardation | 2 hour |
| 59 -The effect of pharmaceuticals and medications on the fetus and infant | 1 hour |
| 60 -Abdominal Mass in children and infants | 1 hour |



| | |
|---|-----------|
| 61 -Two-sided relationship and effect between and the mother and the fetus | 1 hour |
| 62 -Respiratory diseases and its management in newborns | 1 hour |
| 63 -Common metabolic disorders in infants (other than calcium) | 2 hours |
| 64 -algorithmic approach to low height in children | 1 hour |
| 65 -Muscular diseases in children | 2 hours |
| 66 -Hypertension in children | 1 hour |
| 67 -Vomiting in newborns, infants, and children algorithmic approach to examination, diagnosis, and management | 1 hour |
| 69 -misperceptions and misbeliefs in context of maternal breastfeeding | 0.5 hours |
| 69 -Social Support and family support of breastfeeding mothers | 0.5 hours |



Gynecology and Obstetrics

for medical students- Clerkship stage

Number of credits:

- Applied clinical: 6
- Theoretical: 4

Applied Clinical rotation in Clerkship: 2 months

Clinical Syllabus comes further in the clinical curriculum chapters

Theoretical course Sessions

68 hours

Prerequisite: None



Syllabus of Gynecology and Obstetrics theoretical course:

A: Obstetrics and Childbirth

| | |
|--|---------|
| 1 -Definition of midwifery science and vital statistics | 1 hour |
| 2 -brief review of applied Anatomy of Genital organs | 1 hour |
| 3 -Menstrual and ovulation physiology | 1 hour |
| 4 -multicellular stages formation, nesting, placenta, and membranes | 1 hour |
| 5 -Placental physiology | 1 hour |
| 6 -Symptoms and applied methods of diagnosing pregnancy | 1 hour |
| 7 -Embryology emphasis on different stages of embryonic development and the amount of amniotic fluid | 1 hour |
| 8 -Clinical examination of the uterus and taking maternal history | 1 hour |
| 9 -Physiological changes during pregnancy | 2 hours |
| 10 -Pelvic anatomy and its subtypes | 1 hour |
| 11 Definition and assessment of: -Presentation -position -Station -engagement | 1 hour |
| 12 -Protocols of Care during pregnancy and approach to common complaints of the pregnancy (including morning sickness) | 2 hours |
| 13 -Physiology of labor and its signs | 1 hour |
| 14 -The natural course of childbirth and how to perform natural childbirth | |



| | |
|--|---------|
| | 1 hour |
| 15 -Care after the delivery | 1 hour |
| 16 -Delivery presentations | 1 hour |
| 17 – Presentations of Delivery: occipital lobes , posterior , forehead , face and shoulders | 1 hour |
| 18-Induction of labor | 1 hour |
| 19-Dystocia in labor (pathological contractions, pelvic and anatomic reasons, macrosomia, Malformations , presentation causes, etc.) | 2 hour |
| 20 -Fetal Suffering and Fetal Health evaluation Methods | 1 hour |
| 21 - preterm Labor, post-term Labor | 1 hours |
| 22 -Delayed intra-uterine growth | 1 hour |
| 23 -Pregnancy of twins or Multiple pregnancy | 1 hour |
| 24 -Bleedings in thirds trimester of pregnancy (placenta detachment, placenta previa) | 2 hours |
| 25 -Types of placenta and placental abnormalities and umbilical cord | 1 hour |
| 26 -Complications after the birth Infection, bleeding, thrombophlebitis, and breast problems | 2 hours |
| 27 -Blood Type mismatch | 1 hour |
| 28 -Trophoblastic diseases | 2 hours |
| 29 -Vacuum and forceps | 1 hour |
| 30 -Cesarean section and its indications, Indications of hysterectomy after the birth | 2 hours |
| 31 - Amniotic Fluid Problems Hydramnios/Oligohydramnios | |



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|---|---------|
| Fetal malformations and disorders (hydrocephalus, anencephaly, meningocele, etc.) | 2 hour |
| 32 - Hypertensive Disease in pregnancy | 2 hours |
| 33 - premature amniotic membrane Rupture | 1 hour |
| 34 -cardiac disease and urinary system disorders in pregnancy | 1 hour |
| 35 -Diabetes and pregnancy | 1 hour |
| 36 -Abortion | 1 hour |
| 37 - Extrauterine Pregnancy | 1 hour |
| 38 -Resuscitation of the newborn | 1 hour |

B Gynecology

| | |
|---|---------|
| 39 -Clinical examinations and paraclinical evaluations in gynecological diseases | 1 hour |
| 40 -Puberty and menopause | 1 hour |
| 41 -Dysmenorrhea | 1 hour |
| 42 -Vulva and Vaginal diseases | 1 hour |
| 43 -Vaginitis and Cervicitis | 1 hour |
| 44 - Benign diseases of the uterus (including polyps and Hyperplasia) | 2 hours |
| 45 - Malignant diseases of the Cervix including the preparation and interpretation of smears and biopsies | 1 hour |
| 46 -Malignant diseases of the Uterus and Fallopian tubes | 1 hour |



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|---|---------|
| 47 -Benign ovarian tumors | 1 hour |
| 48 -Malignant ovarian tumors | 1 hour |
| 49 -Abnormal bleedings and menstruation signs | 1 hour |
| 50 -Pelvic infections | 1 hour |
| 51 -Amenorrhea | 2 hours |
| 52 -Infertility | 2 hours |
| 53 -Endometriosis | 1 hour |
| 54 - Tuberculosis and genitourinary system | 1 hour |
| 55 -Congenital malformations of the genital organs | 1 hour |
| 56 - pregnancy prevention methods with emphasis on the role of the mother in the prevention of pregnancy and national protocols | 2 hours |



Ophthalmology

for medical Clerkship students

Course duration: 1 month

Number of credits: 3 credits

Essential and core topics and syllabus in clerkship rotation:

1 -Anatomy and physiology of the eye:

Cornea, eyelids,
Lacrimal ducts,
nerves and muscles of the eye ,
and the Orbit

2 -General Ophthalmic Physical Examination:

Anterior segment,
Posterior Segment and retina
Eye mobility and coordination between the two eyes

3 -Common medications and pharmaceuticals in ophthalmology effects of systemic medications on the eye with emphasis on systemic corticosteroids



4 -Common Ocular disorders:

conjunctival and tear film,
diseases of the cornea
disease of the Sclera
Optic nerve and its disorders,
the lens and its disorders

5 -Refractive Errors, its types, algorithmic approach in diagnosis and managements

6 -Strabismus Diagnosis and Management

7 -Glaucoma in adults and children

alarm signs and competency in diagnosing emergency cases,
first steps and indications to be referred.

8 -Ophthalmic Emergencies:

Exposure to alkaline and acidic fluids,
trauma. Lacerations, and rupture of the eye
Thrombotic events and disorders of the eye
Ophthalmic sign and symptoms of poisoning,
diagnostic radiology and imaging in orbital fractures and facial trauma
Ocular Foreign Object algorithmic approach to management

9 - Headaches and eyes

10 - common effects of systemic diseases on the eye
with emphasis on

Diabetes,
Hypertension,
and systemic diseases with ophthalmic presentations



ENT Diseases rotation

for medical Clerkship students

Course duration: 1 month

Number of credits : 3

Essential and core topics and syllabus in clerkship rotation:

1 -Anatomy and physiology of the ear ,
Audiometry

2 -Diseases of the ear

- External ear, and tympanic membrane,
- Otitis media and its complications,
- Diseases of the internal ear,
- Hearing disorders and its differential diagnosis,
- Tinnitus, algorithmic approach to differential diagnosis and management
- Rehabilitation of the hearing disorders,
- Dizziness and Vertigo, algorithmic approach to differential diagnosis and management



- Speech disorders in children, algorithmic approach to diagnosis and management
- Diseases of the seventh and eighth cranial nerve

3 -Head and neck

Surgical approaches and their indications:
 Maxillofacial complex Surgery,
 Fractures of the bones of the face
 Deep cervical infections,
 differentiated diagnosis of cervical tumors,
 reconstructive surgeries of head, face and neck ,
 diseases of the salivary glands

4 -Nose:

Physiology and anatomy of the nose
 Physiology and anatomy of the sinuses ,
 diseases of the nose
 Algorithmic approach to diagnosis and treatment of Sinusitis

5 -Anatomy, physiology and diseases of the mouth and teeth, tonsils, and adenoids

Pharynx and Larynx

6 -Larynx : Anatomy and physiology , laryngeal diseases algorithmic approach in critical cases

7- Bronchospasm anatomy and physiology,

8- esophageal and tracheal diseases,

9- competency in different methods of administrating Airway tracheotomy and patient care,



Psychiatry

for medical students- Clerkship Stage

Course duration: 1 month

Number of credits : 3

Practical Learning and activities

in medical clerkship Psychiatry rotation:

organization and public activities of a psychiatric department:

Each psychiatric section in a general hospital or in a comprehensive psychiatric center should have a suitable number of faculty member psychiatrists, clinical psychologist, social workers and nursing and medical staff.

In terms of responsibilities, for each 10 hospital beds, a “therapeutic-educational team” under the supervision of a Psychiatry professor is formed. It is considered as the psychiatric functional unit; including a clinical psychologist, a social worker, presences of responsible person for occupational therapy, the relevant nursing staff and medical students and paramedics and interns and assistants.



Main activity in this section includes individual psychiatric evaluation and interview of patients admitted by department team (including students, interns, and residents under supervision of psychiatrist responsible) and then a comprehensive evaluation of patients in team works.

further clinical activities in which medical students are involved are as follows:

- Bedside interviews and sessions,
- Clinical department rounds and grand rounds,
- theoretical classes,
- outpatient therapy (psychotherapy),
- the sessions of family therapy group,
- shock therapy ECT,
- psychological tests and evaluations,
- emergency psychiatric visits, interviews, evaluation, and management in emergency ward or emergency department of Roozbeh psychiatry hospital
- Psychiatric counseling and communication with other specialized clinical departments
- special interview and feedback meetings for students in clinical subsets to familiarize with patients' reaction and acceptance of illness, and become familiarized with their natural and abnormal reactions in dealing with patients and other feedback (raising self-knowledge in students)

Theoretical education:

Medical Students in their clerkship rotations, will have about 20 hours of the theoretical sessions in the psychiatric department.

Number of credits : 2

Course Type: Theoretical

34 hours



Main core syllabus

of theoretical sessions in clerkship rotation includes:

| | |
|---|---------|
| 1 -Definition, and scope of application in psychiatric practice | 1 hour |
| 2 -Neurochemistry and neurophysiology of behavior | 1 hour |
| 3 -Emotions and stress | 1 hour |
| 4 - different theories in the structure of the psyche and development of psyche | 2 hours |
| 5 -Defense mechanisms | 1 hour |
| 6 -Principles of interviewing and clinical evaluation in psychiatry | 1 hour |
| 7 -Semiology and Symptoms of psychiatric disorders | 1 hour |
| 8 -Taking a history and examining the patient's mental state | 1 hour |
| 9 -Classifications of psychiatric disorders | 1 hour |
| 10 -Basics of psychopharmacology and organic therapies in psychiatry | 1 hour |
| 11 -Schizophrenia group disorders | 2 hours |
| 12 -Mood disorders | 2 hours |
| 13 -anxiety disorders | 2 hours |



| | |
|---|---------|
| 14 -Disorders related to stress and traumas | 1 hour |
| 15 -Conversion disorders | 1 hour |
| 16 -dissociative identity disorders, multiple-personality disorders | 1 hour |
| 17 - hypochondria and somatization | 1 hour |
| 18 -Disorders of Personality | |
| <ul style="list-style-type: none"> • Antisocial personality disorder. • Avoidant personality disorder. • Borderline personality disorder. • Dependent personality disorder. • Histrionic personality disorder. • Narcissistic personality disorder. • Obsessive-compulsive personality disorder. • Paranoid personality disorder. | 2 hours |
| 19 -Psychiatric disorders following organic brain damages | 1 hour |
| 20 -Psychosomatic disorders | 1 hour |
| 21 -Brain and sexual behavior, physiological sexual responses, different stages of sexual behavior | 1 hour |
| 22 -Sexual disorders and sexology | 2 hours |
| 23 -substance abuse and dependencies | 2 hour |
| 24 -Principles of Child Psychiatric Examination | 1 hour |
| 25 – essentials of children psychiatry | 2 hours |



26 - Familiarity with different methods of cognitive behavioral therapies in psychiatry 2 hours

Intoxications Forensic Medicine and Occupational Medicine

for medical students- Clinical Clerkship Stage

Number of credits: 2

Unit Type: Theoretical

34 hours

Prerequisite : None



Main core syllabus

of theoretical sessions in clerkship rotation includes:

| | |
|--|---------|
| 1 -principals of forensic medicine principles of occupational medicine | 1 hour |
| ۲ -Principles of medical ethics Medical practice rules and regulations (Law articles) | 3 hours |
| 3 - Forensic aspects of death | 3 hours |
| 4 - Identification and identity application of human remains and traces | 3 hours |
| 5 -Suffocations | 2 hours |
| 6 -Forensic medicine and Sexual issues | 3 hours |
| 7 -Traumatology: | |
| General and assault and physical harm | 2 hours |
| Traumas and accidents | 2 hours |
| Frost bite and heat trauma | 2 hours |
| Radiation and electricity | 1 hour |
| Noise and auditory trauma | 1 hour |
| 8 -Intoxication and Poisoning: | |
| Poisoning by cyanide, arsenic, derivatives of mercury | 1 hour |
| Poisoning by medications and pharmaceuticals | 2 hours |
| Poisoning with animal toxins and biologic toxins | 2 hours |
| Poisoning with derivatives of oil and petroleum | 1 hour |



| | |
|--|--------|
| Poisoning by carbon monoxide | 1 hour |
| Poisoning with insecticides | 1 hour |
| Poisoning with lead | 1 hour |
| Poisoning with benzene (solvent) | 1 hour |
| pneumoconiosis (Risks of dust: industrial and environmental) | 1 hour |

9- Indications of admission following intoxication

- Algorithmic approach to intoxicated patient
 - Algorithmic approach to unconscious patient
 - Indications of Dialysis in intoxicated patient
- 2 hours

Public Health 5

Epidemiology of common diseases in Iran and the world

Number of credits: 2

Type of unit: theoretical

Prerequisite : previous public health courses



Main core syllabus
of theoretical sessions in clerkship rotation includes:

34 hours

Definition of Epidemy and Pandemics

A brief review of main epidemics and pandemics in Iran and global scale

Health network in Iran and active national and international surveillance programs

- Epidemiology and control of malaria
- Epidemiology and control of leishmaniasis
- Epidemiology and tuberculosis control
- Epidemiology and control of leprosy
- Epidemiology and control of typhoid
- Epidemiology and control other contagious intestinal feverish diseases
- Epidemiology and control of viral hepatitis
with emphasis on prevention of Hepatitis B and C
- Epidemiology and control of parasites transmitted through soil
Ascaris - hook worm - trichocephalus
- Epidemiology and control of Amebiasis and giardiasis
- Epidemiology and control of diarrheal diseases
- Epidemiology and control of brucellosis
- Epidemiology and control of cholera
- Epidemiology and control of rabies

Epidemiology and control of Noncommunicable diseases (NCDs)

- Main concerns, approaches, millennium objectives and goals



- Epidemiology and control of cancers
- Epidemiology and control of diabetes
- Epidemiology and control of arterial blood pressure
- Epidemiology and control of ischemic heart disease
- Epidemiology and control of Chronic respiratory diseases



Public Health 1

Principles of Health Services

Number of credits : 2

course Type : Theoretical

24 hours

prerequisite : none

General definitions and concepts of health,
the general scope of activities of the Public Health
spectrum of health status

2 hours

Health and well-being in regional and religious contexts

1 hours

current issues of health care in Iran and east Mediterranean region
and how to determine the needs of health care in communities, urban and rural
and the importance of primary health care

2 hours

Principals of **primary health care**

2 hours

Health education and promotion
in various contexts. health and treatment programs
and its effect on people's participation in these services

2 hours

Environmental Health

including infrastructural aspects such as the supply of healthy and adequate water , improving
the **KPIs in contagious and oral fecal diseases,**
regional epidemics, regional disease controls by means of food supply chain improvement



improvement of production and distribution and Consumption of food standards
Air pollution and disease attributed to the pollution of air 2 hours

Principles of maternal care
and special protocols regarding **mothers and children**
(before the age of school and later in the school age)
with emphasis on the population and Spacing between births and the maternal breast feeding
2 hours

-National Programs
in **eradication and elimination of common and endemic diseases** 2 hours

Immunization against infectious diseases
protocols, indications, national and international **vaccination plans/charts** 2 hours

Principles of **occupational health** including diseases caused by the **work, and in the work environment**,
with emphasis on laws and regulations, and the principles and methods of **prevention in occupational diseases**
4 hour

- **World and Iranian health care delivery systems** and international organizations 2 hours

- Different levels of providing health care services in the country 2 hours

- Management, planning and evaluation of health care services in Iran 2 hours



Public Health 2

principles of epidemiology and fight with disease

Number of credits : 2

course Type : Theoretical

34 hours

prerequisite : Principles of health services 1

Main core syllabus

of theoretical sessions in clerkship rotation includes:

34 hours

Definition of epidemiology, ecological approach to diseases

1 hour

common terminologies in epidemiology

1 hour

pathogenesis Factors physical, chemical and biological

4 hours



| | |
|---|---------|
| Host factors | 1 hour |
| Environmental Factors physical-chemical, socio- biological | 1 hour |
| Prevention and preventive healthcare | 2 hours |
| Epidemiological and clinical Studies | 3 hours |
| Epidemics and how to study them (how to collect information , classify and display them by time, place and person) applications of bio-statistics in epidemiology | 6 hours |
| Epidemiology and control of preventable disease (national Program of Immunization) | 6 hour |

- principles of six disease preventable diseases by vaccination in national elimination program and mechanism of immunity (innate and acquired) 2 hours

Principles of **occupational health** including diseases caused by the **work, and in the work environment**, with emphasis on laws and regulations, and the principles and methods of **prevention in occupational diseases** 4 hour

- **World and Iranian health care delivery systems** and international organizations



2 hours

Vaccination and immunization

Vaccine types, manufacturing, maintenance (cold chain) and its administrations

2 hours

- How to set up and run a **vaccination center** and carry out the vaccination program and how to **evaluate the practical program IPE**

2 hours



Public Health 3

family Health, population, and demography

Number of credits : 2

Unit Type : Theoretical

24 hours

Prerequisite : Principles of public health 1 and 2

Course Title :

1 -General ecology of human (definition and scope of studies and issues arising in the ecology of human, environment, biology Human)

1 hour

2 -Human social environment (definition of society, community and population with emphasis on the importance and role of family and household in weaving and construction Social)

1 hour

3 -General demographic (population and structure of the population , trends in the population

1 hour



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| 4 -Demographic policies and family planning | 1 hour |
| 5 -Definition and scope of comprehensive family health services | 1 hour |
| 6 -Factors important in the health of families and their longitudinal process in Iran and the world (fertility rate, marriage , death and mortality rate, M I NMR, human development index, Life expectancy at birth and at 60) and Population growth rate and its changes | 2 hours |
| 7 -Health and care of before the marriage and before the period of pregnancy and preparation for breastfeeding | 1 hour |
| 8 - pregnancy, symptoms of pregnancy , health and care during pregnancy and preparing the mother for breastfeeding success and impact of the The health of the mother and newborn and reduction of maternal and infantile mortality and morbidity | 4 hours |
| 9 -primary health care during delivery and after the delivery and during breast feeding | 1 hour |
| 10 -Pregnancies and babies at risk (or probability of risk) | 1 hour |
| 11 - family adjustment and clinical aspects | 2 hours |
| 12- Health and care for babies of normal and premature and other newborns | |
| 13 - health care for naturally delivered babies with an emphasis on the room mother and the newborn, and the delivery unit adjusted to cultural context sensitivities | 1 hour |
| 14- health care premature and vulnerable for babies | 1 hour |



Epidemiology and control of diarrheal diseases 5 hours

15- Definition , importance, epidemiology and pathology of diarrheal diseases
diarrhea resulting from E Coli, cholera and diarrhea Resulting from vibrio ,
diarrhea parasites and infections caused by Salmonella , Shigella, etc. 1 hour

16- Definition and types of dehydration
and clinical assessment of its degrees (question of observation, turgor and weighing) 1 hour

- Treating diarrhea with regard to the prevention of dehydration
treatment of dehydration (intravenous serum , sera food ORS And indications and how to
administrate) and the role of breastfeeding, diet food, antibiotics and antidiarrheal drugs,
2 hour

- Breastfeeding, education, health, hygiene, food , improving the environment and fighting
with flies in the prevention and control Diarrheal diseases 1 hour

Other important diseases 4 hours

- Overview on other diseases, infectious important common in Iran and the region and travel
medicine and protocols
with emphasis on

tuberculosis
Brucellosis
malaria

- Generalities on eliminated disease, particularly in Iran (rabies , leprosy and)

- Epidemiology and control of non-communicable diseases NCDs
(cancers , rheumatism and heart disease , accidents and poisonings , etc.)



RADIOLOGY

for medical students- Clinical Clerkship Stage

Course duration: 1 month

Number of credits : 3

Essential core topics and syllabus in clerkship rotation:

1 -Principles of physical x- ray and the use of the medicine radiology imaging, radiotherapy

۲ -Principles of Radiology x ray imaging:

including correspondence general radiography X-rays

in different positions(posteroanterior, anteroposterior, lateral , oblique etc.)



normal anatomical representations of the body organs and regions
head and neck , vertebrae column, pelvis,
chest (musculoskeletal, inner organs, normal cardiac and respiratory system
representations), Simple abdominal X-ray,
extremities and bones , joints ,
Medical devices including protheses and orthose, implants, pace makers, sutures etc.
digestive and gastrointestinal system,
genitourinary system,
cardiovascular including cardiac presentation in different ages, central and peripheral
vessels, etc.)

3 -Different methods of diagnostic radiology imaging

simple Radiology,
radiography with contrast , oral and parenteral ,
such as the investigation of gastrointestinal system,
angiography, myelography etc.

4 -Principles of nuclear medicine, indications and application of it in diagnostic approaches

5 - other diagnostic methods:

A) Ultrasonography

with emphasis on emergency abdominal sonography and its
interpretation



B) CT Scan
with emphasis on Chest CT scan and HRCT
and Abdominal CT scan without contrast

Familiarity with principles, methodology and indications of

- Nuclear magnetic resonance (NMR)
- Position emission tomography (PET)
- Digital subtraction angiography (DSR)



DERMATOLOGY

for medical students- Clinical Clerkship Stage

Course duration: 1 month

Number of credits : 3 credits

Essential Core Topics and Syllabus in clerkship rotation:

- 1 -Principles of dermatology
skin layers, its anatomy and physiology
normal variations of skin appearance
- ۲ -parasitic skin diseases
- 3 -Microbial skin diseases
- 4 -Viral skin diseases
- 5 -leprosy, tuberculosis, cutaneous cell diseases, sarcoidosis
- 6 -Superficial fungal diseases
- 7 - nonsuperficial fungal diseases
- 8 -Diseases caused by the radiation of the sun and UV exposure



9 -Blister diseases

10-Allergies and hypersensitivities

occupational allergies, occupational dermatitis

11- Skin benign and malignant disorders,

with emphasis on algorithmic approach in diagnosis and management of

SCC, BSS,

Melanoma diagnostic criteria

Dermatologic alarm signs

12-Skin diseases due to metabolic disorders

13- Autoimmune dermatologic diseases

with emphasis on Lichen planus, Psoriasis, Vitiligo, etc.)

