

**GOCE DELCEV UNIVERSITY, STIP  
FACULTY OF MEDICAL SCIENCES**

**First International Students' Symposium of Faculty of Medical  
Sciences**

**CELEBRATING ACHIEVEMENTS IN MEDICINE, PROMOTING  
HEALTH AND SHARING KNOWLEDGE**

**STIP, 20 APRIL 2016  
MULTIMEDIA CENTRE – GOCE DELCEV UNIVERSITY, STIP**

09:00 – 09:10	<p style="text-align: center;"><b>Welcome note</b>  <b>Prof. Blazo Boev</b>  <b>Rector of the University</b></p>	
09:10 – 09:40	<p style="text-align: center;"><i>The road to science - for students</i></p>	<p style="text-align: center;"><b>Prof. Rubin Gulaboski</b>  <b>Dean of the Faculty of Medical Sciences</b></p>
<b>First session</b>		
<b>Time</b>	<b>Title</b>	<b>Presenter</b>
09:40 – 10:10	<p style="text-align: center;"><i>Studying the cost of treating diabetes in Bulgaria</i></p>	<b>Prof. Doneva Miglena</b>
10:10 – 10:20	<p style="text-align: center;"><i>Features and benefits of <sup>223</sup>Ra radiopharmaceuticals for treatment of cancer</i></p>	<b>Andonela Janeva</b> Student
10:20 – 10:30	<p style="text-align: center;"><i>Immunomodulatory effects of probiotics and their role in allergy</i></p>	<b>Spase Stojanov</b> Student
10:30 – 10:40	<p style="text-align: center;"><i>Future therapies for neurodegenerative diseases using molecular tool for editing genes – CRISPR CAS 9</i></p>	<b>Ana Nikolova</b> Student
10:40 – 10:50	<p style="text-align: center;"><i>Importance of quantum mechanical tunneling phenomena in life sciences</i></p>	<b>Petar Davcev</b> Student
<b>10:50 – 11:30 Coffee break</b>		
<b>Second session</b>		
11:30 – 12:00	<p style="text-align: center;"><i>Regeneration of salivary glands – from in vitro to in vivo models</i></p>	<b>Prof. Mihnea I. Nicolescu</b>
12:00 – 12:10	<p style="text-align: center;"><i>Oral health status among dental medicine students in the two final years of studying</i></p>	<b>Natasa Arsova</b> Student
12:10 – 12:20	<p style="text-align: center;"><i>Effect of the mitotic inactivation on the properties and biologic activity of mesenchymal human stem cells</i></p>	<b>Aleksandra Jakovleva</b> Student

12:20 – 12:30	<i>Estimation of proangiogenic properties of artificial microvesicles from SHSY5Y cells</i>	Kristina Jakovleva Student
12:30 – 12:40	<i>Master plan for treatment – Challenge for the future of dentistry</i>	Stefan Kitanovski Student
<b>12:40 – 14:30 Lunch time</b>		
<b>Third session</b>		
14:30 – 15:00	<i>Community-acquired pneumonia</i>	Dr. Rich Wunderink
15:00 – 15:30	<i>Posterior tibial tendonitis and Hip fractures</i>	Dr. David Burandt
15:30 – 15:40	<i>Angiographic and procedural predictors of periprocedural complications</i>	Strahil Todorov Student
15:40 – 15:50	<i>Nonspecific low back pain treated with Kinesiotaping</i>	Kristijan Nikolov Student
15:50 – 16:00	<i>Abstinent syndrome and deviant behaviors investigated in opiate dependent individuals</i>	Martin Angjelov Student
16:00 – 16:10	<i>Acute coronary syndrome</i>	Matej Otjanski Student
<b>16:10 – 16:20 Closing ceremony</b>		
<b>16:20 Awarding of certificates</b>		

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the Goce Delcev University, Stip.*

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financial support.*

**INTERNATIONAL STUDENTS' SYMPOSIUM OF FACULTY OF MEDICAL SCIENCES  
"Celebrating achievements in medicine, promoting health and sharing knowledge"**

APRIL 20, 2016 - STIP  
ORAL PRESENTATIONS

1. **The road to science – for students**  
Rubin Gulaboski
2. **Studying the cost of treating diabetes in Bulgaria**  
Miglena Doneva
3. **Features and benefits of <sup>223</sup>Ra radiopharmaceuticals for treatment of cancer**  
Andonela Janeva
4. **Immunomodulatory effects of probiotics and their role in allergy**  
Spase Stojanov
5. **Future therapies for neurodegenerative diseases using molecular tool for editing genes – CRISPR CAS 9**  
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6. **Importance of quantum mechanical tunneling phenomena in life sciences**  
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11. **Master plan for treatment – Challenge for the future of dentistry**  
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12. **Community-acquired pneumonia**  
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Martin Angelov
17. **Acute coronary syndrome**  
Matej Otjanski

# INTERNATIONAL STUDENTS' SYMPOSIUM OF FACULTY OF MEDICAL SCIENCES

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APRIL 20, 2016 - STIP

## POSTER PRESENTATIONS

**1. "Incidence of large intestinal carcinoma in patients from Clinical Hospital - Stip for a period of 2010-2015"**

Author: Nikola Stoilkovikj; Co-authors: Gjorgji Shumanov and Slobodan Rogac

**2. "Oral cavity changes after radiotherapy"**

Author: Nikolina Kochovska; Co-author: Darko Kochovski

**3. "Doppler ultrasound: noninvasive way of imaging the blood flow"**

Author: Aleksandra Ristova – Stojanova; Co-author: Oliver Ristov

**4. "Comparison of dissolution test for metronidazole tablets in International and American Pharmacopoeia"**

Author: Violeta Koneva; Co-authors: Biljana Gjorgjeska and Sofija Petkovska

**5. "Gestational diabetes, experience of the Clinic for Gynecology in Skopje in the period 2013-2015"**

Author: Vesna Mladenovska; Co-authors: Biljana Gjorgjeska and Sofija Petkovska

**6. "Acupuncture treatment for lumbar disc herniation"**

Author: Martin Karovski; Co-authors: Jihe Zhu and Blagica Arsovska

**7. "Acupuncture points in treatment of adolescent depression"**

Author: Angela Angelovska; Co-authors: Jihe Zhu and Blagica Arsovska

**8. "High performance polymers in dental laboratory"**

Author: Daniela Mickovska; Co-authors: Ivona Kovacevska, Natasha Denkova and Pavle Apostoloski

**9. "Passive suicidal ideation as a risk factor for suicide among cancer patients"**

Author: Dijana Miloseva; Co-authors: Lence Miloseva and Dajana Bopkovska

**10. "Approximal margin adaptation on class II – posterior interproximal cavity restored with open and closed sandwich technique"**

Author: Jane Nacevski; Co-authors: Hristijan Dimoski, Stefan Kitanovski, Ivona Kovacevska, Natasha Denkova and Kiril Mitevski

**11. "Anesthetic buffering: new advances for use in dentistry"**

Author: Ivana Bojchovska; Co-authors: Darko Kochovski, Sandra Atanasova and Mihajlo Petrovski

**12. "Development of an electrochemical method for estimation of the antioxidative capacity of syringic and ferulic acid with ABTS as a redox mediator"**

Author: Mihail Aleksandrov; Co-

authors: Viktorija Maksimova and  
Rubin Gulaboski

13. **"Varicella in the region of Prilep"**

Author: Meri Stevanoska; Co-authors:  
Vera Dzateva, Eva Markovska and  
Velo Markovski

14. **"Treatment of insomnia  
syndrome with Chinese medicine  
and reflex therapy"**

Author: Todorche Monev; Co-author:  
Jihe Zhu

15. **"Mandibular supraprosthesis  
retained by dental implants - case  
report"**

Author: Ljupka Lazarova; Co-author:  
Evgenija Trajkoska

16. **"Analgesia during intraoperative  
and postoperative period"**

Author: Marinela Popova; Co-authors:  
Aleksandra Toneva and Jovanka  
Stojmenova

17. **"Representation of different  
techniques for determination of the  
working length in endodontic  
treatment"**

Author: Natasha Denkova; Co-authors:  
Katerina Zlatanovska, Simon  
Nadzenski, Dragan Spasov and  
Mihajlo Petrovski

18. **"Types of toothbrushes"**

Authors: Marija Dejkoska and Andrej  
Petrushevski; Co-authors: Sanja  
Naskova, Cena Dimova, Verica  
Toneva and Darko Kochovski

19. **"Contemporary classification of  
supernumerary teeth"**

Author: Igor Cvetanoski; Co-authors:  
Marko Petrovski, Sanja Naskova and  
Cena Dimova

20. **"Artificial sweeteners and oral  
health"**

Author: Ognen Cvetanoski; Co-  
authors: Stefan Ilievski, Sanja  
Naskova and Cena Dimova

21. **"Using of additional  
supplements for oral hygiene"**

Author: Ivana Ristova; Co-authors:  
Mihajlo Petrovski, Ivana Bojchovska  
and Darko Kochovski

22. **"Anemia as a reason for  
hospitalization in the region of  
Kumanovo"**

Authors: Stefan Ilievski and Robert  
Nikolovski; Co-authors: Kristina  
Denchovska, Eva Markovska, Tomica  
Anchevski and Velo Markovski

23. **"Prevalence of Down syndrome  
in the city of Bitola"**

Author: Menche Petrovska; Co-author:  
Nevenka Velichkova

24. **"Applying ROOTT implant  
system directly after extraction of  
teeth"**

Author: Sarita Kadrova; Co-authors:  
Milan Dumitrashkovic, Sanja Naskova  
and Cena Dimova

25. **"Epidemiological characteristics  
of influenza virus in municipality of  
Kumanovo"**

Authors: Robert Nikolovski and  
Kristina Denchovska; Co-authors: Eva  
Markovska and Velo Markovski

26. **"Gua Sha in back pain and neck  
pain"**

Author: Ivana Filipovska; Co-authors:  
Blagica Arsovska and Jihe Zhu





***Faculty of Medical Sciences  
Goce Delcev University – Stip, Macedonia***

**INTERNATIONAL STUDENTS' SYMPOSIUM OF FACULTY OF MEDICAL  
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**APRIL 20, 2016 - STIP**

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## **ORAL PRESENTATIONS**

## **The road to science - for students**

*Rubin Gulaboski*

*Faculty of Medical Sciences, Goce Delcev University, Stip, Macedonia*

The goal of this talk will be focused on the main steps and the obstacles the students meet while making efforts to get involved in the science. The main benefits of being involved in the science are also presented, while some hints are given about application in attractive foundations that provide scholarships and grants for research for students. Also, the personal experience of the author in respect to his road to international science are shared. Students are encouraged to get involved in the science, since this will be a major step forward toward the development of their scientific career.

