Approved by the "**David Tvildiani Medical University**"
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MD e-PBL Educational Program of David Tvildiani Medical University

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Content

Terminology used in the text

DTMU - David Tvildiani Medical University
MD- Medical Doctor
PBL – Problem-Based Learning
Journal Club - group meeting of persons who gether regularly in order to critically discuss articles and works published in periodic scientific editions, as well as, other scientifc literature.
CBL – Case-based Learning
CVS - Cardiovascular System
ECTS - European Credit Transfer and Accumulation System
Log-book - Diary for clinical cases
MCS - Musculoskeletal System
HEM - Hematology
RES - Respiratory System
GI - Gastrointestinal System
Neu - Neuroscience
UR - Urinary System
REP - Reproductive System
END - Endocrine System
Peer-Reviewed - process when the issue (e.g.: PhD work or publication) is evaluated by the expert group in the field.
MCQ - Multiple Choice Questions
OSCE - Objective Structured Clinical Examination
Mini-CS - Minimal/Focused Clinical Skills
DOPS - Direct Observation of Procedural Skills
CBD – Case-Based Discussions
EBMA - European Board of Medical Assessors

1. Introduction

Present document is a revised MD e-PBL program of DTMU. The document reflects the changes planned, evaluated (in piloting regiment) and implemented by the University for the last five years, which were focusing on teaching, learning and assessment, as well as curriculum development areas.

MD e-PBL education program is a one stage integrated highest medical education after successful graduation of which the graduate is awarded with the academic degree of MD.

Academic process is held in Georgian and English languages.

Enrollment into one stage MD e-PBL program is performed according to the rules on obtaining, suspending and stopping students' status, mobility, as well as recognition of previous education.

Employment fields of MD e-PBL are:

- Medical practice as a junior doctor. Junior doctor fulfils function of the doctor under supervision and responsibility of licensed doctor with an authority for independent medical practice.
- Pedagogical and Scientific Activity.

  The person owning academic degree of MD is authorized to continue study in PhD program or take residency program and after passing unified state certificate examination obtain the right of independent medical practice.

2. The NEED for the Program

DTMU MD program has been functioning since 1992 and in 1997 the copyright was issued on it (#1-01/21-34). The program was created as an alternative for disciplinary teaching existing in Post-Soviet countries, including Georgia; its (DTMU MD program) educational methodology was based on the teaching, learning and assessment integrated around organ-systems.

Medical simulations were significant step in the development of curriculum; students were able to train in management of trauma, injections, life-saving basic methods, etc. in a "safe-to-patients" settings.

Participation of the university in TEMPUS *(currently ERASMUS +)* project (*ePBLnet*) since 2012 made possible to implement Problem-Based Learning (PBL), what was a significant step for the development of the program, as well as for professional (pedagogical) development of its academic staff. This approach have decreased teacher-centered teaching and facilitated student-centered teaching of Basic Sciences and Research. Increased the level of program integration and focus on clinical skills, using the knowledge in practice, team work, clinical reasoning and professional aspects. Defined obligatory list of clinical presentations embedded into educational modules organized around organs systems and key functions, also enhances focusing of the program (basic stage) on patients; also focusing both at students learning and program integration. For the means of embedding clinical presentations into the program conditions of their selection are frequency (spread) and significance *(e.g. life-threatening conditions)* from individual, as well as public health point of view. This format of teaching and *learning (as well as Journal Club delivered for training in science skills)* also facilitates the students in acknowledgement of principles of evidence-based medicine, as it encourages students to ask questions, find the best existing scientific evidences, critically *(in relation to the case)* evaluate them.

Problem-Based Learning was later developed with "technique of learning in small groups – interviewing skills", which also means introducing clinical cases and clinical problems in small groups, interviewing standardized patient, history-taking, physical examination, preliminary diagnosis and developing the plan of further patient management. At first it was piloted with VI year students. Currently this format is included from 3rd semester till 5th semester organ system diagnostic classes (in six modules); students study more complicated patient cases and situations at the beginning of clinical stage (6th semester); in 11th and 12th semesters abovementioned is continued with more advanced cases.

Scientific component of program is changed; for the development of students' scientific skills new formats of teaching were piloted and implemented. There is a possibility for student's interests and more choice for the development of future career in the program. Innovative approaches implemented in teaching/learning and assessment increase reputation of the university at national and international levels; gives its graduates the possibility of more choice for further study and employment.

3. The Goal of the Program

The goal of the program is to prepare international level medical staff; with fundamental knowledge and acknowledgment, skills and values required for the practice of medical profession.

Objective of the program is – organizing content/volume of academic courses, as well as teaching and learning which will facilitate:

- Obtaining modern knowledge in Basic Medical and Clinical Sciences;
- Obtaining clinical skills necessary for corresponding level of study (I stage of medical study);
- Developing ethical values important for the profession;
- Readiness for continuous study and development during future professional activity.

4. Learning Outcomes of the Program

Graduates of the program:

- Have knowledge and understanding of sciences about medical practice, health and its promotion, disorders, traumas and disabilities, as well as their prevention and management. Graduates demonstrate possibilities of using the knowledge relative to the individual, as well as in the context of their role in family and society.
- Demonstrate Basic and Clinical Skills: collect information from patients systematically, with compassion and efficiency; perform patients physical examination, choose corresponding diagnostic procedures, interpret results of abovementioned examinations and rationalize choice of management plan; choose corresponding treatment for patients with specific conditions; recognize and manage life-threatening conditions.
- Show properties required for reaching highest standards in medical practice and patient care; including ethical and legal principles, personal honesty and integrity, principles of evidence- based patient care; Understand effect of genetic, historical, social, environmental, political and behavioral factors on health, disease and illness.

- Understand importance of acknowledging other healthcare professionals work and demonstrate wish and possibility of inter-professional work and learning from other groups of professionals.
- Demonstrate potential of further training in any medical specialty or medical sciences.
- Demonstrate value of necessity of life-long learning, development and research
- Have mastered following generic/transferrable skills and experience:
    - Skills of analysis and synthesis.

      Evaluate critically complex, incomplete and contradictory data, their independent analysis, clearly verbalize result of analysis and their subsequent use. Show critical attitude to new information, analyze, summarize, integrate different data, make conclusions, and give evidences and/or contradictory arguments during the analysis of received results.

    - Management of information.

      Search for information from various sources, process large volume of information and its critical evaluation. Use information obtained in professional practice.

    - Problem solving/decision making skills.

      Define, formulate problems, and determine ways to solve them, analyze expected results and make final decision independently. Know additional resources in the framework of specialty and effective use in case of necessity.

    - Communication skills, including in foreign language.

      Demonstrates skills of observation, listening, asking questions, as well as non-verbal communication. Express clear and justified opinions (verbally and in written manner) at professional meetings

    - An ability of continuous updating of learning/knowledge.

      Use complete spectrum of educational-information resources, manage self-education process. Acknowledge necessity of continual updating of knowledge; assess objectively self-knowledge and skills.

