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1 INTRODUCTION

This deliverable report describes how each Partner University identifies their own assessment strategy, developing assessment instruments, validation, and implementation. The first part presents the assessment strategy of each partner university. The second part describes types of assessment instruments and how the instruments were developed, validated and implemented for the new medical error cases. The third one presents the achieved results.

2 ASSESSMENT STRATEGIES FOR THE NEW CASES

2.1 Kazakhstan

2.1.1 Astana Medical University - AMU

Assessment instruments of new cases consisted of two parts: an essay for evaluation of clinical cases and multiple choice questions for evaluation students' knowledge on medical errors.

All essay responses were saved in the Moodle program, for each student and group. We were assessing in the following way: we read the answers and using with the help of the evaluator's table chose the criteria and the program counted the score.

Essay questions were: 1. What did I know, what did I learn, 2. what was unclear for me or with what did I have difficulties during the case tutorial, 3. what did I need to think more or I need to learn the topic deeper about, 4. what was done by the doctor effectively, appropriately, fully in the case, 5. what could be done in a different way during the case tutorial, what would I do to avoid these errors.

Students knowledge was assessed via MCQ test, this test consisted totally of 100 questions on discipline "General Medical Practice", which mean cover all questions, which have been reflected in new clinical cases based on medical errors. Testing was carried out in 4 groups that were trained by D-PBL and 4 groups that were trained according to the traditional method (control group).

2.1.2 Karaganda State Medical University - KSMU

KSMU used virtual patients (VP) scenarios in General Practice for clinical PBL with senior students (Year 5 of undergraduate curriculum) to train them in prevention of medical errors. We investigated how group dynamics influence student perceived ability, experience, knowledge and communication skills to help them manage the patients in the future. Team of GP teachers carefully analyzed possible medical errors in their practice, designed 6 VP cases and lead tutorials with students (PBL-VP track).

After 6 months of completion of cases the students were given multiple choice exam on each case (10 questions per case) and went through 6 OSCE stations with standardized patients' scenarios mimicking the VP cases. Routine progress test score prior to tutorials was used as indicator of initial academic abilities of students. The intervention group included all the students in PBL-VP track, the control groups were composed of students

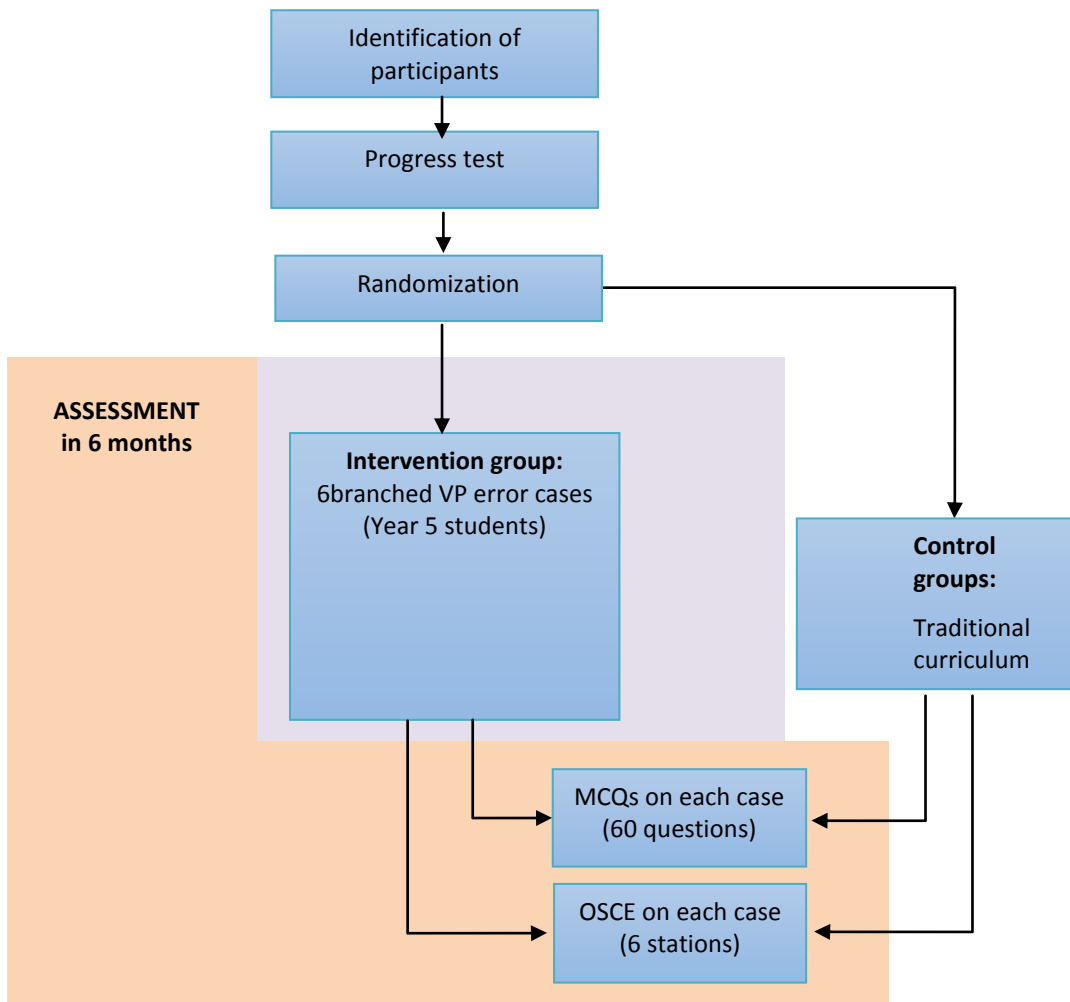
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of regular traditional curriculum (which is not utilising any PBL-VP tutorials) of Year 5 and Year 6 for MCQs, and Year 5 students for OSCE stations.



2.2 Ukraine

2.2.1 Zaporozhye State Medical University - ZSMU

To evaluate the effectiveness of implementation of new VP surgical cases at ZSMU in the frames of an elective course “TAME: Training Against Medical Error in Surgery” the following strategy was developed: Conduction of students’ knowledge assessment before and after the tutorials. Students were evaluated 4 month after the tutorials to note the level of knowledge sustainability.

To assess the initial level of students in Surgery 36 questions on general surgery were developed and tested by 12 students of the 6th year of Medical Faculty and 5 tutors.

To identify the sustainability of knowledge on the discipline “Surgery” it was decided to use 36 questions (6 questions for a case).



2.2.2 Bukovinian State Medical University - BSMU

The goal of the knowledge assessment strategy for new therapeutic cases was to compare the knowledge of students who studied branch cases, linear cases and a control group' knowledge, assessment of the survival of knowledge, definition of student preparation after the introduction of the case method in the educational process.

For outgoing knowledge were used MCQ test of therapy consists of 100 questions (96 students).

Three months after PBL classes assess students' knowledge of new cases was conducted to identify the sustainability of knowledge on therapy after a period of time. For this 60 tasks based on cases information were created (10 tasks per one case): 30 MCQ with single answer (5 per each case), 18 multiple-answer tests (3 per case) and 12 shot open answer tasks (2 per each case).

A comparative assessment of the knowledge of students who studied branch cases, line cases and control group was conducted (the case method was used).

2.3 Vietnam

2.3.1 Hanoi Medical University - HMU

In order to evaluate the effectiveness of new teaching approach on students, the assessment strategy was created and developed. We compared and identified any differences between control and intervention group in terms of their performance towards medical case studies and awareness on medical errors by using MCQs as pre-test and post-test for both groups.

MCQs and T/Fs, covered knowledge of infectious diseases, are designed to evaluate students' performance. The MCQs and T/Fs scores are used to compare the knowledge level between intervention and control groups, before and after intervention.

2.3.2 Hue Medical University - Hue UMP

The objectives of assessment for the new cases were to evaluate the effectiveness of applying new medical errors cases at Hue UMP. The assessment strategy was therefore focused on two broad categories: pedagogical effectiveness of error VPs cases and students' awareness on medical errors. To assess the effectiveness of D-PBL versus traditional method, we applied mixed method including qualitative and quantitative approaches. The quantitative approaches applied MCQs and questionnaires to collect data. For the qualitative approach, we used focus group discussion (FGDs). To identify potential differences between D-PBL approach and traditional teaching approach, we conducted pre-test and post-test and use control group for comparison.

To identify students' knowledge on medical errors, a set of 10 MCQs for each case was developed to evaluate their capability to detect errors given in the new cases. A comparison on total MCQs scores between intervention and control groups were used to test for any differences of knowledge between those groups.



3 DEVELOPMENT OF ASSESSMENT INSTRUMENTS

3.1 Kazakhstan

3.1.1 Astana Medical University - AMU

To evaluate the essay answers were used some criteria: the first criterion is called completeness of answers and had three levels: 2 - the student clearly and fully answers all the questions of the essay, 1- the answers to the question are not full, 0 - there are no answers to more than half the questions and / or monotonous answers from one or two words. In this criterion the maximum points that could be acquired were 20. The second criterion was analysis and assessment of information, 4- correctly and reasonably explains textual information; gives personal assessment of the problem, 3- correctly, but there is no clear justified response, gives personal assessment of the problem, 2 - correctly explains text information; gives a partial personal assessment of the problem, 1 - illiterate interpretation of textual information and partially personal assessment of the problem; 0 - information is not correctly and not reasonably presented; there is no personal assessment of the problem. The maximum points to be acquired were 40. Third criterion for students evaluation is called logical and coherent summary: 4- the summary is clear and concise; the evidence is logical and reasoned; different points of view and personal assessment are given, 3 - the summary is clear, but not concise; the evidence is logical, but not argumentative; a partial assessment is given, 2 - the summary is unclear and partially not clear; the evidence presented is illogical, and partially argued; partial assessment is given, 1- the summary is vague and unclear; but there is evidence and partly argued; but there is no personal assessment, 0 – the summary is vague and unclear; there is no evidence and arguments; there is no personal assessment. The maximum points that a student could get were 40.

Multiple choice question test was conducted by 32 students (4 groups) of Year 5 "General Medicine" were selected for conducting tutorials with D - PBL. A schedule was drawn up taking into account the interdisciplinary approach. The correspondence of the case to the discipline of the module "General Medical Practice", 6 clinical cases with different specialties: unit 1 – cardiology: "Headache", unit 2 –pulmonology: "Cough", unit 3 - hematology: "Weakness", unit 4 - endocrinology: "Thirst", unit 5-pediatric: "Difficult breathing", unit 7 - obstetrics and gynecology: "Bleeding" . The tutorials were held from 06.02.2018 to 29.03.2018, 2 times a week, with duration of 3 hours a day. At the end of each clinical case, an online essay was completed, which was developed on the Moodle platform. (Sample of Students' assessment tool is given in **Annex 1.1.1**).

3.1.2 Karaganda State Medical University - KSMU

The MCQ questions were developed by the same case writers who wrote the cases – 10 questions per each case: 5 questions directly relating to the case and 5 questions relating to the disease discussed in the case, but not necessarily to facts in the case.