## **Studying the cost of treating diabetes in Bulgaria**

*Guenka Petrova<sup>1</sup>, Miglena Doneva<sup>1</sup>, Vasil Valov<sup>2</sup>, Alexandra Savova<sup>1</sup>, Manoela Manova<sup>1</sup>, Marcin Czech<sup>3</sup>*

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*<sup>3</sup>Novo Nordisk Pharma, Warsaw, Poland, Medical University of Warsaw, Warsaw, Poland*

Diabetes is recognized as a huge burden on the health care systems. A cost of diabetes therapy for insulin users is paid by the health insurance system and has to be systematically revealed.

The aim of the study is to calculate and compare the direct medical cost of diabetes and its complications according to type of diabetes, regional differences and hospitalization for insulin treated patients.

In a combined prospective and retrospective observational study with duration of 6 months, 433 patients were randomly selected and were divided into 3 subgroups: 153 patients on insulin analogues, 115 on human insulin, and 165 on a combination of insulin and oral antidiabetic drugs (OAD). Diabetic patients on insulin therapy were recruited by 35 endocrinologists from all regions of the country. The cost of therapy for each group of patients was calculated as a sum of the units of health care resources used and their individual price. The average cost attributable to each individual patient was calculated.

Insulin analogues, due to their higher prices, are with the highest cost per 6-month therapy (326.06 EUR), closely followed by the combination therapy cost (239.77 EUR) in case just insulin therapy is considered. The cost of hospitalizations due to diabetes was found to be lowest in the group of patients on insulin analogues, followed by that for patients on a combination of insulin plus OAD therapy, and highest for the group on human insulin therapy. The main cost drivers are the medications for diabetes (46 % of the total cost on average), outpatient medications for diabetes complications (27%), and hospitalization due to diabetes (14%). These cost components account for 87% of the total cost. When adding the cost of hospitalizations due to diabetes complications, 96% of the total cost is reached.

Economic aspects of regional differences in diabetic patients' pharmacotherapy in Bulgaria are also revealed. A main reason for cost differences in the regions are the type of insulin or type of therapy used because of different socio economic status of the patients. The hospitalizations are the major cost driver. The results show that the patients on insulin and OAD consume more resources including hospitalizations and suffer from more complications of diabetes.

Cost of hospitalizations due to microvascular and macrovascular complications in type 1 and type 2 diabetic patients in Bulgaria is calculated. The patients are separated into two groups depending on the type of diabetes. The total costs for each subgroup are calculated and compared to the total costs of treatment for the observed period. In the type 2 diabetes group there are 50,2% of people with microvascular complications and 84,3% ones with macrovascular complications, whereas in the type 1 diabetes group, there are 39.3% with microvascular complications and 40,4 % ones with macrovascular complications. The total cost of hospitalizations in the type 2 diabetes group is 34 469.76 EUR where poor control of diabetes consists 45%, microvascular complications (23%) and macrovascular complications (31%). In the type 1 diabetes group the total hospitalizations cost is equal to 15 319.33 EUR with the following split: 59% due to poor control of diabetes, 22% due to microvascular complications and 19% due to macrovascular complications. Thus, type 2 diabetes is more costly than type 1 when hospitalizations occur and is associated with higher cost of macrovascular complications. The analyses play an important role in understanding a state of diabetes management and to support informed policy options. The data will ensure an equal patients' access to health care services of the same value and quality.

## Features and benefits of $^{223}\text{Ra}$ radiopharmaceuticals for treatment of cancer

*Andonela, Janeva, Katarina Smilkov*

*Faculty of Medical Sciences, Goce Delcev University, Stip*

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Important consideration in development of effective radiotherapy is the nature of the radiation emitted by the radionuclide. Radionuclides that decay by emitting  $\alpha$ -particles offer the possibility of high controlled therapeutic modality that can be targeted to selected malignant cells.  $\alpha$ -Particles present  $^4\text{He}$  nuclei, and are cytotoxic owing to their short path length ( $<100\ \mu\text{m}$ ) and high linear energy transfer ( $\sim 100\ \text{keV}/\mu\text{m}$ ). In addition to their cytotoxicity, these features provide reduced toxic effect to the adjacent tissue, thus overcoming some limitations that are usually associated with conventional chemo- and radiotherapy. In addition,  $\alpha$ -particle therapy offers the potential for more specific tumour cell killing with less damage to surrounding normal tissues than  $\beta$ -emitters, making this therapeutic modality ideal for elimination of minimal residual or micrometastatic disease.

Radiopharmaceuticals with the  $\alpha$ -emitter radium-223 have shown potential for treatment of different types of cancer. Its favourable radiobiological and radiochemical properties, with predominant alpha emission ( $\alpha$  emission of 5,78MeV with 93.5%, and  $<4\%$   $\beta$  particles and  $<2\%$   $\gamma$  radiation) and  $t_{1/2}=11,4$  days, render this alpha-emitting radionuclide promising for targeted cancer therapy. Together with its short-living daughters, each  $^{223}\text{Ra}$  decay produces four  $\alpha$ -particle emissions which enhance therapy effectiveness at cellular level.  $^{223}\text{Ra}$  localized onto the bone surfaces and/or in calcified tumors can, together with its daughter nuclides, deliver an intense and highly localized dose of  $\alpha$ -particles with less bone marrow dose compared to currently used  $\beta$ -emitting and/or electron emitting radiopharmaceuticals. Skeletal diseases, e.g., primary or metastatic cancer to the bone may be treated with the  $^{223}\text{Ra}$  radiopharmaceuticals. Radium-223 was the first agent used in this class that increased the overall survival in castration-resistant prostate cancer (CRPC) patients with bone metastases. As such, it has recently been approved by the FDA in the form of  $^{223}\text{RaCl}_2$ ,



for the treatment of patients with symptomatic bone metastases and no known visceral disease, since Phase III clinical trial in 922 patients showed significantly improved overall survival vs placebo (14.0 vs 11.2 months). Furthermore, a recent-date case report revealed success in treatment of osseous metastases in breast cancer. It is left to be seen whether the reported successful treatments will elicit further development of radiopharmaceuticals containing radium-223.

**Keywords:**  $\alpha$ -particle, cancer therapy, <sup>223</sup>radium.

# Immunomodulatory effects of probiotics and their role in allergy

Spase Stojanov, Katarina Smilkov

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Probiotics as live microorganisms can confer health benefits to the host, when administered in adequate amounts. Prebiotics on the other hand, are substances that induce the growth or activity of (probiotic) microorganisms. Studies have shown that various effects of different probiotic strains can exert beneficial effects in humans. Most of the studies explore their gastrointestinal effects, but also the studies that present immune enhancement are in rise. Our goal was to explore the studies that relate to immunomodulatory effects of the probiotics, with an accent to allergies and allergic diseases in both, pediatric and adult patients.

Allergic disorders are immune mediated and are characterized by increased IgE synthesis and activation of eosinophils, or can be non-IgE mediated (IgG, Th-cells, complement activation). Some studies show an effect of *Lactobacillus rhamnosus* on humoral immunity in infants with atopic dermatitis. For example, one study indicates that the proportions of CD19+ and CD27+ B- cells significantly increased in the treated patients compared to the placebo group. In another study conducted in 3-12 months infants diagnosed with atopic dermatitis, *Lactobacillus rhamnosus* didn't show any therapeutic effects. Again, a study shows that the peak expiratory flow rate (PEFR) in asthmatic children treated with another probiotic, *Lactobacillus gasseri*, increased in the nighttime, but did not differ in the daytime. In addition, studies have been conducted to confirm their beneficial effects in adults. In a study with 31 adult volunteers with a history of grass pollen allergic rhinitis were treated with *Lactobacillus paracasei*. The outcome of the study showed that nasal pruritus was significantly lower after the treatment. However, in the treatment of pollen allergic rhinitis, *L. acidophilus* and *Bifidobacterium lactis* didn't show significant difference post- vs. pre-treatment. Studies have claimed that the main immunological effects of probiotics underlay in inhibiting the production of cytokines. Also, studies have shown that different strains of probiotics have their own unique mechanism of action. For example, some strains of *Bifidobacterium* induce the production of IL-10 and on the other side inhibit the

production of IL-4. Nearly all strains inhibit the production of IgE in infants and also in adult patients, but induce the production of IgA.

It is of no doubt that probiotics play a role in the immune system. Still, up to now, studies have been inconsistent and more evidence has to be presented to solidify the hypothesis of the health benefits of probiotics, especially when we know that the effects can be modest and may depend on various conditions.

**Key words:** allergy, cytokines, immunity, probiotics.

## **Future therapies for neurodegenerative diseases using molecular tool for editing genes – CRISPR CAS 9**

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Clustered regularly interspaced short palindromic repeats (CRISPRs) are classes of repeated DNA sequences that act in concert with CRISPR-associated (Cas) genes to confer bacterial and archaeal immunity against foreign invading nucleotides such as phages and plasmid DNA. These repeats were discovered in 1980s in E.coli but their functions was not confirmed. After many years in 2007 some research confirmed that S.thermophilus have special resistance against a bacteriophage and infectious virus using CRISPR Cas9 mechanism. In the last few years are made a major advantage in discovering of molecular pathways in bacterias which have provided facile and reliable methods for genome editing. Especially with the development of the CRISPR (clustered regularly interspaced short palindromic repeats)/Cas9 (CRISPR-associated protein-9 nuclease) system, which can recognise desired mutations into the genome, to correct disease-related mutations, and to activate or suppress genes of interest.

The results of recent clinical trials for neurodegenerative disease (ND) therapeutics underscore the need for a more comprehensive understanding of the underlying disease biology before effective therapies can be devised. The CRISPR Cas 9 have opened the door to the development of new model systems for studying the complexity of the nervous system, including animal models and stem cell-derived in vitro models. Till now several species have been used as animal models of neurodegenerative diseases, mostly pigs, sheep, and non-human primates. So far using CRISPR Cas9 in neurodegenerative disease has achieved highly successful results especially in treatment for Amyotrophic lateral sclerosis (ALS), Huntington's disease (HD) and Parkinson's disease (PD).

Precise and efficient gene editing using CRISPR–Cas systems has the potential to advance neuroscience research. Therefore, CRISPR Cas9 might be in the future candidate for successful therapy for neurodegenerative disease. In this review, we discuss prospects of CRISPR/Cas9 as a tool for genome editing in targeted centers in the brain for neurodegenerative disease.

