



Science 4 Health

1. hrvatski kongres preventivske i sportske medicine
te kardiološke rehabilitacije s međunarodnim
sudjelovanjem „SCIENCE 4 HEALTH“ /

*1st Croatian Congress of Preventive and Sports
Medicine and Cardiac Rehabilitation with
International Participation „SCIENCE 4 HEALTH“*

SCIENTIFIC PROGRAM
ZNANSTVENI PROGRAM

BOOK OF ABSTRACTS
KNJIGA SAŽETAKA

17. - 18.09.2021.

GRAND HOTEL 4 OPATIJSKA CVIJETA
OPATIJA, HRVATSKA / CROATIA
www.science4health.eu



CONTENT / SADRŽAJ

WELCOME ADDRESS / POZDRAVNI GOVOR	4
ORGANIZING AND SCIENTIFIC COMMITTEE / ORGANIZACIJSKI I ZNANSTVENI ODBOR	6
SPONSORS AND DONATORS / SPONZORI I DONATORI	7
SCIENTIFIC PROGRAMME / ZNANSTVENI PROGRAM	8
Friday, 17th September / Petak, 17.09.	9
Saturday, 18th September / Subota, 18.09	13
BOOK OF ABSTRACTS / KNJIGA SAŽETAKA	16
NOTES / BILJEŠKE	59
USEFUL INFORMATION / KORISNE INFORMACIJE	60

WELCOME / DOBRODOŠLI!

Poštovane kolegice i kolege,

obzirom na povoljnu epidemiološku situaciju s velikim zadovoljstvom vas obavještavamo da se 1. hrvatski kongres preventivne i sportske medicine te kardiološke rehabilitacije sa međunarodnim sudjelovanjem pod nazivom 'SCIENCE 4 HEALTH' održava 17. i 18. rujna 2021. u Grand Hotelu 4 opatijska cvijeta u Opatiji, te tematski objedinjava struku, znanost i praksu.

Sadržaj kongresa obuhvaća ključna znanja o medicini životnog stila, preventivnoj i sportskoj medicini i kardiološkoj rehabilitaciji.

Program čine plenarna predavanja, znanstvena priopćenja, radionice funkcionalnih testiranja u sportskoj i rehabilitacijskoj medicini (CPET), radionice EKG-a u sportaša te interaktivni edukativni sadržaji.

Na predmetnom kongresu planira se u suradnji sa Sveučilištem u Rijeci predstaviti novi poslijediplomski specijalistički studij 'Sportska i rehabilitacijska medicina' te obaranje Guinnessovog rekorda u najdužem podvodnom hod u jednom dahu u izvedbi našeg sportaša Vitomira Maričića.

Kongres je internacionalnog karaktera, a svoj su dolazak uz predavače iz Republike Hrvatske potvrdili eminentni svjetski predavači iz navedenog područja.

Obzirom na svjesnost o nepredvidivosti ove epidemije, planirali smo hibridni model realizacije kongresa, velika većina predavanja odvijati će se uživo uz sudionike kongresa, dok bi neki inozemni predavači imali virtualna predavanja.

Vašim pozivnim predavanjima, kongresnim priopćenjima i aktivnim sudjelovanjem pridonijeti ćete uspješnosti našeg kongresa.

Velika nam je čast podijeliti sa Vama ovo iskustvo i sigurni smo da će Vašim doprinosom i iskustvom kongres imati veliki uspjeh.

Želimo Vam da uživate u kongresu, razmjeni stručnog i znanstvenog iskustva i međusobnom druženju.

Veselimo se Vašem dolasku!



Predsjednik organizacijskog odbora
Prof. dr. sc. Viktor Peršić, dr. med.

Science 4 Health

17. - 18.09.2021.

GRAND HOTEL 4 OPATIJSKA CVIJETA
OPATIJA, HRVATSKA / CROATIA
www.science4health.eu

Dear Colleagues!

As the result of the favorable epidemiological situation, we are very pleased to inform you that 1st Croatian Congress of Preventive and Sports Medicine and Cardiac Rehabilitation with International Participation under the title 'SCIENCE 4 HEALTH' will be held on 17th and 18th September 2021. at the Grand Hotel 4 opatijska cvijeta.

The congress will cover the key knowledge of lifestyle medicine, cardiac rehabilitation, preventive, and sports medicine.

The program is composed of plenary lectures, scientific communications, functional testing workshops in sports and rehabilitation medicine (CPET), ECG workshops for athletes and interactive and educational content.

In cooperation with the University of Rijeka, there will be presented a new postgraduate specialist study 'Sports and Rehabilitation Medicine', as well as breaking of the Guinness Record in the longest underwater walk in a single breath performed by our athlete, Vitomir Maričić.

This is an international congress, and the eminent world lecturers, together with Croatian lecturers from the aforementioned area have confirmed their arrivals.

Due to the unpredictability of this pandemic, we have a 'hybrid model' congress, meaning that most lectures will be live with the congress participants, while some of foreign lecturers will have virtual lectures.

Your inviting lectures, congress announcements, and active participation will contribute to the success of our congress.

It is a great honour for us to share this experience with all of you, we are sure that with your outstanding contribution and proficiency, this Congress will have a great success.

We wish you to enjoy the congress, to exchange of professional and scientific experience and to enjoy your stay.

We are looking forward to your arrival!



Chairman of the Organizing Committee

Professor Viktor Peršić, MD, Ph.D.

ORGANIZER / ORGANIZATOR:

Special Hospital for Medical Rehabilitation of Heart, Lung and Rheumatic Diseases
Thalassotherapia Opatija / Specijalna bolnica za medicinsku rehabilitaciju bolesti srca, pluća i reumatizma

THALASSOTHERAPIA OPATIJA – Clinic for rehabilitation, treatment and prevention of diseases of the heart and blood vessels / Klinika za liječenje i rehabilitaciju i prevenciju bolesti srca i krvnih žila

DEPARTMENT OF REHABILITATION AND SPORTS MEDICINE, The Faculty of Medicine, University of Rijeka / KATEDRA ZA REHABILITACIJSKU I SPORTSKU MEDICINU, Medicinski fakultet Sveučilišta u Rijeci

COORGANIZERS / KOORGANIZATORI:

Working group on the Prevention and Rehabilitation of Heart and Blood Vessels of the Croatian Cardiac Society / Radna skupina za prevenciju i rehabilitaciju bolesti srca i krvnih žila Hrvatskoga kardiološkog društva

The Faculty of Medicine, University of Rijeka / Medicinski fakultet Sveučilišta u Rijeci

Kvarner Health Tourism Cluster / Klaster zdravstvenog turizma Kvarnera

Croatian Association of Cardiology Nurses / Hrvatska udruga kardioloških medicinskih sestara

ORGANIZING COMMITTEE / ORGANIZACIJSKI ODBOR:

Congress Director / Predsjednik kongresa:

Professor Viktor Peršić, MD, Ph.D. / Prof.dr.sc. Viktor Peršić, dr.med

Secretaries of the Organizing Committee / Tajnica kongresa:

Assist. Prof. Dijana Travica Samsa / Doc.dr.sc. Dijana Travica Samsa, dr.med

SCIENTIFIC COMMITTEE / ZNANSTVENI ODBOR:

D. Gaita (RO), D. Miličić (HR), V. Peršić (HR), V. Mićović (HR), M. Golubić (USA), D. Cerovec (HR), M. Ivanuša (HR), N. Lakušić (HR), A. Ivančić (HR), J. Ferri (HR), D. Travica Samsa (HR), G. Krstačić (HR), S. Dodić (RS), M. Bjelobrk (RS), M. Jukić (USA), O. Andreas Underland (NO), E. Baccarini (HR), V. Mozetič (HR), B. Bjelke (NO), Z. Bahtijarević (HR), T. Meyer (DE), J. Hoff (NO), D. Primorac (HR), V. Ivaniš (HR), Z. Babić (HR), B. Peterlin (SI), D. Raljević (HR), M. Brida (HR), D. Lovrić (HR), D. Popović (RS), D. Plavec (HR), J. Šeparović (HR), M. Škugor (USA), T. Turk Wensveen (HR), D. Rahelić (HR), F. Wensveen (HR), B. Jelaković (HR), J. Šikić (HR), Z. Trobonjača (HR), P. Kuterovac (HR), V. Ivančev (HR), V. Brozičević (HR), T. Čengić (HR), L. Ružić (HR), D. Verbanac (HR), M. KomosarCvetković (HR), I. Kužet Mioković (HR), D. Rakić (HR)

Professional Congress Organiser / Profesionalni kongresni organizator (PCO)

Tourist agency Da Riva d.o.o.

Tel.: +385 51 703 594, Fax: +385 51 272 482, Mob.: +385 91 20 14 850 / +385 91 16 88 234

e-mail: science4health@da-riva.hr; damir@da-riva.hr; tina@da-riva.hr

SPONZORI I DONATORI

Sponsors and Donators

SCIENCE 4 HEALTH
17. - 18.09.2021.

GRAND HOTEL 4 OPATIJSKA CVIJETA
OPATIJA, HRVATSKA / CROATIA





**SCIENTIFIC
PROGRAMME**

**ZNANSTVENI
PROGRAM**

17.09.2021.
Friday / Petak

SCIENCE 4 HEALTH
17. - 18.09.2021.

GRAND HOTEL 4 OPATIJSKA CVIJETA
OPATIJA, HRVATSKA / CROATIA

CONGRESS / KONGRES

08:30 - 08:40 **WELCOMING WORDS / RIJEČ DOBRODOŠLICE**
V.Peršić / Croatia / Hrvatska

13+2 min **CARDIAC REHABILITATION IN CROATIA AND EUROPE / KARDIOLOŠKA REHABILITACIJA U HRVATSKOJ I EUROPI**
08:40 - 10:10 Chairpersons / Predsjedavajući: D. Gaita, D. Miličić, V.Peršić

08:40 - 08:55 Keynote Lecture: Cardiac rehabilitation availability and delivery in Europe - statement endorsed by the EAPC - ESC / Kardiološka rehabilitacija, njeno pružanje i dostupnost u Europi - izjava prihvaćena od strane EAPC - ESC D. Gaita / Romania / Rumunjska

08:55 - 09:10 Our journey through the Euroaspire programme / Naš put kroz Euroaspire program D. Miličić / Croatia / Hrvatska

09:10 - 09:25 An AI-powered Preventive Medicine Approach for Smart Cities / Preventivna medicina za pametne gradove uz pomoć umjetne inteligencije M. Malenica, J. Klarić / Croatia / Hrvatska

09:25 - 09:40 Cardiac rehabilitation availability in Croatia and future directions / Dostupnost kardiološke rehabilitacije u Hrvatskoj i njeni budući smjerovi V. Peršić / Croatia / Hrvatska

09:40 - 09:55 Cardiovascular health in Primorje - Gorski Kotar County / Kardiovaskularno zdravlje u PG županiji V. Mićović / Croatia / Hrvatska

09:55 - 10:10 Cardiovascular disease and risk factors in Croatia / Kardiovaskularne bolesti i faktori rizika u Hrvatskoj V. Kralj / Croatia / Hrvatska

PREPARING ATHLETES FOR THE BEST PERFORMANCE / PRIPREMA SPORTAŠA ZA NAJBOLJE PERFORMANSE

10:10 - 10:20 Znanstvena istraživanja za najbolje performanse sportaša / Scientific research for the best performance of athletes V. Ivaniš / Croatia

10:20 - 10:45 **Breaking the Guinness Record in the Longest Underwater Walk in One Breath by Vitomir Maricic - Live from Thalassotherapy Opatija / Obaranje Guinnessovog rekorda u najdužem podvodnom hodu u jednom dahu u izvedbi Vitomira Maričića - prijenos uživo iz Thalassoterapije Opatija**
Moderator: I. Pavletić Crnić