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OSCE stations were written by staff of practical skills centre after consultations with case writers and were based on the scenario of the case. The checklist for OSCE stations included the following rubrics:

Personal appearance

Welcoming patient for consultation

Adequacy in use of non-verbal communication

Adequacy in use of verbal communication

Quality of medical interview

Defining patient's problems

Reach of medical compliance

Providing information on disease to patient

Adequacy of finishing the interview

Fit to psychological profile of doctor

All the rubrics of checklist are assessed by the trained standardised patient using 0-5 scale where 0 corresponded to no competence, 1 – unconscious incompetence, 2 – conscious incompetence, 3 – edge between incompetence and competence, 4 – conscious competence, 5 – unconscious competence.

While developing the MCQs and OSCE stations, 3 joint meetings of project team, tutors and staff of practical skills centre were held to discuss the issues on structure, validity and content of the instruments. After completion of OSCE stations, the practical skills centre organised 2 workshops to train the standardised patients in interaction with examinees and assessment of their performance.

To test the reliability of the developed instruments we piloted the MCQs on 18 students of Year 6. Unfortunately, the results did not produce good reliability. The resulting Cronbach's alpha for 60 MCQs was only 0,441. We gathered all the tutors to analyse the content of questions and decided that all the questions matched the learning outcomes of the cases and Year 5 curriculum in General Practice. All MCQs were related to either clinically relevant outcomes or underlying mechanisms of the disease understanding of which is required from doctors to make informed evidence-based decisions. Our interpretation of the low reliability was that the traditional methods of teaching did not reinforce knowledge retention and Year 6 students had to randomly guess the answers in some cases. The tutor group decided to pilot the MCQs again for Year 5 students that did not have D-PBL tutorials. However, some minor technical corrections were made MCQs to help students to better comprehend the questions. The second pilot was done for 22 students from traditional curriculum of Year 5. The resulted Cronbach's alpha was 0,711, confirming our previous hypothesis. The MCQs were approved for the use for students in PBL VP track. The Cronbach's alpha for PBL VP track was 0,782.

The similar pilot was done for OSCE stations: all six stations were piloted on 14 students of Year 5. Since all OSCE stations were assessed by the same checklist with 10 rubrics, the reliability was calculated jointly for 10 items on the checklist, and not separately for 60

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resulting items (six station times 10 rubrics). The Cronbach's alpha for the pilot group was 0,763. Thus, both the checklist and the stations were approved for the use in PBL VP track. The Cronbach's alpha for PBL VP track was 0,887. (Sample of Students' assessment tool is given in **Annex 1.1.2**).

3.2 Ukraine

3.2.1 Zaporozhye State Medical University - ZSMU

For the purpose of students' knowledge assessment the following tools were developed:

Pre-assessment tool was created by the University staff to assess their knowledge before the exposure to VP cases. 36 questions on general Surgery were developed. 32 students involved into tutorials and 12 students of control group of the Medical Faculty No1 took part in the survey on hard copies. Several examples are presented in Annex 3.2.1.3.

Knowledge evaluation tool was developed to assess students' knowledge and its sustainability in "Surgery". 36 questions were created by the responsible staff of ZSMU. We attach examples for one of the cases in section **(a). Pre-assessment tool of Annex 1.2.1**.

The working group on VP cases creation consisted of 3 surgeons, these surgeons were also creators of 36 questions for final assessment - 6 questions per one case: 2 single questions for finding the best answer directly related to a case; 2 single questions for finding the right answer related to a disease; 2 open questions connected with a disease (on diagnostics or management strategy, 1-2 word answer needed). After its creation the questions were reviewed by the responsible person Oleksandr Kostrovskyi for VP cases creation at ZSMU and the coordinator from ZSMU Olena Furyk in 01/11/2017.

You can see a report on reviewing the 36 questions of the surgical direction above by the students:

- The cases were corrected grammatically and lexically;
- The surgeons were proposed to shorten the questions 25 and 31 to make them readable;
- 2 questions referred to one case, so it was proposed to give the case in full, as the questions were delivered on-line separately;

After the amendments, the evaluation tool was sent to the tutors and students (11 students of the 6 year of study not involved in the Project) as well for testing.

Some questions contained too much clinical and laboratory data that had no essential value for diagnosis making and were only confusing during differential diagnostics.

(see section **(b). Modification of Knowledge evaluation tool in Annex 1.2.1**). (Sample of Students' assessment tool is given in **Annex 1.2.1**).



3.2.2 Bukovinian State Medical University - BSMU

At the beginning BSMU developed 6 therapeutic cases (course internal medicine) for 6 years students (specialization Medicine). In total, 96 students participated in the Grant Project (32 students studied branched cases, 32 students – linear cases and 32 students engaged in the traditional method. For outgoing knowledge of all students were used standard therapeutic MCQ tests. These tests are used at the University for the initial assessment of the knowledge of all students before studying the subject of internal medicine in the 6th year of the course.

For final knowledge test 60 tasks based on cases information were created. It included 30 MCQs with a single answer (5 per each case), 18 multiple-answer tests (3 per case) and 12 short open answer tasks (2 per case). Examples of questions are given in the annex.

Assess students' knowledge of new cases was conducted on 5th May, 2018 (in paper form). (Sample of Students' assessment tool is given in **Annex 1.2.2**).

3.3 Vietnam

3.3.1 Hanoi Medical University - HMU

With the aim of assessing students' knowledge, two stages of assessment were implemented as follow: Prior to teaching new cases, students were introduced about the PBL approach. Then, they were examined via MCQs and T/Fs that test students' knowledge about infectious diseases in general. After teaching all cases, students were given MCQs and T/Fs test to examine their performance post-intervention.

For the knowledge assessment tool, 61 MCQs were created and developed by responsible staffs of HMU from Department of Infectious Diseases. Composition of six infectious diseases were chose based on the special characteristics of diseases and the popularity of these diseases in Vietnam, including: Typhoid fever, Dengue hemorrhagic fever, HIV/AIDS, Stretococcus suis infection, Tetanus and Viral hepatitis. These tests were used to assess students' knowledge of infectious diseases with the requirement that students need to understand not only these six cases themselves, but also knowledge of infectious diseases circumstances generally.

For "the students' reaction towards different scenarios" assessment tool, 6 T/Fs tests were created and developed. These tests aim to assess students to see how fast students react when they face with these situations. The rational of these T/Fs: In reality, real doctors must regconize and be clear about patients' symptoms in order to make right decisions in short time period. Deciding a statement to be true or false in short time period may lead to further right or wrong decision. The examples of MCQs and T/Fs tests (in English translation version) were illustrated in the Annex 1.3.1.

After the MCQs and T/Fs tests being developed, they were consequently reviewed and received feedbacks in terms of grammar correction, academic contents and format of the

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tests. After amending in response to these feedbacks, the final version of assessment tools was sent to students and tutors.

After teaching all cases, students were given MCQs test to examine their performance post-intervention. (Sample of Students' assessment tool is given in **Annex 1.3.1**).

3.3.2 Hue Medical University - Hue UMP

To assess students' knowledge and capability of detecting error, 10 MCQs were developed by lecturers who were responsible for developing these new cases. The MCQs aimed to assess students' applicable competency (level 3 according to Bloom taxonomy), therefore, we choose the integrated MCQs structure for these assessing purposes.

To develop and validate those MCQs, we decided to do as below: First, in order to let those case writers knew the different levels of questions and could apply Bloom's taxonomy when developing MCQs, those case writers had to attend the course "How to develop MCQs using Bloom taxonomy" which were provided by the expert from HueUMP. Second, those case writers developed the draft of MCQs of their own new developed case. Those MCQs were then reviewed among lecturers who got involved in TAME project at HueUMP. They specialized in paediatrics, internal medicine, surgery, obstetrics and gynaecology. The revised contents included grammar correcting, spelling, specialized terminology and content relating to VP cases. After that, a group of fifth year medical students - who would not participate in the TAME project - were randomly selected to test all those MCQs. Finally, the results of testing were reviewed and MCQs were then revised for the last round. All the lecturers agreed on the final version of MCQs and those MCQs were used to assess the students' knowledge regarding new developed cases on 21st July, 2018 in paper form.

An example of those MCQs were given in the Anex 1.3.2. All the MCQs consisted of 4 parts: a stem which stated a clinical case, a lead (question), a most appropriate answer, and distractors. The MCQs followed the 4 or 5 options formats.

(Sample of Students' assessment tool is given in **Annex 1.3.2**).



4 ANNEXES

ANNEX 1 Tool for students' knowledge assessment (samples)

ANNEX 1.1 Kazakhstan

ANNEX 1.1.1 Astana Medical University – AMU

MCQ for clinical case "Cough"

1. What is characteristic of the clinical picture of pneumonia in the elderly patients?

- A. Acute onset of pneumonia
- B. Clinical picture accompanied with high fever
- C. Erased clinical features
- D. Clinical features with dramatically increased ESR
- E. Symptomatic clinical features

2. What auscultative signs of pneumonia?

- A. Dry wheezing
- B. Amphic breathing
- C. Crackles
- D. Pleural friction
- E. "Silent" breathing

3. Patient 67 years old, complains cough with productive pus sputum, shortness of breath, aggravated by physical exertion, temperature rise up to 38 ° C. Ill acutely after hypothermia. Smokes a lot. Auscultation: on the background of weakened breathing with prolonged exhalation, scattered dry rales are heard from two sides, to the right in the subscapularis area - moist finely crackles, there is also a dull percussion sound. Radiographically: in the lower lobe of the right lung infiltrative shadow. WBC –14 * 10⁹ / l, ESR-22mm / h. Which of the following diagnoses is most likely?