**Keywords:** CRISPR Cas9, neurodegenerative disease, gene editing, amyotrophic lateral sclerosis (ALS), Huntington's disease (HD) and Parkinson's disease (PD).

# Importance of quantum mechanical tunneling phenomena in life sciences

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Numerous reactions involving intra- and intermolecular transfer of protons and other atoms and atomic groups are ubiquitous and essential to life sciences. For example, mutations induced either by chemical agents or in a photochemical manner often involve transfer of protons between DNA bases. Due to the small mass of the proton, these processes are inadequately described by classical physico-chemical approaches. To cover all essential aspects of the problem, one has to rely on a more exact quantum mechanical approach. Due to the dual (wave-particle) nature of the essential building blocks of matter, however, certain “weird” and “counterintuitive” phenomena arise when the processes of proton-transfer are described quantum mechanically. In this study, we analyze rigorously, by a quantum mechanical approach, the processes of transmission of light particles (including protons) through rectangle and Eckart-type barriers. Transmission probabilities are obtained through solutions of one-dimensional Schrödinger equation, and the effects of “tunneling” and “anti-tunneling” through the barriers are discussed and analyzed. The dependence of transmission (as well as the reflection) probabilities on the mass and energy of incoming particles, as well as on the height of the barrier is analyzed and discussed. The fundamental implications of the inherent quantum description of these processes to life sciences are discussed as well. Special emphasis is in this context put on the possible quantum nature of the mutation processes occurring at molecular level, which has certain philosophical implications concerning the very essence of the phenomena of life.

**Keywords:** DNA bases, mutations, proton transfer, quantum mechanical tunnelling, transmission probability.

# Regeneration of salivary glands – from *in vitro* to *in vivo* models

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## **Introduction**

There are several diseases that impair the function of saliva producing by major salivary glands. Salivary glands exhibit a remarkable self-repair potential. This feature has been proven by multiple experiments, in which the gland was able to heal itself, provided that its neural supply remained intact. However, this is valid only until a certain threshold is reached, beyond that the gland cannot regenerate by itself anymore and needs external support.

### ***In vitro* models**

Salispheres are multi-cellular floating clusters, which form in primary cell culture from salivary glands.

Selected cells isolated from this heterocellular population have been used to ameliorate the recovery potential of non-responsive atrophic salivary glands. Cells inside salispheres respond differently to various neural mediators and cell culture behaviour changes accordingly.

### ***In vivo* models**

The unilateral ligation of a salivary excretory duct leads to temporary glandular atrophy, later restored by deligation only. The experiment emphasizes the importance of local stem cells for repopulating the cellular repertoire of both acinar and ductal structures.

## **Conclusion**

Identifying the cells and mechanisms involved in regeneration and repair of salivary glands primes future research on prevention and treatment of xerostomia, dry mouth syndrome and on diminishing the adverse effects that radiotherapy has on salivary parenchyma and ducts.



# Oral health status among dental medicine students in the two final years of studying

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Studying Dental medicine is in a close relationship with oral hygiene and DMF index. DMF (*Decayed, Missing, Filled*) index is used to describe the prevalence of dental caries in an individual level. On the other hand, the higher levels of education of the meaning of the oral hygiene, the more the acquired knowledge is applied.

The aim of this study was to evaluate the oral health status among Dental medicine student in the two final years of studying.

To prove this, all 74 students from fourth and fifth year of Dental medicine were included in this study. In the first phase each of the students have received and filled a questionnaire for their own oral hygiene. All subjects were clinically examined in the second phase and DMF index data were noted. Obtained values were statistically evolved.

According to clinical examination and as well the data from questionnaire survey, DMF index is on satisfactory level in correlation with oral hygiene. The expected results are due to the level of education of the examinees, who are at the final years of their studies.

Oral hygiene is very important factor that affects DMF index, also with dental plaque and food are the main etiological factors for caries appearance. According with the chosen profession as a future dentists and their higher level of education, Dental medicine students are intensively paying attention for their oral health and of course all of that have an impact on DMF index.

**Keywords:** dental caries, DMF index, oral health, oral hygiene, students.

## **Effect of the mitotic inactivation on the properties and biologic activity of mesenchymal human stem cells**

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Stem cells (SCs) present a population of undifferentiated, immature cells, taking responsibility for the regenerative process in the organism by their self-renewal, indefinite division and differentiation into any kind of mature cells of the body. The positive effect from SC transplantation can be achieved by replacement of the damaged cells, as well as by synthesis and secretion of biologic active molecules, affecting migration, angiogenesis and apoptosis. Despite of the positive effects of SC application, there are some ethical restrictions (embryonic and fetal SCs) and concerns as contamination and damage of the genetic material during cell isolation, especially riskiness for uncontrolled division, leading to tumor formation). The clinical application of multipotent mesenchymal stem cells (MSCs) found in adult body, remains promising, due to their stem-cell-like qualities and therapeutic effects, on one hand, and anti-proliferative properties, absence of ethical issues on another hand. In this study, we suggest mitotic inactivation of MSC without harming their properties and biologic activity *in vitro*. MSC were isolated with physical and enzymatic treatment of lipoaspirate of human subcutaneous. The derived stromal vascular fraction (SVF), contains cell population, named as adipose-derived-stem-cells (ADSCs), whose tests confirmed their MSC appurtenance (plastic surface adhesion, mesenchymal differentiation, and specific and unique markers expression). To accomplish mitotic inactivation we selected 10 µg/ml mitomycin C treatment in humidified atmosphere containing 5% CO<sub>2</sub> during 3 hours as optimal. Furthermore the immunophenotype of ADSCs both native and inactive, was compared and expanded to CD44<sup>+</sup>, CD73<sup>+</sup>,

CD34<sup>-</sup>, CD11b<sup>-</sup>, CD19<sup>-</sup>. To test the multipotency of ADSCs, cell culture was maintained in media inducing adipogenic, osteogenic and chondrogenic differentiation, and further stained to indicate specific cell formation. Since migration of endothelial cells is a key event in angiogenesis, the ability of ADSCs to affect HUVECs migration *in vitro* was used in order to display their proangiogenic properties. Our results reveal that mitomycin C treatment leading to mitotic inactivation does not affect potency, stemness and immunophenotype, as well as biological activity of ADCs *in vitro*. Our findings hold the promise of safe use of MSC with an increased risk of unlimited division (embryonic or genetically modified SC).

**Keywords:** mesenchymal stem cells, adipose derived stem cells, mitomycin C, cell therapy.

# **Estimation of proangiogenic properties of artificial microvesicles from SHSY5Y cells**

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Ischemia is a vascular disease which involves a restriction of the blood supply of tissues, causing a shortage of oxygen and glucose needed for cellular metabolism, which leads to death of cells of the tissue. It can be caused by occlusion, atherosclerosis, hypoglycemia, hypotension, traumatic injury and other conditions. Cardiac ischemia is one of the main causes of mortality compared to other types of ischemia. Analysis shows that between 1980 and 2010 the death rate for this type of ischemia rose by almost 50% and amounted 7 million death cases.

Nowadays, the most prospective method of treating this disease is the cell therapy, and more specifically the mesenchymal stem cell therapy. In order to prolong the effect of transplanted cells, there are widely applied genetic modifications of cells using plasmid vectors and defective viruses carrying several copies of the gene of the desired protein. However, there are examples of excessive proliferation as results of these methods.

Therefore, in this study we offer biologically safe tool for delivery of biomolecules to target cells in order to stimulate the process of therapeutic angiogenesis in ischemia. Microvesicles (MV) are cell formations, surrounded by the cytoplasmic membrane of the parent cell, which protects their content of degradation. They enable exchange of information between cells, thus stimulating epigenetic transformation of the target cell. Microvesicles represent a safe delivery tool, since they do not contain nuclear material which makes them incapable of uncontrolled division, but at the same time they retain their ability to stimulate angiogenesis.

As a source of microvesicles we chose a SHSY5Y neuroblastoma cell line, since it is known that tumor cells provide an intensive synthesis of angiogenic growth factors, especially VEGF which is the main trigger of angiogenesis.

Microvesicles were derived by multiple centrifugation of the cells, with further Cytochalasin B treatment. Further, using flow cytometry, the size of the microvesicles was measured which after the third cycle of centrifugation varied between 1 and 3  $\mu\text{m}$ . Finally, co-culturing of microvesicles was performed and SHSY5Y cell line with endothelial cells (HUVEC), respectively.

The results demonstrate that both native SHSY5Y cells and microvesicles derived from SHSY5Y cells are able to stimulate the process of angiogenesis in vitro. More precisely, the number of branches of the capillary-like formation which was induced by the SHSY5Y cells was  $43.5 \pm 3.53$  in an area of  $1 \text{ mm}^2$ , the number of branches induced by microvesicles –  $41.33 \pm 8.51$ . In the positive control (HUVECs cultivated in complete medium) this number amounted  $69 \pm 4.58$ , while in the negative control (HUVECs in “starvation” medium) the number of branches was basically insignificant –  $5.33 \pm 3.79$ .

The results of our study show that artificial microvesicles derived from SHSY5Y cell line have angiogenic potential and they can be used as a safe therapeutic agent for delivery of angiogenic growth factors to target cells in order to stimulate therapeutic angiogenesis in ischemia.

**Keywords:** angiogenesis, endothelium, ischemia, microvesicles, neuroblastoma cells.

## Master plan for treatment – Challenge for the future of dentistry

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The main goal of treatment in dentistry is to create a good and functional dentition in a healthy periodontal environment. Only in that way the lasting of dental restorations can be ensured. From that, the master plan consists of logical (rational) sequences of dental procedures which include periodontal and other dental procedures which have as a goal to ensure a good functioning dentition in a healthy periodontal ambient. The goal of this study is to present a master plan for treatment in modern dentistry. The master plan of periodontal treatment includes different goals for every patient, adequate for their needs. It incorporates a number of procedures in order to accomplish complete gingival and periodontal health, in mind to gain a complete healthy unit which will be able to accept further procedures. The master plan consists of four phases (not including the preliminary phase in which are treated acute diseases and conditions). The first phase is the removal of all etiological factors – etiotropical phase. The second phase consists of all surgical procedures. In the third phase are performed all the reconstructive procedures. And the last phase is the phase of maintenance of the results. It includes instructions for a better oral hygiene and regular controls, individual in regard of every patient needs, of the periodontal status and the status of already existing restorations, because they affect the periodontium.

Instead of a conclusion we can say that only an overall treatment of the patient, solving the problems by priority, and following all the steps, should and must become the future of dentistry.