10:45 - 11:05 **Grand opening / Svečano otvaranje**

11:05 - 11:30 Coffee Break / Refreshments / Pauza za kavu

CARDIOMETABOLISM / KARDIOMETABOLIZAM / Part I / I dio

Chairpersons / Predsjedavajući: J. Šikić, T. Turk Wensveen, D. Rahelić

11:30 - 11:45 Cardiometabolic outpatients clinic / Kardiometabolička ambulatna klinika J. Šikić / Croatia / Hrvatska

11:45 - 12:15 ABBOTT SYMPOSIUM - Hypoglycemia, TIR and Glucovariability - What does a cardiologist need to know? / ABBOTT SIMPOZIJ - Hipoglikemija, TIR i glukovarijabilnost - što sve kardiolog treba znati? T. Turk Wensveen / Croatia / Hrvatska

10 min 12:15 - 11:55	PRESENTATION OF CARDIAC REHABILITATION CENTERS IN THE REPUBLIC OF CROATIA / PREDSTAVLJANJE CENTARA KARDIOLOŠKE REHABILITACIJE U RH Chairpersons / Predsjedavajući: D. Cerovec, M. Ivanuša	
12:15 - 12:25	Krapinske Toplice - Our cardiac rehabilitation model / Naš model kardiološke rehabilitacije	D. Cerovec / Croatia / Hrvatska
12:25 - 12:35	Polyclinics Srčana Zagreb / Poliklinika Srčana Zagreb	M. Ivanuša / Croatia / Hrvatska
12:35 - 12:45	Community based cardiovascular prevention and rehabilitation - experience of Istrian Health Care Centres / Kardiovaskularna prevencija i rehabilitacija u uvjetima lokalne zajednice - iskustvo Istarskih Domova zdravlja	A. Ivančić / Croatia / Hrvatska
12:45 - 12:55	General Hospital Dubrovnik / Opća bolnica Dubrovnik	J. Ferri / Croatia / Hrvatska
13+2 min 12:55 - 13:55	CARDIAC REHABILITATION / KARDIOLOŠKA REHABILITACIJA Chairpersons / Predsjedavajući: G. Krstajić, S. Dodić, N. Lakušić, D. Travica Samsa	
12:55 - 13:10	Physical activity in cardiac rehabilitation - important dosed medicine / Tjelesna aktivnost u kardiološkoj rehabilitaciji - važan dozirani lijek	D. Travica Samsa / Croatia / Hrvatska
13:10 - 13:25	Cardiac rehabilitation: Are we dreaming fantasy? / Kardiološka rehabilitacija: sanjamo li fantaziju?	G. Krstajić / Croatia / Hrvatska
13:25 - 13:40	Exercise prescription and training in cardiac patients / Propisivanje vježbanja i treninga za kardiološke pacijente	S. Dodić / Serbia / Srbija
13:40 - 13:55	Modern role of cardiac rehabilitation - HF and training modalities in patients with PTH / Suвременa uloga kardiološke rehabilitacije - HF i modaliteti treninga kod bolesnika sa PTH	M. Bjelobrk / Serbia / Srbija
13:55 - 14:45	Lunch / Ručak	
13+2 min 14:45 - 16:15	LIFESTYLE AND INTEGRATIVE MEDICINE / STIL ŽIVOTA I INTEGRATIVNA MEDICINA Chairpersons / Predsjedavajući: M. Jukić, V. Mozetić, M. Golubić	
14:45 - 15:00	Innovation in the arts and health - education / Inovacije u umjetnosti i zdravstvenoj skrbi	M. Jukić / USA / SAD
15:00 - 15:15	Medication - Free Treatment in Mental Health / Liječenje bez lijekova za mentalno zdravlje	O. Andreas Underland / Norway / Norveška
15:15 - 15:30	Dr. Google. Threats to Health in the Age of Pseudoscience and Fake News / Dr. Google: prijetnje zdravlju u eri pseudoznanosti i lažnih vijesti	E. Baccarini / Croatia / Hrvatska
15:30 - 15:45	Men's Health in Lifestyle / Muško zdravlje uz stil života	V. Mozetić / Croatia / Hrvatska
15:45 - 16:00	Lifestyle medicine prescription for modern healthcare / Recept medicine životnog stila za modernu zdravstvenu skrb	M. Golubić / USA / SAD
16:00 - 16:15	Living Good - Living Long - Being Healthy - Optimised Ageing / Živjeti dobro - živjeti dugo - biti zdrav - optimizirano starenje	B. Bjelke / Norway / Norveška
16:15 - 16:50	MSD Satellite Symposium: Diagnosis and treatment of pulmonary hypertension / MSD satelitski simpozij: Dijagnostika i liječenje plućne hipertenzije	M. Janković Makek / Croatia / Hrvatska
16:50 - 17:05	Coffee Break / Refreshments / Pauza za kavu	
13+2 min 17:05 - 19:15	SPORTS MEDICINE / SPORTS CARDIOLOGY PART I / SPORTSKA MEDICINA / SPORTSKA KARDIOLOGIJA I DIO Chairpersons / Predsjedavajući: V. Peršić, Z. Bahtijarević, T. Meyer	
17:05 - 17:20	Sports nutrition: emerging role in translational medicine / Sportska prehrana: nadolazeća uloga u translacijskog medicini	D. Verbanac / Croatia / Hrvatska

17:20 - 17:35	Sport medicine in the Republic of Croatia - the view from the football bench into reality / Sportska medicina u Republici Hrvatskoj - pogled s nogometne klupe u stvarnost	Z. Bahtijarević / Croatia / Hrvatska
17:35 - 17:50	Sudden death in football / Iznenadna smrt u nogometu	T. Meyer / Germany / Njemačka
17:50 - 18:05	Cardiovascular implication for sport performance and disease treatment / Kardiovaskularne implikacije na sportske izvedbe i liječenje bolesti	J. Hoff / Norway / Norveška
18:05 - 18:20	The role of genetics in the prevention of sudden cardiac death in athletes / Uloga genetike u prevenciji iznenadne srčane smrti u sportaša	D. Primorac / Croatia / Hrvatska
18:20 - 18:35	Sudden cardiac death and other risks of recreative sport / Iznenadna srčana smrt i ostali rizici rekreativnog sporta	Z. Babić / Croatia / Hrvatska
18:35 - 18:50	How to make conditional training preparations for the top professional athletes? / Kako kondicijski pripremiti vrhunskog sportaša	P. Kuterovac / Croatia / Hrvatska
18:50 - 19:05	Does the Republic of Croatia deserve the Reference Center for Sports Medicine - a point of view from a former Olympian and doctor / Zasluguje li RH Referentni Centar za sportsku medicinu - pogled iz kuta bivšeg olimpijca i liječnika	D. Premuš / Croatia / Hrvatska
19:05 - 19:15	Presenting of the University - Postgraduate specialist study in Sport and Rehabilitation Medicine / Predstavljanje Sveučilišta - PDS Sport i rehabilitacijsku medicinu	University of Rijeka/ Sveučilište u Rijeci/ Medicinski fakultet Rijeka

WORKSHOPS / RADIONICE

08:30 - 08:40	WELCOMING WORDS / RIJEČ DOBRODOŠLICE M. Komisar Cvetković / Croatia / Hrvatska, Irena Kužet Mioković / Croatia / Hrvatska	
13+2 min 08:40 - 10:20	THE ROLE OF NURSES AND PHYSIOTHERAPEUTES IN CARDIAC REHABILITATION AND PREVENTION - PART I / ULOGA SESTARA I FIZIOTERAPEUTA U KARDIOLOŠKOJ REHABILITACIJI I PREVENCIJI - I. DIO Chairpersons / Predsjedavajući: A. Ljubas, M. Komisar-Cvetković, I. Kužet Mioković, M. Heinrich	
08:40 - 08:55	Acceptance of mediterranean diet among patients in the outpatient cardiac rehabilitation program / Prihvaćenost mediteranske prehrane kod bolesnika u programu ambulantne kardiovaskularne rehabilitacije	M. Heinrich, G. Ćurić, M. Ivanuša / Croatia / Hrvatska
08:55 - 09:10	Do we need the International Classification of Functioning, Disability and Health in practice? / Treba li nam u praksi Međunarodna klasifikacija funkcioniranja, onesposobljenosti i zdravlja?	Ž. Muminović, J. Dražić-Balov, M. Ivanuša / Croatia / Hrvatska
09:10 - 09:25	Cardiac rehabilitation from guidelines to successful implementation / Kardiološka rehabilitacija od smjernica ka uspješnoj primjeni	P. Šorić, I. Brajković, K. Silić Gržinčić, J. Stanić, K. Klasan / Croatia / Hrvatska
09:25 - 09:40	Rehabilitation of cardiac patients at the heart of the Zagorje fairytale / Rehabilitacija kardioloških bolesnika u srcu zagorske bajke	J. Halapir / Croatia / Hrvatska
09:40 - 09:55	Preparing nurses for a leading role in CV prevention and rehabilitation / Priprema sestara za vodeću ulogu u KV prevenciji i rehabilitaciji	I. Kužet Mioković, M. Komisar-Cvetković, R. Mrakovčić, I. Brajković / Croatia / Hrvatska
09:55 - 10:10	Implementacija METs sustava u određivanju intenziteta tjelesne aktivnosti / Implementation of MET system in determining the intensity of physical activity	I. Brajković, P. Šorić, K. Silić Gržinčić, J. Stanić, K. Klasan / Croatia / Hrvatska
10:10 - 10:20	DISCUSSION / RASPRAVA	

10:20 - 10:45	Breaking the Guinness Record in the Longest Underwater Walk in One Breath by Vitomir Maricic - Live from Thalassotherapia Opatija / Obaranje Guinnessovog rekorda u najdužem podvodnom hodu u jednom dahu u izvedbi Vitomira Maričića - prijenos uživo iz Thalassotherapije Opatija Moderator: I. Pavletić Crnić	
10:45 - 11:05	Grand opening / Svečano otvaranje	
11:05 - 11:30	Coffee Break / Refreshments / Pauza za kavu	
11:30 - 12:55	RADIONICA: Cardiopulmonary exercise testing in athletes and cardiovascular disease PART 1 / Ergospiometrija u sportaša i kardiovaskularnih bolesnika 1. dio KARDIAN (D. Plavec, V. Ivančev, D. Travica Samsa)	
13+2 min 12:55 - 13:55	THE ROLE OF NURSES AND PHYSIOTHERAPEUTES IN CARDIAC REHABILITATION AND PREVENTION - PART II / ULOGA SESTARA I FIZIOTERAPEUTA U KARDIOLOŠKOJ REHABILITACIJI I PREVENCIJI - II. DIO Chairpersons / Predsjedavajući: V. Fučkar, M. Komisar-Cvetković, I. Kužet Mioković	
12:55 - 13:10	Sexuality in patients with cardiac disease / Spolna aktivnost u bolesnika sa srčanim oboljenjima	J. Paun Judaš / Croatia / Hrvatska
13:10 - 13:25	The influence of isokinetic training on the recovery rate and the outcome of phase II of patient rehabilitation after surgical myocardial revascularization / Utjecaj izokinetičkog treninga na stopu oporavka i ishod faze II rehabilitacije pacijenata nakon kirurške revaskularizacije miokarda	T. Krleža / Croatia / Hrvatska
13:25 - 13:40	Application of nordic walking in phase 2 of cardiac rehabilitation / Primjena nordijskog hodanja u 2. fazi rehabilitacije srca	V. Fučkar / Croatia / Hrvatska
13:40 - 13:55	Influence of diet on glucovariability of patients with risk of cardiovascular disease / Utjecaj prehrane na glukovarijabilnost pacijenata s rizikom oboljenja od kardiovaskularnih bolesti	Ž. Mijolović, T. Turk Wensveen, S. Golubović, V. Bajić, S. Softić, I. Brajković / Croatia / Hrvatska
13:55 - 14:45	Lunch / Ručak	
14:45 - 16:15	RADIONICA: Cardiopulmonary exercise testing in athletes and cardiovascular disease PART 2 / Ergospiometrija u sportaša i kardiovaskularnih bolesnika 2. dio KARDIAN (D. Plavec, V. Ivančev, D. Travica Samsa)	
16:45 - 17:05	Coffee Break / Refreshments / Pauza za kavu	
17:05 - 17:50	SELECTED ABSTRACTS - ORAL PRESENTATIONS / ODABRANI SAŽETCI - USMENA PRIOPĆENJA	
17:05 - 17:20	Strong muscles and a weak heart - a case report of anabolic-androgenic steroid-induced cardiomyopathy / Snažni mišići i slabo srce - prikaz slučaja kardiomiopatije uzrokovane anaboličkim androgenim steroidima	D. Gašparini / Croatia / Hrvatska
17:20 - 17:35	The role of hyperbaric oxygen therapy in athlete recovery and performance / Uloga hiperbarične terapije kisikom u oporavku i uspješnosti sportaša	F. Marinelli, I. Barković / Croatia / Hrvatska
17:35 - 17:50	Sports-related dental injury / Dentalne traume sportaša	I. Bakarčić / Croatia / Hrvatska
17:50 - 18:05	Special equipment in cardiac rehabilitation / Specijalna oprema u kardiološkoj rehabilitaciji	Space treadmill - Raystar - Health / Science / Technology

