

NeuRI 2015 / 5th Student Congress of Neuroscience

Other document types / Ostale vrste dokumenata

Publication year / Godina izdavanja: **2015**

Permanent link / Trajna poveznica: <https://urn.nsk.hr/urn:nbn:hr:184:564915>

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Download date / Datum preuzimanja: **2024-07-30**



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g r u s
volumen 3 supplement 2
april 2015
ISSN: 1849-5427



NEURI 2015

5th Student Congress of Neuroscience
with International Participation

EDUCATION & EXPERIENCE

—
Rijeka/Rab

24th – 26th April 2015

Gyrus vol III sup 2

NEURI 2015

5th Student Congress of
Neuroscience

24 — 26/04/2015

Impressum

GYRUS VOL III SUP 2

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PUBLISHED AND ORGANIZED BY

FOSS MedRi

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CO-ORGANIZED BY

University of Rijeka, Faculty of Medicine

Rab Psychiatric Hospital

PRINT

Printex, Čakovec

FOR PUBLISHER

Filip Đerke, Luka Fotak

COPIES

250

EDITOR

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The translations, opinions, findings, conclusions and recommendations presented in this Supplement do not necessarily reflect those of the Editing Board and are exclusively the responsibility of the Authors.

ENGLISH TRANSLATION

Hrvoje Omrčen

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Welcome note

Dear colleagues,

We live in a time in which new discoveries are being made in the field of neuroscience with every passing day and each new discovery opens up more and more questions about the way our body and mind function. New mechanisms of neuroplasticity and pathophysiology of certain neurological diseases are being discovered with every passing moment, giving us an insight on how our brain functions in terms of learning and memory. In time, all our (for now) unanswered questions will become a thing of the past. For now, we need to ask ourselves - What is consciousness? How do we perceive the world around us? Does free will even exist? If it does, how do we define it? Today, we are surrounded by technology that makes our everyday lives easier but at the same time technology changes the manner in which our brain functions, which raises even more questions. It is time we ask ourselves how long until humanity will be able to create artificial intelligence with the ability to simulate all of our brain functions? Today, neuroscience has truly become an interdisciplinary branch that connects biologists, geneticists, surgeons, psychiatrists, psychologists and computer technicians worldwide, all with the common goal of finally piecing the puzzle together and map the nervous system, from molecules to the most complex phenomenon we call the human mind. We are all welcomed to participate in these astonishing new discoveries and we hope that NeuRi – Student Congress of Neuroscience will play its small but important role in this global goal by creating a platform to all who are interested in studying the most puzzling organ of the human body – the brain.

We hereby welcome you to the 5th installment of NeuRi – Student Congress of Neuroscience in the city of Rijeka – the city “that flows” and on the sunny island of Rab!

Welcome to NeuRi 2015!

Luka Fotak
President of NeuRi 2015
Rijeka, 24th April 2015



Editor's Letter

Dear students and young doctors,

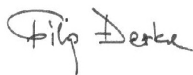
it is my great honour to welcome you to this international student congress, to the 5th Student Congress of Neuroscience - NeuRI 2015. The ever-growing number of participants is a testament to how widely recognized the quality and importance of NeuRI is.

It is very important for students and young doctors to have a place to present the results of their research and professional work.

As the Editor-In-Chief of Gyrus, I am very pleased that we have given you the possibility to publish the abstract book as a supplement to our Journal. The fact that you are taking the first steps of your scientific careers here in Rijeka and in our Journal fills me with pride.

NeuRI is not only an opportunity to acquire new knowledge and experience but also an opportunity to meet colleagues and start new friendships. I wish all of you a productive congress, lifelong memories and, of course, prosperous professional careers!

Filip Đerke,
Editor-in-chief

A handwritten signature in black ink that reads "Filip Đerke". The signature is written in a cursive style with a large initial 'F' and a distinct 'Đ'.





Organizing and scientific committees

Organizing committee

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Participants of the 3rd Student Congress of Neuroscience–NeuRi 2013; Faculty of Medicine Rijeka



Participants of the 2nd Student Congress of Neuroscience–NeuRi 2012; Rab Psychiatric Hospital



Participants of the 4th Student Congress of Neuroscience–NeuRi 2014; Faculty of Medicine Rijeka





Programme

FRIDAY, APRIL 24TH 2015

FACULTY OF MEDICINE, RIJEKA

14:00 - 15:45 REGISTRATION (Great Hall)

16,00 - 16,30 OPENING CEREMONY NEURI 2015 (Auditorium 2)

CHAIRPERSONS: prof.dr.sc. Gordana Župan, Igor Salopek, Luka Fotak,
Ivana Radovčić, Damir Čačić

16,30 - 16,45 GROUP PHOTO OF ALL PARTICIPANTS (in front of the Faculty)

16:45 - 17:45 PLENARY LECTURE (Auditorium 2)

prof.dr.sc. Goran Šimić: Macro- and microarchitecture of cognitive processing

CHAIRPERSONS: prof.dr.sc. Mladenka Tkalčić, Damir Čačić, Ema Karmelić

17:45 – 18:00 COFFEE BREAK (Great Hall)

18:00 - 18:30 SPONSOR LECTURES

18:30 - 19:30 STUDENT PLENARY LECTURE (Auditorium 2)

Igor Salopek: Mental illness Stigma – Peeling the Label

CHAIRPERSONS: prof.dr.sc. Ivanka Živčić-Bećirević, Luka Fotak, Ivana Radovčić

19:45 - 21:00 DINNER (Great Hall)

22:00 WELCOME PARTY

SATURDAY, APRIL 25TH 2015

PSYCHIATRIC HOSPITAL RAB

07:00 DEPARTURE BY BUS TO RAB (Ban Josip Jelačić Square)

10:00 - 11:00 PLENARY LECTURE (Congress Hall)

doc. dr. sc. Vesna Šendula-Jengiđ: Insight – between theoretical model and practice

CHAIRPERSONS: Nikola Babić, Maja Ploh, Emina Horvat Velić

11:00 - 11:15 COFFEE BREAK

11:15 - 12:45 STUDENT SESSION 1 (Congress Hall)

CHAIRPERSONS: doc.dr.sc. Vesna Šendula-Jengiđ, Matea Hrboka, Maša Lovrović

1. Ivana Rukavina: Insight into certain aspects of life of the hospital treated gambling addicts
2. Haris Beširević, Sead Čaušević, Edvina Ibradžić, Sinhad Golubović, Samra Pajazetović, Semra Pajazetović, Aida Šehanović: Munchausen syndrome- Case report
3. Marta Žutelija, Svetlana Imbrišić, Vanesa Vujičić, David Bonifačić, Dina Šverko Vižintin, Lidija Tuškan-Mohar: Is there any difference in emotional intelligence and general emotional experience after stroke?
4. Ema Bokulić, Nikola Šoštar: Ideomotor apraxia and dysphasia as a clinical manifestation of Hashimoto's encephalopathy- a case report
5. Dunja Vujčić, Matej Šapina, Matija Fenrich, Dario Brdarić, Katarina Badak, Marko Pirić, Dinko Puntarić: Assessment of autonomic nervous system using analysis of heart rate variability in young smokers and non-smokers
6. Zala Slabe, Samanta Knapić: Sexual orientation, brain structures and cognition
7. Janez Močnik: Loneliness and Promiscuity among MSM from Attachment theory perspective

12:45 - 14:00 LUNCH

14:00 - 15:30 STUDENT SESSION 2 (Congress Hall)

CHAIRPERSONS: dr. sc. Sanja Katalinić, Maja Mrak, Ema Ormanec

1. Ismir Kukić, Irma Ramić, Bahrija Golubović, Arzumana Ožegović, Ilvana Rabotić, Azra Avdić, Amra Frljak, Lejla Mazić, Elmir Čičkušić: Tuzla Brain Week - TBW 2015 "The brain and individuality"
2. Maja Ploh, Dolores Janko-Labinac: Computational media and multisensory approach in moderate dementia treatment
3. Matea Babić, Maria-Helena Ružić: Music therapy - rehabilitation of patients and stroke
4. Marina Ivanović, Aleksandra Krstić: The anatomy of swearing
5. Vanesa Vujičić, Svetlana Imbrišić, Marta Žutelija, David Bonifačić, Dina Šverko Vižintin, Lidija Tuškan-Mohar: The association between the occurrence of depression after stroke and rehabilitation outcomes
6. Đorđe Pojatić, Dunja Degmečić: Differences of general beliefs in a just world and anxiety levels between deaf and blind patients
7. Marin Lakić: Religion- invisible cure with the visible spectrum
8. Tena Ormuž, Josipa Brčić: Music therapy as a complementary approach with premature infants
9. Aida Pidro, Ada Đozić, Tarik Halimić, Emir Čokić, Enra Lukovac: Complications of herpes encephalitis

15:45 - 16:00 PSYCHIATRIC HOSPITAL RAB SIGHTSEEING

16:00 - 18:00 RAB SIGHTSEEING

18:00 - 20:00 RETURN TO RIJEKA

22:00 PART

SUNDAY, APRIL 26TH 2015

FACULTY OF MEDICINE, RIJEKA

07:30 - 08:30 BREAKFAST (Great Hall)

08:30 - 10:00 POSTER SESSION (Great Hall)

CHAIRPERSONS: prof.dr.sc. Daniela Malnar, Ana Rijavec, Ivan Franin

1. Hrvoje Galić, Hrvoje Bekina, Filip Martinez, Gordana Nedić Erjavec, Matea Nikolac Perković, Korona Nenadić Švigliin, Fran Borovečki, Nela Pivac, Dubravka Švob Štrac: Polymorphisms in the GluR5 glutamate receptor subunit gene (GRIK1) and alcohol dependence
2. Maja Badurina, Ana Filošević, Ivan Odak, Rozi Andretić Wladovski: Development of a new high-throughput assay for behavioral sensitization to psychostimulants in *Drosophila melanogaster*
3. Petra Cukon, Srđana Telarović: Cervical dystonia as the first sign of brain
4. Martina Fišić, Jelena Šimić, Lidija Tuškan-Mohar: Symptomatic epilepsy in acute stroke and chronic phase of stroke
5. Tanja Bukara, Milana Đorđevski, Monika Mačkić, Vlatka Sotošek Tokmadžić: Clinical outcomes of patients with penetrating gunshot wounds to the head
6. Anja Barač, Ivona Jerković, Petra Nimac Kozina: Primary angiitis of the central nervous system (PACNS)
7. Emir Bećirović, Majda Bešlagić: Palliative care for people with ALS
8. Franka Gregurović: Tibetan medicine- scientific foundation with particular reference to the basis and practice of mental hygiene
9. Anja Ključevšek, Nina Krohne: Biopsychological basis of mindfulness
10. Iva Lisica, Roberta Kobale, Josipa Marić: Holistic approach to treatment of a patient with Parkinson's disease
11. Marin Lakić, Iva Lakić: Down's syndrome- prejudices about mental ability
12. Anja Ivković, Martina Ilinić, Dunja Degmečić: Specific Phobia – Fear of Cockroaches
13. Andrej Hladnik, Maja Đorđević: Influence of fulfilled daily requirements for micronutrients and phytonutrients on the quality of life and successfulness in fulfilment of everyday activities

10:00 - 11:00 PLENARY LECTURE (Auditorium 1)

dr.sc. Goran Arbanas: Changes in DSM-5 regarding paraphilias and their clinical relevance

CHAIRPERSONS: dr.sc. Ksenija Baždarić, Iva Dumančić, Igor Salopek, Tena Piljušić

11:00 - 11:15 COFFEE BREAK (Great Hall)

11:15 - 12:45 STUDENT SESSION 3 (Auditorium 1)