- A. COPD, mild exacerbation. Pneumonia in the lower lobe of the right lung
- B. COPD, moderate severity, exacerbation. DN 2 degrees
- C. Bronchial asthma, moderate severity. DN 2 degrees
- D. Bronchial asthma, moderate. Pneumonia in the lower lobe of the right lung
- E. COPD, moderate severity. Pneumonia in the lower lobe of the right lung

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A woman, 65 years old, fainted on the street and was taken by an ambulance to the hospital. Physical examination: tachycardia 120 beats per minute, severe hypotension. At a review radiography of the lungs: total darkening of the right lung. What complication of pneumonia should be considered first:

- A. Acute respiratory failure
- B. Parapneumonic pleurisy
- C. Acute pulmonary heart
- D. Toxic shock
- E. Distress syndrome

Patient A., 69 years old with severe lobar pneumonia with a critical drop in elevated body temperature, suddenly developed severe weakness, dizziness, tinnitus, nausea, and vomiting. Objectively: the patient is pale, marked acrocyanosis, cold sticky sweat, heart rate 100 beats per minute, threadlike pulse, deafness of heart tones, BP 75 / 50mm hg Art. The most likely cause of a sharp deterioration in the patient's condition is the development of:

- A. Sepsis
- B. Cardiogenic shock
- C. Pulmonary embolism
- D. Toxic shock
- E. Acute respiratory distress syndrome

MCQ for clinical case "Thirst"

Diabetes mellitus type 1 is characterized by:

- A. acute onset, young age, ketoacidosis, absolute insulin deficiency
- B. gradual onset, average age, excess weight gain, relative insulin deficiency
- C. acute onset, predominantly female, rapid weight loss, increased appetite, exophthalmos;
- D. gradual imperceptible onset, age over 40, insulin is not vital;
- C. gradual onset, dry skin, bradycardia, constipation, swelling of the face, excessive weight gain

The most active stimulants of insulin secretion are:

- A. amino acids
- B. free fatty acids
- C. glucose
- D. fructose
- E. electrolytes

MCQ for clinical cases " Headache"

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In hypertensive crisis, complicated by acute coronary insufficiency, the drug of choice is:

- A.captopril
- B.chloephin
- C.nifedipine
- D.bisoprolol
- E.furosemide

The group of very high risk in hypertension include:

- A.patients with generalized narrowing of the retinal arteries
- B.patients with localized narrowing of the retinal arteries
- C.patients over 65
- D.patients with diabetes and diabetic retinopathy
- E.patients with a blood cholesterol level of more than 6.6 mmol / l

What level of increase in blood pressure corresponds to the level of 166/94 mm Hg?

- A.I degree
- B. II degree
- C.III degree
- D.Target level
- C.Optimum normal level

What level of increase in blood pressure corresponds to the level of 184/100 mm Hg?

- A.I degree
- B.II degree
- C.III degree
- D.Target level
- E.Normal high pressure

What drug should be recommended to the patient for self-relief of hypertensive crisis?

- A.Captopril
- B.Dibazol
- C.No-shpa
- D.Furosemide
- E.Amlodipine

A 58-year-old woman, after intensive work in the garden area, felt severe pressing pain behind the sternum, breaking pains in her left arm, lack of air, weakness, sweating. Twice took nitroglycerin, the condition has not improved. Objectively: very concerned, scared, pale skin, moist. Heart sounds are deaf, arrhythmia, BP 145/75 mm Hg, heart rate 90 per minute. Probable diagnosis:

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- A. Acute myocarditis
- B. Climacteric cardiomyopathy
- C. Acute myocardial infarction
- D. Arterial hypertension
- E. Intercostal neuralgia

MCQ for clinical case "Weakness"

What type of anemia is accompanied by high reticulocytosis?

- A. Iron-deficiency anemia
- B. chronic post-hemorrhagic
- C. hemolytic anemia
- D. hypoplastic anemia
- E. Vitamin B12-deficiency anemia

Give a characteristic that corresponds to megaloblastic anemia:

- A. a condition characterized by a reduction in the life span of red blood cells due to disruption of their membrane
- B. disease associated with impaired DNA synthesis of red blood cells with a deficiency of vitamin B12 and folic acid
- C. condition accompanied by severe pancytopenia and decreased blood formation in the bone marrow, without signs of hemoblastosis
- D. disease that develops due to a decrease in the activity of erythrocyte enzymes
- E. disease associated with changes in the structure or synthesis of hemoglobin

What laboratory parameters correspond to the diagnosis of iron deficiency anemia:

- A. hyperchromic anemia
- B. reticulocytopenia
- C. microspherocytosis
- D. increased total serum iron-binding capacity
- E. positive desferal test

For iron deficiency anemia are characterized by:

- A. Hypochromia, microcytosis, sideroblasts in sternal punctate
- B. Hypochromia, microcytosis, target erythrocytes
- C. Hypochromia, microcytosis, increased serum iron-binding capacity
- D. Hypochromia, microcytosis, decrease in serum iron-binding capacity
- E. Hypochromia, microcytosis, positive desferal test

What is the maximum amount of iron absorbed per day in the gastrointestinal tract

- A. 0.5 mg

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- B.2.0 mg
- C.3.0mg
- D.4.0 mg
- E.6.0mg

In what form is iron better absorbed from food?

- A.in the form of ferritin
- B.in the form of gem
- C.in the form of hemosiderin
- D.in the form of III-valence iron
- E. in the form of II-valence iron

A 39-year-old man with complaints of dizziness, fatigue, shortness of breath, paresthesias in the limbs and a tendency to diarrhea. When viewed from the skin yellowish color, smoothness of the papillae of the tongue, signs of glossitis. A patient underwent gastrectomy 2 years ago. Hyperchromic anemia is noted. Bone marrow puncture: megaloblastic type of blood formation. An increase in the level of ferritin in the blood. What is the preliminary diagnosis?

- A.Iron-deficiency anemia
- B.B12-deficiency anemia
- C.autoimmune hemolytic anemia
- D.congenital hemoglobinopathy
- E.aplastic anemia

A 32-year-old woman suffers from menorrhagia for a long time. Hemoglobin-79 g / l, CP-0.69, leukocytes $3.8 \times 10^9 / l$, formula without features, serum iron 5.2 mmol / l. What is the intended treatment?

- A. Sorbifer Durules
- B.Ferrus Lek in / m
- C.Folic acid inside
- D.Vitamin B 12 V / m
- E.Erythrocyte mass transfusion

MCQ fo clinical case " Difficult breathing"

A child of 3 years more for 2 days. The disease began with cough, runny nose, fever up to 40C. What type of fever is classified in a child?

- A.Subfebrile
- B.Moderate febrile (38.0–38.9 ° C)
- C. Febrile
- D.Hyperthermic

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E. Hyperpyretic

Child 10 months. T0 body 38.0 C. Cough paroxysmal with sputum difficult to separate. Expiratory dyspnea. Breathing in the lungs is hard, dry whistling and moist fine bubbling rales in all fields. Perkutorno over the lungs - boxed shade of pulmonary sound. Suspected disease

- A. acute pneumonia
- B. acute laryngitis
- C. obstructive bronchitis
- D. acute bronchiolitis
- E. bronchial asthma

A child is 8 years old. On the background of ARVI appeared wheezing, frequent unproductive cough. When auscultation of the lungs breathing weakened, in all fields of wheezing. With percussion - boxed sound. The same symptoms are observed upon contact with a cat, periodically in physical education classes with fast running. The boy's mom has frequent sneezing and tearing in the autumn. The alleged disease in the boy.

- A. obstructive bronchitis
- B. acute pneumonia
- C. + bronchial asthma
- D. acute bronchitis
- E. chronic pneumonia

For the clinic of obstructive bronchitis is characterized by:

- A. cough with viscous sputum
- B. with percussion - tympanic shade of pulmonary sound
- C. expiratory dyspnea
- D. dry wheezing
- E. unproductive cough

ANNEX 1.1.2 Karaganda State Medical University – KSMU

a) Assessment of initial level of knowledge before cases

The assessment of initial level of knowledge was done through *progress test* (PT) administered at the end of the academic year to all the students of KSMU as formative way of measuring the achievement of final learning outcomes. We took the assessment results conducted in May 2016. It was composed of 25-30 clinical vignettes followed by 5-8 multiple-choice questions in different basic sciences and clinical disciplines. The administered questions are the same for all medical students regardless the phase of their

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training. All the questions are designed to test the knowledge required of young practicing doctor and are based on the blueprint of desired competencies of the graduate.

b) Example of MCQs for assessment of knowledge after the cases

This example includes 2 MCQs for each of the 6 cases: the first question deals directly with the content of the case, the second one is based on the clinical material in the case, but not directly relates to it. In the assessment, we had 10 questions on each case – 5 directly relating to the case, and 5 not directly relating. There was a total of 60 MCQs.

1. Early (30-60 minutes after a meal) pains in the epigastric region and behind the sternum are characteristic of the localization of the ulcer defect:
 - A) in the bulb of duodenum
 - B) in the bulbar duodenum
 - C) in the pyloric canal
 - D) in the cardiac and subcardial regions of the stomach
 - E) for all gastroduodenal concomitant ulcers
2. A patient is 30 years old, for 3 years suffers from gastric ulcer 1-2 times a year receives treatment. At this time, vomiting of coffee grounds, general weakness, dizziness. Objectively: pale skin, blood pressure - 90/50 mm Hg. Art., heart rate 110 per minute. What pathology has developed in a patient:
 - A) Zollinger-Ellison syndrome
 - B) Mallory-Weiss syndrome
 - C) hemorrhagic shock
 - D) Penetration of gastric ulcer
 - E) ulcer perforation
3. A 24-year-old patient came to your appointment. She told you that for 1.5 months she was worried about weakness and fast fatigability, in the last 2 weeks she paid attention to an increase in body temperature to 38.7 ° C, an increase in lymph nodes. Independently took paracetamol. She is also worried about swelling and pain in her fingers; it is difficult for her to clench her fingers into a fist. In the morning she feels stiff in the joints of the hands up to 60 minutes, after she passes. Specify the variant to start this state:
 - A) Symmetric polyarthritis with gradual development
 - B) Acute polyarthritis
 - C) Mono, oligoarthritis of the knee or shoulder joints
 - D) Acute monoarthritis of large joints
 - E) Acute oligo-or polyarthritis with severe systemic events

D.3.4 Assessment instruments



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4. Patient E., age 31, came to you for an appointment, complaining of severe pain and swelling of the joints of the hands, pain in the radiocarpal, elbow, shoulder and knee joints, pain during chewing, morning stiffness in the affected joints, lasting up to 14-15 hours day, subfebrile condition, weight loss of 6 kg over the past four months, pronounced general weakness. Works as a postman. In blood tests: hemoglobin - 99.4 g / l, leukocytes - 2.1 thousand, platelets - 519 thousand, ESR - 46 mm / h. Protein electrophoresis: albumin - 43.7%, alpha-1 globulins - 4.9%, alpha-2 globulins, -12.8%, beta-globulins - 12.4%, gamma-globulins - 26.2%. C-reactive protein +++, fibrinogen - 4.38 mg / dL, Valera-Rose reaction - 1: 1028. Iron - 152 mg / dl. What drug is recommended for use in this state

- A) azathioprine
- B) cyclophosphan
- C) chlorbutin
- D) prospidinum

5. The infectious diseases doctor at the infectious diseases hospital examined the patient Amanzholov Anvar, 58 years old. Ill 4th day. Temperature 36.8 ° C. Condition - moderate severity. No appetite. Pale skin, no rash. In the oropharynx calm. There is no thirst. The tongue is covered with white bloom, wet. Cor et pulm without pathology. The abdomen is rounded, retracted, pain in the left iliac region of the cramping character, sigma spasms. Anus is malleable.

Stool up to 5 times a day, thin, scanty, with mucus and streaks of blood. During the act of defecation, Anvar marked "false desires to the bottom." Diuresis is normal.

