MEFANET 2018

12th international conference of medical and healthcare academic institutions in Czechia and Slovakia

27–28 November 2018, Pilsen, Czech Republic

…tell and listen to stories that educate, move and inspire...

editors

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WELCOME WORD

Dear colleagues and students,

we are pleased to welcome you at the 12th year of the MEFANET conference, which traditionally brings together educational technologists, teachers and students from faculties of medicine and faculties of healthcare sciences across Czechia and Slovakia. This year's conference is held under the auspices of Associate Professor Ilona Mauritzová, PhD, Dean of the Faculty of Health Care Studies of the University of West Bohemia.

Besides general concepts of technology enhanced learning, the conference program focuses on a wide range of simulation modalities used in higher education including virtual scenarios and methods for objective evaluation, such as surveys, OSCE, etc. The conference programme encompasses one workshop, two keynote lectures, panel discussion, two sessions with short communications and a guided poster tour.

The workshop will enable participants to uncover links between basic curriculum entities, i.e. learning units and learning outcomes, and objects in scenario-based learning, such as virtual scenarios. Two excellent keynote speakers – Martin Adler (Instruct AG, Munich, Germany) and Michal Nowakowski (Jagiellonian University, Krakow, Poland) have been invited to give a lecture entitled:

1. CASUS – a software for creating and learning with virtual patients,
2. Implementation of OSCE (Objective Structured Clinical Examination): description of good practice based on four successful implementations.

They will cover scenario-based learning and objective structured evaluation, both of them contributing to the areas of higher education science and practice.

We are grateful to the local organizers from the Faculty of Health Care Studies of the University of West Bohemia for their hospitality and help in making the 12th year of the MEFANET conference possible. We also thank all participating speakers and authors of the conference proceedings. It is our sincere hope that this year's conference will become another valuable asset for the MEFANET community.

On behalf of the programme committee and organisation team

Daniel Schwarz & Martin Komenda

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CO-ORGANISERS

Faculty of Health Care Studies of University of West Bohemia in Pilsen
Faculty of Medicine, Masaryk University

GENERAL INFORMATION

Conference venue

PRIMAVERA Hotel & Congress centre****
Nepomucká 1058/128, 326 00 Pilsen, Czech Republic
GPS: N 49°42.62733‘, E 13°24.75845‘
www.primaverahotel.cz

Catering

Lunch is included in the registration fee and will be served in the foyer to all conference participants on 27 and 28 November.

Registration of participants at the conference venue

27 November 2018 from 9.00 to 16.30 h
28 November 2018 from 8.00 to 15.00 h

Information for authors

- A data projector, PC connected to the internet, laser pointer and microphone are available for the lecture.
- All equipment is available for testing before the conference or during breaks.
- Technical support will be available for the whole time of the conference in the congress hall.
- Your presentation file will be uploaded to the PC at a registration desk.
- It will be also possible to upload your presentation directly to the PC in the congress hall; however, we do not recommend this due to time issues.
- Create your presentation; we recommend pptx format, eventually export to pdf.
- Duration of a standard lecture (including discussion) should not exceed 20 min.
- Authors of posters will receive information on poster presentation at a registration desk.
- Official languages of the conference are Czech, Slovak, and English.
- Poster dimensions from A3 to A0 format.

We kindly ask lecturers to stay within the time limit for their presentations.

Tuesday
27 November

10.00 Workshop:
Virtual patient scenarios in curriculum mapping

11.00 **Conference opening**

11.30 Keynote:
CASUS – a software for creating and learning with virtual patients

12.15 ***Lunch***

13.30 Short communications:
Technology-enhanced learning

14.50 ***Coffee***

15.30 Short communications:
Technology-enhanced learning

18.00 ***Reception***

Wednesday
28 November

09.00 **Guided poster tour**

10.00 ***Coffee***

10.20 Short communications:
Simulation in pedagogy and medicine

12.00 ***Lunch***

13.00 Keynote:
Implementation of Objective Structured Clinical Examination

13.40 Panel discussion:
Good practices in OSCE and educational informatics

15.00 **Conference closing**

ABSTRACTS

WORKSHOP

VIRTUAL PATIENT SCENARIOS IN CURRICULUM MAPPING

10.00–11.00 **TUESDAY**

Martin Komenda, Daniel Schwarz, Petr Štourač, Matěj Karolyi, Jakub Ščavnický
Faculty of Medicine, Masaryk University

Curriculum mapping represents one of the reforming endeavour of today's medical and healthcare study programmes. It provides a reliable and effective way to build a correctly compiled and balanced curriculum supported by guaranteed study materials such as educational websites, videos, presentation or virtual cases. This workshop focuses on the introduction of a challenging curriculum mapping domain, which involves the use and link of virtual patient (VP) to a given course or lesson. A systematic in-depth inspection of all courses is needed in order to properly recommend a relevant VP to a specific part of a huge curriculum. A typical medical curriculum usually is described by a very comprehensive text involving hundreds of pages. It is therefore not humanly possible to go through the entire contents or to imagine how given VPs, courses or lessons are interrelated. Is it possible to design, develop and implement any automated online solution providing automated similarities and overlaps detection? This workshop (i) introduces the role of VPs, including online tools for their creation and management, (ii) presents activities of the Medical Simulation Centre together with challenging research domains, (iii) guides the participant through a complicated process of finding similarities between VPs and a selected part of medical curriculum, (iv) demonstrates the platform for an automated detection of overlaps. We will try to answer the following research questions: (i) How can we find similarities between VPs and curriculum? (ii) Can we automatically recommend relevant VPs to a particular course?

The authors were supported from the following grant projects: (i) MERGER project – Reg. No. MUNI/A/1339/2016 funded from the Grant Agency of the Masaryk University; (ii) Masaryk University Strategic Investments in Education SIMU+ (CZ.02.2.67/0.0/0.0/16_016/0002416) funded from the European Regional Development Fund; (iii) Masaryk University 4.0 (CZ.02.2.67/0.0/0.0/16_015/0002418) funded from the European Social Fund.

KEYNOTE LECTURES

CASUS – A SOFTWARE FOR CREATING AND LEARNING WITH VIRTUAL PATIENTS

11.30–12.15 **TUESDAY**

Martin Adler
Instruct AG

Keywords: *CASUS, virtual patients, technical development*

The Casus software and related projects have a long history. Originally started in 1993 at the University of Munich (LMU), the project was established to support case-based learning concepts, or so-called virtual patients (VPs) in healthcare education. The project was implemented by an interprofessional team from medicine, pedagogy, psychology, and technology. Even when the project was transformed into a spin-off company in 2000, the contact to students and educators was still close; further developments were based on the results of academic research and educational projects and still benefitted from close cooperation with national and international networks. Even though VPs have a long tradition in healthcare education, their creation and maintenance is still an ambitious task that has to overcome barriers, such as curricular integration and structure to update the content. The presentation will give an overview about the project, actual state, technical developments and reasons of created concepts as well as successful examples of VP creation and curricular integration. Exemplary successful projects with collaborative learning on virtual patients will be demonstrated. An outlook to potential future opportunities in the field of virtual patients such as learning analytics and automatic assessment methods will be given.