CHAIRPERSONS: dr.sc. Goran Arbanas, Merljinda Ljušaj, Ana Mijić

1. Lejla Mazić, Adnan Salihović, Mirna Selimbašić, Nevzeta Mustafić: Epileptic and non epileptic neurological disorders in pediatric population
2. Fikret Višnić, Arben Taravari: Correlation between neurosis and psychosis with different types of dementia
3. Anis Cerovac, Almir Huremović, Harun Brkić: Neurosurgical therapy of the Chiari type I malformation with syringomyelia
4. Ermin Babajić, Šejma Beganović, Jasmina Grapkić: Huntington's disease-case report
5. Kristina Vrbanc, Igor Antončić, David Bonifačić, Siniša Dunatov, Lidija Tuškan-Mohar: Antiphospholipid syndrome
6. Diana Didović, Mario Habek: Rare etiology of postural orthostatic tachycardia syndrome
7. Matea Maslač, Martina Maslač, Danijela Šoše, Mladenka Vukojević, Arta Dodaj: Testing of individual differences in treatment outcome of patients with cancer metastatic disease in patients treated at the University Clinical Hospital Mostar

12:45 - 13:45 LUNCH (Great Hall)

13:45 - 15:15 STUDENT SESSION 4 (Auditorium 1)

CHAIRPERSONS: doc.dr.sc. Ingrid Škarpa-Prpić, Dolores Marinić, Ana Rijavec

1. Valentino Rački, Nika Gržeta, Kristina Jurdana, Jasenka Mršić-Pelčić, Natalia Kučić: Phenotype changes of microglial cells under various stimuli
2. Ana Dekanić, Miranda Mladinić: Research on factors that control the activation of spinalcord endogenous stem cells
3. Emina Karamehić, Hana Sikira, Maja Krilić, Refet Gojak: Epidemiological and morfological analysis of parameters for diagnosing meningitis on Clinical center of Sarajevo University in a period 2007-2014
4. Đula Erović, Danijela Knežević, Mira Samardžić: Atypical presentation of Subacute Sclerosing Panencephalitis
5. Domagoj Vučić, Ana Nikšić, Rajna Knez: Attitude towards asexuality
6. Ines Kovačić: Is it possible to live without cerebellum?

15:15 - 15:30 COFFEE BREAK (Great Hall)

15:30 - 16:30 STUDENT WORKSHOPS

I. Sanja Kovačić, Marko Sukreški: Childhood inactivity – a public health priority

II. Mirjana Orban, Želimir Skočilić: Neurobiology of common addictions-should medical students and professionals use THC?

16:30 - 17:00 CLOSING CEREMONY NEURI 2015. (Auditorium 1)

CHAIRPERSONS: Igor Salopek, Luka Fotak, Ivana Radovčić, Damir Čačić





Plenary lectures

Macro- and microarchitecture of cognitive processing

GORAN ŠIMIĆ

UNIVERSITY OF ZAGREB, FACULTY OF MEDICINE, CROATIAN INSTITUTE FOR BRAIN RESEARCH, ZAGREB, CROATIA

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In my talk I will try to integrate and interpret recent insights obtained with different structural and functional neuroimaging modalities such as fMRI, EEG/MEG, DTI, and SPECT/PET through state-of-the-art description of the several major neuronal networks of the cerebral cortex (the default mode network, networks for recognition of people and objects, spatial attention, linguistic abilities, episodic memory and emotions, executive functions and behavior). Then, I will describe discoveries in relation to evolution and functional specialization of “concept” neurons and their role in formation of long-term declarative episodic memories, as revealed by microelectrode recordings in epileptic patients. Finally, cognitive enhancement and therapeutic possibilities for selected neuropsychiatric disorders using transcranial magnetic stimulation (TMS - spTMS, rTMS) and transcranial electrical stimulation (TES - tDCS, tRNS, tACS) will be discussed.

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2200](http://dx.doi.org/10.17486/GYR.3.2200)

Insight – between theoretical model and practice

VESNA ŠENDULA-JENGIĆ

RAB PSYCHIATRIC HOSPITAL, RAB, CROATIA

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The phenomenon of insight in major mental disorders is a phenomenon of concern for theorists of psychiatric science, but also an issue that is crucial for the practical application of legal provisions in the field of mental health. The lecture will give a brief overview of the problem of insight into mental illness, particularly in major mental disorders, but will also discuss a number of other, peripheral issues that have ethical, prognostic, and even transcultural implications. From a clinical point of view, the question of insight into mental illness is one of the key issues in diagnostics and prognostics. Clinical practice and research findings consistently confirm that in order to understand the complexity of clinical symptoms and features of mental illness professionals have to acknowledge the patients' personal experience of their illness. In other words, the question of the actual treatment of persons with major mental disorders is based equally on insight and competences of both: patients and clinicians.

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2203](http://dx.doi.org/10.17486/GYR.3.2203)

Changes in DSM-5 regarding paraphilias and their clinical relevance

GORAN ARBANAS

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In 2013 new edition of the Diagnostic and Statistical Manual for Mental Disorders was launched after more than a decade of consultations, discussions and field trials, DSM-5 (Croatian translation was published in late 2014).

In regard to paraphilias, the most noted change from the previous edition is that paraphilias in themselves are not regarded as mental disorders, but one of many varieties of human sexuality. There is a distinction between paraphilias and paraphilic disorders. A paraphilic disorder is a paraphilia that causes distress or impairment, or entails personal harm or risk of harm to others. Therefore a paraphilia does not justify or require clinical intervention, only a paraphilic disorder does.

Diagnostic criteria for paraphilic disorders consist of two criteria: criterion A that specifies the nature of the paraphilia, and criterion B that specifies the negative consequences. Only those who meet both criteria would be diagnosed with a diagnosis of a paraphilic disorder. Those who meet only criterion A have a paraphilia, which is not a mental disorder. A paraphilia is nonnormative sexual behaviour or nonnormative sexual preference, which should not be pathologised.

Specific paraphilic disorders described in DSM-5 are: voyeuristic disorder, exhibitionistic disorder, frotteuristic disorder, sexual masochism disorder, sexual sadism disorder, paedophilic disorder, fetishistic disorder and transvestic disorder.

This new distinction should have impact on sexual rights, clinical work and everyday contact of professionals with people with nonnormative sexual preferences.

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2231](http://dx.doi.org/10.17486/GYR.3.2231)

Mental illness stigma – peeling the label

IGOR SALOPEK

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BACKGROUND: Stigmatization is a social reaction of identification (by stereotypes) and discrimination on the basis of characteristics and situations that are associated with an individual. Both, developed countries and developing countries have high appearance of stigmatisation of individuals suffering from mental illnesses. Thus, people with mental illnesses are very often disabled from achieving their basic human rights.

AIM: Previous studies have so far, paradoxically, shown that medical staff has been extremely stigmatising towards patients with mental illnesses. With this research we would like to determine the intensity of stigmatisation among medical students and the possibility of the impact of Psychiatry course on decreasing the mental illness stigma.

MATERIALS AND METHODS: This research was conducted among 4th year medical students (School of Medicine, University of Rijeka, Croatia) at the beginning and at the end of Psychiatry course. Standardized and validated questionnaire has been used to determine the elements of stigmatisation towards individuals suffering from schizophrenia, depression and PTSD.

RESULTS: We'll present detailed results of our research on the Congress, while our preliminary results demonstrate a decrease in stigmatisation among participants of the research after a month of intensive interactive Psychiatry course.

CONCLUSION: Interactive and contemporary education as a vital part of Psychiatry course could contribute to reducing mental illness stigma among future physicians. Nevertheless, it is necessary to do a follow-up studies to determine whether the level of stigma is reducing or increasing over time and, anyhow, to develop and implement anti-stigma activities as a part of lifelong education of health care professionals.

Keywords: psychiatry, stigma, mental illness, medical students, human rights

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2201](http://dx.doi.org/10.17486/GYR.3.2201)





Symposia

Insight into certain aspects of life of the hospital treated gambling addicts

IVANA RUKAVINA

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The term gambling means investing something valuable in an event that can result in greater and more favorable outcome with two main features: the existence of risk and randomness in the outcome. The main roles of gambling are fun and entertainment but for some people it can lead to serious problems in psychosocial functioning and then we talk about problematic or pathological gambling.

The main purpose of this research paper was to explore different aspects of lives of medically treated gambling addicts at the Psychiatric Clinic Vrapče in 2013 and 2014 by thorough analysis of their medical records in order to deepen general understanding of this type of addiction. The aim was to gain insight into the way of life and the course of developing addiction in patients treated for gambling addiction at the Psychiatric Clinic Vrapče.

The sample of this qualitative study was intentional and it consisted of nine people (seven men and two women) which were retained for treatment at the Psychiatric Clinic Vrapče in 2013 and 2014. The selection criterion was documented diagnostic code F.63.0 within their medical record – the abbreviation for pathological gambling propensity according to the International Classification of Diseases ICD – X.

The method of collecting data for this qualitative research was unobtrusive research method, specifically, the documentation analysis that focused on answering a set of questions previously made for carrying out the aim of this research paper.

Keywords: gambling, addiction, psychosocial problems, life aspects, medical record

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2203](http://dx.doi.org/10.17486/GYR.3.2203)

Munchausen syndrome – case report

HARIS BEŠIREVIĆ¹, SEAD ČAUŠEVIĆ¹, EDVINA IBRADŽIĆ², SINHAD GOLUBOVIĆ¹, SAMRA PAJAZETOVIĆ³, SEMRA PAJAZETOVIĆ³, AIDA ŠEHANOVIĆ⁴

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INTRODUCTION: Munchausen syndrome is a subclass factitious disorder wherein those affected feign disease, illness, or psychological trauma to draw attention to themselves. It is also sometimes known as hospital addiction syndrome. Syndrome shows predominantly physical signs and symptoms, but patients also have a history of recurrent hospitalization and dramatic, untrue, and extremely improbable tales of their past experiences.

CASE REPORT: Man (29) examined by a psychiatrist, as recommended by urologist. Two years ago patient came to a urologist because of pain in the testicle. In 2014 he had varicocele surgery. Since then he still has complaints like pains, swelling of the testicles, and that his urine and sperm contains blood and that they have strange smell. Biochemical analysis were normal. To patient were made CT and MRI of the pelvis, which also were normal. However, the patient continued to seek medical care and attention and looking for additional findings, but they were also normal. Than he shows dissatisfaction. Patient refuses treatment by a psychiatrist, because he can't help him. In the examination he constantly is seeking for re-hospitalization.

DISCUSSION: The exact incidence of Münchhausen's syndrome is not known. A survey of 106 hospital doctors in Germany estimated an incidence of factitious disorder of 1.3%. Studies suggest that up to 9% of hospitalised patients have a factitious disorder. 9.3% of patients presenting with fever of unknown origin were found in one study to be suffering from Münchhausen's syndrome. Patients are more commonly male, and their aged 30-50.

CONCLUSION: This chronic disorder is very difficult to completely cure. The infected person refuses treatment of this syndrome and when he feels he has discovered, than most often he goes to another health facility. The aim of psychotherapy is to change the habits and behavior of patient, and treatment outcome is very uncertain.

Keywords: Munchausen syndrome, factitious disorder, chronic disorder, psychological trauma

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2204](http://dx.doi.org/10.17486/GYR.3.2204)

Is there any difference in emotional intelligence and general emotional experience after stroke?

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INTRODUCTION: Emotional intelligence is a type of social intelligence that involves the ability to monitor one's own and others' emotions, to discriminate among them, and to use the information to guide one's thinking and actions. It is an important predictor of one's success in personal, social and professional life.

AIM: The aim of this study was to investigate if stroke impairs emotional intelligence and does it have any influence on the general emotional experience.