**Keywords:** master plan, modern dentistry, overall care in dentistry, periodontal treatment, phases of treatment.

# Angiographic and procedural predictors of periprocedural complications

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**Introduction:** This study aimed to identify angiographic and procedural factors associated with increased risk of periprocedural complications during coronary angiography and percutaneous coronary intervention and their treatment in a large series of patients from a single coronary interventional center with on-site surgical backup facilities.

**Materials and Methods:** The study reviewed the angiographic and procedural records of total 4965 consecutive diagnostic coronary angiographies (76%) or primary percutaneous coronary interventions (24%) performed at the Institute for cardiovascular diseases “Dedinje” - Belgrade, Republic of Serbia, from January 2012 to December 2013. To identify complication an extensive search has been performed including complication and adverse event registry, catheterization laboratory reports and patients’ discharge letters. Coronary artery type lesions were defined according to the *ACC/AHA classification*, perforations were defined according to the *Ellis classification* and dissections were classified according to *The National Heart, Lung and Blood Institute (NHLBI) nomenclature*.

**Results:** The overall incidence of complications during diagnostic coronary angiographies and primary percutaneous coronary interventions was 29 (0.6%). The most frequently reported complication was coronary artery dissection, occurring in 9 patients (32%), of which 89% with Type D dissection, followed by acute thrombosis after stent implantation in 6 patients (20%), then coronary artery perforation in 6 patients (20%), retained material in coronary vasculature in 4 patients (14%), air embolism in 2 patients (7%) and clinically relevant no-reflow phenomenon in 2 (7%)

patients. The records suggest that Type C coronary lesions were more common in the perforations and retained material group. Protamine sulphate was the common therapy used in all the patients with perforation, with additional sealing with (covered) stents if necessary. Stent implantation was needed only in 50% of patients, all of them with Type II/III perforation. Major complications, such as: cardiac tamponade necessitating surgical intervention, myocardial infarction and death did not occur. Surgical coronary artery revascularization, either urgent as a rescue procedure, or during the subsequent course of hospitalization until discharge, was not needed.

**Conclusions:** Complications of periprocedural coronary procedures are frequently underreported. Performing detailed search, we found that in a high volume cardiac center coronary angiographies and percutaneous coronary interventions have a low risk of complications and that these complications can be managed by the interventional approach. Their unavoidable occurrence in a routine clinical practice demands that comprehensive training in recognizing and managing complications must be an integral part of education and training in the field of interventional cardiology.

**Keywords:** classification, dissection, embolism, perforation, risk factor, thrombosis.



## **Nonspecific low back pain treated with Kinesiotaping**

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Low back pain (LBP), is one of the most common causes and it's still a leading factor for absence from work.

On international level around 80% of the population has already experienced pain in the low back, furthermore millions of people around the world unfortunately suffer from LBP for more than 12 weeks (6 months a year) which is due to non-specific chronic processes with still unknown underlying pathoanatomic changes.

Although there is no widely adopted treatment protocol, the preferred approach is conservative including: electrotherapy, laser therapy, ultrasound, medications, rest, exercise, manual mobilizations and/or manipulations, acupuncture.

In this study we concentrated our efforts on assessing the effects of the Kinesio taping method. The Kinesio Tape (invented by Dr. & Chiropractor Kenzo Kase 1979) consisting of fine cotton fiber and low % of acryl on the under surface, achieves good adhesion to the cutaneous and under-cutaneous tissues which are its main target. In correlation with isokinetic exercises preformed three time a week, final outcomes have shown a significant decreasing of the pain.

According to this specific process we can infer that there is a significant decrease in pathological processes putting the emphasis on the Neuromuscular & Skeletal disorders and the lymph flow. But there still a need of further research in future so the final physiological process of this treatment could be well explained.

# Acute coronary syndrome

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Acute coronary syndrome (ACS) occurs in three forms; ST elevation myocardial infarction (STEMI), non ST elevation myocardial infarction (non STEMI) and unstable angina pectoris. These types are named from the electrocardiogram (EKG) changes. The pathophysiology of this syndrome is due to decreased blood flow in the coronary arteries, and the part of cardiac muscle which is affected from decreased flow is unable to have normal contractility. The most common symptoms are chest pain, radiating to the left arm, pain on the back, nausea (especially for the infarct on the inferior wall), sweating. The ACS is usually associated with coronary thrombosis.

In the emergency department number of tests are usually taken, including myocardial markers such as troponin T or hs troponin, and EKG changes are follow up. Treatment of this syndrome depends of the form of the syndrome. All three forms are treated with aspirin, clopidogrel, and high dose of statins. If the chest pain is very strong, morphine is recommended. If there is no contraindication, thrombolytic administration is applied. The invasive treatment is coronary angiography in patients with ST elevation or new left bundle branch block on the EKG. On the coronary angiography the coronary artery which is occluded is dilatated or a stent is implanted.

**Key words:** acute coronary syndrome, EKG changes, chest pain, treatment.

## **POSTER PRESENTATIONS**

## **Incidence of large intestinal carcinoma in patients from Clinical Hospital - Stip for a period of 2010-2015**

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**Aims:** To systematize and analyze the data of the patients with large intestinal carcinoma in Stip.

**Materials and methods:** For realization of the aim, a descriptive epidemiological method was implemented, with statistical processing and analyzing of the data of patients with pathologically verified large intestinal carcinoma in Regional Dept. of Pathology in Clinical Hospital - Stip during the period of 2010-2015. Findings from the pathologic materials taken by endoscopic biopsies and during an intraoperative resections of the colon were analyzed. From 232 patients who are registered and pathologically verified in RD of Pathology in Clinical Hospital - Stip during the period of 2010-2015, the stage of disease was determined in 98 patients, according to the TNM (tumor, node and methastasis) classification. Mutual comparison was made, depending on local lymph nodes involvement and praesence of distant metastases.

**Results:** From 232 patients with cancer of the large intestine registered and pathologically verified in RD of Pathology in Clinical Hospital - Stip, male were 57,3% and female were 42,7%. The patients are at the age of 47-86, with an average age of 65. Regarding the place of living, 5 (2,2%) patients are living in rural and 227 (97,8%) patients are living in urban areas. Regarding the localisation, large intestinal carcinoma is most frequently localized in the rectum (37,9%) and most rarely localized at the splenic flexure (3%). From 98 patients in whom a TNM classification was performed, during the period of 2010-2015, male were 49 (50%), and female were 49 (50%). Largest number of cases were registered in 2010 (28,6%) and the lowest one in 2013 (7,1%). Most of them were diagnosed at Stage 3 (46,9%) and least of them

were at Stage 0 (1%). From 98 registered and pathologically verified patients according to the TNM classification, in 52 (53,1%) there was a local lymph node involvement and in 46 (46,9%) there was no involvement of the local lymph nodes. Distant metastases were detected in 6.1% of these patients.

**Conclusion:** The incidence of large intestinal carcinoma increases with an age and also, living in urban areas increases a risk of occurring this carcinoma. The late stage diagnosing inhibits the efficiency of curing the disease, which is an imperative for more efficient primary and secondary prevention of the large intestinal carcinoma.

**Keywords:** carcinoma, large intestine, lymph nodes, pathologic verification, TNM classification.

## Oral cavity changes after radiotherapy

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**Introduction:** Radiation therapy is a method that exploits the penetrating power of ionizing radiation that penetrates the body of the specified place and the desired depth and destroying damaged tissue. It is most commonly used to treat tumors in a way that reduces or completely destroys the tumor node. External beam therapy (EBT) and Intensity-modulated radiation therapy (IMRT) are two of the methods commonly used in radiotherapy.

**Aim:** The aim of this study was to detect the changes to the oral cavity that occur after radiotherapy to the head and neck

**Materials and Methods:** For the realization of this survey were examined 22 patients from the Demir Hisar region that had some radiation therapy to the head and neck. The tests were performed by clinical examination and x-ray images. It was also performed an insight into the outpatient books of the primary care dentists and primary care physicians.

**Results:** In 19% there are not changes after radiotherapy. 59% of patients have acute changes while 22% of the changes are of chronic character. From the acute changes most common is dry mouth 77%, followed by 61.5% mucous, difficulty swallowing 46%, burning sensation in the mouth 38% and distortion in perception of taste 30%. 80% of chronic changes fall in chronic xerostomia while chronic *Candida albicans* occurs in 60% of patients and osteoradionecrosis occurs in 20%.

**Conclusion:** From the performed tests and the results we can conclude that in 81% of patients appears change in the oral cavity after radiation therapy to the head and neck. The most common changes are of acute character which, if appropriate treatment is not received, can turn into chronic changes.

**Keywords:** acute changes, oral cavity, patients, radiotherapy, xerostomia.

# Doppler ultrasound: noninvasive way of imaging the blood flow

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**Introduction:** Doppler ultrasound is a risk - free and pain - free noninvasive procedure that uses high frequency sound waves (ultrasound) to examine the blood flow.

**Aim:** Understanding the Doppler ultrasound, the way it works, the range of conditions that could be diagnosed with it.

**Materials and methods:** We have observed the work of Atanas Ristov MD, specialist in internal medicine for three months. Doppler ultrasound is an inevitable part of his everyday work, allowing him to observe the blood flow and to determine the condition of his patients' health. Further more, we read the manual so we could completely understand the way the Doppler ultrasound works. Also, we read many abstracts and reports about the principles and clinical applications of Doppler ultrasound.

**Results:** The way Doppler ultrasound works is quite easy to understand. The transducer sends sound waves that have the ability to pass through the skin and all the other tissues. The sound waves echo off of the blood vessels and bring the information back to the computer. As blood flow is detected, a distinctive sound might be heard. After the information is being processed, a picture will come up on the screen that shows the blood flow.

There are few basic types of Doppler ultrasound:

1. Continuous wave Doppler. This type provides information about the blood flow by using the changes in the pitch of the sound wave. The doctor listens to the sounds to evaluate the blood flow.
2. Duplex Doppler. This type produces a picture of the blood vessel. There is also a graph that gives information about the speed and direction of blood flow.
3. Color Doppler. This type produces a picture of the blood vessel, but there are also colours in the picture and they give information about the speed and direction of the blood flow.
4. Pulsed wave Doppler. The main difference in this type is that the sound wave returns over the same time interval, but at a shifted frequency. The information

about the blood flow origins from a particular location that is chosen by the operator.

There are many conditions that can be diagnosed thanks to this procedure:

1. Heart conditions (congenital heart irregularities, defects on the heart valves),
2. Conditions that may affect the arteries (arterial occlusion, arterial stenosis, aneurysms),
3. Conditions that may affect the veins (thrombophlebitis, deep vein thrombosis),
4. Vascular tumors (benign and malignant).