IMPLEMENTATION OF OBJECTIVE STRUCTURED CLINICAL EXAMINATION. DESCRIPTION OF GOOD PRACTICE BASED ON FOUR SUCCESSFUL IMPLEMENTATIONS

13.00–13.40 **WEDNESDAY**

Michal Nowakowski
Jagiellonian University, Kraków

Keywords: *OSCE, training methodology*

Objective Structured Clinical Examination was implemented at the 3rd year of Jagiellonian University Medical College in 1999. Since then every year we gained experience and knowledge, polished our skills and implemented more OSCE exams at the 2nd and then 6th year of our curriculum. Through series of workshops and training courses we learned also a lot about training methodologies that work for busy teachers at medical universities in various medical schools in Poland. Two more years passed and we developed a compact and effective methodology of implementation of OSCE principles in medical schools. The prototype model of implementation

was tested on our own ground, refined and then applied at 3 other medical schools in Poland and Ukraine. At the moment we offer our help to all those who cherish quality of assessment as much as we do.

Our methodology is based on few basic principles. We provide basic knowledge about OSCE, give an overview of logistics and run workshops to help participants to develop their own stations and then design their own exam. Then we supervise delivery of first small scale OSCEs and facilitate scaling up of the procedure. Instead of providing full exam we develop the local capacity that leads to sustainable results. OSCEs that we help to develop are tailored to particular medical schools needs which facilities sustainability.

During the lecture I will describe critical concepts and present methodology that we developed so that the others may follow the same path avoiding some of mistakes that we made along the way.

SHORT COMMUNICATIONS: TECHNOLOGY-ENHANCED LEARNING

Chairs: Lukáš Bolek, Jaroslav Majerník

THE MEFANET PORTAL OF THE FACULTY OF HEALTH STUDIES (FZS) OF THE UNIVERSITY OF WEST BOHEMIA IN PILSEN

13.30–13.50 **Tuesday**

Lukáš Bolek, Jaroslava Nováková, Lukáš Štich
Faculty of Health Care Studies, University of West Bohemia

Keywords: *web portal, infrastructure, education support*

Within the framework of the long-term plan of the Faculty of Health Studies, FZS showed interest in participating in the MEFANET network – becoming a member of the network in 2015. In the years between 2015 and 2017, project applications were submitted for funding to build infrastructure and start up its own faculty MEFANET portal. Pilot launch of the portal started in 2016, routine operations finally in 2017 after obtaining the ESF project at the University of West Bohemia in Pilsen. Part of the project included activities to develop the portal's infrastructure and at the same time to support authoring activities in the field of electronic learning materials designed primarily for the portal. The portal is currently actively used in teaching.

So far, the LearningWare and LMS Moodle systems have been used to support E-learning at FZS. However, MEFANET is different both in its simplicity and by its specific focus on the medical and healthcare sector.

For the sustainable development of the portal, it is important to obtain grant support for both the creative work and the complete background that this work provides. It is not just about providing HW and SW infrastructure, but also about advisory and service activities for the authors. This includes, for example, the final editing of texts, charts, photographs, soundtracks and spoken comments and posting materials to the portal. At the same time, the FZS Editorial Board is supported, which, besides the quality control of the works, ensures review procedures including the provision of reviewers. Thanks to the ESF project, participants are also adequately rewarded for their work.

Although the MEFANET portal network has been in existence for more than 10 years, FZS did not use it for teaching until 2016. It is only now that when FZS teachers put their materials into the portal, students are beginning to learn more about it and its uses for their study.

FZS has been able to start using the MEFANET portal over the last three years and it is now considered as one of the electronic supports of FZS studies. The aim is to achieve the use of the portal and the MEFANET network as a priority source of quality electronic learning materials.

The material technical base as well as the successful support for the author's activity comes mainly in the form of grants. The portal is filled with newly created educational materials and, at the same time, increases the variety of accesses to them. However, the frequency of approaches is

very volatile, and there are still an insufficient number of FZS students. Discussions with students show that the portal is still not well known and more pathways need to be found to bring students closer to the portal. Additionally, faculty educators have insufficiently used the portal as well. We assume that the ESF project running eliminates these issues significantly. We expect this project to be built upon the first project in 2020, which will complete our efforts to introduce the use of the MEFANET network as a routine support for education at FZS.

- The pilot version of the portal was tested in 2016, routine running from Autumn 2017.
- The first materials were posted on the portal in 2016.
- The portal now has 50 materials and 10 of them are in the review process.
- An additional grant was awarded to support e-learning.
- The MEFANET Editorial Board has begun operating.
- Fundamental information on the portal, publishing terms and copyrights are provided on the faculty website.
- The number of open materials on the portal is 11,000 (as of the end of October 2018).
- A project is being prepared to further support e-learning.

MASSIVE OPEN ONLINE COURSES (MOOCS) IN CZECH HIGHER EDUCATION

13.^{50}–14.^{10} **Tuesday**

Veronika Němečková
University of West Bohemia, Masaryk University

Keywords: *Massive Open Online Course, MOOC, higher education*

Massive Open Online Courses (MOOCs) have been here for a while now. So far, they have not been very commonly used in Higher education In Czech Republic. Is there a good reason to consider them? What features does a course of this kind have? What medical topics are covered so far? How can we use these courses in our teaching and learning and when does it make sense to make your own MOOC? Let's talk about MOOCs.

Massive Open Online Courses (MOOCs) can be used in teaching both in a blended learning and completely distant form as well. Most courses of this kind enable self-paced learning.

In Higher education we can think of Massive Open Online Courses (MOOCs) in several ways, depending on our role. As teachers we can incorporate these courses into our teaching and encourage our students' learning. As researchers we can think of courses of this kind as of an effective way in which we can communicate results of our research and longterm academic interest to general public. Moreover, this effort might attract future students of bachelor, master or doctoral studies at our institution as well. There is also a big opportunity for students in lifelong learning.

The number of Massive Open Online Courses (MOOCs) increases. There is no reason why not to take advantage of it. We can benefit from courses of this kind in Higher education both as teachers and researchers as well.

STUDENTS SURVEY WITHIN THE TAME: TRAINING AGAINST MEDICAL ERROR PROJECT: CHOOSING THE TOOL, RESULTS OF THE SURVEY

14.10–14.30 **Tuesday**

M.O. Avramenko, A.K. Bilyi, O.M. Kostrovskyi
Zaporizhzhia State Medical University, Zaporizhzhia

Keywords: *survey, TAME, LimeSurvey*

A survey is one of the most commonly used approaches for assessment of students' knowledge in many disciplines. The abovementioned method has been known for a long time, but it begun actively applied with the introduction of information technologies into the educational process. The absolute advantage of this method is a possibility of parallel processing of large groups of students with minimal intervention of the tutor, which, firstly, makes the evaluation process fully objective, and, secondly, significantly reduces the duration of this process.

After monitoring the online software available for conducting an online survey, and analyzing its functionality, ease of implementation, accessibility and price policy of these tools, the final choice was made in favor of LimeSurvey, an open source application written in PHP based on the MySQL, SQLite, PostgreSQL or MSSQL databases. It is applicable under the GNU General Public License.

LimeSurvey is a web application that was installed on personal server. After installing LimeSurvey is guided through the web interface. Questions can be added or deleted using a user-friendly editor interface. LimeSurvey has no limitations on the number of polls created, as well as the amount of participants. In addition, LimeSurvey also has no limits on the number of questions for each questionnaire.

To conduct student surveys within the TAME: Training Against Medical Error Project, all questions were divided into groups and each group of questions was on a separate page.

In total, according to the results of the testing, 205 student responses were analyzed, which related to 6 cases that have been studied by the students. One of the main criteria for the good quality of cases created, we considered the consent of students with judgments and techniques that were taught in cases. As we can see in Figure 1, most students agree or fully agree that during the case they felt like they were real doctors.