PATIENTS AND METHODS: We examined 40 patients, aged 60-85 years, with the first ever stroke and 40 control subjects matching age and gender. Patients with previous psychiatric treatment were excluded. We examined emotional intelligence with an Emotional intelligence questionnaire –UEK-45 (Takšić, 2001) and the general emotional experience with an Affect scale- SPNE 34 (Šverko, 2006, 2009). Half of patients were evaluated 5 to 7 days after the stroke, and another half one to three months after the stroke.

RESULTS: There wasn't a significant difference in the results of Emotional intelligence questionnaire between patients who suffered stroke and control subjects. However, the general emotional experience was significantly changed among stroke patients in comparison with control subjects. Patients in the early stage of a stroke showed significantly worse results in the Affect scale than patients who were examined after one month or more.

CONCLUSION: According results, we conclude that general emotional experience changes after the stroke, which can affect quality of life.

Keywords: stroke, emotional intelligence, affect

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2205](http://dx.doi.org/10.17486/GYR.3.2205)

Ideomotor apraxia and dysphasia as a clinical manifestation of Hashimoto's encephalopathy - case report

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Hashimoto's encephalopathy is a rare condition, classifiable as an autoimmune non-paraneoplastic encephalopathy. Euthyroid patients can also suffer from this disease. It shows no response to thyroid replacement therapy, but immunosuppressive therapy has proved to be very efficient in treating this disease. Two types of clinical presentation may be observed, the first being characterized by acute onset with focal neurological deficits and epileptic seizures, and the second by non-specific, subacute symptoms such as cognitive impairment, psychiatric disorders, myocloni, and tremor.

This paper reports the case of a 63-year old woman referred to a neurologist after being diagnosed with instability while walking, forgetfulness, hand tremor, and headache. Routine laboratory tests and CSF examination showed no abnormalities. Infectious etiology, neurodegenerative and systemic connective tissue diseases were excluded. Paraneoplastic and tumour markers were negative. After eight days, the patient experienced cognitive deterioration, motor dysphasia, ideomotor apraxia, myoclonic jerks of hands with a grand mal epileptic seizure. Antiepileptic treatment was started. Laboratory tests showed normal levels of T3, T4 and TSH with increased levels of anti-TPO and anti-hTG antibodies. Based on these results and AST screening tests (Apraxia Screen of Tulia), the patient was diagnosed with Hashimoto's encephalopathy. Daily treatment was started, with 5 plasmapheresis procedures and corticosteroid therapy. Due to good clinical response, the patient was soon discharged. After two months, due to relapse and the development of tremor, ataxia, dysmetria, and myoclonic jerks, pulse corticosteroid therapy was applied. The patient was discharged home with Medrol oral therapy from which she developed Cushingoid appearance without diabetes or osteoporosis. 18 months later, she developed hypothyroidism and was recommended levothyroxine treatment by an endocrinologist. Presently, neurological assessment is normal. The patient regularly checks up with a neurologist and an endocrinologist.

This case report seeks to emphasize consideration of Hashimoto's encephalopathy as a part of differential diagnosis in patients who exhibit atypical neuropsychiatric symptoms, while infectious, paraneoplastic or immune causes of encephalopathy are excluded.

Due to the etiology of the disease and side effects of therapy, a multidisciplinary approach in diagnosis and treatment is needed.

Keywords: apraxia, cognitive impairment, Hashimoto's encephalopathy, hypothyreosis, myoclonic jerks

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2206](http://dx.doi.org/10.17486/GYR.3.2206)

Assessment of autonomic nervous system using analysis of heart rate variability in young smokers and non-smokers

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The effect of nicotine is complex and most of the research of the heart rate variability is done with tobacco in participants trying to cease smoking. Such studies are limited with desensitization of nicotinic receptors, emergence of abstinence symptoms, and the overall modified activation of the autonomic nervous system. The aim of this study is to show the effect of nicotine on young smokers and nonsmokers using descriptive and spectral analytical methods of the heart rate variability.

The research was conducted on 50 participants ($m=23$, $f=27$), average age of 21.8 ± 1.49 years, who were divided into nonsmokers ($n=26$, $m=11$, $f=15$) and smokers ($n=24$, $m=12$, $f=12$). Smokers were smoking 14.8 ± 6 cigarettes on average for 4.77 ± 2.19 years. A baseline ECG lasting 100s was recorded, followed by chewing a gum containing 4 mg of nicotine, after which an ECG lasting 100 s was re-recorded. The ECG analysis was followed by the analysis of the heart rate variability using time domain and frequency domain methods. In order to show the effects of nicotine more precisely, the resulting changes (Δn) were calculated as the difference between the final and initial values of variables, after which the changes ($\Delta n = T2-T1$) were statistically compared between smokers and nonsmokers.

After the application of nicotine, a significant difference was observed in the changes of the average length of the RR intervals ($p=0.01$) and the heart rate ($p<0.01$) between smokers and nonsmokers. Within the spectral analysis, a significant difference was observed in the changes of the absolute value of the spectrum of low frequencies (LF, $p<0.05$), the standardized values of high and low frequency spectra (LF (n.u.), HF (n.u.), $p<0.05$) and the LF and HF ratio (LF/HF, $p<0.05$).

The heart rate variability analysis proved to be a valuable indirect method for analyzing the autonomic nervous system. The obtained results confirm that the effect of nicotine significantly affects nonsmokers, reducing their heart rate variability and the parasympathetic tone, while increasing the heart rate and the sympathetic tone.

Keywords: heart rate variability, autonomic nervous system, nicotine, spectral analysis, ECG
[HTTP://DX.DOI.ORG/10.17486/GYR.3.2207](http://dx.doi.org/10.17486/GYR.3.2207)

Sexual orientation, brain structures and cognition

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Little is known about differences in human brain structures relating to sexual orientation. We can find sexual orientation differences among men and women in terms of function, human exhibit sex differences in reproduction, gonadotropin secretion, cognitive abilities and others.

Research show strong similarities of gay man with brains of heterosexual women in hemisphere dominance and in many other respects; also brains of lesbian woman show similarities to those of heterosexual men.

Our study will focus on differences in cognitive abilities among studied groups, which will be linked with theory of differences in brain structures and sexual dimorphism. In our study there will be included several heterosexually and homosexually oriented participants. First, to define sexual orientation our subjects will have to complete questionnaire. To determine the brain sex of participants we will give them a questionnaire relating to their brain dominance.

For testing the differences in cognition we will use two tests. One for measuring spatial ability and other for testing the verbal fluency in tests subjects. English version is called COWAT – Controlled Oral word Association test, but we will use our own variation of it. The test will include words starting with letters N, O and S, because they are most frequent in Slovene.

With given different sexual orientations in combination with known brain sex of every single subject we will test our hypothesis on how our subject will perform in different cognitive ability tasks.

Hypothesis:

1. Heterosexual men will perform better than homosexual men and heterosexual women on test of spatial abilities.
2. On the verbal fluency test heterosexual women will perform better than homosexual women and heterosexual men.
3. Heterosexual woman will have equal results as homosexual men on questionnaire relating to the brain dominance.
4. Homosexual men will have equal results as heterosexual women on the questionnaire.

Keywords: sexual orientation, brain structures, cognition, homosexual, heterosexual, sexual dimorphism

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2208](http://dx.doi.org/10.17486/GYR.3.2208)

Loneliness and Promiscuity among MSM from Attachment theory perspective

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Promiscuity, sometimes referred to as unrestricted sexual behaviour, can be defined as a set of attitudes towards uncommitted sex, past behavioural experiences with different partners and heightened sexual interest. The level of promiscuity has often been associated with feelings of loneliness that can be characterised by deficiency of (certain) high-quality social relations and subjective negative experiences. As such, the two constructs were frequently investigated among men who have sex with men (MSM), yet the ideas of attachment theory have not been considered yet, when trying to explain the underlying processes. MSM are still a labelled part of our society, especially when it comes to sexual risk behaviour, which may cause the transmission of HIV and other sexual diseases that are prevalent in this population, so it seems important to approach the issue with proper psychological tools and data. In this study it is hypothesized that insecure attachment models of MSM are associated with

- i. higher loneliness scores, as well as
- ii. higher promiscuity scores.

Underlying motives, processes and prevention goals are discussed.

Since the study is still in progress, up-to-date results will be presented at the congress.

Keywords: loneliness, promiscuity, attachment, MSM

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2209](http://dx.doi.org/10.17486/GYR.3.2209)

Tuzla Brain Week- TBW 2015 “The brain and individuality”

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“Tuzla Brain Week - ‘TBW’” is the term that we use to mark the Week of the Brain, here in Bosnia and Herzegovina. This year we celebrated the second Week of the Brain in BiH, that took part in globally determined period from March 16th to 22nd. The preparations of the Project lasted almost a year, and the content covered all age groups, starting from pre-school age, through all levels of education, to senior citizens (retirees), and we also had a special part of the Program for persons with special needs.

The objective of the Project is to raise awareness about the brain, it’s functions, the specifics of this organ, all this in an unusual way, through various forms of education, including lectures and workshops, as well as through sport and urban events.

87 members of the Section for Neuroscience took part in the organization of the Project. This Section operates within “Medicus” - the Association of Students of Faculty of Medicine in Tuzla. General topic of TBW 2015 was “The brain and individuality”. Approximate number of participants, that were included in a total program content, was over three thousand citizens. Through the Project, a special attention was drawn to “Scientific café”, which we have organized throughout the week, where we had the opportunity to listen to lectures of our colleagues from the medical faculties in the region - Zagreb, Rijeka, Osijek, Mostar, Sarajevo.

During the week, a total of 40 workshops were held in various educational institutions and social - pedagogical living communities, as well as 10 sessions with different thematic, all within the main topic.

TBW is a Project of the exceptional importance, achieved regional cooperation also goes in it’s favor, which speaks for itself when we talk about defining and promoting common and clear objectives, with the tendency for improvement and more promising future.

Keywords: Tuzla, brain, week, region, cooperation

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2210](http://dx.doi.org/10.17486/GYR.3.2210)

Computational media and multisensory approach in moderate dementia treatment

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Growth of computational science has conditioned development of neurology and neuroscience in area of diagnostics and treatment. Using multisensory approach in rehabilitation can be expensive and demanding, but by using computational media this can be well done. In 2010, according to our past studies, was created a licensed product, The Blue Dolphin (TBD), which integrates elements of color, light, and music therapy and digital media, formed as 10-minutes long video recording. Until 2012 it was used in releasing stress, but now it has multiple uses.

Main aim of this research was showing effects of TBD in moderate dementia treatment. Research started in 2012 and ended in 2014, and included 22 patients of different age (52-74 years old), sex and dementia etiology (Alzheimer's disease, vascular dementia), and the control group of ten healthy people of the same age range. Participants used TBD twice a week, during two years of research. As measuring instrument was used The Mini Mental State Examination (MMSE), divided in memory, attention and language question categories, which was performed in every patient every three months of research. All participants have signed informed consent.

Results in younger participants after three months of using TBD show increasing of correct attention answers and after six months show the same phenomena in memory questions. The same happens after a year of use in older participants. Female participants show first improvement of language skills after six months of use, while in male that happens after nine months, and the attention and memory results haven't shown any difference. By etiology, improvement of all question categories happens after 6 months in people with Alzheimer's disease (AD) and in 9 months in people with vascular dementia. In healthy people results in all question categories rise after three months and stay the same after that.

In conclusion, TBD shows encouraging results in moderate dementia treatment. It is also very simple to use and includes integrated multisensory approach so it may be used in rehabilitation of people with neurodegenerative diseases.

Keywords: computational media, multisensory approach, moderate dementia, The Blue Dolphin

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2211](http://dx.doi.org/10.17486/GYR.3.2211)

Music therapy- rehabilitation of patients and stroke

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For centuries scientists are trying to break into the mysteries of the human mind. Through the history neuroscience is trying to discover all the functions of the brain which man is even not aware that exist.