    - An ability of adaptation to new environment.

      Demonstrate practical skills of team working, professional subordination/adaptation, and mastering new technologies.

    - Ability of independent work.

Demonstrate skills of efficient time management, selection of priorities, meeting deadlines and coordinated work. Plan wisely the resources associated with own activity. Understand responsibility for the performed work, its assessment and critics.

- Values.

Understand responsibility of knowing and following ethical and legal principles in the context of medicine, demonstrates skills to lead negotiations in the context of profession and participation in the settlement of conflict with any person despite his/her social, cultural, religious or ethnic belonging to protect patient`s rights. Consider justice, social and democracy values in relation with patients and colleagues.

5. Duration of the Academic Year and Amount of Credits

Program of Medical Doctor e-PBL lasts for 6 years and comprises 375 credits.

Academic year consists of 40 weeks (240 working days) and two semesters – fall semester (20 weeks) and spring semester (20 weeks). Between semesters there are vacations.

Teaching is going mainly by rotations.

According to European Credit Transfer and Accumulation System 20 weeks semester of academic year consists of 58 credits for first year, 62 credits for second year, 60 credits for third year, 67 credits for fourth year, 67 credits for fifth year and 61 credits for 6th year.

1 credit considers 30 working hours, out of which 16 hours are mainly the contact hours and 14 hours devoted to the student's independent work.

6. General Structure of the Program

The Course of Basic and Clinical Sciences	**I-II** semester	Introduction in Medical Sciences 1-6								
		MSC	**CV**	**RES**	**HEM**	**UR**	**GI**	**END**	**REP**	**NEU**
	III semester	√	√		√					
	IV semester			√			√			√
	V semester					√		√	√	
		Life Structure	**Life Support**		**Life protection**	**Life Maintenance**			**Life Cycle**	**Life Control**
	VI semester	V	V		V	V			V	V
The Course of Clinical Medicine	**VII** semester		V	V	V	V				
	VIII semester	V			V			V	V	V
	IX semester	V			V		V			V
	X semester	V	V		V		V			
Clinical Clerkship	**XI- XII** semester	√	√	√	√	√	√	√	√	√

This structure schematically describes, how the main topics of curriculum are discussed through different stages, revising learned issues, refining knowledge and skills in 6 year program. System-context discussion of medical problem/topics (II – V semesters), revising the topic in frames of function context (VI semester), further training in appropriate medical specialties (VII – X semester) and knowledge consolidation, clerckship stage (preparing for residency program) of XI-XII semesters.

7. Program Content, Description and Organization

7.1. General Content and Description of the Program

6 year period of study contains 3 stages *(basic medical and clinical sciences course, clinical medicine and clinical clerkship).*

- Course of Basic Medical and Clinical Sciences.
  6 semesters (3 years) are devoted to it. Basic Medical and Clinical Sciences course consists of 182 credits (182 ECTS).

On I year, programs of academic courses are organized in such a manner that (i) in most cases they support better acknowledgment of material of subject blocks included in them, as well as (ii) despite general part of each discipline, material which is a necessary basis for studying human organ systems is studied at II year. Also, delivery of principles of medical ethics significant for the development of physician and future staff is started.

II year entirely and III year fall semester (III-V semesters) are devoted to study of human organ systems and programs of academic courses of basic and clinical sciences are horizontally integrated with each other, are related to study of principles of clinical diagnosis and pharmacology (element of vertical teaching) and make 9 modules of organ systems; mentioned modules are revisited subsequently (3 times) in the framework of spiral curriculum and system based learning and is consolidated during clinical medicine and practice in subsequent years (II and III stage of study).

1. At the stage of basic and clinical sciences, system learning in module starts with embryology, then the structure of its constituent organs is discussed at macroscopic (anatomy), microscopic (histology) levels and as well as conformities of normal functioning (physiology and biochemistry). After this, etiology, pathogenesis (microbiology, pathology – pathanatomy and pathophysiology) of each system diseases, clinical assessment of pathologic processes, typical clinical characteristics of diseases, diagnostics and communication with patient, principles of developing management plan and conservative treatment measures are studied (pharmacology). In each above mentione module learning is presented with embedding PBL-weeks, what is increasing focus on clinical importance and patient benefits of learning materials (fundamental and clinical sciences)
2. III year (VI semester) is organized as a course of interdisciplinary teaching process of basic and clinical sciences (based on essential organ functions) and further is preparatory course for clinical stage. This course is also organized as PBL weeks

The goal of this stage is to focus curriculum on (its basic medical and clinical sciences stages) the most important (basic) issues related to human health and disease, such as human structure, function, lifetime cycle and promotion, life maintenance and protection. Learning is based on modular approach

using PBL and includes the following 6 modules: life cycle, life protection, life support, life maintenance, life structure and life control.

For each of them 3 weeks are devoted. The teaching time in each week is devoted for modular training (tutorials of relevant basic sciences in the module, PBL sessions and general clinical experience - not exceeding 16 contact hours) and non-modular learning (not exceeding 8-10 contact hours per week). Consequently, in each teaching week, contact training generally does not exceed 24-26 hours. Students who will complete this stage satisfactorily (basic medical and clinical sciences) will be eligible for the final exam.

This stage of learning (VI semester) enhances awareness of basic and clinical sciences in clinical context, also covers the important aspects of MD curriculum and is organized into 6 modules:

1. Life cycle – 3 credits
2. Life protection – 3 credits
3. Life support – 3 credits
4. Life support – 3 credits
5. Life structure – 3 credits
6. Life control – 4 credits

In same semester, for non-modular learning student is thought topics as:

7. Radiology – 4 credits
8. Legal aspects of medical practice – 2 credits
9. Public health and epidemiology – 6 credits

1) Life cycle:
    a) Age related (elderly) functional (physiology), morphological (pathology) and behavioral changes, clinical diagnosis and pharmacological issues.
    b) Reproductive system morphology (anatomy, histology, pathology), physiology and diagnostic/clinical assessment methods
    c) Issues of genetics (the norm) and genetic diseases, molecular biology/biochemical genetics, congenital diseases, prenatal diagnostics and clinical-genetic evaluation.
2) Life protection:

Immune system of the body: Issues of the norm and pathology

    a) Lymph system (histology); bacterial/viral pathogens (microbiology allergic diseases, immunology, clinical diagnosis/assessment/pharmacology)
    b) Carcinogenesis and hematological tumors (microbiology, pathology), issues of clinical evaluation of diseases/ pharmacology).
    c) Issues of immunodeficiency (HIV / AIDS) microbiology, immunology, pathology and pharmacology (Prevention + Treatment).

3) Life support:
    a) Aspects of cardio-vascular disease assessment morphology (anatomy, pathology) and function (physiology); issues of patient diagnostic / assessment /pharmacology.
    b) Aspects of respiratory system disease assessment morphology (anatomy, histology, pathology) and function (physiology); issues of patient diagnostic / assessment /pharmacology.
    c) Aspects of heart failure and rhythm disturbance assessment valuable morphology (anatomy, pathology) and function (physiology); issues of patient diagnostic / assessment /pharmacology.

