dies doctorandorum
BOOK OF ABSTRACTS
2017

UNIVERSITY OF OSIJEK, FACULTY OF MEDICINE OSIJEK

POSTGRADUATE DOCTORAL STUDY
OF BIOMEDICINE AND HEALTH

DIES DOCTORANDORUM 2017.

BOOK OF ABSTRACTS

Publisher:
UNIVERSITY OF OSIJEK, FACULTY OF MEDICINE

For the publisher:
Professor Aleksandar Včev, M.D., Ph.D.

Editors:
Assist. Prof. Martina Smolić, M.D., Ph.D., Prof. Maja Miškulin, M.D., Ph.D.,
Prof. Aleksandar Včev, M.D., Ph.D.

Reviewers:
Prof. Ivan Karner, M.D., Ph.D., Prof. Branko Dmitrović, M.D., Ph.D., Prof. Marija Heffer, M.D., Ph.D., Prof. Ines Drenjančević, M.D., Ph.D., Prof. Pavo Filaković, M.D., Ph.D., Assoc. Prof. Vesna Ilakovac, Ph.D., Prof. Maja Miškulin, M.D., Ph.D., Assist. Prof. Martina Smolić M.D., Ph.D.

Text formatting:
Dario Pintar

Prepress and printed by:
Studio HS Internet d.o.o. Osijek

Circulation:
150 copies

ISBN:
978-953-7736-33-0

TABLE OF CONTENTS

Foreword

Faculty of Medicine Osijek for the third time celebrates the Days of PhD candidates: Dies doctorandorum 2017., an annual event, open to the scientific and general public where the research results of our doctoral students and their mentors is opened up to a wider analysis.

The primary objective of the gathering is to enable PhD students to present and discuss their research data in a professional environment. It is expected that participants will benefit from frequently asked questions and pices of advice given from the attending Professors and Peers as well as to strengthen their dissemination skills through valuable experience in communicating their research.

In addition, this kind of gathering of doctoral students, their mentors and internationally recognized scientists is an excellent networking opportunity for the future collaborations.

Dies doctorandorum 2017. is designed to be informal as much as possible in order to facilitate discussion contributing to the scientific excellence and integrity of our PhD students.

However, the meeting is organized to monitor the professional development of our PhD students in the first place. Therefore, like in previous years, the best poster presentations will be selected by Members of the Committee for Doctoral Studies and awarded a Dean's award.

Please keep in mind that some of our PhD candidates will get the opportunity to practise presenting their own ideas, concepts and research results for the first time. Therefore, everyone is invited to create an encouraging environment for our young researchers to continue with their demanding and valuable efforts.

Professor Aleksandar Včev, M.D., Ph.D.
Dean, Faculty of Medicine Osijek

Abstracts of annual seminars

Dissertation Proposal Title: The accuracy of triage decisions in patients with acute coronary syndrome

PhD candidate: Kristina Bačkov, M.Sc., General Hospital Zadar, Unit for Quality in Health Care, Zadar, Croatia
Mentor: Assist. Prof. Dario Nakić, M.D., Ph.D., General Hospital Zadar, Department of Internal Diseases and Nephrology, Zadar, Croatia

Introduction: Early recognition, timely and rapid intervention are keys to reduce morbidity and mortality from acute coronary syndrome (1). The triage is starting point of health care and nurse is the first person to encounter by patient upon arrival at the Emergency Department. Nursing researches suggests that the triage nurses knowledge and experience have an influence on triage decisions (2). Triage decisions that are not consistent with good clinical practice may result in a prolongation waiting time up to a doctors examination and subsequently prolongated time for therapeutic intervention and on that way affect the clinical outcomes of the patients (3). It is important for a nurse to establishe accurate urgency degree of patients condition and the necessary interventions to provide safe and effective health care.

Hypothesis: Accurate triage decision and timely intervention reduce mortality and morbidity of patient. It is important for the nurse to determine the exact degree of urgency of patient condition to provide safe and effective health-care. The research suggests that rates of accuracy are low and there is a delay in providing the necessary intervention. Enhancing the accuracy of triage decision is expected to improve clinical outcomes of the patient.

Aims: Determine the accuracy of triage decisions of the patients with acute coronary syndrome admitted to the Emergency department. Determine the impact of triage decisions on the waiting time until the doctors examination and the required therapeutic intervention.
Determine the correlation of sociodemografic characteristics of nurses with the accuracy of triage decisions.

Materials/Participants and Methods: Research the accuracy of triage decisions and correlations with sociodemographic characteristics of nurses will be conducted in

General Hospital Zadar, General Hospital Karlovac and Clinical Hospital Center Osijek. The research will include all patients released from the hospital with acute coronary syndrome (Unstable angina, STEMI, NSTEMI).
As a source of data to determine the accuracy of triage decisions electronic medical documentation will be used. Clinical parameters that will be examened are: vital functions, risik factors, estabilished triage decisions category, the waiting time until the doctors examination and waiting time until therapeutic intervention, medical diagnosis of patients. Sociodemographic characteristics of nurses who established a triage decision will be used from personal documents of employees in the hospital .

Research plan: The accuracy of the triage decision will be determined by three independent experts, two nacional instructors triage and cardiologist. The accuracy of the triage decisions will be determinated based on wheather a patient with acute coronary syndrome has been assigned correct triage dessicion. The delay is defined time waited by patient from the moment of triage to doctors examination longer than 10 minutes.

Significance/Expected scientific contribution: Research results can be the basis for improving the degree of security and clinical outcomes of the patients with acute coronary syndrome, by introducing organizational measures in the Emergency Department and additional education programs for acquiring specific knowledge and skills of nurses from emergency situations in cardiology.

Keywords: acute coronary, syndrome, triage, nurses, accuracy, Emergency department.

Dissertation Proposal Title: Comorbidity, Psycho-Social Characteristics and Functional Ability of Elderly People with Anxiety and Depression

Phd candidate: Sanja Bekić, M.D., Health Center Osijek, Osijek, Croatia
Mentor: Assist. Prof. Ljiljana Majnarić Trtica, M.D.,Ph.D., Faculty of Medicine Osijek, Osijek, Croatia

Introduction: Anxiety and depression are a risk factors for a number of physical illnesses with a high prevalence in patients with chronic illnesses. They remain largely unrecognized and untreated, causing adverse effects on health and poor quality of life. It is often difficult to clarify and discern a specific symptom as an indicator of chronic illness or depression and/or anxiety. The connection between depression and anxiety was investigated in correlation to a chronic illness, most often coronary heart disease, but was not investigated for the total comorbidity. These disorders are often masked by physical symptoms, such as chronic pain or cognitive dysfunction, or they have been insufficiently clinically indicated. Depression in the elderly population often has a biological background, such as chronic inflammation, atherosclerotic vascular changes associated with brain hypoxia, cognitive dysfunction and degenerative brain changes. The connection between depression as a syndrome for weakness/frailty is well-known, however it can also be a reaction to reduced functionality and chronic illness. Mental disorders can be induced by taking centrally active drugs, especially in patients with polypragmasy. However, patients prone to using analgesics often have masked anxiety/depression.

Hypothesis: Total comorbidity of the elderly is associated with anxiety and depression.

Aims: Determine the frequency and degree of overlapping between anxiety and depression in the elderly population and determine the gender differences. Determine the difference in comorbidity, including diagnosis of the diseases by MKB-10 classification, laboratory blood tests, anthropometric measurements, and the use of drugs that affect mental functions between patients suffering from anxiety/depression and those without these disorders.

Participants and Methods: Three groups of elderly patients (>60 years) will be formed, roughly 400 examinees of both sexes registered in the family medicine

practice. Anxiety screening will be performed using the Beck Anxiety Inventory scale, and depression screening using the Beck Depression Inventory scale. To determine the presence of cognitive disorders we will use a 6-item + clock drawing test, and for sleep disorders the Pittsburgh PSQI questionnaire. The Brief cope questionnaire will be used to determine the coping mechanisms, and for the physical functions analysis a newly formed questionnaire.

Research plan: Following the arrival in the clinic, the patients will be tested for the aforementioned characteristics using the scales of estimation, and divided into three groups. The first group will consist of patients with diagnosed depression, the second patients who, besides depression, suffer from anxiety, and the third group will be the control group, consisting of patients not suffering from anxiety and depression. We will also determine the differences in comorbidity between those suffering from depression and/or anxiety and those without these disorders. The X^2 test and the Fisher exact test will be used to analyse the differences between the observed groups. The significance test will be expressed at the $p<0.05$ level.

Expected scientific contribution: If we were to determine a greater prevalence of anxiety and depression in people with chronic somatic diseases, timely and effective treatment of anxiety and depression in those patients could affect the course and outcome of the chronic disease, improving the symptoms and quality of life. We could also plan measures to prevent the adverse consequences of anxiety and depression on the course and outcome of chronic diseases.

Keywords: comorbidity, depression, anxiety, assessment scale, elderly persons.

Title of abstract: Dandelion *(Taraxacum officinale)* as a possible indicator of wartime contamination in Croatia
Dissertation Proposal Title: The load on the environment pollution of Eastern Croatia metals and metalloids

PhD candidate: Lidija Bijelić**,** M.D.**,** Institute for Medical Assessment, Professional Rehabilitation and Disabled Persons,Varaždin, Croatia
Mentor 1: Prof. Dinko Puntarić, M.D., Ph.D., Catholic University of Croatia, Zagreb, Croatia
Mentor 2: Assist. Prof. Domagoj Vidosavljević**,** M.D., Ph.D., Vukovar General Hospital, Vukovar, Croatia

Introduction: In Croatia, war activities lasted from 1991. to 1998, and were ended by peaceful reintegration of its eastern previously occupied parts (Tanner 1997, Soldo et al. 1999, Plavšić et al.1992, Đanić et al. 1998). The consequences of this long time war activities on human health and the environment are only a in minor part explored, while contamination continues due to the existence of numerous mine fields still representing danger to the population and the environment. One of the characteristics of this war was the excessive use of artillery and airplanes resulting in indiscriminate destruction of civilian targets and infrastructure, including homes, hospitals, schools, churches, bridges, factories, etc. (Puntarić and Brkić 1995, Domazet-Lošo 2010) (Figure 1). This part of Croatia is predominantly lowland with agriculture and farming as the most important part of the economy. This has all left consequences on environment and the population. Some published papers from neighboring countries report of increasing incidence of malignant diseases in the post-war period among the population. (Obralić et al. 2004, Ebling et al. 2004)Research on the concentrations of metals and metalloids in the environment of east Croatia and its possible effect on the health of the population has never been systematically done. Recently, first results related to the concentration of metals and metalloids in soil samples gathered in 28 locations in East Croatia were published (Vidosavljević et al, 2013) and available water resources in rivers and wells of eastern Croatia (Gvozdić et al.2013 and 2015) . In extenso, sampling done on biological samples (serum, urine, hair) of the population and war veterans has shown abnormalities which need to be interpreted accordingly. (Jergović et al. 2010, Vidosavljević et al. 2013, Vidosavljević et al. 2014). Few published works include the presence of rare metals in vegetables of Croatia capital Zagreb

(*Brassicaceae*), and one paper published in 2002 has showed elevated war associated heavy metals on samples of deer kidney, especially in older animals (Puntarić 2013, Lazarus et al. 2005).Punz and Sieghard (1993) distinguished between two groups of trace elements: first contains group of the elements necessary for plants, animals and humans (Cu, Fe, Mn, Mo, Zn, Co, Ni, V) and second contains non-essential and / or toxic elements (Al, Ag, Cd, Cr, Hg and Pb). Zinc, copper and nickel may be toxic for humans in high dose (Puntarić, 2015).
In a recent paper sour study group investigated the presence of metals in the blood, urine and hair of the people exposed to heavy combat operations, after which we determined significantly higher concentrations of Al, As, Ba, T and V in the blood, significantly higher concentrations of As and Cd in urine and Al, Fe, Cd, Pb in the hair of examinees exposed to war operations (Jergović et al. 2010, Vidosavljević et al. 2013). Additional effort has been made to analyze water to establish possible environmental connection with human population, presenting serious issue of high As level in drinking water (Gvozdić et al. 2015). It was found that in comparison with soil samples from areas exposed to low-intensity combat activity, soil samples from areas exposed to heavy fighting had higher concentrations of As, Hg and Pb than allowed by national legislation for organic farming as well as higher concentrations of even Hg than the maximum allowed values for agriculture in general (Vidosavljević, 2013). Meanwhile, with the accession of Croatia into European Union some criteria have been changed. Dandelion for this research was chosen because it was common to all of the sampling sites, previously sampled for soil, regardless whether they were urban or rural locations.In east Croatia, *Taraxacum officinale* is commonly collected in spring to be eaten by humans ("wild horse radish"), cattle or used in traditional medicine (Gjorgieva et al. 2010). During 1430 days of the siege of Sarajevo,war in Bosnia and Herzegovina (1992-1995), dandelion was very important food source (Redžić, 2010). Dandelion has been also chosen as an excellent bio-indicator for heavy metal contamination in environments with various degrees of metal contamination (Czarnowska and Milewska 2010).The main aim of this study was to determine and compare levels of metalloids and metals extracted from leafs of *Taraxacum officinale*from 28 sampling sites; areas of low intensity (LICA) and high intensity of combat activities (HICA) and to compare them with previously published soil results for the same area.Due to the large number of data, a multivariate statistical analysis was applied. To investigate the relationships between observed variables (metals and metalloids) and objects (locations) and for better visualization of the data principal component analysis (PCA) has been applied, followed by varimax rotation.

Aims: Aim of the research was to try to determine whether soil contamination in previously sampled areas of Osijek Barany County, Croatia, has resulted with similar presence in dandelion plants collected at identical locations. Dandelion is considered

as a good phytoindicator plant for heavy metal contamination.

Materials/Participants and Methods: Plant sampling was performed at 28 sites in 11 settlements (two towns and nine villages), during July of 2011. Eight of the villages: Vladislavci (samples 10,11,12), Dopsin (samples 15,16), Hrastin (samples 7,8,9), Čepin (samples 17,18,19), Ćelije (samples 1,2,3), Erdut-Bridge (sample 24), Dalj (samples 25,26), Ernestinovo (samples 4,5,6) and one town Osijek (samples 22,23) were in war areas of higher intensity combat activity (HICA) - a total of 22 samples, and two villages: Potnjani (samples 13,14), Draž (samples 20,21) and one town Našice (samples 27, 28) in the areas of low intensity combat activity (LICA)- a total of six samples.Out of the eight HICA settlements affected by war, three villages were occupied during the war and destroyed (Ćelije, Ernestinovo, Dalj), and four villages were on the front line of defense held by the Croatian forces (Čepin, Vladislavci, Dopsin, Hrastin) as well as the city of Osijek. Map of sampling sites is given in Figure 1.

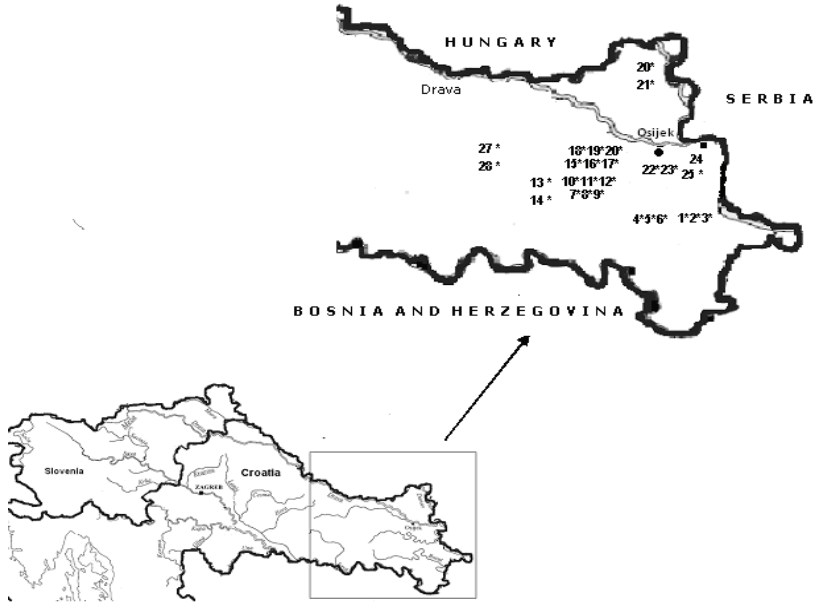

Figure 1.) Map of sampling sites. Osijek is at 45°32´N and 18°44´E.

The principle of sampling was as follows: one sample was taken from the scene immediately subjected to infantry, artillery projectile or, from a current or former

minefield; one sample from the center of a settlement (usually around a church or school) and / or a sample from the agricultural ground on the edge of the settlement. In the control sites i.e. LICA sites - one sample was taken from the center of the village and another one from agricultural soil on the edge of the village.
Sampling included the following settlements: Ćelije, the first destroyed village during the war in Croatia; Ernestinovo, one of the most developed agricultural villages before the war and a place with the highest electrical sub-station in this part of Europe, which sustained three months of heavy fighting; Dalj, a village on theborder with Serbia; the vicinity of Erdut- Bogojevo Bridge at the border crossing on the Danube, which was destroyed by NATO aircrafts in 1999. Dalj itself was location of fierce fightings in during Homeland war (Marcikić and Marušić, 1991). Other war sites (Vladislavci, Hrastin, Čepin, Dopsin) were villages on the front line, except the city of Osijek, where soil samples were also taken from army barracks. For the control group three sampling sites: Potnjani, Draž, Našice (LICA) were used (without registered war activities), which according to the criteria of population, agricultural production and soil composition, correspond with the study group. It is important to emphasize that all of the samples have been taken on the same location where soil sampling was made, results of which have been previously published.(Vidosavljević et al 2013).

Methods: Sample collection and analysis:
The leaves of dandelion (*Taraxacum officinale*) were collected ad 28 locations. Leaves (approximately 100 grams) have been collected and then packed into containers and sent for further analysis. Leaves were rinsed with distilled water, 1 g. of dandelion was diluted with 9 ml HNO_3 and 3 ml. H_2O_2.
All samples were analyzed using the element determination procedure by ICP-MS (ICP-MS, ELAN DRC-e, Perkin Elmer, Waltham, MA, USA). Operating conditions of the ICP-MS were: RF power, 1300 W; plasma gas flow, 15L/min; auxillary gas flow, 1L/min; nebulizer gas flow, 0.93-0.98 L/min; peristaltic pump speed, 1 mL/min; and nickel sampler/skimmer cones. Polyatomic interferences with such elements as Fe, As and Cr were eliminated with instrumental dynamic reaction cell using reactive gas CH_4. The instrument was calibrated after every 12th sample, using the external standard 71-Elemental Group Multi-Element Standard Solution (Inorganic Ventures, Christiansburg, VA, USA) and internal standards containing the elements yttrium, indium, terbium and bismuth (Inorganic Ventures). Although by using ICP-MS we determined the values of all 66 elements; for further data processing we used only the ones that are used in military production, and that have already been investigated in this particular region: Al, As, B, Ba, Cd, Co, Cr, Cu, Fe, Hg, Li, Mg, Ni, P, Pb, Sb, Si, Sr, U, V and Zn (Wallace 2008, Vidosavljevic et al. 2013 and 2014).
To determine the concentrations metals and metalloids at different sampling

locations mean and standard deviations were calculated. The data were analyzed by Mann -Whitney test.
Principal component analysis (PCA) was carried out to discover the structure of data and to observe the sources of variation in the data set. The interpretation of the results of PCA is usually carried out by visualization of the component scores and loadings. The plot can be examined or outlying for influential observations, or it shows if the observations can be visually clustered (Vandeginste 1998, Puntarić 2015). The data were calculated statistically using Statistica 7.0 software package.

Results: Mean concentrations of investigated elements for areas of heavy and low combat activities, minimal, maximal values along with the standard deviation, Mann Whitney test and proposed referral range values (PRR) have been given in Table 1.
Table 1. Descriptive statistics of elements concentrations in dandelion: AM±SD-arithmetical mean±standard deviation; Med-median; Min-minimum; Max.-maximum; *p*- Mann-Whitney at p=0,05; PRR-proposed reference range.

Variable/ µg kg^{-1}	Descriptive Statistics					
	LICA AM±SD Med. N=6	LICA Min.- Max.	HICA AM±SD Med.	HICA Min.- Max. N=22	P	PRR µg/kg
Al	316457,2±107782 107782,2	10032 1497069	270701,3±362542 101913,4	9910 1273618	0,801	-
As	85,2±141 34,0	10,56 373	127,7±347,4 50,2	10 1678	0,178	300
B	5040,1±1771 4559,3	3380,94 7666	12949,3±34250 6215,2	2087 166056	0,484	-
Ba	11345,4±9234 10066,2	1899,73 26232	8212,4±12950 4670,7	1086 62663	0,207	-
Cd	30,1±28,1 32	0,02 73	76,10±202 29,3	0,21 970	0,667	200

Co	153,6±191,5 53,0	13,6 455	80,6±195 35,1	11,4 954	0,594	-
Cr	732,1±1151 294,4	148,73 3074	598,2±1331 261,2	94,09 6517	0,801	-
Cu	3310,0±2416 3089,0	495,53 7483	6251,4± 2868,6	882 76762	0,977	-
Fe	370875,9±683882 95823	57035 1763359	227480,8±15771 112081	45112 1744110	0,889	-
Hg	2,8±2,6 2,6	0,02 7,3	0,4±0,9 0,02	0,02 3	0,035	50
Li	461,2±801 154,3	34,66 2095	310,0±600,3 165,7	45,73 2962	0,844	-
Mg	554000±402000 470000	138000 1355000	1049000±2306000 505000	107000 11250000	0,834	-
Ni	507,9±613 300,2	104,95 1742	494,3±992 273,7	74,09 4908	0,888	-
P	439000+193000 489000	172000 668000	780000±2003000 384800	46000 9702000	0,811	-
Pb	173,6±235 91,2	41,64 651	230,1±424 100	51,28 1980	0,519	300
Sb	7,0±3,5 6,1	3,29 12	11,9±25 25	0,02 106	0,207	-
Si	69,3±38 68,2	25,72 113	128,9±326 326,2	12,94 1583	0,674	-
Sr	3940,5±2475 3717,4	1178 8088	7641,6±17181 17181	1242 84072	0,758	

U	13,3±25,9 3,2	0,02 66	8,4±20,1 20,1	0,02 97	0,840	
V	569,3±1069 147,8	46,48 2744	354,6±790,2 790,3	44,82 3861	0,594	
Zn	14351,7±7702 12967,6	4952 24910	23212,5±63210 63	4223 305480	0,274	

Mean concentrations of Cd, Pb, As and Hg were below those fixed by the Croatian Ministry of Environment .Cd, concentrations of only one sample (Location 7, HICA Hrastin,) exceeded the maximum tolerable levels defined by Croatian legislation. The exceeded concentrations of Pb were found in two samples on HICA locations (Hrastin-7 and 23, Osijek- war) and only in one LICA- agricultural location (Potnjani 14). Higher content of As was found in dandelion leaves sampled at one HICA (Hrastin -7) and one LICA (Potnjane -14) agricultural location. Using Mann Whitney test difference between concentrations of the 21 elements from 22 HICA and 6 LICA was made. Except in one case – concentration of Hg (p=0,035), there were no significant differences in concentrations of each individual metals or metalloids in dandelion leaves between HICA and LICA locations (see Table 1).

Our results show that the metal and metalloids concentrations in the dandelion leaves did not correlate significantly with the concentrations of metals and metalloids in the soil samples. For example, Pearson coefficients $r_{(plants/soil)}$ for each individual element have values ranging from a lowest 0,019 (Ba) to a highest of 0,31(P). Not even in the case of Hg there were no significant correlations between concentrations of Hg in soil and dandelion in LICA areas (Pearson $r_{(plant/soil)=}$ 0,27043 p=0,05) or between Hg in soil and dandelion of HICA areas (Pearson $r_{(plant/soil}$)=0,14 p=0,05).

Results of *t* test on mean values of 21 elements did not show any significant differences between HICA and LICA areas (p=0,05, p=0,780)

Principal component analysis (PCA) was carried out to discover structure of the data (clustering, outliers etc.) and to observe the sources of variation in complex data set. More details on these methods can be found elsewhere (Puntarić 2015, Vandeginste et al, 1998).

To investigate the relationship between variables and objects a PCA model has been applied. PCA was performed on correlation matrix in which the 28 dandelion samples (objects- locations) are described by 21 elements (variables-metals and metalloids). The interpretation of 588 data requires visualization. Variables and objects are displayed on the same plot (e.g biplot). Figure 2 shows the objects plotted in a plane defined by two PCs (cca 90% of the total variation in the data). The objects are split in

two groups along PC1.