18.09.2021.
Saturday / Subota

SCIENCE 4 HEALTH
 17. - 18.09.2021.

GRAND HOTEL 4 OPATIJSKA CVIJETA
 OPATIJA, HRVATSKA / CROATIA

CONGRESS / KONGRES

13+2 min **CARDIAC REHABILITATION MUST GO ON / KARDIOLOŠKA REHABILITACIJA IDE DALJE**
08:30 - 10:45 Chairpersons / Predsjedavajući: J. Šeparović, V. Peršić, D. Plavec

08:30 - 08:45 Special patients: GUCH / Posebni pacijenti: GUCH M. Brida / Croatia / Hrvatska

08:45 - 09:00 Specificities of patients treated with advanced methods of treatment for heart failure /
 Specifičnosti bolesnika liječenih naprednim metodama liječenja srčanog zatajivanja D. Lovrić / Croatia / Hrvatska

09:00 - 09:30 Simpozij tvrtke Boehringer Ingelheim: New power in your hands V. Peršić/Croatia/Hrvatska

**Tematska sekcija / Focus session: Functional tests and cardiovascular imaging /
 Funkcionalni testovi i kardiovaskularno oslikavanje**

09:30 - 09:45 Clinical application of CPET / Klinička primjena CPET D. Popović / Serbia / Srbija

09:45 - 10:00 CPET testing as a valuable tool in differential diagnosis of dyspnea in young athletes / CPET
 testiranje kao vrijedan alat u diferencijalnoj dijagnozi dispneje u mladih sportaša D. Plavec / Croatia / Hrvatska

10:00 - 10:15 Assessment of systolic and diastolic function / hemodynamics / Procjena sistoličke i
 dijastoličke funkcije / hemodinamika J. Šeparović / Croatia / Hrvatska

10:15 - 10:45 AMGEN Satellite Symposium: Treatment of dyslipidemia in AKS - role of PCSK9 / AMGEN
 satelitski simpozij: Liječenje dislipidemija u AKS - uloga PCSK9 R. Miškulin, V. Peršić / Croatia /
 Hrvatska

10:45 - 11:15 Coffee Break / Refreshments / Pauza za kavu

13+2 min **CARDIOMETABOLISM / KARDIOMETABOLIZAM / Part II / II dio**
11:15 - 12:15 Chairpersons / Predsjedavajući: M. Škugor, B. Jelaković, T. Turk Wensveen

11:15 - 11:30 Optimization of glucose control in diabetic patients with and without cardiovascular
 disease M. Škugor / USA / SAD

11:45 - 12:00 CRASH - Croatian action on salt and health / Nacionalna kampanja za smanjenje
 prekomjernog unosa kuhinjske soli (CRASH) - „Manje soli - više zdravlja“ B. Jelaković / Croatia / Hrvatska

12:00 - 12:15 Neurolog i kardiolog kao tim iz snova za prevenciju moždanog udara: ažuriranje /
 Neurologist and cardiologist as a dream team for a stroke prevention: an update I. Strenja Linić / Croatia /
 Hrvatska

12:15 - 12:45 NovoNordisk Symposium: How semaglutide changes the approach to the treatment of type
 2 diabetes and contributes to the overall reduction of cardiometabolic risk / NovoNordisk
 simpozij: Kako semaglutid mijenja pristup liječenju šećerne bolesti tipa 2 i pridonosi
 ukupnom smanjenju kardiometaboličkog rizika T. Turk Wensveen, H. Jurin /
 Croatia / Hrvatska

12:45 - 14:00 Lunch / Ručak

14:00 - 15:15	SCIENCE FOR HEALTH Chairpersons / Predsjedavajući: F. Wensveen, T. Turk Wensveen, F. Schena, B. Peterlin	
14:00 - 14:20	The impact of viral infection on blood glucose regulation; an emerging risk factor for cardiometabolic disease / Utjecaj virusne infekcije na regulaciju glukoze u krvi; novi čimbenik rizika za kardiometaboličku bolest	F. Wensveen / Croatia / Hrvatska
14:20 - 14:35	Autonomic response in athletes with type 1 DM during half marathon / Autonomni odgovori u sportaša sa DM tip 1 u polumaratonu	F. Schena / Italy / Italija
14:35 - 14:50	Treatment by stem cells, myth or reality? / Liječenje matičnim stanicama, mit ili stvarnost?	T. Čengić / Croatia / Hrvatska
14:50 - 15:05	Cardiogenetics / Kardiogenetika	B. Peterlin / Slovenia / Slovenija
15:05 - 15:15	DISCUSSION / DISKUSIJA	
15:15 - 15:30	Sanofi Symposium: Praluent (PCSK9i) – standard of care in patients with high and very high CV risk and dyslipidaemia / Sanofi simpozij: Praluent (PCSK9i) – standard u liječenju pacijenata visokog i vrlo visokog KV rizika sa dislipidemijama	D. Gobić / Hrvatska / Slovenija
15:30 - 16:00	Coffee Break / Refreshments / Pauza za kavu	
13+2 min 16:00 - 18:30	SPORTS MEDICINE PART II / SPORTSKA MEDICINA II DIO Chairpersons / Predsjedavajući: Z. Trobonjača, V. Ivančev, L. Ružić	
16:00 - 16:15	Muscle Metabolic Systems in Exercise / Metabolizam mišića u vježbi	Z. Trobonjača / Croatia / Hrvatska
16:15 - 16:30	Overtraining syndrome - how much is enough / Sindrom pretreniranosti - koliko je dovoljno	V. Ivančev / Croatia / Hrvatska
16:30 - 16:45	Diabetes mellitus and arterial hypertension in mountain activities / Diabetes mellitus i arterijska hipertenzija u planinskim aktivnostima	L. Ružić / Croatia / Hrvatska
16:45 - 17:00	Cardiac arrest on sports pitch / Srčani arrest na sportskom terenu	B. Dangubić/N. Bakarčić / Croatia/Hrvatska
17:00 - 17:15	Mini Coffee Break / Refreshments / Mini pauza za kavu	
17:15 - 17:30	Sports activity in patients with symptomatic deep myocardial bridging on a lengthy segment of a coronary artery- do we have answers to important questions? / Sportska aktivnost u bolesnika sa simptomatskim dubokim premošćivanjem miokarda na podužem segmentu koronarne arterije- imamo li odgovore na važna pitanja?	E.Galić / Croatia / Hrvatska
17:30 - 17:45	Cardiomyopathies in athletes: is there a place for competitive sport in new guidelines? / Kardiomiopatije kod sportaša: postoji li mjesto za natjecateljski sport u novim smjernicama?	V. Ivaniš / Croatia / Hrvatska
17:45 - 18:00	ArvC - impact of genes and exercise / ArvC - utjecaj gena i tjelesna aktivnost	D. Raljević / Croatia / Hrvatska
18:00 - 18:15	Rehabilitation of the top professional athletes, new technologies and trends / Rehabilitacija vrhunskih sportaša, nove tehnologije i trendovi	V. Brožičević / Croatia / Hrvatska
18:15 - 18:30	Ultrasound diagnostics and interpretation of sports injuries in the private healthcare system / Ultrazvučna dijagnostika i tumačenje sportskih ozljeda u privatnom zdravstvenom sustavu	M. Brkljačić / Croatia / Hrvatska

WORKSHOPS / RADIONICE

13+2 min 08:30 - 09:15	PSYHOSOCIAL ASPECTS OF CVD / PSIHOSOCIJALNI ASPEKTI KVB Chairpersons / Predsjedavajući: D. Kruhek Leontić, M. Njegovan, G. Kamenečki	
08:30 - 08:45	Cardiovascular health - psychosocial factors and physical activity / Kardiovaskularno zdravlje - psihosocijalni čimbenici i tjelesna aktivnost	D. Kruhek Leontić / Croatia / Hrvatska
08:45 - 09:00	Smoking cessation counselling / Savjetovanje o prestanku pušenja	M. Njegovan / Croatia / Hrvatska
09:00 - 09:15	Does stationary cardiac rehabilitation aid perseverance through treatment? / Pomaže li stacionarna kardiološka rehabilitacija ustrajnosti u liječenju?	G. Kamenečki, M. Kunštek / Croatia / Hrvatska
09:15 - 10:00	NUTRITIONAL COUNSELING / NUTRICIONISTIČKO SAVJETOVANJE Chairpersons / Predsjedavajući: V. Đurica, S. Lanča, N. Jokić	
09:15 - 09:45	The importance of nutritional support for strengthening the immune system and optimal heart vitality / Važnost nutritivne potpore za jačanje imunološkog sustava i optimalnu vitalnost srca	V. Đurica / S. Lanča / N. Jokić / Croatia / Hrvatska
13+2 min 09:45 - 10:45	THE ROLE OF NURSES AND PHYSIOTHERAPEUTES IN CARDIAC REHABILITATION AND PREVENTION / ULOGA SESTARA I FIZIOTERAPEUTA U KARDIOLOŠKOJ REHABILITACIJI I PREVENCIJI-PART III Chairpersons / Predsjedavajući: D. Rakić, M. Komosar-Cvetković, I. Kužet Mioković	
09:45 - 10:00	Musical therapy as a medicine / Muzikoterapija kao lijek	G. Ćurić, A. Katušić, M. Ivanuš / Croatia / Hrvatska
10:00 - 10:15	Patronage nurses and physical therapists as the cornerstone of prevention and rehabilitation of cardiovascular diseases in the community / Patronažne sestre i fizioterapeuti kao temelj prevencije i rehabilitacije KV bolesti u zajednici	D. Rakić, M. Matijašić / Croatia / Hrvatska
10:15 - 10:30	Scope of work of a nurse / technician in cardiology diagnostics at the Special Hospital Thalassotherapia Opatija / Djelokrug rada mediciske sestre / tehničara u kardiološkoj dijagnostici pri Specijalnoj bolnici Thalassotherapia Opatija	S. Softić, M. Bukvić, Ž. Mijolović, S. Golubović, V. Bajić, D. Travica Samsa / Croatia / Hrvatska
10:30 - 10:45	Task shifting, and why does nursing need it? / Task shifting - Promicanje zadataka i zašto nam je potrebno u sestinstvu ?	M. Komosar-Cvetković, I. Kužet Mioković, M. Barišić, S. Golubović / Croatia / Hrvatska
10:45 - 11:15	Coffee Break / Refreshments / Pauza za kavu	
11:15 - 12:15	RADIONICA: ATHLETES ECG/EKG za sportaše (D. Raljević)	
12:15 - 12:45	Half an hour of self-care-relaxation training / Pola sata izvan formata - trening opuštanja	D. Kruhek Leontić, G. Kamenečki, M. Njegovan / Croatia / Hrvatska
12:45 - 14:00	Lunch / Ručak	