Select etiotropic treatment:

- A) penicillin
- B) Metronidazole
- C) Erythromycin
- D) Ciprofloxacin
- E) Levomycesin succinate

6. The general practitioner examined the patient, Ablay Kishkentaev, 45 years old. He is sick on the 5th day. No temperature. Condition - moderate severity. Concerned about weakness, lethargy, lack of appetite. Pale skin. The tongue is coated with white bloom. Cor et pulm without pathology. The stomach is retracted, pains of a cramping character in the left iliac region, sigma is spasmodic. Anus gapes.

During the act of defecation in Ablai marked "false desires to the bottom." Diuresis is normal.

Specify the nature of the chair with this disease:

- A) frequent, lean, with plenty of mucus
- B) plentiful, watery, frothy, undigested
- C) white, decorated, without pathological impurities

D.3.4 Assessment instruments



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- D) liquid, brown, with overdone food residues
- E) plentiful, with dark green mucus, offensive

7. You have a patient at the reception 20 years old, with complaints of a runny nose, sore throat and painful dry cough. Objectively: body temperature is 36.6 ° C. Pale skin. Breathing through the nose is difficult. The mucosa of the posterior pharyngeal wall is slightly hyperemic. RR 25. In the lungs vesicular breathing, slight wheezing through all the pulmonary fields are heard. Heart sounds are clear, correct rhythm. HR 95 beats / min. Pulse 95. Blood pressure 120/80 mm Hg on both hands. Abdomen with palpation is soft, painless. Liver at the edge of the costal arch.

What diagnostic measure should be chosen for diagnosis:

- A) send to chest x-ray
- B) GBA, GUA
- C) blood chemistry
- D) send to lung scintigraphy
- E) send to sample with bronchodilator

8. A patient, 52 years old, came to see you, complaining of shortness of breath with difficulty exhaling, coughing with a small amount of viscous, slightly yellowish sputum, low-grade fever. Since childhood suffers from chronic bronchitis. From the age of 30 began to disturb the attacks of expiratory suffocation. The last deterioration began a few days ago due to acute respiratory viral infection: cough increased, the subfebrile temperature persisted for a long time, expiratory dyspnea increased.

What drug do you prescribe for emergency care:

- A) Salbutamol
- B) Codeinum
- C) Libexin
- D) Tusuprex
- E) Morphinum

9. A 39-year-old man with hypertension enrolled in the emergency department with complaints of squeezing in the chest at rest and elevation of the ST segment by 4 mm in the lower ECG leads. These effects have decreased after taking nitroglycerin. Cardiac catheterization showed normal coronary arteries, and in a subsequent test with ergonovine, a spasm of the right coronary artery was provoked. Currently taking? -blocker and diuretic. How to change the treatment:

- A) increase the dose of beta blocker
- B) cancel the beta blocker and prescribe a calcium antagonist
- C) add calcium antagonist
- D) add nitrates

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E) cancel diuretic and prescribe nitrates

10. Patient 68 years old, suffered a myocardial infarction 2 years ago. Over the last 6 months, chest pains began to bother, interruptions in the heart, appearing with moderate exertion, increased shortness of breath, and in the evening there are swelling on the legs. Arterial pressure at 140/90 mm Hg, heart rate 84 per minute. On ECG, transmural infarction on the anterior wall, in the scar stage, supraventricular extrasystole. The patient receives aspirin (100 mg), corinfar retard (20 mg), enalapril (5 mg), periodically furosemide. Perform the treatment correction:

- A) add digoxin to therapy, cancel corinfar
- B) cancel corinfar, assign prolonged nitrates, add diuretics
- C) increase the dose of enalapril to 20 mg, add diuretics.
- D) cancel corinfar, prescribe beta-blockers, increase the dose of enalapril to 20 mg
- E) replace corinfar retard with amlodipine

11. Patient Marzhan, 17 years old. She came for a visit to the doctor in the clinic. The patient has complaints of fever up to 37 ° C, headache, fatigue, утомляемость, loss of appetite. When viewed Marzhan pale, blue under the eyes. The tongue is thickly coated with white bloom, the palms are wet, the stomach is slightly swollen and tense. There is pain with deep palpation more to the right. Doctor tactics:

- A) send a consultation to the gynecologist
- B) send for consultation to the surgeon
- C) to give direction to the GBA, GUA, endoscopic method of research of the esophagus, abdominal ultrasound
- D) send a consultation to the gynecologist
- E) give direction radiography of the abdominal cavity

12. At the outpatient admission you suspected a sharp stomach in the patient. What is advisable to do?

- A) hospitalize the patient immediately
- B) prescribe antispasmodics and re-examine the patient after 4-6 hours
- C) check the body temperature and the number of leukocytes in the blood within 12-24 hours
- D) prescribe anti-inflammatory therapy and examine the patient the next day
- E) observe the patient on an outpatient basis and hospitalize if the condition worsens

c) Example of checklist used for OSCE

D.3.4 Assessment instruments



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The similar checklist was used for all 6 stations of OSCE. The interaction with standardized patient closely mimicked the content of virtual patient case. The checklist mostly evaluated the quality of interaction with the patient, rather than clinical knowledge.

Patient Marzhan Akhmetova

* Required

1. **Group ***

2. **Full name of examinee ***

3. *

Mark only one oval per row.

	10	5	0
Appearance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Properly greetings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adequately used non-verbal communication skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adequately used verbal communication skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Qualitatively conducted medical interview	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Identified, formulated the patient problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Achieved drug compliance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Available outlined information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Timely completed the interview	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consistent with doctor attitude and behavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. **Full name of a standardized patient ***



ANNEX 1.2 Ukraine

ANNEX 1.2.1 Zaporozhye State Medical University - ZSMU

a) Pre-assessment tool

1. A patient, M., 35 y.o., with rheumatism in the active phase, has stenosis of the mitral valve of the fourth stage, atrial fibrillation. Six hours ago the patient felt significant levels of pain in the right lower limb in rest. During an objective examination there is no arterial pulsation of the femoral artery on the right, the temperature of the skin of the foot is reduced, it is of the cyanotic color, movement in the foot is limited, and sensitivity is preserved. *Identify the disease.*

- A. Acute violation of cerebral circulation
- B. Acute thromboembolism of the femoral artery on the right
- C. Acute thrombophlebitis of deep veins of the right shin
- D. Erysipelas inflammation of the right shin
- E. Acute lymphangitis of the right lower limb

2. A patient, 60 y. o., with an arterial embolism of the lower extremity, an operation is performed 20 hours after the onset of the disease - emblectotomy from the right femoral artery, blood flow in the vessel was restored. Immediately after the surgery the patient's condition deteriorated sharply and signs of severe intoxication and hemodynamic impairment appeared. *Indicate the most probable cause of the deterioration of the patient's condition:*

- A. Complications after anesthesia
- B. Acute heart failure
- C. Hypertensive crisis
- D. Acquisition of necrobiosis products into the general blood flow from ischemic limb tissues
- E. Thromboembolism of the pulmonary artery

3. The patient, 45 y. o., she is treated because of rheumatism in active phase, combined defect of the internal valve. During the morning activities she felt sudden pain in the left arm followed by its numbling. The pain and numbness have grown. Objectively: the skin of the left hand is pale, relatively cold. There is no arterial pulsation in the whole arm. *What is the most expedient treatment of the patient?*

- A. Prescription of fibrinolytics, anticoagulants
- B. Prescription of antibiotics, anti-infectious agents
- C. Immediate embolectomy
- D. Cardiac catheterization
- E. Immediate thrombinitismectomy

D.3.4 Assessment instruments



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4. A 52-year-old patient complains of a sharp pain in the left shin and foot, which arose 2 hours ago while changing the position in bed. She suffers from mitral heart failure and atrial fibrillation. Local: left foot and shin are pale, cold to the touch, active movements in the foot are limited, tactile sensitivity of the limb is reduced. The pulsation on the popliteal artery and below is absent, but it is recognized on both femur and right popliteal. *What pathology determines such a clinical picture?*

- A. Acute thrombosis of the left femoral artery
- B. Spasm of the artery of the lower limb
- C. Restrictive atherosclerosis of the left lower limb
- D. Embolism of the left popliteal artery
- E. Lymphostasis of the left lower limb

5. In a district hospital that is located 30 km from the Central District Hospital and 180 km from the regional hospital, a 62-year-old patient with an intramural myocardial infarction was on an inpatient treatment. On the 25th day from the onset of the disease sudden pain in the left lower limb appeared at night. The extremity immediately became pale. The active movements in the toes, the ankle and foot have disappeared, the skin sensitivity has decreased, during palpation of the calf muscle moderately pain appeared. Pulsation on the thoracic artery under the inguinal bundle on the left is strengthened compared to the pulsation of the femoral artery on the right. *What is the most likely diagnosis?*

- A. Thrombosis of the femoral artery
- B. Restrictive atherosclerosis of the arteries of the lower extremities
- C. Embolism of the femoral artery
- D. Raynaud's disease
- E. Restrictive endarteritis of the lower extremities

b) Modification of Knowledge evaluation tool

QNo	before	after
6	On the 3rd day after an appendectomy a patient N. noted a high temperature up to 39, 6 ° C, a cold, pain in the right hypochondrium, jaundice of the skin and a painful enlarged liver. What complication can be diagnosed? Identify the surgeon's tactic in this case.	Name the symptom when the patient feels pain firstly throughout the stomach or in the epigastric region, and then it is shifted to the right iliac area. Symptom of Koher-Volkovich
8	A patient, 65 y. o., who is taking digoxin because of chronic heart failure, was delivered to the hospital for a sudden, swollen abdominal pain that arose 2 hours ago. On examination: the skin is	6 hours ago a patient of 42 y. o., who suffers from mitral stenosis and flashing arrhythmia, felt severe abdominal pain, she had a two-time vomiting, a liquid stool. During

D.3.4 Assessment instruments



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	<p>wet, the temperature is normal. Ps - 110 beats / min, AP - 120/70 mmHg. The tension of the anterior abdominal wall around the abdomen is noted during palpation. Intestinal noises are absent. The ampulla of the rectum is empty. At X-ray examination, air-fluid levels in the intestine region are noted. ECG shows flashing arrhythmia without signs of myocardial ischemia. In blood: leuk. - $17,0 \times 10^9 / l$, pH of arterial blood - 7,33, amylase - 110 un. / l. What is the most probable diagnosis?</p> <p>A. Thrombosis of mesenteric vessels B. Intestinal ischemia C. Pectoral stomach ulcer D. Intestinal obstruction due to tumor E. Diverticulosis.</p>	<p>the examination the state of the patient is of moderate severity. Tongue is dry. The abdomen is soft in all areas, the severe pain in Mesogestria is determined. No peritoneal symptoms. Peristalsis of the intestine is weakened. Blood leukocytes - $19 \times 10^9 / l$. What disease is described?</p> <p>A. Acute strangulated intestinal obstruction B. Acute violation of mesenteric circulation C. Aneurysm of the abdominal aorta D. Budd–Chiari syndrome E. Haemorrhagic pancreatic necrosis</p>
27	<p>Complications of sepsis do not include:</p> <p>A. Pneumonia. B. Bed sores C. Thromboembolism. D. Cachexia. E. Hemorrhage.</p>	<p>Which pathological condition does not refer to the complications of sepsis:</p> <p>A. Pneumonia. B. Bed sores C. Thromboembolism. D. Cachexia. E. Hemorrhage.</p>
29	<p>What is a marker for sepsis?</p>	<p>Concentration of what sepsis marker rises more than 2 ng / ml 2-3 hours after the onset of the disease?</p> <p>Procalcitonin</p>

c) Tool for knowledge evaluation after the cases

1. Patient H., 26 y. o., was operated on acute appendicitis 17 hours after the onset of the disease. The operation revealed phlegmonous and gangrenous appendicitis with perforation of the appendix. In the right anesthetized area 50 ml of purulent exsudate was found. *How should a surgeon finish the surgery?*

D.3.4 Assessment instruments



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- A. Operation - appendectomy. It is necessary to drain the abdominal cavity from purulent contents. Drain the abdominal cavity through a separate incision. Prescribe antibiotics of a wide range of effects, put cold on the wound.
- B. Removal of the appendix. Sanation of the abdominal cavity, tight wound suturing.
- C. Operation - appendectomy. Sanation of the abdominal cavity. Tight suturing of the abdominal cavity. Put rubber tube drainage in subcutaneous fat.
- D. Operation - appendectomy. Suturing the abdominal cavity. Antibiotics of a wide spectrum of action.
- E. Operation - appendectomy. Sanation of the abdominal cavity. Draining of the abdominal cavity with gauze strips.