15-STDs (sexually transmitted diseases)

with emphasis on algorithmic approach in diagnosis and management of

HSV and HPV Genital warts and condyloma acuminata,

Molluscum contagiosum,

Chlamydia and gonorrhea,

Syphilis,

and scabies

15 - a summary of Immunology and dermatology, erythroderma,

precancerous lesions, and paraneoplastic skin manifestations



Public Health 4

Medical statistics and research methods

Number unit: 2

Course Type: Theoretical

34 hours

Aims and Objectives:

- 1 -Familiarity of students with **common scientific research methods** in medical sciences
- ۲ - Enable medical students to **collect and statistically express data and information**
- 3 -Familiarity of students with **statistical analysis and methods** in order to fully understand scientific peer reviewed publication
- 4 -Enable medical students to **perform research in basic medical and clinical domain**



Core Syllabus :

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|---|---------|
| 1 -The concept of research and its types | 2 hours |
| ۲ -Different stages of a medical research | 2 hours |
| 3 -A variety of information methods of collecting data | 1 hour |
| 4 -Classify information and express it by table and diagram | 3 hours |
| 5 -Numerical description of information (central indicators and dispersion) | 3 hours |
| 6 -The concept of probability and the expression of its basic rules | 2 hours |
| 7 -Normal distribution and its application in medical sciences | 2 hours |
| 8 -Designing a medical study 1 | 2 hours |
| 9 -Sampling and its simple techniques | 2 hours |
| 10 -Confidence interval and descriptive parameters of a distribution | 2 hours |
| 11 - Designing a medical study 2 Hypothesis, H null and H one | |



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|---|---------|
| <p>statistical test, first and second type error</p> | 3 hour |
| <p>12 -main statistical tests student T test, means comparison, Chi square, etc.</p> | 4 hours |
| <p>13 -Causality vs. Correlation The concept of correlation between two attributes and methods of investigation of the characteristics of quantitative and qualitative (coefficient of correlation zero to on</p> | 4 hours |
| <p>14- statistically Evaluate a chosen medical paper/study</p> | 2 hours |



Infectious diseases

for medical students Clinical Rotations

Number of credits : 3

Course Type : Practical and Theoretical

(51 hours theoretical)

Core Syllabus

1 -Microbial virulence, pathogenesis of infections 1 hour

۲ -Fever

Controlling mechanism and regulating the body temperature

causes of fever ,

the importance of clinical fever ,

various types of fever , epidemiology of fever,

febrile diseases,

Definition of elongated fever

fever of unknown origin (FUO)

۲ hours

3 -Defense Mechanisms of the body

skin and mucus and secretions of the body ,

Hematologic- immunologic: Monocytes , lymphocytes and , macrophages ,

immunoglobulins,

Complement factor system,

interferons

۲ hours



| | |
|--|---------|
| 4 – serologic immunity response : definition , antigen and antibody interaction with antigens, viruses, bacteria, fungi Mycoplasma , rickettsiae and parasites | 1 hour |
| 5 -Principles of treatment with antibiotic identification of organisms , determination of antibiotic sensitivity combination of antibiotics, administration methods and response evaluations | 3 hours |
| 6 -Septic shock damage caused by the shock to the cells , changes in hemodynamic , etiology and pathogenesis of symptoms | 1 hour |
| 7 -Epidemiology of infectious diseases | 2 hours |
| 8 - Gram positive cocci Infections with emphasis on Streptococcus and Staphylococcus | 2 hours |
| 9 - Gram negative cocci Infections with emphasis on meningococcal meningitis and gonococcal urethritis) | 2 hours |
| 10- Gram positive bacilli Infections Listeria , anthrax | 2 hours |
| 11-Infection of the Gram negative bacilli cholera , enterobacteria , Pseudomonas, Salmonella , Hemophilus, Shigella , Brucella | 5 hours |
| 12-Infections with spirochetes syphilis , Leptospira | 2 hours |
| 13- Anaerobic Infections tetanus , botulism , bacteroides | 2 hours |



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|---|---------|
| 14 -Mycobacteria : tuberculosis (bacterial , how to diagnose skin test and culture, sputum sample taking protocols, vaccination , tuberculin testing , prevention and treatments in different settings and protocols) | 4 hours |
| 15 -Leprosy | 1 hour |
| 16 -Fungal infections | 3 hours |
| 17- protozoal Infections, amoeba, malaria , toxoplasmosis, leishmaniasis Giardia and Trichomonas | 5 hours |
| 18-Viral infections common cold and coronaviruses influenza and subtypes herpes simplex and herpes subtypes HPV rabies , pyogenic viruses including : poliomyelitis and coxsackie Other Viral infections such as chicken pox , adeno-associated virus , hepatitis | 5 hours |
| 19-Mycoplasma infections (pneumonia , urethritis) | 1 hour |
| 20-Chlamydial infections (trachoma , psittacosis , urethritis) | 1 hour |
| 21-Rickettsiae infections (typhus , Rocky Mountain) | 1 hour |
| ۲۲-Infections with parasitic worms (Ascaris , tapeworms , cystic hydatid , hookworms, Plasmodium falciparum and other common infections) | 3 hours |





The fourth stage

Clinical Internship

Core Syllabus
and clinical internship rotations



Cardiovascular Diseases

TUMS internship Rotation (undergraduate)
Core Curriculum and Syllabus

The importance of the Cardiovascular course

Cardiovascular diseases are one of the leading causes of death or disability in most countries, including our country, and cardiac patients include a large group of patients referred to general practitioners in outpatient offices, clinics or hospital emergencies.

Therefore, having the highest abilities and knowledge to diagnose and treat these diseases effectively is essential for all physicians.

Educational Objectives of General Practitioners

Main Objective:

- Providing care to patients with a wide range of medical problems under the supervision and guidance of faculty members and clinical ward assistants and playing the role of an independent and capable physician in the near future.



Expected capabilities in the field of knowledge

Expected to achieve the following training goals at the end of internship:

Approach to the following clinical manifestations:

- **Chest pain**
 - Seven descriptive features of chest pain in the Patient's clinical history
 - Signs and symptoms that increase/decrease the risk of **acute coronary syndrome**
 - Signs and symptoms of other life-threatening causes of chest pain (**pulmonary embolism, aortic dissection, compressive pneumothorax, tamponade (in history and examination)**)
 - How to deal with acute chest pain in the emergency room including the following:
 - Proper triage of patients (differentiation of the patient requires hospitalization of the disease that can be followed up on an outpatient scheme)
 - **Early diagnostic procedures** including ECG and chest x-rays
 - Follow-up diagnostic measures if life-threatening causes are suspected
 - **Diagnostic findings of ischemia on ECG**
 - interpreting ECG main signs requiring emergency invasive action (STEMI)
 - **Early treatment of acute coronary syndrome** and other life-threatening causes in the emergency room

- **Dyspnea**
 - Well-acquainted with the diagnosis of important differential Diagnoses (acute coronary syndrome, compression pneumothorax, pulmonary embolism, pulmonary edema, and tamponade)



- Diagnostic findings in favor of acute pulmonary edema in history and examination
- Paraclinical and chest radiographic findings in favor of acute pulmonary edema
- Well-acquainted with natriuretic peptides such as BNP and its applications
- Generalities of the treatment approach for acute pulmonary edema in the emergency department
- Diagnostic findings in favor of pulmonary emboly in history and examination
- ECG findings and chest x-rays in favor of pulmonary emboly
- Diagnostic findings in favor of cardiac tamponade in history and examination
- ECG findings and chest x-ray in favor of cardiac tamponade
- Introduction to the concept of angina equivalent
- **Peripheral Edema**
 - Features of edema in favor of cardiac causes (generalized versus localized, transient versus non-transient)
 - Differential diagnosis of generalized edema
 - History and examination findings in edema of cardiac origin
 - Preliminary diagnostic tests in peripheral edema
- **Palpitation**
 - History and examination findings that increase the likelihood that the palpitation is arrhythmic.
 - Early diagnostic measures in Palpitation
- **Hypotension and Syncope**
 - Well-acquainted with the definition of syncope and **differentiation of syncope from other causes of loss of consciousness such as seizures**
 - Important history and examination findings in syncope
 - Well-acquainted with different types of syncope (**postural hypotension, reflex, neurally mediated, cardiac**)
 - **Diagnostic approach to syncope**

- High-risk cases requiring hospitalization in Syncope
- Important findings of ECG in syncope patient
- Principles of treating neurally mediated syncope
- Well-acquainted with the definition of shock and cardiogenic shock
- Important causes of heart shock (MI, myocarditis, aortic dissection, arrhythmia, heart failure, tamponade, pulmonary embolism)
- Clinical and paraclinical findings in cardiac shock
- Initial treatment of cardiogenic shock

Signs, Symptoms, principles of Diagnosis and Treatment of the following diseases:

- Acute Coronary Syndrome:
 - NSTEMI-ACS
 - Defining unstable angina and differentiating it from stable angina
 - Well-acquainted with the etiology of acute coronary syndrome and myocardial infarction Nip 1 and 2
 - Clinical signs and high-risk examination findings
 - ECG findings in acute coronary syndrome
 - Well-acquainted with the troponin test and its applications
 - General principles of treatment and medication instructions for acute coronary syndrome
 - STEMI
 - Definition of STEMI and its types



- Diagnostic ECG findings
 - Differential diagnoses of ST-segment elevation and pathological Q-wave
 - Well-acquainted with important schedules and types of reperfusion treatments
 - Contraindications to fibrinolytic administration
 - Well-acquainted with the method and dosages of Streptokinase, Reteplase, and Alteplase
 - Success criteria for fibrinolytic administration
 - Well-acquainted with the complications of thrombolytics
- **Stable angina pectoris:**

Definition of stable angina pectoris and typical and atypical chest pain

- Well-acquainted with risk factors for coronary atherosclerosis (modifiable and non-modifiable factors)
 - Well-acquainted with controlling the risk factors for coronary atherosclerosis as part of treatment
 - General acquaintance with exercise testing and other non-invasive methods of coronary atherosclerosis
 - Well-acquainted with the drugs used in the treatment of stable angina, including:
 - Antiplatelet
 - Statin
 - Anti-ischemic drugs
- **Heart failure:**
- Definition of heart failure and its types (systolic and diastolic)
 - Clinical manifestations and findings of important heart failure examination
 - well-acquainted with Functional capacity class I to IV
according to CCS and NYHA
 - Important findings of heart failure on ECG and chest x-ray

- Tests required to evaluate a patient with heart failure
- Diagnostic methods used to evaluate a patient with heart failure
- The role of natriuretic peptides in the diagnosis and management of heart failure patients
- Principles of non-pharmacological treatment in heart failure
- Pharmaceutical treatments in heart failure and their complications. including:
 - ACEI / ARB
 - Beta blockers
 - Aldosterone antagonist
 - Loop Diuretics
 - Nitrates
 - Digoxin
- Well-acquainted with digoxin intoxicity (predisposing factors, symptoms and principles of treatment)

- **Valvular heart disease:**

- Well-acquainted with the following in chronic failure and stenosis of mitral and aortic valves:
 - The most common etiology
 - Clinical signs and examination findings
 - Finds of electrocardiogram and chest x-ray
 - Principles of non-pharmacological and pharmacological treatment
 - Principles of prophylaxis of rheumatic fever recurrence with penicillin
 - Well-acquainted with mitral prolapse and its signs and symptoms
- Well-acquainted with the following in acute mitral and aortic valve insufficiency:
 - Etiology, clinical signs and examination findings
 - Distinguish acute from chronic failure in bed
 - Principles of treatment in acute failure

- **Pericardial diseases:**

- Clinical signs and examination findings of acute pericarditis, tamponade and compressive pericarditis
- ECG and chest X-ray findings in acute pericarditis, tamponade and compressive pericarditis
- Diagnostic approach to compressive tamponade and pericarditis
- General principles of treatment in acute tamponade acute pericarditis and compressive pericarditis

- **Aortic dissection:**

- Features of chest pain and clinical signs of aortic dissection
- Examination findings and chest X-ray in aortic dissection
- Evidence of aortic dissection in CT angiography
- Diagnostic approach to aortic dissection
- Know the principles of aortic dissection treatment
- Indications for emergency surgery in aortic dissection

- **Tachyarrhythmias:**

- Clinical signs of supraventricular (SVT) and ventricular tachyarrhythmias
- Detection of PSVT as a regular narrow complex tachycardia on ECG
- General principles of PSVT treatment
- Diagnosis of tachycardia and ventricular fibrillation on ECG
- Criteria for hemodynamic instability in tachyarrhythmias and general principles of treatment in patients with stable and unstable hemodynamics
- درمانی Therapeutic approach to narrow and wide complex tachycardia
- Well-acquainted with drugs used in the treatment of tachyarrhythmias and their doses (adenosine, verapamil, diltiazem, beta-blockers, digoxin, amiodarone)

- Well-acquainted with the principles of vagal maneuver and carotid massage
 - Well-acquainted with how to give shock and shock dosing
- **Atrial fibrillation (AF) and flutter (AFL)**
 - Well-acquainted with the signs and symptoms of AF and AFL in the history and examination
 - Detection of AF and AFL based on ECG
 - Well-acquainted with ventricular response control drugs and rate control treatment
 - Well-acquainted with shock indications and rhythm control treatment
 - General well-acquainted with the indications for anticoagulant administration
 - Well-acquainted with anticoagulants and their side effects
- **Brady arrhythmia**
 - Symptoms of Brady Arrhythmia
 - Definition of patient sinus node syndrome
 - Detect the types of AV node blocks in the ECG
 - Well-acquainted with medications used to treat bradyarrhythmia, including atropine and dopamine
 - Well-acquainted with patients in need of implantation of a pacemaker
- **Hypertension**
 - Definition of hypertension and its types
 - Important points in the history and examination of the patient with hypertension
 - Organ damage associated with hypertension
 - How to get blood pressure precisely

- Diagnostic approach including measurement at home, "Holter monitoring" and measurement in the physician's Office
- Secondary causes of hypertension along with important points in their history and examination and cases requiring screening for secondary causes
- Preliminary laboratory tests on hypertension
- Non-pharmacological recommendations for the treatment of hypertension
- First-line drugs for the treatment of hypertension and other drug groups
- Objectives of treating systemic hypertension in different target groups
- Principles of treatment in specific groups including people with diabetes, heart failure, kidney failure, ischemic heart disease, pregnant and lactating people
- Definition of refractory hypertension and approach to it
- Definition of emergency cases of hypertension and general principles of treatment and management

Expected capabilities:

- **Chest X-Ray interpretation:**
 - Natural findings include black heart size, cardiac borders, mediastinal size, and pulmonary vascular pattern
 - The concept of enhanced CT ratio and its differential diagnoses
 - View of pulmonary arteries on chest x-ray and related disorders
 - Detection of pleural effusion on chest X-ray
- **ECG Interpretation:**
 - Well-acquainted with how to get an ECG (standard 12-strip, right and back tape)
 - Well-acquainted with the specifications of a standard ECG including:
 - ECG waves (P, QRS, T, U)
 - Rhythm
 - Rate



- Axis
- Intervals (PR, QT)
- ST segment
- Well-acquainted with the following pathologies in the ECG
- LA / RA enlargement
- LBBB / RBBB
- LVH / RVH
- ST elevation / depression
- Pathologic Q wave
- Prolonged PR / QT intervals
- Acute MI
- Pericarditis
- PTE
- COPD
- Hyperkalemia
- Hypokalemia
- Hypothermia
- PVC and PAC
- Fascicular block
- Differential diagnosis of the following
- ST elevation
- Tall T wave
- Pathologic Q wave
- R in V1

- **Cardiac arrest and basic resuscitation (BLS)**
- **Advanced ACLS and pulse-free tachyarrhythmia and asystole / pulse-free electrical activity algorithm**



- Well-acquainted with how to connect and function temporary skin pacemaker
- Well-acquainted with how the defibrillator works
- . Well-acquainted with the concept of cardiac monitoring and working with the monitor.

- **Proficient in the following examinations:**

- Examination of **carotid, brachial, femoral, radial, dorsalis pedis and tibialis posterior pulses**
 - How to **properly auscultate the Precordium and hear the Cardiac foci**
 - **Abnormal findings in Pulmonary Auscultation:**
 - The ability to detect **wheezing and crackling in the lung**
 - **Abnormal findings in cardiac Auscultation:**
 - Ability to distinguish S3 and S4,
 - distinguish systolic murmur from diastolic murmur.
 - Aortic valve stenosis and mitral valve insufficiency
 - Increased JVP detection
 - Diagnosis of peripheral edema in the lower extremities
- **Well-acquainted with common medications, their indications, contraindications, interactions, and side effects:**
- Antiplatelet drugs (aspirin, clopidogrel)
 - injectable anticoagulants (heparin, enoxaparin), and oral anticoagulants (Warfarin, Rivaroxaban)

- Beta-blockers (propranolol, metoprolol, atenolol, carvedilol and bisoprolol)
- Calcium Chanel Blockers (Diltiazem, Verapamil, Amlodipine)
- Nitrates
- Statins (atorvastatin, rosuvastatin) and fibrates
- Digoxin
- Antiarrhythmic drugs (amiodarone)
- Diuretics (furosemide, thiazides)
- ACE and ARB inhibitors (captopril, enalapril, losartan, valsartan)
- Aldosterone antagonist (spironolactone, eplerenone)

Specific objectives

According to the Tehran university of medical Sciences graduates' empowerment document:

- Clinical skills
- Communication skills
- Patient care
- Health promotion and prevention
- Personal growth
- Professional commitment, ethics, and medical law
- Decision-making, reasoning, and problem-solving skills
- Health system and the role of the Physician in it

Description of specific goals:

According to the “Tehran university of medical Sciences graduates' empowerment document”:

• Clinical skills:

A. Definition:



The intern must have the necessary competence in a wide range of clinical skills, including taking a history and performing a clinical examination, recording, and presenting medical information resulting from them, and performing practical procedures (procedures) and laboratory tests according to the set standard.

B. Expected capabilities:

- Prepare patient history logically in a systematic and comprehensive manner that includes current illness, medical history, prevention measures, family, social, occupational history, and systems review.
- Obtaining a history focused on the main complaint in an emergency.
- Performing physical examination in a logical, regular, and comprehensive manner with special attention to the general appearance, vital signs and different parts of the patient's body with respect to the patient's privacy.
- Centralized clinical examination based on the main complaint in an emergency.
- Observing hygienic principles when examining the patient or performing the procedure
- Adjusting the patient problem list by knowing the diagnostic value of each of the findings obtained from the history and examination and writing differential diagnoses based on the patient complaint list.
- Mastery in oral introduction along with proper registration in the file in a legible, comprehensive, and directional manner



- Well-acquainted with the effective factors in choosing a diagnostic test, including pretest probability, test sensitivity and specificity, test cost, test complications and patient preference.
- Ability to interpret various paraclinical components including:

complete blood cell testing,
peripheral blood smear,

Serum electrolytes,
liver, kidney and thyroid function tests,
arterial blood gases,
coagulation tests,
Blood glucose
lipid profiles,
Inflammatory markers,
Cardiac markers,
ECG,
Chest x-ray,
Limb x-ray
Standing and lying X-ray of the abdomen,
Complete urine test,
Spirometry,
Diagnostic analysis of body fluid samples,
Tuberculin test,
and Pregnancy test.

- Registration and presentation of information of hospitalized and outpatient patients, including the following: history, disease course, counseling instructions, off service note, on service note, summary note and discharge note.
- Description of the indications and side effects of the specified clinical procedures and performing these procedures independently and correctly (For information on the procedures specified in the ward, refer to the ward manual or the site of the hospital complex)
- Well-acquainted with common diseases and clinical manifestations in the ward and mastering the approach to these manifestations (For information on the list of common diseases and clinical



manifestations, refer to the manual of the ward or the site of the Hospital complex)

• **Communication skills:**

A. Definition:

The intern must have the necessary ability to communicate effectively with patients, patient companions and colleagues. In addition, he must be able to demonstrate his competence in communicating in all areas orally, in writing, electronically or by telephone.

B. Expected capabilities:

- Demonstrate verbal and non-verbal skills (such as active listening, repetition, clarification, silence, eye and posture communication, and other body language skills) and express empathy when communicating with the patient.
- Ability to obtain the necessary information from the patient and his companions properly.
- Provide the necessary training and information about diagnosis, treatment and prognosis to the patient based on the patient's own information about his disease
- Identify the patient's emotional needs and find the patient's point of view and concerns about his disease.
- Considering the psychosocial status of patients and the ability to communicate with the patient in certain situations (angry and depressed patient, giving bad news, sensitive issues, differences in language or culture)
- Conversation with the patient and companions in appropriate language and regardless of the use of medical terms
- Attract the patient's participation and establish a proper therapeutic relationship with him.
- Interacting with colleagues and getting and giving feedback in accordance with the principles of professional ethics
- Ability to work in the form of group therapy with other members of the health team.
- Ability to deliver speeches properly.
- Ability to communicate with society in the form of mass media and writing scientific texts.



• **Patient care:**

A. Definition:

The intern should have a systematic and holistic view of the patient, the ability to prepare a list of patient problems, choose the method, have a proper diagnosis and determine the care plan. He or she should also be able to identify specific conditions that require consultation or referral to a specialist. The intern is expected to be able to demonstrate his / her abilities in important aspects of patient care such as medical procedures, medication, nutrition, acute, chronic, and emergency care, pain control and rehabilitation.

B. Expected capabilities:

- Differentiate emergency cases from non-emergency cases and provide appropriate care based on the patient's condition.
- Separation of cases requiring hospitalization from cases that can be followed up on an outpatient basis.
- Determining the differential diagnosis for patient problems
- Make the most likely diagnosis based on probability-based thinking.
- Ability to determine the diagnostic and treatment plan according to the history and examination problems.
- Choosing the diagnostic methods that have the highest probability of achieving the result with the lowest cost.
- Presenting a treatment plan and choosing the appropriate treatment from the available treatment options
- Asking and setting specific questions for the consulting physician
- Setting up a patient care plan including medication, nutritional and psychological measures
- Awareness of the patient's social and economic status that can affect the choice of treatment methods (treatment costs)
- Considering the decisions and opinions, religious beliefs, and concerns of the patient in choosing a treatment option



- Considering the availability and complications of diagnostic and therapeutic methods in their selection
- Writing a prescription correctly and based on the principles of prescription.
- Educate the patient on how to use drugs.
- Follow up and review the response to treatment and its side effects.
- Provide nutrition recommendations.
- Appropriate and diagnose the interaction of food consumption with drugs.
- Well-acquainted with palliative measures to reduce patient complaints and symptoms, especially pain.
- Refer the patient for rehabilitation services if necessary.

• **Health promotion and prevention:**

A. Definition:

The intern must have the ability to assess health status and appropriate strategies to promote health and Choose, administrate, and implement different prevention means.

B. Expected capabilities:

- Ability to assess health status, identify and determine risk factors, identify the causes of diseases and their prognostic factors
- Ability to choose appropriate health promotion strategies at primary, primary and secondary prevention levels to reduce the effect of risk factors on personal health
- Well-acquainted with screening interventions in the general population

• **Personal growth:**

A. Definition:

An intern must recognize the importance of personal growth, including the promotion of self-care, mental, psychological, social, economic, and occupational abilities, and know and apply the non-medical knowledge that is effective in personal and professional life.

B. Expected capabilities:

- Well-acquainted with the psychology of change, principles of leadership and management and knowledge of informatics knowledge and its application



- Well-acquainted with the principles of a healthy lifestyle including physical activity, proper nutrition and avoidance of high-risk behaviors.
- Ability to identify your strengths and weaknesses using reflection and feedback techniques
- Identify anger management strategies and emotional behaviors and use them
- Ability to identify stressful situations and stress management strategies
- Identify your educational needs by evaluating individual performance
- Familiarity and use of time management principles
- Familiarity and use of the principles of goal setting and planning
- Well-acquainted with information technology skills including electronic search, word programs, powerpoint, excel and statistical analysis software such as SPSS
- Well-acquainted with English for using non-Persian sources

- **Professional commitment, ethics, and medical law:**

A. Definition:

The intern must accept the set of values, characteristics, and behaviors that ensure the community's trust in the medical profession as medical professional commitments and apply them in his or her practice.