BOOK OF
ABSTRACTS

KNJIGA
SAŽETAKA

Sudden cardiac death and other risks of recreational sport

Zdravko Babić^{1,2}

¹ Clinic for Cardiovascular Diseases, Clinical Hospital Centre Sestre milosrdnice, Zagreb, Croatia

² Faculty of Medicine, University of Zagreb, Croatia

ABSTRACT:

Recreational physical activity, compared to competitive sport, is primarily characterized by a higher age of participants, occasional training, lower physical activity level and mental stress. The frequency of sudden cardiac death during recreational compared to competitive sports activity is more than 10 times higher and is most often the result of coronary heart disease. Although there are guidelines for the prevention and treatment of sudden cardiac death during recreational activity, legislation and its application in everyday life are weaker than in competitive sports activity.

Cardiac overuse injury is a term recently used in the literature to describe the many abnormal changes in the heart and heart muscle as result of prolonged and / or intense physical activity. It is mainly described by isotonic aerobic activity, differs from physiological changes in the sports heart, changes usually affect middle-aged and older athletes, most often over 45 years, and can be irreversible. Decreased right heart, especially right ventricular, adaptability is key to the development of this set of changes and may result in benign ventricular extrasistolia of right ventricular origin to exercise-induced right ventricular cardiomyopathy that is difficult to distinguish from arrhythmogenic right ventricular dysplasia. The more frequent occurrence of atrial fibrillation in recreational athletes is associated with structural and electrical changes in the atria, especially the left atrium, it is associated with accumulated hours of endurance exercise over a lifetime, especially above 4,500 hours when is more often than in the sedentary population.

Recreational sports activity can also be practiced by patients with cardiovascular diseases, but respecting the relevant guidelines of international cardiac societies with an individual approach.

Keywords: recreational physical activity, cardiac overuse injury, sudden cardiac death

Sports-related dental injury

Ivona Bakarčić¹, Renata Gržić²

¹ Community health center Rijeka, Primorsko Goranska county, Rijeka, Croatia

² Faculty of dental medicine Rijeka, Croatia

ABSTRACT:

Sports dentistry is involved in prevention and treatment of orofacial sports injuries and related oral diseases. It includes the collection and dissemination of dental sports injuries. It also encourages research in the prevention of such injuries.

Injuries often occur during sports activities and a great deal of these injuries are caused by dental trauma (1,2). Dental injuries such as tooth fracture, luxation or avulsion are one of the biggest concerns of young athletes as they directly affect the orofacial function. Although there are preventive measures such as mouthguards, there is still a high incidence of dental trauma in young athletes. In children it is reported that sports activities were responsible for 13% of overall oral trauma (2-4).

Orofacial and dental trauma continues to be a commonly encountered issue for the sports medicine team. All sports have some risk for dental injury, but "contact sports" presumably incur more risk (3).

It is important to proceed with immediate evaluation and proper management of the most common injuries to dentition that results in saving or restoration of tooth structure (3,4).

Basketball, football, hockey, martial arts, and boxing carry the highest risk. Skiing, handball, water polo also are included in sports of higher risk of dental injury. However, noncontact sports carry risk as well (2).

Despite the growing body of evidence, mouthguard use and dental protection have not paralleled the increase in sports participation.

It is emphasized that there is a great need for "Team Dentist" for athletes from high schools to professional teams. When it comes to sports, many studies show that mouth guards are effective in reducing the risk of orofacial injuries. Unfortunately, while mouth guards are recommended for many sports, they are still not mandated for most, leaving many children and adults unprotected (3).

Keywords: Sports-related dental injury; tooth fracture; tooth avulsion; mouthguard

Literature:

1. Goettems ML, Schuch HS, Hallal PC, Torriani DD, Demarco FF. Nutritional status and physical activity level as risk factor for traumatic dental injuries occurrence: a systematic review. *Dent Traumatol.* 2014;30(4):251-258. doi: 10.1111/edt.12102.
2. Al-Arfaj I, Al-Shammari A, Al-Subai T, Al-Absi G, Al-Jaffari M, Al-Kadi A, El-Tantawi M, Al-Ansari A. The knowledge, attitude and practices of male sports participants to sports-related dental trauma in Khobar and Dammam, Saudi Arabia - a pilot survey. *Saudi Dent J.* 2016;28(3):136-141. doi: 10.1016/j.sdentj.2016.02.001.
3. Shinobu Tsuchiya, Masahiro Tsuchiya, Haruki Momma, Takuya Sekiguchi, Kaoru Kuroki, Kenji Kanazawa, Takeyoshi Koseki, Kaoru Igarashi, Ryoichi Nagatomi, and Yoshihiro Hagiwara, Factors associated with sports-related dental injuries among young athletes: a cross-sectional study in Miyagi prefecture, *BMC Oral Health.* 2017; 17: 168. Published online 2017 Dec 29. doi: 10.1186/s12903-017-0466-2
4. Young EJ, Macias CR, Stephens L. Common dental injury Management in Athletes. *Sports Health.* 2015;7(3):250-255. doi: 10.1177/1941738113486077.

Implementation of METs system in determining the intensity of physical activity

Ivona Brajković, Paolo Šorić, Ksenija Silić Gržinčić, Jasna Stanić, Kristina Klasan

Thalassotherapia Opatija - Clinic for rehabilitation, treatment and prevention of diseases of the heart and blood vessels, Opatija, Croatia

ABSTRACT:

The 1993 Adult Compendium of Physical Activity standardizes the metabolic equivalent value (MET). According to the values from the Compendium MET, the value of units indicates the energy consumption of physical activities, so we define it as energy consumption at rest or oxygen intake at rest (1 MET = 1kcal/kg/h; 1 MET = 3.5 ml O₂/kg/min). Standard METs values calculate resting metabolic rate (RMR) while corrected METs, obtained by the Harris-Benedict equation, emphasize individual diversity for personal anthropometric characteristics and accurate RMR calculation. Physical activity is then defined as any movement that results from the contraction of skeletal muscle resulting in a significant increase in caloric needs during rest energy consumption. Compendium of physical activity, the intensity of physical activity was categorized as mild (<3.0 MET), moderate (3.0 - 5.9 MET) and strong intensity (≥ 6.0 MET). American College of Sports Medicine (ACSM) guidelines of cardiorespiratory training by F.I.T.T. principle is to determine the frequency, intensity, time and type of training. To understand the intensity of physical activity, it is important to know the parameters of maximum oxygen uptake (VO_{2max}), peak pulse (HR_{peak}), Heart Rate Reserve (HRR) and rating of perceived exertion scale - Borg Scale (RPE). Target Heart Rate (THR) is determined by the Karvonen formula according to the desired training intensity. The ACSM and the American Heart Association (AHA) endorse the stated general minimum recommendations for human health. The parameters indicate an improvement in the cardiovascular and respiratory function of the body, so the METs system is an important factor in defining programmed training in both athletes and terms of rehabilitation.

Keywords: metabolic equivalent, physical activity, corrected MET, VO_{2max}

Literatura:

1. Kozey S, Lyden K, Staudenmayer J, Freedson P. *Errors in MET estimates of physical activities using 3.5 ml x kg(-1) x min(-1) as the baseline oxygen consumption.* J Phys Act Health. 2010;7(4):508-516.
2. Byrne NM, Hills AP, Hunter GR, Weinsier RL, Schutz Y. *Metabolic equivalent: one size does not fit all.* J. Appl. Physiol. 2005;99(3):1112-1119.
3. Haskell WL, Lee IM, Pate RR et al. *Physical activity and public health: updated recommendation for adults from the American College of Sports Medicine and the American Heart Association.* Med Sci Sports Exerc. 2007;39(8):1423-34.
4. Ross R., Blair SN., Ross C., Timothy S., Després JP., Franklin BA., Haskell WL., Kaminsky LA., Levine BD. *Importance of Assessing Cardiorespiratory Fitness in Clinical Practice: A Case for Fitness as a Clinical Vital Sign: A Scientific Statement From the American Heart Association.* Circulation. 2016;134(24):e653-e699

Ultrasound Diagnosis and Interpretation of Sports Injuries in the Private Healthcare System

Morana Brkljačić, Milenka Đinđić-Pavičić

Special Hospital AGRAM – Polyclinic Rijeka, Croatia

ABSTRACT:

The development of technology in the last two decades has left a big mark in medicine especially in radiology.

We are witnessing faster and bigger, almost daily, progress of computer software (IT) systems.

Innovations and increasingly sophisticated capabilities of ultrasound devices suggest the inclusion of diagnostic ultrasound (US) in routine clinical practice. The technical characteristics of ultrasonic devices with the use of high-frequency and high-resolution probes have been significantly improved. The structures that can be shown through the so-called "Ultrasound window", the most common pathology was determined and defined for each individual observed region, and quantification and better standardization of ultrasound procedures were performed.

The application of diagnostic ultrasound (US) of the musculoskeletal system, especially the power Doppler technique (PD), has significantly improved and enabled better and more accurate diagnosis. Among the numerous examinations of various systems in the body, it is widely used for the quantitative and qualitative assessment of various musculoskeletal pathologies, mostly in athletes with sports injuries.

The advantage of ultrasound examination of athletes is reflected in the ability to perform dynamic examinations, as well as the ability to interact with the patient (athlete) and correlate symptoms with the findings of ultrasound examination, which the private healthcare system provides as an instant and overall service.

Keywords: ultrasound diagnostics, musculoskeletal, joints, technology, sport, healthcare system, private

Ethics in sports

Competition and Fair play: What is the Role of Education for Preserving the Values and Ethics of Sport

Morana Brkljačić

Special Hospital Agram – Polyclinic Rijeka, Croatia

ABSTRACT:

To define ethics in sport, we can generally say that it is the application of widely known moral values in various sporting situations and sport in general. A concept that connects sport and morality is that of “moral autonomy”, by which we understand the acceptance of social-moral norms that we accept as part of our human duty, as something that comes directly from within us, something that we adopt as human because we are humans.

When speaking about ethics and sport, or more precisely about ethics in sport or the ethics of modern sport, we mostly become preoccupied with their negative (non-ethical) aspects. Precisely for this reason academic learning and sports education are, actually, the complementariness of each other. They are the two sides of the same coin. If total education makes full development of the over-all personality of a pupil/students possible, it gets the qualities of leadership, tolerance, sharing and team-spirit from sports. The mental development, including the power of reasoning and vocational specialization, of course, comes from the academics. It, therefore, becomes imperative that education should result in the mental, moral and physical development of a students – future or current athletes.

In essence, there are important points of contact of the ethical (moral) and the aesthetic in athletes. In a way, ethics can be regarded as the aesthetics of human relations, that is, our relation to other people and to ourselves.