Assessing students' opinion on the situation described in the cases, we can conclude that most students were more confident in their knowledge and skills before passing the case. At the end of the of the cases, the students' opinion has changed, as you can see in Figure 2. This allows us to positively evaluate the thematic content of the situation, that is reflected in the case. 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.

Choosing the right software for conducting an online student survey greatly optimizes the time and money costs for conducting student knowledge assessment after passing cases with virtual patients within the framework of the Training Against Medical Error Project. The analysis of the results of the student survey concerning the case studies showed that the case materials are well structured, correspond to the tasks set and to the full extent allow students to master the knowledge volume provided for study.

TIPS FOR USING TECHNOLOGY – ENHANCED LEARNING AND TEACHING IN HIGHER EDUCATION

14.30–14.50 **TUESDAY**

Lucie Rohlíková
Faculty of Health Care Studies, University of West Bohemia

Keywords: *technology, e-learning, higher education*

The presentation will introduce tips for using technology in teaching at universities and colleges. The information is based on the evaluation analytics, the discussion of the situation at the individual faculties of UWB and the detailed SWOT analysis.

Examples of good practice of using LMS, Adobe Connect Synchronous e-Learning System, Google Drive, and Mahara Digital Portfolio will be discussed.

Participants will also gain ideas and insights on how to keep an overview, even with the continued innovation of available teaching support technologies.

VIDEO RECORDS OF CADAVERIC DISSECTIONS IN EDUCATION OF HUMAN ANATOMY: PERCEPTIONS OF MEDICAL STUDENTS

15.30–15.50 **TUESDAY**

Jaroslav Majerník, Janka Vecanová, Darina Kluchová, Ingrid Hodorová
Faculty of Medicine, Pavol Jozef Šafárik University

Keywords: *education, anatomy, dissection, multimedia, survey*

The long history of education in human anatomy brought various teaching methods and approaches. Some of them are considered crucial and remains almost unchanged for hundreds of years, while others were designed as something complementary to face to face lectures and exercises allowing learners to study and understand details of particular anatomical structures and systems through various more or less illustrative ways. Despite the fact that anatomy has been taught for centuries, there is no clear consensus of what is the best teaching method to deliver anatomical knowledge and the discussions among professionals continues also in today's modern information technology based era all around the world.

Based on our years of experience in teaching human anatomy, we suggest the cadaver-based instructions are invaluable part in medical education and should be used in combination with traditional lectures and model based practical lessons for deep understanding of anatomy that is necessary for subsequent safe medical practice. Because of the reduced amount of teaching hours dedicated to anatomy, increased number of students, limited capacities of the dissection rooms and most of all because of the lack of cadavers, we tried to develop and offer various effective modalities and materials to our undergraduate students. One of the activities we realized during last three years, was aimed to document instructional dissection procedures and to develop online and offline available video archive. In this way, the upper and lower limbs structures; thorax, abdomen and pelvis systems as well as head and neck regions were processed and integrated into the education processes. Using this we share not only our own approaches and skills to our students, but as we suppose also the tools that help students to improve imagination level as this can be hardly reach only from static and two dimensional textbooks.

The efficiency of our approach was objectively verified by the comparison of students' test and

examination results, that were significantly better in students having access to the instructional video records than in students without this access. However, we also wanted to obtain the feedback from the students to know their perceptions to these multimedia based education materials. Therefore, we conducted a survey, in which the 2nd year students were sked to score 12 questions related to the developed dissection materials using five grade Likert scale on abilities to understand particular anatomy structure or system and to achieve individual learning objectives. One open question was used to collect students' suggestions and comments. 201 students responded to the survey. The huge majority of the students accepted the material very well and declared that this helped them in better understanding of anatomy topics and better preparation for the tests and final exam too. The higher variability of answers was presented in questions related to the technological issues as the students stated they are not able to assess the technological quality of the video records.

The survey demonstrated that the students' perceptions of our activities to prepare illustrative educational outputs are very positive. The majority of medical students felt that it is highly beneficial to use multimedia materials including cadaver dissection video records in conjunction with traditional teaching methods to teach human anatomy. Medical students also declared the online accessibility is highly suitable for achieving learning objectives of anatomy courses.

Results presented in this work were obtained with the support of the national agency's grant KEGA 017UPJŠ-4/2016 "Visualization of education in human anatomy using video records of dissections and multimedia teaching materials".

MULTIMEDIA MODEL CASES FOR INTERACTIVE LEARNING IN PSYCHIATRY AT THE FACULTY OF MEDICINE, COMENIUS UNIVERSITY IN BRATISLAVA

15.^{50}–16.^{10} **TUESDAY**

Michal Turček, Michal Hajdúk, Ľubomíra Izáková, Peter Janík, Dana Krajčovičová, Mária Králová, Zuzana Matzová, Viktor Segeda, Anna Surovcová, Jana Trebatická, Miroslava Zimányiová, Ján Pečeňák

Faculty of Medicine, Comenius University in Bratislava

Keywords: *psychiatry, interactive model case, interactive learning*

We present an interactive multimedia model case that was created within the framework of project focused on standardizing and improving the pregraduate teaching of Psychiatry. The project is realized in cooperation with the Department of Psychiatry and the Department of Paediatric Psychiatry, Faculty of Medicine, Comenius University in Bratislava.

The changing profile of patients hospitalized at psychiatric departments, together with increased focus on patients' right protection require changes in clinical teaching. The aim of the project is to develop new interactive teaching tools easily applicable in both theoretical and practical teaching & learning together with achieving active participation of students in the learning process. Realization of the project requires interactive template preparation, selection of appropriate clinical cases and obtaining informed consent from patients, recording of patient assessments, documentation of laboratory and other findings, and aligning the case information into an illustrative model of selected clinical diagnosis.

We developed new multimedia-based digitalized teaching materials that include interactive multimedia model cases and recordings of psychopathological symptoms.

We offer the presented interactive multimedia model case created in the PowerPoint

environment as an example of an alternative option for complex presentation of clinical problems in the teaching process of Psychiatry. Supported by grant KEGA No. 037UK-4/2017.

POSSIBLE SOURCES OF STUDENT´S PROBLEMS WITH MEDICAL STATISTICS

16.10–16.30 **TUESDAY**

Katarína Kozlíková, Viera Haverlíková, Michal Trnka
Institute of Medical Physics, Biophysics, Informatics and Telemedicine, Faculty of Medicine, Comenius University in Bratislava

Keywords: *medical statistics, medical biophysics, education, textbook*

Currently preferred medicine – evidence based medicine – includes decision making that is supported by different statistical methods as well as error analysis. In accordance with the Slovak state education program, the very essential statistics should be taught at secondary grammar schools in the subject Mathematics and essentials of error analysis in the subject Physics. Because neither Physics nor Mathematics entrance exams take place at medical faculties of Slovak universities, students often underestimate these topics. Therefore, we have included them into the subject Medical Biophysics taught in the first semester of their study.

The aim of this study is to inform about solutions how to help students to overcome the problems with medical statistics.

Besides the oral exam, the student´s knowledge of the subject is evaluated with on-line tests using the MOODLE environment. In the academic year 2017/18 testing of 335 students studying General Medicine and Dentistry in Slovak language revealed that these topics belong to those that are more difficult for students compared to other evaluated. The students answered 186 closed questions concerning statistics including working with graphs and error analysis (4 topics) with mean facility index 67 % compared to remaining 2 127 closed questions included in the test with mean facility index 74 % for the remaining 41 topics of the subject. According to the mean discrimination index 0.09 we assume that students did not answer questions according to their real knowledge, but they just guessed.