B. Expected capabilities:

- Paying attention to providing the best benefits for the patient's health in choosing diagnostic and therapeutic methods
- Treat the patient and his companions with compassion and respect and spend enough time to counsel them

Consider the patient's values, beliefs, beliefs, and concerns in decisions

- Observing the boundaries and boundaries defined in the Physician-patient relationship
- Performing sensitive examinations of a heterosexual patient by a homosexual colleague with the patient or in the presence of homosexual personnel with the patient or in the presence of the patient
- Observing the principle of patient confidentiality in clinical, social and electronic environments
- Introducing yourself to the patient and explaining the type of intervention (history, examination or procedure) and obtaining the patient's consent before starting diagnostic-therapeutic work and during clinical training in the patient's bedside



- Provide patient care regardless of gender, race, socio-economic status, intelligence, ability to pay and cultural factors
- Dealing with respect in behavior and speech with patients, staff and group members
- Having honesty in speech and writing in relation to the patient, other physicians and members of the treatment team
- Reflect on clinical experiences and feedback received and use the result of rethinking for clinical progress
- Commitment to self-learning and keeping your knowledge up to date
- Responsibility and perform the assigned tasks in a complete and accurate manner

Availability during hospital hours

- Observing appropriate professional coverage) To get acquainted with professional coverage, you can refer to the relevant regulations (
- Install ID card on clothes in a place visible to others
- Ensuring that a critically ill or problematic patient is referred to a fellow physician or senior at the end of the work shift and before leaving the hospital
- Acting according to professional criteria in dealing with unprofessional behavior of colleagues

- **Decision-making, reasoning, and problem-solving skills:**

A. Definition:

In the face of a problem, the intern should be able to identify the problem and its dimensions, evaluate different solutions and choose the most appropriate option according to the uncertainty in the decision.

B. Expected capabilities:

- Be able to identify problems
- Be able to raise problems in the form of objective and responsive questions
- Be able to make logical reasoning by considering cognitive errors
- Be able to analyze problems and offer solutions to them
- Be able to prioritize and evaluate solutions according to their consequences, possibilities and limitations, cost-effectiveness, and profits and losses.
- Be able to identify available sources of information and use them to increase knowledge and solve problems
- Be able to use reference books, algorithms and guides



- Health system and the role of the Physician in it:
 - Well-acquainted with the health system of the country and its components
 - Identify the guidelines of the country's health system related to health services



Evaluation:

At the end of the Rotation, the evaluation will be based on performance in the ward as well as in the clinic using the GRF Form Rating Global. This evaluation will also be included in the relevant section of the GRF for the final grade score.

It will also be part of final assessment based on the OSCE exam at the end of the internal medicine internship course, which will assess skills in interpreting ECG findings, chest x-rays, and basic and advanced resuscitation (in the form of the OSCE internal exam at the end of the course).

professional behavior will be evaluated according to the listed items and will be reflected in the relevant section in the GRF.

Feedback:

At the end of the first week of the midterm course, will be given feedback on performance by the faculty or assistant in charge of the treatment team. At the end of the second week, end-of-course feedback on performance will be provided by the faculty in charge of the treatment team or the faculty in charge of internship training. Also, at the end of the second week, feedback about the department will be received by the faculty in charge of the internship. The end-of-course survey in the form of google form will also be conducted on the last day of your presence in the department.

Leave and absence:

Due to the short training period of students in this department, your absence will reduce your use of educational opportunities. Therefore, taking leave is possible only for one working day if it is justified.

In case of emergencies and justified, not attending the department is accepted only after coordination with the faculty in charge of the internship. According to the instructions of the medical school, absence for more than two days (more than 10% of active days) will lead to the extension of the course.



Resources:

According to the sources introduced for the national exam, the **selected chapters from book of essential cardiovascular diseases by Braunwald et al.**, Published by Tehran University of Medical Sciences and the **Harrison Internal Medicine book (the latest edition)** are the official sources of the study.

- In cases where additional resources are needed The source will be provided to you as a PDF file or audio podcast and powerpoint file.

-It is recommended to use the **“UpToDate database” application and webpages** for detailed protocols and discussions.



Gastroenterology and Hepatology

for Clerkship and Internship Rotation (undergraduate)

Aims and objectives

The course aims to provide a fundamental basis in knowledge and skills in the domain of gastroenterology and hepatology.

Students will acquire a systemic understanding of GI and its related organs, and gain broader, more generally applicable knowledge based on previous learnings in the Physio-Pathologies of disorders.

Expected Outcome:

- have a thorough knowledge and understanding of the **normal physiological function and structure** of the gastrointestinal tract and associated organs
- have an **applied knowledge** and understanding of **related physio-pathological changes**
- have an understanding of immunological, infectious and inflammatory mechanisms in general and in specific GI and liver diseases

- Have clinical assessment and **basic clinical judgement** in disorders of the GI domain
- have a comprehensive clinical knowledge of gastroenterology and hepatology disease processes and their effect on gastrointestinal and liver function
- be familiar with ordering and basic interpretation of the range of:
 - **specialized diagnostic processes,**
 - **imaging techniques,**
 - **blood tests,**
 - **and procedures employed in clinical assessment**
- be competent in the diagnosis, treatment and management of gastroenterology and liver disorders and **their interactions with other systemic diseases.**
Students will gain a practical knowledge of gastrointestinal investigation. Students will have a more general understanding of **scientific method** and experience in literature searches, assessment of publications and presentation of scientific reviews will be gained
- be able to **participate efficiently in a clinical team** approaching patient care (**inpatient and outpatient**)
- have developed and be able to apply appropriate management, **communication, and patient-education skills**
- have the skills required to **process new knowledge** through using Textbooks, valid Databases and handbooks, and actively participating in clinical and/or basic research review

Problem-Oriented approach to Common Presentations

It is expected from medical students by clerkship and Internship rotations, to gain competency in **Algorithmic Approach in diagnosis and treatment** of the following:



- Assess and manage **Dysphagia**
- Assess and manage **Abdominal Pain**
- Assess and manage **Abdominal bloating and gas**
- Assess and manage **Diarrhea**
- Assess and manage **Weight Loss**
- Assess and manage **Constipation**
- Assess and manage **Incontinence**
- Assess and manage **Anemia**
- Assess and manage **Abnormal Liver Function Tests**
- Assess and manage **Obstructive Jaundice**
- Assess and manage **Rectal Bleeding**
- Assess and manage **Occult Detected Blood**
- Assess and manage **Nausea and Vomiting**

Gastrointestinal Emergencies

It is expected from medical students by clerkship and Internship rotations in Gastroenterology, general surgery, and emergency medicine departments, to gain competency in **Algorithmic Approach in diagnosis and treatment** of the following:

- Assess and manage **Acute Upper Gastrointestinal Bleeding**
- Assess and manage **Acute Lower Gastrointestinal Bleeding**



- Assess and manage patients with **food bolus obstruction** or **ingested foreign bodies** (including protocols for special objects such as batteries etc.)
- Assess and manage **Acute Abdomen**
- Assess and diagnose fulminant and sub fulminant **liver failure**
- Assess and manage **cholangitis**
- Assess and manage **poisonings** with emphasis on **paracetamol poisoning**

Upper Gastrointestinal and Small Bowel Luminal Disease

- Be competent in diagnosis and basic management of **Gastro-Esophageal Reflux disease**
- Be familiar with principles of **non-malignant Dysphagia and Odynophagia**
- Be familiar with principles of **Esophageal perforation**
- Be competent in diagnosis and basic management of **Drug induced esophagitis**
- Be familiar with Defense mechanisms against acid and pepsin
- Be familiar with Diagnosis and management of Helicobacter pylori infection
- Be familiar with Algorithmic approach to diagnose and management of **Peptic ulcer disease**
 - Be competent in diagnosis steps of H. Pylori
Including urease test, and principles of endoscopic evaluations
 - Be Competent in treatment protocols of H. Pylori

Different protocols and treatment of resistant helicobacter pylori

- **Clinical Differentiation of duodenal Ulcer from Gastric Ulcer**
- **Stress-induced Gastritis** especially in critical patients in Intensive care departments and postoperative care
- Be familiar with early Diagnosis of **Esophageal malignancies**, its predisposing and risk factors, prevention and algorithmic approach

***It is emphasized due to high prevalence in certain regions of Iran**

- Be familiar with early Diagnosis of **Gastric malignancies**
- Be familiar with Diagnosis and management of **Gastrointestinal tuberculosis** especially in patients from eastern border of Iran and Immigrants.
- Be familiar with Diagnosis and management of **Food allergies**
- 13. Be familiar with Diagnosis and management of **Intestinal obstruction and pseudo-obstruction**
- Be familiar with **Short bowel syndrome**
- Be familiar with **Gastrointestinal causes of anemia and occult bleeding**
- Be familiar with Diagnosis and management of **small bowel tumors**

Lower Gastrointestinal Luminal and Anal Disorders

- Be familiar with early diagnosis, clinical manifestations, and basic management of **Diverticular Disease**



- Be familiar with early diagnosis, clinical manifestations, and basic management of **Colonic Angiodysplasia**
- Be familiar with early diagnosis, clinical manifestations, and basic management of **Colonic Polyps**
Including familiarity with
 - **simple peduncular and nonpeduncular Polyps,**
 - **alarm signs of Polyps,**
 - **Familial Polyposis,**
 - and their diagnosis Criteria and Screening algorithms**
- Be familiar with early diagnosis, clinical manifestations, and basic management of **colorectal carcinoma**
- Be familiar with early diagnosis, clinical manifestations, and basic management of **anorectal disease**

Functional GI Disorders

- Be able to Diagnose and manage **functional dyspepsia**
- Be able to Diagnose and manage **non-cardiac chest pain** and **functional heart burn**
- Be able to Diagnose, manage and treat **irritable bowel syndrome (IBS)**

Inflammatory Bowel Disease

Knowledge and skill domains:

- Be competent **in early diagnosis, clinical manifestations, and basic management** of **Crohn Disease and Ulcerative Colitis**
- Be competent in **differentiating Crohn Disease and Ulcerative Colitis**
- Be familiar with Assessment and **dietary management** of the requirements of patients with inflammatory bowel disease

Nutrition in GI rotation

Knowledge and skill domains:

- Be familiar with the principles of **nutritional assessment** and investigation
- Be familiar with the consequences of gut failure and **methods of nutritional support**
- Be competent in management of **obesity and its complications**
- Be competent in Identifying **Eating disorders**
- Be familiar with Assessment and management of **food intolerance** disorders

- Celiac sprue
- Infection related diseases
 - Intestinal microflora in health and diseases
 - Tropical sprue
 - Whipple's disease
 - Parasitic diseases
 - Infectious diarrhea and food poisoning
- Malabsorption syndromes Pathophysiology, manifestations, and approach

LIVER, BILIARY AND PANCREATIC DISEASE

Knowledge and skill domains:

- Be competent in diagnosis, clinical manifestations, and basic management and prevention means and methods of **viral hepatitis**
- with emphasis on **Hepatitis B and C**- due to prevalence and health impact in Iran



Be competent in describing the clinical features, diagnostic methods and principles of management of less common hepatic infections, e.g. **bacterial liver abscess, hydatid and protozoal infections.**

- Algorithmic approach to diagnose and management of **fatty liver disease**
- Algorithmic approach to diagnose and management of patients with **alcoholic liver disease**
- Be familiar with clinical features, investigation and management of **cholestatic liver diseases**
- Be familiar with diagnose and manage **drug induced liver injury and intoxications**
- Be familiar with essential diagnosis and manage **autoimmune liver disease**
- Be familiar with diagnose, investigate, and manage **cirrhosis, portal hypertension and ascites**
- Be familiar with essentials of **hepatocellular carcinoma**, including staging, grading and prognosis.
- Be familiar with **vascular disorders of the liver**
- Be familiar with the principles of management of patients for **liver transplantation**
- Be familiar with the presentation, investigation, and management of **unusual liver infections**

Regarding **maternal, neonatal and pediatric care** familiarity with essentials of following:

- Be familiar with the presentation, investigation, and management of **pregnancy related liver disease**
- Be familiar with **inherited and congenital metabolic liver diseases**
- Be familiar with the presentation and pathophysiology of **neonatal liver diseases**

Systemic diseases and GI and hepatic system

Medical students in gastrointestinal rotation and general internal medicine rotations of TUMS clerkship and internship, should become familiar with correlations of systemic diseases and gastrointestinal system. Through which they recognize the influence of systemic disease (in all organ systems) and its treatments on the structure and function of the luminal GI tract, biliary tree, liver, and pancreas

It is expected to:

Explain the impact of the clinical presentations and treatments of the following diseases on the function of the GI and hepatic systems:

- **Diabetes mellitus**
- **Infectious diseases** such as **Hepatitis B and C** and **HIV infection**
- **Amyloidosis**
- **Vascular disease**, including **different types of vasculitis**, and **occlusive arterial and venous disease**
- **Thyroid disease**, including **hyperthyroidism and hypothyroidism**
- **Neoplastic and Paraneoplastic disease**
- **Electrolyte disorders**
- **Hematologic diseases** including lymphoma and leukemia
- **Organ transplantation**, including bone marrow transplantation and graft vs. host disease
- **Systemic sclerosis** such as **Scleroderma**

GERIATRIC GASTROENTEROLOGY

Medical students in gastrointestinal rotation and general internal medicine rotations of TUMS clerkship and internship, should become familiar with the following General Issues:

- Be familiar with **Impact of age on presentation, diagnosis, and treatment of important gastrointestinal conditions.**
- Be familiar with **Impact of depression and dementia on presentation and treatment.**
- Be familiar with **Pathophysiology of aging**
- Be familiar with **Social and ethical issues Geriatric gastroenterology**
 - Be familiar with **Changes of G.I. function with aging, (e.g.) slowing of colonic motility and rectal dysfunction**
 - Be familiar with **Changes in drug and pharmaceuticals metabolism**
 - Be familiar with **Effect of aging on nutrition**
 - Be familiar with **GI problems in institutionalized and bedridden patients**

Pancreatic Disease

Knowledge domain:

- Algorithmic approach to diagnose and management of **acute pancreatitis**
- Algorithmic approach to diagnose and management of **chronic pancreatitis**
- Be familiar with the **pancreatic mass/cystic lesion**



- Be familiar with the **Cystic fibrosis and other childhood disorders of the pancreas**
- Be familiar with the **pancreatic pseudocyst** and its clinical findings
- Be familiar with **early diagnosis** and management of malignant pancreatic pathologies

Skills domain:

Interns should be able to

- Be competent in **assessing the severity of acute pancreatitis** and the influence of severity on the likelihood of **complications and clinical outcome**
- Algorithmic approach to diagnose and management of a patient with **non-specific abdominal pain and increased amylase**
- Algorithmic approach to diagnose and management of a patient with **severe abdominal pain and increased amylase**
- Algorithmic approach to diagnose and management of patients presenting with acute pancreatitis
- Be familiar with managing acute pancreatitis, including **indications for urgent ERCP** endoscopic retrograde cholangiopancreatography

Biliary Disease

Knowledge and skill domains:

- Be competent in diagnosis and management of **symptomatic and asymptomatic gallstones**
- Describe the **types of stone**, pathogenesis, natural process and clinical presentation of gallstone disease
- Describe **cholangitis triad** and be competent in its **emergency management**
- Be familiar with early diagnosis, clinical manifestations, and basic management of **biliary obstruction**
- Be familiar with the clinical approach to a **pediatric patient with biliary pathology**
- Diagnose and management **Acute Cholecystitis**.
- Diagnose and management **Chronic Cholecystitis**.
- Including Indications of Cholecystectomy

Gastrointestinal Imaging and paraclinical evaluations

- Indications and familiarity with basics of interpreting **gastrointestinal imaging**
- Be familiar with **the indications for ultrasound assessment of the hepatic liver, biliary tree, and portal circulation**



- Be familiar with the **indications for and risks of techniques** for cross sectional with and without contrast CT and MRI imaging of the abdomen
- Be familiar with the **indications, contraindications, risks and benefits of Gastrointestinal Endoscopy**
- discuss the **indications and clinical importance of taking mucosal biopsies of the esophagus, stomach and duodenum.**
- Be familiar with the **indications, contraindications, risks and benefits of endoscopic ultrasound (EUS)**
- Be familiar with the **indications, contraindications, risks and benefits of ERCP**
- Be familiar with **the role of ERCP** in the diagnosis and management of biliary strictures
- Be familiar with the indications, contraindications and risks of **Colonoscopy**
- Be competent in ordering, interpretation, and clinical importance of **laboratory tests such as GOT, GPT, Gamma GT, Alkaline Phosphatase, Amylase, Lipase, LDH, direct and indirect Bilirubin, and inflammatory parameters**



Diseases of the respiratory system

for TUMS clinical undergraduate Rotation

General Expected Competencies & Procedural Skills:

Assessment and registration of patient information:

- Interpersonal communication
- Taking comprehensive History
- Evaluation and examination of patients (Physical examination & Patient assessment)
- Application of rational para-clinical tests
- Perform diagnostic procedures in this program
- Registration of information and preparation of medical records

Clinical reasoning, diagnosis and decision making for the patient:

- Interpretation of paraclinical tests



- Integration of clinical and paraclinical findings
- Clinical inference and judgment
- Diagnosis of the disease (main and differential)
- Clinical decision making and problem solving

Patient Management

- Patient care
- Ordering and prescription of medicine / medical advice
- Performing diagnostic-therapeutic measures mentioned in this program
- Performing rehabilitation and rehabilitation measures mentioned in this program
- Patient referral
- Patient education
- Patient follow-up

Other capabilities:

- Being UpToDate and familiar with Clinical Research protocols
- Team work
- Advocacy (Advocacy)
- Evidence-based medicine
- Using computer and searching for scientific information in electronic sources
- Monitoring the health of the community



Knowledge domain
in Respiratory rotation of internal medicine

| |
|---|
| - Be familiar with Algorithmic approach to diagnose and management of shortness of breath |
| - Be familiar with Algorithmic approach to diagnose and management of acute and chronic cough |
| - Be familiar with Algorithmic approach to diagnose and management of hemoptysis |
| - Be familiar with Algorithmic approach to diagnose and management of Occupational diseases caused by gases and fumes |
| - Be familiar with Algorithmic approach to diagnose and management of Asthma |
| - Be familiar with Algorithmic approach to diagnose and management of Upper respiratory tract infections |
| - Be familiar with Algorithmic approach to diagnose and management of Congenital diseases of the pulmonary system |
| - Be familiar with Algorithmic approach to diagnose and management of COPD |
| - Be familiar with Algorithmic approach to diagnose and management of Upper airway obstruction |
| - Be familiar with Algorithmic approach to diagnose and management of Alpha-antitrypsin deficiency |
| - Be familiar with Algorithmic approach to diagnose and management of Diseases caused by airway disorders during sleep |
| - Be familiar with Algorithmic approach to diagnose and management of Cystic fibrosis |
| Be familiar with Algorithmic approach to diagnose and management of Pneumonias (hospital-acquired or community-acquired pneumonia, atypical pneumonia, |



| |
|---|
| Be familiar with Algorithmic approach to diagnose and management of Eosinophilic lung disease |
| - Be familiar with Algorithmic approach to diagnose and management of Tuberculosis |
| - Be familiar with Algorithmic approach to diagnose and management of Respiratory distress and pulmonary insufficiency |
| Be familiar with Algorithmic approach to diagnose and management of Pulmonary abscess |
| - Be familiar with Algorithmic approach to diagnose and management of Hypoxic and hypercapnic respiratory failure |
| - Be familiar with Algorithmic approach to diagnose and management of Empyema |
| - Be familiar with Algorithmic approach to diagnose and management of Fungal diseases |
| - Be familiar with Types and methods of oxygen therapy |
| - Be familiar with The role of various types of mechanical ventilation Assist, CPAP, PEEP |
| - Be familiar with Algorithmic approach to diagnose and management of Lung cancer |
| -Indications, Timely request, and correct interpretation of essential laboratory/paraclinical evaluations |
| - Be familiar with Algorithmic approach to diagnose and management of Malignancies of the mediastinum and pleura |
| - Be familiar with main interactions of Lungs and air pollution (pm2.5 pm10 and other pollutants) |
| - Be familiar with Algorithmic approach to diagnose and management of Single lung nodule |
| -Interpretation of pulmonary function tests PFTs including spirometry; |

| |
|--|
| - Interpretation of arterial blood gases |
| - Interpretation of pleural fluid analysis |
| - Pleural diseases |
| - Be familiar with Algorithmic approach to diagnose and management of Pneumothorax |
| - CXR interpretation with emphasis on diagnosis of common respiratory diseases including cases of Pneumothorax, COPD, Typical and atypical pneumonias, etc. |
| - Be familiar with Algorithmic approach to diagnose and management of Pleural malignancies |
| - Be familiar with Algorithmic approach to diagnose and management of Pleural effusion |
| - Be familiar with Algorithmic approach to diagnose and management of Collagen diseases |
| - Be familiar with Algorithmic approach to diagnose and management of Occupational respiratory diseases |
| - Be familiar with Algorithmic approach to diagnose and management of Pulmonary artery hypertension |
| - Be familiar with Algorithmic approach to diagnose and management of Occupational diseases due to minerals and metals |
| - Be familiar with Algorithmic approach to diagnose and management of Corpulmoner |
| - Be familiar with Algorithmic approach to diagnose and management of Pulmonary thromboembolism |
| - Be familiar with Algorithmic approach to diagnose and management of Vasculitis (Wegener, pulmonary-renal syndromes) |
| - Be familiar with Algorithmic approach to diagnose and management of Adult Respiratory Suffering Syndrome |

| |
|--|
| - Be familiar with Algorithmic approach to diagnose and management of Lung connective tissue diseases ILD |
| - Be familiar with Algorithmic approach to diagnose and management of Hypersensitivity and allergies |
| - Be familiar with Algorithmic approach to diagnose and management of idiopathic Fibrosis of the Lungs |
| - Be familiar with Algorithmic approach to diagnose and management of Sarcoidosis |

Procedural Skills domain
in Respiratory rotation of internal medicine

| |
|--|
| <ul style="list-style-type: none"> • Be familiar with Performing Pulmonary function tests (PFTs) |
| <ul style="list-style-type: none"> • Be competent in interpretation of Pulmonary function tests (PFTs) |
| <ul style="list-style-type: none"> • Be familiar with plethysmography (measuring lung volumes) |
| <ul style="list-style-type: none"> • Be competent in acquiring ABG (from extremities and femoral) |
| <ul style="list-style-type: none"> • Be competent in interpretation of ABG |
| <ul style="list-style-type: none"> • Be familiar with Indications and observing performing Bronchoscopy (Rigid and flexible) |

| |
|---|
| <ul style="list-style-type: none"> • Be competent in Performing tuberculin skin test |
| <ul style="list-style-type: none"> • Be competent in interpreting tuberculin skin test |
| <ul style="list-style-type: none"> • Be familiar with sleep disorder studies, their indication and general interpretation |
| <ul style="list-style-type: none"> • Be familiar with indications and Correct collection of sputum samples |
| <ul style="list-style-type: none"> • Be familiar with indications and general process of Lung biopsy |
| <ul style="list-style-type: none"> • Be familiar with indications and general process of Thoracentesis |
| <ul style="list-style-type: none"> • Be familiar with indications and general process of Bronchoalveolar lavage (BAL) |
| <ul style="list-style-type: none"> • Be familiar with indications, different types and essential settings of Mechanical ventilation |
| <ul style="list-style-type: none"> • Be familiar with indications and general process of Pleural fluid synthesis |
| <ul style="list-style-type: none"> • - Pulse Oximetry its indications, correct procedure, and interpretation |
| <ul style="list-style-type: none"> - Mantou test |
| <ul style="list-style-type: none"> • - Employing Nebulizers its indications, correct administration of pharmaceuticals by nebulizer |
| <ul style="list-style-type: none"> • Be familiar with indications, and competent in performing emergent Tracheostomy |
| <ul style="list-style-type: none"> • Be familiar with Indications and observing Bronchoscopy in setting of hemoptysis |

It is necessary to complete the following table by the relevant department in the medical school

(It should be available to Students, faculty members and trainers and at the beginning of the course)

-The final grade in each rotation, will be issued officially to TUMS faculty of medicine Just by presenting the completed signed and approves log table.