Music therapy as a medical term is a process in which the therapist uses sounds and music to develop the interconnection between himself and the patient. Using it he improves and strengthens physical, mental, social and emotional health. In the early 90's of the 20th century a large-scale interest for music therapy starts to show. The great benefit of music at cognitive and physical functions was found and named the Mozart effect. Listening to Mozart's music helps arrange patterns of neurons in the cerebral cortex, and especially reinforcing the creative process of the right hemisphere of the brain that is associated with spatio-temporal reasoning. The aim of this study is the influence of music on the brain functions and consists a summary of the plenty researches that connect music therapy with better rehabilitation of patients before and after surgical procedures and neurological conditions, such as stroke. Since music activates brain motor centers in patients during rehabilitation after stroke, listening to music while imagining kicks in the rhythm consequently comes to the activation of appropriate motor centers and faster recovery functions of the affected limbs.

Music therapy is a relatively new branch, so further researches in this area will provide possibilities and solutions for better use of music in medicine and everyday life. The roots of all hides in the fact that the music is the one that connects us to that deep in us; with our emotional, spiritual and most private "I". Therefore, it is only important to know and learn to listen.

Keywords: music therapy, Mozart effect, rehabilitation, surgery, stroke

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2212](http://dx.doi.org/10.17486/gyr.3.2212)

The anatomy of swearing

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Linguistics is a field of science providing an alternative way for having an insight into the human brain and its processes. Swearing, being fundamental to human behaviour, is a very voluminous field which offers a psychological as well as physiological release. Focusing on taboo-language and gender-related differences in the language production, this paper will hopefully offer an alternative way for “picking brains” by following the changes in the brain which occur when people swear.

In this paper we will address the hypoalgesic effect of swearing and the taboo-language production among patients affected by aphasia and Alzheimer’s disease, following the research by a team from the UCLA Easton Center for Alzheimer’s Disease. Furthermore, shedding light on the double standard for how we regard profanity, this paper also aims to explore how we judge women more harshly for using profanity than men. Could it be that we pay more attention to profane women because we do not expect their language to be indecorous? Our brain depicts profane men as annoying; profane women, on the other hand, as tawdry. Exploring the idea of profanity standing for intimacy and a pain-relief device, this paper also explains that both men and women should be capable of using profanity without being looked down upon.

Although our research into this topic as non-(bio)medical students mostly relies on a (neuro)linguistic approach to speech as one of the basic human characteristics, we aim to provide a different perspective on observing the processes that occur in the brain through language.

Keywords: language, swearing, brain damage, gender, equality

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2213](http://dx.doi.org/10.17486/GYR.3.2213)

The association between the occurrence of depression after stroke and rehabilitation outcomes

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INTRODUCTION: Depression is common neuro-psychiatric consequence of stroke, which affects a large percentage of patients who suffered stroke. Also, depression is a factor which significantly affects the rehabilitation of patients with a history of stroke. **AIM:** The aim of this study was to determine the frequency of occurrence of depressive symptoms in patients with a history of stroke and to determine whether these depressed patients show slower progress in rehabilitation.

MATERIALS AND METHODS: We assessed 40 patients, aged 60-85 years, with the first stroke ever. We examined depression with Beck's questionnaire (Beck, 1961) after two weeks of stroke onset. Patients who had previously been diagnosed with a psychiatric illness were excluded from the research.

For the assessment of rehabilitation we used the Stroke Impact Scale (Duncan et al., 2000), where we evaluated the physical and cognitive impairment. The Scale refers to the patient's subjective assessment of his state. We applied the trial 2 months after the stroke.

RESULTS: From the group of 40 patients studied, among them 15 were determined depressive symptoms. Over time, these depressed patients showed significantly poorer progress in rehabilitation in comparison to those who did not develop depression.

CONCLUSION: Based on the obtained results, we conclude that patients who developed depression after stroke, showed slower progress in rehabilitation.

Keywords: depression, stroke, rehabilitation

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2214](http://dx.doi.org/10.17486/GYR.3.2214)

Differences of general beliefs in a just world and anxiety levels between deaf and blind patients

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INTRODUCTION: Deafness is defined as a partial or total inability to hear. Blindness is defined as visual acuity of less than 3/60 in the better eye with best possible correction. Onset of deafness and blindness can cause psychiatric disorders.

AIM: The aim of this study was to compare the influences of long-lasting deafness and blindness on the level of anxiety of participants and on their attitudes towards justice in the world.

METHODS: Anxiety levels were measured using the Beck Anxiety Inventory. Attitudes towards justice were measured using the General Belief in a Just World Scale. A group of deaf people was interviewed by a researcher using Croatian Sign Language, a group of blind people was interviewed also by the researcher and healthy subjects from the control group solved the test themselves. There wasn't gender and number difference (N = 30, 15 women, 15 men) or age difference between two groups.

RESULTS: Blind patients had a significantly higher General Belief score compared to the group of deaf people ($p < 0.01$) but there was no difference between Beck Anxiety score. In both groups the General Belief score was significantly higher if the Beck Anxiety score was lower ($p < 0.01$).

CONCLUSION: The results of this study revealed significantly better attitudes of blind people towards a just world compared to deaf people and they showed a reverse proportional ratio between positive attitudes and anxiety score in both groups.

Keywords: blindness, deafness, just world, anxiety

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2215](http://dx.doi.org/10.17486/GYR.3.2215)

Religion – invisible cure with the visible spectrum

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INTRODUCTION: Faith is usually defined as a belief in the truth of a claim without its checks. Therefore, it is a subjective spiritual interpretation of every person and her perception, our own thinking or communication. Faith has no form, is not physically visible but a spirituality it comes to each "locus minoris resistentiae" in our body .

AIM: To prove, to show that faith has its own medical part, it's an integral part of the treatment of each person, without marking a single person who is not a believer.

MATERIALS AND METHODS: This study included 564 patients on the Clinical Center University of Mostar and Clinical Center University of Tuzla, in period from 28.4.2014. to 15. 3. 2015. on Department of Internal medicine. The ages ranged from 21-81 years, 313 male and 251 female persons. The main method was talking and taking data from early years. I singled 2 groups, ranged from 40 to 55 years. 20 people with gastric cancer who are believers. 20 people with gastric cancer who do not represent the faith, not believers.

RESULTS: After gastrectomy, 20 patients who believe in healing, 17 of them at control diagnosis showed there is no malignancy, 1 died during operation, 2 of them already have metastases. A second group of 20 patients who do not believe in healing showed the following results on the control diagnosis made after gastrectomy: 3 of them showed no malignancy, 16 of them showed a malignancy, 1 died during the gastrectomy

CONCLUSION: In Tuzla Islamic religion is more common, in Mostar Catholic religion. So there is no matter what religion, what faith, but firmly certify (until the contrary is proved), that religion plays a big role in healing of disease.

Keywords: faith, cancer, healing

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2216](http://dx.doi.org/10.17486/gyr.3.2216)

Music therapy as a complementary approach with premature infants

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The goal of this paper is to provide an overview of research on the influence of music therapy on biopsychosocial dimensions of premature infants. According to the American Music Therapy Association (AMTA), this kind of therapy is the clinical and evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship by a credentialed professional who has completed an approved music therapy program. Today this therapy is applied all over the world in many specialized clinics, rehabilitation and education centers as a means of prevention and treatment of various mental and physical disorders. Research has shown that dance/movement therapy is very effective as a complementary method in the treatment of various psychological and neurological disorders, oncological and chronic diseases, eating disorders etc. This therapy is also used as part of an interdisciplinary approach with premature infants; babies born before 37 completed weeks of gestation (more than 3 weeks before the “due date”). Premature infants represent children with neurological risks which may lead to the occurrence of developmental disabilities, which are hard to predict when the baby is born. It is very important to follow the development of prematurely born children until they reach the age of seven. In order to encourage their development, music therapy programs have been designed with techniques that are focused on improving health and quality of life. Also, music therapy can help in bonding process between mother and child, relationship which usually develops difficulties due to premature birth. All things considered, there is need for further and application of this approach as a part of holistic treatment and rehabilitation program is shown.

Keywords: premature infant, music therapy, interdisciplinarity

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2217](http://dx.doi.org/10.17486/GYR.3.2217)

Complications of herpes encephalitis

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Herpes simplex encephalitis is an inflammatory brain disease that commonly manifests with severe clinical forms. Herpes simplex virus (HSV-1 and HSV-2) causes this disease with the most common localization in the temporal and the frontal lobe. The disease manifests as generalised or focal signs of cerebral dysfunction. Case lethality of untreated patients is 70 %, even treated cases can be left with neurological and psychological deficit.

We present a case of a 20-year old female patient, hospitalized due to fever followed by quantitative disorder of consciousness which progressed during the physical examination, with negative meningeal signs. According to the heteroanamnestic data, seven days before hospitalization, patient had signs of general infectious syndrome.

As admitted, the patient experiences a grand mal seizure while further progressing in quantitative and qualitative consciousness disorder and high body temperature non responsive to antipyretics. After a lumbar puncture was performed, antiviral drug (Acyclovir) and an antibiotic (Ceftriaxone) were immediately administered along with other symptomatic and supportive therapy. In the further course clinical condition aggravated, radiological examination (CT and MRI) show brain oedema, intracerebral haemorrhage and initial transtentorial herniation. Considering the malignant course of disease and the non responsive conservative antiviral and antioedematous therapy, urgent craniectomy and transfer to the Department of Neurosurgery was indicated. A decompressive craniectomy was performed leaving the patient without a portion of cranium in the right frontoparietotemporal region. The conservative-surgical treatment cures the primary disease, but neurological consequences epilepsy and intellectual deterioration remained.

In this case we emphasize the importance of initial antiviral therapy when herpes encephalitis is suspected and the importance of a decompressive craniectomy in case of non responsive conservative therapy, because of the numerous complications and high mortality rate.

Keywords: herpes encephalitis, complications, therapy, craniectomy

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2218](http://dx.doi.org/10.17486/GYR.3.2218)

Epileptic and non epileptic neurological disorders in pediatric population

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INTRODUCTION: Epileptic and non epileptic neurological disorders in pediatric population are very often. The most common are convulsiones febriles.

AIM: The head aim of this work is to show detailed statistic piece of informations which are result of scientific investigation work on Clinic for pediatric University Clinilac Hospital Center Tuzla.

MATERIALS AND METHODS: For writing this work we use retrospective method of collecting informations. Materials that are used are clinical registers of patients from Clinic for pediatric and protocols and patients medical histories.

RESULTS: From 3200 patients in year 2014, 299 had epileptic or non epileptic neurological disorder. From 299 procentual we had: status epilepticus -0,67 % or 2 cases, convulsiones - 5,02 % or 15 cases, convulsiones febriles -30,10 % or 90 cases, epileptic seizures -7,69 % or 21 cases, brain crisis - 20,73 % or 61 cases, cephalaea -12,04 % or 36 cases, epilepsy -22,07 % or 67 cases, vertigo -2,34 % or 7 cases. From 299 cases, statistic for gender is : Male =160 patients (53,84 %), Female =139 patients (46,15 %). From 299 cases, statistic for years of age: 1998 -1 case or 0,33 %, 1999 -7 cases or 2,34 %, 2000 -27 cases or 9,03 %, 2001 -17 cases or 5,68 %, 2002 - 12 cases or 4,01 %, 2003 - 21 cases 7,02 %, 2004 - 22 cases or 7,35 %, 2005 - 5 cases or 1,67 %, 2006 - 13 cases or 4,34 %, 2007 -11 cases or 3,67 %, 2008 - 5 cases or 1,67 %, 2009 - 23 cases or 7,69 %, 2010 -20 cases or 6,68 %, 2011 -30 cases or 10,03 %, 2012 - 19 cases or 6,35 %, 2013 -45 cases or 15,05 %, 2014 - 21 cases or 7,02 %.