Conclusion: Doppler ultrasound is very accessible method of evaluating the blood flow. It provides fast and precise informations, allowing the doctors to easily diagnose many different conditions. Not so long ago, evaluating the cranial blood flow was nearly impossible. Today, thanks to the Doppler ultrasound, examination of the cranial blood vessels is easy and fast – that is the latest innovation in this method. These examinations are performed using a pulsed Doppler Probe and a trans temporal approach.

**Keywords:** blood flow, conditions, Doppler ultrasound, procedure.



## Comparison of dissolution test for metronidazole tablets in International and American Pharmacopoeia

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The tablets are commonly used dosage forms and as such are subject to tests to prove their quality. As inevitable here is the test that determine dissolution of active component from the tablet. Over the years the test suffered a series of improvements. At the end it become an official test in pharmacopoeias and mandatory testing for tablets quality. Depending on the properties of the active ingredient, pharmaceutical form and effect of the drug used specific standardized equipment, appropriate medium, and method of analysis is proscribed in pharmacopoeia monographs.

The purpose of this paper was to make a comparison of the tests for metronidazole tablets in official monographs in International Pharmacopoeia and US Pharmacopoeia in order to determine similarities and differences.

Comparison of monographs in both pharmacopoeias was made in terms of apparatus used, the medium, the speed of rotation of the apparatus and the tolerances allowed when performing the test.

Although the dissolution test prescribed in general part of both pharmacopoeias is the same, in the individual monographs the visible differences exist in terms of the prescribed equipment, medium, speed and tolerance, as shown in Table 1.

Table 1 – Dissolution testing for metronidazole tablets, comparison of monographs in International pharmacopoeia and US Pharmacopoeia

	<b>International Pharmacopoeia</b>	<b>US Pharmacopoeia</b>
<b>Apparatus</b>	Paddle	basket
<b>Medium</b>	500 ml buffer pH= 6,8	900 ml 0,1N HCl
<b>Rotation speed</b>	75 rpm	100 rpm
<b>Sampling time</b>	30 min	60 min
<b>Tolerances</b>	not less then 80% of labeled amount	not less then 85% of labeled amount

It can be concluded that the dissolution test of active component in metronidazole tablets is an important parameter for testing the quality, despite the differences that exist in performing the test in various pharmacopoeias. Using the dissolution test in routine control of the production process proves compliance with the required quality of each batch produced. This is particularly important in terms of ensuring the quality of medicines and meeting the standards of good manufacturing practice.

**Keywords:** apparatus, dissolution test, International Pharmacopoeia, European Pharmacopoeia, US Pharmacopoeia.

## **Gestational diabetes, experience of the Clinic for Gynecology in Skopje in the period 2013-2015**

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The term gestational diabetes is a condition of impaired glucose metabolism and insulin action specific to pregnancy. It occurs between 24 and 28 weeks of pregnancy in healthy women who normally do not suffer from diabetes.

About 7% of pregnant women worldwide are diagnosed with gestational diabetes and each year this number is increasing which is one of the most common health problems in pregnancy. Hyperglycemia causes increased growth of the child fetal cells resulting in macrosomia (growth of a baby) and complications during the childbirth. Elevated blood glucose levels do not give any symptoms, so it is extremely important to perform regular gynecological examinations during pregnancy which include measuring the level of glucose in the blood and urine. It should be emphasized that gestational diabetes occurs only during pregnancy and disappears after it. However, there is a risk for those women of diabetes type 2 later.

The aim of our work was to analyze the data obtained from the Clinic for Gynecology in Skopje in the period from 2013 to 2015 and to compare with the data provided by WHO.

The data of 1213 pregnant women, aged from 18 to 48 years with a body mass index (BMI - body mass index)  $\geq 25$  kg / m<sup>2</sup> and one or more additional risk factors for diabetes according to the criteria of the American Diabetes Association were analyzed. The results obtained are in the correspondence to data published by the WHO.

As the conclusion, gestational diabetes occurs in women who have insulin resistance and a relative impairment of insulin secretion. These women have a significant risk of developing diabetes later in life. It is important to identify this group of women for preventing perinatal morbidity, as well as for improving long-term outcomes for the mother and her children.

**Keywords:** diabetes mellitus, gestational diabetes, hyperglycemia, pregnancy.

## Acupuncture treatment for lumbar disc herniation

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**BACKGROUND:** The disc herniation is an illness that comes with aging, which always produces prolapse and irritation of the surrounding nerves, and the conventional medicine offers invasive and painful treatments, such as epidural injection, open lumbar microscopic discectomy or laparoscopic surgery of the spine.

The acupuncture is used for centuries as a successful treatment for many diseases, and thanks to the development of the medicine and better knowledge of the pathological conditions of the organism, now the science is able to prove the effectiveness of this, for the patient easy, almost painless and non-invasive treatment, which in addition of the therapeutic, has a strong analgetic effect in the first phase of the treatment.

**PURPOSE:** This paper aims to demonstrate the efficacy of the treatment with acupuncture over the disc herniation with a purpose for an alternative, less painful and non-invasive treat of the illness.

**MATERIALS AND METHODS:** The research was performed on 30 patients, all of which with symptoms of lumbar pain and all of them have a herniated disc, usually, 29 of them, have a herniated disc between the L4 and L5 vertebrae, and 26 of them with hernia combined with L4, L5 and S1.

In the treatment was performed acupuncture at BL-24 (Qi Hai Su), BL-25 (Da Chang Shu), BL-26 (Guan Yan Shu), BL-27 (Xio Chang Shu), BL-28 (Pang Guang Shu), GB-30 (Huan Tiao), BL-40 (Wei Zhong), BL-57 (Cheng Shen), GB-37 (Guan Ming) и BL-60 (Kun Kun), indoors at a room temperature of about 25 degrees Celsius.

**RESULTS:** According to the statistics, it is obvious that the disc herniation is almost equally present in the both sexes, from 30 patients, 13 were women and 17 were men. The number of treatments is different, but in average 8 treatments are required to treat.

**CONCLUSION:** According to the research conducted by this paper, on the basis of facts and evidences, the acupuncture is a successful therapeutic treatment for disc herniation.

## Acupuncture points in treatment of adolescent depression

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**Introduction** - Depression originates from the Latin word 'depressio' meaning declined bad mood. Adolescent depression implies to depression in teens. Adolescence is a most extravagant period of life where many changes are happening which may affect the behavior of the young people. The causes of depression are not well clarified but are attributed to genetics, abnormality of neurotransmitters and stressful circumstances (abuse, drugs, conflicts, death, separating from someone important, serious illness, irregular lifestyle and etc.).

**Methods** - Acupuncture is an ancient form of Traditional Chinese Medicine that works based on the principle of stimulation of certain points in the body placed in channels called meridians, through which flows the energy - the life force (chi), which correct any imbalance.

**Discussion** - Depression is considered as a problem of the circulation of the chi energy in the body. The main body part responsible for the circulation of this energy is the liver and the heart and pancreas are playing a supporting role. The best known acupuncture treatment to increase the flow of chi energy is called 'Four gates'. This treatment consists of stimulating the source points on both hands, between thumb and forefinger of both legs between the thumb and index finger. For the treatment of depression acupuncture points that are used are: Baihui-DU 20, Shenting-DU24, Taiyang-EX-HN5, Renzhong-DU26, Zhongwan-RN 12, Tianshu-ST25, Qihai-CV6, Shenmen-HT7, Neiguan-PC6, Hegu-LI4, Zusanli-ST36, Sanyinjiao-SP6, Taichong-LR3, Xinshu-BL15, Feishu-BL13, Pishu-BL20, Ganshu-BL18, Shenshu-BL23.

**Conclusion** - Acupuncture as a treatment for adolescent depression is a safe and effective treatment, giving satisfying results.

**Keywords:** Acupuncture, treatment, acupoints, adolescent depression.

## High performance polymers in dental laboratory

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High-performance polymers (HPP) is a material based on PEEK (poly ether ether ketone) or PEKK (poly ether ketone ketone), which has already been successfully used in operations carried out on humans for many years. The material was developed to meet the requirements of dental prosthetics, whose predecessors are being used successfully in human medicine for more than 30 years as spinal intermediate bodies, knuckle joints and hip joint prosthetics, heart valve replacements, so that their biocompatibility and mechanical properties are already tried and tested.

Great interest for HPP due to a demand for products with optimal physical and aesthetic properties is developed nowadays. The material has high flexural and compressive strength. These qualities, coupled with a low modulus of elasticity and therefore low brittleness, ensure the material delivers permanent elasticity. High-performance polymers resistance has got characteristic features that provide more security. Unlike the materials used so far for skeleton restorations, the elastic characteristics of HPP are adaptable to the bone. These high-performance polymers have high long-term stability and low water retention.

HPP offers three different options of processing: HPP as milling blank with special cutter for the manufacture of prosthetic fittings in the common CAD/CAM processes. Processing of HPP of a pressing procedure, through 2 press system, a specially developed vacuum pressing device. Third option is 3d printing on polymer material.

The white color ensures that no dark shadows show through the gingiva. Opaques therefore are not required any more. The innovative material HPP offers new possibilities of fitting patients with fixed and removable high-value dental prosthetics on implants or natural teeth - from individual abutments to telescoping prosthetics, and is ideal framework material for composite veneers for patients with bruxism who require a restoration.

**Keywords:** biologically stable, dental prosthetic, composite materials, HPP polymer, nature-adapted.



# Passive suicidal ideation as a risk factor for suicide among cancer patients

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**Introduction:** Identification of passive suicidal ideas as a clinical relevant risk factor contributes to shedding light on the etiological picture of clinical depression and suicide phenomena among cancer patients. Unfortunately, in Macedonia we do not have standardized psychological techniques which will assess suicidal ideation during psycho diagnostic procedure.

**Objectives:** The aim of this study is twofold. The first aim is to investigate whether we can use the Patient Health Questionnaire-9 (PHQ-9), for the first time in Macedonia, translated on Macedonian language (Miloseva, 2014), item 9 in order to screen passive suicidal ideation. The second aim is to describe the nature of „better to be death thoughts or hurting own self in some way“ reported with structure clinical interviews carried out in order to further asses passive suicidal thoughts of participants, cancer patients, who had endorsed item 9 of this scale.