Note:-

It serves the purpose of determining where each content is, at what time, by which teacher and method.

-Incompleteness of mandatory log table equals repetition of the Rotation

It is to be taught **as main part of the daily action plan** that should be available to board members

The program and the trainees are meant to carry printed copy so that they can easily put the program into practice.



Log table of Essential Core competencies in internal medicine rotations

Row /Title /Content

Place of Training / Training Time

- Get a complete medical clinical history and perform accurate physical examination
- How to write the course of the disease and Daily Progress Notes
- Perform ABG
- Laying the endotracheal tube
- Cardiovascular resuscitations (at least on model)
- Distinguish normal from abnormal EKG
- Put NGT and wash the contents of Stomach
- Ability to prepare and read Urine samples under a microscope
- Ability to analyze urine using urinary test tapes
- Ability to perform and analyze CBC (Complete blood cell count)
- Ability to perform a stool test in terms of OP and OB
- Ability to perform and interpret Gram Staining in
- Samples of sputum - urine - ascites -
- Pleura fluid - joint fluid - spinal fluid.
- Ability to perform LP
- Ability to perform knee joint fluid puncture
- Ability to perform pleural fluid puncture
- Ability to perform ascites fluid puncture
- Ability to perform ophthalmoscopy
- ECG interpretation ability
- CXR Interpreting Ability
- Ability to interpret simple abdominal /chest x-ray images

Ability to take a history and perform a physical examination and And propose a diagnostic plan in the **patient with increased Creatine**

Ability to **interpret ABG/ acid and base disorders**



Ability to take a clinical history and perform a physical examination and propose a diagnostic plan in a patient with **common Electrolyte balance disorders**

Ability to take a history and perform a physical examination, And propose a diagnostic plan in a patient with **Proteinuria**

Ability to take a history and perform a physical examination, And propose a diagnostic plan in a patient with **Hematuria**

Ability to take a history and perform a physical examination and And propose a diagnostic plan in a patient with **Hypertension**

Ability to take a history and perform a physical examination and And propose a diagnostic plan in a patient with **Dysuria**

Ability to take a history and perform a physical examination and And propose a diagnostic plan in the patient with the approach to **Anemia**

Ability to take a history and perform a physical examination And propose a diagnostic plan in a patient with **Thrombocytopenia**

Row Title Content

Place of Training /Training Time

Signature of Professor

Ability to take a history and perform a physical examination And propose a diagnostic plan in a patient with **symptoms of Bleeding and disorders of coagulation system**

Ability to take a history and perform a physical examination and Placing a diagnostic plan in the patient with **increasing and Reduction of white blood cells**



Ability to take a history and perform a physical examination And propose a diagnostic plan in a patient with **Lymphadenopathy**

Ability to take a history and perform a physical examination And propose a diagnostic plan in the patient with the approach to **Splenomegaly and hepatomegaly**

Ability to take a history and perform a physical examination And propose a diagnostic plan in a patient with **fever and FUO (Fever of Unknown Origin)**

Ability to take a history and perform a physical examination And propose a diagnostic plan in a patient with **enlarged size Thyroid**

Ability to take a history and perform a physical examination

And propose a diagnostic plan in a patient with **Musculoskeletal pain**

Ability to take a history and perform complete physical examination in a Patient with **Diabetes Mellitus**

Ability to take a history and perform a physical examination, and propose a diagnostic plan in a patient with **Low Back Pain**

Ability to take a history and perform a physical examination and propose a diagnostic plan in a patient with **joint pain (Arthralgia and Arthritis)**

Ability to take a history and perform a physical examination and propose a diagnostic plan in a **patient with shortness of breath**

Ability to take a history and perform a physical examination and propose a diagnostic plan in a patient with **Hemoptysis**



Row Title Content

Place of Training /Training Time

Signature of Professor

Ability to take a history and perform a physical examination and and propose a diagnostic plan in the **patient with Pleural effusion and inflammation**

Ability to take a history and perform a physical examination And propose a diagnostic plan in a patient with **Acute and Chronic Cough**

Ability to take a history and perform a physical examination and and propose a diagnostic plan in a patient with **Deep Vein Thrombosis (DVT)**

Ability to take a history and perform a physical examination And propose a diagnostic plan in the **patient with Gastrointestinal bleeding**

Ability to take a history and perform a physical examination And propose a diagnostic plan in a patient with **abdominal pain**

Ability to take a history and perform a physical examination And propose a diagnostic plan in a patient with **dyspepsia**

Ability to take a history and perform a physical examination And propose a diagnostic plan in a patient with **constipation**

Ability to take a history and perform a physical examination And propose a diagnostic plan in a patient with **diarrhea**

Ability to take a history and perform a physical examination And propose a diagnostic plan in the patient with **vomiting**



Ability to take a history and perform a physical examination And propose a diagnostic plan in the patient with **jaundice**

Ability to take a history and perform a physical examination And propose a diagnostic plan in a patient with **Ascites**

Row Title Content

Place of Training /Training Time

Signature of Professor/faculty member



Sources and References

in **respiratory diseases rotation of internal medicine:**

- Official pre-internship comprehensive exam resources- updated annually
- UpToDate; Electronic Data base, the last edition
- Harrison's Principles o- Internal Medicine; the last edition
- Cecil's Textbook o- Internal Medicine; the last edition
- International guidelines approved by the Board of Examiners of the Internal Board
- National guideline for common AIDS,
National guideline for tuberculosis
National guideline for non-communicable diseases – COPD and respiratory chapter
- Epidemiological book of common diseases in Iran (latest edition)



Nephrology and Renal diseases

Internship Rotation Course and core Syllabus

▪ EPIDEMIOLOGY AND RISK FACTORS

- Epidemiology of kidney disease Kidney disease in Iran, and international scale
- Aging and kidney disease
- CKDu (chronic kidney disease of unknown etiology)

▪ Glomerulonephritis and Glomerular disease

- Proteinuria
- Nephrotic syndrome
- Minimal change disease Focal segmental glomerulosclerosis
- Immunoglobulin A nephropathy and Henoch- Schoenlein purpura
- Membranous nephropathy
- Acute endocapillary glomerulonephritis
- Crescentic glomerulonephritis



- Infection- related glomerulonephritis
- Approach to **Acute Renal Failure(ARF)**, and **Chronic Renal Failure(CRF)**
Including
algorithmic diagnostic approach, Evaluations, and management.
- **ASSESSMENT OF RENAL DISEASE**
 - History and clinical examination of patients with renal disease
 - Urinalysis and microscopy
 - Clinical assessment of renal function
 - Renal function in the newborn infant
 - The aging kidney
 - Imaging in renal disease
- **URINARY TRACT INFECTION (UTI)**
in infancy, childhood, adolescence, and geriatrics.
 - The definition, epidemiology, pathogenesis, and microorganisms involved.
 - Algorithmic diagnostic approach
 - Algorithmic Therapeutic approach
 - Appropriate follow up and imaging evaluation
 - Lower and upper urinary tract infection in adults and elderly
 - Urinary tract infection in children
 - Renal tuberculosis or other mycobacterial infections in Iran
- **FLUID AND ELECTROLYTE DISORDERS**

- Acid- Base Disorders
- Hypo/hyponatremia:
- Disorders of water balance
- Hypo/hyperkalemia
- Hypo/hypercalcemia
- Hypo/hyperphosphatemia
- Hypo/hypermagnesemia

▪ **Urologic Aspects of Pediatric Nephrology**

Anomalies of the urinary tract:

the trainee will understand a. Diagnosis, evaluation, treatment, and long-term outcome of anomalies of the upper and lower urinary tract such as

- Hydronephrosis,
- Hydroureter
- Posterior urethral valves, prune belly triad syndrome, ectopic or fused kidney

▪ **THE KIDNEY IN SYSTEMIC DISEASE**

- Diabetes mellitus
- Amyloid glomerulopathy
- Sarcoidosis
- Systemic vasculitis
- Systemic lupus erythematosus
- Scleroderma- systemic
- Sjogren's syndrome
- Sickle cell nephropathy

And Hepatorenal Syndrome



Renal TUBULAR DISEASE

- Fanconi syndrome
- Renal tubular acidosis
- tubular disorders

▪ RENAL STONE DISEASE

- Medical management of stone disease
- Algorithmic diagnostic approach, differentiating different types, prevalence and etiologies.
- Algorithmic Therapeutic approach
- Indications of Surgical management of stone disease
- Nephrocalcinosis (shakh-gavazni)

▪ DIALYSIS

- Dialysis Indications
- familiarity with Vascular access Hemodialysis,
- familiarity with hemofiltration and hemodiafiltration
- familiarity with Peritoneal dialysis
- familiarity with management of the dialysis patient

The interns are expected to know the precise Indications and appropriate paraclinical evaluations, and perform routine urine examination.

In addition, he/she must familiarize himself/herself with the following paraclinical evaluations and adjacent interpretations:

Laboratory Evaluations:

- Electrolyte and acid base analysis
- Renal function tests

Renal function testing

- Renal plasma flow, GRF
- Micro albuminuria
- Proteinuria measurement

Immunological tests:

- c ANCA, p ANCA, ANA, anti DsDNA, complement, anti GBM ab, immunoelectrophoresis.

Imaging:

Indications and Interpretation

- KUB
- Sonography (general Familiarity)
- CT imaging (general Familiarity)



Rheumatology

Internship Rotation Course and core Syllabus

Knowledge Domain

- Be competent in algorithmic approach to diagnose and management of **Rheumatoid arthritis** including
 - diagnostic criteria and differential diagnoses,
 - zones involved in musculoskeletal and systemic,
 - clinical progress and variations,
 - indications and contraindications of medications,
 - para-clinical evaluations and laboratory tests' ordering and interpretation
- Be competent in algorithmic approach to diagnose and management of Juvenile **Rheumatoid arthritis (JRA)**
- Be competent in algorithmic approach to diagnose and management of **Seronegative spondyloarthropathies**, including
 - ankylosing spondylitis
 - reactive arthritis
 - psoriatic arthritis
 - inflammatory bowel disease-associated arthritis



- arthritis associated with acne and other skin disease
 - undifferentiated spondylarthritis.
- Be competent in algorithmic approach to diagnose and management of **Lupus erythematosus and antiphospholipid syndrome**
 - systemic Lupus erythematosus
 - with emphasis on diagnostic criteria, scorings, and differential diagnoses
 - management of flare episodes
 - care of systemic involvement evaluations and management
 - with emphasis on renal and glomeruli involvement of SLE and its clinical progress
 - discoid Lupus erythematosus
 - primary and secondary antiphospholipid antibody syndrome
 - drug-related systemic lupus erythematosus.
- Be competent in algorithmic approach to diagnose and management of **Scleroderma**
 - diffuse and limited systemic sclerosis
 - localized syndromes
- Be competent in algorithmic approach to diagnose and management of Sjögren's syndrome
 - with emphasis on diagnostic criteria and differential diagnoses
- Be competent in algorithmic approach to diagnose and management of **Polymyositis and Dermatomyositis**
 - diagnosis and differential diagnosis in adults,
 - when to suspect,
 - initial evaluation,
 - Laboratory testing and imagings including CK, ESR, CRP, **anti-Ro/SSA, anti-La/SSB, anti-Sm, anti-ribonucleoprotein (RNP) antibodies, etc.**
 - biopsy findings**
- **Familiarity with** Metabolic disorders of muscles muscular dystrophies
 - with emphasis on **myasthenia gravis**

- **Familiarity with**
 - relapsing polychondritis,
 - relapsing panniculitis,
 - undifferentiated connective tissue disease
 - overlap syndromes, including mixed connective tissue disease.

- Be competent in algorithmic approach to diagnose and management of **erythema nodosum**

- Be competent in algorithmic approach to diagnose and management of **Vasculitis and Vasculitis related diseases**
 - **polyarteritis nodosa**
 - **temporal arteritis**
 - with emphasis on clinical and para clinical findings, when to suspect, biopsy findings, management
 - **polymyalgia rheumatica**
 - **hypersensitivity and small vessel vasculitis**
 - **Takayasu's arteritis**
 - **systemic necrotizing vasculitis overlaps**
 - **Behcet's disease**
 - **cryoglobulinemia**
 - **central nervous system vasculitis**
 - **pseudovasculitis**
 - **endangitis obliterans (Buerger's disease)**
 - **Wegener's granulomatosis**
 - microscopic polyarteritis and **allergic granulomatosis of Churg-Strauss.**

- Be competent in algorithmic approach to diagnose and management of Infectious arthritis
 - reactive arthritis Infectious and septic arthritis



- **Bacterial Arthritis:**
non-gonococcal and gonococcal arthritis
- **spirochetal arthritis:**
syphilis and Lyme
- **viral arthritis:**
HIV, hepatitis B, parvovirus
- **reactive arthritis**
- **parasitic Whipple's disease**
- **arthritis associated with subacute bacterial endocarditis**

1. **acute rheumatic fever**
2. **mycobacterial arthritis**

- Be competent in algorithmic approach to diagnose and management of Crystal-associated diseases:

Gout (monosodium urate monohydrate)

early diagnosis,
differential diagnosis,
management of acute phase and preventive measure,
life style modification advice provision,

hydroxyapatite (basic calcium phosphate)

Other crystalopathies

- Be competent in algorithmic approach to diagnose and management of Rheumatologic diseases associated with Endocrine disorders:
 - hypoparathyroidism
 - acromegaly
 - hyperparathyroidism
 - rheumatic syndromes associated with diabetes mellitus
 - hyperthyroidism
 - hypothyroidism
 - Cushing's disease.



- Be competent in algorithmic approach to diagnose and management of Bone and cartilage disorders

Osteoarthritis:

— **primary and secondary osteoarthritis (OA)**

pathogenesis
 clinical manifestations,
 Management
 Management of moderate to severe knee osteoarthritis
 Overview of surgical therapy of knee and hip osteoarthritis

— chondromalacia.

— **Osteoporosis**

pathogenesis
 clinical manifestations,

para-clinical evaluations Z-score and T core in bone densitometry
 Management of moderate to severe knee osteoarthritis
 Overview of surgical therapy of knee and hip osteoarthritis
 medications, their indications and contraindications
 and preventive measures in progress of osteoporosis

— osteomalacia

— bone disease related to renal disease,

— Paget's disease of bone

— avascular necrosis of bone (idiopathic, secondary causes, and osteochondritis dissecans.)

— hypertrophic osteoarthropathy

— diffuse idiopathic skeletal hyperostosis

— clinical diagnosis and suspect in insufficiency fractures.

- Be competent in algorithmic approach to diagnose and management of common Hereditary, congenital, and inborn errors of metabolism associated with rheumatic syndromes

○ Disorders of connective tissue:

- Marfan's Syndrome
- osteogenesis imperfecta
- Ehlers-Danlos syndrome
- pseudo xanthoma elasticum



- hypermobility syndrome
 - other mucopolysaccharidoses
 - Osteochondrodysplasias:
 - multiple epiphyseal dysplasia
 - Amyloidosis: primary, secondary and hereditary
- Be familiar with algorithmic approach to diagnose and management of **Raynaud's disease**

- Be familiar with algorithmic approach to diagnose and management of **Intermittent arthritis** palindromic rheumatism/ intermittent hydrarthrosis.

- Be familiar with **Arthritic and rheumatic manifestations** associated with:
 - sarcoidosis
 - pancreatic disease
 - chronic active hepatitis
 - primary biliary cirrhosis
 - medication induced
 - vaccinations induced
 - environmental agents

- Be familiar with algorithmic approach to diagnose and management of **rheumatic disease in the geriatrics and elderly**
-
- Be familiar with algorithmic approach to diagnose and management of **rheumatic disease in the pregnant patient**

- Be familiar with algorithmic approach to diagnose and management of **Pediatric musculoskeletal conditions such as**
 - juvenile spondyloarthropathy
 - Kawasaki disease
 - systemic lupus erythematosus
 - scleroderma syndromes
 - Henoch-Shönlein purpura
 - systemic juvenile rheumatoid arthritis (Still's disease)
 - juvenile dermatomyositis
 - polyarticular juvenile rheumatoid arthritis
 - neonatal lupus syndrome
 - acute rheumatic fever.

Skills Domain

- Clinical history taking
- physical examination
- laboratory evaluations performing and interpretation
- imagings interpretation

Expected competencies for internal medicine Intern in skills domain

- Be competent in indications of joint aspiration with emphasis on knee joint
- Be competent in indications for local and intra-articular steroid injection
- identify risks and benefits of joint aspiration, local, and intra-articular injection treatment
- Be familiar with indications and techniques for nerve block in internal medicine
- explain performing technique and interpretation of polarized light microscopy for crystal arthritis
- Epidemiological methods in the study of rheumatic disease
- Principles of evidence-based practice in rheumatology
- Economic, psychological, and social consequences of rheumatic disease

Laboratory tests performing and interpretation

For each test, understand the biologic rationale, methods for performing, and use/limitations of specific laboratory tests, including

- ESR erythrocyte sedimentation rate,
- CRPC-reactive protein,



- and other acute phase reactants
- Rheumatoid factors,
- Cryoglobulins and circulating immune complexes
- antinuclear antibodies and subtype specificities including:
 - anti-double stranded DNA
 - anti-U ribonucleoprotein
 - anti-Smith
 - anti-centromere antibodies
 - anti-histone antibodies
- LE cell preparation
- ant ribosomal P,
anti-topoisomerase 1,
and anti-synthase antibodies including anti-Jo-1
- antiphospholipid antibodies, including:
 - rapid plasma reagin (RPR)
 - anticardiolipin
- lupus anticoagulant
 - direct and indirect Coombs testing
 - anti-granulocyte antibodies
 - anti-platelet antibodies
- serum immunoglobulin levels, serum protein electrophoresis, and immunofixation
- human leukocyte antigen (HLA) typing
- Anti streptolysin O titer ASO and other streptococcal antibody tests
- serologic and polymerase chain reaction tests for:
 - Lyme disease
 - hepatitis B
 - hepatitis C
 - HIV
 - parvovirus
 - other infectious agents
- uric acid in serum and urine measurements
- Iron studies including Serum iron and serum ferritin and their interpretations
- Flowcytometry studies for analysis of lymphocyte subsets and function



Competency in Diagnostic imaging techniques and criteria in common rheumatologic disorders

Be familiar with following medications used in rheumatology scope:

(Including their mechanism, interactions with other drugs, indications, dosing, available forms and contraindications)

- Glucocorticoids (Systemic, Injections and topical administration)
- NSAIDS different forms and their pharmacokinetics
- Systemic antirheumatic drugs: antimalarials/ gold compounds/ D-penicillamine/ sulfasalazine/ methotrexate
- Cytotoxic/anti-metabolite drugs: azathioprine /cyclophosphamide
- Immunomodulatory drugs: cyclosporine /mycophenolate mofetil / tacrolimus
- Biologic agents: TNF alpha inhibitors/ tocilizumab
- Narcotic and non-narcotic analgesics
- Medications used in the treatment of metabolic bone disease: • calcium and vitamin D forms/ calcitonin/selective estrogen receptor modulators/ parathyroid hormone/ bisphosphonate therapy
- Hypouricemic drugs: allopurinol / probenecid
- Antibiotic therapy for septic joints

Endocrinology

Internship Rotation Course and core Syllabus

Expected capabilities in the field of knowledge

Expected to achieve the following training goals at the end of internship:

- To diagnose endocrine diseases based on clinical methods.
- To interpret relevant laboratory and radiological investigations for the purpose of diagnosis
- To arrive at a treatment plan/s and discuss the pros and cons with the patient and his family.
- To be well-acquainted with the current knowledge and recent advances in the field by self-learning and /or participating in continuing Medical Education programs.
- To deliver preventive and rehabilitative care.
- To organize and manage administrative responsibilities for routine day to day Task management as well as emergent /urgent situations.



Educational Objectives of General Practitioners

By the end of training, trainees should have the requisite knowledge of, skills in, and attitudes towards the situations listed in order to manage:

- Newly presenting disease in the outpatient and inpatient hospital settings in a way that restores health and well-being efficiently and effectively.
- The long-term care of patients in a way that minimizes the impact on health and optimizes long-term disease outcomes.
- Risk factors for a poor outcome, for example: hypertension, smoking, obesity, and hyperlipidemia.
- Emergencies and short-term loss of disease control in a hospital setting in order to minimize the period of hospital admission while making efficient use of resources.
- Disease pre-dating or newly arising in pregnancy in both the outpatient and inpatient settings to optimize maternal and fetal outcomes.
- Adolescent, adult and elderly inpatients and outpatients.
- Screening for, and the prevention and treatment of, complications to optimize intermediate and final health outcomes.
- The application of nationally accepted guidelines in their own practice.
- The whole patient' taking account of personal, social and cultural as well as biomedical factors.
- Social and professional implications such as restrictions on driving and certain types of employment or activity
- Clinical services at department, hospital, district and population level in a way that makes efficient and effective use of resources to optimize health outcomes

All the students will be **involved in the direct care of the patients admitted to the endocrine services.**

This will include taking a complete history and performing a comprehensive examination.

Additionally, students will be required to **attend outpatient endocrine clinics and specialty-clinics (Tehran university of medical sciences outpatient care Clinics within the Campus)**

The residents will be given training in principles of scanning of various endocrine organs and interpretation of paraclinical data.



TEACHING AND TRAINING ACTIVITIES

The fundamental components of the teaching curriculum include:

1. Case presentations & discussion and Clinical bed-side Rounds- Daily
2. Theory Classes within the Clinical ward – Daily
3. Journal club- Once a week
4. Grand round presentation (by rotation departments and subspecialties)- twice a week
5. Faculty lecture teaching

The rounds should include bedside sessions, file rounds & documentation of case history and examination, progress notes, round discussions, investigations, and management plan of interesting and difficult cases in unit discussions.

The training program would focus on knowledge, skills, and attitudes (behavior), all essential components of education. It is being divided into theoretical, clinical and practical in all aspects of the delivery of the rehabilitative care, including methodology of research and teaching.

Theoretical: The theoretical knowledge would be imparted to the candidates through discussions, journal clubs, and Classes. The students are exposed to recent advances through discussions in journal clubs. These are considered necessary in view of an inadequate exposure to the subject in the undergraduate curriculum.

Clinical: The trainee would be accompanied by a faculty member to be able to acquire methods of history taking, examination, prescription writing and management in rehabilitation practice.

Bedside: The trainee would work up cases, learn management of cases by discussion with faculty of the department.