Until 3 years ago, for almost 20 years, essential statistics as well as measurement errors were lectured at the beginning of the semester. This helped the students with evaluation of measurements in the consecutive practical training. After cancelling these lectures, statistics has to be trained only during practical training. Some help is given also through lectures available on MEFANET portal. But as one can see from the test analysis above, this procedure is insufficient. Therefore, we decided to prepare a new textbook dealing with the concerned topics.

The first textbook fully dedicated to essentials of medical statistics originating from our department was published in Slovak in 2003, next volume was published in 2009, again in Slovak. Simplified version of the first volume (only theory without solved problems) appeared as a part of practical training textbooks published in English in the years 2007 and 2010. The new forthcoming textbook in Slovak describes the types of statistical data, gives basic theory of measurement uncertainties analysis, describes and explains the mostly used graphs and how to prepare corresponding tables. Descriptive statistics is represented by sample characteristics of location and variability. Introduction into inductive statistics is made by explanation of confidence intervals for sample characteristics of location. All presented formulas are supported by examples – solved problems in context of various medical disciplines in the whole textbook.

We are aware that the textbook gives really only essentials of medical statistics and data evaluation as it is devoted mainly to students of the first year. But without knowing these essentials, later, they will not be able to understand and to apply those methods that are applied in evidence based medicine starting with relatively simple hypotheses tests up to meta-analyses and cohort studies and how to apply them in individual patient-level decision making.

This work has been supported by the grant KEGA 037UK-4/2016 offered by the Ministry of Education, Science, Research and Sport of the Slovak Republic.

GUIDED POSTER TOUR

Chairs: Ondřej Zahradníček, Martin Vejražka

MULTIMEDIA EDUCATIONAL MATERIALS IN OBSTETRICS & GYNAECOLOGY – MULTIMEDIÁLNÍ VÝUKOVÉ MATERIÁLY V GYNEKOLOGII A PORODNICTVÍ

09.00–10.00 **WEDNESDAY**

René Pruner, Lukáš Rob, Michael Halaška, Martin Hruda, Radovan Vlk
3rd Faculty of Medicine, Charles University

Keywords: *digital video, ObGyn, bstetrics, Gynaecology, Gynecology, electronic study materials*

The aim of this work is to create multimedia presentations of surgical procedures in Obstetrics and Gynaecology, which should reduce the need of presence of medical students in surgical theatres, thus eliminating the increased costs and difficulties posed by a large number of students in the theatre and allowing them to gain first-hand experience anytime they wish. During open surgeries, students do not have a good view of the surgical field and even if they are let to peek inside the human body, it's usually only for a second with no additional educational value.

For many years we have been preparing electronic teaching materials for the database of the 3rd Faculty of Medicine, Charles University - called „Vyuka" (=Teaching). With this project we try to activate more students. We use Panasonic digital Full HD camera with stabilization fixed on a telescopic arm to capture and record operations and examinations. This way we gain the possibility of views that would not be feasible for the viewers physically present in the operating theatre. Continuous follow-up is also important. For some study materials, we use more cameras. The main one records the procedure performed and the other one events around. This replaces the need for students' presence while giving them an authentic feel of the events in the theatre. Material sparing - disposable scrubs, shoes, caps and masks. Students can watch presentations whenever they want, come back to interesting parts and have the opportunity to see even rare surgeries. In addition, they can ask teachers to explain parts, that are not obvious to them.

During the project we created 15 multimedia teaching materials, which can be also used in the following years. Additionally we collected long hours of footage for future processing. Recorded video is edited and annotated. We have good experience with narrated presentations, also in PowerPoint. We perceive the digitization of teaching as an inevitable trend. The output also consists of presenting and sharing these results here on the Mefanet interfaculty platform. We offer cooperation and exchange with other institutions. We consider this to be a more productive way, than if every school makes up its own materials. The long-term sustainability of learning outcomes is important for many years to come.

By creating multimedia teaching materials we are bringing learning to a higher level and allowing students to see what would otherwise be difficult to see.

Study materials available on-line reduce the cost of teaching and save the necessary number of classrooms, repeated lectures, and necessity for students' commuting. It simplifies the creation of individual schedules. Students have the opportunity to learn or view the required parts at any time and repeatedly as needed. There is no need for traditional note taking. Presentations (respectively

parts of them) can be upgraded and optimized year after year. There is no risk that something would be forgotten.

3.LF UK – grant IPUK 236085 - Multimedia Educational Materials in Obstetrics & Gynaecology = Multimediální výukové materiály v Gynekologii a porodnictví.

DEVELOPMENT OF TEACHING AND TESTING ACTIVITIES IN MODULES CELLULAR BASIS OF MEDICINE AND STRUCTURE AND FUNCTION OF THE HUMAN BODY AT THE 3RD FACULTY OF MEDICINE OF CHARLES UNIVERSITY

09.00–10.00 **WEDNESDAY**

Josef Fontana, Eva Samcová, Pavla Balínová, Vladimíra Kvasnicová, Petra Lavríková, Vojtěch Petr, Kateřina Šubrtová, Patrik Maďa, Adéla Krajčová, Jakub Slezák
3rd Faculty of Medicine, Charles University

Keywords: *Medical biochemistry, case reports, testing, e-textbook*

In our project we focused on the development of teaching and testing activities of medical chemistry and biochemistry in the first two years of the general medicine study program at the 3rd Faculty of Medicine. Our aim was (1) to develop a new system that enables work with test statement and exercises, (2) to update and enlarge content of the multimedial e-textbook Function of cells and human body (that students use as their student material) and to expand and update a collection of clinical detective stories (used during seminars of medical biochemistry in the first 2 years of study).

Based on results of students evaluation and our previous experience we decided to further develop instruments and activities that we use for teaching and testing of medical chemistry and biochemistry in modules Cellular Basis of Medicine and Structure and Function of the Human Body (first 2 years of the study).

A) Testing: During the first year, primary examining method are written tests composed of two parts: (1) test statements and (2) short answer part (schemes, pictures, case studies, description of a topic etc.). Our aim was to (1) expand the collection of exercises and (2) develop a system that enables: (a) editing the statements, (b) generating the tests, (c) user-friendly presentation of sample exercises and (d) Q&A interface.

B) Teaching: Multimedial e-textbook Function of cells and human body (see: http://fblt.cz/) was developed to provide all students with a freely accessible and interactive teaching material that covers basic topics from medical biochemistry, human physiology and histology. Based on feedback gained from students and its users (supported by statistics of website traffic) we decided to update and further expand the collection of topics covered by the e-textbook and to create new accompanying files (pictures, schemes and animations).

Supporting the integrated and problem-oriented way of teaching, clinical detective stories (simplified case reports of real patients) were implemented in the teaching of medical biochemistry. Our current project was focus to expand their spectrum to bring student actual and interesting topics

In the part of project focused on testing modalities our team:

1. expanded the collection the test exercises to almost 10 000 statements and exercises,
2. developed a system that is part of our „vyuka“ e-portal (used by both, teachers and students), that enables following modalities:

a. editing the statements,
b. generating the tests: random selection of tasks according to predefined parameters and export to a suitable format,
c. user-friendly presentation of sample exercises to students with a possibility to solve given task, then display the correct solution,
d. ability to Q&A interaction between student and teacher.