4) Life maintenance:
    a) Issues of the digestive system pathology (cancer), valuable assessment of morphology (anatomy, pathology) and functioning (biochemistry: digestion and nutrition assessment).
    b) Methods of clinical diagnostic / assessment/ treatment of valuable morphology for the patients with liver pathology (anatomy, histology, pathology) and functioning (physiology).
    c) Aspects of the pathology of the urinary system (chronical renal insufficiency) assessment valuable morphology (anatomy, histology, pathology) and functioning (physiology); methods of principles of clinical diagnostics / assessment / treatment.
5) Life structure:
    a) Issues of autoimmune pathology (systemic lupus erythematosus) patient assessment valuable morphology (histology, pathology), immunological disorders (Immunology) for clinical diagnostics and assessment.
    b) Autoimmune disease (rheumatoid arthritis) patient assessment valuable morphology (Anatomy, Histology, Pathology), diagnosis / clinical assessment and treatment methods.
    c) The patient's with osteoporosis assessment valuable morphology (anatomy), endocrine control (biochemistry, physiology), clinical diagnosis and management (treatment) issues.
6) Life control:
    a) The aspects of nervous system pathologies (epilepsy) assessment valuable morphology (anatomy, pathology) and function (physiology), issues of the patient's diagnosis and pharmacology.
    b) The aspects of the patient's pathology of the nervous system (multiple sclerosis, trauma) morphology (anatomy, pathology), function (physiology), issues of clinical assessment / management.
    c) The issues of patient's psychiatric problems (schizophrenia) assessment valuable function (physiology, behavioral sciences) and pharmacology.
    d) The issues of the patient's mental problems (Personality disorders) assessment valuable morphology (anatomy) and function (physiology, behavioral sciences).

Accordingly, topic oriented I-II semester, system oriented III, IV, V semesters and function oriented VI semester, comprise the first stage of learning (basic medical and clinical sciences) 182 credits.

At this stage following disciplines participate in modular (155.5 credits) and non-modular (26.5 credits) teaching:

1. Human Anatomy
2. Histology and Embryology
3. Medical Physiology
4. Medical Biochemistry
5. Medical Pharmacology
6. Medical Microbiology
7. Immunology
8. Medical Genetics and Molecular Biology
9. Pathology
10. Behavioral Science I, II
11. Biostatistics
12. Principles of Clinical Diagnosis with Clinical Assessment of Pathologic Processes
13. Biomedical Ethics
14. Principles of Scientific Research I, II
15. Clinical Skills
16. Topographic Anatomy
17. Radiology
18. Legal aspects of medical practice
19. Public health and epidemiology
20. Elective subjects

- <u>The Course of Clinical Medicine</u>

Four next semesters (VII - X) are devoted to it. Clinical Medicine Course consists of 134 credits.

At this basic science stage, learning is enhanced using simulated clinical environment (virtual) and skill are strengthened in real clinical settings.

Learning and training process for students is ongoing in following medical specialties:

1) Internal Medicine containing:

   a) Cardiology

   b) Pulmonology

c) Gastroenterology

d) Nephrology

f) Endocrinology and Metabolism

g) Rheumatology and Systemic Disorders

h) Hematology

i) Allergology and Clinical Immunology

j) Clinical pharmacology

k) Differential Diagnosis and Treatment of Internal Diseases

2) Surgery containing:

a) General Surgery

b) Specialty Surgery

c) Oncology

d) Urology

e) Traumatology and Orthopedics

f) Otorhynolaryngology

g) Ophthalmology

3) Obstetrics and Gynecology

4) Pediatrics

5) Infectious Diseases

6) Nervous Diseases

7) Psychiatry

8) Public Health and Epidemiology

9) Medical Rentgenology and Radiology

10) Dermatovenerology

11) Preventive Medicine with Ecology

12) Principles of Scientific Research

13) Clinical Skills

14) Legal Aspects of Medical Activity

15) Elective subjects

- Clinical Clerkship

One academic year (VI year) is devoted to it. Students have clinical rotations in following clinical disciplines:

1. Internal Medicine:
    1.1. Syndromal Differential Diagnosis of Internal Diseases and Emergency Therapy
    1.2. Rational Pharmacotherapy
    1.3. Physiotherapy and Rehabilitation.
    1.4. Family Medicine
2. Surgical Disorders.
    2.1. Pediatric Surgery
    2.2. Anesthesiology and Reanimatology
    2.3. Emergency Surgery
3. Obstetrics and Gynecology
4. Pediatrics
5. Infectious disorders
6. Nervous disorders
7. Clinical Skills V
8. The extent of elective subjects at VI year is 6 credits

Academic program considers transparency of choice of elective courses (10 credits), as well as, of educational clinical bases (Tbilisi, Klaipeda in Lithuania, etc.) during the study of clinical sciences.

In the purpose of perfecting the practical medical activity, timely diagnostics of patient's clinical condition and mastering methods of providing rational treatment, clinical academic courses (subjects) are taught gradually, for example: teaching of internal diseases are deepened vertically, bottom-up; principles of clinical diagnosis (diagnostic methods, II - III courses), special pathology (etiology,

pathogenesis, clinic, diagnostics, prevention, principles of treatment of nosology) – III – IV year, differential diagnosis and treatment – V year, Syndromal Differential Diagnosis of Internal Medicine and Emergency Therapy – VI year.

The VI year program involves a learning cycle of problem-based pharmacotherapy, offered by the Groningen University (Groningen method). It aims to provide a future doctor with a practical habit of choosing a pharmacologic drug for a particular patient and to get use students to logical thinking from diagnosis to patient treatment. At the end of the cycle, the Objective Structured Clinical Examination is conducted (OSCE), where each student interchangeable is resented as a patient, sometimes physician, and as an evaluator.

Student's clinical skills are developed through individual courses of clinical skills (6 training courses, total of 8 credits) and in all clinical courses. In total, at least 26 credits are gained in simulated and 60 credits in real clinical environment.

Acquisition of scientific skills is conducted through 5 academic courses which in total make 10 credits, out of which 6 credits are devoted to theoretical aspects (Principles of Scientific Research I, II, III) and the rest 4 credits – to scientific works.

Elective (additional) way for acquiring of scientific skills considers:

Course of Project Writing – 2 credits

Delivery of developed project (received by research departments) - 8 credits

Defense of Thesis – 10 credits (see Rules for Regulating the Educational Process at the University).

Resources are enough to fulfil of program objectives; library resources contain text-books, other educational materials, including examples of using knowledge in practice, cases, item bank for self-education, e-resources for skill training, etc., as well as possibility of access to scientific magazines for familiarization with scientific achievements, preparation of project presentations for discussion seminars, etc.

Resources required for the simulation skills training are available for the students. There are materials and e-resources needed for teaching in small groups and PBL format. Access to healthcare services (ambulatory, hospital, other services) needed for acquisition of bedside clinical skills and in basic disciplines is provided.