CONCLUSION: In year 2014 on Clinic for pediatric are hospitalised 299 patients. From 299 patients most common were patients with convulsiones febriles and epilepsy. Our research shows that boys are most common hospitalised than girls.

Keywords: epilepsy, convulsiones febriles, statistic

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2232](http://dx.doi.org/10.17486/GYR.3.2232)

Correlation between neurosis and psychosis with different types of dementia

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INTRODUCTION: With increasing the number of people in the world, the number of patients suffering from dementia is increasing and that becomes a big problem. According with Alzheimer's Society there are different types of dementia, with Alzheimer's disease as the most common type.

AIM: The aim of this study is to see if there is some connection between dementia and neurosis and psychosis.

MATERIALS AND METHODS: A total of 35 patients (mean age: 63,51 ±6.64; 42,86% male, 57,14% female) with dementia were examined for neuropsychiatric symptoms with CMAI (Cohen-Mansfield Agitation Inventory) and NPI (Neuropsychiatric Inventory). Patients were examined with MMSE (The Mini Mental Status Examination) for confirming and to determine the level of dementia.

The results were analyzed descriptively and using Pearson correlation coefficient in IBM SPSS Statistics 22.0.

RESULTS: 48,57% of the patients had mild type, 42,86% had moderate type and 8,57% were with severe type of dementia according to MMSE (mean MMSE: 18,46±5,18). With the NPI 34,29% from the patients had neuropsychiatric symptoms that match to the mild behavioural disturbance, 37,14% with moderate behavioural disturbance and 28,57% matched to severe bahavioral disturbance. Correlation between MMSE score and NPI score was low ($r = -0,213$).

All the patients were evaluated with the Cohen-Mansfield Agitation Inventory and the data was analysed with factor 3 analysis, where physically nonaggressive behaviour (21 reported) and verbally agitated behaviour (23 reported) were most often reported (12 patients with both), patients with aggressive behaviour were rare (7 reported), 7 patients had no symptoms for agitated behaviour. 5 patients had symptoms for all three types of agitated behaviour.

CONCLUSION: Neuropsychiatric symptoms are present at every level of dementia, but there is no correlation with them. For more accurate results there is need for analysis on bigger group of patients.

Keywords: Alzheimer's disease, neurosis, psychosis.

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2233](http://dx.doi.org/10.17486/GYR.3.2233)

Neurosurgical therapy of the Chiari type I malformation with syringomyelia

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Chiari malformation is in general a congenital condition characterized by an anatomic defect of the base of the skull, in which the cerebellum and brain stem herniate through the foramen magnum into the cervical spinal canal. The onset of Chiari malformation symptoms usually occurs in the second or third decade (age 25-45). The diagnosis of Chiari type I in patients with or without symptoms is established with neuroimaging techniques. The most effective therapy is surgical decompression of the foramen magnum, however there is non-surgical therapy to relieve neurophatic pain: pharmacological and non-pharmacological.

The aim of the study was to present neurosurgical methods for the treatment of the Chiari type I malformation with syringomyelia, postoperative improvement in symptoms and the most common postoperative complications.

The retrospective analysis of surgical protocols of the University Clinical Center Tuzla included the operational procedures of patients with Chiari type I malformation. The analysis includes the age and sex of patients, pre and post-operative representation of the symptoms associated with the disease and the occurrence of postoperative complications.

We analyzed 13 patients, eight men and five women. The youngest patient was 28 years, and the oldest was 59, the average age was 41 years. We analyzed the postoperative improvement of the most common symptoms such as headaches, neck pain, balance disorder, motor weakness, numbness, arm weakness, fine movement disorder, muscle atrophy, loss of reflexes. The highest postoperative improvement in symptoms was found in the decrease of the balance disorder (84%), motor weakness (80%) and the fine movement disorders (75%). The lowest symptoms improvements were headaches (28%) and neck pain (34%). The lowest level that cerebellar tonsils lied below the level of the foramen magnum was 7 mm, and the highest 4 mm (averaging at 5.6 mm). 11 operation were done with duroplasty and two without. Artificial dura was used in 8 cases, and the fascia lata in 3 cases. The most common postoperative complication were cerebrospinal (CSF) fluid leaks that occurred in 5 patients. The CSF leaks spontaneously stopped in two patients, and three patients required continuous CSF drainage. Our research showed the postoperative improvement of the most common symptoms such as headaches, neck pain, balance disorder, motor weakness, numbness, arm weakness, fine motor disorder, muscle atrophy, loss of reflexes. The highest postoperative symptom improvements were reduced motor weakness, balance disorder and fine motor disorder. This coincides with other studies that show a postoperative relief of symptoms in 83% of patients.

Keywords: Chiari type I malformation, syringomyelia

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2234](http://dx.doi.org/10.17486/GYR.3.2234)

Huntington's disease-case report

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Huntington's disease (HD) is autosomal dominant neurodegenerative disease that never skips generations. It starts between 30 and 50 years of age and ends after 15-20 years with death. It is a disease of CAG triplet repeats and is characterized by poliglutamine repeats. The number of CAG trinucleotid repeats correlates with the age of the onset of the first symptoms, as well the clinical picture. The selective therapy for Huntington's chorea still does not exist and for symptomatic treatment the blockers of dopamine have turned out to be the most useful. Its prevalence in the world is 8-10 per 100000 inhabitants and in Bosnia and Herzegovina 4,46 per 100000 inhabitants.

We report a case of a 50-year old patient with HD. The symptoms started 2 years before hospital admission when the patient noticed "muscle flutter" on the left side of his face and left shoulder and occasionally on the upper leg. The patient has been hospitalized in the Neurology Clinic in the period of 02-14.08.2014. when he was released under the dg, Distonia. Laesio n. ischiadici sin post vulnum explosivum aa XX. Applied therapy didn't bring any results, patient is less talkative, sometimes can't control his sphincters and has risen amplitude of choreas. The patient is sent on Institute for genetical engineering and biotechnology on University of Sarajevo. When genetical analysis is done suspicion between HD and WD is solved. Sequestering egsones of genotype showed abnormal genotype for HD and normal genotype for WD. "Patient is carrier of one allele from 27 CAG repeatings and one allele from 48 CAG repeatings in the structure of HD gene".

Genetical consulting is important for presenting the results to healthy family members for future life. Approach needs to be multidisciplinary whether the results are good or bad.

Keywords: HD, genetics, chorea.

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2235](http://dx.doi.org/10.17486/GYR.3.2235)

Antiphospholipid syndrome

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The antiphospholipid syndrome is defined by the occurrence of venous and arterial thromboses, often multiple, and recurrent fetal losses, frequently accompanied by a moderate thrombocytopenia, in the presence of antiphospholipid antibodies. The incidence of antiphospholipid syndrome is 5 new cases per 100,000 persons per year.

We report a case of 23 years old male patient without any health issues before. Patient was hospitalized because of a strong headache with development of weakness of right extremities. Severe right temporale headache happened while playing table tennis, which was followed by numbness of a right leg and arm, and fall. He was urgently hospitalized. MRI and MRA of the brain lesion showed subacute flow in the area of the left basal ganglia, ipsilateral insula and frontal operculum region. Morphological changes found in the left ICA, MCA and ACA were telling in favour of vasculitis and subsequent ischemic stroke. Laboratory findings and cerebrospinal fluid analysis showed no pathology. Protein profile of cerebrospinal fluid and blood barrier function were preformed and showed no pathology. Immunological tests were positive on anti-cardiolipid IgG antibody.

The pathogenesis of the antiphospholipid syndrome is related to both prothrombotic and immunologic effects of the antiphospholipid antibodies, therefore we emphasize importance of immunological tests on the antiphospholipid antibodies in any case of young adults' stroke, unexplained dementia, and acquired chorea.

Keywords: antiphospholipid antibodies, stroke, thrombosis, autoimmune disorder

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2236](http://dx.doi.org/10.17486/GYR.3.2236)

Rare etiology of postural orthostatic tachycardia syndrome

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Postural orthostatic tachycardia syndrome (POTS) implicates a heterogeneous group of disorders clinically manifested by similar symptoms. POTS symptoms include tachycardia, palpitations, fatigue, headache, nausea, syncope, exercise intolerance, diminished concentration and tremor. Diagnostic criteria for POTS are a heart rate increase of ≥ 30 beats/minute (bpm) during 10 minutes upon standing up from a supine position without excessive decrease in blood pressure.

We present a patient who, during the last 4 years, had frequent attacks of syncope, headaches, nausea and vertigo, without convulsive symptoms. A comprehensive diagnostic assessment (brain and cervical MRI, EEG and transcranial Doppler) was performed but showed no pathological findings. Cerebrospinal fluid (CSF) analysis showed a normal cell and protein count, with blood-brain barrier dysfunction and positive oligoclonal IgG bands. The patient's difficulties were understood as epileptic seizures and treated with antiepileptics. The symptomatology worsened and the patient was referred to tilt table testing, which revealed POTS with reaching 180 bpm. With additional diagnostic assessment (quantitative sudomotor axon reflex test, quantitative sensory testing and adrenaline and noradrenaline plasma values) a diagnosis of a neuropathic variant of POTS was made and fludrocortisone therapy was initiated. As the disease progressed, several partial complex epileptic seizures were observed and anticonvulsive therapy was modified. Due to poor therapy response, an extended assessment was performed which revealed an increased anti-voltage-gated potassium channel antibodies (anti-VGKC) titer and immunosuppressive treatment began.

Although most cases of POTS are idiopathic, autoimmune cases of POTS connected with anti-ganglionic acetylcholine antibodies were described. In the reported case, POTS was connected with anti-VGKC antibodies which is, according to the literature published so far, the first case of this kind. In conclusion, this case emphasizes the fact that, while treating POTS patients who exhibit a poor response to therapy, it is necessary to keep in mind the autoimmune variants of this syndrome.

Keywords: postural orthostatic tachycardia syndrome, tilt table test, anti-VGKC antibodies

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2237](http://dx.doi.org/10.17486/GYR.3.2237)

Testing of individual differences in treatment outcome of patients with cancer metastatic disease in patients treated at the University Clinical Hospital Mostar

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AIM: The aim of this study was to determine differences in the level of cortisol in a group of patients with cancer present with malignant disease, with increased and decreased level of optimism/pessimism in relation to spirituality.

SUBJECTS AND METHODS: The study included 60 subjects between 49 years to 88 years. Data were collected at the Department of Pulmonary Diseases and TB and Oncology Clinic, and Department of Laboratory Diagnostics, University Clinical Hospital Mostar.

RESULTS: The study included 90 patients presenting with metastatic disease. In the sample were slightly more men represented 48 (53.33%), the highest number of pensioners was 50 (55.55%), and most common they had a secondary education 40 (44.44%). Demographic data as a predictor variable can not predict the status of optimism / pessimism ($\chi^2 = 4.80$, $df = 8$; $p > 0.05$).

Optimists scored higher on coping strategies focused on tasks and avoidance, while pessimists scored higher on a scale of coping focused on emotions and level of cortisol. The level of morning cortisol, in most of the researched sample was below (Reference values: Men and women: 7-10 hours: 171-536 nmol / L; 16-18 hours: 64-340 nmol / L) and does not significantly affect the assessment of optimism or pessimism in patients with metastatic disease who are permanently exposed to chronic stress.

CONCLUSION: Subjects with higher levels of optimism often resort to coping strategies focused on tasks, and avoiding, pessimistic resort to a strategy aimed at the emotions.

Keywords: cancer, cortisol, optimism, pessimism, metastatic disease

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2238](http://dx.doi.org/10.17486/GYR.3.2238)

Phenotype changes of microglial cells under various stimuli

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Microglial cells are resident brain cells that monitor their surroundings and maintain homeostasis. Cells originate from the same progenitors as peripheral macrophages. They perform common macrophage functions such as phagocytosis, antigen presentation and repair of damaged tissue, while having specific central nervous functions like synaptic stripping and regulating pain mechanisms. There are several activation states of microglial cells, each caused by different stimuli.