Two main clusters of objects can be distinguished: a compact cluster which contains the majority of the investigated locations in the right hand portion and two single –member clusters (8 and 13) in left portions of Fig 2. It is obvious from Figure 2 that most of variables (Al, Fe, Ni, Pb, Cr, Mg, As, Co, Li, Ba,Si, Sr, Zn, Cd, Cu, B, Pb, P, V, Sb) are important largely on the measuring sites 8 and 13, but variables Cd and Hg have greater influence on the remaining locations . Higher concentrations of Sb and Pb on the location of destroyed bridge over Danube at location Erdut have lead to extrapolation of this cluster in Figure 1. This is particularly important because the same effect can be seen in previously investigated soil samples for the exact same location (Vidosavljević et al. 2013).

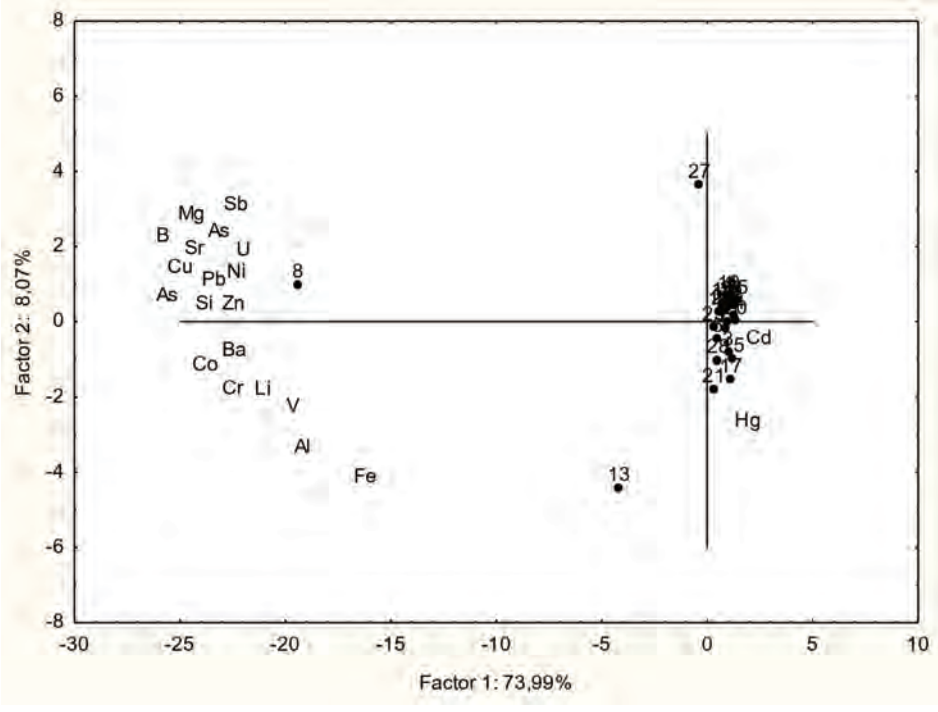

Figure 2. Principal Component Analysis biplot in the PC1/2 coordinate system. The dots are the samples (1-28), the symbols are 22 variables and the cross is the origin of the biplot.

Conclusion: Although there are no significant statistical differences between locations of heavy combats and peacetime locations, there are definite and evident markers of combat activities such are highest concentrations of Pb and Sb on the location of Erdut bridge, place known for heavy air bombardment and fierce fightings.

These concentrations are lower then described by the literature, and do not represent general health risk. Measured values of selected elements in dandelion and soil do not support elevated concentrations of metals and metalloids in population, suggesting other possible sources of contamination. Further extended research should be done.

Keywords: dandelion, war, environment, metals, metalloids, trace elements**.**

Acknowledgement: This study is part of the project "Investigation of long term effects of war on population" by Ministry of Science, Education and Sports Republic of Croatia. Analyses were performed at the Department for Health Ecology, Zagreb Institute for Public Health.

Dissertation Proposal Title: Ejection fraction changes after coronary bypass surgery in patients with impaired left ventricle function: influence of different type of conduits

PhD Candidate: Ivan Budimir, M.D., *Magdalena - Clinic* for Cardiovascular Diseases of the Faculty of Medicine, J. J. Strossmayer University of *Osijek, Krapinske Toplice, Croatia*
Mentor: Prof. Emeritus Antun Tucak, M.D., Ph.D., J. J. Strossmayer University of *Osijek*, Faculty of Medicine Osijek, Osijek, Croatia

Introduction: Impaired function of left ventricle has been a risk factor for mortality associated with coronary artery bypass grafting. Many studies show that patients have better quality of life and ejection fraction after coronary surgery than with medical therapy and also many trials have shown that patients with depressed ejection fraction of left ventricle benefit the most from surgical revascularization . These patients frequently undergo surgical procedures in emergency cirumstances and because the technique of arterial grafting is more challenging and time-consuming, venous grafting is preferred in such situations. LIMA(left internal mammary artery) is a durable conduit when used as a coronary graft and it is superior to SVGs(saphenous vein grafts) in terms of enhanced endothelial function as well as release of nitric oxide and prostacyclin. These features contribute to resistance to atherosclerosis, leading to better short-term and long-term outcomes. Ten-year patency of LIMA grafting is higher than 90%. From our center's experience many of patients with impaired left ventricular function have life expectancy more than 10 years and internal mammary artery can be harvested in reasonable time so it may be worth a try even in emergencies if there would be a singnificatly greater impact on left ventricular fucntion compared to venous conduits.

Hypothesis: Use of internal mammary artery as a graft for surgical coronary revascularization in patients with impaired left ventricular function increases ejection fraction more in comparison to use of saphenous vein as conduit.

Aims: Determine the difference in impact on left ventricular function between different type of conduits. Determine the difference of postoperative freedom from symptoms of ischemia .
Determine the difference in postoperative antianginal therapy.

Materials/Participants and Methods: All patients who underwent coronary artery bypass grafting procedure between December 2011 and December 2016 with ejection fraction of left ventricle lower than 35 % will be considered for research

Research plan: Retrospective study. Patients who underwent isolated coronary artery bypass procedure will be included if their preprocedural ejection fraction was lower than 35 %. They shall be furhter divided in two groups dependig on conduit of choice. First group would be with left anterior descending artery bypassed with left internal mammary artery while members of the other group would be patients whose LAD is bypassed with venous graft. Echocardiography was conducted in all patients 5 days and three months after the procedure.

Significance/Expected scientific contribution: The choice of conduit is of importance for the long-term success of CABG. Even though venous graft is a graft of choice in emergencies many patients have life expectancy longer than ten years so LIMA might be considered especially if it has more beneficial impact on left ventricle ejection fraction.

Keywords: Graft selection, Coronary artery bypass grafting, Myocardial revascularization, Ejection fraction, Left ventricle.

Dissertation Proposal Title: Comparison of radiofrequent ablation and stereotactic ablative radiotherapy in liver metastasis

PhD candidate: Adlan Čehobašić, Polyclinic Radiochirurgia Zagreb, Zagreb, Croatia
Mentor: Prof. Dragan Schwarz, M.D., Ph.D., Polyclinic Radiochirurgia Zagreb, Zagreb, Croatia

Introduction: Radiofrequent ablation is used, among other things, to destroy inoperable small primary liver tumors and metastasis. Using CT, MR or ultrasound for image guidance, physician inserts needle electrode through the skin and advances to the tumor site. Needle electrode is connected to generator, and when in desired position, generator is used to deliver alternating current to the needle. The current carries energy to adjacent cells which induces rapid agitation of cells. Agitating cells produce frictional heat at the site of lesion which causes destruction of tumor (liquefactive necrosis). Radiofrequency ablation is suitable for lesions up to 2 cm in dimeter. Stereotactic body radiotherapy (SBRT), or stereotactic ablative radiotherapy\ fractionated radiosurgery, is modern treatment procedure for extracranial tumors and metastases. It is performed on linear accelerator (LINAC) in few fractionated radiation treatments, which deliver high dose radiation treatment to the tumor. LINAC have ability to shape radiation field size, and to precisely conform dose around tumor, sparring surrounding tissue. It is suitable for any lesion size. High dose ionizing radiation (> 8-10 Gy per fraction) damages DNA (double and single strand breaks), thus blocking cell's ability to divide and proliferate further, and lowers cell populations and functionalities. It also damages blood vessel wall which leads to blood flow reduction to tumor.

Hypothesis: Radiosurgery is superior treatment method for liver metastases to RF ablation in terms of tumor reduction and cost for patient.

Aims: Comparison of results from two different methods will provide answer if radiosurgery is superior method to RF ablation in selected categories: tumor reduction, treatment time and cost for patient.

Materials/Participants and Methods: Participants will be over 18 years old, divided by age and gender. Patients will have oligometastatic disease with proven clinical

and\or radiologically stable locoregional disease. Patients suitable for radiosurgery of liver metastases will be treated with 24-30Gy in single fraction. At least 80% of the prescribed dose (19.2-24 Gy) will have to cover at least 99% of target volume. Total number of metastases in the liver will not be limited.

Research plan: Participants will be scanned on CT and MR. If needed, calypso transponders will be implemented in patient one week prior to CT scanning. Oncologist will delineate metastases and organs at risk while physicist will make treatment plans. All delineations and planning will be done on Varian's Eclipse workstation. QA of treatment plans will be done in Sun Nuclear's softwares: perFraction and DoseCheck. Second verification will be done on Sun Nuclear's 4D measurement array ArcCheck. Passing rate for QA with gamma analysis should be at least 3mm 3%. Patients will be treated on Varian Edge LINAC, and monitored during treatment with optical surface mounting system (OSMS) or Calypso. Follow up period will be 6 months. Results will be compared to RF ablation results in Croatia.

Significance/Expected scientific contribution: contribution to research of in vivo cell sensibility to thermic and ionisation damage, contribution to abscopal effect research.

Keywords: radiosurgery, liver metastases, radiofrequent ablation, oncology.

Title of abstract: Influence of maternal high fat diet on ovarian morphology in rat offspring
Dissertation Proposal Title: Influence of maternal high fat diet on ovarian morphology in rat offspring

PhD candidate: Nenad Čekić, M.D., Department of Surgery, General Hospital Vukovar; Department of Anatomy and Neuroscience, Faculty of Medicine Osijek, University of Osijek, Osijek, Croatia
Mentor: Prof. Radivoje Radić, M.D., Ph.D., Department of Anatomy and Neuroscience, Faculty of Medicine, University of Osijek, Osijek, Croatia

Introduction: Obesity is one of the biggest public-health issues and it has important influence of functioning of whole organism. It can lead to numerous pathological changes on different tissues and organs. Adipose tissue is one of the largest endocrine organ in human. It secretes substances involved in the regulation of energy balance, food intake, participates in the synthesis of steroid hormones and secretes various pro-inflammatory cytokines. Disturbances in the metabolism of adipose tissue are the basis of the pathogenesis of many diseases. In particular it is revealed to the reproductive system. There is important influence of maternal nutrition on the physiological and pathological processes in the offspring which is usually explained as posttranslational modification of the nucleic acids of offspring without changing the genetic sequence. These changes are called epigenetic changes.

Aim: To examine the effect of diet of the mother and offspring on histological changes in the ovaries of female offspring.

Materials and Methods: Ten female rats were randomly divided in two groups. One group was fed with high content of saturated fatty acid food (HFD) and the other one with standard laboratory chow (CD). Female offspring from both groups were randomly divided in two subgroups after coupling and lactation period, subsequently there were four groups of offspring (n=6 each) with different feeding protocol: a) CD-CD, b) CD-HFD, c) HFD-CD and d) HFD-HFD. At the age of 18 weeks offspring were sacrificed and ovarian morphology was studied. Experiments were approved by the Ethics Committee of the Faculty of Medicine University of Osijek and carried out according to European Guidelines on Laboratory Animal Care.

Results: Histopathological analysis of ovaries of offspring of CD mothers shows normal histological characteristics, while in the ovaries of the offspring of HFD mothers large cystic follicles were observed.

Conclusion: Maternal HFD consumption predisposes offspring to increased risk of developing ovarian disorders.

Keywords: obesity, high fat diet, adipose tissue, epigenetics, ovarian morphology.

Dissertation Proposal Title: Correlation between the functional classification of children with cerebral palsy and the findings of intracranial ultrasound and magnetic resonance imaging

PhD candidate: Sanja Delin, M.D., General Hospital Zadar, Department of Pediatrics, Zadar, Croatia
Mentor: Assist. Prof. Andrea Šimić Klarić, M.D., Ph.D., General Hospital Požega, Department of Pediatrics, Požega, Croatia, Faculty of Medicine Osijek, Osijek, Croatia

Introduction: Cerebral palsy (CP) is the clinical entity that designates a group of non-progressive, but often changing motor disorders, caused by developmental disabilities, or brain damage in the early stages of development. The prevalence of children with cerebral palsy is 2-3/1000 of live-born infants in Europe, according to Surveillance of Cerebral Palsy in Europe (SCPE) CP data base.
Neuroimaging methods such as magnetic resonance imaging (MRI) and cranial ultrasound (CUS) are important tools in the characterisation of cerebral palsy (CP).

Hypothesis: The degree of functional deficit for gross and fine motor functions and the associated impairments in children with CP are in strong correlation with the dominant patterns found on the cranial ultrasound and brain magnetic resonance imaging.
The higher degree of cerebral palsy according to the SCPE functional classification is found in children with more severe brain injury visible by cranial ultrasound and brain MRI, and based on the neuroimaging, can predict the outcome of neuromotor development and the need for early intervention / therapy.

Aim: The functioning and morbidity of children with CP registred into the Croatian National Surveliance Program for Cerebral Palsy will be described according to their predominant MRI/CUS pattern.

Materials and methods: Children with CP are registred into the "C28 RCP"- Croatian Register of Cerebral Palsy. "C28 RCP" is an active, voluntary, nationwide, population-based registry. This retrospective and cross-sectional study will be involved children with cerebral palsy living in the Croatia, born from 1st of January 2004 to 31st of December 2007. Functional classification of CP, associated neurodevelopmental impairments and MRI/ CUS will be done according to SCPE.

Research plan: Data on children born in Croatia in 2004-2007. SCPE definitions, functional classifications (Gross Motor Function Classification System -GMFCS, Bimanual Fine Motor Function Classification System -BMFM, IQ, vision, hearing, communication) and the classification of paediatric MRI/CUS based on the predominant pattern (Krageloh-Mann et al.) will be used (table).
Table: SCPE Classification of the predominant pattern of brain MRI/CUS lesion, to which the clinical features can be attributed.

A	**A. Maldevelopments** A.1. Disorders of cortical proliferation, migration or organisation (u/b) * A.2. Maldevelopments-other (holoprosencephaly, Dandy Walker malformation, corpus callosum agenesis, cerebellar hypoplasia)
B	**B. Predominant white matter injury:early 3rd trimester patterns** B.1. Periventricular leucomalacia (PVL) (mild/severe) (u/b) B.2. Sequelae of intraventricular hemorrhage (IVH) or periventricular hemorrhagic infarction (PVHI) (u/b) B.3. Combination of PVL and IVH sequelae (PHVD) (u/b)
C	**C. Predominant grey matter injury:late 3rd trimester patterns** C.1. Basal ganglia/ thalamus lesions (mild/moderate/severe) C.2.Cortical-subcortical lesions only (watershed lesions in parasagittal distribution/multicystic encephalomalacia) C.3. Arterial infarctions (middle cerebral artery-other)
D	**D. Miscellaneous** (cerebellar atrophy, cerebral atrophy, delayed myelination,ventriculomegaly not covered by B, hemorrhage not covered by B, brainstem lesions, calcifications)
E	**E. Normal** * u-unilateral, b-bilateral

Specific research objectives are as follows:
- Determine whether there is any difference in the presence of a particular type of CP based on neurological symptoms in subjects with different functional degrees of motor impairment for gross motor functions (I, II and III level/ambulatory; IV and V level/non-ambulatory).
- Determine whether there is a difference between ambulatory and non-ambulatory subjects in the appearance of fine motor function disorder of the hand according BFMF scale.
- Determine whether there are differences in the presence of associated comorbid

states in ambulatory and non-ambulatory subjects.
-Determine whether there is a difference between ambulatory and non-ambulatory subjects in the survey of different brain MRI patterns according to SCPE classification.
-Determine whether there is a difference between ambulatory and non-ambulatory subjects in the appearance of different CUS patterns according to SCPE classification.
-Determining the potential predictive contribution of the risk factors of the mother and the child (maternal age at birth, parity, multiple birth, delivery mode, place of birth, gender, gestation age, birthweight, Apgar score at 5 minutes, admission in a neonatal care unit, ventilation in this unit longer than 24 hours, convulsions within first 72 hours) to the severity of the functional deficit in the child.
-Relative risks for *epilepsy* and for *severe* vs mild *functional disability* will be calculated with 95% confidence intervals (CI).
Severe functional disability: Levels IV-V of GMFCS , BFMF; IQ<50.
Mild functional disability: Levels I-III of GMFCS , BFMF; IQ≥70.
Comparasion will be made between patterns A vs C and B vs C.
Statistical analysis will be used statistical program MedCalc Statistical Software version 14.12.0 (MedCalc Software bvba, Ostend, Belgium; http://www.medcalc.org; 2014)

Significance/expected scientific contribution: This will be the first research to examine the clinical applicability of a qualitative classification system of brain imaging according to the SCPE (MRI/CUS) criteria made on one national register of children with CP.
We expect that major morbidity and function are strongly associated with the predominant patterns found on MRI/CUS.
We expect that highly significant differences on functional severity assessments and prevalence of mobidities will be found among children with different MRI/CUS pattern.
MRI/CUS may be a useful aid for prediction of later outcomes, additionaly to its role on ascertain the etiology of CP.
Brain MRI may help to understand morphological background of motor impairment and the presence of associated disabilities in children with CP, but the process of plasticity, brain maturation and early intervention can also contribute to the final clinical outcome and the degree of functional deficit.
The results and findings will be used in clinical practice in the design and planning of interventions and therapeutic procedures, which is the secondary prevention of cerebral palsy and neurodevelopmental impairments.

Key words: Cerebral palsy, Functional classification, Intracranial ultrasonography, Magnetic resonance imaging, Surveillance of Cerebral Palsy in Europe.

Dissertation Proposal Title: Erectile function score role in cardiovascular risk assessment

PhD candidate: Ruža Evačić, M.Sc., Genaral Hospital "Dr. T. Bardek" Koprivnica, Croatia
Mentor: Prof. Radivoje Radić, M.D., Ph.D., Department of Anatomy and Neuroscience, Faculty of Medicine, University of Osijek. Osijek, Croatia

Introduction: Sexuality is a human experience that has uncountable positive effects on physical and psychological wellbeing of each person. It is a central component of an intimate relationship and it's any change can disrupt the quality of life and increase the depression development risk. Erectile dysfunction (ED) is defined as a persistent impossibility to achieve or maintain erection, sufficient for pleasuring sexual experience. USA research shows ED is a problem that occupies 15% of men who are 40-50 years old, 45% men older than 60, and 70% of men over 70. In the last decade, research showed the connection between ED and the cardiovascular disease (CD) development. Retrospective research, on 62 men who suffered myocardial infarction (MI), showed that 51.6% had preexisting ED. It proved that ED usually occurs 3-5 years prior to cardiological event, and that the two share many risk factors: age, hypertension, diabetes, smoking, higher BMI, cholesterol and lower HDL. European guidelines for prevention CD in clinical practice, mention that ED is a marker for CD, but do not give measures which one should take once the diagnosis is given. Third Princeton consensus conference concluded that there is a crucial benefit in evaluating cardiovascular risk at younger men who suffer from ED, but do not have CD or diabetes.

Hypothesis:
The research will show that the significant number of men with MI had ED before MI
It will show that ED was not associated with CD but treated as a special entity.
It will determine which erectile function score (EFS) is significant as a cardiovascular risk factor (CRF).

Aims: To asses the frequency, as well as the EF score in men before MI. To asses if ED before MI was treated as a CRF, or as an isolated symptom treated with medicaments.

Materials and methods: Men who had MI before the age of sixty will be given two questionnaires. One to asses the score of ED before MI (standardized IIEF-5 questionnaire), and another to answer questions about medical treatment they were given for ED.

Research plan: First step will be to find men who had MI before sixty, but do not have following: diabetes, Parkinson disease, multiple sclerosis, Peyronie's disease, previous CD, sleep disorder, do not abuse alcohol or any substance. After accepting the terms of the study by informed consent, participants will get two questionnaires. First, consisted of five YES/NO questions about if they had ED before MI, who did they consult, and how was it handled. Second, a standardized IIEF - 5 questionnaire, which will determine participant's erectile function score. All questionnaires will be collected, answers counted and results analyzed using appropriate statistical methods.

Significance: To define EF score which is significant as a CRF and could be used as a trigger for further cardiovascular diagnostic, for men with no other CRF.

Keywords: Erectile dysfunction, cardiovascular disease, myocardial infarction, erectile function score, cardiovascular risk factor.

Dissertation Proposal Title: Impact of health literacy and individual education on the experience of chronic pain

PhD candidate: Nikolina Farčić, MSc, RN, University Hospital Centre Osijek/Faculty of Medicine, Josip Juraj Strossmayer University of Osijek, Osijek, Croatia
Mentor: Assoc. Prof. Vesna Ilakovac, Ph.D., Faculty of Medicine, Josip Juraj Strossmayer University of Osijek, Osijek, Croatia

Introduction: Health literacy presents a group of social and cognitive skills that influence motivation and ability of the individuals to obtain, understand and use the medical informations in order to help them to promote and to preserve health. Patients with poor health literacy have less knowledge about the ways of pain treatment, which is essential for secure pain relief. Nurses are the important link for providing healthcare education and support to adults undergoing pain treatment.

Hypothesis: The level of health literacy obtained by individaul education is correlated with the level of experienced pain in patients suffering from chronic pain.

Aims: The aim is to inquire whether there is a correlation between health literacy and the level of experienced pain in chronic pain patients. Also, we are going to inquire whether there is a correlation between health literacy and patient's age, sex, education level, and duration of chronic pain, as well as attained education of nurses.

Materials/Participants and Methods: As a research instrument for evaluation of health literacy I will use the SAHLSA-50 validated questionnaire. The first part of the questionnaire contains general sociodemographic data, the second part consists of fifty different medical terms joined by two notions and a third „I don't know" answer. For pain evaluation, I will use the VAS scale. Respondents will be the patients of the Department of Pain Medicine, University Hospital Centre Osijek. The research will include sixty patients. Categorical data will be presented with absolute and relative frequency, and numerical data will be described by measures of central tendency and measures of dispersion. Deviations between measurements will be tested with repeated measurement test. The significance level will be set at $\alpha=0,05$. For statistic analysis, I will use MedCalc computer program (version 16.2.0, MedCalc Software, Ostend, Belgium).

Research plan: This prospective research will be conducted in the Department of Pain Medicine, University Hospital Centre Osijek, in a period between 1st of October 2017 till 31st of Decembre 2017. Measurements will be performed three times: on the arrival to the Ambulance of Pain Medicine, after the ten-day individual education, and a month after the education.

Significance/Expected scientific contribution: Medical literature already showed the correlation between level of experienced pain and health literacy, but it remains to determine the role of individual education in health literacy so it could eventually change the experience of pain in chronic pain patients. The results obtained by this research and the affirmation of formed hypothesis could serve as guidelines for improving the medical care of patients suffering from chronic pain as well as for advancement of their capacity of self-care.

Keywords: health literacy, chronic pain, SAHLSA-50, VAS, individual education.

Dissertation Proposal Title: Prevalence of arterial hypertension in Croatian physicians

PhD candidate: Ivan Feldi, M.D., General hospital Našice, Našice, Croatia
Mentor: Assoc. Prof. Lada Zibar, M.D., PhD, University of Osijek, Faculty of Medicine Osijek, Hospital Centre Osijek, Osijek, Croatia

Introduction: Cardiovascular disease (CVD) globally accounts for approximately 17 million deaths a year, almost one third of the total. Complications of arterial hypertension (AH) account for 9.4 million deaths worldwide every year. AH is responsible for at least 45 % of deaths due to heart disease and 51 % of deaths due to stroke. In Croatia, age adjusted AH prevalence was 37.5 %. AH prevalence varies with age. Excessive salt intake was associated with increasing BP and AH. The best method of estimating sodium intake is measurement of its excretion over 24 h.
It remains unclear if greater awareness of modifiable cardiovascular risk factors is sufficient to reduce the prevalence of AH among physician. We aim to investigate the prevalence of AH along with other cardiovascular risk factors including excessive salt intake by measuring urine sodium in Croatian physicians.

Hypothesis: Prevalence of AH in physicians is not lower compared to general population despite of the assumed greater awareness of modifiable cardiovascular risk factors and possible consequences of AH. Natriuria is excessive despite the awareness of harm rendered by increased salt intake on AH and renal function.

Main aim: To determine the prevalence of AH among physicians and to make comparison with prevalence of AH in general population in Croatia.

