

# Abstract Book / 3rd Student Congress of Neuroscience, NeuRi 2013

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# Abstract Book

3<sup>rd</sup> Student Congress  
of Neuroscience  
*Rijeka, Rab*  
April 26<sup>th</sup>-28<sup>th</sup> 2013

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**neURI**

STUDENT CONGRESS  
OF NEUROSCIENCE



# Abstract Book

3<sup>rd</sup> Student Congress of Neuroscience  
*Rijeka/Rab, April 26<sup>th</sup>-28<sup>th</sup> 2013*

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## Contents

- 7 Committees
- 9 Welcome Note
- 11 Programme

### Plenary Lectures

- 19 MLADENKA TKALČIĆ, DANIELA MALNAR: *Are women really from Venus and men from Mars?*
- 20 ROMANA PERKOVIĆ, FILIP TURJAK: *Neuroplasticity: tackling depression by taxi-method*
- 21 VESNA ŠENDULA-JENGIĆ: *Differently about the medical profession – from the myth of Narcissus to mirror neurons and back again*
- 23 KREŠIMIR ROTIM; MARTA BORIĆ, ILIJANA ŠUMONJA: *Minimally invasive spine surgery*

### Symposia

- 27 MATEJA MARELJA: *Treatment evaluation for mental disorders caused by stress*
- 28 EMA TAHTO, LAMIJA POJSKIĆ: *Values of serum lipids in veterans with and without post-traumatic stress disorder*
- 29 SELMA PAŠAGIĆ: *Schizophrenia and other psychotic disorders like schizophrenia with emphasis on the length of stay and treatment in 2007 at the Psychiatric clinic kcu Sarajevo*
- 30 VUK PRICA, LUKA FOTAK: *Biological approach to suicidality*
- 31 MALIK EJUBOVIĆ: *Analysis of social and psychopathological elements in mental patients who perpetrated the criminal act of murder*
- 32 HARIS BABAČIĆ, MAJA BOSHKOVSKA, ARBEN TARAVARI, SANJA MANCHEVSKA: *Prevalence of severe anxiety and depression in patients with headaches (pilot study)*
- 33 SANJA ZUKANOVIĆ, TJAŠA EMERZU, AJA LOVREC, GABRIJELA PLOJ, SARA MIČIČ, YOANA YORDANOVA, MITJA ČERNKO, NORBERT JAUŠOVEC: *Neurofeedback used for the enhancement of fluid intelligence: A Slovenian study*
- 34 SARA MOJZEŠ, VANA DOMINIS: *Musical preferences and their impact on the psychosocial development of adolescents*
- 35 SANDRA STOJIC, NATAŠA ŠIMIĆ: *Recognition of facial expressions during menstrual and late follicular phase of menstrual cycle*
- 36 VANJA TOPIĆ: *Verification of perceptual theory through the analysis of reaction time conditioned by context and accuracy of sentence*
- 37 DANIJELA ŠOŠE, ANITA IVANKOVIĆ, MLADENKA VUKOJEVIĆ, VESNA VARUNEK: *Differences in gender and hypoxic ischemic brain injury in newborns at the neonatology department of the University Clinical Hospital Mostar*
- 38 NICOL RADOLOVIĆ, INGRID ŠKARPA-PRPIĆ: *Nicotine and caffeine as neuroprotective factors in Parkinson's disease*
- 39 MONIKA KOČMAN, PETRA NOVAK, MIRA BUČUK: *Flail-arm syndrome – clinical variant of amyotrophic lateral sclerosis*
- 40 LUKA VLADANOVIĆ: *The incidence of Guillian-Barré syndrome in in the Primorsko-goranska county during the time span of last three years*
- 41 NENAD ČEKIĆ, ANAMARIJA SOLDO: *Anaplastic ganglioglioma in a young men – A Case Report*
- 42 VALERIJA TROJAR: *Speech changes in dementia*
- 43 SAMRA PAJAZETOVIĆ, SEMRA PAJAZETOVIĆ, JASENKO RADOVIĆ, MIRELA OMEROVIĆ, SABRINA ZULČIĆ, DŽENANA ZRNANOVIĆ, ADNAN ALTUMBABIĆ, OSMAN SINANOVIĆ: *The incidence of the 'restless legs' syndrome in the population of Bosnia and Herzegovina*
- 44 IGOR VLATKOVIĆ, VALENTINO RAČKI: *Rhes – a protein which sheds more light on Huntington Disease pathogenesis: review*
- 45 VALENTINA KVESIĆ, ARTA DODAJ, MLADENKA VUKOJEVIĆ, KRISTINA GALIĆ, VESNA VARUNEK: *The relationship between cortisol levels and optimism in patients with newly diagnosed cancer*



- 47 KATJA BILIĆ, TEA MARINKOV, MLADENKA TKALČIĆ, DRAŽEN  
DOMIJAN, SANDA PLETIKOSIĆ, MIA ŠETIĆ: *Global/local  
paradigm in patients with irritable bowel syndrome*
- 48 VESNA PAUŠIĆ, JELENA STANIĆ, ALEKSANDRA MIKOV: *The influence of therapeutical  
horse-riding on improvement of psychological functions in cerebral palsy patients*
- 49 DAJANA LUKIĆ, INGRID ŠKARPA-PRPIĆ: *Epilepsy and sexuality*

#### **Poster Session**

- 53 SREČKO POTIĆ, MIRJANA ĐORĐEVIĆ, SLOBODAN BANKOVIĆ: *Motor  
learning in the rehabilitation persons with disability*
- 54 VALENTINO RAČKI, IGOR VLATKOVIĆ: *Huntington's disease and oxidative stress: review*
- 55 DIN DURAKOVIĆ, DANIEL JURKOVIĆ, ANTE ROTIM: *The  
importance of mild traumatic brain injuries in athletes*
- 56 MIRJANA ĐORĐEVIĆ, SLOBODAN BANKOVIĆ, SREČKO POTIĆ: *Intellectual disability  
and comorbid psychiatric conditions*
- 57 IGOR ISKRA, ROMINA MILANIĆ: *The rythm of life*
- 58 JOSIP RAZUM, ANTE PELIVAN, GRGUR KNEZIĆ, MIRNA MERKEL,  
RIKARD PAŽITKA: *Factors that determine the development of cooperation*
- 59 JAKOV MILIĆ, IVANA BOŽIĆ, IVONA ŠIJAN, LADA ZIBAR, VESNA ILAKOVAC,  
MARIJA HEFFER: *Study habits and chronotype of students of medicine in Osijek*
- 60 KATARINA SABADI, KLEMENTINA RUŽIĆ, TANJA GRAHOVAC: *Atypical antipsychotic  
in the treatment of depression with psychotic elements–case report*

#### **Workshops**

- 65 *Sexuality* (Goran Arbanas, Rajna Knez)
- 66 *Drug addiction* (Rudolf Ljubičić, Hrvoje Jakovac)
- 68 *Body language–workshop for students* (Martina Šendula-Pavelić)
- 69 *Nucleolus–a timekeeper in the neural network* (Mira Krstulja, Ivona Bušac, Lara Ivanović)

#### **70 Acknowledgements**

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## Welcome note

Dear colleagues,

We live in a time where knowledge, values, rules and textbooks are changing at an incredible rate! Neuroscientific findings are changing the concept of human behaviour as well as brain functions and its (psycho) pathology on a daily basis. With progress in technological development that we almost couldn't have even dreamed of a few decades ago, neuroscience has come to be literally 'in the palm of our hand' at anytime. In the same way, the whole world has become a 'global village'. However, all present use of technology generates changes within us by means of which we are often not aware. These include problems with concentration, modern addictions such as addiction to the Internet, redefinition of relationships and moral values. The task of neuroscience will also be to provide the appropriate responses to these changes. We are therefore all invited to participate in this task, and we hope that by organizing the 3<sup>rd</sup> INTERNATIONAL STUDENT CONGRESS OF NEUROSCIENCE – NEURI 2013 we will be able to create a foundation for all those who want to study the most mysterious organ in the human body—the brain.

After successfully organising the Student Congresses of Neuroscience in 2011 and 2012, we would like to create a tradition of 'the April' gatherings for young neuroscience enthusiasts in Rijeka and Rab. Under the motto 'EDUCATION & EXPERIENCE' together with keynote speakers we will gain new knowledge and skills, have the opportunity to present the results of our own research, socialize, establish numerous contacts and unforgettable friendships with likeminded students. We have prepared three days of rich professionally scientific and social programs just for you. Your hosts will be the student association FOSS MedRi, the Rijeka University, School of Medicine, while on Saturday the Congress will be taking place in the Rab Psychiatric Hospital; one of the most representative health care institutions in Croatia.

To conclude, this is a welcome to all of you who, with childish curiosity, made your first little scientific steps during the DECADE OF THE BRAIN, and will continue achieving great things with your own creative energy and desire to discover 'new realms' of the human brain in the 21st century –THE CENTURY OF THE MIND!