Keywords: ethics; sport, athletes, education, fair play moral

Rehabilitation of the Top Professional Athletes, New Technologies and Trends

Vlasta Brozičević

Poliklinika Terme d.o.o., Selce, Croatia

ABSTRACT:

Injuries of top professional athletes are frequent and inevitable, always requiring complex approach in quick and safe recovery. About 55% of all sports injuries are knee injuries, and shoulder injuries are 20%. Only 55% athletes return to sport on the same level. As a natural goal setter, top athlete's recovery brings great challenge to MDs and the team. The art of high quality rehabilitation is based on: individualising the programme, positive rehabilitation environment, shared decision making, building confidence, regular monitoring, assessment and feedback. A top athlete is a project and needs a top team and MDs. Selfconfidence and strong sense of motivation with inner desire to succeed make athlete strong and agile, no matter injuries happen. During rehabilitation process selfdiscipline and optimism are needed.

Method by drVB creates sense of belonging one to another, 24 h a day in search for super health, while keeping athlete's integrity. Strong focus is the key, and trust in the rehab process that is responsible, holistic, multidisciplinary. Involves medical teams, psychologist, nutritionist, family, coach and team. Protocols combine kinesy therapy procedures, regenerative medicine, neurorehabilitation and our MindsetBody Reconditioning system which prepares the athlete for winning. Modern technologies, such as sensors, systems, platforms, wearables, and digital solutions like ultrasound and UTC imaging play also very important role.

Results are confirmed by scoring system. Time for comeback ranges from a few weeks to a few months. Resiliency and the ability to learn from setbacks bring greater results. Vulnerability may occur and be overcome due to the perfectionism that we tested in 120 top athletes.

With new trends to explore, engage, experience, transcend; wearable technologies, insight into a variety of physiological conditions such as sleep quality, nutrition, changing and/or improving habits to even better athletic performance are expected.

Technologies can reduce the incidence of accidents, but injuries will occur. Therefore, top athletes will need to accomplish their goals through the rehabilitation process that involves dedication 100%. Following new trends, we will soon be incorporating new applications into our work that will be available to us by our partner Virgin Pulse tested in 7,5 mill users.

Keywords: physical medicine and rehabilitation, top athletes, technologies, trends

Literature:

University of Michigan, Study of retired NFL players, 2009: <http://ns.umich.edu/Releases/2009/Sep09/FinalReport.pdf>

Krapinske Toplice - Our Cardiac Rehabilitation Model

Duško Cerovec^{1,2}

¹ Special Hospital for Medical Rehabilitation Krapinske Toplice, Croatia

² University Josip Juraj Strossmayer of Osijek – Medical Faculty Osijek, Croatia

ABSTRACT:

Krapinske Toplice is in northwest Hrvatsko Zagorje region, one of the most beautiful corners of Croatia, about 45 kilometers from main city Zagreb. It is a mild climate small town situated in the peaceful valley surrounded by the picturesque hills.

There are 4 hyper-thermal springs, with average outflow capacity of 80 l/s, temperature 39-41 °C.

First medical facility was built in year 1860 as sanatorium, and hospital was founded in year 1952. Now days there are 3 hospitals: Hospital for medical rehabilitation, Magdalena – Clinic for cardiology and cardiac surgery, and Akromion - Hospital for orthopedic surgery.

Cardiac rehabilitation department in Hospital for medical rehabilitation was started in year 1974. Today it's large department with capacity for up to 120 in-hospital patients, out-hospital programs, and extensive non-invasive cardiac diagnostics. Acute cardiac care is organized through our emergency department, Internal medicine ward and Intensive care unit. When it is needed, patients can be fast transferred to invasive cardiac diagnostics and interventions in Magdalena Clinic with whom we share hospital buildings, and then return to our hospital for post-acute care and rehabilitation.

Our cardiac rehabilitation programs are standardized according to current guidelines and comprehensive. Core components are baseline and pre-discharge patient assessment, nutritional counseling, cardiovascular risk factor management, psychosocial interventions, and exercise training.

Physical training is always supervised, with its intensity based on risk assessment and ergometry or alternative functional capacity assessment. ECG monitoring is mandatory on first training, or when training intensity or modalities are changed. For patients who are incapable of conducting group exercises, we provide individual training and other additional physical therapies.

For capable patients group exercises training is also provided outside of hospital in our lovely natural surroundings. During this type of training, we can implement ECG monitoring with mobile devices.

In our thermal water swimming pools patients have additional hydro gymnastics and aquarobics.

In the last few years, Nordic walking is included in our rehabilitation activities, and well accepted from patients.

Today, we can offer comprehensive, safe, and high-quality cardiac rehabilitation programs in beautiful natural environment with blending of tradition and modern medicine.

Keywords: cardiac rehabilitation, Krapinske Toplice, exercise training, Nordic walking.

Music therapy as a medicine

Gabrijela Ćurić¹, Ana Katušić^{2,3}, Mario Ivanuša^{1,4}

¹ Institute for Cardiovascular Prevention and Rehabilitation, Zagreb, Croatia

² University of Zagreb School of Medicine, Zagreb, Croatia

³ Croatian Music Therapists Association, Croatia

⁴ University of Rijeka, Faculty of Medicine, Rijeka, Croatia

ABSTRACT:

Since June 2017, Receptive Music Therapy (RMT) has been applied as a part of the holistic approach for patients involved in an outpatient cardiovascular rehabilitation program at the Institute for Cardiovascular Disease Prevention and Rehabilitation in Zagreb.¹ The intervention by applying RMT involves the systematic use of music and music interventions and the presence of an educated and registered music therapist. It is carried out by applying an individualized approach after cardiac examination, psychological tests and musical history have been conducted, i.e. after a thorough assessment of the patient's affinities to specific genres and types of music has been made.² The RMT intervention is performed in 14 sessions, by listening to the music program on a professional headset, in a quiet environment in duration of 30 minutes. Psychophysical reactions to the music program are monitored, while the attributes of interest in the field of physical and psychological domains (restlessness, depression, tension, pain, sleep quality, range of motion, work capacity, concentration) are evaluated at the beginning and end of the RMT intervention. By stimulating the senses, music can have a positive effect on the behavior of an anxious patient if such music is close and recognizable to a patient and if it gives him/her a sense of safety. The expected effects are a reduction in behavioral, somatic, and psychological symptoms while lowering blood pressure and heart rate. The emphasis in the presentation will be placed on the acceptance of the intervention and the evaluation of the success of the therapeutic effect.

Keywords: outpatient cardiovascular rehabilitation, music therapy, anxiety.

Literature:

1. Ivanuša M, Ćurić G, Kruhek Leontić D, Katušić A, Drmić S. Application of receptive music therapy in patients involved in outpatient cardiovascular rehabilitation: initial experience. *Cardiol Croat.* 2018;13(11-12):420-421. <https://doi.org/10.15836/ccar2018.420>
2. Katušić A, Burić K, Ivanuša M. Uloga glazbe i muzikoterapije u programu kardiovaskularne rehabilitacije. *Medicus.* 2020;29(1):137-42. <https://hrcak.srce.hr/file/337776>

Cardiac arrest on sports pitch - important early CPR and defibrillation

Boban Dangubić^{1,2,3}, Nataša Bakarčić³, Marin Polonijo³, Matej Lulić³, Matija Čargonja³, Dorijan Mavrinc³

¹ Clinical Hospital Center Rijeka, Clinic of Anaesthesiology, intensive medicine and pain management, Rijeka, Croatia

² Faculty of Medicine, Department of Anaesthesiology reanimatology emergency and intensive medicine, University of Rijeka, Rijeka, Croatia

³ Croatian Football Club Rijeka, Rijeka, Croatia

ABSTRACT:

The sudden collapse of Danish soccer player Christian Eriksen during his country's match against Finland at the Euro 2020 championships earlier this year sent shock waves across the stadium in Copenhagen and over the world. Towards the end of the first half, the twenty nine year old midfielder fell face down and laid emotionless for several minutes as his teammates huddled around him and medical staff rushed to the pitch started with CPR and revived his heart. This situation was the best example and has showed us that cardiac arrest is something that can happen to any young player on the pitch. It has also showed us how important is having **Basic Life Support** and to operate with **Automatic External Defibrillator**.

The European Resuscitation Council Guidelines emphasise the importance of providing effective CPR and early defibrillation where possible. The guidelines stipulate that chest compressions should be as uninterrupted as possible. The ratio of compressions to ventilations is 30:2. Depth of compressions is 5 to 6 cm and rate of compression increased 100 to 120 per minute.

Once CPR has started it should not stop unless the victim shows signs of life such as return to consciousness in addition to a return to normal breathing. During the management of cardiac arrest on the pitch, medical team supposes to access the cardiac rhythm and immediately treat any shockable rhythm with automatic external defibrillator. A defibrillator is required for any assessment and treatment of cardiac arrest. Unless there is no defibrillator it becomes even more important to call ambulance and continue with CPR until defibrillator arrives. Early recognition, early CPR, early defibrillation and early post resuscitation care are four main parts in survival in this situation.

Keywords: cardiac arrest, basic life support, automatic external defibrillation

Literature:

1. Murray CJ, Lopez AD. Mortality by cause for eight regions of the world: global burden of disease study. *Lancet* 1997;349:1269-76
2. Sans S, Kesteloot H, Kromhout D. The burden of cardiovascular diseases mortality in Europe. *Eur Heart J* 1997;18:1231-48.
3. Zheng ZJ, Croft JB, Giles WH, Mensah GA. Sudden cardiac death in the United States, 1989 to 1998. *Circulation* 2001;104:2158-63
4. Atwood C, Eisenberg MS, Herlitz J, Rea TD. Incidence of EMS-treated out-of-hospital cardiac arrest in Europe. *Resuscitation* 2005;67:75-80
5. Iwami T, Nichol G, Hiraide A, Hayashi Y, Nishiuchi T, Kajino K et al. Continuous improvements in "chain of survival" increased survival after out-of-hospital cardiac arrests: a large-scale population-based study. *Circulation* 2009;119:728-34
6. Jacobs I, Nadkarni V, Bahr J, Berg RA, Billi JE, Bossaert L et al. Cardiac Arrest and Cardiopulmonary Resuscitation Outcome Reports Update and Simplification of the Utstein Templates for Resuscitation Registries A Statement for Healthcare Professionals From a Task Force of the International Liaison Committee on Resuscitation (American Heart Association, European Resuscitation Council, Australian Resuscitation Council, New Zealand Resuscitation Council, Heart and Stroke Foundation of Canada, InterAmerican Heart Foundation, Resuscitation Councils of Southern Africa). *Circulation* 2004;110: 3385-97.
7. Agarwal DA, Hess EP, Atkinson EJ, White RD. Ventricular fibrillation in Rochester, Minnesota: experience over 18 years. *Resuscitation* 2009;80:1253-8.
8. Deakin CD, Nolan JP, Soar J, Sunde K, Koster RW, Smith GB et al. European Resuscitation Council Guidelines for Resuscitation 2010, Section 4. Adult Advanced Life Support. *Resuscitation* 2010; 81:1305-52.
9. Smith GB. In-hospital cardiac arrest: is it time for an in-hospital 'chain of prevention'? *Resuscitation* 2010;81: 1209-11.
10. Cummins R, Chamberlain D, Hazinski MF, Nadkarni V, Kloeck W, Kramer E et al. Recommended Guidelines for Reviewing, Reporting, and Conducting Research on In-Hospital Resuscitation: The In-Hospital „Utstein-style“, A Statement for Healthcare Professionals From the American Heart Association, the European Resuscitation Council, the Heart and Stroke Foundation of Canada, the Australian Resuscitation Council, and the Resuscitation Council of Southern Africa. *Circulation* 1997;95: 2213-39.