Signs, Symptoms, principles of Diagnosis and Treatment of the following diseases:

- **Basic Sciences as related to Clinical Endocrinology:**

- Hormones and Hormone Action

- Principles of Endocrinology
- The endocrine patient
- Principles of Hormone Action
- Health Care Reform, Population Health, and the Endocrinology
- Laboratory Techniques for Recognition of Endocrine Disorders

- **- Hypothalamus and Pituitary**

- Neuroendocrinology & Disorders of the Neurohypophysis
- Pituitary Physiology and Diagnostic Evaluation
- Pituitary Masses and Tumors

- **- Thyroid**

- Thyroid Physiology and Diagnostic Evaluation of Patients with Thyroid Disorders
- Hyperthyroid Disorders
- Hypothyroidism and Thyroiditis
- Nontoxic Diffuse Goiter, Nodular Thyroid Disorders, and Thyroid Malignancies, Sick euthyroid syndrome



- - **Adrenal Cortex and Endocrine Hypertension**

- The Adrenal Cortex
- Endocrine Hypertension

- - **Reproduction**

- Physiology and Pathology of the Female Reproductive Axis
- Hormonal Contraception and fertility control- current approaches and global aspects
- Testicular Disorders and male reproductive tract
- Sexual Dysfunction in Men and Women
 - Menstrual Disorders and Pelvic Pain
 - The Menopause Transition and Postmenopausal Hormone Therapy
 - Hirsutism and Virilization
 - Gynecologic Malignancies

- -**Endocrinology and pregnancy (Maternal-Fetal)**

- Endocrine changes in pregnancy
- Endocrinology of fetal development
- Normal and aberrant growth
- Puberty, ontogeny, Neuroendocrinology, physiology disorders
- Endocrinology of Fetal Development

- **Growth and puberty**

- Pediatric Disorders of Sex Development
- Normal and Aberrant Growth in Children

- Physiology and Disorders of Puberty

- **Section VIII: Carbohydrates and Fat Metabolism**

- Neuroendocrine Control of Energy Stores
- Obesity
- Disorders of Lipid Metabolism
- Gastrointestinal Hormones and Gut Endocrine Tumors
- Hypoglycemia

- **Diabetes Mellitus**

- Classification of Diabetes and other categories of glucose intolerance
- Epidemiology of Type 1 and Type 2 Diabetes
- Physiology of pancreatic endocrine function
- Insulin gene expression and biosynthesis
- Normal Pancreatic B cell function & Mechanism of Insulin secretion
- Biosynthesis, secretion, and actions of glucagon
- Mechanism of Insulin action
- Regulation of Carbohydrate and lipid metabolism
- Measuring B cell function and Insulin action in clinical practice
- Pathogenesis of Nonalcoholic Fatty Liver disease
- Insulin resistance syndrome
- Pathogenesis of Type 2 Diabetes.
- Monogenic disorders of B cell
- Immunopathogenesis of Type 1 diabetes
- Molecular Genetics of Type 1 diabetes
- Obesity Pathogenesis , Treatment including Bariatric surgery
- Prevention of Type 2 Diabetes



- Prevention of Type 1 Diabetes
- Medical Nutrition therapy in Diabetes
- Exercise in Diabetes
- Metformin
- PPAR agonists
- Alpha glucosidase inhibitors
- Incretin analogues and DPP 4 inhibitors
- SGLT -2 inhibitors
- Other oral therapies in Type 2 Diabetes
- Proposed Treatment Algorithms for Type 2 Diabetes
- Insulin therapy : Conventional and Analogues
- Insulin Pumps
- Insulin Infusion
- Pancreatic and Islet transplantation
- Hypoglycemia in Diabetes
- Spontaneous hypoglycemia in Adults and children
- Diabetes ketoacidosis and HHS
- Diabetes in Pregnancy
- Pathogenesis of Macrovascular complications
- Pathogenesis of Microvascular complications
- Diabetic retinopathy
- Diabetic nephropathy
- Diabetic neuropathy
- Diabetic foot assessment and management
- Connective tissue disorders of Diabetes
- Sexual dysfunction in Diabetes
- Coronary artery diseases and Stroke in Diabetes
- Hypertension in Diabetes
- Clinical trials in Diabetes



- Pregnancy

- Maternal hyperthyroidism
- Maternal hypothyroidism
- Post-partum thyroid dysfunction
- Thyroid cancer in pregnancy
- Pituitary disorders
 - Prolactinoma in pregnancy including management
 - Hypopituitarism in pregnancy
- Adrenal disorders
 - Addison's disease in pregnancy
 - Congenital adrenal hyperplasia

Outpatient Core and Elective Care

TUMS (Tehran University of Medical Sciences) Specialty Clinics:

| | |
|--------------------------|--|
| General Endocrine clinic | |
| Thyroid clinic | |
| Diabetes clinic | |

Resources:

According to the sources introduced for the national exam

the **selected chapters from the Harrison Internal Medicine book (the latest edition)** are the official sources of the study.

- In cases where additional resources are needed The source will be provided to you as a PDF file or audio podcast and powerpoint file.

-It is recommended to use the **“UpToDate database” application and webpages** for detailed protocols and discussions.



Core mandatory geriatrics competencies

for TUMS Medical Students

acquired in clinical rotations of internal medicine, psychiatry, and neurology

- Being Competent in **taking clinical history from the elderly and their companions**, with emphasis on:
 - multiple simultaneous complaint,
 - priority and algorithmic approach,
 - history of falls and balance disorders,
 - complete pharmaceutical
 - and medication history even in absence of efficient verbal communication, etc.
- Being competent in performing Physical examination by elderly patients
- Being competent in acquiring a systemic interpretation of **multiple simultaneous disorders and disabilities, their correlations** and ability to propose an algorithmic approach in diagnosis and an efficient management plan
- Be competent in **medication dose adjustments** necessary in cases with **impaired renal and hepatic function**
- Be competent in systematic evaluation of **multiple medications** used by patient, their interactions, and providing rational advice and adjustments
- Be able to assess and evaluate elderly patients' capability of implementing and undertaking suggested medical plans and suggest necessary support in case of relative incapability.
- Be competent in **cognitive and behavioral assessment** of the patient
- Be competent in algorithmic approach to diagnosis and management of delirium
- Be familiar with algorithmic approach to diagnosis and management of dementia



Neurology

Internship and clerkship Rotation Course and core Syllabus

AIM

The aim of the course is to develop skills and combining theoretical and practical by medical students to Provide the health care to the patients needing Neurology inpatient and outpatient care

TRAINING COURSE AND ROTATION GOAL

At the end of the training the student shall be able to:

- Diagnose and manage majority of conditions in the specialty of Neurology on the basis of clinical assessment, and appropriately selected paraclinical investigations.
- Recognize the importance of Neurology in the context of the health needs of the community and national priorities in the health sector.



- Practice Neurology ethically according to the principles of primary health care, International GCP guidelines (Good Clinical Practice) .
- Demonstrate sufficient understanding of the basic sciences relevant to Neurology.
- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive, and promotive measures/strategies
- Plan and advice measures for the prevention and rehabilitation of patients suffering from disease and disability related to the specialty of Neurology.
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality data relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behavior in accordance with the societal norms and expectation.
- Play the assigned role in the implementation of National Health Plans and priorities, effectively and responsibly.
- Develop skills as a self-directed learner, recognize continuing educational needs: select and use appropriate learning resources.

PROGRAMME OBJECTIVES

The major objectives of the training are:

1. Domain of Knowledge
2. Domain Practical and Clinical skills
3. Domain of Attitudes including Communication skills



1. Domain of Knowledge

At the end of the course, upon successful completion of training and passing the exam the student is expected to

- Acquire comprehensive knowledge of the basics of Neurology including Neuroanatomy, Neurophysiology, Neuroimaging, Neuropathology, infections, Preventive
- Neurology, Neuroepidemiology, Pediatric Neurology and Neurosurgery.

- become familiar with indications and basic interpretation of the commonly used
- Neurophysiological diagnostic Tests like Electroencephalography,
- Electromyography, evoked Potentials.
- become familiar with indications and basic interpretation of common neuroimaging
- investigations such as CT scanning, MRI scanning, and x-rays

2. Domain Practical and Clinical skills

- Diagnose and manage majority of conditions in the field of Neurology based on clinical assessment, and appropriate investigations.
- Possess complete Clinical Diagnostic Skills for the recognition of common Nervous system diseases.
- Acquire skills in invasive procedures such as lumbar puncture
- Able to apply correct clinical judgement and rational cost effective investigations for the diagnosis and management of Neurology Cases in the Wards and Emergency Room..
- Demonstrate skills in documentation of individual case details as well as morbidity and mortality data relevant to the assigned situation.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.

3. Domain of Attitudes and Communication skills

Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal skills and behavior in accordance with the societal norms and expectation.



CORE SYLLABUS

- Algorithmic Clinical approach to Neurological disorders
- main Manifestations of Neurologic disorders
- Growth and Development of the Nervous System
- the Neurology of Aging

NEUROANATOMY and NEUROPHYSIOLOGY

The Neuroanatomy with special emphasis on development of Neuroaxis (brain, spinal cord and neurons and glia), autonomic nervous system and their maturation process in the post natal, childhood and adolescent states; the location and significance of stem cells, CSF pathways, Blood supply and sinovenous drainage of brain and spinal cord, the meninges, skull and vertebral column, the cranial nerves, spinal roots, plexuses, and their relation to neighboring structures; anatomy of peripheral nerves, neuromuscular junction and muscles.

NEUROPATHOLOGY

All pathological changes in various neurological diseases with special reference vascular, immune mediated, de/dysmyelinating, metabolic and nutritional, genetic and developmental, infectious and iatrogenic and neoplastic aetiologies to clinical correlation included. Special emphasis on pathological changes in nerve and muscle in neuropathies and myopathies. Ultrastructural pathologies such as apoptosis, ubiquitinopathies, mitochondrioses, channelopathies, peroxisomal disorders, inclusion bodies, prion diseases, disorders mediated by antibodies against various cell and nuclear components, paraneoplastic disorders etc.

NEUROMICROBIOLOGY

Algorithmic approach to **clinical signs and symptoms, diagnosis, paraclinical evaluations, and therapeutical management** of The various microbiological aspects of infectious neurologic diseases including:



- encephalitis,
- meningitis,
- brain abscess and cold abscess,
- granulomas,
- myelitis,
- cerebral malaria, parasitic cysts of nervous system,
- neurological complications of viral infections such as Polio, EBV,
- Rabies, Herpes and other epidemic viral infections.

CLINICAL NEUROLOGY Skills and Examinations (INCLUDING PEDIATRIC NEUROLOGY and NEUROPSYCHIATRY.)

- The science and skill of history taking and Physical Examination including elements of accurate history taking with emphasis on symptoms associated with neurological disease,
- The neurological physical examination of
 - adults,
 - children,
 - infants,
 - and neonates,
- Neurological **Syndromes** associated with **congenital and acquired neurological disease**,
- examination of **unconscious patients**,
- examination of **higher cognitive functions**,
- examination of **cranial nerves**,

- examination of the **ocular fundus**,
- examination of the **Tone and force of muscles**,
- proper examination of **superficial and deep reflexes** including the alternate techniques and neonatal and released reflexes,
- **neurodevelopmental assessment** of children,
- examination of **sensory system**,
- examination of **peripheral nerves**,
- signs of **Meningeal irritation**,
- **skull and spine examination** including measurement of head circumference, shortness of neck and carotid pulsations .and vertebral bruits.

Algorithmic Clinical approach to common Neurological disorders:

1. Altered states of Consciousness (COMA, Stupor, Delirium, etc.) and GCS scale evaluation

Pathophysiology and diagnosis of Coma, Diagnosis and management of coma, delirium and acute confusional states, reversible and irreversible causes, persistent vegetative states and brain death, neurophysiological assessment and effective correct examination and evaluation of GCS



2. SEIZURES AND EPILEPSY and SYNCOPES

Diagnosis of seizures, epilepsy and epileptic syndromes,

Recognition, clinical assesment and management of seizures

Emphasizing and referring Special situations such as epilepsy in pregnant and nursing

mothers, by driving, risky occupations, its social stigmas

Differentiation of seizures from syncopes, drop attacks, cataplexy, startles etc.

Differentiation from pseudo seizures,

use of conventional and newer antiepileptic drugs, their interactions and adverse effects etc.,

3. HEADACHES AND CRANIAL NEURALGIAS

Acquisition of skills in analysis of headaches of various causes such as those from raised intracranial pressures, migraines, cranial neuralgias, vascular malformations, Meningeal irritation, psychogenic etc.and their proper pharmacologic management.

STROKES and CEREBROVASCULAR DISEASES

Vascular anatomy of brain and spinal cord,

various causes and types of cerebrovascular syndromes,

ischemic vs. hemorrhagic types,

arterial vs. venous types,

investigations of strokes including neuroimaging using dopplers, CT and MR imaging and angiography,

familiarity with essential steps in acute stroke therapy including thrombolytic therapy

principles of management of subarachnoid hemorrhage etc

Strategies for primary and secondary prevention of



Stroke

DEMENTIAS

Concept of minimal cognitive impairment,
Reversible and irreversible dementias,
Alzheimer's and other neurodegenerative diseases
Vascular, nutritional, and infectious dementias,
Familiarity with Pharmacotherapy of dementias,
Familiarity with cognitive rehabilitation and special care of the disabled

PARKINSONISM AND MOVEMENT DISORDERS

Disorders of extrapyramidal system such as parkinsonism, chorea, dystonia,
athetosis, tics, their diagnosis and Familiarity with management,
Familiarity with pharmacotherapy of parkinsonism and its complications,
Familiarity with management of complications of parkinsonism therapy,

CRANIAL NEUROPATHIES:

Disorders of smell, vision, visual pathways,
pupillary pathways and reflexes,
internuclear and supranuclear ophthalmoplegia;
trigeminal nerve testing,
Bell's palsy,

Investigations of vertigo and dizziness, differentiation
between central and peripheral vertigo,
Differential diagnosis of nystagmus ,



CNS and INFECTIONS:

Diagnosis and management of viral encephalitis, meningitis :

bacterial,

tuberculous,

fungal,

parasitic infections such as cysticercosis,

cerebral malaria in endemic regions of Iran and the world (travel preventive and therapeutic medicine)

Familiarity with gram stain and cultures, bac tec, QBC, ELISA and PCR technologies

NEUROIMMUNOLOGIC DISEASES

Familiarity with Diagnosis and management of CNS conditions such as

Multiple sclerosis MS

Myasthenia gravis,

Polymyositis

MYELOPATHIES

Clinical diagnosis of distinction between compressive and non-compressive myelopathies,

spinal syndromes such as anterior cord, central cord syndrome, Brown-Sequard syndrome,

Diagnosis of spinal cord and root compression syndromes,

PAEDITRIC NEUROLOGY:

Normal development of motor and mental milestones in a child,



Attention deficit disorder,
Autism,
developmental dyslexias,
Intrauterine TORCH infections,
Child hood seizures and epilepsies,
neurodegenerative diseases.

COGNITIVE NEUROLOGY AND NEUROPSYCHIATRY:

Detailed techniques of higher mental functions evaluation,
basics of primary and secondary neuropsychiatric conditions such as anxiety,
depression, schizophrenia, acute psychosis, clinical cognitive impairments

with emphasis on competency in

Algorithmic approach to diagnosis and management of:

- **acute confusional reactions (delirium),**
- **primary and secondary dementias,**
- **differentiation from pseudo-dementia**
- **Mild Cognitive Impairment**

Anxiety disorders, Hysteria and personality disorders,
depression and Bipolar disease,
Schizophrenia Delusional and paranoid state

Familiarity with neurological Rehabilitation



Familiarity with **NEUROIMAGING TECHNIQUES**, indications and their interpretation is of great importance.

Xray imaging (specially in emergency cases)

Computer Tomography CT scan,

Familiarity with MR imaging,

Familiarity with EEG,

Familiarity with EMG/NCV,

Neurology clerkship and Internship SOURCES and TEXT BOOKS

- Aminoff,s Clinical neurology: Aminoff M, latest edition
- Handbook of Clinical Neurology; Dr. Soltanzadeh et al. TUMS publications
- selected chapters from Principles of Neuroscience: Kandal and Schwartz latest edition
- Applied neuroanatomy: Carpenter, 9th Edition



Neurosurgery

Undergraduate Internship and clerkship rotation

Core Curriculum of the Neurosurgical Rotations.

The importance of the course

Central nervous system damages are one of the main causes of disability in most countries, including Iran. Taking the burden of traffic accidents and vehicle multiple trauma in Iran it is essential for physicians to be able to manage essential neurosurgical emergency cares.

Due to the prevalence of these diseases, it is necessary for all general practitioners to have the ability to algorithmically diagnose and treat patients, and they should be acquainted with the treatments for back pain, brain and spinal trauma. Although it is short rotation, the essential topics will be covered in clerkship and internship rotations.



The general Objectives of the program and educational goals

In the field of knowledge
should be able to:

1. be competent in diagnosis, clinical approach and essential steps of the following:

- **Cranial Trauma**
- **Spinal Trauma**
- **Increased intracranial pressure**
- **Back pain**
- **Cerebral hemorrhage**

2-Describe the signs, symptoms, principles of diagnosis and general principles of treatment of the above diseases **both in Outpatient set up and in emergency departments.**

3-Get **competent in the clinical skills related to neurological examinations in brain and spinal trauma.**

In the field of professional attitude and behavior,
should show sufficient competencies in the following areas:

- Dealing with respect in behavior and speech with patients, staff and peers



- Have honesty in speaking and writing about the patient, other physicians and members of the treatment team
- Giving priority to the patient, spending enough time listening to their concerns, and empathizing with them in all interactions
- Respecting the boundaries and boundaries defined in the physician-patient relationship
- Respecting the principle of patient confidentiality in clinical, social and electronic environments
- Introducing to the patient and explain the type of intervention (history, examination or procedure) and obtain the patient's consent before starting
- Full Availability during mandatory hospital hours
- Take responsibility and perform the assigned tasks in a complete and accurate manner
- Timing and no delay
- Observing appropriate professional coverage
- Installing the ID card on the gown always in a place visible to others

In the field of patient care,
must demonstrate sufficient competencies in the following areas:

- Obtaining and recording the history of a new patient whose responsibility has been entrusted to you in an organized and logical sequence in his / her file (even if it already exists in the history file or note)



- Perform a complete clinical examination of a new patient who has been entrusted to you and record the examination findings in an organized and logical sequence in his or her file (even if the clinical examination findings have already been recorded in the file).
- Daily recording of the course of the disease based on the SOAP model in the patient file and expression of course changes in the clinical round
- Introduce the patient for whom you are responsible in the clinical round and follow up the actions requested for the patient
- Wash your hands before contacting the patient and observe the basic principles of hygiene in interaction with the patient
- Discarding sharp objects such as needles or blades in the safety dedicated hazardous box after the procedure and not leaving them unattended

The Good Medical Practice domains are:

1. Knowledge, skills, and performance
2. Safety and quality
3. Communication, partnership, and teamwork
4. Maintaining trust



General management of the head injured patient

- KNOWLEDGE

To achieve competence in the general management of head-injured patients

The medical student should be able **to algorithmically approach to diagnosis, management, and treatment of head trauma**, with emphasis on ability of correct judgement in emergency situations and be acquainted with evaluation of **bed-side clinical alarm signs** in head trauma patient including:

- **signs of intracranial pressure ICP rise,**
- **rhinorrhea and rhinorrhagia,**
- **otorrhea and otorrhagia,**
- **transient loss of consciousness,**
- **transient memory loss,**
- **tenderness in spinal ridge and evaluation risk of probable vertebral damage (avoiding further CNS damage by stabilizing and proper collars such as Philadelphia teiled rigid collar)**
- Pathophysiology of head injury and of multiple trauma including an understanding of:

Cerebral perfusion and oxygenation,

Raised intracranial pressure,

Impaired intracranial compliance,

Intracranial herniation

Medical management of acutely raised intracranial pressure

- **Indications for operative intervention**

- familiarity with intervention including the use of **cranial pressure monitoring Principles**
- familiarity with diagnosis and confirmation of brain death
- familiarity with Principles of intensive care of head injured patients
- expertise in **spinal stabilization**
- **radiological assessment** in head injured patients
- **Natural sequence of recovery** from head injury including neurological, cognitive and behavioral disability and posttraumatic epilepsy
- Role of **neurological rehabilitation**
- **Prevention of secondary** insults

CLINICAL SKILLS

- Clinical assessment of the multiply injured patient
- Neurological assessment of the head-injured patient including:
 - **Assessment and categorization of impaired consciousness,**
 - **Recognition and interpretation of focal neurological deficits**
- Acquaintance with clinical **risk Interpretation of CT scans and plain radiology**
- Clinical assessment of the head-injured and multiply-injured patient
Interpretation of multi-modality cerebral monitoring
- Ability to assess and advise on the transfer of head-injured patient using image-transfer and consultations.

General management of the
Head soft tissue trauma (Injured Scalp)

To achieve competence in the management of cranial soft tissue trauma

KNOWLEDGE

- Anatomy and blood supply of the scalp
- Indications for primary and secondary closure of wounds
- Indications for antibiotic prophylaxis

CLINICAL SKILLS

- Assessment of tissue perfusion and viability

TECHNICAL SKILLS AND PROCEDURES

- Wound exploration under local and general anesthesia
- Wound debridement
- Arrest of scalp hemorrhage
- Layered closure of the scalp without tension
- Suturing technique
- Wound drainage and head bandaging

General management of
subarachnoid hemorrhage (SAH)

To achieve competence in the general management of subarachnoid hemorrhage (SAH)



KNOWLEDGE Domain

- Etiology of SAH
- Pathophysiology of SAH WFNS grading of SAH
- Principles of resuscitation and timing of interventions.
- Indications for CT scanning,
- diagnostic lumbar puncture, CT angiography and digital subtraction angiography
- Principles of management of post-hemorrhagic hydrocephalus
- Indications for endovascular and surgical intervention

CLINICAL SKILLS

- Interpretation of CT scans including
- assessment of intracranial blood load, hematomas and hydrocephalus
- Basic familiarity with interpretation of cerebral angiography

TECHNICAL SKILLS AND PROCEDURES

- **Performing Lumbar puncture**
- **Diagnostic lumbar puncture interpretations and differential diagnosis**
- To recognize and manage delayed cerebral ischemia following subarachnoid hemorrhage. Familiarity with Pathophysiology of delayed cerebral ischemia including the impact of secondary insults Principles governing the augmentation of cerebral blood flow
- Assessment of a **deteriorating patient**
- Recognition and management of **secondary insults Interpretation of CT scans**
- Familiarity with Management of hypervolemic hypertension
- **Assessment of the unconscious and deteriorating SAH patient.**
- **Interpretation of CT scans**

General management of the spinal injury patient

Knowledge domain:

To achieve competence in all aspects of the non-operative management of spinal injury patients

- Pathophysiology of spinal cord injury Classification of spinal fracture dislocations
Biomechanics of spinal instability
- Indications for halo traction and external stabilization
- Indications for and principles of open reduction and stabilization

CLINICAL SKILLS Domain:

- Clinical assessment of the spinal injury patient
- Management of spinal shock
- Interpretation of plain radiology, CT and MRI scans Liaison with spinal injury
-

TECHNICAL SKILLS AND PROCEDURES Domain:

- Use of external immobilization
including cervical collars and spinal boards
- Appropriate Application of Philadelphia Collar without positional shift in cervical spine

General management of Lumbar radiculopathies

To achieve familiarity in the management of lumbar compressive radiculopathies

- Indications for operative management of lumbar radiculopathies
- Applied anatomy of the lumbar spine with particular reference to degenerative neural compression and morphological variations in vertebral anatomy
- Familiarity with Principles of peri-operative care Complications of surgery

General management of Compressive cervical myeloradiculopathies

To achieve familiarity in the management of compressive cervical myeloradiculopathies

- Indications for operative and nonoperative management of cervical myeloradiculopathies
- Applied anatomy of the cervical spinal column with particular reference to the relationships between the bony elements, spinal cord, nerve roots and vertebral arteries
- To achieve familiarity Selection of surgical approaches
- Principles of peri-operative care
- Complications of surgery

CLINICAL SKILLS

Familiarity with Interpretation of plain radiographs, CT scan, MRI scans and CT myelograms



General management of
Pediatric head and spinal injury

Knowledge Domain

To achieve competence the management of **accidental and non-accidental pediatric head and spinal injuries.**

- Pathophysiology of raised intracranial pressure in children following head injury
- Prevention and treatment of secondary insults
- Medical management and intensive care in pediatric head injury
- Pathophysiology, legal and social aspects of non-accidental injury in children
- Management of perinatal trauma,
- growing fractures and penetrating injuries in children
- Indications for decompressive craniectomy in management of intractable increases in ICP
- Rehabilitation after mild, moderate and severe head injuries
- Classification, assessment, investigation, and management of pediatric spinal injuries

CLINICAL SKILLS

Algorithmic Assessment and clinical management of children with head and spinal injuries



Anesthesia and Intensive Care for General Medicine Trainees

Department of Surgery, Internal Medicine (ICU) and
Department of Anesthesiology and Intensive Care

Internship Theoretical and practical

Description of the course and its outcomes:

During this period, students will become familiar with the principles of **airway administration, water and electrolyte principles, acid and base, as well as cardiopulmonary resuscitation.**

Topics of theoretical sessions:

- Airway management
- Fluid & Electrolyte Balance
- Acid/base Balance
- Cardiopulmonary Resuscitation
- Monitoring Principles

Practical Topics:

Intravenous Access and Serum Administration
Essential monitoring principles in the operating room and ICU
ABG Interpretation
Airway Management
Fluid Therapy
Cardiopulmonary resuscitation (primary and advanced)

Practical Sessions: Professors of Anesthesiology and ICU during the days of students' presence in the operating room and ICU

Total course hours:

First week Operating room: 5 days, 5 hours each.