In a healthy brain, they possess a ramified shape with many branches for communication with nearby cells, enabling their monitoring function. At the first sign of homeostasis disruption, they change form and adapt to their new surroundings. Common stimuli include bacteria, viruses and ischemia. Each stimulus requires a unique response, and microglial cells answer by performing different functions and releasing different signal molecules, while changing their morphological shape.

In our in-vitro studies, we work with BV-2 immortalized microglial cell line, which have proven to be a valid substitute for primary microglia. We will present several different shapes of microglia caused by three distinct stimuli: virus infection with murine cytomegalovirus, LPS and hypoxia. Furthermore, we will discuss the implications of microglial activation in the human brain.

Keywords: microglia, neuroinflammation, cell morphology

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2239](http://dx.doi.org/10.17486/GYR.3.2239)

Research on factors that control the activation of spinal cord endogenous stem cells

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The stem/progenitor cells in the central nervous system are the subject of the intense research since they open new possibilities for the treatment of the brain and spinal cord injuries and neurodegenerative diseases, but the molecular and cellular pathways that control their activity are largely unknown.

In the present study the factors that regulate spinal cord endogenous stem/progenitor cells were explored using Activating Transcription Factor 3 (ATF3) as their novel dynamic marker in the neonatal rat spinal cord *in vitro* preparation. We have previously shown that ATF3 is expressed in the cytoplasm of the quiescent ependymal spinal stem/progenitor cells (nestin, vimentin and Sox2 positive), but that the expression changes into nuclear after activation and mobilization of ependymal cells *in vitro*.

We hypothesized that the activation of the spinal stem/progenitor cells *in vitro* may be influenced by neonatal neuronal network activity, by excitotoxic or ischemic damage and by the lack of molecules in the culture medium. The results have shown that the pharmacological inhibition of glutamate, GABAA or glycine receptors has no influence on spinal stem cell activation *in vitro*. Thus, we conclude that the *in vitro* activation of spinal stem cells is not neuronal network dependent. Similarly, we have shown that neither excitotoxic nor ischemia-like experimental spinal cord injury have further enhanced the activation of spinal ependymal stem cells *in vitro*. On contrary, our results have shown that the addition of the molecules such as Nerve Growth Factor (NGF), goat serum and insulin into culture medium, could change the number of activated ATF3-nuclearly positive ependymal spinal cord stem cells, suggesting that the molecules contained in blood or cerebrospinal fluid could regulate the spinal stem cell quiescence or activity. Additionally, we have shown that the short time window of 3 days *in vitro* is not enough to allow the stem cell differentiation into neuronal or glial cells.

This study contributes to our knowledge of the factors controlling the activity and quiescence of the spinal cord stem cells and opens the directions for further studies that would enable their controlled activation after injury.

Keywords: ATF3, endogeneous stem cells, *in vitro* spinal cord preparation

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2240](http://dx.doi.org/10.17486/GYR.3.2240)

Epidemiological and morfological analysis of parameters for diagnosing meningitis on Clinical center of Sarajevo University in a period 2007-2014

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Meningitis means inflammation of the meninges. It can be caused by bacteria or viruses. Considering morphology of cerebrospinal fluid, there are purulent and serous meningitis. Purulent meningitis is caused by bacteria and serous mostly by viruses and Mycobacterium tuberculosis. Over 60% of bacterial meningitis in newborns are caused by Streptococcus B, while H. influenza, N. meningitidis and S. pneumoniae are responsible for most cases in patients older than 1 year. Most of serous meningitis cases are caused by Enteroviruses (Echo and Coxsackie group) and Mumps virus. Golden procedure for diagnosing meningitis is lumbal puncture.

Our aim was epidemiological analysis of patients' data on Infectology clinic of Clinical center of Sarajevo University diagnosed with meningitis during the period 2007-2014. Parameters that we analyzed are age of patients, sex, microbiological cause of meningitis, monthly and yearly incidence, symptoms, meningeal irritation signs and analysis of cerebrospinal fluid morphology. 263 patients were analyzed, of which most of them were children (44%). There were 66% of men. More cases were serous (55%) than purulent (32%), while CSF was not analyzed in 15% of cases. Purulent meningitis was mostly caused by S. pneumoniae (55%) and N. meningitidis (25%), while serous meningitis was mostly caused by mumps virus (33%) and HSV (11%). The biggest number of cases was noticed in 2011 and the incidence was the highest (42%) in summer (June-September). 79% of patients had fever, 74% headache and 63% complained on vomiting. Kerning's sign was positive in 41% of cases, upper Brudzinski's sign in 48% and lower Brudzinski's sign in 25%.

According to the results, serous meningitis is more often than purulent, and children are the most exposed group. Symptoms of meningitis are not specific, but if there are associated they can lead us to further diagnostic procedures. Absence of meningeal irritation signs is not excluding the diagnosis of meningitis. These results can be useful when deciding about empiric therapy and triage of patients in primary healthcare.

Keywords: meningitis, meningeal irritation signs

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2241](http://dx.doi.org/10.17486/GYR.3.2241)

Atypical presentation of Subacute Sclerosing Panencephalitis

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Subacute sclerosing panencephalitis (SSPE) is a progressive inflammatory disorder of the central nervous system with both poor prognosis and high mortality. The disease has been related to a persistent and aberrant measles virus infection and no effective treatment has been available.

We report a case of SSPE by a 6 years old boy with a history of a respiratory infection two months prior to his presentation. From that time he had been lethargic, slow to complete school assignments and unable to understand simple requests around activities of daily living. His sleep pattern had also become disturbed. One month later he began to have drop attacks. The only other symptom of note was headache for five days. His chest x-ray demonstrated bronchopneumonia. A CT scan and EEG were reported to be normal.

His past medical history revealed that he was the product of a normal delivery at 38 weeks. At 15 months of age he contracted pneumococcal meningitis but had a complete recovery from this. Because of his meningitis, he had not received his MMR immunization. At 18 months of age he contracted measles. Subsequently he had recovered from that and development had been entirely normal. Clinical examination revealed a lethargic but cooperative boy. Cranial nerves were otherwise intact. The motor examination was entirely normal. He had a mildly asymmetric gait but there was no ataxia. Within one month of his presentation he had deteriorated to the point where there were periods of time when he appeared not to be aware of his surroundings and was ataxic to the point where he needed to be fully supported when walking. He had only occasional words and continuing myoclonia.

At the time of his last visit, the major issues were that he was sleeping through most of the day. Clinical examination revealed no interaction and evidence of a severe spastic quadriplegia. There was evidence of decerebrate posturing.

Keywords: SSEP, atypical, respiratory infection

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2243](http://dx.doi.org/10.17486/GYR.3.2243)

Attitude towards asexuality

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INTRODUCTION: Asexuality is a sexual orientation, or lack thereof, when an individual feels no sexual attraction to other people of either sex, with low or absent desire for sexual activity. Even though asexual people usually do not experience the need for physical, they can still have needs for emotional intimacy. Nowadays, asexuality can be considered the fourth sexual orientation, in addition to heterosexuality, homosexuality and bisexuality, with a prevalence of 1% within the population.

AIMS OF THE STUDY: The aim of this study was to investigate whether there is a difference in awareness of asexuality between different groups of participants within the general population.

MATERIALS AND METHODS: Participants from all the country were included in this research (N=540), and were then distributed in four regions of the country. Students of medicine and psychology were of central interest. Participants were also divided by professional qualification into seven groups. The research was conducted via a questionnaire developed by the authors. The Asexuality questionnaire consisted of 18 questions, with each forming an independent variable to measure. An online survey was conducted, with participant being acquired via social networks and redirected to the survey, which was constructed and presented via the web page www.limesurvey.com. Provided data from the questionnaire was anonymous.

RESULTS: The results showed no difference in the attitude towards asexuality based on gender and age, nor between the different groups of participants based on professional qualification, regions of the country, colleges and different sexual orientations (asexual and non-asexual). 42 participants (7.8%) declared themselves as asexual.

CONCLUSION: The differences on attitude towards asexuality, between asexual and non-asexual participants, show a lack of education within both groups about asexuality. The majority of both groups assume that asexuality is associated with mental trauma from childhood, and that asexuality represents a synonym for Hypoactive Sexual Desire Disorder/Female Sexual Interest or Arousal Disorder. Surprisingly, 48% of respondents from the non-asexual group consider asexuality as a sexual orientation while only 28% of those who declared themselves as asexual consider asexuality to be an orientation.

Keywords: asexuality, population, questionnaire, attitude.

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2244](http://dx.doi.org/10.17486/GYR.3.2244)

Is it possible to live without cerebellum?

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Cerebellum is a part of the brain responsible for motor control and some cognitive functions. Cerebellar agenesis is a complete absence of the cerebellum.

The aim of my research was to find out something more about clinical presentation of patients with cerebellar agenesis.

The methods I used involved reading published papers, so I report four cases diagnosed as cerebellar agenesis.

First case report is a 7-year-old girl unable to walk. Her motor development was slow. Her IQ was just under the normal levels, her reading and speaking was not clear and handwriting was not good. Neurological exam showed ataxic walking, dysmetria, dysdiadochokinesia, medial strabismus and briefly increased deep tendon reflex. MRI revealed complete cerebellar agenesis and posterior fossa full with cerebrospinal fluid (CSF).

Second case report is a 24-year-old primigravida. She is in a consanguineous marriage. Ultrasound examination showed absence of cerebellar structures with ptosis of both occipital lobes occupying the anatomical space of the posterior fossa.

Third case report is a 17-year-old boy with history of neonatal hypotonia. He was first observed at the age of 4 because of persistent ataxia. MRI showed absence of cerebellar tissue and empty cerebellar space filled with CSF. His current neurological status shows moderate ataxia, mild dysmetria and mild mental retardation.

Fourth case report is a 24-year-old woman with unexplained vomiting and nausea. She has been experiencing dizziness and walking difficulties. Her motor development was slow. She had unintelligible speech until she was six years old.

In conclusion, clinical presentation of patients with cerebellar agenesis varies. The most common symptoms are walking difficulties, problems with balance, speech difficulties, nausea and dizziness. In some cases, even though they are rare, a person can normally live without cerebellum. Doctors believe that in these cases other parts of brain take over functions of missing cerebellum.

Keywords: cerebellum, cerebellar agenesis, motor development, ataxia, dysmetria

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2245](http://dx.doi.org/10.17486/GYR.3.2245)



gyrus

Gyrus je časopis Studentske sekcije za neuroznanost. Časopis pišu i uređuju studenti, a izdaje se 4 puta godišnje. Cilj i namjera Gyruusa je popularizirati i približiti najnovije spoznaje iz područja neuroznanosti široj akademskoj zajednici.





Posters

Polymorphisms in the GluR5 glutamate receptor subunit gene (GRIK1) and alcohol dependence

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Glutamate, major excitatory neurotransmitter in the brain, has an important role in mediating the effects of alcohol and development of alcohol dependence. GRIK1 gene, encoding the GluR5 subunit of glutamate kainate receptors, has been associated with alcoholism, while certain GRIK1 polymorphisms have significant influence on the action of topiramate, drug used in alcoholism treatment.

The aim of this study was to investigate the association of GRIK1 gene polymorphisms (rs2832407 and rs2186305) with alcohol dependence in subjects of Croatian origin.

Genotyping was performed in 276 alcohol-dependent and 298 healthy subjects by using Real-Time PCR after extraction of DNA from the blood with salting out procedure. We compared the frequency of GRIK1 genotypes and alleles, between alcohol-dependent and healthy subjects using χ^2 test, considering the effects of gender and smoking. The distribution of genotypes and alleles of GRIK1 polymorphisms has been investigated in alcohol-dependent patients subdivided according to age of onset of alcohol abuse, suicidal and aggressive behavior, and type of alcoholism according to Cloninger classification. Haplotype analysis of polymorphisms has been conducted using Haploview version 4.2 software.