*Welcome to Rijeka and Rab on NEURI 2013!*



Igor Salopek  
PRESIDENT OF NEURI 2013  
Rijeka, 26<sup>th</sup> April 2013



Participants of the 1<sup>st</sup> Student Congress of Neuroscience – NEURI 2011;  
Faculty of Medicine Rijeka



Participants of the 2<sup>nd</sup> Student Congress of Neuroscience – NEURI 2012;  
Rab Psychiatric Hospital

## Programme

April 26<sup>th</sup> (Friday)

FACULTY OF MEDICINE, RIJEKA

- 14.00–16.00 REGISTRATION (Great Hall)
- 16.00–16.30 OPENING CEREMONY NEURI 2013 (AUDITORIUM 2)  
CHAIRPERSONS: Gordana Župan, Igor Salopek, Sven Pal,  
Dragana Jurić, Domagoj Gajski, Marija Vrljičak
- 16.30–16.45 GROUP PHOTO OF ALL PARTICIPANTS  
(in front of the Faculty)
- 16.45–17.45 PLENARY LECTURE (AUDITORIUM 2)  
**Mladenka Tkalčić, Daniela Malnar:** Are women really  
from Venus and men from Mars?  
CHAIRPERSONS: Gordana Rubeša, Ivanka Živčić-Bećirević,  
Dragana Jurić, Ante Šokota, Luka Fotak
- 17.45–18.15 COFFEE BREAK (Great Hall)
- 18.15–19.15 STUDENT PLENARY LECTURE (AUDITORIUM 2)  
**Romana Perković, Filip Turjak:** Neuroplasticity: tackling  
depression by taxi-method  
CHAIRPERSONS: Igor Prpić, Kristina Pilipović,  
Igor Salopek, Damir Čačić, Marija Vrljičak
- 19.15–20.30 DINNER (Great Hall)
- 21.00 WELCOME PARTY

April 27<sup>th</sup> (Saturday)

PSYCHIATRIC HOSPITAL RAB

- 10.00–11.00 PLENARY LECTURE (CONGRESS HALL)  
**Vesna Šendula-Jengić:** Differently about the medical profession—from the myth of Narcissus to mirror neurons and back again  
CHAIRPERSONS: Darko Ledić, Tatjana Ružić, Sara Vukasović, Ivana Radovčić, Hrvoje Omrčen
- 11.00–12.15 STUDENT SESSION (CONGRESS HALL)  
CHAIRPERSONS: Vesna Šendula-Jengić, Boris Sever, Romana Perković, Tea Crnogaj, Kruno Topolski
1. **Mateja Marelja:** Treatment evaluation for mental disorders caused by stress
  2. **Emma Tahto, Lamija Pojskić:** Values of serum lipids in veterans with and without post-traumatic stress disorder
  3. **Selma Pašagić:** Schizophrenia and other psychotic disorders like schizophrenia with emphasis on the length of stay and treatment in 2007 at the Psychiatric clinic KCU Sarajevo
  4. **Vuk Prica, Luka Fotak:** Biological approach to suicidality
  5. **Malik Ejubović:** Analysis of social and psychopathological elements in mental patients who perpetrated the criminal act of murder
- 12.15–13.15 LUNCH AND SIGHTSEEING
- 13.15–14.45 STUDENT SESSION (CONGRESS HALL)  
CHAIRPERSONS: Ksenija Baždarić, Ivana Smoljan, Nenad Čekić, Karla Rubelj, Jurica Vidović
1. **Haris Babačić, Maja Boshkovska, Arben Taravari, Sanja Manchevska:** Prevalence of severe anxiety and depression in patients with headaches (pilot study)
  2. **Sanja Zukanović, Tjaša Omerzu, Aja Lovrec, Gabrijela Ploj, Sara Mičič, Yoana Yordanova, Mitja Černko, Norbert Jaušovec:** Neurofeedback used for the enhancement of fluid intelligence: A Slovenian study
  3. **Sara Mojzeš, Vana Dominis:** Musical preferences and their impact on the psychosocial development of adolescents
  4. **Sandra Stojić, Nataša Šimić:** Recognition of facial expressions during menstrual and late follicular phase of menstrual cycle
  5. **Vanja Topić:** Verification of perceptual theory through the analysis of reaction time conditioned by context and accuracy of sentence
- 15.00–17.00 RAB SIGHTSEEING
- 21.00 SURPRISE PARTY

08.30–09.00 BREAKFAST (Great Hall)

09.00–10.30 STUDENT SESSION (AUDITORIUM 1)

CHAIRPERSONS: Amir Muzur, Ingrid Škarpa-Prpić,  
Nikolina Zrakić, Marin Mličević, Ivana Maričić

1. **Danijela Šoše, Anita Ivanković, Mladenka Vukojević, Vesna Varunek:** Differences in gender and hypoxic ischemic brain injury in newborns at the neonatology department of the University Clinical Hospital Mostar
2. **Nicol Radolović, Ingrid Škarpa-Prpić:** Nicotine and caffeine as neuroprotective factors in Parkinson's disease
3. **Monika Kocman, Petra Novak, Mira Bučuk:** Flail-arm syndrome—clinical variant of amyotrophic lateral sclerosis
4. **Luka Vladanović:** The incidence of Guillian-Barré syndrome in the Primorsko-goranska country during the time span of last three years
5. **Nenad Čekić, Anamarija Soldo:** Anaplastic ganglioglioma in a young man—A Case Report
6. **Valerija Trojar:** Speech changes in dementia

10.30–10.45 COFFEE BREAK (Great Hall)

10.45–12.15 STUDENT SESSION (AUDITORIUM 1)

CHAIRPERSONS: Mira Krstulja, Martina Šendula-Pavelić,  
Ema Karmelić, Dora Karmelić, Maria-Helena Ružić

1. **Samra Pajazetović, Semra Pajazetović, Jasenko Radović, Mirela Omerović, Sabrina Zulčić, Dženana Zrnanović, Adnan Altumbabić, Osman Sinanović:** The incidence of the 'restless legs' syndrome in the population of Bosnia and Herzegovina
2. **Igor Vlatković, Valentino Rački:** Rhes—a protein which sheds more light on Huntington Disease pathogenesis: review
3. **Valentina Kvesić, Arta Dodaj, Mladenka Vukojević, Kristina Galić, Vesna Varunek:** The relationship between cortisol levels and optimism in patients with newly diagnosed cancer
4. **Katja Bilić, Tea Marinkov, Mladenka Tkalčić, Dražen Domijan, Sanda Pletikosić, Mia Šetić:** Global/local paradigm in patients with irritable bowel syndrome
5. **Vesna Paušić, Jelena Stanić, Aleksandra Mikov:** The influence of therapeutical horse-riding on improvement of psychological functions in cerebral palsy patients
6. **Dajana Lukić, Ingrid Škarpa-Prpić:** Epilepsy and sexuality

12.15–13.15 POSTER SESSION (GREAT HALL)

CHAIRPERSONS: Đulijano Ljubčić, Goran Arbanas,  
Dragana Jurić, Dajana Lukić, Ana Oljača

1. **Srećko Potić, Mirjana Đorđević, Slobodan Banković:** Motor learning in the rehabilitation of persons with disability
2. **Valentino Rački, Igor Vlatković:** Huntington's disease and oxidative stress: review
3. **Din Duraković, Daniel Jurković, Ante Rotim:** The importance of mild traumatic brain injuries in athletes



4. **Mirjana Đorđević, Slobodan Banković, Srećko Potić:** Intellectual disability and comorbid psychiatric conditions
5. **Igor Iskra, Romina Milanić:** The rythm of life
6. **Josip Razum, Ante Pelivan, Grgur Knezić, Mirna Merkler, Rikard Pažitka:** Factors that determine the development of cooperation
7. **Jakov Milić, Ivana Božić, Ivona Šijan, Lada Zibar, Vesna Ilakovac, Marija Heffer:** Study habits and chronotype of students of medicine in Osijek
8. **Katarina Sabadi, Klementina Ružić, Tanja Grahovac:** Atypical antipsychotic in the treatment of depression with psychotic elements -case report

13.15–14.00 LUNCH (Great Hall)

14.00–16.00 WORKSHOPS (LECTURE HALL, AUDITORIUM 1, 2, 8)

I. **Sexuality** (Goran Arbanas, Rajna Knez)

II. **Drug addiction** (Rudolf Ljubičić, Hrvoje Jakovac)

III. **Body language – workshop for students** (Martina Šendula-Pavelić)

IV. **Nucleolus – a timekeeper in the neural network** (Mira Krstulja, Ivona Bušac, Lara Ivanović)

16.00–16.45 PLENARY LECTURE (AUDITORIUM 1)

**Krešimir Rotim, Marta Borić, Ilijana Šumonja:** Minimally invasive spine surgery

CHAIRPERSONS: Lidija Tuškan-Mohar, Rajna Knez, Domagoj Gajski, Dušanka Beslač, Merljinda Ljušaj

16.45–17.15 CLOSING CEREMONY (AUDITORIUM 1)

CHAIRPERSONS: Igor Salopek, Sven Pal, Dragana Jurić, Damir Čačić, Marija Vrljičak





# Plenary Lectures



## Are women really from Venus and men from Mars?

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Mladenka Tkalčić<sup>1</sup>, Daniela Malnar<sup>2</sup>

1. University of Rijeka, Faculty of Humanities and Social Sciences, Department of Psychology, Rijeka, Croatia

2. University of Rijeka, Faculty of Medicine, Department of Anatomy, Rijeka, Croatia

The question whether gender differences in behavior and cognitive abilities could be explained by the differences in the brain structures and functions of women and man, is still a current one. As it is with complex behaviors, the key is in the interaction of biological, psychological and social factors.

While some authors are prone to exaggerate and overemphasize the differences of various aspects of the female and male behavior and cognitive functioning (like the author of the book 'Men Are from Mars, Women Are from Venus'), others are more inclined to accept the hypothesis of gender similarities, which states that not even small differences in behavior and cognition could be ascribed to the differences of the female and male brain.