2. A patient M., 26 y. o., was delivered to a clinic with a diagnosis of acute appendicitis. Clinical and laboratory examination showed acute appendicitis. During the operation, gangrenous appendicitis with perforation was detected. Appendectomy is performed, the abdominal cavity is sanitized and sutured tightly. The postoperative period was difficult, for 4 days the temperature rose to 38.6 ° C, in the following days it rised up to 39 ° C, with the chill, the pain intensified, there were peritonal symptoms in the right half of the abdomen. *What kind of tactical mistake was made by the surgeon during the operation? What is the complication? What is the further tactics of a surgeon?*

- A. The abdominal cavity was not drained. An abscess in the right iliac area was formed. An urgent operation is needed.
- B. The abdominal cavity was not drained. An abscess in the right iliac area was formed. Observation is needed.
- C. The abdominal cavity was not drained. An abscess in the right iliac area was formed. Broad-spectrum antibiotic is needed.
- D. The abdominal cavity was not drained. To solve the question of further tactics, it is necessary to perform fibrogastroduodenoscopy.
- E. The abdominal cavity was not drained. Cold to the right side of the iliac area, antibiotics and observation for 10 hours are needed.

3. What operation is most desirable to perform in a patient of 20 y. o. with acute catarrhal appendicitis?

Laparoscopic appendectomy

4. Name the symptom when the patient feels pain firstly throughout the stomach or in the epigastric region, and then it is shifted to the right iliac area.

Symptom of Koher-Volkovich



ANNEX 1.2.2 Bukovinian State Medical University - BSMU

MCQ with a single answer:

5. Early changes in ECG in acute myocardial infarction are:

- A. * Selection of segment ST
- B. Changes in the QRS complex
- C. Inversion of the T-wave
- D. Violation of the heart rate
- E. Changes Q-wave

28. In patients with systemic lupus erythematosus, changes in the skin color of the distal phalanges of the fingers and toes under the influence of cold agents are observed. Diagnosis of Raynaud's syndrome is established. What phases are characterized by Raynaud's syndrome with systemic lupus erythematosus:

- A. Collaboration and cyanosis of the skin
- B. Syngeneity of the skin
- C. Skin reddening
- D. Redness and cyanosis of the skin
- E. * Affinity, blueness and reddening of the skin

Multiple-answer tests:

2. In a patient of 25 years with a long petiole there is an ulcer genesis of bleeding. In the pathogenesis of ulceration in the gastrointestinal tract, the following will be distinguished:

- A. * Increased secretion of gastric juice
- B. Slow evacuation of gastric juice in the duodenum
- C. * Delayed neutralization of gastric juice in the duodenum
- D. * Reduced mucosal stability to gastric juice
- E. * Helicobacter pylori infection

17. A 35-year-old patient appealed to a doctor with complaints of rapid fatigability, thirst, dry mouth, increased hunger, frequent urination. Suspected diabetes mellitus. What tests should be performed by the patient to confirm the diagnosis?

- A. * Determination of blood glucose level
- B. * Determination of the level of glycosylated nonmoglobin
- C. General blood test
- D. General urine analysis
- E. Biochemical analysis of blood

D.3.4 Assessment instruments



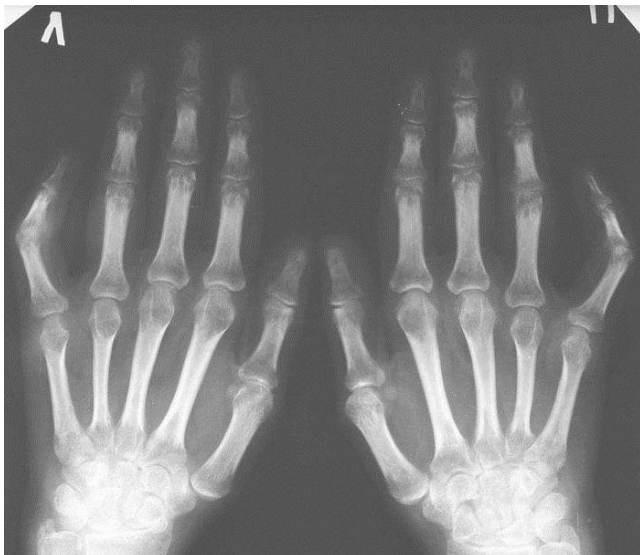
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Shot open answer tasks:

2. Name the side effects of treatment with inhaled glucocorticosteroids.

9. A patient N., 36 years old, fell ill 6 years ago, when, after overcooling, pain and swelling in the small joints of the hands and feet appeared, early stiffness, subfebrile. A prednisone dose of 25 mg / day was prescribed, followed by a maintenance dose of 10 mg. The last deterioration occurred with a decrease in the daily dose of prednisolone to 5 mg / day due to the appearance of arterial hypotension. Pain began to disturb even at rest. Objectively: obesity of the second degree, moonlike, carnivorous, cyanotic face, hypertrichosis. Deformation of the proximal between the phalanxes, radial joints, sharp restriction of movements in these joints, pronounced atrophy of the muscles. AT 160/100 mm Hg. Art. Total blood count: ESR - 45 mm / hr, rheumatoid factor - 128 units / ml. X-ray of brushes:



Your diagnosis _____

ANNEX 1.3 Vietnam

1.3.1 Hanoi Medical University – HMU

Examples of MCQs tests

TT	Question	Answers
1.	You are a doctor at the Medical Department. A 32-year-old male patient visited for a month of fever and cough. The patient has no special history. Patients with mild fever in the afternoon, dry cough, 5 pounds in 1 month. The patient was diagnosed with fatigue. No difficulty breathing. Listen to your lungs normally.	A. Blood formula B. Blood formula, lung XQ C. Blood formula, pulmonary XQ, HIV test D. Blood formula, blood sedimentation, XQ lung

D.3.4 Assessment instruments



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TT	Question	Answers
	What tests will you recommend at the clinic:	
2.	You are a doctor at the Department of Examination. A 29-year-old male patient came to consult for a new HIV positive test. History of drug injection patients for many years. Patients who have not received ARV treatment. The patient had fever and diarrhea for more than 1 month, lost 10 kg within 3 months. Examination of patients with oral thrush. Lungs do not have rales, no difficulty breathing, soft stomach does not react. What is the most rational handling now:	A. Consultation on prescribing ARV drugs B. Hospitalization for patients C. Give the patient a fungal medicine and prescribe ARV D. Prescribe antibiotics and antifungals for 5 days and re-visit
3.	You are on duty at the Department of Parasitic Viruses. You receive a 46-year-old female patient hospitalized with fever and cough lasting more than 1 month. Patients who are newly diagnosed with HIV positive from the primary hospital, have not yet been treated for ARV. Examining provincial patients, having oral thrush, dry cough, difficulty breathing slightly when exertion. SpO2 92% breathe room air. HA 110/70. Regular heartbeat, no blowing sound. Lungs without rales, murmur alveoli are both sides. Pulmonary X-ray with interstitial pneumonia. While waiting for other test results, what medicine will you prescribe immediately to the patient:	A. Fluconazole B. Fluconazole + Cephalosporin generation 3 C. Fluconazole + Cotrimoxazole D. Quinolone
4.	A 40-year-old male patient who was admitted to the long-term fever parasite virus department in HIV patients was detected and treated for 2 months. Previous CD4 for ARV treatment is 56 tb / mm3. The patient had a fever for 1 month now, a slight fever in the evening, accompanied by a white sputum cough, no blood. Examination of patients with a number of lymph nodes along the P-cervical dorsal muscle, 1x1 cm size, mobility, little pain. Normal heart lung. Soft belly, splenomegaly is not large. CTM, SHM normal. What suggestions do you recommend for patients at the time of admission:	A. X-ray lung, lymph nodes B. X-ray lung, blood sedimentation, lymph nodes C. X-ray lung, blood sediment, BK sputum, lymph nodes D. X-ray lung, sediment blood, sputum BK, CD4, lymph nodes
5.	36-year-old female patient is being treated at VRKST with diagnosis of pneumonia in HIV patients. Patients were prescribed antibiotics for 5 days.	A. Change antibiotics B. Continue the antibiotic for another 5 days and then

D.3.4 Assessment instruments



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TT	Question	Answers
	Currently the patient still has fever and cough. XQ lung captures lesions that have helped. Sputum smear negative. Blood culture negative. The next most appropriate management approach is:	repeat the chest XQ C. Bronchoscopy D. CT scan chest

Examples of T/Fs tests

Circle the option for True / False for the following statements	True	False
Tetanus patients need to treat road wounds when:		
A. The wound is infected	T	F
B. The wound is dry and clean	T	F
C. The wound has a foreign object, which flows	T	F
D. The wound was crusted but swollen, the patient felt pain	T	F
Tetanus patients should watch for new complications that occur during treatment		
A. Lung infection	T	F
B. Urinary infections	T	F
C. Ulcers of the pressure points	T	F
D. Perforation	T	F

1.3.2 Hue Medical University - Hue UMP

Question 1. A 35 years old women, got hospitalized during your duty. She underwent normal labour, delivered vaginally and gave birth to a boy weighed 3,800 grams. After active management of stage III, she had vaginal bleeding. What should you do immediately in this case?

- A. Transmission of oxytocin, control of the uterus
- B. Peeling, controlling the uterus
- C. Injecting oxytocin into the uterus, controlling the uterus
- D. Setting up an intravenous infusion, controlling the uterus
- E. Examination of the cervix, vagina, controlling the uterus

Question 2: A 22 years old primiparous pregnant woman has hospitalized because of a headache. The gestational age is 36 weeks. You check and found that her blood pressure is 170/100 mmHg. The pregnant woman complaint much about her headaches. When touching her abdomen, you feel hard. The fetal heart is not as clear as before. What should you do next?