Theory: 5 days, 1 hour each

Total 30 hours

Second week ICU: 5 days, 6 hours each

A total of 60 hours in two weeks

General objectives of the course:



Acquiring some of the most vital and essential theoretical and practical skills and knowledge in the intensive care unit, including airway management and cardiopulmonary resuscitation

Specific objectives of the course:

the principles of the Airway management and administration theoretically and practically

the principles of essential monitoring in the anesthesiology and intensive care unit theoretically and practically

the principles of Fluid and electrolyte administration in Critical patients theoretically and practically

ABG interpretation

primary and advanced cardiopulmonary resuscitation theoretically and practically

Theory and practical skills and knowledge of intravenous access and administration

Training Method:

Education is theoretical and practical in two Modules.

In the first week, every day from 8 to 9 am in the topics mentioned theoretical class is held for students and the first day of practical training from 9-14 hours is dedicated to training of airway administration in skill lab of hospital. During the next 4 days in the first week of training, practical and on the bedside patients in the operating room will be within 4 days in the second week on the first day of practical CPR training (basic and basic Advanced) will be performed in Skill Lab and then over the next 4 days, training will be in the intensive care unit and practically and educational rounds will be on the patients' bedside.

Student Evaluation Method:

In two ways:

DOPS for intravenous access and administration, as well as Ambo Bag Mask Ventilation
OSCE for intubation, ABG interpretation, cardiopulmonary resuscitation, Fluid and electrolyte management and essential monitoring

Sources:

The source of the study for students for the topics of airway and monitoring and Fluid and electrolyte and open acid will be from **the latest edition of Basics of Anesthesia, Miller and Stoltz** and the source for cardiopulmonary resuscitation will be the latest **AHA guidelines** for this topic.



Session Title: **Airway Management**

General objectives:

Familiarity with the principles of the Airway Management

Specific objectives:

Introduction to Airway Anatomy

Familiarity with the equipment used in the Airway Management

Introduction to positions and maneuvers of the Airway Management

Introduction to ventilation with bags and masks

Introduction to Airway Intubation

Familiarity with „Difficult Airway Prediction Methods”

Training Method:

One hour theory Session

One day (5 hours) practical training in hospital skill Lab with educational aids and moulage

4 days practical training in the operating room

5 days of practical training in ICU

Source: Basic of Anesthesia Miller and Stoelting Latest version

Session Title: **Monitoring Principles**

General Objectives: Familiarity with essential monitoring principles in operating room and ICU

Specific objectives: Introduction to the principles of EKG

Introduction to EtCO₂ Principles

Introduction to the principles of Spo₂



Introduction to Temperature Monitoring

Introduction to bispectral index principles

Introduction to the principles of Blood pressure monitoring

Training Method: One hour theory class

5 days practical training in the operating room

5 days practice training in ICU

Source: Basics of anesthesia Miller and Stoelting Latest Edition

Session Title: Intravenous Access

General objectives:

All students learn how to insert a Reliable Peripheral intravenous Catheter.

Specific objectives:

Introduction to venous anatomy

Introduction to Peripheral Intravenous device administration

Introduction to Central Intravenous Access

Training Method:

One hour theory class

5 days practical training in the operating room

5 days of practical training in ICU

Evaluation Method: DOPS in operating room

Source: Basics of anesthesia Miller and Stoelting Latest Edition

Session Title: Fluid and Electrolyte, Acid-Base Balance

General objectives:



Familiarity with ABG interpretation and administration of fluid and electrolyte in operating room and ICU.

Specific objectives:

Introduction to the routine intravenous replacement fluids in adults and children

Learn how to administrate fluids

Introduction to acid-base disorders

Treatment of acid-base disorders

Training Method:

One hour theory class

5 days practical training in the operating room

5 days of practical training in ICU

Source: Basics of anesthesia Miller and Stoelting latest Edition

Session Title: Cardiopulmonary Resuscitation

General objectives:

Familiarity with the basics and advanced cardiopulmonary resuscitation principles.

Specific objectives:

Introduction to BLS

Introduction to ACLS

Introduction to Post CPR management

Training Method:

Two hours of theoretical class 10 days of practical training directly in the operating room and ICU and dispatching for CPR with residents in the emergency department and other hospital wards in case of CPR code announcement

The Latest CPR Guideline by AHA



Surgery

TUMS internship Rotation (undergraduate)
Core Curriculum and Syllabus

1- Duration of the course:

The minimum mandatory duration of the general surgery internship is two months.

— Definition of the month during the internship:

- One month in TUMS Internship rotations in general medicine curriculum is equivalent to at least 130 hours. Excluding on-call duty.

— It is necessary to attend night shifts in a certain minimum quantity and perform the assigned tasks efficiently and with a sense of responsibility by the interns.



- None of the interns of the internship course can be assigned to other colleagues and interns in any way and under any circumstances (in case of illness or excuse. Must have performed the required number of duties).
- reaching certain quantity of night shifts and procedures is required to receive the final grade certified officially.

2- Duration of educational hours during the course:

Interns must accomplish at least 260 hours of clinical training in the general surgery department.

3- The person in charge of the program:

By approval of the surgery group director, one of the faculty members of the group is appointed as educational focal point; Responsible for arrangement of medical student internship rotation.

In each hospital ward, one of the faculty members will be responsible for training the interns in the relevant ward with the approval of ward head of surgery.

4- Faculty members of the program:

All members and departments of general surgery, including professors, faculty members and surgeons, and assistants and fellowship students are involved in training medical interns.

5- Expected outcome of this training program:

The purpose of this training program is to create a good foundation for independent practice of medicine after graduation as a general practitioner, which provides important aspects of providing and promoting health. Acute and chronic preventive medicine and care in the field of diseases
Include surgical procedures.



A - In the field of knowledge:

- 1- Acquiring the necessary knowledge and the ability to implement it in management of common surgical complaints and common symptoms in surgical diseases
- 2- Recognizing the generalities of general surgical diseases and gaining the necessary competency to use it in the primary medical treatment of patients within the scope of the duties of a general practitioner and competency in prioritizing and timely referral of patients.
- 3- Acquiring knowledge related to performing simple outpatient procedures that can be performed by a general practitioner in scope of medical council and MoH&ME guidelines.

B - In terms of skills:

- 1- Ability to take a clinical history. Performing physical examination and planning differential diagnoses in patients with general surgical problems
- 2- Ability to perform surgical core mandatory procedures
- 3- Ability to interpret laboratory tests and interpret para-clinical evaluations and imaging in the field of surgery
- 4- Ability to diagnose the indications and contraindications of surgical treatment in various diseases and the indications for referral, urgent, and emergent management.

C - In the field of attitude:

Attitude and behavior in accordance with the codified indicators of general competencies standards approved in March 2003 with emphasis on medical ethics, professional behavior, Accountability, and sense of responsibility. Effective communication and teamwork training. Social healthcare and means of prevention.



Content that should be taught and learned to achieve the above-mentioned objectives:

note:

This training program covers some orthopedic topics.

Urology and neurosurgery topics are covered in other chapters.

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| Algorithmic approach to diagnose and management of Gastrointestinal bleeding |
| Algorithmic approach to diagnose and management of Breast complaints (mass, discharge, pain) |
| Algorithmic approach to diagnose and management of Thyroid nodules |
| Algorithmic approach to diagnose and management of Pain and swelling of the limbs (with emphasis on vascular problems) |
| Algorithmic approach to diagnose and management of Perianal complaints (mass, discharge, pain) |
| Algorithmic approach to diagnose and management of Abdominal wall hernias |
| Algorithmic approach to diagnose and management of fluid and electrolytes balance disorders and competency in major intravenous serum therapy methods |
| Competency in Trauma and multiple Trauma management |
| Algorithmic approach in initial assessment and resuscitation Airway assessment and algorithmic steps and procedures. Algorithmic approach to diagnose and management of Head and spine trauma |

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| Algorithmic approach to diagnose and management of Neck trauma |
| Algorithmic approach to diagnose and management of Chest trauma (penetrating and Blunt) |
| Algorithmic approach to diagnose and management of Abdominal and pelvic trauma (penetrating and Blunt) |
| Algorithmic approach to diagnose and management of Trauma of Limbs and extremities |
| Competency in Preoperative preparations |
| Be familiar with diagnosis and management of Common complications of surgery |
| Be familiar with Common mismanagements, iatrogenic complications, and Mistakes in Surgery domain |
| Competency in clinical History taking of surgical patients |
| Competency in clinical examination of surgical patients |
| Be competent in common diagnostic interpretations of surgical findings in radiographies |
| Be competent in primary evaluation of trauma patient |
| Be competent in Basic Administration of Airway and efficient patient Intubation |
| Be competent in Draining the pneumothorax with a needle |



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| Be familiar with Chest tube administration (in surgery rotation or emergency medicine rotation observing the procedure is mandatory and performing under supervision of superiors is recommended) |
| Be competent in Control of external bleeding |
| Be familiar with saphenous vein cutdown (in surgery rotation or emergency medicine rotation observing the procedure is mandatory and performing under supervision of superiors is recommended) |
| Be competent in Immobilization of the body (neck, limbs and pelvis) |
| Be competent in approach to patient in hemodynamic Shock |
| Be competent in Primary management of burn patients |
| Be competent in Use of basic surgical instruments |
| Be competent in Biopsy and excision of skin and subcutaneous lesions |
| Be competent in Local anesthesia (topical and via injections) |
| Be competent in Suturing and soft tissue primary and secondary closure methods |
| Be competent in Simple wound debridement |
| Be competent in Dressing and bandaging |
| Be competent in incision and drainage of superficial abscesses |

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| Be competent in dressing and prepping protocols in operation rooms, Wearing gowns and sterile gloves correctly |
| Be competent in Injections & Venipuncture / Arterial Puncture /extremities Injections / Multi-Functional IV administration specially in infants, children and elderly |
| Be familiar with Central venous pressure measurement |
| Be competent in Insertion of gastric tube and gavage protocols |
| Be competent in Insertion of urinary catheter - Foley urinary catheter and Nelaton urinary catheter |
| Communication skills |
| Ability to record information -Complete efficient documentation of patient records and transcripts |
| Ability to use evidence-based medical resources in surgery |
| Feeling responsible for patients |
| Paying attention to the patient's systematic and complete systematic examination and symptoms |
| Giving importance to documenting patients' progress and writing records |
| Paying attention to educating and justifying the patient and his companions efficiently avoiding complicated medical terminologies |
| Knowledge of the principles of medical ethics and their implementation |



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| Giving importance to the problems of the society in the field of surgical diseases |
| Emphasize cost-effectiveness and quality of care |
| The importance of teamwork in dealing with patients with multiple or severe trauma |

It is necessary to hold intensive training programs (at least once a week) with the active participation of interns

Grand Round

Emergency Round

Clinic outpatient management

pre-op and post-op visits

Daily Morning report

8- How to teach and learn:

in terms of strategy

Using community-oriented medical education strategies. SPICES. Recommended.

It is necessary to teach each of the subjects in the most appropriate way that leads to the best learning in the interns.

The use of active learning methods and interactive teaching methods is recommended.

Examples of teaching and learning methods are:

Bedside teaching

Ambulatory teaching

Problem-based learning

Apprenticeship model

Lecture

Small group discussion

Large group discussion

Computer-assisted learning

Role play



Role model
Video presentation
Workshop
Task-based learning
Demonstration

Formative assessment methods of Knowledge, skills and attitudes and how to provide feedback during the course:

It is necessary that during each section of knowledge, skills and attitudes of interns be objectively evaluated by professors and assistants. For this purpose, various evaluation methods such as:

- . Mini-Clinical Evaluation Exercise (mini-CEX)
- . Clinical Encounter Cards (CEC)
- . Clinical Work Sampling (CWS)
- . Blinded Patient Encounters (BPE)
- . Direct Observation of Procedural Skills (DOPS)
- . Case-based Discussion (CbD)
- . Multisource Feedback (MSF)

Used. It is mandatory to provide appropriate feedback to trainees after formative evaluations (the use of "Global rating forms" is not recommended as the only form of formative assessment. The use of multiple assessment methods adds to its validity and reliability)

Sources:

In the field of knowledge:

The same resources as the pre-internship comprehensive exam including

selected chapters of **Schwartz's textbook of general surgery**

in the field of skills

Surgery Handbook Author Amir Keshvari et al. baraye farad Publications



Urology

for Clerkship and Internship Rotation

Aims and objectives

The main aim of this document is to demonstrate those common clinical domains of urology that are generic to the majority of practicing physicians, and that must be covered during undergraduate medical training.

In Appendix 1, TUMS students can document their progress through the urology rotation, for inclusion in their undergraduate logbook.

KEY PRESENTATIONS OF UROLOGICAL DISEASE

These can be broadly categorized as follows:

- Algorithmic approach to diagnose and management of **Visible or invisible hematuria**
- Algorithmic approach to diagnose and management of **Lump in the scrotum**
- Algorithmic approach to diagnose and management of **Pain in the scrotum**
- Algorithmic approach to diagnose and management of **male patient with sexual problems**
 - erectile dysfunction
 - premature ejaculation
 - penile deformity
- Algorithmic approach to diagnose and management of **Pain in the costovertebral angle**
- Algorithmic approach to diagnose and management of **Mass in the costovertebral angle**
- Algorithmic approach to diagnose and management of **Pain in the groin**
- Algorithmic approach to diagnose and management of **Mass in the groin**
- Be competent in algorithmic approach to diagnose and management of **Urinary tract infection**
 - cystitis
 - pyelonephritis
 - epididymo-orchitis
 - balanitis



— prostatitis

- Algorithmic approach to diagnose and management of **Urosepsis**
- Algorithmic approach to diagnose and management of **Lower urinary tract symptoms**
 - difficulty holding urine
 - difficulty voiding urine
- Algorithmic approach to diagnose and management of **Urinary incontinence**
 - urge incontinence
 - stress incontinence
- Algorithmic approach to diagnose and management of **Urological trauma**
 - fractured penis
 - fractured pelvis
- Algorithmic approach to **Raised PSA**
- **Perioperative care, management of urological complications** and care of the critically ill patients.
- Familiarity with **Urodynamics and Neurology**.
- Familiarity with **Genito-urinary trauma**.



Physiopathology of urologic disorders

Surgical Anatomy of the Retroperitoneum, Kidneys and Ureters

- Anatomy and Embryology of GU tracts, adrenal & retroperitoneum.
- Applied physiology and biochemistry pertaining to Urology, Nephrology, renal transplantation and renovascular hypertension.
- Investigative urology & Genito-urinary radiology and imaging including nuclear medicine.
- Male Infertility, Andrology and Urological endocrinology
- Sexual dysfunction- investigations and management.
-

Infections and Inflammation

- **Infections of the Urinary Tract.**
- Inflammatory Conditions of the Male Genitourinary Tract
- Interstitial **Cystitis** and Related Disorders
- Be competent in Algorithmic approach to diagnose and management of **Sexually Transmitted and Associated Diseases** and Related Conditions:

- **Bacterial Vaginosis (BV)**
- **Chlamydia.**
- **Gonorrhea.**
- **Hepatitis.**
 - with Emphasis on **HBV HCV**, prevention and handling in endemic regions of Iran and promotion in the population at risk

- **Herpes simplex and genital Herpes**
Be competent in Algorithmic approach to diagnose and management of different types of Herpes infections
- **HIV/AIDS & STDs.**
- **Human Papillomavirus (HPV)**, screening and vaccination preventive protocols
- **Pelvic Inflammatory Disease (PID)**
- **STDs & Infertility**
with emphasis on Chlamydia and gonorrhea
-
- **STDs during Pregnancy**
- **Syphilis**
Be familiar with Algorithmic approach to diagnose and management of complications

- Other STDs
trichomoniasis, scabies, etc.

- Urological Implications of HIV infection
- **Cutaneous Diseases** of the External Genitalia
- **Tuberculosis** and Other **Opportunistic Infections** of the Genitourinary System

Urolithiasis

- Be familiar with its Clinical, Biochemical & Surgical aspects
- Be competent in Algorithmic approach to diagnose and management of
 - Upper Urinary Tract Calculi
 - Lower Urinary Tract Calculi
- Familiarity with indications and principles of Surgical approach, PCNC, Intracavity, Cystoscopy, and ESWL

Urinary Incontinence in male & female patients

- Be familiar with Algorithmic approach to diagnose and management of **urinary incontinence in male & female patients**
- Be able to differentiate between **Stress Incontinence & Urge Incontinence**

Prostate and Seminal Vesicles

- Competency in Biology, Endocrinology, and Physiology of the Prostate and Seminal Vesicles
- Be competent in Etiology, Pathophysiology, and Epidemiology of **Benign Prostatic Hyperplasia**



- Be competent in national and international screening protocols of **Benign and malignant Prostatic Hyperplasia**
- Natural course, Evaluation, and **Non-surgical Management** of Benign Prostatic Hyperplasia
- Familiarity with Minimally Invasive and Endoscopic Management of Benign Prostatic Hyperplasia
- Be competent in Epidemiology, Etiology, and Prevention of **Prostate Cancer**
- Be familiar with indications and Pathologic differentiation of Prostatic Neoplasms, Ultrasonography and Biopsy of the Prostate
- Be familiar with **Tumor Markers** in Prostate Cancer
- Be familiar with Early Detection, Diagnosis, and Staging of Prostate Cancer
- Be familiar with Definitive Therapy of Localized Prostate Cancer : Outcomes Expectant Management of Prostate Cancer
- Be familiar with indications of Retrograde Retropubic Prostatectomy
- Be familiar with indications of Prostatectomy and Pelvic Lymphadenectomy
- Be familiar with indications of Radiation Therapy for Prostate
- Be familiar with indications of Hormonal Therapy for Prostate
- Be familiar with Management of Hormone-Resistant Prostate Cancer

Common urological conditions of childhood

• Have an awareness of the most common urological problems in childhood with emphasis on:

- Be familiar with **Urinary Tract Infection in Childhood**
- Be familiar with Algorithmic approach to diagnose and management of **Undescended Testis**
- Be familiar with **Phimosis**
- Be familiar with **Acute Scrotal Pain and Swelling**

Male Infertility

And male reproductive organ

- Be familiar with Algorithmic approach to diagnose and management of the causes of **Male infertility**
- Be familiar with Algorithmic approach to diagnose and management of **Erectile Dysfunction (ED)**
- Understand the physical & psychological causes of erectile dysfunction
- Be familiar with the implication of ED as a marker for systemic vascular disease

Core Curriculum and Essential training program

gynecology diseases and obstetrics including gynecology and obstetrics emergencies

for internship Rotation
(undergraduate medical students)

- Course length: 2 months (minimum core mandatory)

* Definition of month in the internship period:

- Each month of internship in general medicine training is equivalent to at least 130 hours, Excluding mandatory shifts.

The maximum required night shifts is 12 per month.

It is necessary to attend night shifts in a certain quantity and perform the assigned tasks efficiently and with a sense of responsibility by the interns.



- None of the night shifts of the internship period can be assigned to other colleagues and interns in any way and under any circumstances (in case of illness or excuse. At the end of the course, he / she must have completed the required number of guards).
- Reaching the specified quantity and quality assessment is necessary for the final certificate.

- Duration of effective training hours during the course: 260 hours (minimum core mandatory)

- Program manager: responsible for student education / deputy director of hospital education

- Program faculty members: Hospital faculty members, including the whole spectrum from the professors to specialty Residents.

- **Expected outcome of this training program:**

The intern must have sufficient knowledge of epidemiology, etiology, pathogenesis, pathology, clinical manifestations, clinical history, the impact of potential physical and psychological factors on the patient, and the basics of patient treatment in the context of common and important gynecology diseases and gynecology emergencies.

1- The intern of the gynecology department at the end of her training course should be able to obtain a detailed history and physical examination and prepare a list of correlated problems and differential diagnoses, and has learned the appropriate diagnosis and treatment and discuss their treatment method.

2- The intern of the gynecology department should have learned the appropriate diagnostic approach to the main complaints and symptoms of gynecology at the end of the course.

3- The intern of the gynecology department should be able to perform practical diagnostic and therapeutic measures that every obstetric and gynecological patient needs at the end of her training course in the gynecology department.

4. The intern of the gynecology ward must be able to interpret the common laboratory tests and radiology used in the gynecology ward at the end of her training course in the gynecology ward.



5. The intern at the end of the gynecology training course should be able to write the correct summary of the file, Off service note, On service note, Progress note.

At the end of the gynecology training course, the intern must be able to provide outpatient treatment, hospitalization, and refer patients to provide the best medical care.

interns must be able to appropriately communicate at the end of the course. Provide care empathically and collaboratively with the patient's family and companions, other physicians and practitioners.

The intern's relationship with the patient should be based on the understanding and feeling of empathy and methods of participation in order to gain the patient's trust.

For this purpose:

A-The intern must listen carefully and patiently and spend time with the patient and his companions, and in addition to establishing a professional relationship with him, analyze and record the detailed history and information discovered. Reciprocally provide the patient and his / her companions with the necessary information about the details of the treatment situation, the possible risks of different methods, and the necessary prevention instructions.

B- The intern should consider the influence of factors such as age and gender, level of education, religious-cultural and socio-economic backgrounds in how to communicate with the patient and his companions and consider the patient's position according to the above factors.

C- The intern should learn to consult with other medical professionals at the appropriate time and find and use their share and role in the patient treatment process. Also have an active and constructive participation in group work.



- **Indicators for determining the essential content and methodology for determining the essential content:**

- The issue of the priorities of the health system
- Common and important complaints and diseases in gynecology
- It is needed by the society.
- To have an impact on the health of women and family.
- The disease can be prevented and have a screening program
- The role of graduates in the health system
- Success stories and international Valid Protocols

Resources used in determining the criteria for determining the necessary content:

- Approvals of the regulations of the Ministry of Education
- Use the experience of faculty members
- Considering the goals and needs of the Deputy Minister of Health
- Approvals of the headquarters of the Supreme Council of the Cultural Revolution
- Needs assessment acquired from surveys on general medicine graduates
- Use of health information and epidemiology of gynecological diseases



Skills that should be taught and learned so that the intern can have the diagnostic and therapeutic ability and appropriate referral skills in gynecology diseases and gynecology emergencies:

A- In the field of knowledge:

| |
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| Abnormal uterine bleeding |
| Menstrual disorders - dysmenorrhea -PMS |
| Menopause and HRT |
| Upper and lower genital tract infections |
| Amenorrhea |
| Abdominal pain (acute-chronic) In Pregnancy-nonpregnancy |
| Pelvic pain (acute-chronic) In Pregnancy-nonpregnancy |
| Infertility |
| Mass or discharge from the breast |
| Pelvic masses benign – malignant |
| Cervical findings abnormal Pop smear |
| Hypertension in pregnancy |

| |
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| Gestational Diabetes |
| Consciousness disorder - Convulsions in pregnancy |
| Contraception |
| Fever - Shortness of breath Itching - Nausea Vomiting in pregnancy |
| Anemia in pregnancy |
| Thyroid disorders in pregnancy |
| Infectious diseases in pregnancy |
| High-risk and multiple pregnancies |
| Post pregnancy Complains and diseases |
| Bleeding - placental p.- infection- Urine retention) |
| Dystocia |
| Midwifery bleedings: first half: abortion – GTN-EP = Second half: Decolman- Placenta Previa – DIC |
| Gastrointestinal diseases in pregnancy |
| Premature labor - Premature rupture of the amniotic sac - inadequate intrauterine growth of |
| Fetal – IUFD |
| Fetal distress-Meconium excretion- Cord prolapse |
| Trauma in pregnancy and trauma to the genitals |

| |
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| Cardiovascular disease in pregnancy |
| Indications, usage forms, contraindications and side effects of commonly used Pharmaceuticals and Drugs |
| Imaging methods in obstetrics and midwifery |
| <p>Patient referral Indications*:</p> <ul style="list-style-type: none"> - Indications (Attached) - How to refer (patient preparation, documentations, registration, etc.) - Referral centers - Levels of care providing health services and patient referral system according to the implementation of the program of urban and Rural family physician nationwide) |
| <p>Legal issues related to the context</p> <ul style="list-style-type: none"> - issuance of a death certificate - a medical excuse certificate - Cases of sexual abuse - Abortion - Termination of pregnancy - reporting side effects of drugs Mandatory ADR Adverse drug reaction by Iranian ministry of health |
| Common causes of maternal mortality and the status of this index in Iran, the region and the worldwide |
| Common causes of infant mortality and the status of this index in Iran, the region and the worldwide |



| |
|--|
| Common causes of Near Miss and the status of this index in Iran, the region and the worldwide |
| Maternal health care |
| National system of maternal care |

* since knowledge of referral indications plays a key role in reducing maternal mortality, it is attached to the appendix of all referrals (immediate – non-immediate).