Curriculum is organized around themes and modules.

7.2. Themes of Curriculum

Themes of Curriculum are:

1. Basic and Clinical Sciences
2. Clinical and Communication Skills
3. Public and Population Health
4. Personal and Professional development

These themes are implemented along entire vertical of the curriculum. Their objectives and short contents and some details of their delivery are given below.

7.2.1. Basic and Clinical Sciences

This theme contains knowledge about (i) normal structure, function of human and development at all levels of organization – from molecular and cellular to organ systems and entire body; (ii) diseases, disorders and changes caused by development damage, their treatment, internal and external factors affecting results.

The graduate can demonstrate the following:

- Understands normal and damaged structure of human body, function and behavior in the context of diagnostics, management and prevention of health problems.
- Uses the best existing evidence for prevention or treatment of disease, symptoms management and minimization of disability.
- Clinical data analysis, considering peer-reviewed publications, for assessment of their validity and possibility of generalization
- Participates in generation, interpretation and dissemination of medical knowledge
- Understands the limitations of existing medical knowledge

Materials delivered through lectures, seminars, PBL and CBL scenarios, as well as via journal club at the stage of basic and clinical sciences belong to the theme.

At the stage of Clinical Medicine and during Clinical Clerkship some sessions discuss concepts of basic sciences and most of them focus on clinical use of knowledge. During clinical rotations numerous study possibilities address this theme. At the level of clinical clerkship the students have possibility to use this knowledge in ambulatory and hospital practice for wide range of clinical situations.

7.2.2. Clinical and Communication Skills

This theme develops clinical and interpersonal skills required for medical practice. It contains training in communication with patients and colleagues, history taking and clinical examination, other clinical skills including basic life support. Age, ethnicity, social condition and disability are considered in communication.

The graduates demonstrate the following:

- Ability to listen, identify patient's, his/her family and caregiver's opinions, address them, use measures needed for effective communication.

- Ability to find clinical symptoms and signs through patient interview and examination, interpret them. Use received information for planning further examination.

- An ability to keep data obtained in the result of observation, as well as an ability to communicate with others concerning these data.

- Ability to conduct clinical procedures required for enrollment into residency programs, particularly procedures significant for management of life-threatening situations.

- Ability to help patients and their family members in preserving health.

At basic and clinical levels the students have an ability to work in small groups in PBL and clinical skills classes (the course "Principles of Clinical Diagnosis with Clinical Assessment of Pathologic Processes"), in the form of role playing and communication with standardized patients, clinical skills, in the format of training courses in clinical skills; at the level of clinical medicine despite the abovementioned perfection of clinical and communication skills at ambulatory/hospital patient's bedside is added in conditions of wide range of disorders.

7.2.3. Public and Population Health

Contains key issues of public health, social determinants of health and illness, effect of social, economic and environmental factors on health and society; strategies of society health improvement (not only disease treatment), acknowledgment of effect of poverty, unemployment, homelessness (other social factors) on health.

The graduate can demonstrate the following:

- Acknowledges factors affecting population health and the role of these factors in health support, prevention and disease treatment.

- Acknowledges legal, social, economic, historical and political context of medical practice.

- Has an ability to identify and analyze health issues related to the society, is able to contribute constructively in discussion of these issues.

At the stage of basic and clinical study discussion of these issues is possible in PBL classes; The students have possibility to study social health and sociologic issues affecting health via integrated way, in patient-centered context. At clinical stage significant topics are delivered in the format of lectures and seminars via discussion of corresponding cases; significant content of this topic is also delivered in the format of psychiatry, obstetrics and gynecology, pediatrics, family doctor and other academic courses.

7.2.4. Personal and Professional Development

Contains acknowledgement of necessity of ethical behavior, life-long learning, group work, respect-based relationship with patients and colleagues. Issues of legal ethics, economics and quality of patient care, including regulations of medical field, consent for treatment, care standards. Development of critical evaluation skills is conducted by analysis of published articles. Statistical approaches/methods are taught to develop skills for data analysis.

The graduate demonstrates the following knowledge/skills:

- Ethical behavior considering needs of patients and their family; considers need of confidentiality and expresses respect to individual autonomy, allows patients and their family members to make informed decisions concerning issues of medical care.

- Acknowledges that decisions on disease or results are frequently made in ambiguous situations and when the doctor has to make maximally rational decision based on the best evidences and specific needs of patient.

- Use of evidence-based knowledge when making clinical decision.

- Acknowledgement of statistical approaches in data analysis.

- Has an ability to work as a group member and take responsibility in relevant situations.

- An ability of organizing and management of notes, records, information including use of corresponding technologies.

- Ability to teach, help peers, presentations, etc.

Ethics seminars and forums with presentations and discussions on real situations ethical issues at the stage of basic and clinical sciences belong to the theme, as well; aspects of this topic are included in PBL scenarios. PBL sessions at this stage of teaching is especially important in delivering various aspects of personal development, through group dynamics, practice and critical feedback.

At the stage of clinical medicine and clinical clerkship students have possibility to practice these skills when communicating with patients and colleagues.

7.3. Modules of Curriculum

1. Musculoskeletal System and Principles of Clinical Diagnosis

The objective of the course is to learn medical aspects of musculoskeletal system with interdisciplinary approach: including pathology, histology, physiology, biochemistry. Issues of system histomorphology, normal functioning and metabolism are discussed; principles of this system`s trauma, healing and degenerative changes, pathology of inflammatory, tumorous, metabolic, nutritional and congenital pathologies and principles of clinical manifestations. Physical examination, symptoms, signs and methods of diagnosis with clinical assessment of pathologic processes of this body system. As well as significant aspects of pathology (definition, classification, pathogenesis mechanism, and related syndromes) generally related to neoplastic process.

The module helps students to learn:

- Structure and function of musculoskeletal system.
- Structure of musculoskeletal system, interrelation between the function and dysfunction.
- Histomorphologic properties of bones, joints, muscles.
- Mechanism and structure of contraction, muscle excitability and conduction of excitation from nerve to muscle.
- Norm and disorders of musculoskeletal system, anatomic (micro-, macroanatomic), physiological and pathophysiologic bases of physical signs.
- Describe frequent traumas of musculoskeletal system.
- Developmental malformations/disorders of bones, joints, soft tissues.
- Tumors of bones, joints, soft tissues, tumorous disorders.
- Inflammatory and traumatic damage of bones and joints.
- Characteristics of common arthritic conditions.
- Concept of disorders, illness. Acknowledge meaning and function of medical interviewing.
- Peculiarities of medical interviewing in specific populations and situations.
- Aspects of general physical examination.
- Interpretation of laboratory data and putting them into clinical context.
- Epidemiology of bone system, effect on life quality, significance of keeping physical activity/healthy life style in prevention of musculoskeletal system problems.
- Effect of chronic pain syndromes on patient's life.
- Normal structure and function of skin.
- Competent history taking during clinical conditions with skin problems.