- a. Let the pregnant woman rest and have ultrasound examination of the fetal heart.
- b. Prescribe antihypertensive drugs and have ultrasound examination of fetal heart

D.3.4 Assessment instruments



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c. Execute an emergency C-Section.

d. Use antenatal corticosteroids for fetal lung development, antihypertensive drugs and ultrasound examination of the fetal heart

Question 3: A 22-year-old woman, with a gestational age of 33 weeks. Her blood pressure is 166/114 mmHg. During her first antenatal care at 7-week of gestational age, her blood pressure was 124/72 mmHg. The protein in the urine is now 3+, in the previous test is 0. She has a headache feeling which she never had before. ALT and AST values are 92 and 105 respectively. After using antihypertensive drugs, Magnesium sulfate and Betamethasone, what should you do next?

a. Bed rest completely and maintain pregnancy

b. Bed rest completely until 37 weeks of gestation, amniocentesis to assess fetal pulmonary maturity, then induced labor.

c. Induction of labor and have vaginal birth.

d. Execute Caesarean section

e. Continue to monitor pregnancy

Question 4: A 30 years old pregnant woman, with 34 weeks of gestational age, visits you for a periodical antenatal check-up. At the examination, you find that her blood pressure is 150/100mmHg. The pregnant woman told you that before she got pregnant, her blood pressure was regularly checked and it was only around 110/70mmHg; The most recent time, at 16 weeks of gestational age, her blood pressure was just the same. What is your diagnosis?

a. Preeclampsia

b. Chronic hypertension.

c. Gestational hypertension.

d. None of above are correct.

Question 5: A pregnant women with PARA is 2002. This is her third pregnancy. She is at 34 weeks of gestational age and is diagnosed with mild pre-eclampsia. She is assigned to be monitored and has bed rest completely. Then, the patient develops a seizure. which of the following drugs are not used?

a. Seduxen.

b. Oxytocin.

c. Magiesulfate.

d. Furosemid.

D.3.4 Assessment instruments



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ANNEX 2. Results of students' assessment

ANNEX 2.1 Kazakhstan

ANNEX 2.1.1 Astana Medical University - AMU

Stakeholder	Instrument type	Key evaluation questions	Dates
<p>Learner (Year 5 students of medical curriculum)</p> <p>32 students (4 groups) of Year 5 "General Medicine" were selected for conducting tutorials with D - PBL.</p>	<p>Progress test</p> <p>MCQ test consisted totally of 100 questions on discipline "General Medical Practice" and 6 clinical cases after intervention</p>	<p>What is the initial level of students' performance before the tutorials?</p> <p>Does the use of error VPs affect learner clinical performance and knowledge relating to medical error?</p>	<p>The tutorials were held from 06.02.2018 to 29.03.2018, 2 times a week, with duration of 3 hours a day. At the end of each clinical case, an online essay was completed, which was developed on the Moodle platform.</p> <p>In May 2018 MCQ test</p>

Assessment instruments consisted of multiple choice questions for evaluation students' knowledge.

MCQ test had conducted after clinical cases completed by students, results compare with answers where students learning by traditional method, result from using D-PBL cases based on medical errors were high 84.8%, to compare with traditional method where result was 83.7%.



ANNEX 2.1.2 Karaganda State Medical University - KSMU

VP cases in General Medical Practice

Stakeholder	Instrument type	Key evaluation questions	Dates
Learner (Year 5-6 students of medical curriculum) <i>(39 students of intervention group, 36 students of Year 5 control group and 14 students of Year 6 control group)</i>	Progress test MCQ test and OSCEs in each cases 6 months after intervention	What is the initial level of students' performance before the tutorials? Does the use of error VPs affect learner clinical performance and knowledge relating to medical error?	

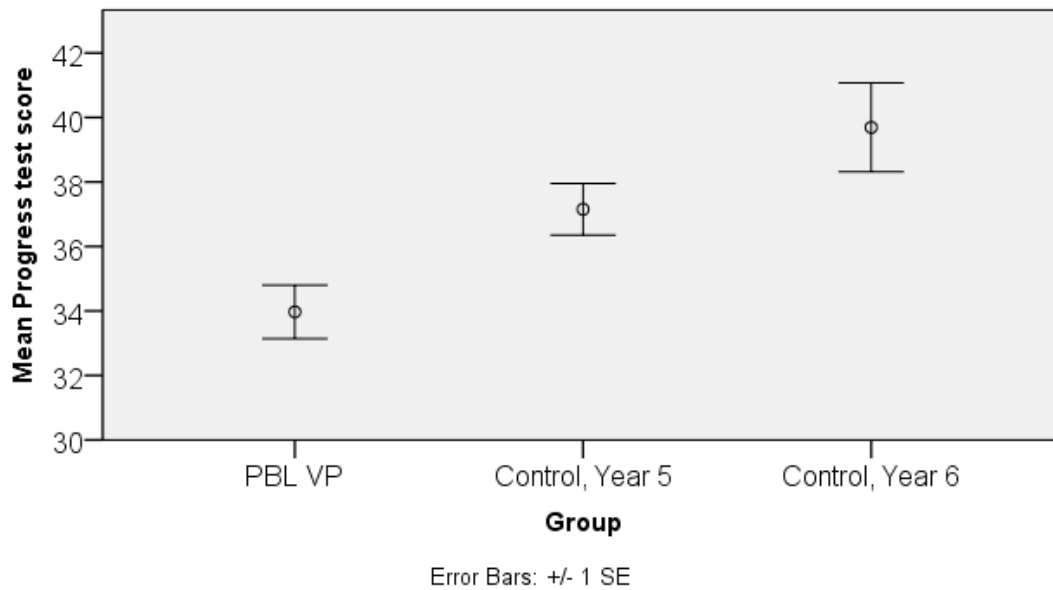
6 months after completion of cases the students were given multiple choice exam on each case (10 questions per case) and went through 6 OSCE stations with standardized patients' scenarios mimicking the VP cases. Routine progress test score prior to tutorials was used as indicator of initial academic abilities of students. The intervention group included all the students in PBL-VP track, the control groups were composed of students of regular traditional curriculum (which is not utilizing any PBL-VP tutorials) of Year 5 and Year 6 for MCQs, and Year 5 students for OSCE stations.

Unfortunately, the initial level of students as judged by progress test score differed in all 3 groups of students (intervention, Year 5 control and Year 6 control). It could be the consequence of randomization. Due to this fact, the progress test score was used as covariate in all consequent analysis to eliminate the effect of previous knowledge on result of OSCE and MCQ exam.

D.3.4 Assessment instruments

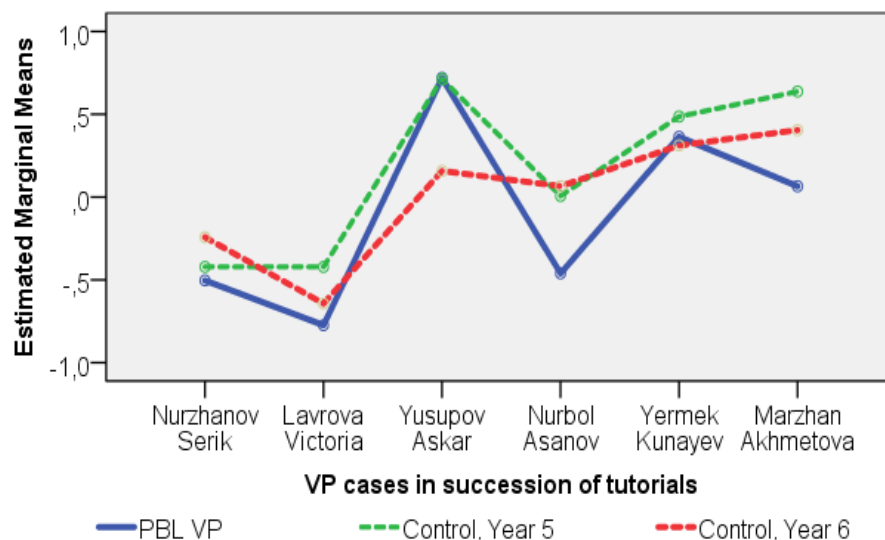


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Comparing assessment results of PBL VP track to control group, we registered that in 4 cases PBL VP demonstrated similar knowledge retention, in 2 cases it was lower. Patient interview skills (as assessed by OSCE) were much better for 3 cases and comparable for other 3 cases. So, the virtual patient cases tend to provide better practical applications (measured by OSCE), but less benefits to knowledge retention (measured by MCQ).

MCQ on each case in 6 months after PBL VP



Covariates appearing in the model are evaluated at the following values: Progress test score = ,0090382

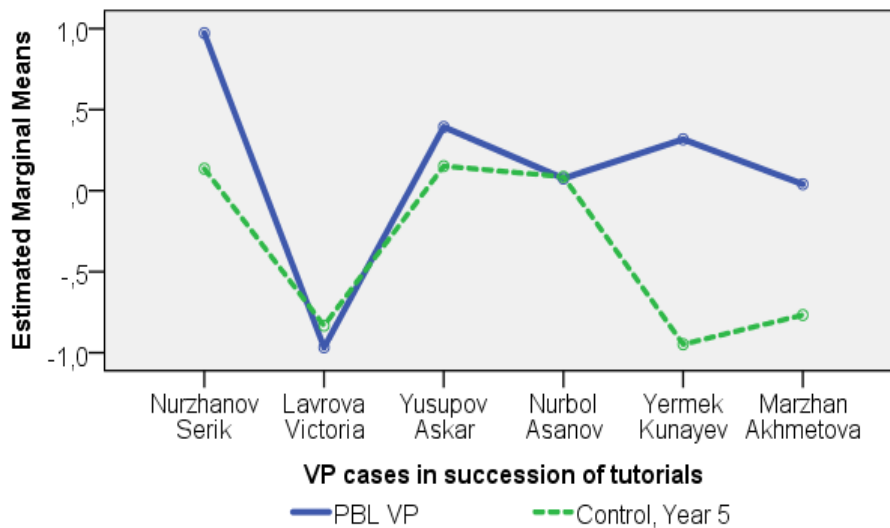
D.3.4 Assessment instruments



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OSCE on each case in 6 months after PBL VP



Covariates appearing in the model are evaluated at the following values: Progress test score = $-.1492881$

1. The initial level of students as judged by progress test score differed in all 3 groups of students (intervention, Year 5 control and Year 6 control). Due to this fact, the progress test score was used as covariate in all consequent analysis to eliminate the effect of previous knowledge on result of OSCE and MCQ exam.
2. Knowledge retention is not the most prominent feature of PBL VP case, though it provides comparable results to traditional curriculum.