B- In the field of skills:

| |
|---|
| Expected Outcome: |
| 1- Ability to acquire clinical history from the patient and his companions efficiently |
| 2- Ability to write Documentations and patient summaries correctly including On & off service notes & progress note according to mentioned scientific references and protocols. |
| Ability to perform physical examination on the patient |
| Ability to perform genital examination |
| Ability to perform breast examination |



Ability to fully record and document patient-related findings

Comprehensive ability of analysis and interpretation of the findings

Ability to design appropriate diagnostic and treatment plan
(Algorithmic approach in diagnosis and treatment)

Ability to prescribe basic and necessary drugs in obstetrics and gynecology

- Indications and contraindications,
- side effects
- Drug interactions
- Dose adjustments in pregnancy
- Pharmaceutical advice and changes due to stages and trimesters of pregnancy is of high importance (emphasis in teaching and evaluation is mandatory)

Ability to provide counseling before and after pregnancy

- Pre and post marriage Consultation tailored to cultural context of patients,
- providing contraceptive consultations to the families
- patient education in Obstetrics and gynecology context according to general practitioner roles and regulations.

Ability to interpret essential laboratory and radiological tests including:

beta HCG,
Hormonal Assessment,
blood cell count,
Complete urine test,
NST,
Pop smear,
Wet Smear,
spermogram

| | |
|---|---|
| And general interpretation and familiarity with sonography | |
| Ability to refer the patient when necessary | |
| Management of emergencies (acute and abnormal uterine bleeding, Hypertension; | |
| Ability to perform curettage at least on the model | |
| Ability to perform the following practical procedures and actions: | |
| | <ul style="list-style-type: none"> • uterine massage (one handed and two handed) |
| | <ul style="list-style-type: none"> • Administer urinary foley catheter |
| | <ul style="list-style-type: none"> • Fetal heart auscultation |
| | <ul style="list-style-type: none"> • Leopold examinations |
| | <ul style="list-style-type: none"> • Installation of speculum and preparation of Pap smear |
| | <ul style="list-style-type: none"> • Cardiopulmonary resuscitation of mother and baby |
| | <ul style="list-style-type: none"> • Perform a normal spontaneous delivery (NVD) |
| | <ul style="list-style-type: none"> • Performing an Episiotomy and further steps |
| | <ul style="list-style-type: none"> • Curettage in cases of placental tissue retention |

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| <ul style="list-style-type: none"> • Extracting pregnancy products leaving the cervix (with Placenta Pince) |
| <ul style="list-style-type: none"> • Placing and extracting IUDs |
| <ul style="list-style-type: none"> • Stabilization and transfer of the baby from the delivery room |
| <ul style="list-style-type: none"> • Start breastfeeding in the first hours of birth |
| <p>Ability to actively integrated maternal care handbook</p> |

***Skills mentioned are core and essential ones. Further skill and ability sets might be mandatory by Hospital Authorities administration.**

**** Active participation in bedside management as a team member and simultaneously skill-Lab education both are emphasized, and one does not replace the other.**

C- In the field of attitude:

- commitment to the principles of medical ethics in professional behavior and respect religious context and beliefs of the patient and her accompanies.
- Having the appropriate professional attitude and the ability to create a sense of trust and mutual respect between the patient physician and all colleagues of the health team
- Value the patient's independence in choosing and active participation of the patient in decisions related to him.
- Respect for the mutual rights of the patient and the physician
- Appropriate communication with the patient and his companions based on cultural, religious and economic backgrounds. Social, Age, gender and level of education
- Familiarity with the advances of medical knowledge and how to apply new medical methods and participation in the promotion of medical knowledge



- participating actively in Planning and conducting Patient Education.
- Recognize the legal responsibilities of the general practitioner
- participating actively in Planning and conducting research



How to teach and learn

In terms of education strategy, implementing “Community-oriented medical education - SPICES” is recommended.

The use of strategies becomes necessary to preferably teach each of the topics in the most appropriate way that leads to the best learning in interns.

The use of active learning methods and interactive teaching methods is recommended.

Examples of teaching and learning methods are:

- Bedside teaching
- Ambulatory teaching
- Problem-based learning
- Apprenticeship model
- Lecture
- Small group discussion
- Large group discussion
- Computer-assisted learning
- Role play
- Role model
- Video presentation
- Workshop
- and Task-based learning
- and Demonstration

Main Sources:

The same resources as the pre-internship exam including:

and Danforth David N, et al. Danforth Obstetrics and Gynecology. 9 th edition.
Lippincot, Williams & Wilkins; 2003

Integrated care of the injectors of the rage of the ungrateful fungus of the physician
Cle peepee V (Maternal Health Department of the Ministry of Health and Medical
Education)



- 1- National system of maternal mortality care (Department of Maternal Health of the Ministry of Health and Medical Education)
- 2- Minimum competencies expected from a general practitioner graduated from medical universities of the Islamic Republic of Iran (Deputy Minister of Education of the Ministry of Health and Medical Education)
- 3- Clinical education and evaluation »What every clinical professor should know (Dr. Elahe Malekan Rad et al.)
- 4- Internal evaluation indicators based on basic standards of general medical education (Deputy Minister of Education, Ministry of Health and Medical Education)
- 5- National guidelines for family planning of the Ministry of Health
- 6- Guide to family planning services for general practitioners



Pediatrics

Internship Rotation Course and core Syllabus

1- Duration of the course:

The minimum mandatory duration of the Pediatrics internship rotation is **three months**.

- Definition of the month during the internship:
 - One month in TUMS Internship rotations in general medicine curriculum is equivalent to **at least 130 hours. Excluding on-call duty**.

- It is necessary to attend night shifts in a certain minimum quantity and perform the assigned tasks efficiently and with a sense of responsibility by the interns.

- None of the interns of the internship course can be assigned to other colleagues and interns in any way and under any circumstances (in case of illness or excuse. Must have performed the required number of duties).

- A certain quantity of night shifts and procedures is required to receive the final grade certified officially.



2- Duration of educational hours during the course:

Interns must accomplish at least **390 hours** of clinical training in the pediatrics general and specialty departments. (Including PICU and NICU)

3- The person in charge of the program:

By approval of the pediatrics group director, one of the faculty members of the group is appointed as educational focal point; Responsible for arrangement of medical student internship rotation.

In each hospital ward, one of the faculty members will be responsible for training the interns in the relevant ward with the approval of ward head of pediatrics.

Expected Outcomes in Pediatrics Internship Rotation:

A. In the field of knowledge:

- The pediatric intern must have sufficient knowledge of epidemiology, etiology, pathogenicity, pathology, clinical manifestations, Clinical history, the impact of potential physical and mental factors on the patient, basic principles of patient treatment in the field to diagnose and manage common main pediatric diseases and pediatric emergencies.
- It is necessary to provide **50% of pediatric internship training in outpatient centers -including TUMS clinics, affiliated health centers- and emergency rooms.**
- Tehran university of medical sciences TUMS is committed to provide suitable infrastructure for education, including health centers that meet the educational standards of clinics, emergencies, etc., and to provide education for each of the following subjects in the most appropriate place for teaching that subject.
- It is necessary for **infant resuscitation and breastfeeding workshops** to be held properly to gain competency in these subjects, and Tehran University of Medical Sciences and Health Services will have continuous and complete supervision over its proper implementation.



- **Pediatric Interns are expected at the end of the rotation, to be competent in following knowledge domains and be able to implement them in their medical practice:**

| Knowledge Domain |
|---|
| <ul style="list-style-type: none"> • The normal physical and mental development of children from birth to puberty |
| <ul style="list-style-type: none"> • Abnormal physical and mental developmental processes from birth to puberty |
| <ul style="list-style-type: none"> • Natural and abnormal behaviors in different age groups of children and their families |
| <ul style="list-style-type: none"> • Clinical application of healthy child care strategies and monitoring the development of children |
| <ul style="list-style-type: none"> • Differential diagnoses and complications of common neonatal problems |
| <ul style="list-style-type: none"> • Clinical application of nutritional care including: breastfeeding, complementary feeding, school age nutrition, and adolescent nutrition. |
| <ul style="list-style-type: none"> • Signs and symptoms of nutritional deficiencies common in infants and children, |
| <ul style="list-style-type: none"> • How to feed children with special nutritional needs with emphasize on chronic and metabolic diseases - premature infants |
| <ul style="list-style-type: none"> • Nutritional factors predisposing malnutrition in children |

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|---|
| <ul style="list-style-type: none"> • Know the clinical application of the national and international immunization programs and familiarity with the uses and contraindications of vaccines and use it appropriately in clinical practice |
| <ul style="list-style-type: none"> • Clinical application of screening and disease monitoring programs at birth and at other ages according to national criteria Clinical application of strategies to promote children's health |
| <ul style="list-style-type: none"> • Know and fully understand the epidemiology and causes under 5 mortality in children |
| <ul style="list-style-type: none"> • Know and fully understand the epidemiology and causes infantile mortality |
| <ul style="list-style-type: none"> • Know and fully understand the epidemiology and causes of Maternal mortality and near miss scenarios |
| <ul style="list-style-type: none"> • Clinical application of the principles of control and prevention of the spread of infectious diseases in patients and health care providers |
| <ul style="list-style-type: none"> • The effects of family and community on children's health and illnesses |
| <ul style="list-style-type: none"> • Clinical application of the provisions mentioned in the “national guidelines for integrated maternal and children care” |
| <ul style="list-style-type: none"> • Clinical application of physiological and behavioral changes during puberty |
| <ul style="list-style-type: none"> • High-risk individual and social behaviors during adolescence |
| <ul style="list-style-type: none"> • Competency in Common complaints and clinical findings in pediatrics and their differential diagnoses |



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| <ul style="list-style-type: none"> • Competency in Common laboratory and paraclinical findings in pediatrics and their differential diagnoses |
| <ul style="list-style-type: none"> • Competency in describing Symptoms of common chronic diseases in pediatrics |
| <ul style="list-style-type: none"> • Competency in Common and important emergencies in pediatrics (according to the content of the mandatory core educational program) |
| <ul style="list-style-type: none"> • Competency in Principles of cardiopulmonary resuscitation in children |
| <ul style="list-style-type: none"> • Clinical application and Clinical physiopathology of body fluids and electrolytes Regulation of in practice |
| <ul style="list-style-type: none"> • Composition and types of serum fluid therapy available in the pharmaceutical market and their contents ,and administration notes in certain pathological conditions requiring fluid therapy; with emphasis on: Diarrhea and vomiting, heart and kidney failure, ADH secretion disorders, etc. |
| <ul style="list-style-type: none"> • Competency in principles of administrating common pharmaceuticals and drugs use in the common pediatric disorders |
| <ul style="list-style-type: none"> • Indications and methods of drug administration in outpatient setting, inpatient setting, and emergency department patients |
| <ul style="list-style-type: none"> • Competency in the principles of drug administration in breastfeeding mothers- Indications, relative and strict contraindications. |
| <ul style="list-style-type: none"> • Referrals and how to refer to higher levels of treatment in common pediatric problems |

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| <ul style="list-style-type: none"> • Know the importance of the findings in the history and clinical examination |
| <ul style="list-style-type: none"> • Legal laws related to pediatrics, with emphasis on: child abuse, medical abortion, etc. |
| <ul style="list-style-type: none"> • Epidemiology of endemic diseases and regional priorities |
| <ul style="list-style-type: none"> • Competency in Different forms of antifungal drugs used in pediatrics |
| <ul style="list-style-type: none"> • Indications for hospitalization in common pediatric diseases |
| <ul style="list-style-type: none"> • Step-by-step diagnostic approach to common diseases according to the patient's benefit and cost-effectiveness |

B- In the field of skills

1. TUMS medical Interns at the end of their pediatrics training period must be competent in clinical history taking and accurate physical examination, organizing Problem Lists and has learned the appropriate differential diagnosis and appropriate algorithmic diagnosis and treatment and can discuss and implement management and treatment methods.
2. The pediatric intern should have learned the appropriate diagnostic approach to the main complaints and symptoms of pediatrics at the end of the course.
3. The pediatric intern must be able to perform practical diagnostic and therapeutic measures to diagnose common diseases in pediatrics at the end of his/her training course in the pediatric ward.
4. The pediatric intern must be able to interpret the common laboratory tests and radiology used in the pediatric ward at the end of his / her training course in the pediatric ward.
5. At the end of his / her internal training course, the intern must be able to correctly write the Profile summary ,Off-service note, On-service note, Progress note, Referral note, Consultation note and Discharge note
6. At the end of the training course, the intern should be able to provide outpatient treatment, hospitalization in necessary cases and timely refer patients to a pediatrician in special circumstances.



| Skills Domain |
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| — ability to communicate with children and adolescents and their families and other members of the treatment team effectively and professionally to obtain accurate and essential clinical information. |
| — Ability to clinically examine newborn, infants, toddlers, and adolescents. |
| — Ability to record clinical evidence and findings and the course of the disease in the patient's file Clinical history, course of the disease, requesting tests, writing counseling, case summary and death certificate / report CPR / Transfer sheet |
| — Ability to deal with the critically ill or terminal patient and his / her family and report bad news to them appropriately |
| — Ability to measure growth criteria including height, weight, head circumference and BMI and interpret the results based on standard growth curves |
| — Ability to assess Development in different aspects using available tools (Denver etc.) |
| — Ability to provide efficient advise the patient and his family on abnormal and harmful behaviors and habits |
| — Ability to take nutritional history in different age groups of children |
| — Ability to determine the nutritional adequacy of the diet in different age groups of children |
| — Ability to provide nutritional counseling to the patient's family (supplementary nutrition and nutritional aids) |
| — Ability to provide efficient advise and promote infant breastfeeding |

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| — Ability to provide efficient advice on preventing high-risk behaviors during adolescence and adolescence |
| — Ability to provide efficient advice to prevent accidents: poisoning, burns, falls from heights, suffocation and reduce risks while driving ,etc. |
| — Ability to use screening tools and protocols correctly to maintain the health of children in the community |
| — Ability to provide efficient advise to infants’ families on breastfeeding, normal sleep-wake patterns, urination and defecation . Screening and vaccination tests and dietary and vitamin supplements and circumcision in boys |
| — The ability to draw a family tree when confronted with a possible genetic or familial disease |
| — Competency in the ability to collect and integrate evidence obtained to make diagnostic and treatment decisions |
| — Ability to make differential diagnoses of common peditrics complaints and provide diagnostic programs for each complaint |
| — Ability to make differential diagnoses of common pediatric clinical findings and provide diagnostic programs for each complaint |
| — Ability to interpret common para-clinical findings in peditrics and a step-by-step approach to differential diagnosis and timely request for tests |
| — Ability to follow common chronic diseases of children by considering the complications of the disease and its effect on growth, development, and emotional, social and economic functioning of the family |
| — Ability to calculate the correct dose of the drugs and medications based on the weight and age of the child |
| — Ability to write prescriptions for common medications such as antibiotics and antipyretics |
| — Creating the ability to teach the patient and family how to use the medication and evaluate the level of family cooperation in this regard |



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| — Ability to assess the severity of dehydration based on history and clinical examination |
| — Ability to perform oral fluid therapy and provide advice to the family in this regard |
| — Ability to calculate and write medication instructions in hospitalized patients due to dehydration and how to assess the adequacy of treatment |
| — Gain skills in applying the mana and healthy child approach in dealing with common pediatric diseases |
| — Ability to deal with and take initial efficient action in common pediatric and neonatal emergencies including CPR And similar cases) |

Competency in performing required procedures including diagnostic and therapeutic skills and procedures

table of practical skills & Procedure required in Pediatrics Rotation

All of the following skills are mandatory, preferably taught at the beginning of the course (in the Clinical departments or TUMS Skills lab Training Center)

| Core Mandatory Skills and procedures |
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| • Venous access |
| • Lumbar puncture (in whole senile spectrum: from infancy to geriatric patients) |
| • Ventilation with Ambu-bag |
| • Arterial blood gas sampling (ABG) |
| • Intravenous blood sampling |



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| <ul style="list-style-type: none"> • Placing a urinary catheter Nelatone and Foley |
| <ul style="list-style-type: none"> • inserting the endotracheal tube |
| <ul style="list-style-type: none"> • inserting the gastric tube |
| <ul style="list-style-type: none"> • standard ECG taking (including placement of leads) to interpretation in children and adult |
| <ul style="list-style-type: none"> • employing electroshock device |
| <ul style="list-style-type: none"> • Performing and interpreting peripheral blood smear PBS |
| <ul style="list-style-type: none"> • employing glucometer |
| <ul style="list-style-type: none"> • employing a urine strip test |
| <ul style="list-style-type: none"> • injections: Intramuscular, subcutaneous, intradermal, intravenous |
| <ul style="list-style-type: none"> • Perform pulse oximetry |
| <ul style="list-style-type: none"> • Perform mantle test |
| <ul style="list-style-type: none"> • Measuring bleeding time test |
| <ul style="list-style-type: none"> • Infectious tissue sampling throat culture, blood culture, sputum sampling protocol and timings |
| <ul style="list-style-type: none"> • employing suction |
| <ul style="list-style-type: none"> • employing oxygen therapy and nebulizing devices |
| <ul style="list-style-type: none"> • employing the infant warmer |
| <ul style="list-style-type: none"> • employing Incubator |
| <ul style="list-style-type: none"> • Skills in performing step by step CPR - in all age groups |



- Effective performing of Heimlich maneuver - in all age groups

C- In the field of attitude:

- the principles of appropriate professional and ethical behavior
- Acceptance of the dignity and human rights of the patient and his family
- Acceptance of individual values, personal beliefs and rights of the patient and his family
- Practice being fully aware of “Patient bill of Rights”
- Understand the importance of affordable and efficient health care in providing health services
- Understand the importance of the three axes of physician, patient preferences and scientific evidence in clinical decisions
- Understand the importance of the physician's role as the “Coordinator” of the treatment team and understand the role of other members of the treatment team

Indicators for determining the essential content -core content- And its methodology

- The issue should be one of the priorities of the country's health system, including immunization and mana program, Healthy baby and breastfeeding, Early child development
- The issue should be one of the international priorities of health care,
- Prevalence and importance of complaints and diseases in pediatrics based on references
- Be needed by the community.
- Have impact on the health of children and families.
- Preventability of the Disease and having adjacent screening program
- The role of graduates in the country's health system

Resources used to determine essential content metrics:

- The approvals of the Higher Cultural Educational Council
- Approval of the regulations of the Ministry of Health and medical Education MoH&ME
- Use the experience of faculty members
- Considering the goals and needs of the Ministry of Health and medical Education MoH&ME–
- Needs assessment of general medicine graduates
- .Employing health information and epidemiology of children's diseases in the country

Content to be taught and learned to achieve the above outcomes:

Syllabus titles:

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| — Definition of pediatrics, its characteristics, and scope of activities |
| — Epidemiology of Diseases and Child Mortality in Iran |
| — Familiarity with the health system and children's health programs in the country |
| — Get a clinical history and physical examination of the child |
| — Familiarity with “disease screening protocols” based on national and international programs |
| — Familiarity with normal and abnormal growth patterns in children and how to use growth curves |
| — Familiarity with natural and abnormal development patterns and developmental assessment tools in children according to the national program of healthy children and early child development |



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| <p>— Nutrition in different periods from six months to puberty (assessment, counseling) according to the national program of healthy children and early child development</p> |
| <p>— Familiarity with common nutritional problems in childhood and adolescence according to the national program:</p> <ul style="list-style-type: none"> ▪ FTT ▪ Obesity ▪ Rickets ▪ micronutrients deficiency |
| <p>— competency in national immunization program</p> |
| <p>— Familiarity with international immunization programs</p> |
| <p>— Promote children's health</p> |
| <p>— Familiarity with legal laws related to pediatrics with emphasis on child abuse, abortion, etc.</p> |
| <p>— Resuscitation of children and resuscitation in infants</p> |
| <p>— Familiarity with the evaluation of a critically ill child according to the national program of Mana</p> |
| <p>— Examination of the healthy term baby and primary care of the delivery room</p> |
| <p>— Familiarity with " emergency measures " and " referrals " in:</p> <ul style="list-style-type: none"> ○ In critically ill infants with poor feeding، ○ Hypo / hyperthermia, ○ Convulsions, ○ respiratory distress, ○ Cyanosis ○ Apnea ○ Genital ambiguity |



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| <ul style="list-style-type: none"> ○ Acute abdominal symptoms ○ Lethargy and jaundice |
| — Maternal breast feeding, the benefits, and problems |
| — Algorithmic diagnostic and management approach to a child with earache, rhinorrhea, and sore throat |
| — Algorithmic diagnostic and management approach to a child with cough (acute and chronic); wheezing and tachypnea |
| — Algorithmic diagnostic and management approach to a child with a fever |
| — Evaluation and initial treatment of a child with meningeal symptoms |
| — Competency in "emergency measures" and "referrals" in: <ul style="list-style-type: none"> ○ A child with cyanosis, ○ respiratory distress, ○ Airway obstruction: <ul style="list-style-type: none"> croup, epiglottitis and foreign body ○ Acute asthma attack |
| — Initial evaluation and treatment of a child with chest pain, palpitations and heart murmurs and timely referral of these patients |
| — Diagnostic treatment approach to a child with vomiting and diarrhea and evaluation of dehydration and oral fluid therapy accordingly |
| — Familiarity with " emergency measures " and " referrals " in : a child with heartburn, constipation and jaundice |



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| <p>— Competency in "emergency measures" and "referrals" in: Child with headache</p> |
| <p>— Competency in "emergency measures" and "referrals" in: Child with seizures, seizures and fever, treatment of status epilepticus</p> |
| <p>— Competency in "emergency measures" and "referrals" in: a child with “Acute Flaccid Paralysis”</p> |
| <p>— Approach to the child with lymphadenopathy and timely referral of the patients</p> |
| <p>— Competency in "emergency measures" and "referrals" in: A child with lameness and arthritis</p> |
| <p>— Competency in "emergency measures" and "referrals" in: Child with hypoglycemia, hypocalcemia</p> |
| <p>— Competency in "emergency measures" and "referrals" in:</p> <ul style="list-style-type: none"> -a child with reflux, -urinary tract infection, -hematuria, -hyperuricemia -urinary incontinence |
| <p>— Competency in "emergency measures" and "referrals" in: A child with Leukorrhea, red eye, Tear complaints and other common ophthalmic problems</p> |
| <p>— Evaluation and initial treatment of common skin diseases in infants and children with emphasis on atopic dermatitis, urine induced dermal irritations</p> |
| <p>— Competency in "emergency measures" and "referrals" in: A child with anemia and bleeding tendency</p> |

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| <p>— Initial evaluation and treatment of a child with various types of shock: hemorrhagic, septic anaphylaxis, etc. and timely referral of the patients</p> |
| <p>— Initial evaluation and treatment of a child who has swallowed corrosive substances caustic soda or a foreign object and timely referral of these patients</p> |
| <p>— Initial evaluation and treatment of a child with a level of consciousness disorder (coma and delirium) and timely referral of these patients</p> |
| <p>— Initial evaluation and treatment of the child with trauma, drowning, snake and scorpion bites and poisoned child and timely referral of these patients</p> |
| <p>— How to administrate intravenous fluid in normal and abnormal conditions and common acid and base disorders</p> |
| <p>— Competency in Evaluation and initial treatment of infectious diseases with emphasis on:</p> <ul style="list-style-type: none"> ○ Diphtheria ○ Tetanus ○ Pertussis ○ Tuberculosis <p>and timely referral of these patients</p> |
| <p>— Evaluation and initial treatment of common viral diseases with exanthems with emphasis on:</p> <p>Viral Exanthems (Rashes)</p> <ul style="list-style-type: none"> ○ Measles (rubeola) ○ Rubella ○ Varicella / chickenpox ○ Fifth disease. ○ Roseola. <p>and timely referrals if needed</p> |
| <p>— Evaluation and initial treatment of common allergies in children and infants and timely referral of these patients</p> |
| <p>— Evaluation and initial treatment of common parasitic diseases with emphasis on leishmaniasis kala azar and malaria and timely referral of these patients</p> |



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| <p>— Competency in the evaluation, diagnosis, initial treatment of diabetes mellitus, diabetic ketoacidosis DKA And timely referral of these patients</p> |
| <p>— Symptoms of inherited metabolic diseases and timely referral of these patients</p> |
| <p>— Familiarity with " emergency measures" and "referrals" in: infants and children with congenital heart disease</p> |
| <p>— Competency in "emergency measures" and "referrals" in: A child with muscle diseases including myasthenia gravis and Duchenne dystrophy</p> |
| <p>— Familiarity with the rational prescription of medications and the principles of prescription in pediatrics</p> |
| <p>— Interpretation of cell blood count CBC in all age groups</p> |
| <p>— Performing and interpreting peripheral blood smear in children</p> |
| <p>— Interpretation of urine test, urine strip and stool smear</p> |
| <p>— Interpretation of CSF analysis</p> |
| <p>— Familiarity with common and important radiographic imagings in pediatrics</p> |
| <p>— Competency in Interpretation of common and important cases in children ECG</p> |



Main sources:

The same resources as the pre-internship exam:

- **Nelson Essential of Pediatrics** / latest Edition WB Saunders
- Principles of **national maternal-child care program** (mana)
- **Breastfeeding book AAP**
- Integrated care of a healthy child
- **National Growth Monitoring Program**
- Textbook for **child and infant resuscitation** American Academy of Pediatrics
- **Thyroid Screening Booklet**
- Articles on child nutrition in the Iranian Nutrition Association and the topic of vaccination based on the latest edition of the **National Vaccination Booklet**

Resources for further reading:

- The 5-minute pediatric consult
- Rudolph's Fundamentals of Pediatrics
- Manual of ambulatory pediatrics
- Harriet Lane handbook



course plan of clinical rotations
in emergency medicine

Department of Emergency Medicine

Important notes for emergency medicine interns

This clinical ward you are attending for one to three months, has significant differences with other clinical sectors and wards.