**Material and Methods:** In the frame of the UGD supported project, the data were collected from Department for maxillofacial surgery, Clinical Hospital, Stip, Macedonia, during the period 2014-2015. The final survey sample consists of 90 patients (64% female and 36% male) aged 19-70 years. Inclusive criteria: patients were diagnosed with cancer in maxillofacial region. We applied: Patient Health Questionnaire-9 (PHQ-9), for the first time in Macedonia, translated on Macedonian language and structured clinical interview. One week after they become familiar with the diagnose they fill up PHQ-9 scale, and after three weeks clinical interviews were carried out. Written informed consent was obtained by all study participants.

**Results:** First of all we checked the reliability (Cronbach`s alpha) for the PHQ-9 scale translated on Macedonian language and sample. The reliability coefficient was good (alpha > 0.85). We found that patients with diagnosed cancer who endorsed „passive

suicide ideas item 9“ were more likely to have suicidal thoughts which were described latter on during clinical interview. We analyzed thoughts reported by patients in the frame of modified categories of suicidality based on Walker et al. (2011). Of 52 (57.77%) of patients who endorsed item 9 with „yes“, the highest percentige was in category with passive suicidal thoughts 32 (61.54%).

**Conclusion:** We have confirmed our expectations that we can use Macedonian translated version of PHQ-9 scale, item 9 („Thoughts that you will be better to be dead or of hurting yourself in some way“) in combination with clinical structured interview in order to asses passive suicidal ideation. Due to the limitation of this study, more studies are needed in future. There is a need of multidisciplinary work and teams between maxillofacial surgeons, clinical psychologist, psychiatrist and oncologist.

**Keywords:** passive suicide ideas, depression, risk factors, suicide.

## **Approximal margin adaptation on class II – posterior interproximal cavity restored with open and closed sandwich technique**

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The sandwich technique is used for restoring class II caries where glass-ionomer cement is used as a liner under some composite restorations. There are two variations of the sandwich technique, the open sandwich and the closed sandwich technique. The open sandwich technique involves the placement of glass ionomer cement into the base of a proximal cavity and filling the preparation with glass ionomer up to the level of the dento-enamel junction. The final portion of the restoration is placed with composite resin to provide wear resistance and aesthetics on the occlusal surface. The closed sandwich technique involves placing the glass ionomer at the base of the proximal box so as it falls just short of the external cavo surface. After setting, the glass ionomer is etched and a dentine bonding agent is applied before placing a composite resin into the proximal box and occlusal surface, leaving the glass ionomer cement encased within the preparation. In this study we will test the approximal margin adaptation on teeth restored using both open and closed sandwich techniques. On 30 extracted teeth we prepared class II cavities where 15 of them were restored using the closed and 15 using the open sandwich technique. The teeth around the margins of the restoration (the crown and root) were then isolated using varnish which is not permeable for methylene blue, then they were placed in a solution of methylene blue to check the micropermeability of the margins. In that solution the teeth were kept seven days and after that they were cut in longitudinal sections. Under microscope we checked the marginal adaptation of the teeth restored using closed and open sandwich technique i.e. if the margins on the longitudinal section were colored in blue. All the teeth in our study had a very good marginal adaptation, no significant differences were found in the teeth restored using the open sandwich technique and closed sandwich technique. Because of the properties of the glass ionomer cement, as listed in various

literature: (1) the glass-ionomer material bonds both to the tooth structure and the composite, thereby increasing retention form; (2) fluoride contained in the glass-ionomer material reduces the potential for recurrent caries; and (3) the glass-ionomer material, because of its bond to tooth structure, provides a better seal when used at non-enamel margins; the marginal adaptation was very good on our test subjects, which implies that in clinical use these techniques may provide a good alternative for restorations to minimize the chances of seconder caries formation.

**Keywords:** class II restoration, closed sandwich technique, marginal adaptation, open sandwich technique.

## **Anesthetic buffering: new advances for use in dentistry**

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Local anesthetics are chemical substances given infiltrative or at the surface, which temporarily block the implementation of pulses through nerve fibers. Thus they cause anesthesia of the tissue that is innervated by that nerve without damaging of the nerve. The aim of this study was to evaluate the role and benefits of local anesthetic buffering. Patients often complain of a burning sensation and burning in the area of anesthetic deposition due to the acidity of the anesthetic solution. With local anaesthetic buffering these negative effects are removed. Latest advances in technology allow mixing of solutions for local anesthesia with alkaline substances immediately before injection of anesthetic, making the anesthetic's onset quicker, more reliable, and more comfortable for the patient. The buffering process uses a sodium bicarbonate solution that is mixed with the cartridge of local anesthetic. The interaction between the  $\text{NaHCO}_3$  and  $\text{HCL}$  in the local anesthetic creates  $\text{H}_2\text{O}$  and  $\text{CO}_2$ .

For buffering, Onpharma's Onset Mixing Pen is most commonly used. The pen has cartridges of Onpharma bicarbonate solution and can be used to accurately buffer dental anesthesia. The process of buffering takes 5 seconds chairside and should be done immediately before the placement of a dental syringe and injection of the anesthesia.

As a conclusion we can noted that buffering of the local anesthesia can have a lot of advantages in everyday dental practice for reducing the pain and discomfort caused by the injection process.

**Keywords:** local anesthetics, anesthetic buffering, sodium bicarbonate solution.

## Development of a electrochemical method for estimation of the antioxidative capacity of syringic and ferulic acid with ABTS as a redox mediator

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**Introduction:** Aim of this study was to develop a electrochemical method for investigation of the antioxidative potential of Ferulic and Syringic acid, by using the antioxidant abilities of vitamin C, as a referent substance. Ferulic acid is a hydroxycinnamic acid found in many traditional herbal medicines. It is commonly found in seeds of plant such as rice, wheat and oats. It has been shown as an effective topical antioxidant which is used as an efficient photoprotective for the skin. It is already known that ferulic acid can be an effective scavenger of free radicals and it has been approved in certain countries as food additive to prevent lipid peroxidation. Additionally, it alleviates oxidative stress as well as decreases glucose levels in diabetic rat. Syringic acid, a naturally occurring O-methylated trihydroxybenzoic acid monomer extracted from *Herba dendrobii* L., *Rosmarinus officinalis* L., *Origanum vulgare* L. and *Thymus* L. that acts as an antioxidants to clear free radicals. These findings suggest that Syringic acid may act to inhibit the development of diabetic cataract through aldose reductase.

**Materials and methods:** Standard solutions of Syringic and Ferulic acid with molar concentrations of 5 mmol/L, (*Sigma Aldrich*), ABTS (2,2'-azino-bis(3-ethylbenzothiazoline-6-sulphonic acid) with molar concentration of 1 mmol/L and Vitamin C with molar concentration of 5 mmol/L were used as a standard solutions. Cyclic voltammetry with a standard 5 mL electrochemical cell with three electrodes: glassy carbon electrode, a working electrode, reference electrode (Ag / AgCl), and a counter platinum electrode. The antioxidative properties of these two phenolic acids was performed by using ABTS as a redox mediator. By using Vitamin C as a reference, we evaluated the antioxidative potentials of these two acids. All the experiments were performed in acetic buffer solution (pH=4.6), and KCl (0.001 mol/L) as an electrolyte.

**Results:** Cyclic voltammograms of these acids have shown an increase of the current

of oxidation peaks of the ABTS, which shows that both acids have high antioxidative potential. Ferulic acid in concentration of 0.1 mmol/L gives a rise of the current of the oxidation peak of ABTS ( $E_{pa} = 0.55$  V) for 0.452  $\mu$ A, and Syringic acid (0.1 mmol/L) have shown an increase of 0.827  $\mu$ A. In comparison, vitamin C, in the same concentration as phenolic acids, has shown an increase of 0.464  $\mu$ A. This indicates that antioxidative potential of Syringic acid is approximately the same as the potential of vitamin C. Ferulic acid have shown the highest antioxidative potential from the examined substances.

**Conclusions:** This simple and fast method for estimation of the antioxidative potential of Ferulic and Syringic acid, have confirmed their high antioxidative potential. The method can be further developed and improved for estimation of the antioxidative potential of many phytochemicals obtained from the medicinal plants. Moreover this method could serve for investigation of mechanism of oxidation of ferulic and syringic acid, which cannot be predicted by other commonly used spectroscopic method for measuring the antioxidative potential. Therefore, further investigations on the electrochemical properties of these acids are needed.

**Keywords:** antioxidants, cyclic voltammetry, ferulic acid, syringic acid, vitamin C.

## Varicella in the region of Prilep

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**Introduction:** Varicella is a rash viral disease caused by alpha herpes viruses. As the other herpes viruses after the primary infection the virus remains life-long in the organism in a latent form. Upon low immunity a second clinical manifestation could appear in a form of herpes zoster. Part of the developed countries protects themselves from this disease with a vaccine. In the R. of Macedonia vaccine prophylaxis is not conducted.

**Purpose:** To see if varicella is present in the region of Prilep. To see what the morbidity is, what the distribution per age is and in which period of the year mostly appears.

**Materials and methods:** Ten-year period of varicella presence in the region of Prilep has been analyzed from 2006 to 2015. Data obtained from the Health Center Prilep have been used (department of epidemiology). The obtained results are shown in tables and graphics.

**Results:** In the period of analysis from 2006 to 2015 in Prilep region, 3,994 infected with varicella were totally registered. Most cases with varicella are in 2012, total 871 (with morbidity 901,6/100,000), and in 2008 with total 185 (morbidity 191.5/100,000) is the lowest number of people infected with varicella. Regarding seasonal distribution varicella in the Prilep region is present during the whole year, with most cases of infected people in winter period, in December with 648(16.2%), in November with 578(14.5%) and in January with 371(9.3%) infected for the period of 10 years. The lowest seasonal index of 0.38 is for August and September, i.e. 104(2.6). The number of most cases infected for a month is 122 in December 2011, and the lowest number of people infected is 1 in August 2012 and 2015 (in the analysis for the period of 10 years there were people reported with varicella every month). There is significant difference in the distribution regarding sex (male 2123, female 1871). There is large difference in the distribution regarding village/town, 3.178/816. Regarding age, people



who are most infected are school children at the age of 7-14, 1,801(45.09%). In pre-school age 0 to 6, 1,502(37.6%). In the group of high school students between 15 and 19 years old, there are 252.(6.3%), 20 to 29 years old, 184 (4.6%). Significant number of infected are in the adults groups t. e. 30 to 39 years, 180(4.5%) and 40 to 49 years old, 58 (1.4%). Emphasis must be put on adults 50 to 59 with 13 infected people and 4 infected were reported above the age of 60 .