Additional aims:
1. To determine prevalence of CV risk factors.
2. To inquire of possible CV risk influencing life habits.
3. To determine sodium in urine.
4. To determine prevalence of CV events.
5. To propose evidence based life style changes to reduce the CVD risk.

Participants and Methods: The survey will be designed as a cross-sectional study. It will include about 500 physicians of different specialties and non-specialists working

in hospitals, medical centers and faculty of medicine.
Research plan: The participants will be given a questionnaire, their BP will be measured and will be asked to deliver a urine sample to measure natriuria. The results will be compared to AH prevalence and salt intake in general population.

Expected scientific contribution: If the study confirms the presumed hypothesis by the planned scientific data analysis, then it would contribute to the unknown epidemiology of AH and related CVD risk among Croatian physicians.

Keywords: arterial hypertension, physicians, sodium intake, natriuria, cardiovascular risk factors.

Dissertation Proposal Title: Oxidative stress in gestational diabetes mellitus (GDM): role of glutathione (GSH) and glutathione peroxidase 1 and 3 (GPX1 and 3)

Ph.D. candidate: Martin Gredičak, M.D.,General Hospital Zabok, Zabok, Croatia
Mentor 1: Assist. Prof. Rajko Fureš, M.D.,General Hospital Zabok, Zabok, Croatia
Mentor 2: Marija Ljubojević, Ph.D. Institute for Medical Research and Occupational Health, Zagreb, Croatia

Introduction: Oxidative stress (OS) is present in pregnancy affected by GDM and may be cause or consequence of pathology. GSH and GPXs are involved in OS resistance detoxifying physiological and induced accumulation of peroxides. GPX1 and GPX3 proteins may be stress induced, and possible changed in GDM. GPXs are small (25kDa) cytosolic enzymes usually active as tetramers that breakdown peroxides using GSH as reducer with essential trace element selenium (Se) necessary for activity of both enzymes. GPX1 is ubiquitous in cells cytoplasm and GPX3 can be expressed on cell basement membrane and/or excreted and found in plasma.
GDM occurrence is nearly 18%, estimated on basis of early pregnancy (second trimester) fasting glucose > 5.1 mM and criteria of standard oral glucose tolerance tests (OGTT), that are globally accepted.
All comopnent in this research can be used to gain insight into possible causes of GDM and some even can be used as potential biomarkers of condition severity.

Hypothesis: Changes in level of Se and GPX3 in blood and GPX1 in placenta can be directly correlated with GSH as indicator oxidative stress in pregnant women with diagnosed GDM.

Aim: Investigate and connect:
a) the association of GSH and GPX1 and 3 levels in relevant biological samples with Se content
b) changes in GSH content, expression and distribution of GPX1 in placenta tissue
c) and GSH content and expression of GPX3 in blood and from healthy control compared to GDM mothers

Matherials and methods: Samples of blood and urine for biochemical and other analysis will be collected late in pregnancy (about 36 week) of glycemic normal and

only diet regulated GDM women (at least 10 samples from each group) in regular pregnancy control from in advance informed and voluntary involved future mothers. Placentas after childbirths of all women will be collected for Se analysis (ICP-MS) and for immunochemical studies of GPX1 and GPX3 as parts in liquid nitrogen and piece in fixative for IHC.

Conclusion: As there are disputes about benefits of Se we will try to establish status of Se and GSH, with GPX1 and GPX3 in normal and GDM pregnancies to connect changes to possible causes and indicate rational for supplementation.

Keywords: Gestation diabetes mellitus (GDM), glutathione (GSH), glutathione peroxidases (GPXs), immunohistochemistry (*IHC*), inductively coupled plasma mass spectrometry (*ICP-MS*)

Title of the dissertation proposal: Influence of education and magnesium on the quality of life of patients with type 2 diabetes without insulin therapy

PhD candidate: Zvjezdana Gvozdanović, M.Sc., Genaral Hospital Našice, Našice, Croatia
Mentor 1: Assist. Prof. Nada Prlić, Ph.D., Faculty of Medicine Osijek, Osijek, Croatia
Mentor 2: Assist. Prof. Ines Bilić - Ćurčić, M.D., Ph.D, Clinical Hospital Centre Osijek, Faculty of Medicine Osijek, University of J. J. Strossmayer Osijek

Introduction: Patients suffering from type 2 diabetes have inevitable cardiometabolic effects that can be avoided by good glycaemic control. Therefore, with therapy and nutrition, magnesium micronutrient intake is also included, which plays an important role in carbohydrate and glucose metabolism. Specific education is based on teaching about: illness, possible complications, the importance of proper nutrition, taking medication, physical activity, risk factors and their impact on improving the outcomes of treatment and the quality of life of a patient.

Hypothesis: Magnesium intake as a dietary supplement and specific education of type 2 diabetic patients without insulin therapy will improve glycaemia and quality of their life.

Aims: The main objective of the study would be to examine the effect of magnesium addition and specific education on glycaemia and quality of life in patients with type 2 diabetes without insulin therapy. Specific objectives are aimed at examining differences in glycaemia and quality of life before and after education and regular introduction of magnesium into the examined group compared to the control group of patients according to age, sex, level of education, marital status, years of diabetic life, economic status.

Participans and methods: Subjects are patients with type 2 diabetes without insulin therapy at the age of 18-75, treated in hospital departments or in the diabetic hospital at Našice General Hospital. Planned number of respondents is 200 (100 respondents in intervention group who will take 400 mg of magnesium per day and 100 in the control group). Patients with whom it is not possible to communicate will be excluded from the study. As a research instrument, standardized questionnaires will be applied:

the Morisky Medication Adherence Scale (MMMAS-8) and the Croatian version of the SF-36 (Short form health suvery-36) questionnaire assessing the quality of life.

Research plan: The research will be prospective (from October 1st 2017 to March 31st 2018), randomized into two groups (intervention and control). All respondents will fill out the questionnaires and solve the test on knowledge and attitudes related to life with diabetes. Blood samples will be collected from all respondents for biochemical analysis prior to education (glucose maturation, HbA1c, serum magnesium), their blood pressure, body weight, body height and BMI will also be measured. The results will be the basis for creating an operational training plan. The education will be performed by a nurse educator and a diabetologist. The intervention group will take 400 mg of magnesium per day for 6 months. Six months after education and the start of magnesium intake in the examined patient group, the same measurements will be repeated on subjects from both groups.

Expected scientific contribution: The results of this research should show that magnesium intake and specific training in the treatment of type 2 diabetic patients are important for the outcome of the treatment (improvement of the metabolic parameters) and the quality of life of the examinees.

Keywords: magnesium, type 2 diabetes, education, quality of life, drug compatibility.

Dissertation Proposal Title: Evaluation of cerebral vasoreactivity by transcranial doppler sonography in patients with chronic obstructive pulmonary disease

PhD candidate: Marina Hlavati, M.D., General Hospital Našice, Našice, Croatia
Mentor: Assist. Prof. Svetlana Tomić, M.D., Ph.D., Clinic Hospital Center Osijek, Osijek, Croatia

Introduction: Cerebral vasoreactivity (CVR) is ability to maintain constant cerebral blood flow on specific stimulus. It can be measured with transcranial doppler sonography (TCD). Hypercapnia stimulates dilatation and hypocapnia constriction of cerebral arterioles. One of TCD testing of CVR is breath-holding test. Breath-holding index (BHI) is calculating as percentage of increase mean blood flow velocity in arteria cerebri media during patient hold breath. The normal BHI values in Croatian population are between range 1.03-1.65. Chronic obstructive pulmonary disease (COPD) is associated with an overproduction of reactive oxygen and nitrogen species that lead to the oxidative stress (OS) and can have influence on cerebrovascular disfunction during hypercapnia in COPD patients. Total antioxidative status (TAS) can be determine from plasma COPD patients.

Hypothesis: CVR is reduced in COPD patients and in correlation with degree of COPD.

Aim: Determine CVR in COPD patients; degree of CVR disoder in comparation with the degree of COPD; correlation between degree of COPD and systemic OS; correlation of TAS and CVR.

Materials/ Participants and Methods: Prospective observation cohort study with 120 participants, both sex of full age, divided in 4 groups according to GOLD classification: I.mild, II.moderate, III.severe COPD and IV.healthy volunteers. The excluded criteria: previous cerebrovascular disease, significant carotid stenosis, inadequate TCD signal, atrial fibrillation, fever and acute egzacerbation of COPD. Risk factor under control: arterial hypertension, hyperlipidaemia, ischemic heart disease, diabetes. Habits: non or moderate alcohol consumption and cigarette smokers included.

Research plan: All the participants should make spirometry, fill up questionnaire, measure body and continually vital function, make blood analysis. The breath-holding

test should be done by protocol, calculate BHI from formula. Statistic analysis include nonparametric X2, Fisher's test and Pearson's correlation coefficient.

Significance/ Expected scientific contribution: Using of TCD as cheap, noninvasive and reliable method in following up the risk of cerebrovascular disease in COPD patients and TAS in estimation the systemic OS.

Keywords: breath-holding index; cerebral vasoreactivity; chronic obstructive pulmonary disease; oxidative stress; transcranial doppler sonography.

Dissertation Proposal Title: Rumination and impairment of cognitive control in internalizing and externalizing mental disorders in adolescents

PhD candidate: Sanja Jandrić, M.Sc., Clinical Hospital Center Osijek, Unit for Child and Adolescent psychiatry, Osijek, Croatia
Mentor: Prof. Pavo Filaković, M.D., Ph.D., Department of Psychiatry and Psychological Medicine, Faculty of Medicine Osijek, University of J.J.Strossmayer Osijek, Osijek, Croatia

Introduction: Adolescence marks the transition from childhood to adulthood. Physical changes occur first and happen much faster than in any other developmental period. These changes are associated with hormonal changes during puberty and the appearance of adult sexuality. The process of psychological maturation during puberty affects shifting from dependence on parents to increased involvement with peers and others. Also it affects taking responsibility for making decisions about two important aspects of adult age, work and love. This transition is accompanied by more important roles of peer group and newly discovered cognitive ability that allows adolescents to think about future events and develop their own identity.

Within the Response Styles Theory (Nolen-Hoeksema) rumination is defined as a stress reaction that involves repeated and passive focusing on the symptoms of stress, the causes of the symptoms, their significance and consequences. When people ruminate they focus on negative effects of problems which prevents them from active problem solving. In other words, rumination foster negative thinking and behavior that are associated with negative feelings.
Our cognitive skills are integrated into a higher level of executive system. Executive functions direct and regulate cognitive functions. They select and successfully monitor behaviors that facilitate the attainment of chosen goals. Executive functions include basic cognitive processes such as attention control, cognitive inhibition, inhibitory control, working memory, cognitive flexibility and cognitive control. In recent years there are more researches of executive functions, both in children with normal development and children with deviations in the development. Results has shown that changes in executive functions can be associated with maturation and as well with damages in the central nervous system.
Cognitive control is the process that allows information processing and behavior to

vary adaptively from moment to moment depending on current goals, rather than remaining rigid and inflexible. Cognitive control processes include a broad class of mental operations including goal or context representation and maintenance, and strategic processes such as attention allocation and stimulus-response mapping. Cognitive control is associated with a wide range of processes and is not restricted to a particular cognitive domain. The presence of impairments in cognitive control functions may be associated with specific deficits in attention, memory, language comprehension and emotional processing. Also, it can be manifested through the impaired planning, execution or monitoring of cognitive tasks and the performance of particular phases involved in a particular activity. Furthermore, the damage may include selfcare deficit and disturbed social relationships. Personality changes, such as impaired self-control and self-directedness, emotional lability, impulsiveness, disinhibition, iritability, specific thinking and difficulty in moving attention, are also common. Also, it is possible that person neglect physically neglect or may have a lack of motivation and energy.

In the last three decades, the traditional view of mental illness as distinct categories of disorder is experiencing numerous changes. It has been shown that many disorders occur in comorbidity and exist on continuum in different dimensions. A large number of studies have confirmed that certain mental disorders in adulthood share a certain percentage of common factors and that they exist on two dimensional continuum: on an externalized dimension, transferring the risk to disinhibited, antisocial disorders and behavioral disorders caused by psychoactive substances use; on an internalized dimension, transferring the risk of mood disorders and anxiety disorders. Furthermore, these findings of the two-dimensional model of psychopathology have been confirmed in recent researches of child and adolescent psychopathology, suggesting the structure stability function during the development.

Recent researches of comorbidity of mental illness are focused on the identification of neurocognitive processes and deficits that can affect appearance and formation of mental disorders. So far little attention has been given to processes of rational-emotional control, such as the process of rumination. Although rumination in most studies is related to depression, several studies have confirmed a connection between ruminations and other forms of psychopathology, such as anxiety, eating disorders, and psychoactive substance abuse. Likewise, some researches has shown that rumination is associated with abnormalities in the functioning of neural circuits associated with emotional regulation and executive functions, particularly cognitive control.

Previous researches has examined rumination and cognitive control in adult population, while only few studies have examined it with youth. A small number of empirical studies lighted the influence of rumination and poor cognitive control on the development of internalizing mental disorders in adolescents, while there

is no data of the influence on the development of externalizing psychopathology in adolescents. Considering the limited number of findings, especially in clinical adolescent samples, further researches is needed. Consequently, with the principle that rumination and cognitive control show a stable structure of development in time, this research has a significant scientific contribution. The obtained results can provide valuable information for creating the goals of therapeutic interventions.

Hypothesis: There is a correlation between high levels of rumination and low cognitive control with internalizing and externalizing mental disorders in adolescents where the rumination is a mediator between poor cognitive control and psychopathological symptoms in both groups.

Aims:
Main aim:
Determine the relationship between rumination and impairment of cognitive control in internalizing and externalizing mental disorders in adolescents.

Secondary aims:
1. Determine rumination and cognitive control in a group of adolescents with internalizing mental disorders.
2. Determine rumination and cognitive control in a group of adolescents with externalizing mental disorders.
3. Investigate the association between rumination and cognitive control with symptoms of anxiety and depression in a group of adolescents with internalizing mental disorders.
4. Investigate the association between rumination and cognitive control with symptoms of aggression in a group of adolescents with externalizing mental disorders.

Materials/Participants:
Participants:

The participants will come from the region of Eastern Croatia, indicated for the psychological testing after the first psychiatric examination at the Unit for Child and Adolescent psychiatry at the Clinical Hospital Center Osijek. The participants will be divided into two groups, experimental and control group. An experimental group is consisting of adolescents with externalizing mental disorders (eg, F90 Hyperkinetic disorders and F91 Conduct disorders). The control group is consisting of internalizing mental disorders (eg. F92 Mixed disorders of conduct and emotions, F93 Emotional disorders with onset specific to childhood and F98 Other behavioural and emotional disorders with onset usually occurring in childhood and adolescence). The study will

involve a minimum of 200 participants, 100 per each group. Prior to the beginning of the research, each potential participant will be given oral and written explanation to the purpose of the research and the manner of its implementation. Then they will be asked for written consent to participate in the research, which will sign adolescents, as well as one of the parents.

Methods: The subjects will be psychologically tested within the routine psychodiagnostic assessment indicated by the psychiatrist for child and adolescent psychiatry in the order referred to psychologist during the period from October 2017 to October 2018.

The following psychodiagnostic procedures will be used:

1. The participants will completed the Croatian version of the Youth Self-Report (YSR) which consists of 113 items leading to the following primary subscales: social withdrawal, somatic complaints, anxiety/depression, social problems, thought problems, attention problems, delinquent behaviour, and aggressive behaviour. Two second-order scales reflecting internalizing and externalizing and a total problem score can be calculated. The time frame of symptoms includes the past 6 months. Reliability and validity have been shown to be good both for the original version and the Croatian version of the YSR.
2. The participants will complete selected tasks from the Cambridge Neuropsychological Test Automated Battery (CANTAB; Cambridge Cognition, Cambridge, United Kingdom), an Intra–Extra Dimensional Set Shift. The Intra–Extra Dimensional Set Shift test (IED) is a computerized analogue of the Wisconsin Card Sorting Test and will be used to examine general cognitive control. The dimensions include color– filled shapes and white lines, with simple stimuli including only one of these dimensions and complex stimuli including both. Participants will be presented with two color–filled shapes and must indicate the correct response by touching it on the screen. The correct response is learned through feedback, and after six correct responses, the rule and/or stimuli change. Shifts are intra–dimensional first (i.e., only color–filled shapes) and then switch to extra– dimensional (ED, i.e., white lines).
3. The participants will complete the Croatian version of The Children's Response Styles Questionnaire (CRSQ; Abela, Brozina, & Haigh, 2002) which is a 25-item scale that assess the extent to which children respond to sad feelings with rumination (defined as self-focused thought concerning the causes and consequences of depressed mood), distraction, or problem solving. The measure is modeled after the Response Styles Questionnaire (Nolen-Hoeksema & Morrow, 1991) that was developed for adults. For each item, youths are asked to rate how often they respond in a particular way when they feel sad on a 4-point Likert scale ranging from *almost never* (1) to *almost always*

(4). Sample items include, "Think about a recent situation wishing it had gone better" and "Think 'Why can't I handle things better?'"

4. The participants will complete the Croatian version of The Beck Depression Inventory, which is a 21 question multiple choice self report inventory, one of the most widely used psychometric test for measuring the severity of depression. Its development marked a shift among mental health professionals. It is designed for individuals ages 13 and over, and is composed of items relating to symptoms of depression such as hopelessness and irritability, cognitions such as guilt or feelings of being punished, as well as physical symptoms such as fatigue, weight loss, and lack of interest in sex. Scale contains 21 questions. Each answer is being scored on a scale value of 0 (not at all) to 3 (severely). Higher total scores indicate more severe depressive symptoms.

5. The participants will complete the Croatian version of The Beck Anxiety Inventory which is a 21 question multiple choice self report inventory that is used for measuring the severity of anxiety in children and adults. The questions used in this measure ask about common symptoms of anxiety that the subject has had during the past week (including the day you take it) (such as numbness and tingling, sweating not due to heat, and fear of the worst happening). It takes 5 to 10 minutes to complete. Scale contains 21 questions. Each answer being scored on a scale value of 0 (not at all) to 3 (severely). Higher total scores indicate more severe anxiety symptoms.

6. The participants will complete Aggressive Scale (SNOP) (Vulić-Prtorić, 2008) which consists of 40 questions: 9 for the subscale of Oppositional defiant disorder, 15 for the subscale of Conduct, 9 for the subscale of the Victim and 7 for the Subscale Tormentor. Respondents record their responses to the 5-degree Lykert scale by estimating how much behavior described in the claims often occurred in the last 6 months: (1 = never, 2 = rarely, 3 = sometimes, 4 = frequently, 5 = very often. Coefficients of internal consistency (Cronbach alpha coefficients) were determined on a normative sample of children and adolescents and for the entire SNOP scale were 0.93 and for the subscales ranged from 0.81 to 0.88.

Statistical Methods: Statistical data analysis will be calculated using the program package SPSS 21. for Windows. In the case of categorical variables, measurements of nonparametric statistics (frequencies, percentages, media, mod) will be used for the description of the sample, and in other cases, parametric statistics will be used (arithmetic mean, variance, standard deviation, standard error of arithmetic mean).

The normal distribution of the numerical variables will be tested by the Kolmogorov-Smirnov test. Categorical variables will be described in absolute and relative frequencies.

To investigate differences in rumination and cognitive control in both groups of

adolescents it will be used t test for independent samples (in the case of normal distribution) or Mann-Whitney test. For comparison of more than two independent groups, it will be used the ANOVA or Kruskal Wallis test, depending on the normality of the distribution.
The differences between the category variables will be tested by chi-square (x2) test.
The associations between variables will be checked by the Pearson correlation coefficient or Spearman's correlation coefficient.
In order to evaluate the significance of the obtained results, it was chosen the level of significance of $p < 0.05$.

Research plan:
Conducting research:

The study is planned as a cross-sectional study.
The inclusion criteria are:
A) Adolescents between the ages of 12 and 18, both gender
B) Adolescents indicated for the psychological testing after the first psychiatric examination under dg.:

a) F90 Hyperkinetic disorders and F91 Conduct disorders

b) F92 Mixed disorders of conduct and emotions, F93 Emotional disorders with onset specific to childhood and F98 Other behavioural and emotional disorders with onset usually occurring in childhood and adolescence according to the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10).

The exclusion criteria are:
A) Adolescents whose IQ, diagnosed though psihological testing, is lower than 70
B) Adolescents having a adolescent crisis with psychotic symptoms
C) Adolescents and parents who refuse to sign informed consent for participation in the study.

Significance/Expected scientific contribution: The scientific contribution of this research will illuminate the role of rumination and impairment of cognitive control in the formation of a clinical picture of mental disorders in adolescents and their figuration in an internalizing or externalizing form. Namely, there is still a small number of researches that investigate rumination and executive functions in adolescents in general, especially in those with internalizing psychopathology, and in adolescents with externalizing psychopathology such data on a clinical sample almost do not exist. The research will also make contributions to improving the dimension aspects

of classifying the examined mental disorders, within the existing categorical ICD and DSM classification systems for mental disorders, which already accept dimension qualifiers to a degree that does not change the affiliation of the category disorder.

Keywords: Internalizing, externalizing, rumination, cognitive control, adolescents.

Title of abstract: Can a single dose of artificial tears affect the visual field test results?
Dissertation Proposal Title: Can a single dose of artificial tears affect the visual field test results?

PhD candidate: Vera Jelušić, M.D., Clinical Hospital Centre Osijek, Department of Ophthalmology, Osijek, Croatia
Mentor: Assist. Prof. Dubravka Biuk, M.D., Ph.D., Department of Ophthalmology, Clinical Hospital Centre Osijek, Osijek, Croatia

Introduction: Automated perimetry is a standard procedure in managemant of glaucoma and is widely used to assess functional glaucomatous loss. Few studies have reported about the fact that visual field testing requires concentration and that on the other side can cause fewer blinks and tear film instability. Any disturbance of ocular surface may cause variations of visual acuity and visual field test results.

Aims: To evaluate the need for artificial tears on visual field testing in patiens under topical antiglaucoma medications with dry eye symptoms.

Participants and Methods: We followed patients with primary open-angle glaucoma, pigmentary glaucoma or pseudoexfoliative glaucoma treateted with topical antiglaucoma drops (containing BAK) with dry eye symptoms who came to a regular control. All patients had a long-term follow-up with at least two or more standard visual fields and best-corrected visual acuity 0.5 or better. The diagnosis of dry eye disease was made on anamnesis of presence of symptoms of dry eye (feeling of burning, dryness, forein body sensation in the eye), tear break-up time (TBUT) of less then 10s and dyeing of cornea with floureseine. Standard visual field testing was performed on the Humphrey Field Analyzer by a trained technican using standard full threshold strategy with programm 30-2. After one week, one drop of artificial tear was instilled into each patint´s right eye, while the left eyes served as control, and visual field testing was performed again after five minutes. The reliability parameters (false positive, false negative, fixation lose), mean deviation (MD), pattern standard deviation (PSD) and the test times were compared between visits ($p<0,05$).

Results: We had a research group of 20 patients in our study. No significant difference was observed in any VF testing parameters of control eyes ($P>0.05$). In artificial tear administered eyes, significant improvement was observed in test duration, reliability parameters, mean deviation and pattern standard deviation ($P<0.05$).

Conclusion: A single dose of artificial tears administrated immediately before visual testing can improve the test results and decrease test time in glaucoma patients with ocular surface disease. The importance of this study is limited because of the small number of examines.

Keywords: visual field testing, artifitial tears, topical antiglaucoma drops, open-angle glaucoma, ocular surface disease.

Dissertation Proposal Title: Quality of life predictors for patients with ileostomy and colostomy

PhD candidate: Marija Kadović MSN,MScQH, University Hospital „Merkur" Zagreb, Zagreb, Croatia
Mentor: Prof. Gordana Pavleković, M.D., Ph.D., School of Medicine, University of Zagreb, Zagreb, Croatia

Introduction: Patients with malignant or benign inflammatory bowel disease often receive a stoma, which alter the body's appearance but also the patient's life habits (1). Patients who get stoma, do everything to make their quality of life (QOL) on the level before surgery. Permanent education and evaluation of quality of care will reduce complications, unnecessary additional costs for health care, and will increase the QOL of the patient (2).

Hypothesis:
- Colostomy patients have better QOL than patients with ileostomy
- There is a difference between the QOL of stoma patients with education and social - psychological support and the patients without education and life support.

Aims: To determine is there a difference in the perception of the QOL in ileostomy and colostomy patients.Determine which predictors during recovery have beneficial effects.Determine is there a difference in the QOL perception in patients after surgery and five years later. Define QI's and necessary resources for establish Register for stoma patients.

Materials/Participants and Methods: Two independent groups of participants will be involved in the study: patients with ileostomy and colostomy who will fill a validated City of hope QOL – questionnaire (3). The quantitative research method will show the results of the anonymous questionnaires, a part of the questionnaire will be descriptive questions that will ask the patient's opinion and such responses will be processed qualitatively.