There were no significant differences in the distribution of genotypes and alleles of GRIK1 polymorphisms between alcohol-dependent and control individuals, as well as between different subsets of alcohol-dependent patients. A low degree of linkage disequilibrium (LD) was revealed for rs2832407 and rs2186305. In the analysis of polymorphism rs2186305 statistically significant difference was found in the frequency of carriers of genotype CC versus T allele carriers between healthy women and women addicted to alcohol ($p = 0.0188$; χ^2 - test), suggesting an association between this polymorphism with alcoholism, but only in women.

The results should contribute to a better understanding of the role of the GRIK1 gene and glutamate receptors in the development of alcoholism, as well as to the research of new potential therapeutic targets.

Keywords: alcohol dependence, GRIK1, genotype, haplotype, polymorphism

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2218](http://dx.doi.org/10.17486/GYR.3.2218)

Development of a new high-throughput assay for behavioral sensitization to psychostimulants in *Drosophila melanogaster*

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Addiction to psychostimulants is a serious behavioral disorder that leads to a cascade of neurochemical changes in the brain associated with pathological form of neuroplasticity. Studying these changes is important in order to understand long-term effects that drug have on the brain, with the goal to define treatments which will prevent or cure addiction. Behavioral sensitization is defined as stronger behavioral response to repeated drug administration of the same dose and it is related to sensitize craving for drugs in humans. Because, behavioral sensitization is caused by long-term changes in the brain functioning, it is often studied in the model organisms.

In *Drosophila*, behavioral sensitization is traditionally measured using video recordings followed by visual analysis, which is time consuming process and prone to subjectivity. In this study we are defining a new, high-throughput assay for measuring behavioral sensitization in *Drosophila*. The assay is an adaptation of “*Drosophila* Activity Monitoring System” (DAMS), which allows long term monitoring of the changes in locomotor activity and sleep in large numbers of flies.

We are testing different protocols with the aim of achieving a reproducible stronger locomotor response to the second exposure of the drug in same concentration. In the process we are varying drug concentrations, duration of exposure to the drug and the length of the time between exposures. We are testing responses to cocaine and methamphetamine which are delivered through food. Both of these drugs interact with the mechanisms of arousal in mammals and flies, and lead to increased wake activity and decreased sleep.

Our aim is to undertake a behavioral screen for genes which are involved in the process of behavioral sensitization. Identification of such genes will enable investigation of mechanisms which underlie sensitization, and are related to craving and development of addiction in mammals.

Keywords: addiction, psychostimulants, *Drosophila*, behavioral sensitization, locomotor activity

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2219](http://dx.doi.org/10.17486/GYR.3.2219)

Cervical dystonia as the first sign of brain demyelination

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Dystonia (DYT) is a disorder characterized by involuntary muscle contractions that cause repetitive movements or abnormal postures. There are several forms of DYT. In cervical dystonia (CD), contractions cause anterocollis, retrocollis, lateral or sagittal shifts (torticollis), sometimes causing pain. It can be a symptom of other diseases, like Wilson's disease or a reaction to different medication (iatrogenic).

We report a 27-year old female with a CD. The symptoms have started two months ago with unvoluntary painless head and neck movements on the right side. Previously, the patient was treated with amoxicillin with clavulanic acid and metronidazole, due to odontogenic absces. With the occurrence of a skin rash, the medicatons were stopped and the patient was given an antihistamine drug. The patient has also been diagnosed with Hashimoto disease.

Multi Slice Computed Tomography (MSCT) of the brain showed hypodense lacunar lesion in the right nucleus putamen. Laboratory results showed no pathology in ceruloplasmine concentration, serum copper or 24-hour-urine copper, and detected a low red cells count. The patient was admitted to hospital for the further examination. Brain Magnetic Resonance Imaging (MRI) - T2 and FLAIR, showed supratentorial paraoccipital billateral hyperintensive lesions. Liquor analysis hasn't showed intratecal syntesis. Visual Evoked potentials (VEP) results were normal. Due to testing results, definitive diagnosis of Multiple Sclerosis (MS) could not have been made. The patient was released from the hospital after the application of Botulinum toxin 100 U in the affected muscles.

On the last control, there was no neurological deficite.

We emphasize the importance of differential diagnosis of primary causes of CD.

Keywords: dystonia, Hashimoto disease, hypodense lacunar lesion

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2220](http://dx.doi.org/10.17486/GYR.3.2220)

Symptomatic epilepsy in acute stroke and chronic phase of stroke

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INTRODUCTION: Stroke is a common cause of symptomatic epilepsy. It can occur in the acute phase, or months, or even years after stroke (in the chronic phase). We investigated the characteristics of epileptic seizures, types and localizations of strokes that led to it in the patients hospitalized in University Hospital Centre Rijeka.

MATERIALS AND METHODS: We identified 37 women and 27 men hospitalized in the period from January 1st 2013 to March 13th 2015 at the Department of Neurology, University Hospital Centre Rijeka, diagnosed with symptomatic epilepsy after stroke. We analyzed their medical records in order to determine at which phase of stroke epilepsy appeared, whether it was an ischemic or hemorrhagic stroke, where the lesion was localized according to the findings of CT, and whether seizures were partial or generalized.

RESULTS: In 26 female and 13 male patients epilepsy occurred in the acute stage of stroke (in most of the cases changes were not detected by CT or have been localized in the irrigation area of ACM), while in 11 female and 14 male patients occurred in the chronic phase (CT scans mostly showed changes in the irrigation area of ACM or basal ganglia), 7 months - 10 years after stroke. 20 men and 22 women had partial seizures, generalized seizures occurred in 9 women and 7 men, and one female patient had both types of seizures. In 5 female patients seizure type was not mentioned in the documentation. All the men suffered from ischemic stroke, while women in 28 cases had ischemic, and in 9 cases hemorrhagic stroke.

CONCLUSION: Our results show that it is possible that localization of stroke has an influence on the incidence of symptomatic epilepsy. Partial seizures appear in the most patients of both sexes, both in acute and in chronic phase of stroke.

Keywords: stroke, symptomatic epilepsy, CT

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2221](http://dx.doi.org/10.17486/GYR.3.2221)

Clinical outcomes of patients with penetrating gunshot wounds to the head

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INTRODUCTION: Penetrating craniocerebral gunshot wounds to the head are mostly firearm related injuries made as a result of homicide, accident fatalities and mostly suicide attempt. It is well know that the most common cause of mortality and morbidity among patients with penetrating head gunshot injuries are devastating injuries to the central nervous system and caniocerebral structures. Despite this negative prognosis, survival and recovery was observed.

AIM: To estimate clinical outcome and discuss about Glasgow coma score (GCS) as a possible predictive factor in patients with penetrating gunshot wounds.

METHODS: The record of 16 patients admitted in intensive care unit KBC Rijeka with a penetrating gunshot wound between 2009 and 2014 were retrospectively reviewed.

Gunshot wound to the head without brain injury was observed in 2 patients with a mild disturbance of consciousness(GCS 13-15). All 16 patients were artificially ventilated. All patients who were on artificial ventilation more then 8 days (31.2%) developed an infection which is monitored with elevated inflammatory parameters: Crp and leukocytes. Gunshot wounds to the head are in 75% result of suicide attempts. The highest number of patients was received in 2009 (8 of 16 patients, or 50 %).

CONCLUSION: Patients who have had a GCS less than 5, on receipt of the intensive care unit, had poorer treatment outcome compared to patients in whom there is a higher GCS at admission to the ICU. Assessment GCS score is an important prognostic factor in patients with gunshot head injury.

Keywords: GCS, penetrating wounds, gunshot

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2222](http://dx.doi.org/10.17486/GYR.3.2222)

Primary angiitis of the central nervous system (PACNS)

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In this case report we present a patient with cognitive impairment as a result of primary angiitis of the central nervous system (PACNS). Our patient is male, age 54, with 15 years of education. Patient presented with difficulty in pronouncing, nasal speech and weakness during period of one year. Neurocognitive status showed impairment of episodic memory and concentration, attention verbal, and visual memory deficiency (MMSE 25). Brain CT scan showed no acute hemorrhage or ischemia, but chronic vascular changes in deep white matter of cerebral hemispheres, basal ganglia, thalamus, and pons with lacunar lesion next to the head of left nucleus caudatus. Brain MRI showed intracerebral hemorrhage in right temporal lobe, multiple gliotic/malacian zone paraventricular, predominant in basal ganglia and hemispheres of the cerebellum. Differential diagnose of multiple intracerebral hemorrhage includes vascular malformations, cerebral amyloid angiopathy, ischemic stroke, cerebral venous sinus, tumor, cerebral vasculitis etc.

Medical diagnostic included laboratory tests, prostigmin test, EMNG, AchR and MuSK antibodies test, EEG, cerebrospinal fluid analysis. Through his medical evaluation, which has been performed to exclude any infections or malignant process, we finally conducted cerebral digital subtraction angiography (DSA) to diagnose PACNS. Cerebral DSA showed multiple, non significant stenosis on specific vascular segments, implying high suspected vasculitis. After immunologist being consulted, patient was prescribed with methylprednisolone during 3 next days and cyclophosphamide next 6 months. Control DSA is planned in the future. PACNS is one of the most formidable diagnostic and therapeutic challenges to neurologists. Given the low specificity of cerebral angiogram and not uniform clinical presentation, PACNS is best approached by an organized team with expertise in neurovascular disease, immunology or rheumatology, neuroradiology, and neuropathology.

Keywords: cognitive, vasculitis, DSA, hemorrhage

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2223](http://dx.doi.org/10.17486/GYR.3.2223)

Palliative care for people with ALS

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Amyotrophic lateral sclerosis (ALS), also known as the Lou Gehrig's disease, is a progressive neurological illness that affects the central and the peripheral motor neuron. The central motor neurons set in the brain and in the spinal cord equally degenerate. When the impulses cease to reach the muscles due to the decay of the motor neurons, atrophy of muscles appears as a sign of lesion of the central motor neuron and fasciculation of the skeletal muscles due to the lesion of the peripheral neuron. Other symptoms are consequences of these changes and include muscle weakness, cramping, slurred/ nasal speech, and difficulties in swallowing and breathing. The function of the bulbar musculature and sphincter remains the same, so as the ability to recognize touch, sound, smell, and taste. Mental abilities and consciousness are undamaged. The probability of being diagnosed with this disease is 1-3,9 cases per 100 000 people. The frequency of the illness rises with aging. The cause of developing ALS is still unknown, but toxic influence of glutamate, disorder of the immunological processes, activity of the neutrophic factors, and environmental factors damage the human health.

The aim of this work is to show the characteristics of the specialist palliative medicine as a comprehensive approach to the illness and the patient with the assistance of a multidisciplinary team, optimal intervention and symptom control, good communication and emotional support, procedure of making ethical decisions, and evaluation of the needs and demands of the patient. The beginning of the palliative treatment is also introducing the patient with the diagnose, explaining that the disease can develop differently, that there is no cure for it, and letting the patient know that there are certain ways of helping him. An important issue is the deficit of hospital capacity, absence of specialized institutions for quality palliative care, while the existing private capacities are quite often unreachable to most of the families because of the high prices.

The conclusion of the work is that the palliative care is the only way in which the patient will have a better life, even though there is a lot of effort put into raising public awareness about this disease and finding a cure for ALS.

Keywords: ALS, palliative care, multidisciplinary approach, neurological patients.