In the second main part of project dedicated to teaching activities we:

1. updated and expanded the content of the multimedial e-textbook Function of cells and human body: 8 new subchapters were created, 12 subchapter were updated and more that 100 new accompanying files (pictures, schemes and animations) were formed. The e-textbook is freely accessible at webpage: http://fblt.cz/,
2. expanded a collection of clinical detective stories (new 50 in Czech and 50 in English) and updated the topics to be more relevant to current knowledge. These are used during the seminars in the 1st and 2nd study year.

Based on the ongoing results and feedback gained from students and teachers, the project fulfilled the key defined tasks:

1. to devepol a new system that enabled user-friendly management and work with test statement and exercises,
2. to update and enlarge content of the freely accessible e-textbook Function of cells and human body,
3. to update and expand a collection of clinical detective stories used for teaching medical biochemistry in integrated and problem-oriented way.

The project was supported by grants of Charles University: 236082/IPUK/2016-2018 and 236087/IPUK/2016-2018.

DEVELOPMENT OF A COURSE INTRODUCTION TO PRACTICAL METHODOLOGY OF SCIENTIFIC WORK FOR UNDERGRADUATE STUDENTS OF GENERAL MEDICINE STUDY PROGRAM

09.00–10.00 **WEDNESDAY**

Kateřina Šubrtová, Romana Šlamberová, Josef Fontana, Peter Ivák, Tomáš Sychra, Jakub Slezák, Alžběta Kantorová
3rd Faculty of Medicine, Charles University

Keywords: *research methodology, graphical skills, presentation skills*

Aim of the current project was to implement a new elective course „Introduction to Practical Methodology of Scientific Work" to the curriculum. This course is focused on undergraduate students of the general medicine study program that want to improve their theoretical knowledge and practical skills of research methodology. These acquired practical skills include an ability to process their scientific work into a scientific poster (using professional graphic software) and oral presentation.

All teaching units have a full e-learning support and were recorded.

Around 80 student scientific projects are presented during the Student scientific conference at the Third Faculty of Medicine every year. Part of these projects are presented as an oral presentation, part in a form of posters. Based on results of students evaluation from previous years, there was identified a need for deeper knowledge and practical skills of research methodology among students that present at the conference. Evaluating students emphasized both basic components of practical presentation skills: area of graphical component of their presentation and area of their presentation skills and work with the auditorium.

The newly implemented course was therefore focus on:

1. providing students of general medicine study program with adequate theoretical knowledge of basic methodology of scientific work (planning of the research project, presentation of scientific work, searching for scientific information, grant application, fundamentals of statistics, transfer of knowledge and technologies etc.).
2. acquiring practical skills necessary for creating effective communication via poster and oral presentation: work with professional graphic software (Adobe Illustrator) to create poster presentation, preparing slides for oral presentation, work with audio-visual instruments, best-practice in communicating their work to an audience.

In the period 2016-2018 three rounds of the course took place (one is running currently). In the current scheme the course comprises of:

1. the theoretical part consisting of 6 teaching units: planning of research project, basic forms of presentation of the scientist work: abstract, poster and oral presentation –< best-practice, sources of financing for research projects, fundamentals of transfer of knowledge and technologies, ethical behaviour in science etc.
2. the practical part consisting of:
   a. 2 practical trainings focused on work with professional graphic software (Adobe Illustrator) to create poster presentation, preparing slides for oral presentation
   b. 2 practical trainings of presentation skills and work with audio-visual instruments
3. individual work of students: students are assigned one selected scientific article and their task is to convert it to poster/oral presentation - students should demonstrate that they can practically apply the knowledge and skills they learned during the course.

4. final presentation of the individual work of students to the evaluation committee and their colleagues.

Ongoing feedback gained from students shows that they appreciate both theoretical knowledge and practical skills they acquired during the course. They feel a real improvement in their work. The majority of presented works (during the final presentation) are of high quality.

The course has full e-learning support via the e-portal „vyuka“ used at the Third Faculty of Medicine. All teaching units were recorded.

Based on the ongoing results of the project we can conclude, that the it fulfils the defined tasks:

1. new elective course called „Introduction to Practical Methodology of Scientific Work“ was implemented the curriculum,
2. the course improves practical skills of students to process their scientific work into a poster presentation (using professional graphic software) and oral presentation,
3. students aquire basic presentation skills for efective communication of their work to an audience.

The project was supported by grants of Charles University: 236095/IPUK/2016-2018.

HOW DO STUDENTS USE THE E-LEARNING COURSE PRACTICAL TRAINING IN MEDICAL BIOPHYSICS?

09.^{00}–10.^{00} **WEDNESDAY**

Viera Haverlíková
Faculty of Medicine, Comenius University in Bratislava

Keywords: *medical biophysics, e-learning course, theoretical backgrounds, tests*

Medical Biophysics as a theoretical background of medical education is taught at the Faculty of Medicine, Comenius University in Bratislava (FM CU), in the first semester. Time allocated to face-to-face teaching is limited to 24 hours of lectures and 36 hours of practical training. Previous research showed significant heterogeneity of students' initial knowledge and skills. This resulted to the development and implementation of the e-learning course supporting the face-to-face practical training in Medical biophysics at FM CU. The aim of pedagogical research was to find out whether students considered the course to be useful.

The e-learning course "Practical training in medical biophysics" offers general study instructions (e.g. occupational health and safety requirements, assessment rules, measurement report guidelines, semestral project guidelines), study materials summarising high school physics backgrounds (e.g. physical units, measurement errors, essentials of statistical data processing), study materials related to particular practical tasks (theoretical background, measurement guide and measurement report) supplemented by self-evaluation tests and some additional external sources (video-guides, web-lectures, journal articles). The course was open to all 348 first-year students. They were informed about the course in the first lecture, when they were asked to answer introductory test and personal questionnaire available in the course. For the experimental group of 28 students it was obligatory to answer self-evaluating tests prior to particular practical training. Data provided by the learning management system were analysed and compared with time schedule.

Totally 329 students enrolled to the course. Quarter of them answered only the introductory test and/or the personal questionnaire and did not use study instructions, educational materials or self-evaluating tests. The remaining 248 students (71 % of all first-year students) used mostly

high school physics backgrounds (4 documents, 133 ± 23 users per document), study instructions (6 documents; 128 ± 33 users per document) and presentations of theoretical backgrounds related to particular practical tasks (20 documents, 107 ± 30 users). Measurement reports (16 documents) were viewed by 59 ± 27 students and self-evaluating tests related to particular tasks were answered only by 48 ± 13 students. The lower use of self-evaluating test was affected by the fact that the tests' availability was tailored to the schedule of the experimental group for which these tests were obligatory. Totally 79 students visited the course even after the semester during the examination period (61 % of students in experimental group and 36 % of students who used the course more than to answer the introductory test and persona questionnaire). In the examination period students used mainly presentations of theoretical background of particular practical tasks (54 students), self-evaluating tests (10 students) and study instructions (8 students).

Using the course by the students during the semester and the examination period indicates that students consider the course useful. Students mostly used materials presenting high-school physics backgrounds, study instructions and presentations of theoretical backgrounds related to practical tasks. It would be advisable to make self-evaluating tests available regardless of the schedule of individual study groups - to allow students answer the tests whenever they want. Another challenge is to extend the course with contextual problem-based tasks allowing individual as well as team based learning.

This work was supported by KEGA 037UK-4/2016 „Monitoring and development of scientific abilities of university students of medical and biomedical study programmes".