In this lecture we will be focusing on different hypotheses and theories of the source of gender differences in behavior and cognitive functions, support them with research results and offer our own outlook on this interesting and always intriguing subject.

CONTACT: [mladenka.tkalcic@ffri.hr](mailto:mladenka.tkalcic@ffri.hr)

## Neuroplasticity: tackling depression by taxi – method

---

Romana Perković<sup>1</sup>, Filip Turjak<sup>2</sup>

1. Josip Juraj Strossmayer University of Osijek, Faculty of Medicine, Osijek, Croatia

2. Josip Juraj Strossmayer University of Osijek, Faculty of Economics, Osijek, Croatia

At the present time the human environment provides a rich source of social, psychological and physiological risks for which the neurological disorders in humans occur more often. On the other hand, increasing changes and risks in our environment bring also a lot of opportunity for better understanding of the human body response to these threats. Using this opportunity we are able to take advantage of the potential that hides in brain plasticity and at the same time cope with serious neurological disorders such as depression.

There are indications that certain changes occur in the structure of the brain of depressed people and the question arises whether it is possible in patients with a simple, noninvasive method prevent or 'fix' this situation. Using knowledge of the methods by which there is an increase in some regions of the brain, or their reorganization, we hypothesize that the intentional repetition of certain behaviors will reduce or resolve symptoms of severe depression.

CONTACT: [romana.per@gmail.com](mailto:romana.per@gmail.com)

## Differently about the medical profession – from the myth of Narcissus to mirror neurons and back again

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Vesna Šendula-Jengić  
Rab Psychiatric Hospital, Rab, Croatia

Medicine has always been regarded as one of the most prestigious professions in most countries as well as in ours. The criteria guiding the personal choice of future career are not unequivocal as it was earlier popular belief. Today the general impression is that the honourable medical profession of physician is in deep crisis. Is it actually true? There is one perception of physicians as materialists who do not (any more) care about the profession and alleviation of human suffering. Conversely, there is the opinion that physicians are underpaid for their hard work, which is generally carried out in poor conditions, and that the number of physicians is decreasing. Economic, social and transitional crisis and globalization in this region have raised new problems whose solution is not in sight.

Responsibility and concern for human health are public and social issues in which the community can pass or fail the test. The community has the right to take the test again, use argumentation and political manoeuvring. A whole range of non-health parameters affect the quality and availability of health care: from diagnosis to treatment. However, the issue of individual health and/or illness instantly reduces all these issues to a very personal and demanding doctor-patient relationship in which, apart from the medical knowledge and skills of physicians, all the other qualities necessary for a humane, empathetic and responsible relationship are tested.

Although nowadays we increasingly talk about the health services market and health as commodity, the physician-patient relationship cannot be seen outside the terms of deeply personal, in which the physician's attitudes and messages and the patient's expectations are determined by a number of unconscious processes.

Research concerning the physicians' status and job satisfaction in the context of the whole system showed disturbing results even in developed countries. Figures of over 70% claiming dissatisfaction with life, increased tendency to depression, suicide and addictions, call upon reflection on the quality of life of a physician, career choice and satisfaction. It is a precedent that many doctors today, despite employment opportunities, do not work in their profession.

During the study, students have certain affinities that to some degree define the course of their further training, and even present and future interpersonal relations. Personality characteristics are important in the creation of their own future, as well as working and social environment.



How to be a good physician? What is the measure of success today?  
How to be satisfied with oneself and one's job? Is it still correct to say that  
medicine is a vocation?

CONTACT: [vesna.sendula@gmail.com](mailto:vesna.sendula@gmail.com)

## Minimally invasive spine surgery

---

Krešimir Rotim, Marta Borić, Ilijana Šumonja

University Hospital Center 'Sestre milosrdnice', Department of Neurosurgery, Zagreb, Croatia

Considering microsurgical discectomy as the 'gold standard' for the treatment of disc herniations, minimally invasive lumbar spine surgery concept implies achieving clinical outcomes comparable to the standard microscopic technique while enabling faster recovery for the patients. The access to spine is kept to a minimum avoiding muscle, tendons and soft tissue damage. Other advantages of the minimally invasive spine surgery include: possibility of performing in local anaesthesia, shorter hospital stay, limited blood loss with consecutively reduced fibrous tissue development, faster return to work and everyday activities.

Percutaneous laser disc decompression (PLDD), selective endoscopic discectomy (SED) and microdiscectomy using tubular retractor system are minimally invasive spine surgery techniques.

PLDD was first performed in Europe in 1986, and the US Food and Drug Administration approved it for use in the USA in 1991. The scientific principle of the method is that in an enclosed hydraulic space, since fluid is non-compressible, a small change in volume will result in a disproportionately large change in pressure. Evaporation of water by laser energy creates a pressure gradient that leads to migration of the herniated portion away from the nerve root. Since the patient is awake during the procedure, the nerve root injury is downsized to minimum.

The tubular retractor system consists of a series of concentric, thin-walled tubular retractors of variable length which allow surgery using the operative microscope, endoscope or combination of techniques.

The SED technique is based on the special designed endoscopes that provide excellent visualization for selective removal of a portion of the herniated nucleus pulposus with preservation of the healthy part of the disc and with less chance of intervertebral space collapse.

Studies performed to compare minimally invasive techniques to standard microsurgical discectomy have concluded that minimally invasive methods do not provide different overall outcome and are acceptable and effective alternatives to standard microdiscectomy that offer many advantages.

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# Symposia



Mateja Marelja

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**RESEARCH BACKGROUND:** Treatment of PTSD includes education, psychosocial, psychotherapeutic support and psychopharmacotherapy. Treatment also includes marriage, family psychotherapy, sociotherapeutic procedures, relaxation and creative techniques.

**EXAMINIES-METHODS:** The study included 101 patients. All subjects were psychiatric patients of the Department for critic conditions, KHC Rijeka, and all suffer from mental disorders caused by stress or trauma. Respondents were separated in two categories, 'Hospital' and 'Day Hospital', because of the different treatment program. Data were collected through the 2011. and 2012. year. The basis of the research are questionnaires; Brief Symptom Inventory (BSI) and the Impact of Events Scale-Revised (IES-R). Participants of study answered the questionnaire on arrival at the hospital (first measurement), the departure from the hospital (second measurement) and after 6 months of treatment (third measurement).

**RESULTS: HOSPITAL:** The highest results in BSI questionnaire are in first measurement, second measurement is the lowest, and at the third measurement results are little bit higher compared to the second measurement, but still lower than the first measurements. Statistically significant difference between first and second measurement is noticeable mainly in all dimensions of BSI questionnaires (except phobia) and total score.

The most common symptoms are anxiety, obsessive-compulsive, depressive, paranoid and somatization.

**DAY HOSPITAL:** For BSI questionnaire results show the highest score in first measurement, the decrease in the second measurement, and in the third slightly increased, but is still less than the first. Most symptoms show statistically significant change except somatization and obsessive-compulsive. The symptoms in IES-R questionnaire are also the highest in the first measurement, and lowest in the second measurement, while the highest overall score is in the second measurement, and the lowest in the third measurement.

**CONCLUSION:** It has been proven that the psychotherapeutic programs that are used to treat disorders caused by stress or trauma are effective immediately after treatment and six months after treatment is completed. Hospital program has proven to be more effective in the treatment of disorders caused by stress or trauma in comparison to the Day Hospital Program.

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## Values of serum lipids in veterans with and without post-traumatic stress disorder

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**INTRODUCTION:** Searching the data of scientific and research papers PubMed and also other sources on the internet, we found out that six studies were published about the change of serum lipid concentration in the blood of examinees with post-traumatic stress disorder (PTSD). The problem of PTSD is very evident in Bosnia and Herzegovina because of the recent war.

**AIM:** The aim of this paper is to identify any differences in lipidogram of veterans with and without PTSD compared with the control group.

**METHOD:** 90 examinees participated in this study and based on psychiatric testing they were divided in three groups of 30. The age of the examinees was between 39 and 55 years. The first group is control group made up of healthy examinees without previous war experience. Second group are veterans without PTSD, and third group are veterans with PTSD. All examinees were treated through daily hospital at Clinic for Psychiatry, Clinical Center University of Sarajevo, where their serum lipids were determined.

**RESULTS:** After the data analysis, we came to this result: The average values of cholesterol in veterans with and without PTSD are significantly higher compared to control group. The same case is with average values of triglycerides and VLDL. HDL is significantly higher in the control group when compared to other two groups. The average values of LDL in the control group are slightly above the reference values, while in other two groups the variation is much bigger.

**CONCLUSION:** The average values of cholesterol, triglycerides, VLDL and LDL in veterans with and without PTSD are statistically higher when compared with the control group and those values are higher than the maximum reference values. Concerning HDL, average values in veterans with and without PTSD are statistically lower when compared with the control group, but are in reference range limit. Although there is a considerable statistical difference in average values of atherogenic index between the examined groups, still all values are in reference range limit.

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## Schizophrenia and other psychotic disorders like schizophrenia with emphasis on the length of stay and treatment in 2007 at the Psychiatric clinic KCU Sarajevo

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**INTRODUCTION:** It has been over two hundred years since schizophrenia was first described clinically, however, schizophrenia has remained a medical puzzle even today. Schizophrenia is a mental disorder of unknown etiology characterized by disorder of thought and perception and the affect is inadequate or numb. The name comes from the Greek words schizo-split, and fren-soul, mind, intellect, and from its name we can see that this is a disease in which there is no split between cognitive and affective processes.