- Differential diagnosis and management plans with frequent and significant dermatologic disorders.
- Psychological effects caused by skin problems.

2. Hematopoietic System and Infections

The module contains two topics: hematopoietic system and infectious disorders: is oriented to the discussion of normal development, functions, exchange of blood corpuscles; as well as studies various disorders and pathologies of this system, iron homeostasis, blood coagulation, principles of clinical manifestations and aspects of modern treatment; discusses issues of infectious disorders, medical microbiology, pathology, clinical manifestations and diagnostics.

The module helps students to learn:

- Normal development, function and exchange of red blood cells, white blood cells and thrombocytes.
- Red blood cells and iron homeostasis and metabolism.
- Pathophysiology, pathochemistry, pathomorphology and etiology (including infectious) aspects of various diseases of red blood cells and iron homeostasis.
- Cellular and biochemical mechanisms of blood coagulation; pathophysiology of diseases of homeostasis and thrombosis.
- Corresponding diagnostic evaluation of patients with blood disorders.
- Pathogenesis of infection and basic principles of antimicrobial pharmacotherapy; viral structure, genetics of metabolism and main characteristics of classification.
- Mechanism of action, pharmacokinetics, clinical use, toxicity of antitummor drugs.
- Principles of epidemiology, prevention of viral hepatitis; issues related to patients' life style who have active viral hepatitis.
- Role of labor protection management in health organizations; responsibility of system workers for health care of themselves, colleagues and patient.

3. Cardiovascular System

The objective of the module is delivery of principles of scientific research needed for acknowledgement of cardiovascular system disorders in relevant clinical contexts with integrated teaching of system anatomy, histology, physiology and pharmacology; facilitates understanding of fundamental concepts by the students' which is the basis and/or the reason for cardiovascular disorders, symptoms and signs. The module discusses mechanisms, manifestations, clinical examination and management of cardiovascular disorders and significant aspects of public and population health.

The module helps the students to learn:

- Anatomic (micro- and macroanatomic), physiologic and pathophysiologic basis of cardiovascular system norm and disorders/diseases, physical signs, clinical assessment and treatment.
- Heart failure based on preload and afterload understanding.
- Valvular disorders based on understanding of cycle of heart work.
- Ischemic heart diseases – with basis of their pathology, pathophysiology.
- Discussion (including in the context of common disorders of cardiovascular system) of ECG based on understanding of spread of electric wave through heart.
- Disorders of cardiovascular system: basic issues (anatomy and physiology) valuable for diagnostics, symptoms and signs, examination technique, diagnostic procedures.
- Describes activity mechanism, pharmacokinetics, clinical use, toxicity of medicines affecting cardiovascular system.
- Basic understanding of methods (ECG, chest X-ray, load tests, ultrasound, heart catheterization, CT, MRI, scintigraphy) used for examination of patients with cardiovascular disorders, data interpretation and analysis in clinical context.
- Interpretation of laboratory data of patients with cardiovascular disorders and analysis in clinical context.
- Standardised basic physical examination of system.
- Management of cardiovascular disorders and emergency conditions (therapeutic and surgical).
- Use of cardiovascular disorders for understanding significant issues of public health (factors affecting society and public health such as tobacco, diet, load, healthy life style and disorder).
- Ethical aspects of resource management in relation with cardiovascular disorders.

4. Respiratory System

The aim of the module is to learn medical aspects of human respiratory system through interdisciplinary approach: structural organization and development of respiratory system, system functioning, physiologic processes and properties are discussed at the level of macroanatomy and histomorphology through participation of anatomy, histology, physiology, pathology, principles of clinical diagnosis and pharmacology; Pathophysiologic aspects and pathomorphologic issues of respiratory system disorders for making basis of physical examination and functional assessment of the system; as well as the objective of the module is to learn pharmacologic agents used for the treatment of respiratory system and issues of diagnostics. Teaching of history taking, physical examination, making correct medical notes/records, as well as discussion of significant aspects of population health.

The module helps students to learn:

- Physical signs of the norm and disorders/diseases of respiratory system, anatomic (micro- and macroanatomic), physiologic and pathophysiologic bases of clinical evaluation and treatment.
- Anatomy of chest and lungs.
- Exchange of oxygen and carbondioxide between air and blood and transport of gasses in blood.
- Basic principles of acid-base balance, acid-base disturbances and compensatory reactions.

- Issues of basic pathology and pathophysiology of obstructive, restrictive and pulmonary vascular disorders.
- Characteristics of patients with pulmonary disorders (history, clinical symptoms and signs). Technique of examination, diagnostic procedures.
- Action mechanism, pharmacokinetics, clinical use, toxicity of pharmacologic agents affecting respiratory ways and lungs.
- Basic interpretation of methods (chest X-ray, function tests, CT, MRI) used for examination of patients with respiratory system disorders, data interpretation and analysis in clinical context.
- Interpretation of laboratory data of patients with respiratory system disorders and analysis in clinical context.
- Standardised physical examination of the system.
- Management of respiratory system disorders and emergency situations (therapeutic and surgical).
- Use of respiratory disorders for acknowledgement of issues significant for public health (factors affecting society and public health such as tobacco, healthy life style, diet, environmental factors, working and living conditions).
- Ethical aspects of management of resources related to respiratory system disorder.

5. Digestive Tract and Nutrition

The module serves to understanding of scientific principles of clinical practice in gastroenterology through analysis of key clinical issues; discusses system structure and function between the norm and disorders, as well as in relation with basic sciences and clinical practice. Facilitates understanding of issues of mechanisms, clinical manifestations and management of gastrointestinal disturbances.

The module helps the students to learn:

- Structure and function of digestive system (including liver)
- Physical signs of norm and disorders/diseases of digestive system, anatomic (micro- and macroanatomic), physiologic and pathophysiologic bases of clinical evaluation and treatment.
- Processes and mechanisms responsible for symptoms and signs of frequent symptom complexes of gastrointestinal system and liver [dyspepsia (peptic; reflux; gall-stone; functional) stomach pain and change of bowel movements, gastrointestinal bleeding, jaundice].
- Eating - digestion of nutrients and absorption, metabolism at the level of entire body, creation of energy, requirement of nutrients, obesity, hunger, role of vitamins and minerals.
- Typical characteristics of digestive system disorders, history, clinical symptoms and signs, examination technique, diagnostic procedures.
- Pharmacologic agents affecting digestive tract: action mechanism, pharmacokinetics, clinical use, toxicity.
- Basic acknowledgement of methods (GI X-ray, endoscopy, CT, MRI, ultrasound) used for examination of patients with gastrointestinal problem, data interpretation and analysis in clinical context.
- Interpretation of laboratory data of patients with gastrointestinal disorders and analysis in clinical context.

- Standardasied basic physical examination of the system.
- Management of gastrointestinal disorders and management of emergency conditions (therapeutic and surgical).
- Risk-factors, social and behavioral aspects of gastrointestinal disorders.
- Influence of gastrointestinal chronic disorders and syndromes on patient's life.