HIGH FIDELITY SIMULATION IN MEDICAL PHYSIOLOGY: SLOVAK EXPERIENCE

09.^{00}–10.^{00} **WEDNESDAY**

Silvia Hnilicova, Pavol Vitovic, Pavol Hnilica, Daniela Ostatnikova
Faculty of Medicine, Comenius University in Bratislava

Keywords: *high-fidelity simulations, human physiology, medical education*

In Slovakia, in the first two years medical students are taught Basic Science without any clinical experience. Traditional curriculum in Human Physiology at Faculty of Medicine, Comenius University in Bratislava, Slovakia involves lectures for all students and direct teaching in small group labs, all taught in traditional classrooms.

After the establishment of the Simulation Center, Institute of Physiology was the first to include high fidelity simulations in our MD program curriculum. Four clinical scenarios for 2nd Year students were developed. They involve high fidelity manikin clinical scenarios (Case of Bleeding, Asthma, Myocardial Infarction and Hemorrhagic Shock) with teaching objectives of Human Physiology course (Blood physiology, Respiratory Physiology, Cardiovascular Physiology and Integrative Physiology, respectively). They are mandatory for all students. The aim of our study was to analyze, if adding Simulation into teaching would increase motivation and improve test results among our students.

63 anonymous self-reported detailed Likert-style questionnaires (1: disagree, 5: totally agree) were collected from sample of students (n=63, 40 females and 23 males). 98% of them reported that simulation program increased their knowledge and improved results in final tests. Simulations motivated them to study Physiology (mean 4,72 ± SD 0,3), helped them in understanding clinical significance of study material (mean 4,83 ± SD 0,2), improved understanding of the topic (mean 4,59 ± SD 0,4), and enhanced critical clinical thinking of students.

Simulation program in Slovakia was found to be beneficial for students by increasing motivation and improving performance, and found to be valuable addition to traditional Physiology classes.

High Fidelity Manikin Simulations can be used in Basic Sciences and preclinical subjects to increase motivation and help students to identify clinical significance of studied material.

Project „GOING GLOBAL" (No. 002UK-2/2016) is co-financed by the Ministry of Education, Science, Research and Sport of the Slovak Republic.

EVALUATION OF INNOVATIONS IN THE SUBJECT OF NURSING PRACTICE

09.^{00}–10.^{00} **WEDNESDAY**

Jana Křivková, Petra Bejvančická, Jitka Krocová
Faculty of Health Care Studies, University of West Bohemia

Keywords: *innovation; nursing procedures; nursing; nurse*

Teaching the subject of Nursing Practice is very challenging for a correct understanding of theoretical knowledge and the acquisition of practical skills - nursing procedures and interventions. In order to acquire the correct nursing practices that a student is expected to acquire during the course of study, it is appropriate to add demonstration methods to the instructional method – learning video. The aim of the research was to find out what teaching methods students use for home preparation of the course Nursing Practices and whether the training videos would increase the effectiveness of the preparation for the acquisition of proper nursing practices.

The research part was carried ou using quantitative research in which respondents were approached who were studying full-time and combined form of bachelor's degree at the University of West Bohemia Faculty of Health and have been directly involved in teaching the subject nursing. In the research, a questionnaire method was used, a questioning technique with semi-structured questions. In the first phase, the Innovation of the subject was tested on a group of students of general nurse and midwife for the 1 st year (n=65) without the submitted audiovisual screenings created by FZS ZČU Pilsen, a questionnaire survey was submitted to students. Subsequently, the same group of respondents was pilot tested after the launch of the Innovation of the subject of Nursing Practices through the audiovisual projection were evaluated of individual nursing performances and evaluated through evaluation.

The representation of the respondents in both sets was 73,8 % (n = 48) and the combined forms 26,2 % (n = 17) from the Bachelor's degree. A research survey found that respondents (n = 65) in both groups had the same opinion for a sufficient time subsidy in teaching nursing practices in the classroom in the subject of Nursing Practice. The consensus was also expressed in a subsequent discussion with the teacher to answer questions about the given performance. We notice great difference in the use of teaching methods for self-study and home preparation. Using the audiovisual projection, the respondents in the first set mentioned only 9 responses (5%) compared to the respondents in the 2nd set, who already mentioned the use of videos from internet sources in 27 replies (41,5 %) and created by FZS ZČU Pilsen in 43 replies 66,2 %). Respondents after the innovation of the subject stated a higher efficiency of teaching at 60,9 % (n = 39). In the vast majority (n = 57; 87,7 %), the respondents of the FZS ZČU Pilsen FZS are seen as significant for all students and not only for non-health workers (students from grammar schools, health schools and similar kindergartens) (n = 5; 7,7 %), nurses and general nurses, midwives (n = 3; 4,6 %) or nurses (n = 0; 0 %).

On the basis of the findings, the author created, in cooperation with Martin Juhu, educational videos that serve as a study support for students of the full-time and combined form of bachelor

study at KOS FZS ZČU Plzeň for the subject Nursing procedures - general nurse, midwife with financial support of the FZS Plzeň, project number VS-18-021. Students use audiovisual support as feedback when studying the subject outside the classroom and the clinical workplace. Innovations in teaching the subject of Nursing Practice are thus contributing to improving the quality of teaching and subsequently to providing nursing care in healthcare facilities.

Audiovisual screenings were supported by the internal competition project VS-18-021.

SHORT COMMUNICATIONS: SIMULATION IN PEDAGOGY AND MEDICINE

Chairs: Daniel Schwarz, Petr Štourač

USING SIMULATION INSTRUCTION IN PRACTICAL LESSONS MEDICAL PARAMEDIC

10.20–10.40 **WEDNESDAY**

Stanislava Reichertová[1,2,3], Eva Pfefferová[1]
[1] *Faculty of Health Studies, University of West Bohemia in Pilsen*
[2] *Health and Social Faculty of the University of South Bohemia in České Budějovice*
[3] *1st Internal Clinic of the University Hospital in Pilsen*

Keywords: *medicine, student, clinical situation, methodical exercises*

Theoretical knowledge and theoretical training are a matter of course in medicine and constitute both a foundation and a large part of teaching. At the same time, however, there are many practical skills in medicine, some of which have a life-saving nature. A number of clinical situations require a reasonably fast sequence of diagnostic and therapeutic steps and a combination of practical application of knowledge and manual skills. The fact that the lives of the person often depend on the speed and accuracy of the individual acts, convince us everyday practice.

To teach medicine is not only theories and textbooks, but practical lessons are needed in specific health situations. Practical learning opportunities for a real patient are limited in urgent medicine for a variety of reasons. A particular situation may occur rarely, an immediate life-threatening emergency can not be inexperienced hands, and these situations often come unexpectedly and unexpectedly. The solution can be simulation teaching, which offers the possibility of transferring theoretical knowledge into practice. This type of training allows practicing skills in a real environment without endangering the health and life of the patient.Using simulation teaching, situations can be modeled and modified differently. From the student's point of view, this is a safe and attractive method of teaching. Simulation lessons can be used to practice seemingly simple tasks such as taking biological material, training difficult communication with a deaf or blind patient, and in serious injuries and acute conditions, you can rehearse situations when there is a mistake on the part of a health care professional. In this type of teaching, students have the possibility of repeated contact with a certain disease or condition that can be elevated to a state of imminent threat to the life of the patient without the risk of harming his or her health.

The essence of this method of teaching is not only the correct approach to solving the situation but also the active approach, knowledge and verification of various solutions, mutual communication in the team, understanding of the patient's behavior, assessment of suitability or inappropriateness of individual team members and possible cooperation with other members of the health team with components of the integrated rescue system. The main objective of

the inclusion of simulation teaching in the education process is the individual approach to the student's possibility of self-realization and motivation to try to provide professional health care and first aid in real conditions of practice. An important condition for the quality of this type of teaching is a retrospective assessment of the situation both on the part of the teacher and on the part of the student and self-reflection of each student.