**GOALS OF THE RESEARCH:** to determine the length of stay of 50 patients suffering from schizophrenia and other psychotic disorders hospitalized at the Psychiatric clinic KCU Sarajevo during 2007., and then determine the most commonly used therapy in the treatment.

**SUBJECTS AND METHODS:** the research which was conducted at the Psychiatric clinic KCU Sarajevo has retrospective, analytical-descriptive character. The subjects of this research are history of diseases of 50 patients with code diagnosis on discharge F20-F29 . Patients were elected by method of accidental sample. The method of the accidental sample we conducted after the election according to the protocol by taking from archive every third patient to number 50. From the history of diseases we took and analyzed the relevant variables.

**RESULTS:** Out of the total 50 patients, there were 28 women and 22 men which is 56% of women and 44% of men. The average age of patients was approximately 37 years, the youngest patient was 18 years old and the oldest 69 years. Average length of stay is 45 days, the shortest stay was 8 days, and the longest 109 days. Most patients were hospitalized from 1-2 months to 60%, and 16% achieved hospitalization for more than 2 months. Multiple hospitalizations had 64% of patients. 41 patients or 82% during hospitalization were receiving more than one psychotropic drugs, resto monovalent therapy. Remission is achieved in 34 patients or 68%.

**CONCLUSION:** In a larger number of patients the length of treatment was more than a month and the most commonly used therapy was polyvalenta.

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## Biological approach to suicidality

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Decreased serotonin function has been linked with suicidal behavior in a variety of psychological disorders. Research has shown that people who attempted committing suicide have a decreased serotonin metabolite - 5-Hydroxyindoleacetic acid (5-HIAA) - level in their cerebrospinal fluid. Decreased 5-HIAA is noticeably more frequent in persons who attempted committing suicide in a violent fashion. Some studies suggest that decreased 5-HIAA level can be a predictor of a future suicidal behavior.

A connection between low serum cholesterol level and suicidal behavior has frequently been reported, but it remains unclear how a low cholesterol level can be connected with brain functions linked with suicidal behavior. A study conducted by Lalovic and associates has shown that persons who committed suicide in a violent fashion have lower cholesterol levels in the grey matter than the persons who committed suicide in a non-violent fashion. There was no statistically significant difference in serum cholesterol levels between persons who committed suicide and those who attempted suicide.

A concept that genetic factors can contribute to suicidal behavior has sparked numerous researches that aimed to identify certain contributing genes. Up to now, studies have focused on the serotonin pathway, because suicidal intents and death by suicide itself have been linked with the serotonin pathway. Two genes have been shown to be of significance for suicidality: the first is the introne polymorphism (A218C OR A779C) of the tryptophan hydroxylase 1 gene (TPH1) - which is considered to be a quantitative risk factor for suicidal behavior, and the other one is the insertion/deletion of the polymorphism serotonin transporter gene (5-HTTLPR), which does not seem to partake in general suicidal behavior, but in violent and repetitive attempts of suicide. Furthermore, data shows that the MAO-A gene, which is linked with impulsive-aggressive personality traits, is not directly linked with suicide, but can induce violent suicide methods in patients that have other suicide risk factors.

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## Analysis of social and psychopathological elements in mental patients who perpetrated the criminal act of murder

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**INTRODUCTION:** Murder is one of the social phenomena that causes great public attention. Motives for the murder are determined by the court but also by the judicial experts, psychological and psychiatric experts whose objective findings help to prove the truth and to respond to the question why the murders actually occurred.

**GOALS OF THE RESEARCH:** To determine whether the persons with mental illness commit murder more frequently comparing to the rest of the population.

**PATIENTS AND METHODS:** The study was conducted as a retrospective study in central Bosnia during the period 1987-2013 based on the information from judicial expertise. All cases of murder whose perpetrators had had medical records that indicated some sort of mental illness, have been analyzed in this research.

**RESULTS:** Out of the total of 233 cases of murder, a separate group of 37 cases in which the perpetrators of murder had some sort of mental illness before the crime. Risk factors for committing murders are: alcohol-89 cases, state of the amended affect-79, psychosis-37, without the influence of psychopathological-27, infanticide-1. The age structure of the murderers: 20-29 years-6 cases, 30-39 years-18, 40-49 years-6, 50-59 years-6, over 60 years-1. Education: incomplete primary school-2 cases, primary school-15, high school-19, college degree-1. The way in which crimes had been committed: choking-1 case, cold weapon-27, firearm-8, car trampling-1. Place of crime: house-22, restaurant-3, a public post-15, office-5. Number of victims: 1 victim -27 cases, 2 victims-6, 3 victims-1, 4 and more victims-3. Relationship between the victim and the perpetrator: parent-8, child-4, a member of the family-11, an acquaintance-9, a passer-10, an official person- 3. Diagnosis: schizophrenia-13, paranoid schizophrenia-17, paranoia-5, a behavior disorder-1, psychotic disorder-1. Health status before: without seeing a doctor-10, outpatient treatment-2, inadequate treatment-10, repeatedly hospitalized-15.

**CONCLUSION:** The existence of a mental illness cannot be considered to be a risk factor for the execution of the crime of murder.

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## Prevalence of severe anxiety and depression in patients with headaches (pilot study)

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**INTRODUCTION:** One of the most frequent neurological disorders is headache. The International Headache Society had declared two types of headaches, primary and secondary. Migraine as a type of primary headache is one of the most common types along with tension headache and affects the quality of life of the patients.

**AIM:** The aim of this study is to determine the prevalence of severe anxiety and depression in patients with headaches compared to healthy controls.

**MATERIALS AND METHODS:** A total of 28 patients (mean age:  $46.4^2 \pm 16.29$ ; 21.4 % male, 78.6 % female) with headaches and 50 healthy controls (mean age:  $25.62 \pm 7.59$ ; 18% male, 82% female) were screened for severe anxiety and depression using the Beck's Anxiety Inventory (BAI), Taylor's Manifest Anxiety Scale (TMAS) and Beck's Depression Inventory (BDI). The patients were divided in two groups: with migraines (42.86%) and with non-migraine headaches – other primary and secondary headaches (57.14%).

The results were analyzed descriptively and using chi square test, Pearson correlation coefficient and Fisher's exact test in IBM SPSS Statistics 19.0 program.

**RESULTS:** 50% of the patients with migraines had severe anxiety (mean BAI:  $23.67 \pm 17.45$ ), 16.6% moderate and 25% severe depression (mean BDI:  $18.75 \pm 14.25$ ). 14.3% of the non-migraine headache group of patients had severe anxiety and severe depression. Compared to healthy controls, anxiety was higher in patients with migraines ( $p < 0.0127$ ) as well as depression ( $p < 0.00207$ ), but not in non-migraine patients (anxiety:  $p > 0.6269$ ; depression:  $p > 0.2453$ ).

Correlation between anxiety and depression was strong in both, patients with migraines ( $r = 0.801$ ) and non-migraine headaches ( $r = 0.776$ ).

**CONCLUSION:** Severe anxiety and depression are more prevalent in patients with migraines but are not more prevalent in patients with other types of headaches compared to healthy individuals. However, the number of the patients involved in the study is too small to make a definitive conclusion and requires further investigations.

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## Neurofeedback used for the enhancement of fluid intelligence: A Slovenian study

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The broad area of modern neuroscience is constantly applying electroencephalogram (EEG) biofeedback training, also known as neurofeedback training (NFT), for the improvement of functioning of healthy and/or clinical population. NFT has gained reputation not only as an intervention tool for those with ADHD (Holthamer, 2008; Arns, de Ridder, Strehl, Breteler & Coenen, 2009) and epilepsy (Serman & Egner, 2006), but also as an enhancement of various artistic performances, such as music performance (Egner & Gruzelier, 2003), sports (Hammond, 2007) and cognitive processing, underlying learning (Dempster & Vernon, 2009), working memory (Keizer, Verment & Hommel, 2010), creativity and last but not least: intelligence (Keizer, Verschoor, Verment, & Hommel, 2010). Aim of this study was to determine whether the usage of NFT results in higher capacity of fluid intelligence. 35 psychology students, divided into a control (n=17) and experimental group (n=18) participated in 25 individual research sessions. Test-Retest differences in the experimental group were observed in theta and lower alpha frequency band. The assumption that was tested: the increase in parietal theta frequency band over frontal theta frequency band positively correlates with improvements in fluid intelligence, measured and monitored by Raven's Progressive Matrices. Although the results were not statistically significant, there is a tendency that increased parietal activity correlates with better results on tasks of fluid intelligence. Despite the inconsistency of results with our expectations, further research is recommended.

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## Musical preferences and their impact on the psychosocial development of adolescents

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In adolescence is affinity to a musical genre one of the important factors of expressing identity and expression of group affiliation.

Adolescence is the period in which comes to opposing parental opinion and inclining toward peers who belong to a specific subculture. Listening to the same kind of music, adolescents want to build their own sense of belonging to a particular social group.

The aim of this study was to determine to what extent the preference for a certain style of music helps in socialization among peers, how music influenced the development of personality and the extent of their peers when choosing musical preferences.