6. Nervous System

The module serves to discussion of nervous system as a whole and gives basis for acknowledgement of nervous system disorders. Learnt problems cover wide list of nervous system, started from cellular-neurophysiologic basis including person's neurobiological and behavioral issues. The course discusses examination methods and strategies used in behavioral science.

The module helps the students to learn:

- Neurobiological and psycho-social factors significant for human brain and its functions.
- Factors organizing human behavior: perception, memory, affect, attention.
- Behavioral disorders and methods of their diagnostics; neuroanatomic and physiologic mechanisms of complex behavior of human.
- Identification of biologic systems and action mechanisms of psychotropic medicines; Influence of medicine on human behavior, cognition and emotions.
- Dynamic interaction of biosocial systems and human behavior.
- General reactions of motor unit and issues of its pathology.
- Pathology of peripheral nerves` disorders and valuable issues for clinical evaluation.
- Issue of pathology of CNS disturbances/disorders.
- Pathology of cerebrovascular disorders and its understanding in the view of clinical pathology as a base for diagnostics and treatment.
- Disturbance in antenatal brain development and perinatal damage.
- Skull and spinal cord trauma.
- Nervous system tumors pathology, symptoms and signs, examination technique and diagnostic procedures.
- Pathology, symptoms and signs of CNS infections, examination technique and diagnostic procedures.
- Pathology of various genesis metabolic disturbances.
- Medicines affecting nervous system: classification, action mechanism, pharmacokinetics, clinical use, side effects and toxicity, drug interaction.
- Needs of patients with dementia, organization of multidisciplinary care and coordination
- Functions of an atorney of disabled patient.

7. Urinary System

The objective of the module is to understand the system, structural organization and development, discussion of physiologic, adaptive and pathophysiologic characteristics of system functioning and regulation; study of congenital and acquired disorders of the system, as well as issues of mechanisms, clinical manifestations and management of urinary system disorders.

Teaching of history taking, physical examination, making correct medical notes concerning the patient having urinary system pathology including use of theoretical knowledge in relation with clinical case.

The module helps the students to learn:

- Issues of basic anatomy, histology and development of kidneys and their blood circulation.
- Relationship between tubular structure and function.
- Control of renal blood circulation and glomerular filtration and the role of kidneys in acid-base balance.
- Fluid distribution in the body including water passage.
- Water-salt balance and participation of disturbance in establishment of pathologic syndrome (e.g.: hypertension and edema).
- Assessment of kidney function (including plasma clearance).
- Main clinical syndromes of urinary system; modern approaches of diagnostics and treatment.
- Congenital anomalies, tumors, obstructive disorders of kidneys and urinary system.
- Typical characteristics, history, clinical symptoms and signs, examination technique, diagnostic procedure of urinary system disorders.
- Pharmacologic agents acting on urinary system: action mechanism, pharmacokinetics, clinical use, toxicity.
- Basic understanding of methods (ultrasound, CT, MRI) used for examination of patients with urinary system problems, data interpretation and analysis in clinical context.
- Interpretation of laboratory data of patients with urinary system disorders and analysis in clinical context.
- Standardised basic physical examination of the system.
- Management of urinary system disorders and emergency conditions (therapeutic and surgical).
- Influence of urinary system chronic disorders and syndromes on patients' life.

8. Reproductive System

The module serves to molecular, genetic, chromosomal basis of health and disorder. In relation to woman health it covers physical, mental, ethical, economic, environmental and social-political aspects – influence on preserving health in woman's entire life cycle, including pregnancy. In relation with

infants contains discussion of intrauterine life and newborns, age-related changes of the system in women and men.

The module helps the students to learn:

- History taking from gynecologic patients.
- Interpretation of data of patient's anamnesis, physical examination and mental status examination.
- Gynecologic patient's physical examination.
- Developing gynecologic patient's management plan.
- History taking and examination of pregnant.
- Discussion of contraception issues.
- Screening of infectious disorders during pregnancy.
- Invasive and non-invasive screening in pregnant.
- Pregnancy complications
- Physiologic and pathologic labor
- Obstetric examination (combined, cervix, etc.)
- Determination of blood loss after delivery
- Arrangement of gynecologic procedures and examinations, interpretation of examination results.
- Identification of communication and cultural issues to be considered during family history taking and associated skills.
- Issues related to the health and social care of refugees and asylum seekers.
- Identification of sources for helping refugees and asylum seekers.
- Epidemiologic evidences influencing women decision on whether to take hormone replacement therapy.
- Key ethical and legal issues arising in relation to refugees and asylum seekers.

9. Endocrine System

Discusses functioning of endocrine system in the norm and during pathology: issues of endocrine system structural organization and development at macro- and microanatommic level, components of the system, their functioning, biochemical characteristics of relationship and regulation and physiology and pathophysiology of processes. Facilitates understanding of pathomorphologic basis of congenital and acquired disorders of the system, study of issues of clinical and laboratory diagnostics and treatment.

History taking, physical examination, study of making medical notes/records from patients with endocrine system pathology including synthesis of theoretical and practical knowledge.

The module helps the students to learn:

- Structural, biochemical and physiologic principles of normal functioning of endocrine system.
- Anatomy of endocrine system organs (micro- and macroanatomy) and normal physiologic effects of hormones.
- Regulation of hormone production of endocrine system organs.
- Pathology and pathophysiology of endocrine disorders, including endocrine tumors, as well as hormone deficit/excess.
- Principles of epidemiology, clinical manifestations and treatment of endocrine system disorders.
- Pharmacologic agents acting on endocrine system: action mechanism, pharmacokinetics, clinical use, toxicity.
- Basic understanding of methods (ultrasound, CT, MRI) used for examination of patients with endocrine problems, data interpretation and analysis in clinical context.
- Interpretation of laboratory data of patients with endocrine system disorders and analysis in clinical context.
- Standardised basic physical examinations of the system.
- Management of endocrine disorders and emergency conditions (therapeutic and surgical).
- Issues of epidemiology of endocrine disorders on the example of diabetes mellitus and thyroid gland disorders.

8. Strategy of Teaching and Learning

Educational philosophy of DTMU MD program is based on such curriculum design and delivery which serves to achieve program learning outcomes. Principles base on facilitation of students learning, independent thinking, collaborative work and initiative. Implementation of abovementioned is possible with:

(i) the strategy, which makes the program background and
(ii) the methods of teaching/learning used in the program.

(i) Educational strategy is – delivery of spiral curriculum with integrated system based approach using problem based learning and outcome-based education, through the mandatory and elective components of the curriculum.

(ii) Teaching/learning methods used in program

Curriculum teaching and learning strategy is based on the following:

- **Student-centered**
  This means that during planning, delivery and assessment of the curriculum more focus is made on learning not on teaching, in whole the objective is to focus students more on developing understanding and other skills; learning methods are chosen for effective support of students.