**Conclusions:** Varicella is constantly present in the period of 10 years that has been analyzed for the Prilep region. In 2012 there are most infected people 871, and least infected 185 in 2008. Most infected people with varicella are in December 648(16.2%), and least infected are in August (2.6%). Largest number of people infected with varicella is school children at the age of 7-14 with 1.801(45.09%).

**Keywords:** seasonal distribution, varicella, virus.

# Treatment of insomnia syndrome with Chinese medicine and reflex therapy

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**Motivation** – The disease of modern people. With the rapid lifestyle and everyday stress, insomnia is a disease which occupies 1/3 of the world's population. Periodically occurs in every person at some phase in its life. Over the years it occurs more frequently and more actively. Female population suffers more often and leads to: depression, reduced immunity, cardiac and systemic diseases.

**Method** - Acupuncture is an alternative (without medication and stimulants) way of dealing with insomnia. By its appearance you can begin with acupuncture treatment immediately, which involves application of needles in certain acupuncture points on the human body. If necessary applying moxa is helpful.

**Result** - Patients who had a problem with insomnia and requested acupuncture for help, feel much better immediately after the first treatment, because acupuncture uses natural stimulus of the human body to solve the problem. Unlike drugs, the treatment of insomnia with acupuncture has no contraindications.

**Conclusion** - The human body is programmed to solve and fight against external and internal influences on its own. Whatever the reasons (mostly reduced immune system), modern people in a certain way are reliant on drugs in order to protect themselves from intruders. Acupuncture is a way to get rid of the chemical application of dealing with insomnia. With just few points and a few treatments we can have a much better, healthier and more peaceful sleep without any contraindications.

# **Mandibular supraprosthesis retained by dental implants - case report**

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**Introduction and aim:** For an implantology treatment to be successful it is necessary to know the indications and contraindications for placement of implants and ancillary (retention) elements that enable better connection of prosthetic superstructure.

The aim in our study was to show the advantages and benefits of mandibular prosthetic superstructure which is impacted with implants on a patient.

**Clinical case:** It is a patient who is set mandibular prosthetic superstructure and is impacted by dental implant.

**Conclusion:** Implant dentistry is unique because additional foundation may be created for a desired prosthodontic result. There was a positive effect, like stable connection helped by the dental implants.

## **Analgesia during intraoperative and postoperative period**

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**Introduction:** Nowadays, epidural analgesia is frequently used to liberate the patient from pain with the application of epidural catheter. Besides the good sensitive block, it also provides a weak motor block. It is used during operation and in the first postoperative days. The sensitive block is very advantageous in the postoperative period for analgesia.

**Case report:** The case is about an eighty-year-old woman who had bloody feces and exhaustion. She has been admitted to Clinical Hospital in Stip, reported having constipation almost one month before she came in the hospital. Moreover, a year ago, she was hospitalized as rectorrhagia and noduli haemorrhoidales case.

After a detailed clinical investigation done, the diagnosis set was adenocarcinoma intestinocrasi. An operation needed to be done, and so it was decided with the patient's approval. Endotracheal general anesthesia in combination with epidural analgesia were used throughout the operative procedure, and the epidural analgesia continued in the postoperative period until the fifth day.

The epidural catheter was placed between L<sub>2</sub>-L<sub>3</sub>. During the operation, Bupivacaine 0.25% 3ml/h was given to the patient through the epidural catheter. The operation lasted for about 6 hours. Additionally, Fentanyl 2ml+2ml+1ml and muscle relaxant Pancuronium bromide (Pavulon) 4mg+1mg+1mg were given intravenously.

**Conclusion:** Using epidural analgesia reduced the doses of Fentanyl and Pavulon for intravenous anesthesia during the intraoperative period and as a consequence of epidural analgesia the patient was liberated from pain during, and 5 days after the operation.

**Keywords:** adenocarcinoma, analgesia, bupivacaine, epidural catheter, operation.

# Representation of different techniques for determination of the working length in endodontic treatment

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**Introduction:** The working length is the distance between occlusal reference point and the place where the channel should be expanded, cleaned and filled. Determination of the working length during endodontic treatment is a key procedure for successful endodontic treatment.

**Aim of the research:** We set the goal of making an assessment of commonly used techniques for determining the working length in dental offices in Stip.

**Material and method:** For the realization of our goal a questionnaire was prepared that included all the techniques for determining the working length. The dentists in their dental practice were asked to notice all the advantages and disadvantages, and how satisfy are they while using them. The research was conducted randomly in 15 dental offices in Stip.

**Results:** Obtained results showed that the most commonly used method is X-ray method of determining the working length, with a high level of security in its implementation.

A small part use tactile sensitivity method and Apex locator as the most modern and safest method of determining the working length.

**Conclusion:** Modern techniques for determining the working length in a large percentage increase success of endodontic treatment. It is really important and necessary to have an initial X-ray, apex locator or combination of several methods for accurately working length.

**Keywords:** apex locator, x-ray, working length.

## Types of toothbrushes

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**Introduction:** The toothbrush is an oral hygiene tool used to clean the teeth and gums. Toothbrushes have important everyday role because of personal oral hygiene. Proper toothbrush care is important for oral health. Tooth brushing is fundamental to oral hygiene. Brushing helps to remove plaque and food.

With simple removing the plaque of the teeth we actively prevent cavities and other periodontal diseases from appearance in the oral environment. It is very important to know properly how to brush your teeth, to remove the plaque and prevent further deposition of it.

**Aim:** The aim of this study was to note the plenty of toothbrushes that everyone uses nowadays.

**Material and method:** For the realization of this survey a questionnaire with four questions was made. Forty students from second year of Dental Medicine were included in the survey.

**Results:** The most of the students (90%) use manual brush. Forty percentages answered that they use brush with soft fibers. The dentist helped to choose a brush in 45%. The most of them (40%) use Colgate toothbrush.

**Conclusion:** As a general conclusion, the survey showed that various types of toothbrushes were used for proper oral hygiene. It was commonly used manual toothbrush with medium fiber recommended by the dentist.

**Keywords:** dental plaque, oral hygiene, questionnaire, teeth, toothbrush.

## Contemporary classification of supernumerary teeth

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Hyperdontia or supernumerary teeth are teeth that are additional to the normal series and can be found in almost any region of the upper and lower dental arch. The etiology of supernumerary teeth is not completely understood. Various theories exist for the different types of supernumerary teeth. They have been classified mainly based on their morphology and location. Also, there is a classification of supernumerary teeth associated with syndrome or non- syndrome. Supernumerary teeth are usually associated with cleft lip and palate or other syndromes such as Gardner's syndrome, trichorhino cleidocranial dysplasia and phalangiic syndrome. However, it can be present in patients without any systemic pathology.

The aim of the study is to emphasize the contemporary classification of supernumerary teeth. In order to accomplish this, research of scientific base (PubMed, Medline) was made.

Our result was that different authors classified very dissimilar. First group of authors classified supernumeraries as single or multiple. Single supernumeraries were further classified based on morphology as conical, tuberculate, supplemental and, composite odontoma which may be compound or complex. Multiple supernumeraries were classified as those associated with syndromes and those which are not associated with syndromes. According to morphology, supernumerary teeth may be further classified as accessory and supplemental. Accessory teeth do not resemble the normal form and have a morphology that deviates from the normal appearance of the teeth. Supplemental teeth are extra teeth but have the shape and size of normal teeth. Second group of authors classified supernumeraries into two types according to their shape: supplemental and rudimentary. Supplemental or eumorphic refers to supernumerary teeth of normal shape and size, and may also be termed incisiform. Rudimentary or dysmorphic defines teeth of abnormal shape and smaller size, including conical, tuberculate, and molariform types.

As a conclusion, independent which classification will be used, the presence of supernumerary teeth can cause alterations in neighbouring teeth, commonly retained teeth or delayed eruption, as well as dental malposition, diastema, tooth rotation and inclination, ectopic eruption, occlusal problems, etc.

**Keywords:** classification, hyperdontia, supernumerary, teeth.



## Artificial sweeteners and oral health

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Sugar substitutes have sweet taste (like sugar), but have no calories or carbohydrates. The artificial sweeteners don't contribute to weight gain, don't cause decay and don't raise blood sugar levels. Since sugar substitutes are many times sweeter than sugar, only small amounts are needed to sweeten foods and beverages. All, except saccharin, are approved as safe for use during pregnancy.

The aim of the study was to make research based on the questions: are the artificial sweeteners healthy and how each of them influence on oral health. For realisation of the study aim, research of the scientific base (PubMed, Medline and MedScape) was made.

The generic name, chemical structure, product name and details, positive and negative attribute, will be shown as table chart.

Sugar substitutes have been thoroughly tested by The Food and Drug Administration (FDA) and have been established as safe for use as tabletop sweeteners or as ingredients in foods and beverages.

**Keywords:** food, health, oral, sweeteners, tooth.

## Using of additional supplements for oral hygiene

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Removing the dental plaque is the most important part of the oral hygiene. Except of using dental brush and tooth paste there are a lot of other additional supplements for adequate oral hygiene such as: interdental brushes, dental floss and mouthwash solutions.

The aim of this research was to assess the usage of these additional supplements among the students of dental medicine.

For reaching the aim we made a questionnaire with adequate questions. The questionnaire was answered by total number of 137 students on dental medicine.

After processing, the results showed that 74.25% from the students use additional supplements. Most of them, 66.26% use dental floss, 16.12% of them use interdental brushes, and just 8.2% use both of them. 67.64% from the students uses mouthwash solutions, most of them non-alcoholic. Also, most of the students that use mouthwash solution also use interdental brushes or dental floss.

We can conclude that more than a two-third of the students use additional supplements for maintaining adequate oral hygiene. That is very important because most of them will be dental professionals in future, so they can help in education of the patients for maintain adequate oral hygiene. But the low percentage of students that use interdental brushes has to be improved.

**Keywords:** brushes, dental students, oral health, oral hygiene.

## **Anemia as a reason for hospitalization in the region of Kumanovo**

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**Introduction:** Anemia is reduced capability of the blood to transport oxygen to tissues, most likely because of reduced number of erythrocytes, hemoglobin or other variations of red blood cells. Most common anemias are: sideropenic, aplastic, hypochromic, megaloblastic, hemolytic and secondary anemia. Sideropenic anemia is caused by deficit of iron; aplastic most likely for disorders in the bone marrow; hypochromic because of reduced concentration of hemoglobin; secondary anemia is a consequence of various diseases; megaloblastic – DNA synthesis disorders and hemolytic as a result of premature destruction of erythrocytes.

**Objectives:** The aim of this paper is to analyze the frequency of anemias in the department of internal medicine in General Hospital of Kumanovo, as well as to establish the type, gender, place of living and average age in which anemias occur.