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## Recognition of facial expressions during menstrual and late follicular phase of menstrual cycle

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Studies of activating sex hormones effects, showed greater efficiency of females during menstrual phases, which are characterized by higher levels of sex hormones. Since the right hemisphere is responsible for the recognition of emotions, and high levels of estrogen have an inhibitory effect on the right hemisphere functioning, better performance could be expected in the task of recognizing different facial expressions in the menstrual phase, when hormone levels are at the lowest possible level. On the other hand, according to the evolutionary hypothesis, greater success in the tasks can be expected during the late follicular phase, when conception is possible. Main goal was to examine the effectiveness in task of emotional recognition of happiness, sadness, fear and pain, during menstrual and late follicular phase. In examination participated female students ( $N=30$ ) of Mostar University, age 19-24, with regular menstrual cycle who didn't consume oral contraceptives. In the purpose of this study, was constructed task of recognizing emotional facial expressions (happiness, sadness, fear, pain) which examinees performed two times (2. and 13. day of cycle). As performance parameters were used time of recognition, expressed in milliseconds, and number of errors. The obtained results showed no statistically significant differences in the efficiency in performing tasks, given in the different phases of menstrual cycle. Analyses showed significant differences in time recognition of different facial expressions, which was later confirmed by analyzing the number of errors, too. In conclusion, it can be said that the hypothesis of activational effects of sex hormones has not been confirmed. Also, the assumption of greater success in recognition task, in a time when conception is possible, according to evolutionary hypothesis, has not confirmed.

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## Verification of perceptual theory through the analysis of reactiontime conditioned by context and accuracy of sentence

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A classic debate in cognitive psychology and cognitive science has concerned the format in which information is stored and manipulated in the human brain. According to perceptual symbol theories, the complete representation of an object, called a simulation, should reflect physical characteristics of the object. Amodal theories, in contrast, do not make this prediction. The goal was to compare amodal and perceptual theories in sentence-picture comprehension task. It was assumed that the reaction time is going to be shorter in situations with adequate context compared with reaction time in situations with inadequate context, all that in correct sentences. In contraire, in incorrect sentences, it was supposed that the reaction time is going to be longer in situations with adequate context compared with reaction time in situations with inadequate context. Shorter reaction time in situations with correct sentences was also assumed because of fewer mental operations required in process of comprehension. We tested the hypothesis, derived from perceptual symbol theory, suggesting that people mentally represent context in which they are used to see the person mentioned in verbal description. Context (adequate-inadequate) was manipulated by having participants read a sentence that implicitly suggested a particular context for an object. In order to vary a context, four groups of professions of public people were selected (a football player, a handball player, a politician and a singer). After reading a sentence, subjects were presented with a set of pictures. Forty-eight black-and-white pictures were used in this experiment. Then, reaction times in each of the situations were measured. In this experiment, thirty-nine male students were the participants ( $N=39$ ). There was no difference ascertained between reaction times in correct and incorrect sentences. With pictures matching the context of the object implied by the sentence the response was faster than with pictures that did not match the context when the sentence is correct, and conversely when the sentence is incorrect. The finding is interpreted as offering support for theories positing perceptual symbol system.

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## Differences in gender and hypoxic ischemic brain injury in newborns in neonatology department of the University Clinical Hospital Mostar

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**AIM:** Aim of this research was to determine prevalence of perinatal brain lesions, and to determine the connection of patoanatomical lesions with gestation age and the connection of gestation age with neurological clinical presentation (hypoxic-ischemic encephalopathy – HIE) and then determine outcome of the treatment considering of patoanatomical lesions and neurological clinical presentation (HIE).

**PATIENTS AND METHODS:** Patients were neonatal children treated on Department of neonatology and intensive care at the Mostar Clinical Hospital under diagnosis of perinatal brain lesions in period between 1st of the January 2003. and 31st of the December 2004. Materials were used from protocols and histories of diseases. In statistical analysis we used  $\chi^2$ -test.

**RESULTS:** The prevalence of perinatal brain lesions on Department of neonatology and intensive care at the Mostar Clinical Hospital was 40,1/1.000 live born children. There was 48 (45,3%) pre term and 58 (54,7%) on term born children. Research shown greater participation of male children (67%) than female (33%). We found statistically important difference in the patoanatomical type of lesions in the connection to the gestational age. According to those results in pre term born children intracranial bleeding of second stage was predominant and on term born children brain oedema was predominant. The results have shown that there was no connection between gestational age and neurological clinical presentation. HIE of second stage was predominant in both groups of children.

**CONCLUSIONS:** In this research we determine greater presence of intracranial bleeding in group of pre term born children and brain oedema in group of term born children. HIE of second stage was predominant in both groups of children.

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Parkinson's disease (PD) is a chronic neurodegenerative disorder which affects 1% of the population aged 60 and over. The etiology of PD has not yet been fully clarified, although it is known for years that the patients suffer from degeneration of dopaminergic, primarily nigrostriatal neurons. It is assumed that the disease results from interaction of genetic and environmental factors. An important role is attributed to the action of free radicals, mitochondrial dysfunction and oxidative stress mechanism.

Many recent researches are focused on the connection between the effects of various environmental factors and lifestyle of the development and progress, but also in the diagnosis and treatment.

Interestingly, the strongest evidence of clinical trials on the role of environmental factors and lifestyle in the development of PD are those of smoking as a protective factor. Unlike nicotine, studies regarding consumption of caffeine and black coffee, still have no definite results and precise indicators to confirm caffeine as a reducing factor of PD.

In these studies, FTQ (Fagerstrom Tolerance Test) has proved to be a very good tool in the assessment and analysis of habits (like smoking and drinking caffeine), and their impact on the PD. We applied FTQ to a study group of patients with varying disease activity.

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## Flail-arm syndrome – clinical variant of amyotrophic lateral sclerosis

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**INTRODUCTION:** Motoneuron disease (MND) is an acquired, rarely hereditary neurodegenerative disorder of motor neurons with progressive flow. The most common form of MND is amyotrophic lateral sclerosis (ALS), a progressive and fatal disease. Studies have shown MND as consequence of the activity of genetic factors, environmental factors and style of life. In acquired forms the cause is not known, but there are some indications that the cause may be trauma, physical activity and exposure to chemical substances. Rare type of MND, variant of ALS, is flail-arm syndrome (FAS) it manifests with signs of lower motoneuron disease in upper extremities and does not affect or minimally affects bulbar muscles and lower extremities in the early stage of disease.

**CASE REPORT:** 70-year old man, hypertonic, has been admitted because of progressive weakness in upper extremities over 6 months. Nobody in her family has not had similar symptoms. Examination has shown symmetrical weakness mostly in upper extremities and shoulders, hypotrophy of the deltoid muscle and supraspinatus muscle on the right side. MR cervical spine has shown diffuse degenerative changes, narrow spinal canal and compression of spinal cord in C5 / C6 segment, without signs of myelopathy.

**CONCLUSION:** Taking in account the clinical signs and symptoms, the patient has flail-arm syndrome. A coexistence of FAS and cervical spondylosis that causes trouble in diagnostics has been seen in literature.

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## The incidence of Guillain-Barré syndrome in in the Primorsko-goranska county during the time span of last three years

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**OBJECTIVE:** The aim of this/the study was to examine the incidence of acute polyradiculoneuritis (Guillain-Barré syndrome) in the Primorsko-goranska county of northwestern Croatia.

**MATERIAL AND METHODS:** We analyzed patients admitted at the Neurology Clinic, University Hospital Centre of Rijeka, in the time span of three years. We analyzed demographic data, severity of clinical picture, therapeutic procedures and treatment outcome.

**RESULTS:** During the time span of three years, 14 patients with acute polyradiculoneuritis (Guillain-Barré syndrome) were treated at the Neurology Clinic, University Hospital Centre of Rijeka. 8 patients had mild clinical picture, and 6 patients who had severe clinical picture required intensive care treatment. 3 patients required artificial mechanical ventilation. 11 patients had an infectious disease two weeks before symptoms of GB begun. All patients received immunoglobulins in the dose of 2g/kg of body mass. The patients were surveilled during the six months. 12 patients had favorable outcome (mRs 0-2), two patients had severe neurologic deficits, and there were no lethal outcomes.

**CONCLUSIONS:** The study support the notion that the incidence of Guillain-Barre syndrome in the Primorsko-goranska county is consistent to the incidence previously described in the literature. It is important to provide an accurate diagnosis as quickly as possible and to begin a treatment program immediately together with early neurorehabilitation to reduce potential residual neurological deficits.

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## Anaplastic ganglioglioma in a young men – A Case Report

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Gangliogliomas account for only about 1% of all intracranial neoplasms. They are most common in children and young adults and the most frequent clinical presentation are seizures. The typical gangliogliomas (WHO grade I and II) are intracranial tumors with benign character and behavior. Five percent of gangliogliomas are more aggressive (WHO grade III) and usually develop after radiotherapy for a benign ganglioglioma.

We report a case of a 28-year-old male with earlier anamnesticly verified headaches localized frontally who is observed in Clinic of Neurology c, University Hospital Center Osijek because of an initial epileptic seizure. Intracranial examination showed a right, frontoparietally positioned expansive process, suspected to be a glial tumor. Neurosurgical treatment is planned and given in Clinic of Neurosurgery, University Hospital Center Zagreb. Histopathology examination showed a ganglioglioma (GII/II). After surgery, patient underwent radiotherapy. Control MR after six months showed suspect recurrence of primary disease. After new neurosurgery treatment, the diagnosis of anaplastic ganglioglioma (GIII) was proven and patient underwent chemotherapy with temozolomide. In subsequent neurosurgical, neurological and neuroradiological control examinations there were not new signs of progression or recurrence.

Although the optimal treatment for anaplastic ganglioglioma has not been established, patients who were treated surgically with adjuvant radio- and chemotherapy have better prognosis without progression or recurrence.