Repeated exercises of model situations will provide students with sufficient preparation for their demanding profession.This need for current practice puts high demands on the training of medical rescuers.Simulation instruction is one of the ways to fulfill these requirements and to prepare the medical rescue graduates in their future profession.

IMPLEMENTATION OF THE ULTRASOUND SIMULATION IN THE EDUCATION AT THE FACULTY OF MEDICINE, COMENIUS UNIVERSITY IN BRATISLAVA

10.40–11.00 **WEDNESDAY**

Pavol Vitovič, Miroslava Laurovičová, Daniel Kosnáč, Helena Svobodová, Alexandra Wagner, Silvia Hnilicová
Faculty of Medicine, Comenius University in Bratislava

Keywords: *simulation, ultrasound, education*

Recently, medical education is facing a considerably serious problem of an inadequate contact with the patient during the clinical education. As a result, the students, as the future medical professionals, have no chance to learn habit for working with the patients resulting in the reduced quality of an education. This deficiency can be eliminated by simulations, which have been an integral part of an increasing number of subjects taught at the Faculty of Medicine of Comenius University in Bratislava (FMED UK) since 2013 as part of general medical and dental medicine.

One of the basic skills every student need to learn is the use and control of medical devices. Technological developments in this field are advancing, education seems to be indispensable, and this especially applies to ultrasonographic diagnostics (USG). USG is becoming more accessible with wider range of application within health care, requiring a doctor not only to master USG, but also to quickly analyze the obtained information and to set a precise diagnosis. Within the theoretical teaching, students are provided with theoretical basics, however, there is not enough time to transfer them into the practical lessons. A possible solution has appeared to be an implementation of USG simulation, which was for the purpose of medical education, established at the beginning of 2018. The USG simulator is a torso of adult human enabling one to train USG by using various types of probes (linear, abdominal, TEE). A wide range of pathologies (abdominal, cardiac, pleural, FAST) are integrated into the simulator, with many of them students do not have an opportunity to meet in the clinical classes. Also, the control program allows one to turn on/off echogenicity or view only specific structures in the human body.

USG simulator, as a brand new member of simulator family at the Department of simulations and virtual medical education FMED UK, is a state-of-art tool being slowly implemented into the curriculum of an increasing number of theoretical and clinical classes being taught at our Department starting from the Physiology (2nd year) up to Internal medicine (3rd to 6th year). We are continuously optimizing the content of all the classes while trying to fit USG simulator into those classes. The most relevant class is Internal medicine where the simulation scenarios are being demonstrated on the patient simulator as well as on USG simulator. Our target is to have not only full implementation of USG simulator but also to open running courses on USG using both

USG simulator and real devices.

FMED UK, as the oldest and largest authority of the Slovak Republic in the providing of medical education in both the pre- and postgraduate studies, is aware of the problems in the clinical education, and the need to implement new trends in the education of future doctors. USG simulator allows one to learn USG from the very beginning and gradually improve. This increases the retention of the knowledge of students who are able to routinely handle and interpret the USG image, which only increases their competitiveness on the labor market.

HISTORY OF SIMULATIONS AND "SIMULATIONS" IN THE INSTITUTE OF MICROBIOLOGY, MEDICAL FACULTY, MASARYK UNIVERSITY, BRNO

11.^{00}–11.^{20} **WEDNESDAY**

Ondřej Zahradníček
Faculty of Medicine, Masaryk University

Keywords: *simulation, medical microbiology*

Simulations in medicine are recently considered a modern way, how to get medical students involved into topics that cannot be shown in reality for many reasons: suitable case is not available, real patient would be endangered if students would participate on diagnostic and/or treatmet attemps, and also the fact that the student cannot be present during the complete process for time reasons. Especially the last reason is valid also for laboratory branches of medicine, including microbiology. Therefore our institute started to simulate the differencial diagnostic in medical microbiology much sooner than it started to be popular. Our idea was (and is) that students able to understand the diagnostic algoritm in medical microbiology would be also able to understand diagnostic algoritms in clinical subjects. Later we also started to learn students how to decide properly in some situations typically conected with microbial infections.

In our simulations we combine all existing available methods. One part of "simulations" is just the fact that our microbial strains are mostly derived from Czech collection of microorganisms (CCM),. but they simulate "wild" clinical strains that would have almost higher virulence and so be able to cause laboratory infection. Some identification tests based on enzymatic reactions by microbes are simulated by artificial colours, as real strains would never have so perfect results. Newer simulations have rather form of a teacher-moderated story, where students are supposed to write their conclusions to the protocol and after that they obtain teacher's feedback. Of course, some of them also became part of the e-learning support of our blended-learning subject. The same can be told about other parts of our teaching: e. g. description of microscopy preparations is partially replaced by labbeling a picture of a microscopical preparation, etc.

RESULTS OF IMPLEMENTATION OF DECISION-PROBLEM BASED LEARNING WITH VIRTUAL PATIENTS IN SURGERY IN THE FRAMES OF TAME: TRAINING AGAINST MEDICAL ERROR PROJECT REALIZATION

11.20–11.40 **WEDNESDAY**

M. O. Avramenko, O. O. Furyk, A. S. Pavlenko
Zaporizhzhia State Medical University, Zaporizhzhia

Keywords: *medical error, surgery, course*

Today together with traditional methods of teaching there is a range of modern innovative methods of student training. In the framework of the TAME: Traning Against Medical Error Project (Erasmus + 561583-EPP-1-2015-1-KZ-EPPKA2-CBHE-JP (2015-2944 / 001-001), pedagogical method of D-Problem-Based Learning (D-PBL) was introduced at ZSMU, an innovative for Zaporizhzhia State Medical University approach.

The aim of the research is to specify the outcomes of the implementation of learning on Virtual Patients in Surgery within the TAME: Training Against Medical Errors Project.

In the frames of the TAME: Training Against Medical Error Project implementation a methodology of using Virtual Patients in surgery was introduced at ZSMU. To realize the project during 2016-2018 academic years a database of Virtual Patients (VP) of surgical direction with medical errors was developed, the academic curriculum was modernized and elective course for 32 students of the 6th year of the specialty "General Medicine" was implemented. For the training of the students the D-BPL methodology with branch cases (Virtual Patients) was used. For analysis the students were divided into 2 groups: 1st group consisted of 14 male students and 2nd group was formed by 18 female students. Other 12 students who were taught traditionally formed the control group. The statistical analysis was conducted on the PC using the students' database (both branch and control groups) in the software application «STATISTICA® for Windows 6.0» (StatSoft Inc., № AXXR712D833214FAN5). A non-parametric statistical method - Mann-Whitney U test (for quantitative attributes) was used to measure the reliability of the difference among two independent samples.

The training in the frames of "Training on medical error in Surgery" elective course lasted 6 weeks and included 48 hours for classwork (36 hours for tutorials and 12 hours for lectures) and 72 hours for independent work (120 hours in total).

Before the beginning of the tutorials the pre-assessment was conducted for the students involved to evaluate the initial level of their knowledge in the field of Surgery (36 questions on finding right answer were used), the average index was (56,42%), wherein the index of the students of the 1st group had only a tendency to the highest one and did not reliably differ ($p>0,05$) from the index of the 2nd group (54,93%).