The importance of nutritional support for strengthening the immune system and optimal heart vitality

Vanja Đurica¹, Sabina Lanča², Neda Jokić¹

¹ Thalassotherapia Opatija / Special Hospital for Medical Rehabilitation from Heart, Lung and Rheumatism / Clinic for treatment Rehabilitation and Prevention of Cardiovascular disease, Opatija, Croatia

² Pula General Hospital, Pula, Croatia

ABSTRACT:

Diet therapy and nutrition have a significant place in the treatment of patients with chronic non-communicable diseases. Balanced diet in prevention and treatment is part of the guidelines of all relevant world and European professional societies. It is important that clinical dietitian/nutritionist collaborate and align recommendations to provide the optimum care for the patients and optimizes treatment. Considering the importance of nutrition during COVID-19 pandemic, the European Federation of the Associations of Dietitians as well as the WHO have made public health nutrition advice and guidelines for maintaining an optimal nutrition status. Diet, nutritional and fluid intake are very important because the symptoms can affect appetite and ability to eat, making it difficult for nutritional needs. A balanced diet includes: protein - for healthy muscles, organs and the immune system, carbohydrate foods - for energy and fibre, fruits and vegetables - for fibre, vitamins and minerals to support the immune system, dairy foods - for calcium and other important minerals for healthy bones and teeth, fluid - for good hydration. All the recommendations promote nutrients, foods, and dietary patterns that are included in a Mediterranean diet, which is considered healthy and anti-inflammatory. The Mediterranean diet is a way of eating that's based on the traditional cuisines of Greece, Italy and other countries that border the Mediterranean Sea.

Plant-based foods, such as whole grains, vegetables, legumes, fruits, nuts, seeds, herbs and spices, are the foundation of the mediterranean diet. Olive oil is the main source of added fat. Living the Mediterranean way also means being physically active and sharing meals with loved ones.

Keywords: nutrition therapy, COVID-19, mediterranean diet, healthcare

Literature:

1. Royal College of Nursing (RCN), British Dietetic Association (BDA) and British Association of Parenteral and Enteral Nutrition (BAPEN) (2020) IMPROVING YOUR NUTRITION During and After COVID-19 Illness, <https://www.malnutritionpathway.co.uk/library/covid19yellow.pdf>
2. Štimac, D., Krznarić, Ž., Bender Vranešić, D., Glišić Obrovac M.: Diet therapy and clinical nutrition, Zagreb 2021.
3. Greta Krešić, :Trendovi u prehrani.Opatija:Fintrade & tours d.o.o. Rijeka; 2012.

Does the endothelium of competitive athletes benefit from the consumption of n-3 polyunsaturated fatty acids-enriched hen eggs?

Ana Stupin^{1,2,3}, Ivana Jukić^{1,3}, Luka Kolar^{3,4}, Marko Stupin^{3,5}, Petar Šušnjara^{1,3}, Anita Matic^{1,3}, Nikolina Kolarović^{1,3}, Zrinka Mihaljević^{1,3}, Ines Drenjančević^{1,3}

¹ Department of Physiology and Immunology, Faculty of Medicine Josip Juraj Strossmayer University of Osijek, Osijek, Croatia

² Department of Pathophysiology, Physiology and Immunology, Faculty of Dental Medicine and Health Josip Juraj Strossmayer University of Osijek, Osijek, Croatia

³ Scientific Center of Excellence for Personalized Health Care, Josip Juraj Strossmayer University of Osijek, Osijek, Croatia

⁴ Department of Internal Medicine, National Memorial Hospital Vukovar, Vukovar, Croatia

⁵ Department for Cardiovascular Disease, Osijek University Hospital, Osijek, Croatia

ABSTRACT:

Aim: Present study aimed to determine the effect of n-3 PUFAs enriched hen eggs consumption on microvascular vasodilation, microvascular responsiveness range to a stress challenge and markers of oxidative stress in competitive athletes.

Materials and Methods: 23 competitive athletes were divided to Control group (N=9) who ate three regular hens' eggs/daily (249 mg n-3 PUFAs/day), and n-3 PUFAs group (N=14) who ate three n-3 PUFAs enriched hen eggs/daily (1053 g n-3 PUFAs/day) for 3 weeks. Endothelium-dependent (post-occlusive reactive hyperemia, PORH; and iontophoresis of acetylcholine, AChID) and endothelium-independent responses (iontophoresis of sodium nitroprusside, SNPID) of skin microvascular blood flow was assessed by laser Doppler flowmetry in pre- and post- acute exhausting exercise (AEE) sessions. Blood pressure (BP), body composition, body fluid status, serum lipid and free fatty acids profile, markers of oxidative stress (TBARS; thiobarbituric acid reactive substances) and antioxidative defense (FRAP; ferric-reducing ability of plasma and serum antioxidant enzymes activity), were measured before and after respective dietary protocol.

Results: Serum n-3 PUFAs significantly increased, n-6/n-3 ratio decreased (by 27%), PORH and AChID at rest were significantly enhanced, and SNPID at rest remained unchanged in n-3 PUFAs group, while none was changed in Control group. BP, body composition and body fluid status were not changed in any group. TBARS and FRAP remained unaffected by diet protocol in both groups, while serum GPx and SOD (but not CAT) activity significantly decreased in n-3 PUFAs, and remained unaltered in Control group. PORH, AChID and SNP were significantly reduced post-AEE, in both groups compared to pre-AEE measurement, both before and after respective diet protocol. Only AChID responsiveness range to AEE (Δ AChID) significantly increased following n-3 PUFAs consumption.

Conclusion: n-3 PUFAs functional food consumption contributes to enhanced microvascular endothelial function at rest, as well as to its adaptation to the AEE in competitive athletes. (Funded by the European Structural and Investment Funds grant for the Croatian National Scientific Center of Excellence for Personalized Health Care, University of Josip Juraj Strossmayer Osijek - grant #KK.01.1.1.01.0010).

Keywords: n-3 polyunsaturated fatty acids, athletes, acute exercise, endothelium, microcirculation, oxidative stress

Application of Nordic Walking in Phase 2 of Cardiac Rehabilitation

Vjekoslav Fučkar

Special hospital for medical rehabilitation Krapinske Toplice, Krapinske Toplice, Croatia

ABSTRACT:

Exercise intolerance with accelerated fatigue and dyspnea are the main features of heart failure. The course of heart failure is characterized by frequent rehospitalizations in short periods of time, leading to a poorer prognosis, reduced quality of life, and a significant increase in treatment costs. A cardiac rehabilitation program is considered to be the most effective measure of secondary prevention of cardiovascular disease.

The goals of prevention programs are to reduce morbidity and mortality for high-risk patients. The main goals of cardiac rehabilitation are to limit mental and physical stress due to CVD, reduce the risk of mortality due to CVD and improve cardiovascular function to help the patient achieve the highest possible level of quality of life. Exercise has been accepted as an integral part of non-pharmacological methods of treating cardiac patients because of its benefits for the health of patients.

Thus, Nordic walking has found its place in cardiac rehabilitation as a type of physical activity in which symmetrical and transformational effects on the human body are achieved through coordinated work of the arms and legs in a normal movement pattern and the use of sticks. Based on previous research, it can be concluded that a properly designed Nordic walking program is a good example of physical activity that is applicable to people suffering from cardiovascular disease.

Keywords: nordic, walking, physical activity, cardiac rehabilitation, exercise

Literature:

1. American Nordic Walking Health Benefits. (n.d.). Dostupno na <https://www.americannordicwalking.com/health-benefits>
2. Bullo, V., Gobbo, S., Vedramin, B., Duregon, F., Cugusi, L., Di Blasio, A., Ermolao, A. (2017). Nordic Walking can be incorporated in the exercise prescription to increase aerobic capacity, strength and quality of life for elderly: a systematic review and meta analysis. *Mary Ann Liebert, Inc.*, 21(2) 1-70. Dostupno na <https://pubmed.ncbi.nlm.nih.gov/28756746/>
3. Lakušić i sur. Mjesto i uloga kardiološke rehabilitacije u suvremenoj kardiologiji. Dostupno: <https://bib.irb.hr/datoteka/251276>. Cardiac_rehabilitation_rad.doc Pristupljeno: 21. studeni, 2019.

Sports activity in patients with symptomatic deep myocardial bridging on a lengthy segment of a coronary artery - do we have answers to important questions?

Edvard Galić^{1,2}, Tvrtko Jukić³, Petar Bešlić², Zrinka Planinić², Ante Pašalić², Marko Perčić², Dominik Kancir⁴, Ninoslav Rudman²

¹ School of Medicine, University of Zagreb, Croatia

² Clinical Hospital Sveti Duh, Zagreb, Croatia

³ Krapina-Zagorje County Emergency Medicine Institute, Krapina, Croatia

⁴ Krapina-Zagorje County Health Center, Krapina, Croatia

ABSTRACT:

Myocardial bridging (MB) is a congenital anatomic variation of the coronary arteries wherein one or multiple epicardial coronary arteries take a partially intramural course, causing segments to be covered by a layer of myocardium. This variation is most often asymptomatic, but there have been case reports of MB-adjacent angina pectoris, myocardial ischaemia or infarction, even sudden cardiac death. Symptoms may, but need not be related to physical exertion. We present the case of a 27-year-old male patient who presented to the Emergency Department with an intermittent feeling of tightness in the chest without propagation. The presence of an acute coronary event was ruled out by emergency care workup. The heart was deemed structurally healthy on echocardiogram. A stress-test was performed, observably with marked chronotropic activity, and ultimately aborted with the appearance of chest oppressions and an electrocardiographically positive coronary reserve test. The diagnostic scope was therefore widened in order to assess for possible anatomic variations of the coronary arteries and deficits in myocardial perfusion. MSCT coronary angiography revealed the existence of deep as well as markedly lengthy (60 millimetres) myocardial bridging on the middle and distal segment of the LAD artery, displaying the characteristic “milking” of coronary arteries in systole. Given the patient’s youth and the presence of symptomatic, very lengthy and profound MB paired with marked chronotropic activity, a beta-blocker was introduced, and the patient was restricted from high physical strain and competitive sports. Open questions and low-level recommendations remain about the exact form of physical activity which is to be permitted to patients with symptomatic MB, especially in regard to the role of the location, depth and, principally, length of MB.