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2224](http://dx.doi.org/10.17486/GYR.3.2224)

Tibetan medicine: scientific foundation with particular review on postulates and practice of mental hygiene

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In Tibetan medicine, health is not achieved as long as mental health isn't present. Even though it is an equivalent to WHO definition of health, in comparison with conventional Western medicine, Tibetan medicine offers strategies to become familiar with one's own mental construction and physiology of the mind.

Because hygiene semantically implicates a continuous activity with its final result (i.e. purity of the mind), it is preferred upon health to demystify the consequence of a process. By this poster, it is my goal to systematically present latest research in the field of contemplative neuroscience. Tool used for the development of this research was online medical database (e.g. www.online-baze.hr).

Keywords: Tibetan medicine, mental hygiene, mental training, default mode network, mind wandering

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2225](http://dx.doi.org/10.17486/gyr.3.2225)

Biopsychological basis of mindfulness

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The term mindfulness is usually described as maintaining a non - judgmental moment - by - moment awareness of our thoughts, feelings, bodily sensations and surrounding environment. Person is consequently capable of being permanently aware. That can lead to physical relaxation, emotional balance, behavioral regulation, self - perception alternation and decentration. Mindfulness is known to have numerous positive effects, such as anxiety and depression decrease, prevention of depression relapse, suicide prevention and it can also be used as an alternative cure for diseases such as cancer, multiple sclerosis, Parkinson's disease and most importantly, for increasing general quality of life.

Our aim was to figure out, whether mindfulness influences brain in any possible way and if there are, despite of psychological, also any physiological changes. To achieve our goal, we have examined the online - available literature, especially articles and summed up the results.

We know that our connections and the structure of our brain can be changed if we are exposed to the same behavior over and over again. This phenomena called neuroplasticity is responsible and fundamental for alteration in our brain after mindfulness meditation training. Studies that compare non - meditations to the experienced ones have revealed differences in size and density of gray matter in prefrontal cortex, amygdala, and hippocampus - areas that are also responsible for memory, learning and regulation of emotions. Some researchers have also confirmed epigenetic changes in some regulatory genes after a sufficient period of regular meditation.

Mindfulness can reshape our brain and neurological findings can profoundly explain the well-known psychological changes that occur as a consequence of mindfulness based meditation. With this scientific evidences of beneficial effects we could use the meditation as a preventive or healing alternative in variety of psychological and physical problems.

Keywords: mindfulness meditation, neuroplasticity, brain alterations, epigenetic changes

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2226](http://dx.doi.org/10.17486/GYR.3.2226)

Holistic approach to treatment of a patient with Parkinson's disease

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Parkinson's disease is a progressive neurodegenerative disorder that occurs due to damage in substantia nigra which results in dopamine deficiency. The etiology is unknown, although it is probably a combination of genetic and environmental factors such as viruses, toxins and vitamin E. Clinical picture is dominated by rigidity, akinetic tremor and bradykinesia with postural instability, and the diagnosis is confirmed by the positive response to levodopa treatment. A very important part of the treatment, aside from pharmacotherapy are physiotherapy and exercise, adequate nutrition and psychotherapy. Physical activity significantly decreases the progression of disease and psychotherapy has positive effects on maintaining social activities and reduction of depression, which is an often comorbidity of the condition. Case report: 60 year old patient, a seaman, came with symptoms such as double vision, urinary difficulties and occasional weakness in arms and legs six years ago. He gradually started having mood changes, loss of energy and interest, difficulties with sleeping and swallowing, dizziness and difficulties in maintaining balance. Physical status initially did not show typical symptoms: resting tremor, bradykinesia and muscular rigidity. The differential diagnosis included tumor of the central nervous system, unclear neurological disorder, cervicobrachial syndrome with radiculopathy, prostate adenoma and other. After extended diagnostic procedure for suspected Parkinson's disease a specific therapy was applied, as well as the therapy for the concomitant depressive disorder. The patient performs daily physical therapy, regularly swims, once or twice a year is stationary treated in a special rehabilitation hospital, maintains a balanced nutrition and conducts occupational activities. Family physician regularly carries out supportive psychotherapy with the patient and his family. Today, the patient is in a good general condition, with satisfactory weight and is independently mobile with preserved speech and social contacts.

Conclusion: With a holistic approach that includes pharmacotherapy, psychotherapy, physical therapy, a balanced diet and occupational therapy it is possible to considerably ease the symptoms of the disease, delay the onset of complications and maintain a better quality of life in patient with Parkinson's disease and his family.

Keywords: Parkinson's disease, family practice, holistic health, physical therapy

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2227](http://dx.doi.org/10.17486/GYR.3.2227)

Down's syndrome – prejudices about mental ability

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INTRODUCTION: Down syndrome (DS or DNS) or Down's syndrome, is a genetic disorder caused by the presence of all or part of a third copy of chromosome 21. It is typically associated with physical growth delays, characteristic facial features, and mild to moderate intellectual disability. It is Named by British scientist John Langdon Down, who described it in 1866.

AIM : The aim of this study is to prove that children who have Down's syndrome have the opportunity of intellectual development, with a different approach. The aim of this research is also to break the myth of their mental capabilities and "peel off the label" with them in modern society.

MATERIALS AND METHODS: We conducted a survey among 3252 people in the age group 18-70 years. The largest number was between 18 and 30 years, and we chose them as an authoritative group (2972). The survey included 10 questions, and we have provided a test of intellectual abilities among children with Down syndrome.

RESULTS: 48.48% of respondents think that children with DS can intellectually thrive even above the expected features, 42.42% think that may or progress to the border, 1% of them think it could not possibly thrive, 8% think that they can progress, but very little. In the intelligence test, intended for children up to age 14, of 10 children with DS ,7 of them has reached the threshold of 75%, while the other three did not pass the test. Of 10 children without DS, 8 of them solved the test over 75%, one did not pass, and one had a 100%.

CONCLUSION: Although insignificant, we say that with a little different approach and attention we can raise the threshold of their IQ, to support them in it so that they are not labeled in society.

Keywords: Down Syndrome, test, progress

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2228](http://dx.doi.org/10.17486/GYR.3.2228)

Specific Phobia – Fear of Cockroaches

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Specific phobias are considered the most common phobias and the most common psychiatric disorder amongst woman (in men right behind of using psychoactive drugs). Katsaridaphobia is constant and irrational fear of cockroaches. Most people feel uneasy when they are near cockroaches but people with katsaridaphobia are having a feeling of intense fear. Phobia is presented individually with anxiety, tachycardia, sweating and with excessive cleaning, overuse of insecticide, keeping the doors and windows constantly closed. This irrational fear has it's roots in unpleasant experiences with cockroaches in childhood.

Our goal was to investigate the presence of katsaridaphobia in student population and to see variations between the sexes, students who have preferences toward humanities/ social vs. natural, technical and biomedical sciences, positive personal or family psychiatric anamnesis and the region where they are studying.

122 students of Croatian universities have filled in Fear of Cockroaches Questionnaire (FCQ) through Facebook poll.

Results have been divided in 5.categories (from 1.category: no fear or extremely low level of fear to 5.category: extreme fear, phobia). There are 57,38% respondents in 1.category (also 82,35% of male respondents belong here) and 7,38% in 5. category (all of which are women). Fear is more pronounced in women, students who have preferences toward humanities/social studies and in people with positive psychiatric anamnesis.

This research has confirmed the fact that specific phobias are more common in women. The fact that students in humanities/social studies have higher incidence of fear can be explained by the fact that 81,13% of students are female. People who have panic disorder and/or depression in personal/family anamnesis have higher incidence of fear.

Keywords: phobia, fear, cockroaches, questionnaire

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2229](http://dx.doi.org/10.17486/GYR.3.2229)

Influence of fulfilled daily requirements for micronutrients and phytonutrients on the quality of life and successfulness in fulfilment of everyday activities

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Ignoring the importance of eating habits as a key factor of a healthy lifestyle and efficiency in everyday work is a concerning situation. Nowadays, we witness that there is an obvious aberrance of that which is conceived as good and healthy in theory from its implementation in everyday life. In this research the goal was to explore the influence of a fulfilled daily requirement for micronutrients and phytonutrients on the quality of life and successfulness in fulfilling everyday activities.

We followed 80 students from 19-24 years of age for three months. All students were examined before and after the research period with a standard assessment poll which is focused on self-assessment of efficiency of fulfilling everyday activities and quality of life. Group under research has been given a task to drink daily a 5 dl beverage which was made of one beetroot, one carrot, one apple, 15 g of blueberries and 50 g of fresh spinach. Such a beverage should fulfil the basic daily requirement for all micronutrients and phytonutrients.

The results show statistically significant lowering in the feeling of tiredness (from 30 to 7%). There is a statistically significant lowering in the number of students which had their mood lowered for a majority of time (from 15 to 6%). Statistical significance is shown in the number of students that have enough energy for extracurricular activities (from 5 to 36%). Staggeringly significantly lowered are the results concerning mental functions; the number of people which have problems with maintaining concentration (from 21 to 3%) and those that stated they have difficulty in concentration most of the time (from 27 to 8%).

It appears that an adequate amount of fruit and vegetables has influence on certain aspects of everyday functioning and successfulness in fulfilling everyday activities and activities that require mental strain.

Keywords: nutrition, micronutrients, quality of life

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2230](http://dx.doi.org/10.17486/GYR.3.2230)





Workshops

Childhood inactivity – a public health priority

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The continuing epidemic of cardiovascular diseases (CVD) calls for renewed and intensified public health action to prevent heart disease and stroke. The widespread occurrence and silent progression of atherosclerosis has created a CVD burden that is massive in terms of its attendant death, disability, and social and economic costs. Atherosclerosis begins to develop in childhood and progresses into the adult years, under strong influence of the risk factors. Recent studies of children, adolescents, and young adults have demonstrated the close link of blood cholesterol level, blood pressure level, smoking, physical inactivity and obesity with the extent and severity of atherosclerosis among people well below age. These findings underscore the opportunities for preventing CVD during childhood and adolescence, as well as the lifelong importance of prevention. For most children, atherosclerotic vascular changes are minor and can be minimized or even prevented with adherence to a healthy lifestyle. Accordingly, participation of children in sports and active play has never been more crucial than it is today. Furthermore, beside the beneficial role of physical activity in delaying or preventing metabolic complications such as type 2 diabetes, hypertension and consequently cardiovascular diseases, it has also been shown that it improves bone mineral density, increase school performance, and have a positive effect on mental health.

As a confirmation of exceptional public health importance of physical inactivity in adult age and children nowadays, the World Health Organisation (WHO) Member States in resolution 66.10 have agreed on a voluntary global non-communicable disease target for a reduction of 10% in physical inactivity by 2025. In order to achieve those objectives, it is necessary to guide relevant scientific research and implement the results in effective strategies that can lead to improved cardiovascular health of the population.

Keywords: atherosclerosis, risk factors, childhood inactivity

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2246](http://dx.doi.org/10.17486/GYR.3.2246)

Neurobiology of the common addictions – are students of medicine allowed to use THC?

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Neuroscientific comprehensions have enabled us to form a different approach to a whole group of diseases from the earlier one that introduced moralistic paradigm a priori in treating such patients.

Irretrievable encroachment in neurotransmitter system and violation of integrity of neuron membranes confirmed the concept of addiction as chronic, progressive and degenerative ailments.

In modern integrative approach we would like to confront mainstream ideas about addictiological patients but also of the public which is heavily influenced by mass media, with neuroscientific comprehensions. We would like to especially demonstrate the effect of the most popular intoxicants from the aspect of medical workers - medical professionals in decision making important for our profession.

Keywords: neurotransmitters, neurobiology, intoxicants, addictions

[HTTP://DX.DOI.ORG/10.17486/GYR.3.2247](http://dx.doi.org/10.17486/gyr.3.2247)

Acknowledgments

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We would like to thank the following supporters for their generosity and support during the 5th Student Congress of Neuroscience–NeuRi 2015



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