Three months after the tutorials on-line evaluation of students' knowledge was conducted to identify the sustainability of knowledge on Surgery after some period of time. For this reason a test of 36 questions was 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). The average results of the assessment (65,34%) were reliably higher ($p<0,001$) than the results of the pre-assessment (56,42%), and also higher than the results of the assessment of students of the control group (52%). Comparison of the results of the 1st and 2nd groups showed no reliable difference ($p>0,05$), (65,64%) and (65,11%) respectively.

The results of the State Licensing Examination KROK-2 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.

Thus, the average result of the 1st and 2nd groups on the State Licensing Examination KROK-2 had only the tendency ($p>0,05$) to the highest result of the control group and measured up to respectively (79,99%) against (77,73%). The comparative analysis showed that the result of the 1st group (76,79%) was reliably lower ($p<0,01$) then the result of the 2nd group (82,49%).

However, the average result of the sub-test "Surgical profile" (80,98%) was higher ($p<0,05$) than the control group's results (75,21%). Wherein, it was found that the 1st group (77,43%) had a reliable decreasing ($p<0,05$) of knowledge in comparison with the results of the 2nd group (83,75%).

The students were trained in safe environment according to the D-PBL methodology with Virtual Patients and medical errors, and this training contributed to knowledge improvement on the discipline ($p<0,01$) and results improving in the sub-test "Surgical profile" of the State Licensing Examination KROK-2 ($p<0,05$) in the comparison with the control group.

The gender-related comparative analysis showed that the students of the 2nd group (female gender) had higher ($p<0,01$) results to the ones of the 1st group on the State Licensing Examination KROK-2 and the sub-test "Surgical profile" ($p<0,05$).

In the medical practice, it will become the basis for avoiding medical errors, limiting harm and improving overall health-care safety.

VIRTUAL PATIENTS ENHANCING LIFELONG LEARNING IN UROLOGY AND ONCOLOGY

11.40–12.00 **WEDNESDAY**

Daniel Schwarz, Matúš Hlaváčik, Kateřina Maršálová
Faculty of Medicine, Masaryk University,
Institute of Biostatistics and Analyses, Ltd

Keywords: *lifelong learning, virtual patients*

Lifelong learning of physicians in Czechia is organized by professional medical associations receiving significant support from pharma and biotechnology industries. Despite the delayed onset of technology-enhanced learning, there have been several e-learning projects and online platforms for case-based learning launched recently.

"Renal carcinoma and virtual patients" (ca-ledviny.cz) is a new project aimed at scenario-based learning with all cases associated with this type of kidney cancer.

Although the target group involves oncologists and urologists, this educational platform has the potential to become an interesting learning resource for specialists in other medical disciplines as well.

The experience from the WAVES knowledge alliance helped to design a sustainable project and to accelerate its early phase.

WAVES knowledge alliance 562463-EPP-1-2015-1-UK-EPPKA2-KA (Erasmus+).

PANEL DISCUSSION: GOOD PRACTICES IN OSCE AND EDUCATIONAL INFORMATICS

Chairs: M. Komenda, S Hnilicová

FIRST OSCES - OBJECTIVE STRUCTURED CLINICAL EXAMS IN FACULTY OF MEDICINE, COMENIUS UNIVERSITY

13.40–14.00 **WEDNESDAY**

Silvia Hnilicova, Pavol Vitovic, Fabian Schmitt, Daniela Ostatnikova
Faculty of Medicine, Comenius University in Bratislava

Keywords: *OSCE, simulation, medical education*

Simulations in medical education are an essential part of the curriculum of highly-ranked medical schools, used in undergraduate and postgraduate education of students and physicians. At the Medical Faculty of the Comenius University in Bratislava, there were simulation with mannequins incorporated into many specialties and subspecialties education. The new method which was included lately in our curriculum were OSCEs - Objective Structured Clinical Simulations and Exams. OSCEs are special simulations with the use of standardized patients that have been developed for the purpose of clinical skills training as well as student assessments. They are already part of state examinations in many universities around the world, but novel in Central Europe Universities. Standardized patients are the most frequently professional actors, patients – volunteers or students who are trained to perform the role of a patient with precisely defined disease, a history, and possibly a physical examination.

Goal: Our goal was to verify if using OSCEs in our medical school is possible to implement and effective for training and evaluation.

Students from the second, fourth, fifth and sixth year were randomly selected for the pilot study. Students filled in a questionnaire before and after simulated patients. Standardized patients were chosen from students who voluntarily enrolled. They were trained. Standardized patients provided instant verbal individual feedback to students after encounter. Clinical cases were adjusted cases from OSCEs cases from partner NYU University.

In the course of two weeks, 107 students were enrolled in the study, who were able to screen an average of 1.9 standardized patients. Overall, 206 OSCEs took place. The OSCEs included students at the Physiological Institute, the Pediatric Department and the Department of Internal Medicine. Standardized patients presented patients with three clinical cases – Type I Diabetes Mellitus, Chest Pain, Bronchial Asthma. Students expressed satisfaction with the given form of teaching in the questionnaire, considered it very beneficial and interested in introducing it into the teaching. They most appreciated the formative feedback and would want more of it in the future.

The OSCEs are very effective and an interactive tool for enabling clinical skills training, a feedback tool and student assessment format. Their introduction into teaching would substantially enrich

the medical education of future physicians.

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SIMUPORTFOLIO: COMPLEX PLATFORM FOR MEDICAL AND HEALTHCARE EDUCATION

14.00–14.20 **WEDNESDAY**

Matěj Karolyi, Vojtěch Bulhart, Zdeněk Loula, Jakub Ščavnický, Roman Vyškovský, Martin Komenda
Faculty of Medicine, Masaryk University

Keywords: *medical and healthcare education, curriculum management, electronic study materials, software development*

The project Masaryk University Strategic Investments in Education SIMU+ reflects the current situation on the labour market, which is characterised by shortages of graduates with advanced practical skills in selected fields. In close cooperation with the MUNI 4.0 complementary project, it addresses the need for graduates' practical readiness, the importance of study programmes for the labour market and the promotion of new learning trends. The project will be implemented throughout 2017–2022 across the entire Masaryk University and will involve almost all of its faculties. Construction of the Medical Simulation Centre (SIMU) at the Faculty of Medicine of the Masaryk University is the first part of the project. The second part focuses on the development of methodological background for a real application of simulation-based learning to medical and healthcare curricula. SIMUportfolio represents an innovative web-based application enhancing these activities together with systematic curriculum management, harmonisation and mapping.

Thanks to modern frameworks for the development of web-based portals and applications, we are able to create applications for enhancement of teaching quickly and swiftly. We have developed SIMUportfolio together with medical experts (teachers/guarantors) who gave us feedback and became our primary users. SIMUportfolio represents the creation of an innovated, sophisticated and dynamic system that makes it easier for students and teachers to learn and, consequently, streamlines students' knowledge and skills for practice.

We have developed the pilot version of SIMUportfolio and we have continued with adding more functionalities based on users' needs. In addition, efforts are being made to extend the platform and the methodology of curricula mapping between partner universities in Europe. Nowadays, the SIMUportfolio platform provides functionalities for curriculum management, curriculum mapping, content browsing, study materials referencing, reporting and OSCE (objective structured clinical examination.

The primal goal of our endeavour is to increase the quality of education at the Faculty of Medicine of the Masaryk University and to spread techniques for curriculum mapping across focus groups. Thanks to applications such as SIMUportfolio, teaching is well described and organised, and teachers/guarantors have a better overview of the subjects taught by themselves and their colleagues.

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