- **Directed self-learning**
  Means that teacher makes objectives/tasks and the responsibility of the students is to implement them: responsibility for the learning is shared between the teacher and student through student's active (non-passive) participation.

- **Promoting**
  Teaching methods and the role of the teacher is determined as promoter of searching; the program contains didactic teaching (mostly on the first stage of the curriculum, I and III topics of the course) and is embedded in such a manner that gives necessary information to the student to think and understand what he/she has learned.

- **Integrated (Deep-Learning)**
  The goal is to give clinical meaning to everything what the student learns to make learning process interesting and relevant, in the same time, we need the students to know scientific principle of the medicine so that deep understanding of basic medical sciences to make background for the clinical skills and practice. The students also have to understand why they study these issues, be able to use information critically, not to learn for "examination", which they forget immediately after passing. This approach is included for facilitation of deep learning.

- **Understandable learning objectives**
  Understandable learning objectives work as communication measure between students and teachers, it makes understandable what is learned and assessment of learning outcomes.

- **Use of spiral curriculum**
  The program bases on cyclist around 9 modules of spiral curriculum. The cycle makes three spirals. I spiral of the cycle is the stage of basic and clinical sciences; where in human system based modules explanation of mechanisms of system norm and pathologic processes, clinical (meaning) assessment of pathologic processes; typical clinical manifestations, diagnostics of disorders, principles of developing patient's management plan, communication with him/her, etc. II spiral bases on the first one and is organized around 9th module at the stage of learning clinical medicine, represents so called transitional stage between at first mostly directed study and more self-directed study of the third stage. At 2nd stage deeper revision of 9 organ systems

is done by working at real patients cases, more focus on patients medical and social, health problems, communication peculiarities; III spiral is clinical clerkship, bases on students previous experience (I, II spiral) with the purpose of his/her (knowledge, skills) consolidation and preparation for practice (residency program).

- **Structured around educational module**
  At the stage of basic and clinical study module content is delivered during the sessions of academic week which is also included in problem based learning (*PBL week*) and case-based learning *(Principles of Clinical Diagnosis with Clinical Assessment of Pathological Processes)* in order the students to have additional measures for understanding the relevance of their learning to the future clinical practice.

8.1. Methods of Learning

- **Problem-Based Learning (PBL)**
  Students work in small groups with facilitator at series of clinical problems. Groups work three times a week (2+2+1 hours) and work on one problem during the week. They start working on it at the first session, make learning objectives (under supervision of facilitator); at the second session they come back with found information, discuss it, receive further information concerning the patient/problem for stimulation of further study; they continue the feedback and finish working at problem at the third – one hour session.

- **Case-Based Learning (CBL)**
  Students work in small groups; it is like PBL, however, with significantly smaller time (per each case); Principles of Clinical Diagnosis with Clinical Assessment of Pathological Processes; Courses of Clinical Skills. Cases will be used in most of the clinical courses.

- **Competency-Based Learning**
  The students work to reach experience in particular (specific) list of competencies, e.g.: cardiopulmonary resuscitation, communication skills with patients, etc.

- **Portfolio-Based Learning**
  At the stage of clinical study students fill log-book where they write information related to the curated patients, acquired skills, discussed ethical issues, ambulatory, hospital, cases and skills seen at other clinical institutions. In defined components (in case of reaching) they are awarded with credits. Student's personal education plans are also part of the portfolio; the student can identify (we expect from them) own strengths and weaknesses.

- **e - Learning**

There are important e-resources for self-education in the library, including for preparation to PBL and CBL, training in clinical skills, preparation of presentation, scientific project, etc.

- Patient Oriented Learning
  Students study from real patients, everywhere where it is possible, in the ambulatory and hospital environment, rehabilitation center, etc.

- Lectures
  Lectures are important academic resources for curriculum. It is encouraged the lectures to be interactive as much as possible; focused to present big (macro) picture, to clarify difficult issues and/or summarize particular material, so that existing material can be learned more effectively.

- Discussions in large group
  Discussions in the group are used for debates. Some issues of ethics are delivered by this way. The students duty is to present specific opinions and justify the new position.

- Discussions in small groups /workshops
  The students have discussions in small groups – despite PBL and CBL tutorials, for example discussion of scientific works at Journal Club format.

- Posters
  Presentation of project works in the framework of academic module/course (e.g.: principles of scientific research).

- Observation of clinical practice
  Students study through observation of clinicians and patients communication in order to start practice, based on the knowledge obtained from patients and colleagues.

- Clinical experience under supervision
  Students have to obtain as much experience as possible through communication with patients. Constructive feedback given by the staff significantly influences their education; this is possible by either observation of patients or presenting the data to the staff members or students by presentation.

- Group learning
  The students work in groups including in the format of PBL and case-based learning where they learn to listen others, respect others' and different opinions, get accustomed to group discussion, share responsibility on group work, agree the opinions and develop other

interpersonal skills. Importance of group work is emphasized during learning of clinical and communication skills and during all clinical rotations.

- **Role-play**
  Role-play is valuable for learning of issues in which the students might have less personal experience, including e.g.: communication with "problematic" patients, from different cultural environment, etc. Simulated patients may be involved here; which also helps the feedback related to the academic sessions and evaluation of students.

- **Presentations**
  During the program the students make presentations for other students and the staff. Some presentations are verbal, some are posters, some individual or prepared in groups, some in small groups (e.g.: PBL tutorial), some in bigger groups.

- **Peer Tutoring**
  There is valid evidence that humans learn an issue much better when they teach. PBL and CBL stimulate peer tutoring; there are such formats in DTMU; there is a big experience of tutoring junior students by senior students in basic disciplines (share their experience in learning progress), as well as they teach clinical skills (there are three such interest groups at the university: surgery, obstetrics and gynecology and neurology).

- **Practical Classes**
  Practical classes are necessary resource so as to facilitate the students in understanding scientific knowledge on human body; in correlation of knowledge with clinical problem in PBL and CBL format and in discussion of patients seen during clinical rotations.

- **Training of Clinical Skills**
  The students have access to labs of clinical skills where the students study clinical skills in safe environment, models and mannequins are the means for training in such skills, which is impossible by practice on each other. Sessions of clinical skills are embedded in curriculum from basic and clinical sciences level and continue in the years of clinical practice.

9. Assessment Strategy

9.1. Introduction

The goal of MD program is to prepare humane, clinically competent practicing doctors with skills of clinical reasoning and life-long learning. Assessment strategy is used to facilitate reaching this goal. Although, it is generally accepted that assessment is main characteristic of learning, we hope that our

students will not be oriented only on passing exams; assessment is integrated in curriculum to facilitate the educational approach.

MD program facilitates obtaining knowledge and development of problem-solving skills through group- and self-directed learning. Assessment framework helps this approach through acknowledgment and motivation, gives direction to progress adequacy and gives the student feedback on issues which need further work.

Assessment tests judgement and use of knowledge, skills (clinical assessment, procedure skills, critical thinking) and professional behavior.