Keywords: myocardial bridging, coronary arteries, coronary angiography, chest pain, sports cardiology

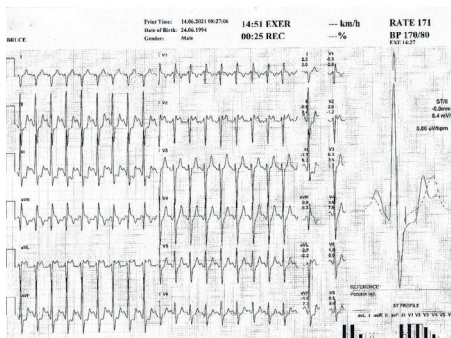


Fig. 1: ECG- stress test abortion

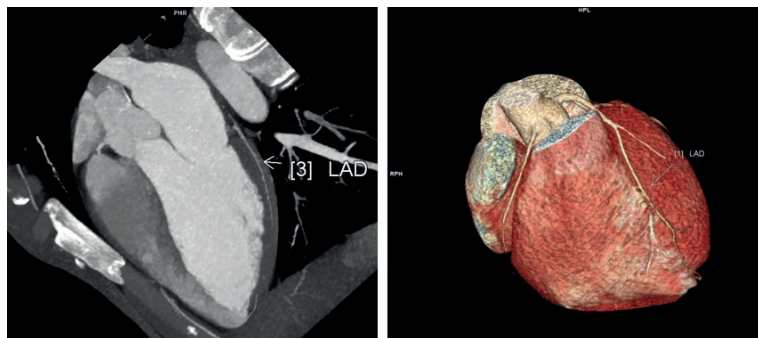


Fig. 2: MSCT coronary angiogram with the depiction of coronary arteries, deep and lengthy MB on LAD

Extreme anaerobic exercise impairs cytotoxicity and enhances cytokine production – a flow cytometry study of human blood lymphocytes

Dora Gašparini^{1,2}, Inga Kavazović¹, Igor Barković^{1,3}, Vitomir Maričić⁴, Viktor Ivaniš², Dijana Travica Samsa^{1,2}, Viktor Peršić^{1,2}, Bojan Polić¹, Tamara Turk Wensveen^{1-3,*}, Felix M. Wensveen^{1,*}

¹ Faculty of Medicine, University of Rijeka, Croatia

² Special Hospital for Medical Rehabilitation of Heart, Lung and Rheumatic Diseases Thalassotherapia Opatija, Croatia

³ Clinical Hospital Centre Rijeka, Croatia

⁴ AIDA - International Association for the Development of Apnea, Croatia

* These authors contributed equally.

ABSTRACT:

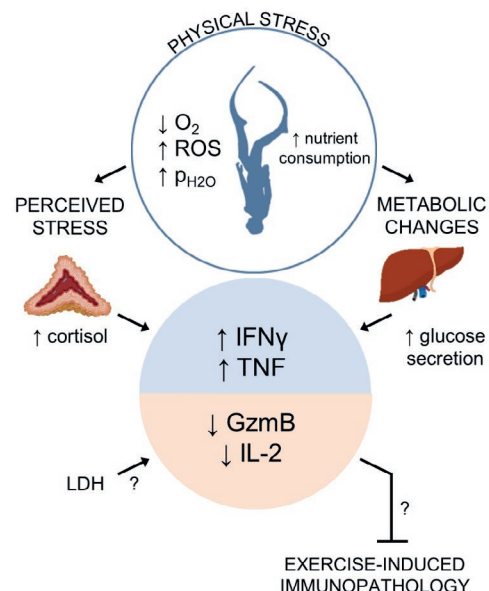
Exercise is well known to have beneficial effects for our body. However, exercise is not universally beneficial for the immune system and can become detrimental at high intensity. Little is known about the underlying mechanism of increased susceptibility to infection under conditions of intense physical strain. Freedivers, people who dive to high depths on a single breath, perform extreme exercise under anaerobic conditions. In this study, we investigated the impact of freediving on the cytotoxic arm of the immune system. At rest, elite freedivers did not display changes in their immunological profile compared to non-diving controls. In contrast, after a freedive, granzyme B and IL-2 production were impaired, whereas IFN γ and TNF secretion were increased by cytotoxic immune cells. Using in vitro models mimicking freedive conditions, we could show that hypoxia in combination with stress hyperglycemia had a negative impact on Granzyme B secretion. IL-2 production was inhibited by stress hormones. Our findings suggest that in response to extreme stress, cytotoxic immune cells transiently change their functional profile to limit tissue damage.

Keywords: Cytokines; Cytotoxicity; Diving; Exercise; Hypoxia; Lymphocytes; Sport

Funding: This work was supported by a University of Rijeka Support grant (19-41-1551) and the Croatian Science Foundation (IP-2016-06-8027, IP-CORONA-2020-04-2045) to FMW and (IP-2020-02-7928) to TTW.

Graphical Abstract: Freediving impairs cytotoxicity and enhances cytokine production. Freediving-induced metabolic changes, physical and perceived stress decrease the production of GzmB and IL-2, and increase the production of IFN γ and TNF by peripheral blood lymphocytes.

O₂ = oxygen, ROS = reactive oxygen species, p_{H2O} = water pressure, IFN = interferon, TNF = tumor necrosis factor, GzmB = granzyme B, IL = interleukin, LDH = lactate dehydrogenase



Strong muscles and a weak heart – a case report of anabolic-androgenic steroid-induced cardiomyopathy

Dora Gašparini¹, Igor Klarić², Viktor Ivaniš², Dijana Travica Samsa^{1,2}, Viktor Peršić^{1,2}, Tamara Turk Wensveen^{1,3}

¹ Faculty of Medicine, University of Rijeka, Croatia

² Special Hospital for Medical Rehabilitation of Heart, Lung and Rheumatic Diseases Thalassotherapia Opatija, Croatia

³ Clinical Hospital Centre Rijeka, Croatia

ABSTRACT:

The use of anabolic androgenic steroids (AAS) in supraphysiological doses has grown during the last decade in the population of athletes aiming to increase their physical performance. The use of AAS in high doses may cause cardiomyopathy, hypertension, thrombosis, myocardial infarction, connective tissue disorders and aortic dissection. We hereby report a rare clinical case of AAS-induced cardiomyopathy in a young individual with a highlight on the importance of the multidisciplinary approach to its diagnosis and treatment. A 46-year-old Caucasian male bodybuilder presented with exercise intolerance unrelated to maximum training load and post-workout water retention during the last 6 weeks. Previously, he has been taking 500mg of testosterone enanthate every 8 to 12 days for 4 years. After a month of cessation period, he started taking 1000mg of testosterone undecanoate in 6-week periods. Laboratory and anthropometric assessment were followed by echocardiography which confirmed the diagnosis of AAS-induced cardiomyopathy. Further diagnostic assessment of osteoporosis, hepatic, renal and psychological complications was performed. Long-term administration of AAS with unknown pharmacokinetic and pharmacodynamic properties should be considered as a cause of newly diagnosed cardiomyopathy, especially in previously healthy individuals with an athletic background. This unique and complex presentation of AAS adverse effect opens for better recognition and treatment of their potentially fatal effects.

Keywords: Androgens; Cardiomyopathies; Drug-Related Side Effects and Adverse Reactions; Testosterone; Testosterone Congeners

Rehabilitation of Cardiac Patients at the Heart of the Zagorje Fairytale

J. Halapir

Special Hospital for Medical Rehabilitation Krapinske Toplice, Croatia

ABSTRACT:

At the initiative of Krapina Zagorje Country as well as its health and tourism professionals, the Health Tourism Cluster was established - "Zagorje, health at your fingertips". It aims to improve the health tourism offer and create a recognizable and competitive health tourism portfolio that would satisfy even the most demanding clients.

With its long-term dedication to the rehabilitation of not only cardiac, but also neurological, orthopedic and trauma patients, the Special Hospital Krapinske Toplice is one of the leaders in developing health tourism, health promotion, education and disease prevention. The hospital is located in a quiet valley at the heart of Hrvatsko Zagorje, boasting a thermal spring and offers treatment and rehabilitation programs, which along with its abundance of natural beauty and historical and religious sights promote the feel-good atmosphere of the facility.

Keywords: rehabilitation, cardiac rehabilitation, health tourism, prevention, health promotion

Acceptance of the Mediterranean diet in patients in the outpatient cardiovascular rehabilitation program

Marija Heinrich¹, Gabrijela Ćurić¹, Mario Ivanuša^{1,2}

¹ Institute for Cardiovascular Prevention and Rehabilitation, Zagreb, Croatia

² University of Applied Health Sciences, Zagreb, Croatia

ABSTRACT:

The Mediterranean diet includes the method of growing, harvesting, fishing, canning, processing, preparation and consumption of food. This diet is based on olive oil, cereals, legumes, fresh or dried vegetables, moderate amounts of fish, dairy products and meat. Studies have proven, the first among them The Seven Countries Study, that the Mediterranean diet is the healthiest known diet. Studies conducted in Spain have shown that the Mediterranean diet is cardioprotective, so therefore cardiovascular patients are strongly advised to accept such a diet. The medicinal properties are attributed to the consumption of integral cereals up to three times a day, olive oil characterized by anti-oxidative and anti-inflammatory effects, reduced intake of meat and dairy products, minimal processing of foods and their way of consumption. This results in an improvement in endothelial function, lower insulin resistance and the incidence of the metabolic syndrome.^{1,2}

At the beginning of the rehabilitation procedure, all patients involved in the outpatient cardiovascular rehabilitation program at the Institute for Cardiovascular Prevention and Rehabilitation in Zagreb as part of the standard treatment³ complete the 14-item Questionnaire of Mediterranean diet adherence. These answers should suggest what kind of fat the patients consume the most, how much fruit and vegetables is represented in their daily diet, what type of meat they commonly eat and how processed meat is that they commonly eat, how much sweets and wine they consume, how many fish meals they eat in a week, how many nuts, how many legume meals they consume a week and what is their common way of preparing food. By educating patients during the program, we strive to encourage patients to adopt the principles of the Mediterranean diet because of its medicinal properties. We achieve this by controlling risk factors, conducting group education on the importance of proper nutrition, organizing workshops and individual education that will help achieve therapeutic goals. At the end of the rehabilitation procedure, the patients again complete the 14-item Questionnaire of Mediterranean diet adherence and in this way we determine their acceptance, effectiveness of education and patient's readiness to change their eating habits. The research on the adoption of the Mediterranean diet is aimed at showing the acceptance of this type of diet, the efficiency of education and the readiness of our patients to change their eating habits.

Keywords: Mediterranean diet, education, adherence, outpatient cardiovascular rehabilitation.

Literature:

1. Booth JN 3rd, Levitan EB, Brown TM, Farkouh ME, Safford MM, Muntner P. Effect of sustaining lifestyle modifications (nonsmoking, weight reduction, physical activity, and mediterranean diet) after healing of myocardial infarction, percutaneous intervention, or coronary bypass (from the REasons for Geographic and Racial Differences in Stroke Study). *Am J Cardiol.* 2014 Jun 15;113(12):1933-40. <https://doi.org/10.1016/j.amjcard.2014.03.033>
2. Alibabić V, Mujić I. *Pravilna prehrana i zdravlje*. Veleučilište u Rijeci, Rijeka, 2016. Available from: https://www.veleri.hr/files/datoteke/knjige/digi/VA_KnjigaPravilnaPrehranaIzdravlje_Web_Dec2016_0.pdf (February 25, 2020).
3. Heinrich M, Galez Janevski K, Ćurić G, Ivanuša M. The role of the nurse in the cardiovascular rehabilitation team. *Cardiol Croat.* 2016;11(10-11):544-5. <https://doi.org/10.15836/ccar2016.544>

Community based cardiovascular prevention and rehabilitation - experience of the Istrian Health Care Centers

Ante Ivančić

Istrian Health Care Center, Pula, Croatia

ABSTRACT:

Istrian Health Care Center (IDZ), is a public health care institution that covers broad spectrum of primary health care services, for a population of the Istrian County (210 000 inhabitants).

Our mission, among others, is to: "analyze specific health care needs of the population and to develop innovative health care models".

Considering cardiovascular diseases (CVD) as a leading health problem, for over a decade we provide various programs of cardiovascular prevention (CVP).

In 2018 we extended our activities to CV rehabilitation. Launching of the rehabilitation was possible thanks to the colleagues of Thalassotherapia Opatija who guided us in the approach to protocols, training, permanent consultation and supervision.

Key characteristics of the program are:

- CV prevention is offered to patients with CV risks (hypertension, diabetes, obesity).
- CV rehabilitation aimed to patients after myocardial infarction, stent placement or other cardiac interventions.
 - second and third phase of rehabilitation are provided with all 3 pillars : cardiovascular training, lifestyle changes, education.
 - medical professionals on the primary level (district nurses, physiotherapists, kinesiologists) provide the majority of activities.
- activities are offered in all 7 of our local primary health care centers, thus making the service accessible.
- all activities are covered by the Croatian Health Insurance Fund
- model is cost effective . The cost of the rehabilitation of a patient in our program is five fold lower than in inpatient rehabilitation.