Research plan: Study will be cross-sectional with respondents who get stoma in the period of 1.9.2012 - 1.9.2017. They will get anonymous City of hope questionnaires to

their home addresses. After filling, the patients will return the questionnaires to the researcher who will define the QOL predictors, and required resources for establish Register of stoma patients, and elements for the specific education.

Expected scientific contribution: The expected contribution is to define the predictors of the quality of life of patients with stoma and suggesting ways of more effective nursing care.
It's also necessary to define the prerequisites for the Register of stoma patients Croatia for easier monitoring of all quality indicators and quality of life**.**

Keywords: Quality of life, Ileostomy, Colostomy, Postoperative care, Nursing care.

Dissertation Proposal Title: The ability of community health nursing interventions on response improvement to the colon cancer screening

PhD candidate: Sanja Kanisek, MSN, RN, Health Centre Osijek, Osijek, Croatia
Mentor: Prof. Rudika Gmajnić, M.D, Ph.D, Health Centre Osijek, Osijek, Croatia

Introduction: Results of the first cycle of the National program for early detection of colon cancer (CC) showed that responses to screening at the national level were 21%, and in Osijek-Baranja County (OBC) 20.3%, which is significantly less than acceptable (45%) and desirable response (60%). The population is made up of individuals of different ages, cultures, values and levels of education, which can aggravate their understanding of the information provided and influence motivation for participating in the screening so that the written information should be supplemented with verbal interventions. The activities of community health nursing in the team of the National preventive program for early detection of CC are home visits to motivate participation by distributing tests.

Hypotesis: Community health nursing interventions improve residents' response to CC screening.

Aims: Examine the ability of community health nursing interventions on improved response to the CC screening.

Materials/Participants and Methods: The interviewed group will consist of 250-300 persons in randomly selected family medicine practices in urban and rural areas, who were called for screening but failed to respond in the period of 6 months (random selection of two birth years in the call cycle). A questionnaire designed for the National program for early detection of CC will be used as a research tool.

Research plan: Patient data of those who failed to respond to the written call the National program for early detection of CC, who are the patients of the selected family medicine practices, will be extracted from The institute of public health (IPH) database. The effectiveness of conducted community health nursing interventions, ie the respondents' motivation to participate with the delivery of tests during home visits will be evaluated by the analysis of the submitted tests of the respondents in the IPH database.

Expected scientific contribution: The results would point the ability of community health nursing interventions on response improvement to the CC screening, the need to implement these interventions at the OBC level as well as the importance of IT connectivity of community health nursing, IPH and family medicine practices with the purpose of improving the organization of the implementation of the National preventive program for early detection of CC.

Key words: colon cancer, screening, community health nursing

Dissertation Proposal Title: Laryngeal attack frequency at patients with hereditary angioedema

Ph.D. candidate: Ljerka Karadža- Lapić, M.D., General Hospital Šibenik, Šibenik, Croatia
Mentor: Assist. Prof. Draško Cikojević, M.D., Ph.D., University Hospital Center Split, Split, Croatia

Introduction: Hereditary angioedema due to C1 inhibitor deficiency (C1-INH-HAE) is a rare autosomal dominant disease caused by mutations in the *SERPING1* gene. The clinical symptoms include skin swelling, abdominal pain, and life-threatening episodes of upper airway obstruction. It can affect many body regions, but potentially life-threatening laryngeal oedemas are the most worrisome. Attacks are usually triggered by infections, trauma or stress, by medications such as oral contraceptives with oestrogen or ACE inhibitors. Specific therapeutics for HAE treatment includes C1-INH concentrate (plasma derived or recombinant) and bradykinin receptor B2 antagonist. In the emergency department it is essential to establish the diagnosis as quickly as possible so that the most effective therapy may be administered to resolve painful or life-threatening edema. Prophylactic treatment during triggering procedures, as colonoscopy, gastroscopy, bronchoscopy, cystoscopy, operations in general anesthesia with intubation, dental-oral procedures, is recommended.

Aims: to determine the correct number of patients with C1-INH-HAE in two families with positive family history; to detect *SERPING1* mutation; to determine genotype–phenotype correlation; to analyze C1-INH-HAE treatment.

Participants and Methods: Twenty-three subjects from two families, including ones with already established C1-INH-HAE diagnosis, M and F, were recruited for clinical data evaluation (questionnaire, medical documentation analysis) and molecular analysis (C4, C1-INH, C1-INH function, genotyping).
The Healthcare Network, including The Instructions for hereditary angioedema that were implemented in the Hospital Information System (HIS), Šibenik General Hospital was created to analyze treatment and preventive measures before triggering procedures.

Preliminary results:
· 10 patients with low C4 and C1-INH levels and normal C1-INH function;
· The same *SERPING1* mutation at one participant in both families
· Before the Instructions for hereditary angioedema were implemented in the HIS, all patients were treated with corticosteroids and antihistamines during laryngeal oedema attacks. Preventive measures before triggering procedures were not applied.

Conclusion:
1. Molecular analysis of large C1-INH-HAE families can provide new insights on the genotype-phenotype relationship making determination for long- term prophylaxis easier for clinicians.
2. Establishment of C1-INH-HAE diagnosis before first symptoms occurs is essential in prevention and specific treatment during potentially life– threatening laryngeal oedema attack
3. The procedure in HIS should improve treatment of HAE patients and prevent adverse events.

Keywords: Hereditary angioedema, Laryngeal oedema, attacks, frameshift *SERPING1* mutation, Management instructions.

Proposal Title: Impact of stereotactic ablative radiotherapy regime and biologic effective dose on radiological dynamics of lung metastases

PhD candidate: Hrvoje Kaučić, M.D., Polyclinic Radiochirurgia Zagreb, Zagreb, Croatia
Mentor: Prof. Dragan Schwarz, M.D., Ph.D., Polyclinic Radiochirurgia Zagreb, Zagreb, Croatia

Introduction: Lungs are one of the most common sites for metastatic disease. A widely accepted management for solitary and oligo- lung metastases (LM) is surgical resection. Some patients are not eligible for surgery because of poor lung function, low performance status or comorbidities. Radiosurgery, ie. Stereotactic Ablative Radiotherapy (SABR) provides an effective alternative to surgery in those patients. Conventional radiotherapy has local control rates around 40%, and 5-year survival around 10%. SABR delivers a total Tumor Dose (TD) of 30-60 Gy divided in 1-5 fractions. Patients treated with SABR have an overall local recurrence rate of 26% with a Biologic Equivalent Dose (BED) < 100 Gy, and 8% with BED > 100 Gy, along with the 3-year overall survival rate at 88%. Radiobiologically, a single TD > 20 Gy has cytotoxic and added vascular damage effects, that lead to surviving cell fraction of 10^{-12}. Typical follow up for LM is radiological, at 2, 4 and 6 months after the SABR. Radiological dynamics of irradiated LM represents the only feasible way to measure the actual radiobiological effect on LM in vivo. In our facility, we treated patients with LM using single-dose and fractionated regimes, with BED escalations over 100 Gy. Our initial results at 2 months follow up vary from 7-72% volume regression.

Hypothesis: Regime of SABR and level of BED escalation over 100 Gy have impact on the radiobiological effect, ie. the radiological dynamics of the treated LM.

Aims: Comparison of radiological follow up at 2, 4 and 6 months after single-dose and fractionated SABR will be used to determine the extent of SABR and BED escalation regime over 100 Gy impact on the radiological dynamics.

Materials/Participants and Methods: Patients over 18, with indication for SABR according to international guidelines for LM, regardless of primary tumor site, will be treated with either single-dose or fractionated SABR. BED will be individually calculated for each patient. Statistical data will be processed.

Research plan: Single dose is defined as 1 x 25-30 Gy, and fractionated as 3 x 15-20 Gy or 5 x 12 Gy. BED is defined with adequate formula. Patients will be scanned on MSCT. Contures will be made by radiooncologist, and treatment plan by radiophysicist on Varian Eclypse Aria OIS. QA will be made by radiophysicist. Treatment will be performed on Varian Edge LINAC either in deep breath hold or in free breathing. Image guidance and motion tracking will be done by CBCT and Optical Surface Monitoring System, respectively. Radiological follow up will be conducted by radiologist using Computer Assisted Diagnostic and RECIST at 2, 4 and 6 months after SABR, defined as volume regression or progression.

Significance/Expected scientific contribution: Contribution to in-vivo research of the radiobiological effect of radiation dose rate and BED escalation on irradiated tissue.

Keywords: Radiosurgery, Stereotactic ablative radiotherapy, Biologic effective dose, Lung metastases, Radiobiology.

Title of abstract: Data security in the electronic nursing documentation
Dissertation Proposal Title: Influence of nursing education on data protection in the electronic nursing documentation

PhD candidate: Miroslava Kičić, M.Sc., School of Nursing Vinogradska, Zagreb, Croatia
Mentor: Assist. Prof. Damir Bosnar, M.D. PhD, Department of Ophthalmology, Clinical Hospital Sveti Duh, Zagreb, Croatia

Introduction:
The fundamental problems of patients' data protection and risks. The awareness of data security is particularly important when the nurses collect and handle the data. It is necessary for the nurses to have the knowledge of protecting the patients' written documentation, store it safely in order to avoid data misuse and data loss. This is even more important in terms of data being stored electronically. Data stored electronically is exposeed to higher risk and data hacking and electronic data storage generally speaking, makes data more accessible and potentially more sensitive.

Aim:
1. To determine whether there is a conection between degree of education and the IT education of nurses.
2. To determine whether there is a conection between knowledge of legal regulations and the level of nurses education.
3. To determine differences in management of nursing documentation and ways of using computers between nurses with secondary and higher educational degree.
4. To determinate the correlation between risk awareness of sensitive data handling as well as data protection, level of education and professional status among nurses.

Materials/Participants and Methods:
Respondends: two groups of nurses
Nurses with secondary education in Clinical Hospital Sveti Duh
Nurses with college and/or university degree who attend the second year of university graduate study of nursing at Medical Faculty of Zagreb University, academic year 2012./2013.

The Research was conducted in two phases:
data collection – anonymous questionnaire, 26 questions divided in two groups,

general and specific
General data: gender, qualifications, years at work and duty that nurs currently performs
Specific data: knowledge of data protection in patients, personal data protection regulations and legislations; knowledge and usage of relevant software packages and practices, the general IT knowledge. Analysing the attitude of how the nurses' have adopted to usage of the patients information electronically, following the data protection rules and regulations as well as, adapting to change due to the data protection act in the workplace.
Data processing, data analysis, used programs – Excel (Microsoft Excel 2010) and SAS (Cary NC:SAS Institute Inc.)
Absolute and relative frequencies tables have been created. Fisher and x^2 test have been used.

Results: Formal IT education with a secondary degree 42,3%, an education with a college and/or university degree has come to a total of 100% of those interviewed.
The knowledge of the legal system for personal data protection (secondary degree 19,3%, college and/or university degree 47,1%)
Both groups have mainly used the computers for management of nursing documentation (secondary degree 57,7%, college and/or university degree 70,6%)
Significant differences occur in using of computer for research (secondary degree 1,9%, college and/or university degree 37,3%)
Larger number of nurses with college and/or university degree manage nursing documentation in electronic form (43,1%) and nurses with secondary degree mainly manage documentation by combining electronic and written form (82,7%)
Nurses with secondary degree have less access to the computer (46,2%) and those with college and/or university degree have easier access to the computer (84,3%)
Identical opinion of both examined groups in the attitude towards quality at education related to management of nursing documentation.
Both of the groups almost unanimously agreed that for the increase of quality is needed a larger number of nurses (secondary degree 92,3%, college and/or university degree 88,2%) a large number of computers (secondary degree 92,3%, college and/or university degree 90,2%) and improvement of IT education for nurses (secondary degree 84,6%, college and/or university degree 90,2%).

Conclusion: It was expected that research results would contribute to a better understanding of problems and help to define guidelines for further nurses education and use of IT tehnology in management of nursing documentation.

Keywords: data security, electronic nursing documentation, education, ethics.

Dissertation Proposal Title: Patient satisfaction with the one-day cataract surgery

Phd candidate: Štefanija Kolačko, M.D., Josip Juraj Strossmayer University of Osijek Faculty of Medicine
Mentor: Prof. Biljana Elabjer Kuzmanović, M.D., Ph.D., Sveti Duh General Hospital, Zagreb

Introduction: Cataract is a clouding of the normally transparent lens. It is most common in the elderly, hence the name „senile cataract" as is the most common cause of reversible vision loss worldwide and it is assumed that the number of blind people, due to cataract, will increase to 50 milion by 2020. Quantitative cross-sectional study was conducted on the subject „Patient satisfaction with the one day cataract surgery".

Aim: The aim was to determine the dergree of patient satisfaction with the one day cataract surgery and detect crtical points that could serve as a basis for the future improvements.

Hypothesis: Patients are satisfied with the one day cataract surgery.

Participants and methods: The data in this study was collected by an anonymous questionnaire. The Questionnaire was used to analyze the levels of patient satisfaction and to determine to what exent is their satisfaction affected by the organization of work at the Universitiy hospital, accommodation on an outpatient basis, the information obtained by doctors and nurses, the surgery and being discharged from the hospital two hours after surgery under local anesthesia.

Results: Statistical analysis of the obtained dana showed that the majority of patients, 87,2% of them, are satisfied with the cataract surgery, 8,1% are partially satisfied and the minimum number of patients, only two of them, are somewhat dissatisfied with the operation. There is no patient who is unhappy with the cataract surgery.
Conclusion: Studies have shown that hospitalization is an expecially traumatic and stessful experience, which is greatly reduces with the introduction of the daily hospital care.

Keywords: cataract surgery; daily hospital care; nurse; patient satisfaction.

Dissertation Proposal Title: Association between bullous pemphigoid and kidney: a new target for PB180 antibodies

PhD candidate: Igor Kuric, M.D. University hospital Osijek, Department of Dermatology and Venereology, Osijek, Croatia
Mentor 1: Assoc. Prof. Lada Zibar, M.D., Ph.D., Department for Dialysis, Internal Clinic, University Hospital Center Osijek, Osijek, Croatia; Faculty of Medicine, Josip Juraj Strossmayer University of Osijek, Osijek, Croatia
Mentor 2: Prof. Marija Heffer, M.D., Ph.D., Department of Medical Biology and Genetics, Faculty of Medicine, Josip Juraj Strossmayer University of Osijek, Osijek, Croatia

Introduction: Bullous pemphigoid is a chronic, autoimmune, subepidermal, blistering disease that affects skin and mucous membranes. It is characterized by the presence of immunoglobulin G (IgG) autoantibodies specific for the hemidesmosomal structures BP180 (collagen type XVII) and less frequently BP230. The binding of these autoantibodies with the release of cytokines from T cells leads to complement activation, recruitment of neutrophils and activation of proteolytic enzymes that destroy the hemidesmosomes causing the formation of subepidermal blisters.
Indirect immunofluorescence (IIF) is a routine diagnostic test for bullous pemphigoid performed using normal human skin substrate with the patient's serum that detects IgG autoantibodies that bind to the epidermal side of the skin basement membrane. With current commercial kits it's accurate in approximately 75% of patients.
Bullous pemphigoid is associated with neurological diseases like dementia, cerebral stroke and Parkinson's disease, explained by the presence of collagen XVII in the central nervous system. A recent study by T. Hurskainen et al. reported that collagen XVII is also expressed in podocytes of normal human and mouse kidneys and in endothelial cells of the glomerular filtration barrier. It's function in kidneys has been analyzed in knockout mice displaying a role in the attachment of podocyte foot processes to the glomerular basement membrane where it contributes to podocyte maturation with a possible role in glomerular filtration.

Hypothesis: PB180 antibodies target the collagen XVII structures in kidney.

Aim: The goal of this research is to detect the presence and the binding of PB180 autoantibodies on collagen XVII structures in kidneys.

Materials/Participants and Methods: Serum will be taken from a patient with bullous pemphigoid disease confirmed with the following criteria: (1) clinical features – tense cutaneous blisters with no or transient involvement of mucosal surfaces and sparing head and neck areas, (2) typical immunoglobulin basement membrane deposits detected with perilesional skin DIF, (3) detection of anti-BP230 and/or anti-BP180 IgG by ELISA. The serum will then be used on both a mouse kidney substrate and a human kidney substrate using a standard IIF protocol.
The kidney substrate is cryosectioned (4μ) and the fragments are placed in silanized slides. The patient's diluted serum is incubated (to a ratio of 1:20) with the substrate for 30 minutes at room temperature in a humid chamber, followed by trizma base buffer/calcium (TBS
Ca^{2+}) rinse. The reaction is developed by secondary antihuman antibodies (IgG, IgA, IgM, and C3) produced in rabbits, murines or caprines, and conjugated with fluorescein isotiocianate (FITC). The reading of the reaction is done on epiluminescence microscopy.
The procedure will be repeated with serums from 10 patients with bullous pemphigoid.

Research plan: With regards to the incidence of bullous pemphigoid we plan to collect the necessary serums over the course of one year. The IIF testing will be conducted on the same day that each serum is collected. We will continue to monitor all new and relevant publications regarding bullous pemphigoid during this time. Upon the completion of testing another 3 months will be used to detail our findings.

Significance/Expected scientific contribution: The significance of our research is twofold.
(1) It opens new possibilities in diagnostics of bullous pemphigoid. Provided our hypothesis is correct human and mouse kidneys could be used as a substitute substrate in IIF diagnostics. Further research can be conducted to compare it's sensitivity to human skin's, possibly leading to a better detection material (much like monkey esophagus is used as a more sensitive substrate in a similar autoimmune blistering disease Pemphigus vulgaris).
(2) It offers value in clinical practice adding kidney disease to the list of known comorbidities. A more detailed monitoring of patient's kidney functions will be warranted in order to detect signs of glomerular filtration impairment. With appropriate treatment we will be able to further improve the health of our patients.

Keywords: bullous pemphigoid, BP180, collagen XVII, Glomerular basement membrane, Foot process.

Disertation Proposal Title: A map of the cytokine gene polymorphism and their impact on the development and progression of prostate cancer

PhD candidate: Damir Lenz, M.D., Department of Urology, General County Hospital Našice, Našice, Croatia
Mentor: Prof. Josip Galić, M.D., Ph.D., Faculty of Medicine in Osijek, Department of Urology, Clinical Hospital Osijek, Osijek, Croatia

Introduction: Most of the cancer occurs in a series of steps that assume mutations in tumor suppressor genes and oncogenes. External factors, mutagenic chemicals and radiation can stimulate carcinogenesis, internal - immunosuppression or chronic inflammation. Cytokines are involved in each inflammatory process, and polymorphisms is the promoter regions of cytokine gene. It was shown that the tumor cell network is rich in inflammatory cytokines, chemokines and growth factors that have produced tumors and affects tumor progression.

Hypothesis: The gene polymorphism by its influence on reduced or high cytokine production, causing individual differences in immune response, may alter the anti-inflammatory immune response to prostate cancer.

Aims:
1. Make a map of associated polymorphisms of cytokine genes at different stages of cancer
2. test a map of cytokine gene polymorphisms with other published data to determine whether there are variations in cytokine genomes in polymorphisms
3. test whether this map has a prognostic value in assessing the progression of prostate cancer and can it be based on the same speculating about optimal therapy for a particular patient

Participants and Methods: The subjects are patients with prostate cancer.The study includes retrospective and prospective elements. Patients with 120 prostate cancer will be divided into groups depending on the Gleason sum and the TNM degree. Prostate tissue will be taken from biopsies, operational materials, and paraffin cocoons. Two control groups of patients will be formed: a group of 120 patients and other of 35 healthy volunteers. Blood samples will be taken for serum cytokine

and PSA assay. Methods: All blood sample analyzes, DNA analysis, flow cytometry and immunohistochemistry tests and polymerase chain reaction on genomic polymorphisms in peripheral blood samples and prostate tissue will be performed. The presence and value of IL-6, IL-10, TGF-β, IFN-γ, TNF-α in serum will be determined by a specific ELISA test.

Research plan: In this project, polymorphisms will be explored in genes for certain cytokines at different stages of prostate cancer in samples from peripheral blood and prostate tissue.

Expected scientific contribution: the basic contribution is in the mapping of the cytokine gene polymorphisms associated with prostate cancer and its various stages. We expect to find correlation and significant differences in the polymorphisms of inflammatory genes in patients with malignant variants of the carcinoma a difference in the expression of polymorphisms of genes supporting the hypothesis of local cytokine production disorder as a factor for the progression of prostate cancer.

Keywords: Prostate cancer, cytokine, cytokine gene polymorphism.

Title of abstract: Lifestyle and eating habits of Murska Sobota General Hospital employees
Dissertation Proposal Title: Lifestyle and eating habits of Murska Sobota General Hospital employees

PhD candidate: Metka Lipič Baligač, M.Sc., Genaral Hospital Murska Sobota, Murska Sobota, Slovenia
Mentor: Assoc. Prof. Majda Pajnkihar, Ph.D., Faculty of Health Sciences - University of Maribor, Maribor, Slovenia

Introduction: Unhealthy eating habits affect the occurence and maintenance of physiological risk factors which are related to cardiovascular system diseases, such as high blood pressure and high cholesterol and glucose levels in blood. The purpose of balanced diet is maintaining and improving health and the quality of life, as well as prevention of symptoms of food deficiency (such as dermatitis, eye defect and brain damage) and deficiency diseases (pellagra, rickets, scurvy etc.), also excessive eating, that can lead to many civilization illnesses.
Using suitable statistical methods and comparing mean values, we have examined the differences between lifestyles and eating habits of men and women who work at Murska Sobota General Hospital. Namely, women live longer than men. Furthermore, mortality rate is lower for women due to different diseases (even in younger age). In this paper we have examined whether the differences between two sexes are hidden in lifestyles or in different eating habits.

Aims: The aim of this project is to determine whether there are differences in the lifestyle and eating habits between two sexes. Furthermore, to establish if there are differences in the frequency of consumption of daily meals and indulging in less healthy food and drinks. Taking these things into account we can make a conclusion about the eating habits of examinees and their lifestyle. Their exercising habits will also be viewed.
We have introduced following hypothesis:
H1: Men and women differ in the frequency of having certain meals.
H2: Men and women differ in the frequency of consumption of certain less healthy food and drinks.
H3: Men and women differ in the workout frequency in their spare time.

Materials/Participants and Methods

Questionnaire, sample and methods

For the purposes of this paper we have used the questionnaire data conducted within the master's thesis of the author of this paper (Eating habits of Murska Sobota General Hospital workers, 2015). The research was carried out using a modified work organization CINDI (Countrywide Noncommunicable Disease Intervention) questionnaire, „Health related to behavioral style", comprised of 40 questions, with addition of 5 questions dealing with vegetarian diet.

This research examinees have been employees of Murska Sobota General Hospital. The sample of research included 279 out of 902 employees. The sample dealing with education and sex can be compared to similar ones in the real population. To calculate the size of the sample, in the general inequality, we have taken into account following elements - assessment of shares, the strength and standard mistakes for the sample size of the share in 5%; therefore allowing for the difference between population share (population share is the „real" percentage of unhealthy diet in Murska Sobota General Hospital, that we are not familiar with), and our own assessment on the expected sample smaller than 5%.

252 examinees have finished the questionnaire (90,3% examinees included in the sample of research). 55 examinees (21,8%) are men, 197 examinees (78,2%) are women. 22 examinees (8,7%) have finished elementary school education, vocational high school had 26 examinees (10,3%). 114 examinees (45,2%) had secondary education and 90 examinees (35,7%) had higher education. Half of the examinees (50,4%) are part of middle class. More than a half (57,1%) live in the rural areas. The most common distance from the workplace is 2 to 10 km (44,4%). 17,9% of employees comes to work by foot or is cycling, and 79% of employees comes by car.

Average age of examinees is 42 (± 9,2 years). Average height is 168,1 cm (± 8,2 cm). Average weight is 70,9 kg (± 12,9 kg). Average body mass index is 25,0 (± 3,7).

Results:

The eating habits of men and women were compared using variables that measure how often examinees indulge in following meals: breakfast, morning meal, lunch, afternoon meal, dinner, occasional meal (in front of TV).

Variables are measured on a scale:

1. every day,
2. 4-6x per week
3. 1-3x per week
4. never,

that are among variables that are measured by level order.

The differences between men and women were checked by Mann-Whitney test. The differences were confirmed at a 5% risk level ($p < 0,05$). If they were statistically

significant, we established, based on a mean rank (MR), which group has more meals. It was indicated that between men and women there are statistically significant differences in the frequency of consumption of only dinner (Z = -2,305, p = 0,021), therefore men (MR = 107.92) more often have dinner compared to women (MR = 131,69). Every day 58,2% of men have dinner and only 46,7% of women. Whereas statistically significant differences between two sexes were not found for breakfast, morning and afternoon meal, lunch and occasional meal (P> 0,05) (Table 1).