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## Speech changes in dementia

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**INTRODUCTION:** Dementia is a combination of signs and symptoms associated with the declining of the brain function. It affects cognition, emotions, personality, behaviour and speech, as well. Speech is processed in the Broca's area which in the majority of people lies in the left hemisphere. Psycholinguistically, speech production involves message generation, making the language plan and articulation. In speech, dementia reflects both in the content and form: with hesitations, aphasia, neologisms, slowed speech, creative use of language, poor concentration to the topic of the speech, chaotic and nonsensical speech, confabulations, abnormal vocalisations, avoidance of communication and (parent) fixations.

**AIM:** The aim of the research was to identify the differences between speech by the demented and non-demented elderly.

**METHODS:** Thirty texts by people over 65 were analysed: fifteen by the demented and fifteen by the non-demented. The speakers were shown a drawing from the Boston Diagnostic Aphasia Examination and asked the question »What do you see?«. Texts were recorded, transcribed and analysed according to the content and form.

**RESULTS:** The texts by the demented – some will be presented during the presentation – are shorter than the texts by the non-demented and include less information. The texts by the demented are characterized by the focusing on the unessential, literal understanding, inability of abstract thinking, well-preserved automatic speech and social phrases and the end-of-the-tongue states. The greatest differences are seen in the number of causal-consequent relations mentioned in the text, the number of non-lexical words used, the ratio between the verb 'be' and all verbs, and the number of self-corrections.

**CONCLUSION:** The main difference between the demented and non-demented speakers is that the demented are less capable to compensate for the deficits that weaken their speech capacity than the non-demented elderly.

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## The incidence of the 'restless legs' syndrome in the population of Bosnia and Herzegovina

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**OBJECTIVE:** The aim of this study was to obtain the frequency of Restless Legs Syndrome (RLS) in the population over 18 years of age in Bosnia-Herzegovina as well as its distribution among age groups and genders.

**SUBJECTS AND METHODS:** The sample consisted of 1,328 persons of both sexes older than 18 years. The sampling was done in two ways: through a random sample telephone survey (651) and an oral survey 'on the street' (678).

**RESULTS:** Out of the 1,328 respondents, 602 men/ 726 women. The frequency of RLS in the surveyed population was 8.20%, with the female/male ratio 2:1. In relation to the total number of those found with RLS, male/female ratio was 31 (5.15%)/78 (10.74%). Differences in the severity of the condition singled out 14 mildly affected patients (12.84%), 41 moderately affected (37.61%), 45 severely affected (41.28%) and 9 profoundly affected patients (8.26%). The random sample telephone survey, which involved 651 persons (342 male/ 309 female), revealed 65 respondents with the symptoms of RLS or 9.98% (25/7.31% male and 40/12.95% female). The oral 'on the street' survey, involved 678 respondents (260/38,35% male and 418/61,65% female), revealed that 44 (6.49%) of them suffered from the symptoms of RLS (6/2.31% male and 38/9.09% female). Differences are not statistical significant.

The respondents were split into three age groups. The first age group was comprised of respondents aged between 18 and 34, the second between 35 and 54, and the third with older than 55. The largest number of affected belonged to the second age group (35-54 years/51,38%).

**CONCLUSIONS:** The results obtained in this study indicate that there are 8.20% of Bosnia-Herzegovina population over 18 years suffering from the symptoms of RLS, with female/male ratio 2:1, and most frequent in the 35-54 years group.

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## Rhes – a protein which sheds more light on Huntington Disease pathogenesis: review

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Huntington's disease (HD) is neurodegenerative genetic disease caused by autosomal dominant mutation. Main symptoms include chorea, hyperkinesia, dementia and psychosis. The disease occurs when the number of cytosine-adenine-guanine (CAG) repeats exceeds a certain threshold in a defect HD gene. This consequently brings to production mutated Huntingtin proteins (mHtt) with polyglutamine tracts (polyQ).

Even though mHtt is a constituent protein in a variety of tissues, neurons within the corpus striatum and cerebral cortex are affected the most in HD. Research has been carried out to identify why specific regions are most affected. No solid pathogenic pathways have yet been found which support the traditional assumption that the dopamine system was key.

Using a different approach scientists discovered a connection between HD and Rhes, a protein enriched in striatum.

In interaction with mHtt Rhes augments its cytotoxicity which leads to a more severe case of HD with a damaged corpus striatum in the background.

As this is fairly new research there are still uncertainties, nevertheless shall I try to present the newest findings in this review from several different articles. Even though we shouldn't get ahead of ourselves, it wouldn't be overly bold to state that this newfound knowledge might lead to new therapeutic approaches in HD and other pathogenic similar disorders, something which we'll also look into.

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## The relationship between cortisol levels and optimism in patients with newly diagnosed cancer

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**AIM:** The aim of this study was to determine correlation between optimism and cortisol levels in patients with newly diagnosed cancer in the University Clinical Hospital Mostar. We expect that there will be differences in the levels of cortisol in patients with newly- found malignancies in the levels of pessimism and optimism, nor in the distribution of age groups or by gender.

**SUBJECTS AND METHODS:** The study included 30 (18 men and 12 women) patients with histologically verified diagnosis of malignant diseases of various systems that came on first inspection to the Department of Oncology. Patients met briefly with the design and purpose of the research, and they were asked to participate in the study and signed an informed consent.

In patients diagnostic methods did not found metastatic changes in the adrenal glands or the brain. The patients did not receive any corticosteroid agents or spironolactone, and did not suffer from Cushing's or Addison's syndrome.

The purpose of this research a questionnaire with general information about the participants, which included questions that were related to their gender and age, education, marital status, satisfaction with health, information on religion, employment, and the financial condition.

In order to test the level of optimism / pessimism applied the Croatian version of the Scale of optimism and pessimism (Chang, 1994; according PENEZIĆ, 2002). Purposes of evaluation styles of coping with stressful situations questionnaire used to cope with stressful situations (Eng. Coping Inventory for stressful Situations, CISS ) (Endler and Parker, 1990a, 1990b; according Soric and Proroković, 2002). The questionnaire is measuring coping styles as a stable personality trait (according Soric and Proroković, 2002. Checking the psychometric characteristics of the scale was found that the scale demonstrates satisfactory reliability of internal consistency, and types of test-retest (by Soric and Proroković, 2002). At our sample reliability of the scale is satisfactory and it was 0.84, and subscale ranges from 0.696 to 0, 83.

**RESULTS:** Analysis of the results showed no significant gender differences in the level of optimism and pessimism (Table 1). As for coping gender differences were found only for coping subscale focused on the task. Men were achieved more results on this subscale than women.

In order to determine whether the respondents in the studied variables



with respect to age was made a division of the respondents into two groups: a group of young and elderly groups. No significant differences in measures of self-evaluation.

Furthermore, the purpose of the study subjects were divided into groups of those high on the subscale of optimism and those low on the dimension of optimism. In order to determine subjects high and low on the optimism subscale scores were converted to values. The test showed no significant differences in cortisol levels between those high and low on optimism.

They also tested the differences in the level of cortisol in those high and low on the subscale of pessimism. There were no significant differences in cortisol levels between those high and low on the subscale of pessimism. Both groups achieved baseline cortisol levels.

There was no significant correlation between levels of optimism and cortisol levels as well as levels of pessimism and cortisol.

In the total sample of patients with newly-found cancers were more optimistic.

**CONCLUSION:** Given that we were doing research on a sample of patients with newly detected malignant disease of various organ systems that have not been exposed to the treatment of the malignant disease and did not have metastatic disease, we had a total sample of baseline cortisol, the more the scale of optimism, and we did not have differences in gender and ways of coping. Further research should include the duration of the disease or to make a comparative study on patients who were treated for a longer time malignancy.

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According to the biopsychosocial model, attention focusing to the painful sensation plays an important role in the ethiology of the irritable bowel syndrome (IBS). Chronic pain results in focusing on the pain which then leads to the increased experience of pain and the symptoms of IBS. The goal of the present study was to examine visual spatial attention distribution change in patients with IBS. 27 patients with diagnosed IBS were engaged in an experiment where Navon's global/local task and questionnaire which measures neuroticism, trait anxiety and visceral anxiety were used. The results showed a typical global precedence effect in patients with IBS. In line with that, global precedence index (the difference between reaction time in global and local task) and neuroticism negatively correlated. Patients high in neuroticism showed smaller global precedence index or higher reaction variability. On the other hand, global precedence index was not significantly correlated with trait and visceral anxiety, which shows that anxiety is not a performance moderator in global/local task.

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## The influence of therapeutical horse-riding on improvement of psychological functions in cerebral palsy patients

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**INTRODUCTION:** The Cerebral Palsy (CP) is an illness that appears as a consequence of a brain damage suffered during the early phases of development – before birth, during the birth or after the birth up to the second year of age of an infant. The characteristic clinical sign of CP is motorical insufficiency that manifests as abnormal patterns of position and movement of the body and limbs, combined with abnormal muscular tone and its distribution. Therapeutical horse-riding and hipotherapy are recognized as rehabilitation methods which could improve some of the physical, psychological and social functions and to make learning easier for the disabled people.

**THE AIM:** The goal of the research was evaluation of some psychological functions in a group of attendants of therapeutical horse-riding conducted to improve their physical functions.

**MATERIALS AND METHODS:** An anonymous questionnaire, designed for this research, was used to obtain the data. The evaluation of presence of particular features was achieved by 1-5 scaling, in which smaller numeric value represented lower level of presence of particular psychological feature and vice versa.