9.2. Key Principles of Assessment

Assessments should be valid and reliable in context.
Formative assessments are used in order to inform students quite frequently about their progress. The staff has to be informed concerning each student in order to conduct repeated activities for helping the student to solve the problem. Formative assessments are used mainly for the purpose of feedback, however, it also takes part in assessment if the student has passed the course.
Summative assessments can be also used for the feedback to students, either formative or summative (Semester) results are included in students' personal files concerning their achievements.

9.3. General Criteria of Assessment in Themes according to the Education Stages

General criteria of assessment in each theme and descriptors for education in each stage are given below.

9.3.1. Basic and Clinical Sciences

- Adequate knowledge and understanding of human normal and disordered structure, function, behavior.

- Ability to use this knowledge for diagnostics, management and prevention of health problems (use of theory in practice).

- Ability to organize and present information in coherent, logical and complete form.

I. Stage – study of basic and clinical sciences in the context of clinical meaning, "paper-based" patients, standardized patient cases.
II. Stage – use of obtained knowledge at first level on "real" patients.

III. Stage – integration of obtained knowledge (through all parts of the program) and preparation for the first year of residency.

9.3.2. Clinical and Communication Skills

- Ability to obtain and interpret clinical symptoms and signs by interview and examination of patients, record and relate them to each other; use them in relation with other existing clinical data to develop management plan with patient and other professionals.

- Shows and understands necessity of doctor-patient relationship, ability to listen to patient and his/her family members and uses all means for effective communication.

- Ability to conduct important clinical procedures including solving emergency clinical situations.

I – stage studies how to conduct clinical procedures and effective communicate with patients (mainly standardasied or virtual patient) either in classroom environment or on real patient.

II - stage – is done in more experienced, clinical and communication skills in hospital and ambulatory patients, environment through intensively monitored practice.

III - stage - is quite competent in clinical procedures and communication with patients, is preparing for residency program in conditions of limited supervision.

9.3.3. Public and Population Health

- Shows understanding of political, organizational and economical frameworks in which Medicine works in Georgia (and globally), including national healthcare system structures and functions.

- Shows knowledge in issues and techniques included in study of disorders influence at population, public and individual level.

- Evaluates rights and needs for persons with mental and physical disabilities.

- Shows knowledge of social and psychological load of persons with chronic disorders and/or disabled ones and their caregivers.

- Shows understanding of knowledge in issues (including screening) of health support and prevention of disorders.

- Evaluates needs for local society in relation with delivery and access to services.
- Shows knowledge in principles of control of contagious disorders.

I-stage - Studies psychological, social and population issues in the context of health and disorders by cases, seminars.
II-stage during rotations in clinical medicine shows knowledge related to the importance of context of psychological, social and health services for patients.
III-stage shows patient-centered practice in conditions of limited supervision in ambulatory and hospital settings.

9.3.4 Personal and Professional Development

- Shows understanding of medical practice, professions, professional behavior.
- Shows understanding of legislation related to the medical field.
- Agrees to necessity of use of evidence-based medicine in making clinical decision.
- Shows basic understanding of statistical approaches for data analysis and an ability to choose the most suitable statistical method for specific situation.
- An ability to evaluate publication critically.
- An ability to collaborate as a team member.
- Shows skills of writing information, organization and management, including use of corresponding information technologies.

I –stage Learns principles of professional practice and effective learning.
II-stage during clinical rotation in conditions of supervision and monitoring trains in using professional standards and requirements.
III-stage shows professional standards and requirements in the context of limited supervision.

9.4. Methods of Assessment

- Multiple choice questions, where the students choose the best answer from the list of possible answers. Most of the questions are asked in the format of clinical scenarios or vignettes.

- Mini-Cases, which are involved in practical classes of diagnostics course are also included, for example, in clinical skills training course.

- Questions of Problem Analysis, where the students are given short vignettes in which either context or stimuli for questions are delivered, which requires data interpretation, critical analysis and knowing mechanisms of patient's problems from students.

- Objective Structured Clinical Examination (OSCE), where students perform the tasks from their structured list, which may contain practical procedures, methods of interview or data interpretation.

- Clinical Cases, e.g.: Mini-CEXs, where observation on students, their communication with standardized and/or real patient is done, and where they also answer the questions asked by the examiner.

- Direct Observation of Procedural Skills, where students are observed to see how they fulfil particular procedures to prove competency (e.g.: measuring pressure, etc.).

- Case-Based Discussion (CBD), where students are asked questions by structured way on cases in which they are actively included.

- Portfolio, set of evidences which represents the skills obtained by students, how to deliver and accept constructive critics for their personal development and study.

- Reports, Oral Presentations or Posters fulfilled during particular academic modules (e.g.: Principles of Scientific Research).

- Progress Test – currently the students take international progress test delivered by EBMA twice a year which also allows giving feedback to students; for possibility of personal development and defining their own learning objectives by analysis of student's individual need. Where it is possible assessment is done in clinical context and written assessments are used like practicing doctor's duties, such as: for example: patient notes – history collected during personal supervision of patient by the student, examination results, diagnostics and management plans.

- Writing Critical Evaluation about journal article.

- Scientific Research Project for grant application.
- Interpretation of Patient Data.
- Use of electronic recipe system (e-prescription) at relevant level.

Examiners

DTMU plans according training course in assessment for all examiners. Responsible examiners are required to attend the course developed in the framework of staff development program by DTMU Medical Education Center (MEC).

The staff who develops written or OSCE or MINI CEXs exam questions are required to attend the workshop on Item-Writing. For examiners in OSCE it is required to attend the course organized in the framework of the staff development program and participation in preparatory session arranged before the exam.

Feedback and Students Progress

The students regularly are given feedback in each assessment. This means detailed feedback about results in each part of assessment or each topic, scores by individual components, e.g.: in module, module subject blocks, OSCE or MINI CEXs according to the station/competence. Mentioned is delivered verbally, in written form, individually.

Students progress is monitored by the Dean, Course Leader, teachers of clinics (locally, as well as tutors (PBL) and teachers (practical sessions), in order to identify timely the weaknesses for facilitation and repeated teaching/study and/or training.

Feedback and Assessment Given by Students

Feedback given by the students is important to be reflected in education quality and must be used in assessment of entire course or individual sessions. Already existing and operating feedback systems will be continued, as well as study of the ways for their perfection, where it is necessary.

Representatives of students are involved in most of committees (except of strategic management and finances) of DTMU, most of them are nominated by students union (SYSSA).

Collection of feedback from students at various levels of program is described below.

Basic and Clinical Sciences

Students feedback is collected through online questionnaires immediately after finishing theoretical sessions, practical classes, PBL sessions.

Feedback Concerning Clinical Practice

Students feedback during the period of clinical rotation (mandatory and elective courses) and is collected through online questionnaire, currently it is collected by DTMU quality assurance service and after analyses presents to the Faculty Council. In future, these data will be processed under supervision of vice-dean (in the field of medical education) by participation of assistant dean and coordinators of corresponding years (for assessment of clinical bases relevant questionnaire is used).