Table 1: Frequency of consumption of daily meals according to sex

How often do you eat mentioned meals?	Sex	Frequency *				MR	Z	p
		1	2	3	4			
Breakfast	Male	45,5%	18,2%	25,5%	10,9%	119,32	-0,880	0,379
	Female	45,2%	9,1%	26,4%	19,3%	128,51		
morning meal	Male	34,5%	18,2%	32,7%	14,5%	123,50	-0,360	0,719
	Female	34,0%	16,8%	31,0%	18,3%	127,34		
Lunch	Male	76,4%	10,9%	12,7%	,0%	123,59	-0,432	0,665
	Female	72,6%	17,8%	6,6%	3,0%	127,31		
afternoon meal	Male	16,4%	7,3%	32,7%	43,6%	140,29	-1,661	0,097
	Female	20,3%	14,7%	32,5%	32,5%	122,65		
Dinner	Male	58,2%	20,0%	16,4%	5,5%	107,92	-2,305	0,021
	Female	46,7%	10,2%	27,9%	15,2%	131,69		
occasional meal (e.g. in front of TV)	Male	9,1%	12,7%	38,2%	40,0%	117,53	-1,124	0,261
	Female	9,6%	3,6%	40,6%	46,2%	129,01		

* 1 – every day, 2 – 4-6x per week, 3 – 1-3x per week, 4 – never
MR – mean rank according to sex, Z – Z statistics of Mann-Whitney test, p – statistic significance of Mann-Whitney test

Furthermore, we have also examined if there are statistically significant differencies in the frequency of consumption of less healthy food.
The differencies were checked the same way as the meals, with Mann-Whitney test.
Studies have shown that there are no significant differences in the frequency of consumption of less healthy food and drinks between men and women. Statistically significant differences have been found only in the frequency of consumption of canned food, such as soups etc. (Z = -3,129, p = 0,002) that men (MR = 150,67) often indulge, which is not the case with women (MR = 119,75). Even 58,4% of women have

answered that they never eat canned food, such as soups etc. Whereas only 32,7% of men have answered that they never eat canned food.

We also checked whether men and women differ in the frequency of recreational exercising in their spare time. They have been asked how many days a week (0-7) they use their spare time to be physically active in following ways:
• high intensity activity (aerobics, running, fast cycling, trekking or mountain biking, fast swimming, mountain and hill climbing, skiing, ski running, fitness, basketball, etc.)
• moderate intensity activity (cycling on flat surfaces, slow swimming, fast hiking, dancing, bowling, etc.)
• hiking (walking).
All three independent variables have been measured on interval scale, therefore the difference can be checked with t-test for independent samples. However, since it has been proven that distribution variable for all three of them deviates from normal, because the Kolmogorov-Smirnov test is statistically significant ($p < 0,05$) (Appendix 2), the help of a t-test is not appropriate. Accordingly we used again the Mann-Whitney test that does not foresee the distribution of normality.
It was indicated that between men and women there are statistically significant differences in the frequency of high intensity activity (aerobics, running, fast cycling, trekking or mountain biking, fast swimming, mountain and hill climbing, skiing, ski running, fitness, basketball, etc.) ($Z = 3,772$, $p < 0.001$). In their spare time men (MR = 157,15) on average are intensively active 2,51 days a week, whereas women (MR = 117,94) are intensively active just 1,45 days a week. There were no significant differences in the frequency of high and moderate intensity, hiking, walking, etc. ($p > 0,05$) (Table 2).

Table 2: Frequency of spare time activities according to sex

Types of spare time activities	Sex	PV	SO	MR	Z	p
high intensity activity	Male	2,51	2,18	157,15	-3,772	0,000
	Female	1,45	2,13	117,94		
moderate intensity activity	Male	2,85	2,45	136,04	-1,115	0,265
	Female	2,43	2,26	123,84		
hiking (walking on mostly flat surfaces)	Male	2,73	2,52	111,88	-1,704	0,088
	Female	3,33	2,44	130,58		

PV - mean value, SD - standard deviation
MR - mean rank according to sex, Z - Z statistics of Mann-Whitney test, p - statistic significance of Mann-Whitney test

Conclusion:

We can draw a conclusion that there are statistically significant differencies in eating habits and also in the lifestyles between two sexes.

Men, compared to women, statistically significantly more often eat dinner, more often indulge in canned food, such as soups, etc. That means that we can accept the first and second hypothesis and state that men and women differ in the frequency of consuming certain meals and the frequency of consuming certain less healthy food and drinks. Therefore, we can conclude that men have slightly worse eating habits or that they are, compared to women, less aware of what to eat and when. It is important to say that the frequency of the consumption of dinner does not necessarily mean bad eating habits, therefore for more relevant results the daily food intake rate of an examinee should be checked. On the other hand, we discovered that men and women do not significantly differ in the frequency of taking moderate intensity activities in their spare time, but there are statistically significant differences in the frequency of taking high intensity activities (aerobics, running, fast cycling, trekking or mountain biking, fast swimming, mountain and hill climbing, skiing, ski running, fitness, basketball, etc.). That means that we can accept third hypothesis and say that men and women differ in the frequency of exercising recreationally in their spare time. Based on the obtained results it is hard to conclude that women live longer than men just because of better eating habits and healthier lifestyle. Even if eating habits and lifestyle had clear influence on the life of a person, the question why women live longer than men is far more complex and it cannot be appropriately answered just by pointing out different eating habits and lifestyles, but with genetic predispositions and further reasearch.

Keywords: lifestyle, diet, employees' eating habits, men, women.

Title of abstract: Educational impact on compliance of medical personnel in hand hygiene in General county hospital Požega
Dissertation Proposal title: Educational impact on compliance of medical personnel in hand hygiene in General county hospital Požega

PhD candidate: Božica Lovrić, M.Sc, Požega County General Hospital, Požega, Croatia
Mentor: Assist. Prof. Domagoj Drenjančević, M.D., Ph.D., Clinical Hospital Centre Osijek, Faculty of Medicine Osijek, Osijek, Croatia

Introduction: Infections related to healthcare represent a great problem for the patient safety and, due to that, its supervision and prevention should be at the top of priority list of a healthcare institution. In developed countries, 5-10% of patients get that kind of infection in acute care hospitals. In third world, proportion of patients with infection related to healthcare, exceeds 25%. While having these infections, problems are multiplex and they consider long-lasting stay in hospital, possible long-term invalidity, increased resistance of microorganisms to antimicrobial medications, additional financial burden, high expenses for the patient and his family, but also the high number of deceased (1, 2, 3). The importance of hand hygiene education of the entire personnel in the healthcare institution is extremely important (4). Education of healthcare employees is an inseparable part of operating range of the Hospital infection team (5). Permanent education is not just a legal, but also an ethical duty of each healthcare worker (6). A consequence to that is arise of Croatian directions for hand hygiene published in 2011, in which a concept of "My five moments for hand hygiene" is explained in a detailed way (6, 7).
"My five moments for hand hygiene" is a concept developed by a group of experts from World health organization (WHO) while working on Directions for hand hygiene. The concept has been proposed as a reference approach for accurate conduction, teaching and evaluation of hand hygiene.
Moment 1 signifies conduction of hand hygiene before a contact with a patient.
Moment 2 signifies conduction of hand hygiene before an aseptic procedure. Moment 3 signifies conduction of hand hygiene after the exposure to body fluids. Moment 4 signifies conduction of hand hygiene after a contact with a sick person. Moment 5 signifies conduction of hand hygiene after a contact with the environment of a sick person.

Aims: The aim of research was to identify compliance in hand hygiene of healthcare workers before and after education, as well as to identify which method of hand hygiene healthcare workers apply more often.

Materials/ Participants and Methods: Research was conducted on three groups of healthcare workers. The first group were nurses, the second group were physical therapists and the third group were laboratory technicians. Hand hygiene acts of healthcare workers, were observed before and after the education of measures of proper hand hygiene. Through the process of education went 212 nurses/ medical technicians, 10 physical therapists and 13 laboratory technicians. All examinees are employees of General county hospital Požega. Research was conducted in General county hospital Požega in a period from 1 December 2013 until 1 April 2014. Before the education 473 observations were collected and 613 observations were collected after the education. Before the education, in a period of eight weeks, views were taken on a daily basis. Education of proper hand hygiene measurements was conducted through work in small groups in a period of seven weeks and WHO's presentation materials (slides and movies) were used for it (8, 9). After the education, everyday views were conducted in a period of five weeks. Proper hand hygiene performance was observed by a nurse responsible for control of hospital infections. Observation of compliance in the acts of hand hygiene was conducted in accordance to the rules defined by WHO. Compliance during hand hygiene is a proportion between the number of performed actions and the number of opportunities. Monitoring hand hygiene included five moments for hand hygiene. Results have been registered in observation forms. Proper hand hygiene methods included applying alcohol and rubbing it into hands, or washing hands with soap and under the source of running water.
Statistical methods: Nominal indicators were shown by division of frequency in groups and by its proportion. For affirmation of differences between proportions of two independent samples (number of indications before and after the education) χ^2-test and Fisher's exact test were used. For the evaluation of importance of the obtained results, $P < 0.05$ level of importance has been chosen.
Originally written database programs and statistical package Statistica (Stat Soft Inc ver 12) have been chosen.

Results: In this research, 473 indications for hand hygiene were recorded before the education and 613 indications for hand hygiene were recorded after the conducted education. Before the education, compliance in hand hygiene was 261 (55,2%) indications, whereas after the education compliance was 483 (78,8%) indications (Fisher's exact test, $p < 0,001$). After the education, in 45 indications (9,3%) hygienic hand washing was carried out, and in 438 indications (90,7%) hygienic rubbing (Fisher's exact test, $p < 0,001$) (Table 1).

Table 1. Compliance in hand hygiene before and after the education

	Number of (%) examinees			
	Before the education	After the education	Total	p*
Without conducted had hygiene	212 (44,8)	130 (21,2)	342 (31,5)	< 0,001
Conducted hand hygiene	261 (55,2)	483 (78,8)	744 (68,5)	
	∑ 473 (100)	∑ 613 (100)	∑ 1086 (100)	
Hygienical washing	142 (54,4)	45 (9, 3)	187 (25,1)	< 0,001
Hygienical rubbing	119 (45,6)	438 (90,7)	557 (74,9)	
	∑ 261 (100)	∑ 483 (100)	∑ 744 (100)	

*Fisher's exact test

Before the contact with a patient, out of 371 indications, 98 indications (26,4%) are without conducted hand hygiene, out of which 72 indications (45%) were before the education (Fisher's exact test, $p < 0,001$).

Before the education, without conducted hand hygiene and before the aseptic procedure, there were 55 indications (68,8%), whereas after the education there were 25 indications (31,3 %) without conducted hand hygiene. (Fisher's exact test, $p < 0,001$). (Table 2).

Table 2. Hand hygiene before the contact with a patent and aseptic procedure before and after the education.

	Number of (%) examinees			p*
	Before the education	After the education	Total	
Before the contact with a patinet				
Without conducted hand hygiene	72 (45)	26 (12,3)	98 (26,4)	**<0,001**
Conducted hand hygiene	88 (55)	185 (87,7)	273 (73,6)	
Total	160 (100)	211 (100)	371 (100)	
Hand hygiene method				
Hygienic hand washing	51 (58)	9 (4,9)	60 (22)	**<0,001**
Hygienic hand rubbing	37 (42)	176 (95,1)	213 (78)	
Total	88 (100)	185 (100)	273 (100)	
Before the aseptic procedure				
Without conducted hand hygiene	55 (68,8)	69 (42,6)	124 (51,2)	**<0,001**
Conducted hand hygiene	25 (31,3)	93 (57,4)	118 (48,8)	
Total	80 (100)	162 (100)	242 (100)	
Hand hygiene method				
Hygienic hand washing	4 (16)	3 (3,2)	7 (5,9)	**<0,001**
Hygienic hand rubbing	21 (84)	90 (96,8)	111 (94,1)	
Total	25 (100)	93 (100)	118 (100)	

*Fisher's exact test

In the moment after the risk of exposure to secretions, before the education, hand hygiene was conducted in 26 indications (47,3 %); whereas after the education, hand hygiene at that moment was conducted in 27 indications (87,1%). (Fisher's exact test $p < 0,001$).

Table 3. Hand hygiene after the risk of exposure to secretions, before and after the education.

	Number of (%) examinees			p*
	Before the education	After the education	Total	
After the risk of exposure to secretions				
Without conducted hand hygiene	29 (52,7)	4 (12,9)	33 (38,4)	**<0,001**
Conducted hand hygiene	26 (47,3)	27 (87,1)	53 (61,6)	
Total	55 (100)	31 (100)	86 (100)	
Hand hygiene method				
Hygienic hand washing	12 (46,2)	5 (18,5)	17 (32,1)	**0,042**
Hygienic hand rubbing	14 (53,8)	22 (81,5)	36 (67,9)	
Total	26 (100)	27 (100)	53 (100)	

*Fisher's exact test

After the contact with a patient, before the education, before the education, hand hygiene was conducted in 105 indications (66,5%), whereas after the education growth of hand hygiene conduction was registered in 182 indications (90,5%). (Fisher's exact test, $p < 0,001$).

After the contact with patient's environment, from the total number of 31 cases, without conducted hand hygiene was 13 cases (41,9%). From 18 cases (58,1%) where hand hygiene was conducted, 9 (50%) chose hand washing hygiene, while 9 (50%) chose hygiene of hand rubbing. Although there are differences, they are not statistically significant. (Table 4).

Table 4. Compliance in hand hygiene after the contact with patient and after the contact with patient's environment, before and after the education.

	Number of (%) examinees			p*
	Before the education	After the education	Total	
After the contact with a patient				
Without conducted hand hygiene	53 (33,5)	19 (9,5)	72 (20,1)	**<0,001**
Conducted hand hygiene	105 (66,5)	182 (90,5)	287 (79,9)	
Total	158 (100)	201 (100)	359 (100)	
Hand hygiene method				
Hygienic hand washing	62 (59)	18 (9,9)	80 (27,9)	**<0,001**
Hygienic hand rubbing	43 (41)	164 (90,1)	207 (72,1)	
Total	105 (100)	182 (100)	287 (100)	
After the contact with patient's environment				
Without conducted hand hygene	12 (52,2)	1 (12,5)	13 (41,9)	0,095
Conducted hand hygiene	11 (47,8)	7 (87,5)	18 (58,1)	
Total	23 (100)	8 (100)	31 (100)	
Hand hygiene method				
Hygienic hand washing	7 (63,6)	2 (28,6)	9 (50)	0,335
Hygienic hand rubbing	4 (36,4)	5 (71,4)	9 (50)	
Total	11 (100)	7 (100)	18 (100)	

*Fisher's exact test

After the contact with patient's environment, not any statistically significant difference in hand hygiene, before and after the education, was registered.

Conclusion: From the conducted research it can be concluded: There is significantly higher compliance in hand hygiene between the healthcare workers after conducted education. After conducted education, healthcare workers choose hygienic hand rubbing as a method of hand hygiene more often. Positive short-term results of a conducted campaign have been noticed through this research, while for the long-term results, permanent education and repeated observations will have to be provided.

Keywords: hand hygiene, hygienic washing, hygienic rubbing, my five moments, compliance.

Dissertation Proposal Title: The Effect of Isotretinoin and High Fat Diet on Adipokine Concentrations and Development of Metabolic Syndrome in Sprague Dawley Rats

PhD candidate: Ivana Lovrić, M.D., Faculty of Medicine Osijek, University of Osijek, Osijek, Croatia
PhD student advisor: Prof. Tatjana Belovari, M.D, Ph.D., Faculty of Medicine Osijek, University of Osijek, Osijek, Croatia

Introduction: Isotretinoin (13-cis retinoic acid) is commonly used in dermatology to treat severe cystic or recalcitrant acne unresponsive to topical and antibiotic therapy. It also affects other organ systems and has many side effects. There are only few animal studies describing the general toxic response of Isotretinoin on the entire organism. It is not well known whether Isotretinoin therapy and high fat diet effect adipokine concentrations in the blood.

Hypothesis: The administration of Isotretinoin and the way of feeding rats affect the serum concentration of adipokines, the development of metabolic syndrome, and histological changes in liver and pancreas tissue.

Aims:
- to determine the level of leptin, adiponectin and ghrelin in serum of all rat groups
- to determine the level of glucose and insulin in serum of all rat groups
- to determine the level of cholesterol, triglyceride, HDL, LDL, AST, ALT, creatine kinase in serum of all rat groups
- to analyze the degree of steatosis, fibrosis and necrosis in liver of all rat groups
- to analyze the size and distribution of Langerhans's islets in pancreas of all rat groups
- to analyze the short-term and long-term effect of Isotretinoin and high fat diet on the organism of all rat groups

Materials and Methods: 48 Sprague Dawley rats (PND 111; 24 males, 24 females) will be included in the study. Rats will be divided into 6 groups, 4 male and 4 female rats in each. The first three groups will be fed with standard laboratory chow diet (CD; 10% fat ;CON-CD,
ISO-CD 1, ISO-CD 2), while the fourth, fifth and sixth group will be fed with high fat

diet (HFD; 45% fat ; CON-HFD, ISO-HFD 1, ISO-HFD 2). Each Isotretinoin dose will be administered daily in different concentrations (1-7, 5 mg/kg; 2-15 mg/kg) for 28 days.

Research Plan: On 29th day of the experiment, to 24 rats (4 from each group; 2 males 2 females) Oral glucose tolerance test (OGTT), Insulin release test (IRT) and Insulin Tolerance Test (ITT) will be performed. Blood for glycemia determination will be drawn from a tail vein.
After that, on 29th day of the experiment, the same group of animals (2 females, 2 males) from each group will be killed and their pancreas and liver will be isolated, weighed and carried out for further histological analysis. Biochemical blood analysis will include liver transaminase, cholesterol, triglyceride, HDL, LDL, leptin, adiponectin and ghrelin concentrations. Blood for biochemical analysis will be taken from the right heart of the animal during the sacrifice.
The rest of the animals, 4 from each group (2 females and 2 males) will remain in the experiment for another 28 days and continue being fed CD, or HFD. During that time, Isotretinoin will not be administered to any animal group. On the 56th day of the experiment, the protocol described in the previous section will be initiated to the rest of the animals.

Significance/Expected scientific contribution: We found interesting to gain insight into the short-term and long-term metabolic changes on the organism induced by Isotretinoin and high fat diet, and to study its effect on lipid and glucose metabolism. For the clinical practice, it is interesting to know whether and how changes in blood concentration of adipokines effect Isotretinoin therapy.

Keywords: isotretinoin; insulin resistance; adipokines; metabolic syndrome.

Dissertation Proposal Title: Metallothioneins (MTs) and chaperonin 10 (CPN10) status in gestational diabetes mellitus (GDM)

PhD candidate: Sanja Malinac Malojčić, M.D., General Hospital Zabok, Zabok, Croatia
Mentor 1: Assist. Prof. Rajko Fureš, M.D., Ph.D., General Hospital Zabok, Zabok, Croatia
Mentor 2: Marija Ljubojević, Ph.D., Institute for Medical Research and Occupational Health, Zagreb, Croatia.

Introduction: Phisyological stress in pregnancy might be observed trough status of MTs and CPN10. These proteins are stress induced and possible changed in GDM. MTs are small cystein rich proteins mainly involved in essential trace elements (Zn and Cu) homeostasis and in response to oxidative stress and CPN10 is together with other member of heat shock protein family HSP60 as a multimer involved in mitochondrial protein folding, and as secreted factor in immunosupression. The interaction of MTs and CPN10 in their physiological roles and possible changes in pathology, including GDM, is unknown.
GDM develops mainly when the pregnant woman is not able to produce an adequate insulin response during pregnancy and both, child and mother are affected by GDM. Screening on basis of early, up to 24^{th} week fasting glucose > 5.1 mM and criteria of oral glucose tolerance tests (OGTT), show GDM prevalence at nearly 18%.

Hypothesis: Decreased Zn and MTs in blood and placenta samples and decreased Zn occupancy in MTs can be directly correlated with CPN10 as indicator of protein misfolding in pregnant women with diagnosed GDM and all that factors can be directly involved in condition pathology.

Materials and methods: The investigation work will be designed as case-control study.

Aims: to investigate from samples in healthy control compared to GDM mothers:
a) the association of MTs and CPN10 levels from placenta and possible blood
b) the association of MTs levels and occupation in biological samples with Zn levels
c) changes in expression and distribution of MTs and CPN10 in placenta

From informed and voluntary involved future mothers samples of blood and urine for

biochemical and other analysis will be collected in one point late in pregnancy (~36 week) in regular control of glycemic normal and diet regulated women with GDM (at least 10 samples from each group). Placenta, after each childbirth, will be collected for measurement of trace element zinc (ICP-MS) and immunchemical analysis of MTs and CPN10 (parts in LN for proteins and metal analysis and pices in fixative for IHC).

Conclusion: Investigation of possible causes of GDM and biomarkers of severity is important and both MTs and CPN10 can be used for this purpose.

Keywords: gestation diabetes mellitus (GDM), metallothioneins (MTs), chaperonin 10 (CPN10), heat shock protein 60 (HSP60), immunohistochemistry (*IHC*), inductively coupled plasma mass spectrometry (*ICP-MS*)

Dissertation Proposal Title: The use of complementary and alternative medicine among patients in primary health care in Croatia

PhD candidate: Matea Matić, M.D., Faculty of Medicine Osijek, Osijek, Croatia
PhD Student Advisor: Prof. Maja Miškulin, M.D., Ph.D., Faculty of Medicine Osijek, Osijek, Croatia

Introduction: The popularity and prevalence of complementary and alternative medicine (CAM) use is on the rise. CAM encompasses a large number of diagnostic and therapeutic procedures as well as a diverse use of natural products which are used for the purpose of healing, recuperation and health maintenance. Complementary medicine, by definition, complements the standard treatment procedures while alternative medicine is independent and excludes other types of treatment. There is relatively little research on CAM in Croatia, specifically; recent studies were based on smaller samples of doctors or usually involved specific groups, such as individuals suffering from oncologic diseases.

Hypotheses:
Patients do not have sufficient knowledge, but they often use CAM and do not report it to their chosen physician
Patients who are less satisfied with their chosen physician use CAM more often and it has an effect on their therapeutic compliance

Aims:
To investigate the knowledge and attitudes towards the use of CAM among patients in primary health care in Croatia
To investigate the types, prevalence and most common reasons for CAM use among patients in primary health care
To explore the frequency of reported CAM use to a chosen family physician
To investigate the relationship between CAM use and the patient's satisfaction with the chosen family physician and its influence on therapeutic compliance

Materials/ Participants and Methods: This cross-sectional study will be conducted from
January till June, 2018 and it will involve patients who visit the family physician's office

during that time. The estimated sample size is 1000 patients. The specially designed anonymous selfreported questionnaire will contain questions related to the patient's sociodemographic status, his/her health condition, questions related to knowledge, attitudes, prevalence of use, types of CAM and the most common reasons for CAM use. It will also contain questions related to the reported use of CAM to the chosen physician and questions concerning the satisfaction with the chosen physician and therapeutic compliance. Statistical analysis will be conducted with SPSS software.

Research plan: Every doctor employed in the field of family medicine in Croatia will be informed via e-mail about the research study along with a request to include patients who visit their office in the aforementioned period. After the patients give their informed consent, they can complete the questionnaire.

Significance / Expected scientific contribution: This study seeks to recognize new facts related to the increasingly present CAM. Among other, the results will demonstrate the influence it has on the possible reduced satisfaction with the chosen doctor, as well as the influence it has on therapeutic compliance.

Keywords: family practice, complementary therapies, primary health care, Croatia.

Abstract Title: Factors influencing early prediction of spontaneous intracerebral hemorrhage treatment
Dissertation Proposal Title: Factors of early prediction of successful treatment of patients with spontaneous intracerebral hemorrhage

PhD candidate: Nina Mihić, M.Sc., Institute of Health Insurance HNC Mostar, Mostar, Bosnia and Herzegovina
Mentor: Prof. Bruno Splavski, M.D., Ph.D., Department of Neurosurgery, Faculty of Medicine Osijek, Clinical Hospital Center, Osijek, Croatia

Introduction: Intracerebral hemorrhage (ICH) is spontaneous bleeding in brain tissue associated with higher rate of mortality and morbidity. The most common causes of bleeding usauly occurring in basal ganglia are arterial hypertension, arteriovenous malformations, cerebral aneurysms, amyloid angiopathy, primary and secondary brain tumors, coagulopathy, and anticoagulant therapy. Brain computed tomography (CT) is a method of choice for the ICH diagnosis. The prognosis of spontaneous ICH is unfavorable in general and in particular when hematoma spread into ventricular system.