**RESULTS:** The results of the research showed that disorders of psychological functions can be identified as concomitant disorders in the group of people who suffer from Cerebral Palsy. Statistically significant differences were found for every feature in the first and second measurement, as well as statistically significant differences of total scores in first and second measurement.

**CONCLUSION:** As a conclusion, therapeutical horse-riding has positive effects on studied psychological functions of people who suffer from Cerebral Palsy, and for this reason can be recommended as a complementary therapy in habilitation treatment of these patients.

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## Epilepsy and sexuality

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We are defined as sexual beings from the moment of our birth. Sexuality is an important part of each and every one's life. The way an individual express its sexuality is unique and it depends on many factors, including gender, age, sexual orientation, cultural background, life experiences and some medical factors.

Epilepsy is one of the most common neurological disorders among all neurological diseases.

It affects a person's self-confidence, as well as understanding their own or another's body image, mood and several numbers of factors that are important in social relationships.

Epileptic seizures have origins in brain parts associated with sexual function (temporal and frontal lobes of the great brain), that can also be damaged, and cause negative effects in the sexual life. In addition, the areas that experienced seizures can cause contrary consequences, such as a feeling of sexual pleasure.

We should not forget the psychosocial factors (such as anxiety and stigma) of the disease itself that most certainly affects the sexual lives of patients with epilepsy.

Clinical studies show that about one quarter to one third of patients with epilepsy have sexual dysfunction, but also that the vast majority of people with epilepsy (in whom the disease is well controlled) have a normal, satisfying sex life.

Moreover, people with epilepsy often consider themselves inferior, and therefore unattractive to the opposite sex. The problem in that is the fear that causes the avoidance of emotional and intimate relationships with other people.

We should not forget the fact that anti-epileptic therapy itself can affect on sexual dysfunction. Drugs used to treat epilepsy have common side-effects such as erectile dysfunction.

Clinical studies in large groups of patients with epilepsy show that sexual difficulties were more expressed and found to be more significant in groups where the seizures have began before the adolescence age.

In studies of sexual dysfunction involving men and women with epilepsy, the assessment of sexual function that were showed in The Arizona Sexual Experience Scale (ASEX) (which we used in our study) were very helpful.

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# Poster Session



## Motor learning in the rehabilitation persons with disability

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Motor learning presents a set of procedures associated with experience which lead to the relatively permanent changes in the ability of motor functioning in person.

The aim of this work is to sublime scientific knowledge about motor learning, its characteristics and special features and possibilities of using this concept in the treatment of persons with disability. Theoretical elaboration of the problem was performed by examining the available literature, searching electronic databases, using the services of Serbian Library Consortium for Coordinated Acquisition.

References from the literature show that the motor learning is characterized by increased quality of the movement with repetition; that achieved quality of movement persists in a longer period of time without any movements; that the participation of the conscious movement control of the motor action is reduced and the variability in movement execution during learning is decreased as well as that the possibility of finding a of developmental coordination disorder and cerebral palsy, and only recently. The literature is significantly deficient in knowledge of the potential rehabilitation treatments based on motor learning in persons with other physical impairments, with sensory impairments and with reduced intellectual capacity, although some authors believe that the principles of motor learning are applicable to a much wider range of children with impairments.

It can be concluded that there is a basis and justification for the use of motor learning in the rehabilitation of persons with various forms of impairments, along with the appreciation of all the specifics of these populations, including atypical learning strategies as a direct result of atypical development. However, this issue needs to be further illuminated by future research, primarily empirical.

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Huntington's disease (HD) is an autosomal dominant, progressive neurodegenerative disorder. It is characterized by multitude of different symptoms including choreiform movements, psychiatric disturbances and cognitive deterioration. Underlying molecular genetic defect is an expanded cytosine-adenine-guanine (CAG) repeat in the huntingtin gene which leads to creation of the huntingtin protein containing polyglutamine repeats. The mutant huntingtin is misfolded, resists degradation and causes neuronal dysfunction and eventual cell death. Recent studies have shown that oxidative stress is one of the key pathophysiological steps in HD. Oxidative stress is an imbalance between the production of reactive oxygen species and a biological system's ability to readily detoxify the reactive intermediates or easily repair the resulting damage.

In this review we present data of newer studies which indicate the role of mitochondrial dysfunction, metabolic deficits, and increased oxidative stress in HD. Possible therapeutic effects of antioxidants in treatment of HD will also be covered with a special emphasis on the protective effects of peroxisome proliferator-activated receptor gamma coactivator 1-alpha (PGC-1  $\alpha$ ).

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## The importance of mild traumatic brain injuries in athletes

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**INTRODUCTION:** Mild traumatic brain injuries (MTBI) appeared in contact sports, bicycling, as well as in team sports as soccer, ice hockey, American football, basketball, are increasingly studied by scientists and clinicians, especially in children and adolescents. MTBI includes a transient complex mechanism of neural function disturbances due to traumatic biomechanical forces. Objective is to present a scientific background given by recent pathophysiological studies on sport-related MTBI, which pay attention to long-term consequences and cognitive deficits in cases of too early physical and cognitive exertion after injuring, especially in children and adolescents; to present recent understanding by which mild sport-related traumatic brain injuries should have more conservative approach in judging of recovery period before return to play.

**METHODS:** The base of PUBMED for articles published in last ten years was searched with key words: mild traumatic brain injury/concussion/sport/ athletes. Articles considered scientific and clinical standards upon which contemporary approach to the management of MTBI is based were reviewed.

**DISCUSSION:** New pathophysiological and neurocognitive research indicates that MTBI are more serious than was estimated before. Pathophysiologically MTBI includes diffuse axonal injury in initial phase as a consequence of the rotational force, activation of the inflammatory cascade, swelling, ischaemia, oxygen free radicals effects, ion disturbances and programmed cell death in the secondary phase. Release of neurotransmitters contributes to the secondary phase. Therefore, MTBI require more conservative approach regarding the return to play decision.

**CONCLUSION:** Physical and cognitive rest are imperative for the acute healing period. Children and adolescents with mild traumatic brain/head injuries require a longer recovery period than adults. In cases of too early return to play, new injury may lead to sustained consequences. Prevention is directed to use of protective equipment, to change of some playing rules, to unfair play discouraging as well to education.

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Intellectual disability is a condition of determined or incomplete mental development that occurs before the age of eighteen years of age and is accompanied by limitations in adaptive and intellectual abilities. Comorbidity is an occurrence of a clinical entity superimposed on the primary disease or condition. In persons with intellectual disability we find the frequent occurrence of comorbid psychiatric problems, than in those with average intellectual functioning.

The aim of this paper is to review scientific findings on the prevalence and characteristics of psychiatric disorders in persons with intellectual disability. Data used in this study were collected by searching electronic databases (EBSCO Host, ProQuest) available through the Serbian Library Consortium for Coordinated Acquisition.

The obtained results show that the data on the prevalence of comorbid psychiatric disorders in persons with lower levels of intellectual functioning vary and often depend on the diagnostic criteria, the methodology of the conducted research and the characteristics of the studied population. The presence of associated psychiatric disorders can be expected in 30% to 70% of people with intellectual disability. Incidence of psychopathology is related to the level of intellectual functioning, and in patients with more severe and more common finding associated disorders.

The authors point out that the same psychiatric disorders may also be seen in the population of persons with intellectual disability as well as in persons with typical development, but that difference in the manifestation of symptoms, their intensity and frequency is also visible. Also, it was observed that the most commonly described comorbid conditions are depression and schizophrenia, in which the focus of a large number of researchers are problems of detection and differential diagnosis of symptoms. Identification of mental impairments in persons with intellectual disability is difficult because of overlapping symptoms, limited verbal ability of subjects to report changes, reduced cognitive abilities of these individuals, as well as the lack of good metric characteristics of existing diagnostic instruments.

Although the findings of many studies suggest the increased prevalence of psychiatric disorders in persons with intellectual disability, difficulties in detecting comorbid psychopathology result in reduced opportunities for the inclusion of these persons in adequate treatments.

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## The rythm of life

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The influence of endogenous and exogenous biological rythms on health and general condition of human body is an essential concept in chronobiology. Development of new technologies, especially in the field of diagnostic imaging and genetical research, opens new possibilities in research in this area. Therefore, new theories regarding the role of biological rythms in ethiopathogenesis of various diseases and conditions have been suggested. Besides the already known effects of circadian rhythm on various physiological functions (vigilance, cognitive abilities, blood pressure level, pulse frequency, intestine motility etc.), it has recently been suggested that asynchronous or in some other way altered biological rhythms are somehow responsible for development of schizophrenia, mood disorders, cancers etc.

The aim of this research was to present the latest achievements in chronobiology and to suggest their potential in clinical medicine. As a part of this research, a questionnaire has been conducted in which 32 students of University of Rijeka have participated. The goal of this preliminary survey was to determine the relationship between certain physiological and unphysiological parameters.

The survey polled 15 male and 17 female subjects. Following parameters have been evaluated through solving online tests and by answering questions: ability to recognize rhythmic sequences, subject's chronotype, risk of developing a mood disorder and regularity of the menstrual cycle of female subjects. The analysis of the survey showed that subjects who have lower scores in rhythmic sequences recognizing test and whose results near to evening type have a statistically significant ( $p < 0.05$ ) higher risk of developing a mood disorder. Also, this survey has revealed a statistically insignificant ( $p = 0.2$ ) correlation between the irregularity of a menstrual cycle and the increased risk of developing a mood disorder.

The results of our research confirm the hypothesis that disturbances of biological rhythms, either endogenous or exogenous, can have an impact on the development of mood disorders. However, there is a need for further research, preferably on a larger number of subjects, in order to confirm and clarify this correlation.