ANNEX 2.2 Ukraine

ANNEX 2.2.1 Zaporozhye State Medical University - ZSMU

Stakeholder	Instrument type	Key evaluation questions	Dates
1. Learner (Medical Faculty No1, Surgery) <i>(32 students of a branch group and 12 students of a control group)</i>	36 questions for pre-test Learner performance relating to Surgical cases	What is the initial level of students performance before the tutorials? Does the use of error VPs affect learner performance and knowledge relating to medical error?	05.12.17 end of April, 2018

D.3.4 Assessment instruments



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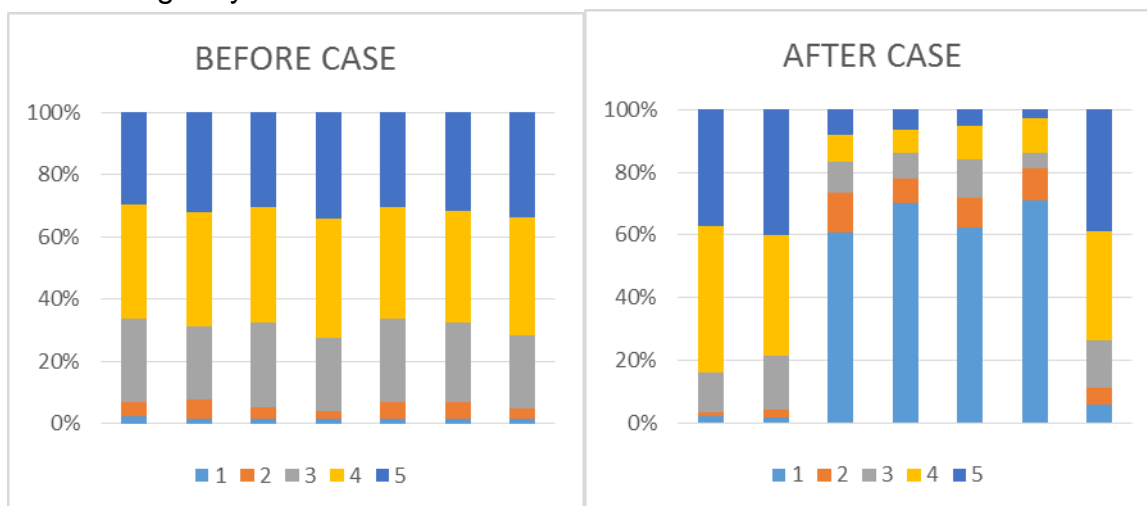


The students were pretested to find their outgoing knowledge level. Three months after the tutorials on-line evaluation of students' knowledge was conducted to identify the sustainability of knowledge on Surgery after a period of time. For this reason 36 questions were created (6 questions per one case): 2 single questions for finding the best answer directly related to a case; 2 single questions for finding the right answer related to a disease; 2 open questions connected with the disease (on diagnostics or management strategy).

32 students: 18 girls and 14 boys.

The age of students was from 22 to 24 years. The average – 23 y.o.

Mistakes made by students indicate the correct drawing up of the case map and the methodologically correct formation of the nodal elements and the links between them.



The results of the assessment were compared to the pre-assessment and the State Licensing Examination KROK-2 results for analysis.

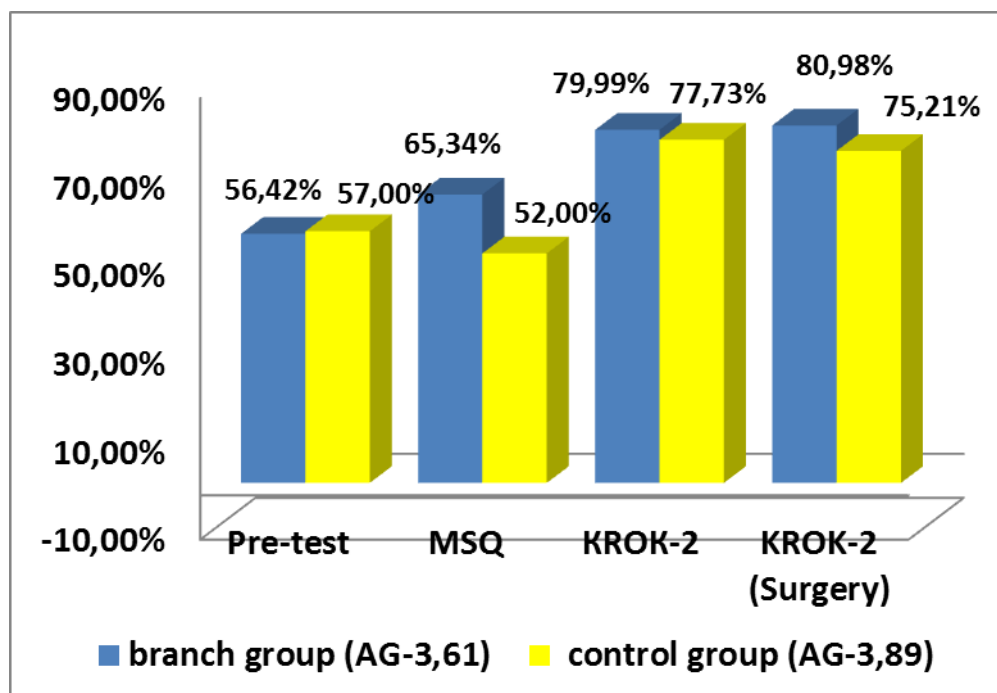
The results of the assessment (65.34%) were reliably higher ($p < 0,001$) than the results of the pre-assessment (56,42%), and higher than the results of the assessment of students of the control group (52%).

The results of and the rate value of the correct answers of the sub-test “Surgical profile” of the students, who were taught according to the D-PBL training methodology with VPs and medical errors, were also taken into consideration. The result of the State Licensing Examination KROK-2 had only the tendency ($p > 0,05$) to the highest result of the control group and measures up to respectively (79,99%) against (77,73%). However, the result of the sub-test “Surgical profile” was (80,98%) and was higher ($p < 0,05$) than the control group's results (75,21%).

D.3.4 Assessment instruments



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ANNEX 2.2.2 Bukovinian State Medical University - BSMU

Stakeholder	Instrument type	Key evaluation questions	Dates
Learner	Survey/Focus Group/Interview/MCQ etc.		
Internal medicine cases: Branch group - 38 students (27 female, 11 male) Linear group - 35 students (28 female, 7 male) Total 73 students/9 Tutors	Learner Assessment instrument (Final Knowledge test - 60 questions)	Does the use of error VPs affect learner performance and knowledge relating to medical error? 1. Do the error VPs provide an effective and engaging learner experience? 2. Do the error VPs represent an appropriate workload for inclusion into existing curricula?	05/05/2018

D.3.4 Assessment instruments



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A. Results of Questionnaire “60 questions” showed that the students from I group who studied branch cases answer the questions better (63,9% right answers) than in other two groups (61,4% and 48,97% relatively).

B. The lowest result of correct answers was observed in the block of multiple-answer tests in all comparison groups.

C.

D. Results of Questionnaire “60 questions” after cases in 3 groups

	Questionnaire “60 questions”, % right answers	1-30 (MCQ)	31-48 (multiple- answer tests)	37-60 (shot open questions)
I group - branch cases	63,9	71,1	59,2	61,6
II group – linear cases	61,4	69,3	56,3	58,7
III group- control	48,97	60,7	42,5	43,7

Student assessment was also carried out based on the results of the final modular control of internal medicine. The students who studied branches cases were more successful than their colleges from control group and group who engaged linear cases.

	Average mark of the final modular control of internal medicine	Average score (GPA) of the final modular control of paediatrics	Qualitative academic performance , %
I group - branch cases	3,68	157,8	50,7
II group – linear cases	3,57	153,1	49,3
III group- control	3,5	150,1	

D.3.4 Assessment instruments



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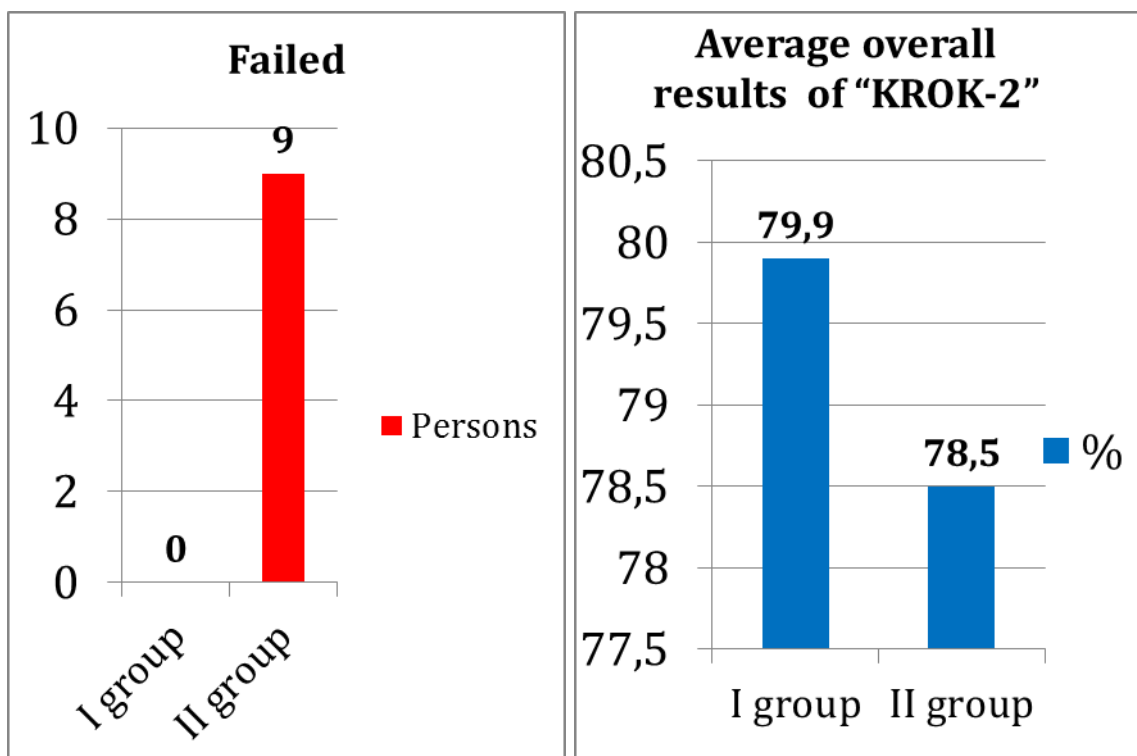
The effectiveness of the cases implementation was also evaluated by the results of the state exam "KROK 2. Medicine". The students were consists of 2 groups. The first group - experimental group (I) included 73 students who studied by PBL method of education. The second group - control group (II) comprised 287 students of medical faculties trained in the traditional form.

It was found that the average results of the state exam for students who studied under the PBL were higher compared to the graduates from control group (79.9% versus 78.5%, $P > 0.05$).

Nine students of control group did not overcome the minimal barrier at 60.5%. However in the experimental group all the students have passed the state exam.