Hypothesis: Older age, comorbidity, hematoma volume, significant amount of blood in the ventricular system, hemorrhage in the posterior cranial fossa, certain laboratory parameters, and poor quality of life and personal habits, are significant prognostic factors influencing morbidity and mortality and may contribute to an unfavorable outcome of spontaneous intracerebral hemorrhage.

Aim: The aim of this study is to establish and analyze early prognostic factors influencing treatment of spontaneous intracerebral hemorrhage

Materials/Participants and Methods: A cohort of 160 randomized patients diagnosed with spontaneous ICH and treated at Department of Neurology, University Clinical Hospital Mostar, will be analyzed in an observational retrospective study.

Research plan: The investigated features will be: gender, age, and patients' personal habits; comorbidity; location, dimensions and volume of ICH and perifocal edema; state of consciousness at the hospital admission and discharge assessed by Glasgow

Coma Scale (GCS); outcome at hospital discharge assessed by Glasgow Outcome Scale (GOS); admission serum parameters; neuroradiological diagnostic methods used.

Significance/Expected scientific contribution: The study may contribute to better understanding of spontaneous ICH cause and its development, as well as to predict the treatment outcome, identifying patients with increased risk for the disease.

Keywords: Spontaneous intracerebral hemorrhage; Prognosis; Factors influencing management outcome.

Dissertation Proposal Title: Personality traits and coping strategies as deteminants for choice of drug addiction treatment

PhD Candidate: Mirjana Mikulić, M.Sc., Mental Health Centre, Široki Brijeg, Bosnia and Herzegovina
Mentor: Assoc. Prof. Dunja Degmenčić, M.D., Ph.D., Faculty of Medicine, University of Osijek, Osijek, Croatia

Introduction:
Opioid addiction is a chronic issue with a compulsive need for opoids and continuence with drug abuse, regardless of negative consequences. Two major drug addicion interventions in Bosnia & Herzegovina include: supstitutional (methadon) therapy and institutional (abstinence) therapy. Personality traits (Kornør & Nordvik, 2007) and stress coping strategies (Sudraba et al., 2015) have been shown to be a part of opioid dependence aethiology. Drug addiction treatment choice might be connected with specific personality profiles and preference in stress coping strategies.

Hypothesis:
Higher levels of stressful life events are present among opioid addicts in comparison to control group
Considering current published results (Kornør & Nordvik, 2007), higher Extraversion and Neuroticism is expected among opioid addicts in comparison to control group
Taking into consideration the intervention program of a chosen treatment, higher levels of Agreeableness and Neuroticism are expected among supstitution therapy users in comparison to institutional abstinence therapy users.
Higher levels of Avoidance, as well as lower levels of Problem focused coping strategies are expected among opioid addicts in comparison to control group
Taking into consideration the intervention program of a chosen treatment, higher levels of Problem focused coping strategies are expected among institutional abstinence therapy users are expected, while higher levels of Avoidance are expected among supstitution therapy users

Aims:
Compare levels of stressful life events between opioid addicts and the control group
Compare personality profiles of opioid addicts and the control group

Compare personality profiles of supstitutional therapy users and institutional abstinence users
Compare stress coping strategies between addicts and the control group
Compare stress coping strategies of supstitutional therapy users and institutional abstinence users

Participants, Methods, Research Plan, Scientific contribution: Total of 600 subjects, constituing three groups (two experimental, one control) will participate in this research. Subjects from experimental groups will be users of supstitutional therapy at Drug addiction prevention and outpatient treatment centre, Mostar (N=200) users and institutional abstinence therapy at Community Cenacolo, Međugorje (N=200) users. Control group subjects (N=200) are Community Health Centre users and will be demografically comparable to experimental groups' subjects.
Subjects will fill out The Holmes-Rahe Life Stress Inventory (1967), Coping Orientation to Problem Experience (Carver, Weintraub & Schreier, 1989) and International Personality Item Pool (Goldberg, 1992) to assess the aimed research concepts.
This research will give insight to possible connection of life stress events, personality profiles and stress coping strategies with drug addiction therapy choice.

Keywords: treatment type choice, life stressors, personality profiles, coping strategies.

Dissertation proposal title: Comorbidity of postraumatic stress disorder (PTSD) and chronic schizophrenia - relevance of early stress trigger

Phd candidate: Snježana Milanović Hromin, M.D., Department of Psychiatry, Zadar General Hospital
Mentor: Assoc. Prof. Dunja Degmečić, M.D., Ph.D., , M.D., Ph.D., Faculty of Medicine, University J.J. Strossmayer, Osijek, Croatia

Introduction: Psychiatric comorbidities are common among patients with schizophrenia. Substance abuse comorbidity predominates. Anxiety and depressive symptoms are also very common throughout the course of illness, with an estimated prevalence of 15% for panic disorder, 29% for posttraumatic stress disorder, and 23% for obsessive-compulsive disorder. It is estimated that comorbid depression occurs in 50% of patients, and perhaps 47% of patients also have a lifetime diagnosis of comorbid substance abuse. There are articles about associations, examining whether these comorbidities are "more than chance" and might represent (distinct) phenotypes of schizophrenia. Among the anxiety disorders, the evidence at present is most abundant for an association with obsessive-compulsive disorder. Additional studies in newly diagnosed antipsychotic-naive patients and their first-degree relatives and searches for genetic and environmental risk factors are needed to replicate preliminary findings and further investigate these associations.
Trauma histories are common in patients with schizophrenia, and childhood trauma is a risk factor for psychosis. Patients with schizophrenia may be at increased risk for exposure to trauma, due to illness-related features, environmental influences, and/or comorbid substance use. Many factors complicate the diagnosis and investigation of co-occurring PTSD and schizophrenia, including the presence of psychotic symptoms within the context of PTSD, or PTSD symptoms—such as reexperiencing the trauma—that may mimic psychotic symptoms. Furthermore, psychotic symptoms (eg, hallucinations and delusions) or experiences (eg, involuntary hospitalization, seclusion, restraint, forced medications) may themselves be a traumatic event contributing to PTSD, though they have not been uniformly considered as a potential precipitating stressor.
A total of 20 published studies have reported on the epidemiology of PTSD in schizophrenia. These samples, including those which considered psychosis-related symptoms or experiences, found a prevalence of PTSD among patients with psychosis

0%–67%. A weighted average of the available data from these (heterogeneous) studies crudely estimates a 29% prevalence of PTSD in patients with schizophrenia, compared with a 7.8% estimated lifetime prevalence of PTSD in the US general population.
While the majority of these studies focused on patients with chronic schizophrenia, Strakowski et al found that 4 of 18 (22%) patients with a schizophrenia-spectrum disorder met criteria for PTSD antecedent to their first psychotic episode. The diagnosis of PTSD predated the onset of the psychotic disorder by more than 1 year in 2 of these 4 patients. In a cohort of 170 patients with a FEP, Neria et al found a 10% prevalence of PTSD.
The presence of PTSD has also been shown to be associated with more severe psychopathology (including cognitive impairments), higher rates of suicidal ideation and suicidal behaviors, and more frequent outpatient physical health visits and hospitalizations in patients with schizophrenia.
Factors, both clinical and neurobiological, that confer increased vulnerability to PTSD in patients with schizophrenia have been largely unexplored. We are aware of no published genetic or family studies of patients with schizophrenia and PTSD.

Hypothesis :

1. Majority of studies found an increased prevalence of PTSD in excess of that in the general population, including inpatients with chronic schizophrenia, there is little other evidence to support the hypothesis that PTSD is part of the illness of schizophrenia. The increased prevalence may be largely accounted for by environmental factors, particularly increased rates of exposure to childhood trauma or as the direct result of psychosis-related trauma.
2. Given the different patient characteristics (age, sex , comorbidity , health status, socio - economic status , compliance, early stress trigger) can be expected differences in treatment and mental illness outcome.

Aims:

1. To establish connection between postraumatic stress disorder (PTSD) and chronic schizophrenia
2. Notice possible areas for improving the quality of psychiatric care through mental health services in the community
3. Establish a connection between chronic mental disoreder and early stress trigger

Materials / Participants and Methods:

The subjects were all patients older than 60 who are screened throughly in Zadar homes for chronic mental illnesses diagnosed with a mental disorder (ICD-10 , ICD 10). The first group includes all patients diagnosed with a chronic mental disorder with psychiatric comorbidity. The control group is made up of all patients with

mental disorder without comorbidity. Features that will be monitored as age, sex, comorbidity , mental status , socio-economic status, early stress trigger. The study will be respected patient privacy, patients will be informed of the purpose of research and will consent to participate in research to confirm the signature on the form of informed consent . Planned statistical methods is regression analysis.

Research plan: It will be conducted retrospective study. Demographic and clinical patient data will be collected and analyzed from the electronic medical records of two different homes for chronic mental illnesses information systems. Anamnestic data of patients with mental illness comorbidity will be collected thoroughly by the examiner who will search for early stress triggers. The medical data in an electronic file for all these patients with mental disorders will be evaluated by a specialist psychiatrist and compared with the same data relevant family doctor and possibly by the Center for Social Welfare.

Significance / Expected scientific contribution: The research results will provide the basis for assessing early stress triggers and implementing measures to reduce the incidence of potential comorbid mental disorders such as PTSD and chronic schizophrenia.

Keywords : PTSD, chronic schizophrenia, early stress, trigger, comorbidity.

Dissertation Proposal Title: The effect of VEGF expression on glandular and platelet cervical cancer on different biological tumor behavior

PhD candidate: Ivana Miljanović-Špika, M.D., Clinic of Gynecology and Obstetrics, University Hospital Center Osijek, Osijek, Croatia
Mentor: Prof. Zlatko Topolovec, M.D., Ph.D., Clinic of Gynecology and Obstetrics, University Hospital Center Osijek, Osijek, Croatia

Inroduction: The gene expression of VEGF A is increased in the cervical cancer cells. There is higher VEGF A expression in adenocarcinoma cells in comparison to squamos cell carcinoma. Increased expression of VEGF A is associated with poor survival of patients suffering from cervical cancer.

Hypothesis: Increased gene expression of VEGF A in adenocarcinoma in relation to squamos cell carcinoma could be responsible for the different biological behavior of this cancer, worse response to radiotherapy and generally worse prognosis.

Aims: To detect the expression of VEGF A in the cervical cancer cells of platelet and glandular origin on paraffinic histological slides of cervical cancer, using immunohistochemical methods for determing neoangiogenesis with polyclonal antibodies to VEGF A and to determine the prognostic significance of VEGF expression for survival of participants.

Participants and methods: The study included 60 subjects treated for cervical cancer at University Hospital Center Osijek from 2010 to 2015, which only precondition was that all of them were treated with a primary surgical procedure. Participants were monitored for a period of time ranging from 60 to 132 months, and the termination of the follow-up was due to death from the underlying disease or other disease or termination of the study. Data organisation was implemented through its own relational database in MS Acces 2000.

Research plan: The tissue taken for histological analysis will be fixed for 24 hours in 10% formalin and incorporated into paraffin. Paraffin blocks will be cut into cubes of 3-5 μm thickness and then painted by standard hemalaun-eosin. Cervical cancer tissues cut to a thickness of 4 μm will be deparafinized in xylene and gradually hydrated

through a series of alcohol dilutions then incubated at 95°C for 20 minutes with a citrate buffer solution. The primary antibody used will be a commercially available rabbit polyclonal anti-VEGF antibody for detection of 165, 189 and 121 amino acid isoforms of VEGF A in dilution of 1:100. 2 µg of the primary antibody will be used for 1 hour at 37 °C. Immunohistochemical staining will be performed with biotinylated secondary antibodies, the procedure of streptavidin labeled peroxidase of horse radish (HRP), followed by AEC chromogen, giving a reddish brown color. The intensity of the developed red-brown color in the tumor cell, as a measure of expression of the VEGF gene is proportional to the amount of antibodies bound to the antigene.

Expected scientific contribution: To determine the expression of VEGF A in tumor cells of adenocarcinoma and squamosa cell cervical cancer and demonstrate how it affects the biological behavior of the tumor that would help determine the prognostic significance of clinical and pathohistological factors for survival of the participants.

Keywords: VEGF A, cervical cancer, neoangiogenesis, biological behavior, survival.

Dissertation Proposal Title: The molecular mechanisms involved in development of Drug-Induced Fatty Liver Disease (DIFLD) models and the use of Glucagon-like peptide-1 (GLP-1) analogues in the therapy of DIFLD *in vitro*

PhD candidate: Tea Omanović, M.D., Department of Pharmacology, Faculty of Medicine Osijek, University of Osijek, Osijek, Croatia
Mentor: Assist. Prof. Martina Smolić, M.D., Ph.D., Department of Pharmacology, Faculty of Medicine Osijek, University of Osijek, Osijek, Croatia

Introduction: Non-alcoholic Fatty Liver Disease (NAFLD) is a leading cause of liver disease in the western world, with increasing prevalence in the last decades. NAFLD encompasses a spectrum of disorders such as steatosis, non-alcoholic steatohepatitis and fibrosis/cirrhosis with a risk of death from liver failure or hepatocellular carcinoma. Therefore, it represents a significant health problem. Recent studies showed that Glucagon-like peptide-1 (GLP-1) based therapies could be effective in improving hepatic endpoints in patients with NAFLD, by reducing hepatic fat content and hepatic steatosis as well as preventing fibrosis. Although NAFLD is frequently thought of as a hepatic manifestation of metabolic syndrome, drug-induced steatosis also represents a common event in NAFLD. Previously, numerous drugs had been proven to cause fatty liver disease (FLD), however molecular mechanisms of drug-induced fatty liver disease (DIFLD) are not fully elucidated.

Hypothesis: The use of GLP-1 analogues in DIFLD *in vitro* models hampers development of hepatotoxicity.

Aim: The aim of this study is to evaluate molecular mechanisms involved in development of DIFLD *in vitro* and to assess the use of GLP-1 analogues as a therapeutic option in these models.

Materials and Methods: HuH7, a well differentiated human hepatoma cell line will be used to develop the NAFLD models *in vitro*. The extent of steatosis, apoptosis and lipogenetic pathway' genes expression will be evaluated by Oil-Red-O staining, MTT assay and RT-PCR, respectively.

Research plan: To generate FLD and DIFLD models, HuH7 cells will be incubated with increasing concentrations of fatty acids (FA) and increasing concentrations of amiodarone and tamoxifen, respectively. Furthermore, cells will be treated with different concentrations of GLP-1 analogues as pretreatment, cotreatment and posttreatment of FLD and DIFLD models. After incubation with FAs and hepatotoxic drugs, the extent of steatosis, apoptosis and lipogenetic pathway' genes expressions will be evaluated, respectively. Additionally, the effect of GLP-1 analogues on expression of the main modulators and transcriptional factors of drug induced hepatotoxicty will be assessed.

Expected scientific contribution: The molecular mechanisms of DIFLD modeling systems will be elucidated as well as the protective effect of GLP-1 analogues in the development of DIFLD in cultured hepatocytes.

Keywords: NAFLD, DIFLD, GLP-1 analogue, amiodarone, HuH7.

Dissertation Proposal Title: Comparison of the intra-articular knee joint injection versus radiofrequency neurotomy of the genicular nerves in clinical treatment of chronic pain in patients suffering from knee osteoarthritis.

PhD candidate: Ivan Omrčen, M.D., Department of Anesthesiology, Reanimatology and Intensive Medicine, Clinical Hospital Center Osijek, Osijek, Croatia
Mentor: Assist. Prof. Ivan Radoš, M.D., Ph.D., Clinical Hospital Center Osijek, Faculty of Medicine Osijek, Josip Juraj Strossmayer University of Osijek, Osijek, Croatia

Introduction: Chronic pain (CP) in patients with knee joint osteoarthritis (KJO) is managed with non-pharmacological, pharmacological and surgically treatments. The intra-artricular knee joint (IAKJ) corticosteroids and local anesthetics injection proved effectiveness in pain relief and small improvement in physical function in short term. Radiofrequency neurotomy (RN) applied to articular nerve branches (genicular nerves) is new type of treatment for relieaving CP in KJO.

Hypothesis: RN of genicular nerves in patients with CP in KJO is more effective in pain relief than IAKJ corticosteroids and local anesthetics injections.

Main aim: To compare the efficacy and duration of analgesia managed by RN of genicular nerves versus IAKJ injection of corticosteroids and local anestethics in patients with KJO.

Additional aims:
To compare the efficacy in function improvement managed by RN of genicular nerves versus IAKJ injection in patients with KJO.
To determine prevalence of neuropathic component of CP in patients with KJO.
To assess the prevalance of depression as a cofactor and its influence on CP in patients with KJO.
To record a post-procedure adverse events during the follow-up period.
To determine association of serum levels of ghrelin with intenisty of CP in patients with KJO.

Materials/Participants and Methods: The survey will be designed as a randomized prospective cohort study.

Research plan: The participants will be randomly assigned to receive percutaneous RN of genicular nerves under fluoroscopic guidance (RF group; n=35) or the intra-articular injection of corticosteroids and local anestethics (IA group; n=35). Visual analogue scale (VAS), Western Ontario and McMaster Universities (WOMAC) Index of Osteoarthritis, PAIN detect, The Depression Anxiety Strees Scale and serum levels of ghrelin will be measured at baseline and at 1, 3, and 6 months post-procedure.

Expected scientific contribution: If the study confirms the presumed hypothesis by the planned scientific data analysis, then it would contribute to creating clinical algorithm for treating CP in patients with KJO.

Keywords: Knee osteoarthritis, genicular nerve, intra-articular injection, radiofrequency, pain.

Title of abstract: The quality of life of women with breast cancer: one month and one year after the mastectomy
Dissertation Proposal Title: The quality of life of women with breast cancer: one month and one year after the mastectomy

PhD candidate: Stana Pačarić, M.Sc., University Hospital Center Osijek, Osijek, Croatia
Mentor: Prof. Jozo Kristek, M.D., Ph.D., University Hospital Center Osijek, Faculty of Medicine Osijek, Osijek, Croatia

Introduction: Increase in the incidence of breast cancer **i**n the year 2008 the incidence rate per 100,000 women was 63.6, in Croatia**.** The data for Osijek-Baranja County for the period from 2009 to 2010 are slightly higher than the Croatian average and they cover 118 patients / 100 000**.** Quality of life - individual's perception of their position in life in the context of the culture and value systems in which they live (WHO)**.** Increased risk of developing physical states (vomiting, insomnia and pain) and psychological distress (depression, anxiety, negative thoughts, fear of cancer recurrence and death, loneliness, sexual problems and problems with self-image), which badly affects the quality of life and survival**.** Significant changes in the quality of life at different levels: physical, functional and emotional level, and have worse sexual adjustment and poorer image of themselves.

Aim: Examine the quality of life of women with breast cancer one month and one year after the surgery and to compare the quality of life one month and one year after the mastectomy.

Materials/Participants and Methods: Prospective research of the quality of life of women with breast cancer at the Clinical Hospital Center (KBC) Osijek at the Department of Surgery**.** Croatian version of the questionnaire EORTC Quality of Life (QLO) - C 30 (version 3), the questionnaire with a module breast cancer EORTC QLQ - BR 23 and a sociodemographic part of the questionnaire**.** The questionnaires were applied one month and one year after the surgery (mastectomy). The research was conducted on 101 patients, 50 (49.5%) of them were the patients, having passed one month after the surgery and 51 (50.5%) of them were the patients, having passed one year after the surgery. Categorical data are presented in absolute and relative frequencies. Numerical data are described by median and limits of the interquartile

range. Differences of categorical variables are determined by χ^2 test and, if necessary, by Fisher's Exact Test. The normality of the distribution of numerical variables is tested by Kolmogorov-Smirnov test. Differences of numerical variables are tested by Student's t-test, and variables that deviate from normal distribution by Mann-Whitney U test. The level of significance is set at 0.05.
The statistical program SPSS (version 16.0, SPSS Inc., Chicago, IL, USA) is used for the statistical analysis.

Results: The average age of the patients was 56 years in patients having passed one month after the surgery and 54 years in patients having passed one year after the surgery
Most of the patients have secondary education, 49 (48.5%), and , 66 (65.3%) of them are married 80 (98.7%) of patients started/ underwent the chemotherapy and 54 (94.7%) underwent the radiotherapy (radiation).
The values of functional status are significantly higher in patients, having passed one year after the surgery (global health status ($p = 0.019$), physical ($p = 0.003$), role ($p = 0.003$), emotional ($p = 0.014$), cognitive ($p = 0.045$) and social functioning ($p = 0.004$). Symptoms are more significant in women, having passed one month after the surgery: fatigue ($p = 0.039$), nausea / vomiting ($p = 0.001$), pain ($p = 0.014$), dyspnoea ($p = 0.007$) and appetite loss ($p = 0.004$) (Table 3).
The quality of life evaluated by the scale QLQ-BR23 - most affected by the scale turned to be the body image functioning and the anxiety over the hair loss, with no significant differences between groups. The symptoms affected more significantly patients, having passed one month after the surgery. The functional scale ($p = 0.006$) was significantly more affected one year after surgery, and the symptom scale ($p <0.001$) one month after the surgery (Table 4).

Conclusion: Taking into consideration the symptom scale, the quality of life in women, having passed one year after the surgery, is better in comparison to the functional scale.
On the other hand, taking into consideration the functional scale, the quality of life is better in women, having passed one month after the surgery.

Keywords: breast cancer, quality of life, mastectomy, satisfaction, woman.

Dissertation Proposal Title: Bile duct diameter changes after laparoscopic cholecystectomy: magnetic resonance cholangiopancreatography prospective study

PhD candidate: Tomislav Pavlović, M.D., Department of Radiology, University Hospital"Sveti Duh" Zagreb, Zagreb, Croatia
Mentor: Prof. Zvonimir Sučić, M.D., Ph.D., Department of Radiology, University hospital "Sveti Duh" Zagreb, Faculty of Medicine Josip Juraj Strossmayer University of Osijek, Osijek, Croatia

Introduction: The bile duct diameter can be changed because of different factors. Obstructive changes, stones and previous surgical procedures can cause bile duct dilatation. As an additional factor that can cause bile duct dilatation, age and cholecystectomy are mentioned. Previous studies have contradictory results about the dilatation of bile ducts after cholecystectomy. With this research we want to help resolve the controversy, the advantage of this prospective study compared to earlier studies is based on the sample and methods and the accuracy because of sensitivity and specificity of the MRCP review.

Hypotesis: The diameter of the bile duct increases after laparoscopic cholecystectomy.

Aims: To determine the influence of laparoscopic cholecystectomy on the diameter of the bile duct measured by MRCP. Investigate changes in intrahepatic and extrahepatic bile ducts before and after laparoscopic cholecystectomy (3 months and 6 months after surgery), investigate changes intrahepatic and extrahepatic bile duct diameters with age and the possible association of diameter changes with biochemical parameters.

Materials/Participants and Methods: The examinees are the patients older than 18 years who are referred to elective laparoscopic cholecystectomy due to gallstones or gallbladder cholesterol. It will be screened for 50 patients. The control group will consist of 50 people without liver disease, gallbladder disease, bile duct disease and pancreas and with normal laboratory findings.

Research plan: Patients will be screened after for at least 8 hours fasting, within 7 days before cholecystectomy, then after 3 months and 6 months after cholecystectomy. The standard MRCP protocol will be used for examination. The diameter of the

intrahepatic and extrahepatic bile duct will be measurement at multiple points in the frontal and sagittal plane perpendicular to the bile duct os from the mucosal to mucosal surface.

Significance/Expected scientific contribution: The fact that in patients with cholecystectomy a wider diameter of the bile duct can be expected compared to the general population can be of great importance in preventing unnecessary searches such as laboratory analysis, radiological imaging methods and invasive techniques. Understanding of significant bile duct dilation may be of utmost importance to reduce the number of unnecessary controls and potential complications after invasive examinations.

Keywords: bile duct, cholecystectomy, magnetic resonance cholangiopancreatography, diameter, dilatation.

Dissertation Proposal Title: The incidence of pseudophakic cystoid macular edema in diabetic patients

PhD candidate: Ivana Pivić-Kovačević, M.D., Department of Ophthalmology, Faculty of Medicine Osijek, University Hospital Centre Osijek, Osijek, Croatia
Mentor: Assist. Prof. Suzana Matić, M.D. Ph.D, Department of Ophthalmology, Faculty of Medicine Osijek, University Hospital Centre Osijek, Osijek, Croatia

Introduction: Cystoid macular edema (CME) is an important cause of visual decline after uncomplicated phacoemulsification cataract surgery. The incidence of pseudophakic CME may be higher in diabetic patients. It usually occurs 1-12 months after cataract surgery and has peak incidence at 6-10 weeks. Although microinsicional cataract surgery techinques have diminished possibility for ocular complication such as CME, manipulation during surgery and surgery per se results in production of certain inflammatory agents that may lead to CME formation. Optical coherence tomography (SD-OCT) has recently emerged as an alternative to fluorescein angiography for diagnosing pseudophakic CME. A worldspread use of SD-OCT has not yet resulted in consesus in diagnostic criteria for pseudophakic CME. Early detection of macular disfunction and edema formation may be of big importance in preserving its morphology and functionality by introducing early treatment options.