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## Factors that determine the development of cooperation

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Throughout our evolutionary history, cooperation was the essential tool of survival. It is being experimentally researched within the framework of the game theory. We used a modified version of the 'prisoner's dilemma' to determine the development of cooperation in different conditions. The subject could choose between options 'split' and 'steal', where he or she could, depending on the option chosen by the opponent, win half of the money (in case they both chose 'split'), the whole amount of money (in case he chose 'steal' and the opponent 'split') or nothing (in case he chose 'split' and the opponent 'steal') in a specific round. The game consisted of 5 rounds, and it was possible to win a maximum amount of 10 kuna in each of them. One of the players was in fact an assistant in the experiment that used one of the following strategies: 'always steal', 'always split' or 'tit for tat' (split in the first round and then copy the last opponents' move). The goal was to determine the development of cooperation throughout the rounds considering the preset strategy of the assistant, and genders of both subjects and the assistants.

The rate of cooperation was 65% in the whole sample. When 'always steal' strategy is being used, the subjects quickly begin to punish the non-cooperative behavior of the opponent. On the contrary, they don't exploit the vulnerable position of the opponent in the 'always split' strategy, where very high rates of cooperation are being observed (over 85%). In the 'tit for tat' strategy, the cooperation rises as an answer to the cooperation shown by the opponent at the beginning, but it faces a sharp decline in the last rounds. The data showed no consistent differences regarding gender.

It can be concluded that the starting willingness to cooperate makes a crucial influence on the development of cooperation, but it doesn't necessarily guarantee cooperation in the late stages of interaction.

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## Study habits and chronotype of students of medicine in Osijek

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**INTRODUCTION:** Sleep is necessary for normal psychophysical functioning. Throughout their lives people go to bed and get up in accordance with their chronotype.

**AIM:** Considering the fact that medical students spend a lot of time studying, we were interested in how they manage to adjust learning habits to their chronotype and how it reflects on their academic success.

**SUBJECTS AND METHODS:** We examined a total of 332 medical students in Osijek (97 males). Information on chronotype, learning habits, academic success and basic information on the respondents were acquired using an anonymous questionnaire.

**RESULTS:** There were no significant gender differences in chronotype, success and study time. Statistically significant differences were observed in chronotype when comparing students of different academic success – less successful students had later chronotypes. There was no significant difference in the study time in groups by academic success or chronotype. Significant differences exist in the amounts of time of studying among the students in relation with age - younger students study more. The difference in chronotype distribution between students of different classes was not observed.

**CONCLUSION:** Differences in chronotype exist between students of different academic success, while differences in the amount of studying time exist between medical students of different years in Osijek.

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## Atypical antipsychotic in the treatment of depression with psychotic elements–case report

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We present the 33-year old female patient which appeared psychiatrist because of interferences from circuit depressive disorders. Clinical picture is dominated by apathy, loss of strenght and interest, insomnia, inappety, projection and fears prepsychotic level.

Due to this mental disorders, patient is hospitalized at the Clinic for Psychiatry, Clinical Hospital Centar Rijeka. The patient states that within two years she lost weight, 30 kilograms. During hospitalization, she was treated with medication (antipsychotic, antidepressant, hypnotic) and psychotherapy.

By drug therapy depressive symptoms are in reduction with an evident increase in body weight. The patient is satisfied, adequatly function in all spheres of life, compliantly in further future (daily-hospital program and ambulatory control).

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# Workshops



## Sexuality

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Sex therapy consists of an array of counselling and therapeutic procedures that aim at establishing individual sexual health and/or sexually healthy relationship, and also at alleviating consequences of sexual health disorders and enabling people to cope with them more satisfactorily. Although this kind of therapy has been developing for half a century worldwide, in Croatia structured education in sex therapy started out only a decade ago, and today there are nine licensed sex therapists that finished education founded and organized by the Croatian Association for Sexual Therapy.

In this workshop, a case study from the sex therapy that will show the complexity of sexual health issues, ways of approaching these issues and ways of dealing with them will be presented. Students will have an opportunity to learn how to take a sexual history and will become familiar with some of the counselling/therapeutic interventions used during sex therapy.

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## Drug addiction

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Addiction is nowadays defined as a chronic, relapsing brain disease. World Health Organization, taking into account the criteria of DSM-IV and ICD-10, recommended a comprehensive definition of addiction as a disease:

Addiction as a disease is defined as a psychological and sometimes physical condition that occurs due to the interrelationship between living organisms and (repeatedly taken) psychoactive substances, and is characterized by behavioral and other mental processes which always involve internal coercion (a sign of loss of control due to the overwhelming desire) to continue with occasional or regular use of substances in order to experience the pleasant effects or avoid suffering because of withdrawal, despite awareness of the presence of harmful consequences (health, social and other). Tolerance may or may not be present. A person may be addicted to several psychoactive substances at the same time.

Medical science in the field of drug addiction has remarkably progressed, so that opiate addicts, which few decades ago were considered as a quite incurable, today can be effectively treated.

Although addiction has historically been viewed as a disease of 'weak personality' and bad 'choices' that are made voluntarily by the addict, recent studies have revealed an underlying drug-induced activity changes in brain regions that are important for the normal processes of motivation. Nowadays, drug addiction is generally considered as a chronic relapsing diseases of the brain reward system ('pleasure center', motivation center), that is located predominantly in the limbic structures of the brain. Functional basis of the reward system is comprised of dopaminergic neurons in the ventral tegmentum that project to the nucleus accumbens, amygdala and prefrontal cortex. Drug-mediated activation of this system generates 'pleasure' signals which are by local neuronal circuits misinterpreted as a signals resulting from beneficial external events, what ultimately strongly motivate addicts to repetitive drug application, leading thus to vicious cycle of addiction. The associated behavioral changes occur secondary to permanent and strongly motivated efforts of addicts in order to restimulate brain reward system and to maintain its satisfactory activity.

Treatment for heroin addicts is a long (and lifelong) process, with unpredictable dynamics and final outcome. Addictive diseases are major social and medical problems with significant comorbidity and mortality. The basic elements of the therapeutic process are pharmacotherapy, psychotherapy, psychoeducation, rehabilitation, assisting in the search for

meaning in life, family psychosocial intervention procedure (social rehabilitation and reintegration), prevention of viral diseases, control urine sampling for entrusting abstinence, as well as parallel treatment of comorbid psychiatric disorders and somatic diseases. According to the estimates for 2009. in the EU, about 70% of all opiate addicts are treated with methadone. Others are treated with buprenorphine, and in a small number with SR morphine and codeine. For the treatment of addiction to opiates, in Croatia are available opiate agonists (methadone and buprenorphine), that are classified as a substitution therapy or maintenance therapy and which aim to avoid (or or diminish) withdrawal syndrome. In about 70% of cases of opiate addicts is possible to establish good control over addictive behavior, protect the overall health, reduce the risk of death and achieve a significant improvement in social functioning as the addicts themselves and their families.

New therapeutic efforts are based on the reduction of the transport of addictive substances into the brain - that approaches involve preparation of antibodies that form complexes unable to cross blood-brain barrier or enzymes accelerating the metabolism of the compounds in the blood.

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Today, when the communication over different monitors that allure us with special virtual worlds and social networks is increasingly replacing face-to-face communication, it becomes more difficult to discern nonverbal messages or we just misinterpret or ignore them completely. Words that we convey through interactions with others are, whether we like it or not, always accompanied with body language and can reveal much more than the spoken word. Posture, mikroekspressions, distance from the speaker, eye contact, facial mimics, gestures and many others are subtle ways of conveying emotions, attitudes, and overall internal experience that often even the speaker is not aware of (beside well trained politicians and actors). There is a reciprocal relationship between the physical expression of emotions and the way we read and interpret information about the emotional states. Facial expressions are an important source of information in communication, especially for the development of attachment and social learning. Measuring facial muscle movements scientists are discovering and interpreting the emotions, frauds and lies. Our body sends messages and at the same time mirrors the people around us. If we show to others spontaneity, openness, empathy, vulnerability and do not take defensive attitude those behaviours are more likely to be seen in others. Posture or certain facial expression affects not only how others see us, affects also our own emotions and thoughts and can change the way in which we see ourselves and the way we behave. Understanding body language is a precondition for any good communication and an essential part of the repertoire of skills especially in the helping professions, and they has to be incorporated in the personal and professional identity. Through this workshop we will try to identify and raise awareness of some of the nonverbal, body signals and explain their meaning.

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## Nucleolus – a timekeeper in the neural network

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Spacetime interaction requires understanding of space and time. Anatomy explains space by dismantling one into a multitude. Physiology teaches about the function as an emanation of space, ignoring the time. The point of pathology is transformation: space and time are changing, until the negation when space is no longer there and time has passed. Then, is it possible, from the viewpoint of anatomy, physiology and pathology, to claim that nucleolus has anything to do with time? The discussion uses the partition, interaction, emanation and above all the changes as an arguments that the nucleoli are timekeepers.

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## Misija.

Unapređujemo kvalitetu života  
kroz brigu o vašem zdravlju.

## Vrijednosti.

Timski rad. Izvršnost. Bliskost.

## Vizija.

JGL je internacionalna farmaceutska tvrtka sa širokim spektrom brendiranih generika, fokusirana na razvoj i proizvodnju lijekova za osjetila. Lideri smo u korištenju "blagodati morske vode u svrhu zdravlja.



[www.jgl.hr](http://www.jgl.hr)

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