Let's review the most important of them:

- In the emergency department, you will encounter a large quantity of patients during different shift hours. Patients with different clinical complaints that all have one thing in common: that due to referring to the emergency department (regardless of the problem they have), they consider themselves emergency patients and a priority. and expect you to deal with them despite the fatigue and work pressure. And receive them at all hours and conditions.



- .In this section, you will get acquainted with the different conditions of stable and unstable patients and the range of worsening of various diseases, both acute and chronic.
- During the course under the supervision of faculty members and under the direct supervision of emergency medicine assistants, you will get acquainted with the history, examination and diagnostic and therapeutic measures that are performed in the emergency department with the main approach to the patient's main complaint, and capabilities You get the definition of common and important references; You will also learn the basics of basic and advanced resuscitation, basic and advanced airway management, and initial treatment of a trauma patient through workshop training.

Course Terms and Conditions

- **At the beginning of the course, based on the list announced by the faculty in alphabetical order with a general ratio of 2-3-2, you will be divided between three educational, research and medical centers of Imam Khomeini (3), Sina (2) and Shariati (2), respectively. This division is done by the head of general medical education of the group and is applied according to the approvals of the executive council.**
- Your presence in the emergency department: from the 16th of each month to the next 15 months (on all days of the week, both holidays and non-holidays)
- Attendance in the form of at least 20 shifts in the form of 10 morning shifts (7 am to 7 pm) and 10 night shifts (7 pm to 7 am the next day)
- on the first day of the course, a briefing session will be held, the time and place of which will be announced to you at most one day before the start of the course and the presence of all interns except the guards is required in this session.
- The shift schedule will be announced to you by the center liaisons 1 to 2 days before the start of the course, and the final list must be announced by the interns' representative of each center no later than 14 hours before the start of the course. The division will be done and announced by the liaison of each center and by lottery.
- Acquiring name etiquette and logbook as soon as possible after the start of the course is of high importance.



- Read the various items in the logbook to receive a stamp from the on-duty assistant at the end of each shift. Passing shifts and workshops is a prerequisite for announcing the end of the course; Therefore, at the end of each shift, complete the seal of approval of the assistant and the faculty on duty by mentioning the date and time of the shift in the logbook. On the day of the workshop, bring your logbook with you and receive the seal of approval from the organizer of the workshop.
- In each of the shifts, you are obliged to deliver all patients admitted to the emergency medicine service at their bedside, and at the beginning of the course and to avoid possible mistakes, you can do this under the supervision of residents. Obligated on any day of the course.
- You are on time and introduce yourself to the resident on duty at the site designated for you. In each of the patrols, it is obligatory to write the course of the patients' disease. Which are accepted during the shift
- , Are you. CVs should include complete vital signs (self-checked), differential diagnoses, and future diagnostic and treatment plans. Obviously, on-duty assistants will oversee the proper performance of these tasks and will assist and guide you.
- ❖ Attendance at morning reporting sessions is required for overnight interns on duty.
- The core schedule for each month will be announced in the briefing session and you can get more information from your center interface.
- ❖ The schedule of workshops will be announced every month in the briefing session. To facilitate your presence, three workshops will be held in three centers.
- ❖ The representatives of each center are obliged to announce the program of division of the workshops during the first 48 hours of the course according to the criteria that will be explained in the briefing session. Participation in the workshop is mandatory and only possible during the current month.
- Considering that you will be the face and front member of the emergency medicine treatment team dealing with patients, you are expected to introduce yourself to the patient politely, always have name badge and etiquette, and follow the instructions approved by the university.
- In dealing with critically ill and restless patients, inform the caregivers immediately and, if it is not possible to measure vital signs (for any reason), discuss this with the resuscitation team representative.
- . Note that trainees and medical clerkship students will also be present in the emergency ward during your course and the emergency situations may be very unfamiliar to them.



- As much as you have the opportunity, pay attention to their training when taking histories and performing procedures with assistants.
- By performing the procedures, be sure to inform the responsible faculty staff or resident in charge and if you are not familiar with the procedure, after observing, participating and approving the assistants or members of the Office of Scientific-Practical, perform the procedures independently.
- Follow the Hygiene related instructions to the outpatient operating room is mandatory in all centers.
- Due to the unpredictable conditions of the emergency department, pay attention to the consumption of fluids on duty and act at the earliest opportunity after coordinating with the assistant in charge of eating (for a short time).
- All tasks in the emergency department is done as a team, so try to have a friendly and respectful relationship with your responsible assistants to make it easier for you to endure the hardships of the emergency department and conditions.
- Absence from the shift is possible only in special cases and by presenting documents and by introducing the replacement person and informing the center interface. Obviously, the caretaker who is absent must be replaced during the course, and if for any reason this is not possible, a score will not be sent by the group for the end of the section, and the intern is obliged to bring a letter of introduction from the faculty again to justify the reason for the absence in order to pass the guard or guards who have been absent. The same is true for workshops and end-of-course exams.



General objectives:

expected at the end of the rotation by each Medical Intern:

- **Show professional and competent behavior in their interactions with patients, those who accompany the Patient and all members of the care team.**
- **In different clinical and crisis situations, attain the power of management, skill and confidence necessary to perform professional duties, as expected from a responsible physician**
- **manage all patients with common, important to emergent complains and diseases, using the whole spectrum of medical skills from resuscitating and stabilizing the patient, to history taking, performing necessary physical examinations, and reaching differential diagnosis and going toward further steps.**
- **Take the necessary steps to achieve the diagnosis and management of the patient and manage his or her complain appropriately.**
- **approach algorithmically Based on scientific evidence-based knowledge and “practical approved guidelines” on diagnostic and therapeutic measures, in accordance with the protocols of emergency medicine, as a responsible medical practitioner and efficient member of emergency ward team.**



| Session Number | Session Topic | Skill/Knowledge Objective | Instruction Method (Skill lab/Bedside/hybrid) | How to evaluate | Content of educational assistance |
|----------------|---------------------------------------|---|---|--|--|
| i | BLS Basic Resuscitation | 1. Intern should be able to perform 3 stages of the encounter with the patient without response, in order and correctly. | Combination of Clinical Bedside, Clinical round sessions, And Skill lab | Evaluation based on performance in the Hospital and log book. Written and oral questions | Official Sources mentioned in Curriculum, PowerPoint Content & Educational Film |
| ii | BLS Basic Resuscitation | 1- Intern should be able to do 3 stages of the approach to the patient without response on the Moulage, respectively. 2- Intern should be able to perform chest massage on moulage correctly. 3- The intern should be able to perform two different airway control maneuvers correctly at least 80% on the moulage. | Skill-Lab | Evaluation based on performance in the Hospital and log book. Evaluation of interns' group performance as resuscitation team and presenting different scenarios on educational Moulage | Educational Moulage AED Official Sources mentioned in Curriculum |
| iii | Advanced Resuscitation ACLS | 1- Intern should be able to perform at least 5 steps in dealing with cardiac arrest 100% correctly 1- The intern is able to pay attention to the reversible | Combination of Clinical Bedside, Clinical round sessions, And Skill lab | Evaluation based on performance in the Hospital and log book. | PowerPoint Content & Educational Film Official Sources |

| Session Number | Session Topic | Skill/Knowledge Objective | Instruction Method (Skill lab/Bedside/hybrid) | How to evaluate | Content of educational assistance |
|----------------|---------------------------------------|--|---|--|--|
| | | causes during resuscitation. | | Written and oral questions | mentioned in Curriculum |
| iv | Advanced Resuscitation ACLS | <p>1- Intern should be able to perform chest massage and use ECT on moulage correctly.</p> <p>2- Intern should be able to obtain a secure intravenous Access and subsequently Administrate and prescribe CPR drugs</p> | Combination of Clinical Bedside, Clinical round sessions, And Skill lab | <p>the Performance carried out in the ward on patients</p> <p>Evaluation of interns' group performance as resuscitation team presenting different scenarios on educational moulage</p> | <p>Educational Moulage AED Defibrillator</p> <p>Official Sources mentioned in Curriculum</p> |
| v | Approach to a trauma Patient | Intern should be able to perform important steps in dealing with trauma patients in desired sequence - minimal score of 80% | Combination of Clinical Bedside, Clinical round sessions, And Skill lab | <p>The Performance carried out in the Ward</p> <p>log book</p> <p>Written and oral questions</p> | <p>PowerPoint Content & Educational Film</p> <p>Official Sources mentioned in Curriculum</p> |
| vi | Approach to a trauma Patient | 1- Intern should be able to perform at least two different methods in controlling bleeding and resuscitation of hemorrhagic shock 100% correctly on the moulage | Skill-Lab | <p>The Performance carried out in the ward on patients</p> <p>Group performance of interns</p> | <p>Educational Moulage Kevlar Backboard Official Sources mentioned in Curriculum</p> |

| Session Number | Session Topic | Skill/Knowledge Objective | Instruction Method (Skill lab/Bedside/hybrid) | How to evaluate | Content of educational assistance |
|----------------|--------------------------------------|--|---|---|--|
| | | 2- Intern should be able to perform two methods of spinal immobilization with at least 80% of the correct principles on the training moulage | | as trauma team and presenting different scenarios on educational moulage | |
| vii | Approach to a patient with poisoning | <ol style="list-style-type: none"> 1. Intern should be able Take the initial steps properly dealing with poisoned patient. 2. Be familiar with the indications and contraindications of gastric lavage meals | Combination of Clinical Bedside, Clinical round sessions, And Skill lab | The Performance carried out in the department log book Written and oral questions | PowerPoint Content & Educational Film Official Sources mentioned in Curriculum |
| viii | Airway Management | <ol style="list-style-type: none"> 1- Intern can properly intubate on the Moulage 2- Be able to administrate LMA properly | Combination of Clinical Bedside, Clinical round sessions, And Skill lab | <p>The Performance carried out in the ward on patients</p> <p>Group performance of interns as team of Airway Administration and presenting different scenarios on educational moulage</p> | <p>Educational Moulage Laryngoscope</p> <p>Basic and advanced airways Official Sources mentioned in Curriculum</p> |

| Session Number | Session Topic | Skill/Knowledge Objective | Instruction Method (Skill lab/Bedside/hybrid) | How to evaluate | Content of educational assistance |
|----------------|---|--|---|---|--|
| ix | The principles of Approach to Critical patient | 1- Intern should be able to perform correct diagnostic and therapeutic measures in dealing with a critical patient while maintaining confidence and calmness | Combination of Clinical Bedside, Clinical round sessions, And Skill lab | The Performance carried out in the department log book Written and oral questions | PowerPoint Content & Educational Film, Official Sources mentioned in Curriculum |
| X | Principles of dealing with off center Ambulant patients | 1. Intern should be able to perform primary measures in patients in off center emergency 2- Intern can discuss the necessary diagnostic methods in the patient with trauma 3- Intern can mention the appropriate treatment method in each case | Combination of Clinical Bedside, Clinical round sessions, And Skill lab | The Performance carried out in the department log book Written and oral questions | PowerPoint Content & Educational Film, Official Sources mentioned in Curriculum |
| Xi | Triage Principles | 1 Intern can obtain a suitable History of the patient 2- Intern can mention the necessary criteria in triage of patients 3- Intern can name different levels of triage | Combination of Clinical Bedside, Clinical round sessions, And Skill lab | The Performance carried out in the department log book Written and oral questions | PowerPoint Content & Educational Film, Official Sources mentioned in Curriculum |
| Xii | Dealing with patients with loss of consciousness | 1- Intern can express 4 important priorities in dealing with patients with decreased consciousness, 100% correctly. 2- Intern can perform at least 2 different ways to handle | Combination of Clinical Bedside, Clinical round sessions, And Skill lab | The Performance carried out in the department log book Written and oral questions | PowerPoint Content & Educational Film, Official Sources mentioned in Curriculum |

| Session Number | Session Topic | Skill/Knowledge Objective | Instruction Method (Skill lab/Bedside/hybrid) | How to evaluate | Content of educational assistance |
|----------------|---|---|---|--|--|
| | | patient with loss of consciousness | | | |
| Xiii | approach to shock | 1. Intern should be able to perform proper diagnosis, approach and initial management and resuscitation on different types of shock | Combination of Clinical Bedside, Clinical round sessions, And Skill lab | The Performance carried out in the department log book Written and oral questions | PowerPoint Content & Educational Film, Official Sources mentioned in Curriculum |
| Xiv | Dealing with Chest Pain patient in the emergency room | 1-Intern should be able to express 4 important priorities in dealing with patients with chest pain, 100% correctly 2. Intern should be able to diagnose and manage different scenarios of chest pain patient | Combination of Clinical Bedside, Clinical round sessions, And Skill lab | The Performance carried out in the department, log book Written and oral questions | PowerPoint Content & Educational Film, Official Sources mentioned in Curriculum |
| Xv | Dealing with abdominal pain patient in the emergency room | 1-Intern should be able to express 4 important priorities in dealing with patients with abdominal pain, 100% correctly 2. Intern should be able to diagnose and manage different Scenarios of abdominal pain patient | Combination of Clinical Bedside, Clinical round sessions, And Skill lab | The Performance carried out in the department log book Written and oral questions | PowerPoint Content & Educational Film Official Sources mentioned in Curriculum |
| Xvi | Dealing with a convulsive patient in the emergency room | 1-Intern should be able to express 4 important priorities in dealing with patients with seizure, 100% correctly. | Combination of Clinical Bedside, Clinical round sessions, And Skill lab | The Performance carried out in the department log book | PowerPoint Content & Educational Film Official Sources |

| Session Number | Session Topic | Skill/Knowledge Objective | Instruction Method (Skill lab/Bedside/hybrid) | How to evaluate | Content of educational assistance |
|----------------|---|---|--|--|---|
| | | 2-Intern should be able to diagnose and manage for different scenarios of patient with seizure | | Written and oral questions | mentioned in Curriculum |
| Xvii | Dealing with a patient with shortness of breath emergency | 1-Intern should be able to express 4 important priorities in the treatment of patients with dyspnea, 100% correctly 2-Intern should be able to make diagnosis and management for different scenarios of patient with dyspnea | Combination of Clinical Bedside, Clinical round sessions, And Skill lab | The Performance carried out in the department, log book Written and oral questions | PowerPoint Content & Educational Film Official Sources mentioned in Curriculum |
| Xviii | Dealing with a patient with Burning emergency | 1-Intern should be able to express 4 important priorities in the treatment of patients with burning trauma, 100% correctly 2-Intern should be able to make diagnosis and management for different types of burning (Chemical, Electric, oil driven and petrol, etc.) | Combination of Clinical Bedside, Clinical round sessions, And Skill lab | The Performance carried out in the department, log book Written and oral questions | PowerPoint Content & Educational Film Official Sources mentioned in Curriculum |

Medical interns during emergency department rotation may also have the chance to observe administrating chest tubes, percutaneous pacemakers, and environmental incidents such as frost bite or Heatstroke in the emergency ward. **Otherwise all approach algorithms and relative procedures are a part of skill-lab and included in core syllabus.**

Clinical Calendar

Clinical practical education syllabus in daily clinical practice

Performance Evaluation: In clinical bedside, written and oral questions.

| | Course Title | Resources | Objectives |
|-----|----------------------------|--|--|
| i | Anaphylaxis | Official Sources mentioned in Curriculum | Intern can accurately describe diagnostic and therapeutic procedures in anaphylaxis patient |
| ii | Vascular Emergencies | Official Sources mentioned in Curriculum | Intern can accurately describe diagnostic and therapeutic procedures in vascular emergency patients |
| iii | Fever and chills of Sepsis | Official Sources mentioned in Curriculum | Intern can accurately describe the diagnostic and therapeutic procedures in the patient with fever and chills and sepsis |
| iv | Dizziness | Official Sources mentioned in Curriculum | Intern can accurately describe and perform diagnostic and therapeutic procedures in vertigo patients |
| V | Syncope | Official Sources mentioned in Curriculum | Intern can accurately describe and perform diagnostic and therapeutic procedures in Syncope patient |

| | Course Title | Resources | Objectives |
|------|-----------------------------|--|---|
| Vi | Arrhythmia and palpitation | Official Sources mentioned in Curriculum | Intern can accurately describe diagnostic and therapeutic procedures in patients with arrhythmia and heart palpitations |
| vii | focal Neurological symptoms | Official Sources mentioned in Curriculum | Intern can accurately describe and perform diagnostic and therapeutic procedures in patients with new and focal neurological symptoms |
| viii | Gastrointestinal infections | Official Sources mentioned in Curriculum | Intern can accurately describe diagnostic and therapeutic procedures in patients with gastrointestinal infections |
| ix | Respiratory infections | Official Sources mentioned in Curriculum | Intern can accurately describe diagnostic and therapeutic procedures in patients with respiratory infections |
| x | Skin Infections | Official Sources mentioned in Curriculum | Intern can accurately describe and perform diagnostic and therapeutic procedures in patients with skin infections |
| Xi | Neurological infections | Official Sources mentioned in Curriculum | Intern can accurately describe diagnostic and therapeutic procedures in patients with neurological infections |

| | Course Title | Resources | Objectives |
|------|--|--|--|
| xii | Urinary tract infections | Official Sources mentioned in Curriculum | Intern can accurately describe diagnostic and therapeutic procedures in patients with urinary tract infections |
| Xiii | Venous access | Official Sources mentioned in Curriculum | Intern learns and performs environmental vegin properly |
| Xiv | Bladder Catheter | Official Sources mentioned in Curriculum | Intern learns and performs bladder catheters properly |
| Xv | Nasogastric tube administration | Official Sources mentioned in Curriculum | Intern learns and performs nasogastric pipe insertion properly |
| Xvi | Subcutaneous, intramuscular, and intravenous injections and intraosseous | Official Sources mentioned in Curriculum | Intern learns and performs subcutaneous, intramuscular and intravenous injections and intraosseous correctly |
| xvii | Performing and interpreting ABG | Official Sources mentioned in Curriculum | The intern learns and interprets ABG correctly |

| | Course Title | Resources | Objectives |
|-------|--|--|--|
| Xviii | Limb immobilization and splinting | Official Sources mentioned in Curriculum | The intern learns and performs extremity and extremity correctly |
| xix | Abdominocentesis | Official Sources mentioned in Curriculum | Intern learns and performs Abdominocentesis correctly |
| xx | Thoracocentesis | Official Sources mentioned in Curriculum | Intern learns and performs Thoracocentesis correctly |
| xxi | Lumbar Puncture | Official Sources mentioned in Curriculum | The intern learns and performs the LP properly |
| xxii | Primary care of wound Bandage sand dressing | Official Sources mentioned in Curriculum | Intern learns and performs primary care of wound bandaging and dressing properly |
| xxiii | Local anesthesia | Official Sources mentioned in Curriculum | Intern learns and performs local anesthesia correctly |

| | Course Title | Resources | Objectives |
|--------|--|--|---|
| xxiv | Suturing | Official Sources mentioned in Curriculum | Intern learns and performs all kinds of Suturing correctly Simple interrupted suture, Continuous (running) suture, Horizontal and Vertical mattress suture |
| xxv | Ophthalmic care and eye washing | Official Sources mentioned in Curriculum | Intern learns and performs basic Ophthalmic care and washing |
| xxvi | Epistaxis management | Official Sources mentioned in Curriculum | Intern learns and performs correct management of nasal bleeding |
| xxvii | Acquiring an EKG and interpreting it | Official Sources mentioned in Curriculum | Intern takes Electrocardiogram and interprets it properly (from first steps in placing leads, and operating the device to correct essential core interpretations) |
| xxviii | Patient monitoring | Official Sources mentioned in Curriculum | Intern learns and performs patient monitoring correctly |
| xxix | The way the patient is treated and restrained is restless and aggressive | Official Sources mentioned in Curriculum | The intern learns and performs the method of dealing with and controlling the restless and aggressive patient properly and as needed. |

| | Course Title | Resources | Objectives |
|-----|---|--|--|
| xxx | Documentation, writings, and legal considerations | Official Sources mentioned in Curriculum | Intern learns and executes legal considerations in writing the Patients documentations, various certificates, hospitalization and discharge notes. |

Student Evaluation Method: percentage of assignments presented, final test percentage, and Chief Education Faculty staff's Evaluation.

| Unit Evaluation Method | Percentage score |
|---|------------------|
| Evaluation of clinical function of interns continuously and with different evaluation methods MCQ, DOPS, etc. Logbook Behavioral assessment Professional ethics in dealing with patients and staff | 60% |
| The final exam , oral and written. The questions are based on the understanding and application of core essential knowledge. | 40% |
| Total | 100% |



Resources and educational materials:

- **Rosen's Emergency Medicine Concepts and Clinical Practice – Latest Edition**
With emphasis on chapters 12,13,14,15,22,23,24
- **Robert & Hedges Clinical Procedures in Emergency Medicine: chapter 3 -5 – Latest Edition**
- **Clinical Procedure in Emergency Medicine Roberts and Hedjes – Latest Edition**
- **American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care (BLS, ACLS) – Latest Edition**



Annexes





Tehran University of Medical Sciences
School of Medicine

Competency framework for medical graduates

Tehran University of Medical Sciences



Approved by
curriculum reform
committee
Of TUMS MD program