Hypothesis: Pseudophakic macular edema is more common in patients with longer duration of diabetes mellitus, higher level of HbA1-C, diabetic retinopathy and complicated cataract.

Aims: To evaluate the incidence of pseudophakic cystoid macular edema in diabetic patients after uncomplicated phacoemulsification cataract surgery using SD-OCT.

Participants and methods: The study includes 30 consecutive cohort of diabetic patients with normal preoperative foveal thickness who will undergo uncomplicated phacoemulsification cataract surgery at Institute of Ophthalmology, School of Medicine University Josip Juraj Strossmayer Osijek, University Hospital Centre Osijek in the period from May 2017.
Exclusion criteria will be previous intraocular surgery of any type or a history of uveitis, non diabetic retinal disease, earlier macular edema or thickening of any ethiology,

previous laser photocoagulation within 3 months before cataract suregry, choroidal disorders, proliferative diabetic retinopathy, or impossibility to perform OCT.

Research plan: Diabetic patients will be followed up to 6 months after cataract surgery and examined to evaluate their foveal thickness and corrected distance visual acuity (CDVA) using Snellen chart. All patients will pass ophthalmological examination, grading of lens opacification according to the Lens Opacities Classification System III (LOCS III), fundus examination and fundus photography. The level of diabetic retinopathy will be recorded as none, mild, moderate or severe non proliferative retinopathy. All patients will have OCT examination on dilated pupil on day before surgery (baseline), 1 week, 1 month, 3 months and 6 months after the surgery that will be followed with corrected distance visual acuity examination.Foveal thickness changes will be measured and compared to baseline levels. On each visit they will undergo blood testing (glucose and HbA1C blood level measurement). All phacoemulsification cataract surgeries will be done in topical anesthesia through 2,75 mm long self sealing clear corneal incision, followed by capsulorhexis, hydrodissection, phacoemulsification, irrigation, aspiration of the cortex and implantation of a foldable intraocular lens (SA60AT,MA60AC,Acrysof IQ SN60WF, Alcon Laboratories, Ar40E Sensar, AMO). Non sutture is required. All surgeries will finish with intracameral cefuroxime administration as standard for endophthalmitis prophylaxis. Postoperatively, topical corticosteroid and antibiotic combination eye drops (dexamethasone and neomycin,polymyxin B) 5x times daily and ointment in the same combination 2 times before sleeping for one week after surgery and then 3x times eye drops and 1x time ointment before sleeping will be administered for totaly one month. All surgeries will be done by the experineced surgeon using mostly stop and chop technique or divide and conquer depending on the type of cataract. The cummulative dissipated energy (CDE) and ultrasound (US) time will be recorded as main system parameters during the surgery. Patients will be classified in two groups (insulin dependant and insulin independant).

Expected scientific contribution: To evaluate the incidence of cystoid macular edema after uncomplicated phacoemulsification cataract surgery due to duration and severity of diabetes, presence of diabetic retinopathy, level of HBA1-C and hardness of cataract before surgery. Results will help defining the real incidence and diagnostic standard of pseudophakic CME as well as defining treatment protocol. This is of big importance in preserving macular function in diabetic patients population. This aims might provide more precise risk stratification and in time treatment as well as targeted prophylaxis for patients with high-risk characteristics. This is the only way of preserving visual function and quality of life in diabetic patients.

Keywords: cystoid macular edema, phacoemulsification cataract surgery, SD-OCT imaging, diabetes mellitus.

Dissertation Proposal Title: Health Literacy in Fourth and Fifth Category Patients (Australasian Triage Scale) who asked for help in the Integrated Hospital Emergency Admission Unit (IHEAU)

PhD candidate: Harolt Placento, M.Sc., General Hospital Našice, Našice, Croatia
Mentor 1: Assist. Prof. Nada Prlić, Ph.D., Faculty of Medicine Osijek, Josip Juraj Strossmayer University of Osijek, Osijek, Croatia
Mentor 2: Assoc. Prof. Lada Zibar, M.D., Ph.D., University Hospital Center Osijek; Faculty of Medicine Osijek, Josip Juraj Strossmayer University of Osijek, Osijek, Croatia

Introduction: During the last two decades, health literacy is increasingly recognized as an important factor in the exchange and application of information among patients, their social networks, service providers and healthcare systems. Consistent links between low health literacy and reduced preventive health behaviour, increased hospitalization, and increased risk of death have been identified. From IHEAU data it is apparent that more than half of the patients seeking help fall into the fourth and fifth triage categories.

Hypothesis: Patients of the fourth and fifth triage categories (Australasian Triage Scale) who asked for help without a family doctor's referral in an Integrated Hospital Emergency Admission Unit are more often health illiterate.

Aims: To determine the medical literacy of patients in the fourth and fifth triage categories (Australasian Triage Scale) who asked for help without a family doctor's referral in an Integrated Hospital Emergency Admission Unit.

Materials/Participants and Methods: A validated survey questionnaire SAHLSA-50 will be used as the study tool. The first group of questions will contain general demographic definitions, and the other group will consist of fifty different items (parent words) to which two notions and the answer "I do not know" are added. The respondents are adult patients of the fourth and fifth triage categories Patients (Australasian Triage Scale) seeking help in IHEAU and adult patients in family medicine practitioners. Sample size is 200-300 examinees. Descriptive and nonparametric statistical processing will be applied, the level of significance will be set to $\alpha = 0.05$. The IBM SPSS Statistics (ver.15.0, SPSS Inc., Chicago, IL, USA) statistical programme will be used.

Research plan: This cross-sectional research will be conducted in the GH Našice and the Našice Health Centre in the period from February 1st 2018 to April 1st 2018. Prior to the start of the research, the approval from ethical commissions at GH Našice and Našice Health Centre will be received.

Significance/Expected scientific contribution: The research will determine the health literacy of the target patient group. If the research is to find that they are more often health illiterate, they should improve the quality of education, encourage change of negative and development of positive attitudes among patients. If the research is to find that patients are mostly health literate, it should be considered which actions (education) would contribute to reducing the utilization of the current health system.

Keywords: Health literacy, Emergency hospital admissions, Health literacy measurement, Patient literacy, Access to Care.

Dissertation Proposal Title: Effect of high-fat maternal diet on expression of leptin receptor in hypothalamic nuclei in offspring of Sprague-Dawley rats

PhD candidate: Zvonimir Popović, M.D., Department of Neurology, UHC Osijek; Department of Anatomy and Neurosciences, Faculty of Medicine Osijek, Osijek, Croatia
Mentor 1: Prof. Silva Butković-Soldo, M.D., Ph.D., Department of Neurology, UHC Osijek; Department of Neurology, Faculty of Medicine Osijek, Osijek, Croatia
Mentor 2: Prof. Marija Heffer, M.D., Ph.D., Department of Medical Biology and Genetics, Faculty of Medicine Osijek, Osijek, Croatia

Introduction: Leptin is the major satiety factor that suppresses appetite, while stimulating energy expenditure. (Stofkova, 2009) It is secreted by adipose tissue and binds to leptin receptor in central and peripheral tissue. (Abella et al., 2017) Mouse model with *db/db* mutation, defective leptin receptor, develops leptin resistance and obesity. (Lee et al., 1996) Although remodeling of brain in rats happens during whole life, embrional development and postpartal three weeks are considered crucial for long term imprinting of hypothalamic neurocircuits. During postpartal period lactation has a large influence on these processes (Bouret, Draper, & Simerly, 2004) Maternal high-fat feeding during lactation interferes with formation of anorexigenic pathways in hypothalamus, leading to abnormal obesity of offspring. (Vogt et al.)

Hypothesis: Offspring of mothers who have been fed high fat diet will present with lower leptin receptor expression than those from control mothers. Most affected nucleus should be *arcuate*, but changes should be also visible in other hypothalamic nuclei.

Aims: To assess effects of different maternal diet on establishment of satiety neural networks in offspring, and also how certain diet predispose offspring to development of metabolic disorders. The study will identify the order of affected satiety nuclea.

Materials and methods: Twentyfour male offspring rats divided into 4 subgroups depending on their maternal and offspring control (CD) or high-fat (HFD) diet as follows: CD/CD, CD/HFD, HFD/CD, HFD/HFD. At 22 weeks of age they will be sacrificed. Fixed brain tissue will be immunohistochemicaly stained for leptin receptor.

Expression of leptin receptors will be analyzed using ImageJ software. Data analysis will be performed using SPSS Statistical Software.

Research plan: Ten Sprague Dawley female rats will be divided in 2 groups depending on their diet for 6 weeks, after which they will be mated with male rat. After gestation and lactation period offsprings will be divided in 4 subgroups (6 in each group) depending on the combined mother/offspring diet.

Expected scientific contribution: Our research will show impact of maternal/ offspring high fat diet on modification of hypothalamic neurocircuits in offsprings, allowing us to estimate potential critical window and timing of potential interventions in order to prevent development of metabolic disorders.

Keywords: leptin receptor, hypothalamic nuclei, rat, adipokines, high fat diet.

Acknowledgements: Željka Kačarević Perić, Ph.D., Vedrana Ivić, Ph.D.; Prof. Radivoje Radić, M.D., Ph.D., University of Osijek, Faculty of Medicine Osijek, Osijek, Croatia

Abstract Title: Changes of locomotor parameters in smokers as an early predictor of Chronic Obstructive Pulmonary Disease (COPD)
Dissertation Proposal Title: Changes of locomotor parameters in smokers as an early predictor of chronic obstructive pulmonary disease (COPD)

PhD candidate: Goranka Radmilović, M.D., Special Hospital for Medical Rehabilitation, Daruvarske toplice, Daruvar, Croatia
Mentor: Prof. Sanja Popović-Grle, M.D., Ph.D., Clinic for Pulmonary Diseases Jordanovac, University Hospital Center Zagreb, Zagreb, Croatia

Introduction: In the last 15 years smoking and COPD have been in the focus of many researches, not just as a disease that is a leading cause of mortality in the world, but also as a disease that affect the entire body, especially the musculoskeletal and cardiovascular system. One of the first clinical signs in COPD patients is the reduced body capacity, which is usually attributed to reduced lung function. Nevertheless, pulmonary changes are only a partial cause, while the other part, less researched, is reduced musculoskeletal function. Therefore, there is a need for such a type of research that would point to changes in locomotor parameters that are going parallel with lungs, or even earlier, than the pulmonary function tests can show.

Hypothesis : Changes of locomotor parameters in smokers appear parallel, or earlier with the pulmonary function tests that could prove respiratory disorder measured by spirometry and bronchodilator test.

Aims : To determine:
whether changes of locomotor parameters in smokers appear parallel or earlier than the pulmonary function tests can prove the respiratory disorder, and early disease predictors in smokers
the effect of smoking on the development of chronic degenerative rheumatic diseases and the correlation between smoking start time and pack years with a degree of changes in the musculoskeletal system.

Materials/Participants and Methods : The study will include 160 patients, M and F, aged 40-65 with a diagnosis of chronic degenerative rheumatic diseases, smokers and non-smokers, who are oriented in the time and space and can understand

questions posed in questionnaires and execute orders needed for measurements. Prior to the start of the survey, the respondents will be introduced to the research goal and by signing informed consent will give an approval for participating in the research. All patients will be measured body weight and height, BMI, percentage of fat and muscle tissue, waist circumference, skincare thickness, respiratory index and thoracic spine flexibility index, pulmonary tests, CO ppm, pack years, quadriceps strength, 6MWT, bpm, blood pressure, SaO2 and degree of dyspnea and fatigue by the Borg scale. Each patient will complete CAT and DASS questionnaire. Exclusion criteria: patients with diagnosed COPD, severe cardiovascular or malignant diseases.

Research plan : Cross-sectional study among patients hospitalized in Special Hospital for Medical Rehabilitation Daruvarske toplice which meet the criteria for inclusion and exclusion.

Significance/expected scientific contribution: Determining changes in locomotor parameters and early disease predictors in smokers who are prone to develop COPD.

Keywords : smoking, COPD, musculoskeletal parameters, decreased body capacity, chronic degenerative rheumatic disease.

Dissertation Proposal Title: Link between neonatal hyperbilirubinemia, phototherapy and development of nutritional allergies in children

PhD candidate: Katarina Raković, M.D., Pediatric Clinic, University Hospital Center Osijek, Osijek, Croatia
Mentor: Assist. Prof. Silvija Pušeljić, Pediatric Clinic, M.D., Ph.D., University Hospital Center Osijek, Osijek, Croatia

Introduction: Studies have found a link between neonatal hyperbilirubinemia and childhood allergic diseases. An imbalance in prooxidant-antioxidant mechanism plays an important role in the pathogenesis of allergic diseases. High-level bilirubin might act like pro-oxidant and induce airway inflammation. Bilirubin could inhibit the Th-1 cell response leading to a delay the immune system in the Th-2 → Th-1 switch. Phototherapy affects the Th-2 to Th-1 switch (by increasing TNF-α, IL-1β, IL-8, and decreasing IL-6) besides directly damaging the DNA, decreasing the NK-cell activity (through UV light), and interfering with the CD4+/CD8+ cells (through UV light). These factors help in the induction of airway inflammation that might lead to the development of allergic asthma later in life. Experimental models have shown that unconjugated bile acids inhibit the growth of intestinal anaerobic bacteria (for example bacteroides and lactobacilli). This effect may be exaggerated during neonatal hyperbilirubinemia with high bilirubin levels. The changes in the gut microbiota composition and the prevention of Th-1 response could act synergistically along with other factors to influence the development of allergic diseases in later life.

Hypothesis: Neonatal hyperbilirubinemia has been linked to the development of childhood nutritional allergies in the later life.

Aims: To assess the rate of childhood nutritional allergies after neonatal hyperbilirubinemia and phototherapy in the first year of life.

Participants and methods: The study included 120 children born in University Hospital Center Osijek in one year, and had neonatal hyperbilirubinemia and requiring phototherapy during the neonatal period. Those children were born in the months of March, June, September and December (in order to cover all four seasons of the year) and followed by one year of age. Questionnaire about nutrition and possible side effects will be written during their stay in the hospital after birth, at the age of 4 months, the age of 8 months and with the age of one year.

Research Plan: This anonymous study included healthy newborn of both gender, with laboratory verified hyperbilirubinemia. Children's mothers will be familiar with the purpose of the study. We excluded children with preterm/low birth weight, maternal diabetes, and neonatal infection. Data is going to be collected in the first year of life, on four occasions, in collaboration with parents and paediatricians in primary health care.

Expected scientific contribution: Reveal the influence of hyperbilirubinemia in the development of nutritional allergy.

Keywords: hyperbilirubinemia, phototherapy, nutritional allergy, Th1, Th2.

Title of abstract: Antioxidant vitamins C and E restores normal endothelial function and oxidative status during high salt loading in young healthy women
Dissertation Proposal Title: Role of oxidative stress in high salt diet-induced endothelial dysfunction in young healthy women

PhD candidate: Lidija Rašić, M.D., Department of Emergency Medicine Osijek-Baranja County, Osijek, Croatia
Mentor: Assist. Prof. Ana Stupin, M.D., Ph.D., Department of Physiology and Immunology, Faculty of Medicine Osijek, J. J. Strossmayer University of Osijek, Osijek, Croatia

Introduction: Recent studies have shown that one week of HSD causes significant impairment of microvascular reactivity in young healthy women, coupled with the increase of oxidative stress markers in peripheral blood, including decreased antioxidant capacity (FRAP) and increased lipid peroxidation (TBARS).

Aims: Our study aimed to examine the effect of peroral intake of antioxidant vitamins C and E during one week of HSD on microvascular endothelial function and oxidative status in young healthy women.

Materials/Participants and Methods: 27 young healthy women were divided in control (CTRL, n=12) and experimental (C+E, n=15) group. CTRL group was subjected to low salt diet (LSD; 2.3 g NaCl/day) during 1st study week, and during 2nd week they consumed HSD (14 g NaCl/day). C+E group had the same eating plan as CTRL, with the addition of consuming 1000 mg of vitamin C and 800 IU of vitamin E per day during 2nd week of protocol. Skin microvascular post-occlusive reactive hyperemia (PORH), and microvascular blood flow following iontophoresis of acetylcholine (endothelium-dependent) and sodium nitroprusside (endothelium-independent vasodilation) were measured using laser Doppler flowmetry before and after diet protocols. Oxidative status was examined using FRAP method, as indicator of antioxidative capacity and TBARS method as indicator of lipid peroxidation. Blood pressure (BP) and heart rate (HR) were measured at the beginning of each study visit. Venous blood and 24-hour urine samples were analyzed for sodium, potassium, urea and creatinine levels before and after diet protocols. Measurements were performed on the first day of the protocol, after 1st week of LSD and after 2nd week of HSD.

Results: Changes in 24h urinary sodium confirmed all subjects conformed to the diet protocol. There was no change in BP and HR before and after HS diet in both study groups. In CTRL, PORH significantly decreased after HSD compared to LSD (P=0.05) while it was preserved in C+E group showing no difference between HSD and LSD (P=0.619). Endothelium-dependent dilation was significantly impaired after HSD in CTRL group (P=0.004), while this impairment was not detected in C+E group after HSD (P=0.050). Endothelium-independent dilation was not affected after HSD in either CTRL (P=0.274) nor C+E (P=0.355). FRAP was significantly decreased in CTRL after HSD (P=0.005), while this decrease in C+E group was not detected (P=0.896). TBARS was significantly increased in CTRL after HSD (P=0.035), while TBARS in C+E after HSD was not changed (P=0.946).

Conclusions: These results have confirmed that HSD alters endothelial function and oxidative status in young healthy women. Parallel intake of vitamin C and E during HSD prevented endothelial impairment, as much as the increase of lipid peroxidation, and maintained the antioxidant capacity during HSD on the same levels as during LSD. These results suggest that HSD impairs endothelial function precisely by increasing oxidative stress level and that antioxidant vitamins may have important role in maintaining microvascular health in young healthy population.

Keywords: endothelium, microcirculation, high salt diet, oxidative stress, antioxidants.

Acknowledgement: This study was supported by Croatian Science Foundation under the project #IP-2016-06-8744 Interaction of Renin-Angiotensin and Adrenergic System in Oxidative Stress Induced Endothelial Activation (RAS-AdrenOX).

Title of abstract: Prevalence and Correlates of Posttraumatic Stress Disorder after Ischemic Stroke
Dissertation Proposal Title: Prevalence and Correlates of Posttraumatic Stress Disorder after Ischemic Stroke

PhD candidate: Stela Rutović, M.D., General Hospital „Dr. Josip Benčević", Slavonski Brod, Croatia
Mentor 1: Prof. Dragutin Kadojić, M.D., Ph.D, Department for cerebrovascular diseases, Clinical Hospital Center Osijek, Osijek, Croatia
Mentor 2: Prof. Ivan Požgajn, M.D., Ph.D., Department od Psychiatry Clinical Hospital Center Osijek, Osijek, Croatia

Introduction: Although posttraumatic stress disorder (PTSD) commonly occurs due to traumas caused by exposures to violence and natural disasters, literature shows that PTSD can also occur after acute, life threatening medical events such as acute coronary syndrome or cerebrovascular events .

Aims: The aims of this study are to establish prevalence of PTSD in patients with acute ischemic stroke, and its relationship to stroke localization, type of ischemic stroke, severity of neurological deficit, age and gender, marital status.

Materials/Participans and Methods: We measured the prevalence of stroke-induced PTSD with the PTSD Checklist-specific for stroke (PCL-S) in adults who had an ischemic stroke (IS). A PCL-S score of 50 or more indicated likely PTSD. We tested for potential predictors of stroke-associated PTSD , including demographics (age, gender, marital status), subtype of IS (using the TOAST classification), lesion localization (right cerebral hemisphere, left cerebral hemisphere, brainstem and cerebellum) and disability (measured by modified Rankin Scale).

Results: Of the 85 patients with acute IS 11 (12,94%) had a PCL-S score of 50 or more, the mean score was 30 (range 17 to 78 of 85).Mean age of participants was 63 years, 53 (62,35%) were men and 32 (37,65%) were women. We found positive correlation between PTSD and higher degree of disability (P<0,001) with 95%CI ranging from 0,202 do 0,563. Patients with PTSD had lesions more frequently localised in right cerebral hemisphere (33.3%) and brainstem (33.3%), P=0,013. We found no significant correlation of PTSD with age, gender,marital status or subtype of IS.

Conclusion: Our research found high prevalence of PTSD in patients who had IS. Symptoms of PTSD in patients were correlated with higher degree of disability, right sighted hemispheral lesions and brainstem lesions. We found no correlation of PTSD with subtype of ischemic stroke, age, gender or marital status.

Keywords: ischemic stroke, PTSD, disability, lesion localization, age.

Title of abstract: Translation and validation of the Croatian version of the multidimensional work motivation scale
Dissertation Proposal Title: Elements of motivation as predictors of job satisfaction based on self-determination theory

PhD candidate: Eva Smokrović, M.Sc., Institute for Home health care and rehabilitation "Helena Smokrović", Croatia, University of Osijek, Faculty of Medicine Osijek, Department of Nursing, Osijek, Croatia
Mentor: Prof. Radivoje Radić, M.D., Ph.D. University of Osijek, Faculty of Medicine Osijek, Osijek, Croatia

Introduction: Multidimensional Work Motivation Scale (MWMS) is a reliable and valid instrument for operationalising the Self-Determination Theory in practice. It was translated into seven languages, and its validity and reliability were proved in nine different countries. As the search of literature showed that there was no formal translation of this instrument into the Croatian language.

Aim of this study was to translate MWMS and test its validity and reliability in practice.

Materials/Participants and Methods: The data was collected through a web survey conducted from 1 March to 12 April 2016, and the final sample consisted of 141 Croatian native speakers from all Croatian counties, of various professions, and employed in different work areas in both private and public sectors.

Results: Our results confirm that the translated instrument is reliable and valid. The items of the translated instrumented loaded on the six factors as expected and showed a good fit to the basic factor structure. As in previous studies, minor problems were identified with the Introjected Regulation construct.

Conclusion: The translated version can be used in its present form as a valid and reliable instrument for operationalising the aforementioned theory also in the Croatian context.

Keywords: Self-determination theory; Questionnaire; Validation; Croatian language; Crosscultural; Autonomous motivation; Controlled motivation.

Acknowledgement: We would like to thank: Marylène Gagné, BA McG., MA PhD Roch., School of Psychology, University of Western Australia for her consent and Tanja Paškvan for the review of the translated instrument and the proofreading of the manuscript. Finally, we would like to thank all the participants of the study

Dissertation Proposal Title: Prognostic values of inflammation-based prognostic scores and red blood cell distribution width in patients with follicular lymphoma

PhD candidate: Anto Stažić, M.D., Div. of Hematology, Dept. of Internal Medicine, University Hospital Center Osijek, Osijek, Croatia
Mentor: Assoc. Prof. Lada Zibar, M.D.,Ph.D., Div. of Nephrology, Dept. of Internal Medicine, University Hospital Center Osijek, Faculty of Medicine, University of Osijek, Osijek, Croatia

Introduction: Follicular lymphoma (FL) is the most common indolent form of Non-Hodgkin lymphoma (NHL). At an earlier stage the treatment is mostly unnecessary and patients undergo only regular checkups. The treatment is started if patient develops lymphoma-related symptoms (B-symptoms) or signs of disease progression. Follicular lymphoma international prognostic index (FLIPI) and tumor grade are the best predictors of outcome at time of diagnosis. In another form of NHL, diffuse large B-cell lymphoma, high baseline red blood cell distribution width (RDW) was found an independent prognostic marker of poor outcome.[1]

Hypothesis: Prognostic values of *inflammation-based prognostic scores and RDW* in FL patients are novel and independent predictors of outcome, *event-free survival (EFS)* and overall survival (OS).

Aim: To evaluate prognostic significance of inflammation-based prognostic scores, Glasgow prognostic score (GPS), prognostic nutritional index (PNI), neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR) and RDW in FL patients on disease outcome, EFS and OS.

Participants and Methods: Around 100 FL patients treated at University Hospital Center Osijek, Croatia, from 2006 to 2016, will be retrospectively analyzed using medical records. Inclusion criteria will be FL of clinical stage I-IV by Ann Arbor staging with complete clinical data at time of diagnosis. PNI will be calculated as $10 \times$ serum albumin value (g/dL) $+ 0.005 \times$ total lymphocyte count per mm^3. Univariate and Cox regression analysis will be performed by SPSS 10.0 for Windows (10.0 SAS Institute Inc, Cary, NC, USA).

1 Periša V, Zibar L, Sinčić-Petričević J, Knezović A, Periša I, Barbić J. Red blood cell distribution width as a simple negative prognostic factor in patients with diffuse large B-cell lymphoma: a retrospective study. Croatian Medical Journal. 2015;56(4):334-343. doi:10.3325/cmj.2015.56.334.