**Materials and methods:** With retrospective study, all of the hospitalized patients of the department of internal medicine in General Hospital in Kumanovo in the period of 2011 to 2015 were analysed and patients hospitalized for anemia, in total of 194, were selected. The data for the patients was processed and 6 types of anemia were selected. Statistical data was also made for gender, average age of the hospitalized patients as well as the place of living (urban/rural areas).

**Results:** In period of 5 years, there are 194 registered cases of hospitalized patients with severe clinical signs of anemia, who were treated ambulatory. According to the obtained data, sideropenic anemia was the most common registered anemia that was registered in 105 patients (54,12%). Right behind sideropenic anemia is secondary anemia that was registered in 65 patients (33,51%). Continue to follow are megaloblastic anemia, registered in 19 cases (9,79%); aplastic anemia registered in 3 cases (1,55%); hemolytic and hypochromic anemia that had only one registered case. According to the gender analysis, it can be stated that anemias are more frequent in female population. Out of 194 registered patients, 107 patients are female (55,15%) and 87 patients are male (44,85%). Analysis of the data showed that anemia is more frequent in urban areas with 130 out of 194 cases (67,01%) in comparison to

the rural areas with only 64 cases (32,99%). In compliance with the data, the average time of hospitalization is 12 days and average age of hospitalized patient is 70,23 years. Year analysis showed that most cases of hospitalized patients are in 2014 year (47 patients in total) and least amount of hospitalized patients are in 2012 year (31 patient in total). When the patients were admitted to the department of internal medicine, the average hemoglobin value was 76,024 g/L and average amount of erythrocytes was  $2,8 \times 10^{12} / L$ . When the patients were discharged, the average hemoglobin value was 99,07g/L and the average amount of erythrocytes was  $3,5 \times 10^{12} / L$ . After the comparison between the admission and discharge data, it was concluded that there was a drastical improvement. Three patients, or 0,15% of all patients died due to anemia.

**Conclusion :** In the region of Kumanovo, in 5 years, the most commonly registered anemia was sideropenic anemia (54,12%), before secondary anemia (33,51%).

The most affected is the female population (55,15%).

Significant difference was established in between urban and rural areas of living with the urban population (67,01%) being affected two times more than the rural population (32,99%).

Average time of hospitalization was 12 days with significantly improved value of hemoglobin and amount of erythrocytes.

**Keywords:** anemia, hospital, Kumanovo, erythrocytes, hemoglobin.

# Prevalence of Down syndrome in the city of Bitola

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**Introduction:** Down syndrome, or trisomy 21, is a complex genetic disease resulting from the presence of 3 copies of chromosome 21. The origin of the extra chromosome is maternal in 95% of cases and is due to the failure of normal chromosomal segregation during meiosis. There are many cytogenetics methods for early detection and diagnosis for the DS, some of them are invasive and the others are non-invasive methods.

**Material and methods:** To identify the number and gender of Down syndrome (DS) patients and ages of parents in the City of Bitola, Macedonia, in the period of 10 years. According to medical registry book during 2006 to 2015 there are three cases of Down syndrome. All patients are baby girls. Two of them were born in 2006 and the other one was born in 2008.

**Results and discussion:** All the information is taken from counseling service for infants, toddlers and pre-school children and development counseling medical center in Bitola. Cytogenetic analysis in children with DS are taken from clinical hospital Dr. Trifun Panovski from Bitola, from gynecological department. Physical therapy takes place in the center for children with special needs.

**Conclusion:** Early detection and diagnosis of DS are very important. Also, ages of parents and their choice whether to continue pregnancy or not should be respected. Although advanced maternal age is a major risk factor for trisomy 21, most children with Down syndrome are born to mothers <30 years of age.

**Key words:** screening, prenatal diagnosis, Dawn syndrome, trisomy 21

## Applying ROOTT implant system directly after extraction of teeth

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**Introduction:** ROOTT implant system consists of three types of implants and depending on the need and the condition of the bone the appropriate type of implant is applied. The implants have superior osteointegration and you can immediately apply them after the extraction of teeth. Of great importance is the selection of appropriate patient that would respond to treatment with implants, and of course the choice of the implant by the therapist. The application of ROOTT implants directly after the extraction of the teeth is a good choice and simple one for patients because it shortens their visits and on the other hand excellent results are obtained.

**Aim:** Application of ROOTT implants immediately after extraction of teeth and their prosthetic load.

**Case report:** Patient, 45 years old appears in the practice with a desire for fix prosthetic compensation on the left side in the upper jaw. A review was made and a plan for therapy by applying implants that will be further bearers of the planned bridge construction. In the next visit the gangrenous radices 23 and 24 were extracted and two implants were placed at the point on 24<sup>th</sup> and 25<sup>th</sup>. In the same visit the imprint is taken for making fixed bridge construction.

After a week a trial of sample in metal was made and new orthopantomographyc image was taken that showed excellent integration on the implants.

After two days a fixed bridge structure is set and the patient is still monitored and he has an excellent condition of his teeth. After six months new consultation is scheduled and also new orthopantomographyc image to check the condition of the bone and the implants.

**Conclusion:** Implantation after extraction is simple procedure, affordable by patients, fast and significantly shortens the time of visit.

# Epidemiological characteristics of Influenza Virus in Municipality of Kumanovo

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**Introduction:** Influenza is an acute respiratory disease with significant morbidity and mortality. It is caused by Orthomyxovirus, but from the three types, only type A and type B have epidemiological significance. Influenza occurs in the form of epidemics and pandemics (Influenza B may increasingly occur in sporadic cases). Since 1997, there is a world circulation of H1N1 and H3N2, which are subtypes of influenza A. They can cause outbreaks once a year or once in 2 or 3 years. In 2009 H1N1 caused pandemic. Epidemic in a region is declared if there is a spread over 3 to 5% of the total number of registered residents, and epidemics exist from 6-8 weeks.

**Objectives:** The aim of the paper is to analyze epidemiological properties in the region of Kumanovo in the period from 1989 to 2015, to see in what years and what kind of coverage were the outbreaks, in what period of the year they occurred and which age group is most affected.

**Materials and Methods:** In a retrospective study, from 1989 to 2015 the number of influenza cases was analyzed, as well as the number of cases divided by age groups in the period from 2001 to 2015 on the territory of Kumanovo. There was elaboration on four age groups. The first age group were children of preschool age (from 0 to 4 years), the second group were children of school age (5 to 14), the third group was working age population (15 to 65) and the fourth group consisted of senior citizens (over 65 years). The information obtained by summarizing the log data records of patients from the Center for Public Health - Kumanovo. The population used in the epidemiological estimates is obtained from the State Statistics Office according to the censuses conducted in 1981 (60,842 inhabitants), 1994 (65,233 inhabitants), 2002 (70,842 inhabitants) and data obtained from the Center for Crisis Management under Kumanovo municipality, which in 2012 counted 105,484 inhabitants.

**Results:** Over a period of 26 years there were 81,739 registered cases of influenza. According to the data obtained in 1991, 1994, 1996, 1998, 2001, 2002, 2003, 2004, 2006, 2012 and 2013 there were less than 2% registered patients of the total number

of residents, so it can be said that in those years there were no epidemics. Increased number of cases between 2 and 3%, respectively, on the verge of declaring epidemics were the following years: 1990, 2000, 2005, 2008, 2010, 2014 and 2015. According to the results gained from the Municipality of Kumanovo in the period from 1989 to 2015 we registered a total number of 8 outbreaks. The first registered epidemic was in 1989, which showed that 16.98% of the total population or 10,333 persons suffered from flu. The second outbreak in 1992 was with a total number of 10,073 cases or 16.56%, the third in 1993 was 12.55% or a total number of 7,633 patients, and the fourth in 1995 with 15,135 cases or 25.13% of the total population that also represents the largest recorded epidemic in the investigated period in the Municipality of Kumanovo. The fifth registered epidemic in 1997 affected 5.5% of the total population or 3,313 persons, the sixth in 2007 with 4,920 cases or 6.95% of the total population, the seventh in 2009 with a total number of 6,073 cases or 8.57% of the total population and the last registered epidemic in 2011 with 2,900 cases or 4.09% of the total population.

One interesting data is that in the pandemic year of 2009, there were a total number of 6,072 registered cases (8.57%). According to the monthly analysis for the period from 1989 to 2015 the data showed that the largest number of contaminated persons was in March – 31,181 infected, before in January with a total number of 24,977 cases, in February 14,973 patients and it can be said that epidemics in this 26-year period occurred in these three months. There was significant influenza activity in December with a total number of 5,549 infected, in April 3,296 and in November 1,365. In the residuary months there are no registered cases of flu or there are only sporadic cases probably caused by influenza B virus. According to an analysis by age groups between 2001 and 2015 a total number of 29,070 treated patients, there were 3,965 cases or 13.64 % in preschool children's age group, 8193 cases registered or 28.18% in the school children's age group, 15,057 cases registered or 51, 80% in the working population group and 1,855 cases registered or 6.38% in the group of elderly population over 65 years.

**Conclusion:** In these 26 years analyzed period in Kumanovo region are registered 8 flu epidemics.

The largest epidemic outbreak was in 1995 with 15,135 cases (25.13%).

Even 5, of 8 total outbreaks, are significantly larger number of cases of the pandemic in 2009.

Epidemics occur in March, January and February with significant activity in December.



The largest number of cases has the largest age group of 15 to 60 years old, and the least affected are in the age group over 65 years.

**Keywords:** flu; influenza; Kumanovo.

## **Gua Sha treatment for neck and back pain**

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The purpose of this presentation is to show the effect that is achieved in Gua Sha treatment for neck and back pain.

Gua Sha is an old Chinese secret which is used nowadays. The meaning of Gua is scraping and the meaning of Sha is red skin like bruises. It is a palpation and skin stimulation, where the skin is under a pressure and the Sha-lines are formed.

The Gua Sha treatment begins with a smear of oil containing herbs or essential oils, and then using the Gua Sha tool passing over the specified area with downward movement. With the tool is formed a recess or a vacuum which draws toxic fluid from the tissue depth on the skin surface.

Benefits of Gua Sha are: eliminating of the three types of „Bad Qui”, eliminating the circulatory stagnation, eliminating waste and toxic products, eliminating the pain, establishment of normal circulation, inflow of fresh blood, inflow of a large amount of oxygen, intake of nutrients necessary for muscle tissue, a normal function of the tissue, better immunity.

**Keywords:** Gua Sha, Bad Qui, stagnation, vacuum, toxic products.