The difference in the mean score of the therapeutic profile among the students of the experimental and control group had a significant difference (77.2% versus 76.3%, $P \leq 0.05$).

General results of KROK-2 exam



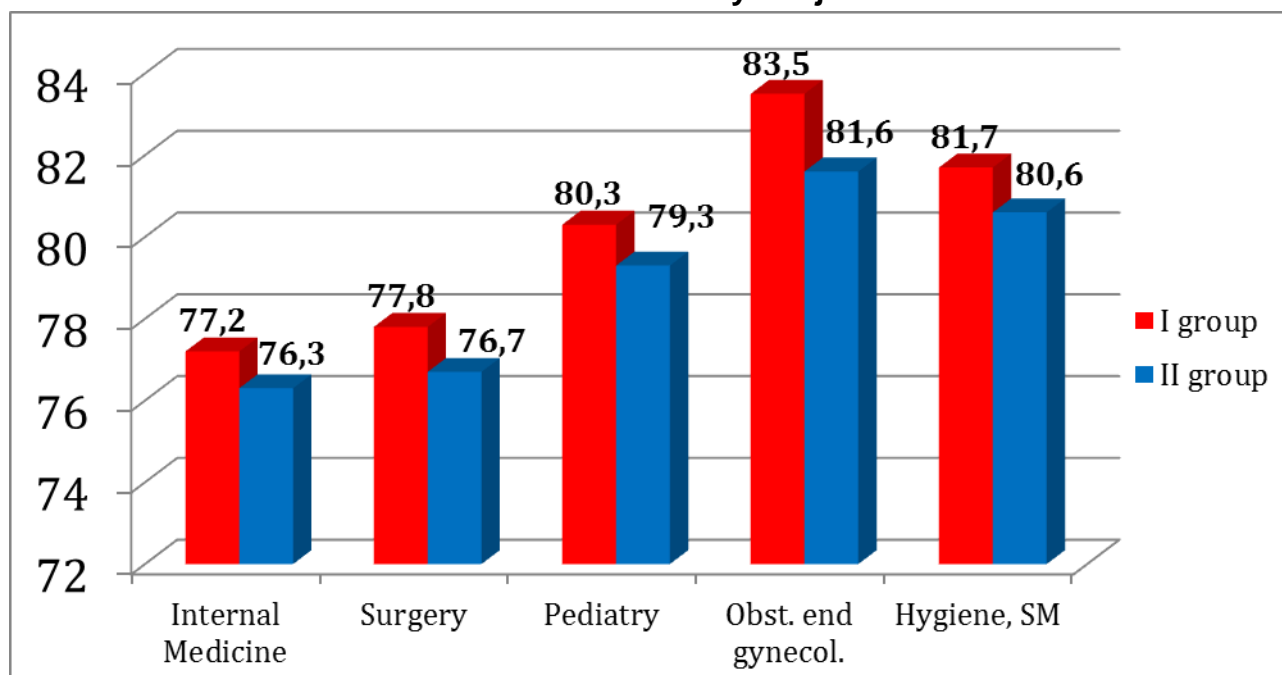
D.3.4 Assessment instruments



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Results of KROK-2 by subjects



ANNEX 2.3 Vietnam

ANNEX 2.3.1 Hanoi Medical University - HMU

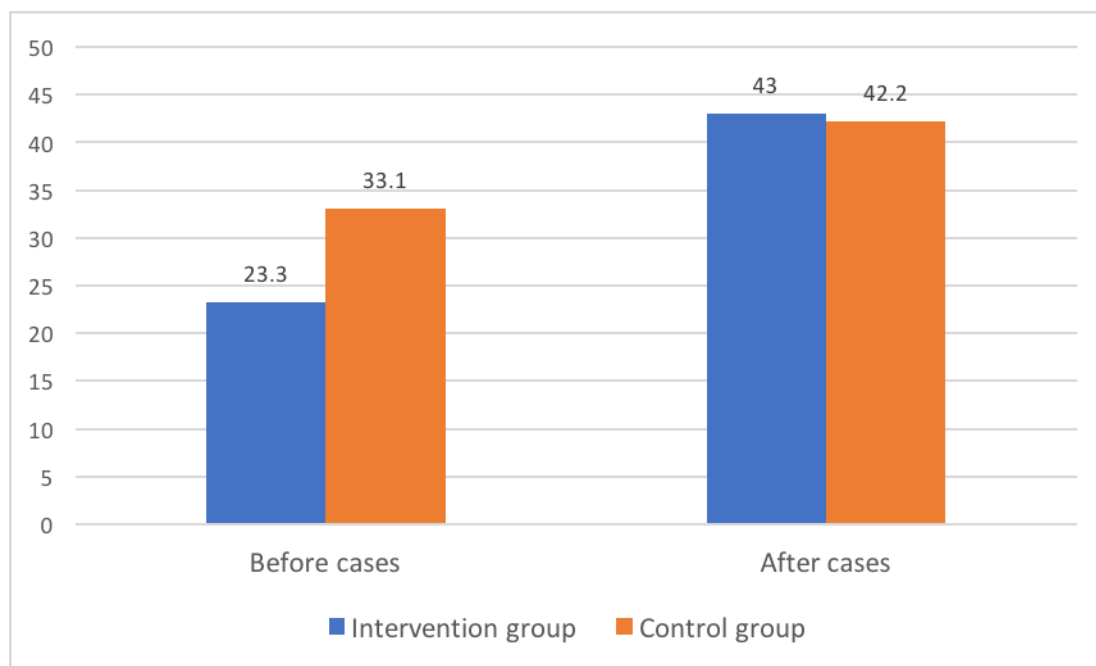
Stakeholder	Instrument type	Key evaluation questions	Dates
Students (learning new cases)	MCQs and T/Fs	<ul style="list-style-type: none"> - What is the initial level of students knowledge prior to the tutorials? - Does the use of error VPs affect learner performance and knowledge relating to medical error? 	March 2018

The students were conducted MCQs and T/Fs tests prior to the tutors to assess their performance. After the intervention, they were post-tested again to evaluate changes in their performance and the sustainability of their knowledge.

D.3.4 Assessment instruments



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Among 70 students participating in the study (intervention arm: 35, control arm: 35), 54.3% of the intervention arm and 48.6% in the control arm were female students. There was a significantly positive change in students' performance among the intervention group comparing to that of the control group. Prior to the tutorials, the intervention group had significantly lower scores (23.3 ± 10.2) compared to the control group (33.1 ± 7.6) ($p < 0.01$). After completion of the trials, students reported a significantly increase of MCQ scores (43.0 ± 6.7 in the PBL group and 42.2 ± 9.1 in the control group).

	n	%	n	%
Changes in MCQs score:				
Decrease in post-test from pre-test score ^a	1	2.9	4	11.4
Increase in post-test from pre-test score ^b	34	97.1	31	88.6
No change in post-test from pre-test score ^c	0	0.0	0	0.0

It is also indicated that only one student experienced a decrease in MCQ score in the intervention group, while four students in the control group had a decreased score in post-test from pre-test score. Other students had an increase in their post-MCQ scores compared to their pre-MCQ score (97.1% in the intervention group and 88.6% in the control group). The difference is not statistically significant ($p = 0.36$).

D.3.4 Assessment instruments



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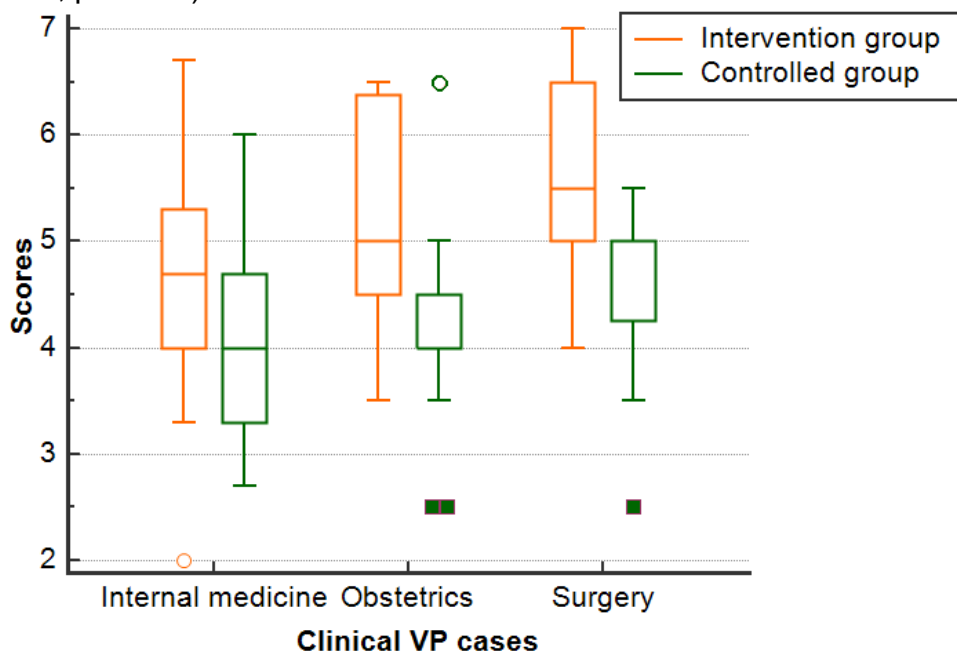


ANNEX 2.3.2 Hue Medical University - Hue UMP

Stakeholder	Instrument type	Key evaluation questions	Dates
Learner/Tutor	Survey/Focus Group/Interview/MCQ etc.		
56 learners 56 students	112 MCQs: 56 learners (case group) and 56 students in the same class, gender, 4th year learning outcome with each learner (control group).	Multiple-choice questions (MCQs) for each clinical case after 2 months of intervention, including: 2 internal medical cases (15 MCQs). 2 external medical cases (20 MCQs). 2 obstetric cases (20 MCQs). Score range of each student from 0 to 10.	21/7/2018

We matched the intervention group of 56 students enrolled in the course and 56 students who did not participate in the same gender and learning outcomes in the fourth year. A total of 112 students were assessed through MCQs for each clinical case after 2 months of intervention. Score range of each student from 0 to 10.

Knowledge of the students in the intervention group was more likely to answer MCQs than the control group (mean score: 5.20 ± 1.05 and 4.23 ± 0.92 , mean difference: 0.97, 95% CI: 0.60 – 1.34, $p < 0.001$).



The mean scores of MCQs in the intervention and control groups for internal medical cases (mean scores 4.73 ± 1.02 and 4.06 ± 0.94 , mean difference: 0.67, 95% CI: 0.10 – 1.24, $p = 0.023$), for external medical cases (mean score 5.74 ± 0.89 and 4.53 ± 0.82 , mean

D.3.4 Assessment instruments



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difference: 1.21, 95% CI: 0.61 – 1.80, $p < 0.001$), for obstetric cases (mean scores 5.37 ± 0.97 and 44.17 ± 0.98 , mean difference: 1.20, 95% CI: 0.47 – 1.93, $p = 0.002$).