Research plan: The FL patients records will be searched to evaluate disease outcome, OS and EFS in relation with clinical and laboratory features within the prognostic scores and RDW.

Significance/Expected scientific contribution: Early recognition of poor disease outcome by using prognostic scores and RDW in FL patients at time of diagnosis can help to select them for an early treatment, to reduce complications, slow the progression and increase survival.

Keywords: Non-Hodgkin lymphoma, follicular lymphoma, inflammation-based prognostic scores, red blood cell distribution width, survival.

Dissertation Proposal Title: Impact of arterial stiffness and endocan concentration on survival in patients on chronic hemodialysis

PhD candidate: Mario Šafer, M.D., Department of Nephrology, Virovitica General Hospital. Virovitica, Croatia
Mentor: Assist. Prof. Dubravka Mihaljević, M.D., Ph.D., J.J. Strossmayer University of Osijek, University Hospital Centre Osijek, Osijek, Croatia

Introduction: Cardiovascular disease (CVD) is the main cause of morbidity and mortality in chronic kidney disease (CKD) patients. Arterial stiffness results in increased central pulse pressure, cardiac workload, and left ventricular hypertrophy and has been shown to be a strong predictor for cardiovascular morbidity and mortality in dialysis population. Endocan is a soluble proteoglycan of 50 kDa expressed by the vascular endothelium and recent study reported that endocan is overexpressed in cancer, sepsis, obesity, CKD and inflammatory conditions. Serum endocan levels were applied to a novel prediction model of all-cause mortality and cardiovascular events in CKD patients.

Hypothesis: Patients on chronic hemodialysis with increased pulse wave velocity (PWV) as a measure of arterial stiffness, should have increased concentration of plasma endocan level as a marker of endothelial dysfunction and vascular damage and poor cardiovascular outcome.

Main aim: To investigate relationship between PWV and endocan concentration in patients on chronic hemodialysis and theirs impact on cardiovascular outcome.

Additional aims:
To investigate the relationship between PWV and endocan with other biochemical parameters
To test the ability of PWV and endocan as a predictors of cardiovascular events
To investigate the impact of single hemodialysis session on PWV and endocan concentration.

Matherials and methods: One hundred stable chronic hemodialysis patients will be enrolled in the prospective study. Exclusion criteria will exclude patients with

malignant diseases, acute inflammatory processes, tachyarrhythmias and dialysis vintage less than three months.

Research plan: Measurement of PWV will be performed with Mobil-O-Graph Agedio B 900 device before the midweek dialysis session and right after. All blood samples will be obtained and analyzed in Central laboratory of University Hospital Osijek.

Research contribution: There was no study that compares arterial stiffness with endocan concentration and occurance of cardiovascular events in patients on chronic hemodialysis. The main contribution of this study will be to predict the population of patients on chronic hemodialysis which has particularly increase risk of poore cardiovascular outcome on the basis of relatively simple PWV measurement and biochemical analysis.

Keywords: Hemodialysis, CVD, arterial stiffness, PWV, endocan.

Title of abstract: Poincaré plot analysis and newborn pain
Dissertation Proposal Title: Pain reactivity of the autonomic nervous system in newborns

PhD candidate: Matej Šapina, M.D., Faculty of Medicine Osijek; University Hospital Osijek, Osijek, Croatia
Mentor: Assist. Prof. Silvija Pušeljić, M.D., Ph.D., Faculty of Medicine Osijek; University Hospital Osijek, Osijek, Croatia

Introduction: The reaction on pain in newborns includes both physiological and behavioral changes. The analysis of the heart rate variability is a valuable physiological response measure, which includes different analysis methodes, including the Poincaré plot analysis. The Poincare plot is a phase space scatter plot containing consecutive RR intervals on one axis, and a lag+1 on the other. An ellipse is fithed, where its width and length are determined by standard deviations parallel and perpendicular to the line of identity. The short axis represents a measure of short term, while the long axis represents a measure of long term variability, which correlate with other measures of the autonomic nervous system.

Aims: The aim of this study is to observe the changes in the Poincaré plot descriptors after a heel stick procedure.

Participants and Methods: Only full term infants APGAR score >9/9, without congenital malformations, were included in the study, which resulted in a sample containing 25 newborns (14 male and 11 female), 72 hours old, with mean birth mass 3311.6±438.3 g were included in the study. inc, After recording a baseline high frequency tachogram, a heel stick blood sample procedure was done, which represents the pain stimuli. The collected data was further analyzed using the Poincaré plot analysis.

Results: Statistically significant changes were observed in linear heart rate parameters. Painful stimuli caused a significant decrease both in the short and long axsis of the Poincare plot. Positive correlations were found between the differences of the mean heart rate interval, the short, and long axis, but also between the total variability and both axes. Respectively a negative correlation was found between the heart rate and both axes.

Conclusion: The Poincare plot analysis might have a valuable role in pain research. Painful stimuli in the neonatal population induces significant changes in the Poincare plot descriptors, which correlates with short term and long term variability.

Keywords: autonomic nervous system, Poincare plot, recurrence plot, pain.

Dissertation Proposal Title: Cognitive impairment in patients with obstructive sleep apnea

PhD candidate: Jelena Šarić Sučić, M.D., Department of Neurology, UHC Osijek; Department of Anatomy and Neurosciences, Faculty of Medicine, University of Osijek, Osijek, Croatia
Mentor: Prof. Silva Butković Soldo, M.D., Ph.D.**,** Department of Neurology, UHC Osijek, Osijek; Department of Neurology, Faculty of Medicine, University of Osijek, Osijek, Croatia

Introduction: Obstructive sleep apnea (OSA) is a sleep disorder that involves cessation or significant decrease in airflow in the presence of breathing effort. It is characterized by recurrent episodes of upper airway collapse during sleep. Signs and symptoms of obstructive sleep apnea include excessive daytime sleepiness, loud snoring, observed episodes of breathing cessation during sleep, abrupt awakenings accompanied by gasping or choking, morning headache, difficulty concentrating during the day, high blood pressure and cognitive impairement. Many studies have reported a wide range of neurocognitive impairments in obstructive sleep apnea hypopnea syndrome patients, including selective and sustained attention, information processing speed, short-term memory including working memory and executive functioning.

Hypothesis: Patients with obstructive sleep apnea have cognitive impairment in comparation with healthy population.

Aims: The primary aim of this prospective study is to examine whether there are certain cognitive changes in patients with obstructive sleep apnea that can be proven by capturing and analyzing cognitive evoked potentials P300, or determining whether there are differences in the cognitive potential evoked values compared to the results obtained in a healthy population. Secondary aim is determine which part of cognition is most damaged in patients with obstructive sleep apnea.

Materials/Participants: We will include patients with obstructive sleep apnea and a control group of subjects. The study covers subjects of both sexes, in the age range of 18-65 years. We will exclude all patients with other severe organic and psychiatric impairment and patient.

Methods: Cognitive evoked potentials P300 will be recorded in all study subjects and to a healthy individuals using sound paradigm and psychological test to determine which part of cognition is most damaged.

Research plan: All patient with symptoms of obstructive sleep apnea will be recorded with computerized polysomnography to get diagnose of obstructive sleep apnea. After that, cognitive evoked potentials will be recorded in all study subject using sound paradigm. Cognitive evoked potentials and psychological test will be done to a healthy individuals and compare results with patients with obstructive apnea.

Significance/Expected scientific contribution: Evaluate patients with obstructive sleep apnea and detect cognitive impairment if it is present and prevent cognitive deterioration in these patients.

Keywords: sleep apnea, obstructive sleep apnea, cognitive impairment, cognitive evoked potentials P300.

Dissertation Proposal Title: Correlation of antiTPO concentration with thyroid hormones as a predictor of clinical hypothyroid development

PhD candidate: Mila Vasilj Mihaljević, M.D., Family Medicine Ambulance, Health Center Vukovar, Vukovar, Croatia
Mentor: Prof. Ivan Mihaljević, M.D., Ph.D., Clinic of Nuclear Medicine and protection from irritation, University Hospital Center Osijek, Osijek, Croatia

Inroduction: Chronic autoimmune thyroiditis is a thyroid inflammation due to immune system disorders with genetic predisposition (positive family history) Infiltrated thyroid gland, but also thyroid lymphocytes, respond to thyroid antigens by producing the corresponding antibodies and thereby causing a clinical picture of the disease. The most common consequence of autoimmune inflammation is the damage of thyroid tissue with stroke formation and the disturbance of the thyroid hormone secretion function - hypothyroidism or less frequently, hyperthyroidism. Several antibodies and antigen-specific T lymphocytes are associated with autoimmune thyroid disease. The main antigens are thyroglobulin (Tg), thyroid peroxidase (TPO) and TSH receptor.

Aims: The aim of this paper was to investigate the relationship of TPOAt concentrations to concentrations of TSH and FT4 and FT3 in a sample of patients with diagnosed chronic lymphocytic thyroiditis. We also investigated whether the presence and concentration of TPOAt as well as the TSH concentration is predicting factor for clinical hypothyroidism which is defined as prescribing the drug's thyroid gland drug therapy

Participants and methods: This study included 144 patients with a diagnosis of chronic lymphocytic thyroiditis.). We only used euthyroid and hypothyroid patients measured by the TSH concentration within our laboratory reference values. Out of the study we excluded a total of 59 respondents; Those who initially had TSH values below the reference range, patients with TPOAt status lacking, patients who took specific Thyroid Therapy excluded were those who developed hyperthyroidism, and those with TSH and TPOAt levels outside the limits Resolution, leaving 85 respondents for statistical processing.

Results: : The mean age of diagnosis patients was 46.44 ± 14.97 years. The youngest patient is 12 years old and the oldest 75 years old. Of the total number of patients, no clinical and laboratory image of hypothyroidism was developed within 10 years of 38 patients (44.7%), while 47 (55.29%) patients received therapy for disease development. Of the 47 patients who received therapy, 32 (68.09%) started receiving medication at the first arrival of a nuclear medicine specialist, while the other 15 (31.91%) had an average of 9.7 months of hypothyroidism.

Conclusion: : In conclusion, in a cross-sectional study, we showed a positive correlation of TPOAt concentration with TSH concentration within euthyreoid and hypo-thyroid span as well as negative correlation of TPOAt with FT3 and FT4.

Keywords: thyroiditis, autoimmune, hashimoto, antiTPO, correlation.

Dissertation proposal title: The relationship between urinary iodine concentration and anthropological characteristics of children aged 6-12 years in the Republic of Croatia

PHD candidate: Valentina Vidranski, M.Sc., University Hospital Center Sestre milosrdnice, Zagreb, Croatia
Mentor 1: Assoc. Prof. Tomislav Jukić, University Hospital Center Sestre milosrdnice, Zagreb, Croatia
Mentor 2: Prof. Zvonko Kusić, M.D., Ph.D., Croatian Academy of Sciences and Art, Zagreb, Croatia

Introduction: Inadequate iodine intake causes numerous functional and developmental disorders of which is the most important psychomotor development of children, who are the most vulnerable population along with pregnant women. Related to that, numerous studies of intellectual disabilities were done but those about child motor development compared to iodine intake are insufficient and very limited. In the past, Croatia was an area with a severe lack of iodine but in 1996th a new law on universal salt iodination with 25 mg iodide potassium per kilo salt was introduced, and as a result, we achieved a sufficient iodine intake.

Hypothesis: Hypotheses of this work are that there is difference in a size of relation between urinary iodine concentration (UIC) on children's anthropological characteristics (AC), that there is a difference between UIC and AC by sex and age and that there are difference between UIC, AC and physical activity among school children.

Aims: The aim of this study was to determine relationship between urinary iodine concentration - iodine status with some anthropological characteristics of children aged 6-12 years.

Materials, Participants and Methods: The survey will last for a year and will include a minimum of 500 children aged 6-12 years. We will collect urine, informed consent of the parents, completed questionnaire on the dietary and physical activity habits of individual child, in schools of Zagreb and Osijek. Samples will be collected in sterile vials/vacuum tubes (4 aliquots) and frozen at -20 and -70 °C. Children will be measured

on the special diagnostic instrument for body composition and anthropometry, ultrasonic examination of the thyroid gland and measuring motor skills will be done. UI will be determined on automatic analyzer using original manufacturer's reagents and quality controls. Statistical data processing will be done using the MedCalc statistical program.

Research plan: Testing selected, randomized, school children during one year-all seasons (winter, spring, summer and autumn) in different locations, urinary iodine concentration determination and statistical data processing.

Significance/Expected scientific contribution: It is well known that the adequate intake of iodine is invaluable to the population of Croatia and in general, so, this research will assess how great it is relationship between iodine status and motor development of children.

Keywords: urinary iodine, iodine deficiency, anthropological characteristics, school children, physical activity.

Acknowledgement: I am grateful to Academician Kusić on his work and great efforts to prevent iodine deficiency in the Republic of Croatia and to Assoc. Prof. Jukić for supporting me in carrying out this research. We have no conflicts of interest.

Dissertation proposal title: Treatment of urinary tract infections in primary care: effect of educational intervention on quality indicators

PhD candidate: Željko Vojvodić, M.D., Health Centre Osijek, Bijelo Brdo, Croatia
Mentor: Assist. Prof. Suzana Mimica-Matanović, M.D., Ph.D., University Hospital Center Osijek, Faculty of Medicine Osijek, University of Osijek, Osijek, Croatia

Introduction: Urinary tract infections are the second most common bacterial infections (after respiratory) in primary care setting, with potential for serious complications, increased risk of therapeutic failure, hospitalizations and death from urosepsis, especially among older persons and immunocompromised. Aging of population together with narrowing spectrum of efficacious agents additionally make selection of optimal agents more and more difficult, and therapeutic outcome uncertain. Excessive utilization of antimicrobial agents, together with non-rational, inappropriate selection play an important role in the development of bacterial resistance. In Croatia, the utilization of antimicrobials is increasing since in teh lasst twenty years. There are several cross-sectional investigations on their prevalence and treatment in primary care, but no studies challenging effects of educational intervention on quality indicators.

Hypothesis: Prescribing practice in urinary tract infections among general practitioners in Croatia regarding effect on quality indicators is suboptimal. It can be improved with short term, targeted educational campaign. The improvement will be easily detectable through specific, measurable quality indicators.

Aims:
- to study patient characteristics (age, gender, symptoms, comorbidities),
- to evaluate prescribing practices according to quality indicators - before educational intervention: empirical therapy based on symptoms, empirical therapy based on urinanalysis, correction of treatment based on urine cultures, initiation of antibiotic after three days of symptomatic therapy, prescription of quinolones, prescription of older antimicrobials (nitrofurantoin, fosfomycin), prescription of other antimicrobials,
- to evaluate the same quality indicators six months after educational intervention
- to study general practitioners' characteristics (age, gender, educational background – with or without specialization in family medicine, average number of visits per day, work in practices distant or close to clinical centres).

Materials/ Participants and Methods: Prospective, cohort study of prescribing practice before and after educational intervention, among thirty general practitioners from all parts of country, together with 30 GPs without intervention. Antimicrobial consumption was expressed in DDDs.
Statistical analysis was performed using Statistica 7 software. Median values and ranges were used for description of the variables (numeric, small samples). Nonparametric Mann-Whitney test was used to examine the differences between summary data (median frequency for groups of antibiotics (quinolones, beta-lactams, co-trimoxazole, older agents) for all individual practices as independent groups. Statistical significance was considered at the level $p<0.05$.

Research plan: Beginning from October 2017 the participants will start to record data on antibiotic prescriptions for uncomplicated urinary infections according to specific quality indicators. A month later they will be sent a leaflet with educational material, as well as additional information from selected web sites. They will be invited to send questions to the investigator by e-mail. After six months, they will submit second set of data on antibiotic utilization together with questionaire form regarding their characteristics (see Aims).

Significance/ expected scientific contribution
The investigation will prove that a short educational intervention is capable to provide significant reduction in antibiotic prescriptions among general practitioners, as well as to reduce the proportion of fluoroquinolones compared to older agents (nitrofurantoin, fosfomycin).

Keywords: Antibiotics, urinary infections, general practice, educational intervention, antibiotic resistance.

Dissertation Proposal Title: Prevalence of traumatic dental injuries and associated factors among schoolchildren in Eastern Croatia

PhD candidate: Martina Vrdoljak, D.M.D., Faculty of Medicine Osijek, University of Osijek ,Osijek, Croatia
Mentor: Assist. Prof. Marko Matijević, D.M.D., Ph.D., Faculty of Medicine Osijek, University of Osijek, Osijek, Croatia

Introduction: A traumatic dental injury (TDI) is a public dental health problem because of its frequency, occurrence at a young age, costs and that treatment may continue for the rest of the patient's life. They are frequently met to schoolchildren ; therefore, the prevention and inter-ception of traumatic pathology within parents, teachers and children is more than necessary. There has been little research on the prevalence of dental trauma in comparison with the prevalence of dental caries. There are no epidemiological studies available on the traumatic dental injuries in schoolchildren in Eastern Croatia.

Hypotheses: Prevalence of TDIs in Eastern Croatia is high among schoolchildren.

Aims:
To assess the prevalence and types of TDIs in 9- and 14-year-old schoolchildren in Eastern Croatia
To determine whether TDIs were related to gender and socio-economic indicators 3. To evaluate the effect of overjet and inadequate lip coverage on the prevalence of TDIs 4. To assess the prevalence of treated and untreated TDIs.

Materials/ Participants and Methods: This cross-sectional study will be conducted from January 2018. till January 2019. on a sample of children enrolled at public schools in 5 counties of Eastern Croatia (Virovitičkopodravska, Osječko-baranjska, Požeško-slavonska, Brodsko-posavska, Vukovarskosrijemska). Estimated sample size is 2000 children. The epidemiological classification adopted by WHO and modified by Andreasen et al. Will be used to classify TDIs. All clinical examinations will be carried out on patients by a trained dentist. Dental examination will be conducted in a seated position, in a room with good lighning using sterilized or disposable dental mirrors, probes and gauzes. The universal infection control precautions will be followed during

examination. Data will be processed and analyzed using the Statistical Package for Social Sciences(SPSS).

Research plan: Schools will be contacted via e-mail about their interest in participating in the study. When the schools send their agreement, information letters will be sent to all caretakers of the children explaining the objectives of the study. The letter will also contain an anonymous socio-economic questionnaire. The clinical examination will be conducted only on children whose parents signed the consent and filled the questionnaire.

Significance / Expected scientific contribution: This research will show patterns of TDI occurence and treatment possibilites which may induce some public health prevention programs of TDIs itself, and all of their possible consequences.

Keywords: prevalence, traumatic dental injuries, schoolchildren.

Title of abstract: The autonomic nervous system and neonatal pain
Dissertation proposal title: The autonomic nervous system and neonatal pain

PhD candidate: Dunja Vujčić, M.D., University Hospital Osijek, Osijek, Croatia
Faculty of Medicine Osijek, University of Osijek, Osijek, Croatia
Mentor: Assist. Prof. Silvija Pušeljić, M.D., Ph.D., University Hospital Osijek, Osijek, Croatia, Faculty of Medicine Osijek, University of Osijek, Osijek, Croatia

Introduction: The physiological response of neonates to painful stimuli is not completely understood. For long, a paradigm neglecting their capability of feeling pain was proposed, which changed drastically in the last 20 years, after getting more insight in the changes that chronic pain does to newborns. A physiological response includes changes in the heart rate, respiratory rate and iritability. Heart rate variability provides a useful and reliable, noninvasive way in observing the autonomic nervous system, by using time and frequency domain methodes.

Aims: The aim of this study is to observe the changes in the spectral domain of the heart rate variability after a painful stimulus.

Materials/Participants and Methods: The subjects were obtained by simple random sampling. Only full term infants with APGAR score >9/9, without congenital malformations, were included in the study. 14 male and 11 female participants, mean birth mass 3311.6±438.3 g, and 72 hours old, participated in the study. After recording a baseline high frequency tachogram, a heel stick blood sample procedure was done, which represents the pain stimuli. The collected data was further analyzed using spectral domain analyses.

Results: Statistically significant changes in the low frequency and high frequency band spectres have been found. A reduced RR interval variability was observed after the pain stimulus, which corresponds with a increase in the heart rate and, and a reduction in the RR interval duration.

Conclusion: After applied pain stimuli, neonates experience significant changes in the heart rate, the sympathetic and parasympathetic branch of the autonomic nervous system.

Keywords: neonatal pain, heart rate variability, autonomic nervous system, spectral domain analysis.

Dissertation Proposal Title: Diabetes type 2 as a prognostic factor for schizophrenia remission quality

PhD candidate: Antonia Vuk, M.D., Psychiatric hospital "Sveti Ivan", Zagreb, Croatia
Mentor: Assist. Prof. Igor Filipčić, M.D., Ph.D., Psychiatric hospital "Sveti Ivan", Zagreb, Croatia; University of Osijek, Faculty of Medicine Osijek, Osijek, Croatia

Introduction: Diabetes mellitus (DM) is a global pandemic disease. It is a heterogeneous group of metabolic diseases characterized by hyperglycemia, leading to harmful and costly micro and macro vascular complications, physical disability and functional impairment.
Schizophrenia is a complex mental illness characterized by psychotic symptoms, cognitive impairment, functional decline and usually a chronic course. It affects about 1% of the population and is associated with 2-2.5-fold higher risk for premature death related to somatic comorbidities.
It has been reported that people with schizophrenia have 2-5-fold increased risk of diabetes type 2 (DMT2) than the general population but the reasons why individuals with schizophrenia are more prone to developing DM are not entirely defined. Recent studies have demonstrated an association of etiopathology of schizophrenia and DM, particularly poorly controlled, with elevated concentrations of inflammatory mediators. Specifically: IL-6 (Interleukin 6), TGF β (Transforming growth factor beta) and TNF α (Tumor necrosis factor alpha).
Although there are indications of shared vulnerability factors, some recent studies suggest that hyperglycemia itself is an inducer of oxidative stress and through several different mechanisms lead to elevated levels of various inflammatory mediators.

Hypothesis: DMT2 comorbidity at patient's hospital discharge is associated with a lower quality of schizophrenia remission determined after six months, regardless of other clinical, vital and sociodemographic parameters.

Aims: To estimate prognostic value of DMT2/hyperglycemia for impairment of schizophrenia remission quality.

Materials/participants and methods: The targeted population will be patients diagnosed with schizophrenia (MKB-10: F20) and DMT2, diagnosed at least three

months before the start of the study. Participants will be of both sexes, aged 25-65 and treated in a specialized psychiatric hospital.

Research plan: A prospective cohort study will be conducted at the Psychiatric Hospital "Sveti Ivan" in Zagreb. The recruitment period will last for four months and follow-up after hospital discharge will last for six months.
Significance/expected scientific contribution: Contribution to the understanding of etiopathology and the remission of schizophrenia.

Keywords: schizophrenia, remission, diabetes, hyperglycemia, cytokines.

The list of PhD Candidates, Mentors and Titles of abstracts of annual seminars

Delin, Sanja	Assist. Prof. Andrea Šimić Klarić, M.D., Ph.D	Correlation between the functional classification of children with cerebral palsy and the findings of intracranial ultrasound and magnetic resonance imaging	25
Evačić, Ruža	Prof. Radivoje Radić M.D., Ph.D.	Erectile function score role in cardiovascular risk assessment	28
Farčić, Nikolina	Assoc. Prof. Vesna Ilakovac, Ph.D.	Impact of health literacy and individual education on the experience of chronic pain	30
Feldi, Ivan	Assoc-. Prof. Lada Zibar, M.D., Ph.D	Prevalence of arterial hypertension in Croatian physicians	32
Gredičak, Martin	Assist. Prof. Rajko Fureš, M.D., Ph.D	Oxidative stress in gestational diabetes mellitus (GDM): role of glutathione (GSH) and glutathione peroxidase 1 and 3 (GPX1 and 3)	34
Gvozdanović, Zvjezdana	Assist. Prof. Nada Prlić, PhD.	Influence of education and magnesium on the quality of life of patients with type 2 diabetes without insulin therapy	36
Hlavati, Marina	Assist. Prof. Svetlana Tomić, M.D., Ph.D.	Evaluation of cerebral vasoreactivity by trancranial doppler sonography in patients with chronic obstructive pulmonary disease	38
Jandrić, Sanja	Prof. Pavo Filaković, M.D. Ph.D.	Rumination and impairment of cognitive control in internalizing and externalizing mental disorders in adolescents.	40

Vujčić, Dunja	Assist. Prof. Silvija Pušeljić, M.D., Ph.D.	The autonomic nervous system and neonatal pain	132
Vuk, Antonia	Assist. Prof. Igor Filipčić, M.D., Ph.D.	Diabetes type 2 as a prognostic factor for schizophrenia remission quality	134

ISBN 978-953-7736-33-0