After constant grow, Covid 19 epidemic has substantially disrupt our activities . In 2018 we had 848 patients in treatment , in 2019 -1482 and in 2020 -969.

Rehabilitation started in 2018 in the city of Pula, and our plan was to introduce it in all 7 local centers, but it has happened only in 3 so far.

We hope that Covid 19 epidemic will be overcome soon and other critical medical problems will come into focus.

Keywords: community based prevention and rehabilitation of cardiovascular diseases

Cardiomyopathies in athletes: is there a place for competitive sport in new guidelines?

Viktor Ivaniš

Special Hospital for Medical Rehabilitation of Heart, Lung and Rheumatic Diseases Thalassotherapia Opatija, Croatia

ABSTRACT:

Cardiomyopathies are an important cause of sudden cardiac death/arrest (SCD/SCA) in young individuals and exercise has been implicated as a trigger for fatal arrhythmias. New recommendations on sports activities and exercise in patients with cardiomyopathies include major novelties. One of the most pertinent novelties of these guidelines is the change in the sports activity recommendations in patients with hypertrophic cardiomyopathy (HCM). For the first time, patients with HCM may participate in competitive sports or high-intensity exercise (class IIb C) if they have no risk markers (defined as the absence of previous symptoms, arrhythmias, or an abnormal blood pressure response to exercise, as well as a sudden cardiac death risk score < 4). Equally, patients with HCM can participate in competitive sports if they are genotype positive but phenotype negative (IIb C). High-intensity exercise is not recommended in any patient with arrhythmogenic cardiomyopathy (ACM), even in those with a mutation but without phenotypic expression (genotype positive/phenotype negative). In noncompaction cardiomyopathy, fitness for sports activities is based on ventricular function: competitive sports and high intensity exercise are allowed when the left ventricular ejection fraction (LVEF) exceeds 50% in patients without symptoms and other risk markers (IIb C) and both are restricted when the LVEF is less than 40%. In individuals with dilated cardiomyopathy the guidelines are more restrictive regarding the LVEF threshold allowing competitive sports, which is established at 45% (as long as there are no other risk factors); this cut-off was 40% in the previous guidelines. A genetic study is now recommended to assess the individual risk of athletes with certain cardiomyopathies. In this context, the existence of pathogenic genetic variants associated with a high risk of cardiovascular events, such as those found in lamin A/C (*LMNA*) and filamin C (*FLNC*) in patients with dilated, arrhythmogenic (ACM), or noncompaction cardiomyopathy, indicates that athletes with the same condition require a different management approach and different recommendations, which may be particularly restrictive for competitive and high-intensity sports. In summary, the guidelines do not establish diagnostic recommendations for the management of symptomatic athletes, but specific recommendations on sports activities after determination of the underlying cause.

Keywords: Cardiomyopathies, Hypertrophic cardiomyopathy (HCM), Arrhythmogenic cardiomyopathy (ACM), Noncompaction cardiomyopathy (LVNC), Dilated cardiomyopathy (DCM), Competitive sport, Sudden Cardiac Death.

Literature:

¹ 2020 ESC Guidelines on sports cardiology and exercise in patients with cardiovascular disease. European Heart Journal 2020 – doi /10.1093/eurheart/ehaa605

² Comments on the 2020 ESC guidelines on sports cardiology and exercise in patients with cardiovascular disease. Rev Esp Cardiol. 2021;74(6):488–493

Healthy Weight Management Program - Importance of Regular Physical Activity, Healthy Nutrition and Pharmacy Consultation in the Prevention and Treatment of Obesity

Jovanović Željko¹, Kocić Zora², Beljan Karmen¹

¹ Faculty of Health Studies University of Rijeka, Croatia

² Pablo Rijeka pharmacy, Rijeka, Croatia

ABSTRACT:

Introduction

Croatia is ranked eighth among the member states of the European Union by the number of obese people, 18.7% of people in Croatia are obese. Of particular concern is the high prevalence of obesity in children (11.2% - fifth rank). The aim of study was to examine the importance of pharmacy consultation and the correlation between physical activity and nutrition in the improvement of health and to confirm that people with the right nutritional habits are more likely to avoid sedentary lifestyle.

Subjects and methods

Subjects were at the age 18-55 years, regular users of physiotherapy services to improve the overall health status. The sample was random and included 500 subjects, of which 290 men and 210 women. An anonymous questionnaire of 25 questions was used and contained questions on age, gender, body weight and height, nutritional, sports and other lifestyle habits.

Results

Subjects with regular physical activity had lower BMI. The majority of respondents regularly consumed vegetables and grains, and rarely fast food and sweets. Respondents are mainly engaged in physical activity several times a week, usually in order to preserve and improve health.

Conclusion

Respondents with regular physical activity and pharmacy consultation rarely choose fast and calorie foods and prefer proper and balanced diet, which results in normal BMI. This study represents a guide map for the development of a comprehensive program adapted to the everyday use in community pharmacy practice and family medicine, which can be used by physicians, pharmacists, nutritionists and physiotherapists to prevent obesity and cardiovascular risk factors.

Keywords: obesity, prevention, treatment, physical activity, pharmacy

Does stationary cardiac rehabilitation aid perseverance through treatment?

Gordana Kamenečki, Marijana Kunštek

Special Hospital for Medical Rehabilitation Krapinske Toplice, Croatia

ABSTRACT:

Cooperability of patients, adherence to physicians' instructions and taking prescribed medications are ever-increasing problems which appear during treatment of chronic non-infectious diseases, with which psychological factors play a significant role (memory, trust, understanding), therefore, the role of a psychologist is important in this aspect of treating patients with coronary diseases.

Secondary and tertiary prevention affect the health of patients after the disease has already manifested. During cardiac rehabilitation, our mission is to influence the attitudes, values and behaviours of people to ameliorate the anxiety associated with chronic diseases and to send the message of "I want" and not "I have to" live a certain way ("I am happy I no longer smoke, "I love to exercise more", "This chard is great") as clearly as possible.

Lectures, work in small groups and individual psychological counselling administered during a patient's rehabilitation play an important role by increasing motivation for a change of behaviour (diet, physical activity, taking medications, quitting smoking/abstinence). Relaxation techniques are also administered, which help reduce anxiety and control physiological reactions and, when adopted, can significantly aid the patient in everyday life, especially by reducing fear of a repeated heart attack.

Testing of cooperability, adherence to taking the prescribed medications and change of behaviour are conducted by surveying the patient when entering psychological treatment (*example: do you take the prescribed medication regularly; do you know which medicine does what?*).

Keywords: stationary cardiac rehabilitation, chronic non-infectious diseases, attitudes, behaviours, cooperability, adherence do physicians' instructions

Task shifting – promoting assignments and why we need it in nursing

M. Komosar-Cvetković, I. Kužet Mioković, M. Barišić, S. Golubović

Thalassotherapia Opatija / Specijalna bolnica za medicinsku rehabilitaciju bolesti srca, pluća i reumatizma/ Klinika za liječenje, rehabilitaciju i prevenciju bolesti srca i krvnih žila, Opatija, Croatia

ABSTRACT:

The lack of health professionals in Europe and world, as well as in our country is a negative trend that requires solutions in order to prevent long-term consequences. When observing the situation from the future perspective, especially demographic and epidemiological trends, it is likely that we will have to deal with multidimensional problem. Due to the aging of the population, the proportion of diseases is increasing, technological development is growing, and this will result in the changed approach in clinical practice, and thus increased demands in the work of all health professionals. The development of specific clinical competencies in nursing leads to the transfer of certain competencies from physicians to nurses, and this may be seen in many countries.

In this way, nursing plays a key role in certain segments of care because they can significantly contribute in reducing the burden of illness since they are the most numerous health professionals. The examples of today's nursing practice in developed countries of Europe and the world speak in favour of this statement.

Keywords: lack of health professionals, task shifting, specific knowledge and competencies

Literatura:

1. Aithal, A. i Aithal P. S. 2017. ABCD Analysis of Task shifting – an optimum Alternative Solution to Professional Healthcare Personnel Shortage. *International Journal of Health Sciences and Pharmacy*, 1 (2): 36–51.
2. Evans, D. 2009. Mental Health Nurse Prescribing: Challenges in Theory and Practice. *Mental Health and Learning Disabilities Research and Practice*, 6: 97–106.
3. Hauser, G. i Šustić, A. 2019. Task shifting – prenošenje ovlasti unutar zdravstvenog sustava. U: Zbornik radova s međunarodnog kongresa „1. Kongres KOKOZ-a i 3. Hrvatski kongres medicinskog prava s međunarodnim sudjelovanjem”, ur. Kurtović Mišić, K. et al., 3: 356. Split: Sveučilište u Splitu, Pravni fakultet.

Cardiovascular disease and risk factors in Croatia

Verica Kralj, Ivana Brkić Biloš, Marinka Šimunović Gašpar

Croatian Institute of Public Health, Zagreb, Croatia

ABSTRACT:

The aim of this study is to give an epidemiological overview of cardiovascular diseases (CVD) and the prevalence of the most significant risk factors for their occurrence in Croatia.

Material and methods: This study was based on data from European Health Interview Survey (EHIS), which was conducted in Croatia in 2019, and mortality data from the annual report of the Croatian Bureau of Statistics, presented as an absolute number, percentage, crude and standardized rates. The data on diseases and chronic conditions, as well as on risk factors were collected from the EHIS study (self-reported), whether the person has or had the specific chronic disease or condition in the past 12 months.

Results: According to the results, 3.75% of men and 3.1% of women state that they have had a heart attack, 8.5% of men and 9.3% of women have coronary heart disease, 3.2% of men and 3.5% of women have had a stroke, hypertension 38.4% of women and 35.8% of men, diabetes 11.5% of women and 12.9% of men. Elevated blood lipids are reported by 19.9% of respondents, 41.3% of respondents are overweight, while 23.0% are obese or have a BMI greater than 30 kg / m². 22.1% of respondents are daily smokers, 25.6% of men and 19.5% of women.

CVDs are the leading cause of mortality in Croatia. In 2019, 22,020 people died of CVDs, or 42.5% of total mortality. They are the cause of death of 47.9% of dead women (12,673) and 36.9% of dead men (9,347). The most frequent diagnostic subgroups as the cause of death are ischemic heart disease with a share of 15.4% and cerebrovascular disease with a share of 10% in total mortality. The crude mortality rate from CVD in 2019 was 541.7 / 100,000, in men 474.3, and in women 605.0 / 100,000.

In the last 15 years, there has been a positive trend of decreasing mortality from CVD in Croatia, which is more pronounced for cerebrovascular diseases than for ischemic disease - 49% decrease in mortality for CVD in total from 2000 to 2016, 34% for ischemic heart disease, and 54% for cerebrovascular disease.

Conclusion: Although in the last fifteen years mortality attributed to CVDs has shown a continuous decrease, they still represent a leading cause of mortality and morbidity. However, having in mind an ageing population, all-present globalization and urbanisation, and a high prevalence of risk factors such as obesity and diabetes, we can expect a rise in the burden of cardiovascular diseases unless comprehensive prevention measures are undertaken.

Keywords: cardiovascular diseases, prevalence, risk factors.

The Influence of Isokinetic Training on the Recovery Rate and the Outcome of Phase II of Patient Rehabilitation After Surgical Myocardial Revascularization

Tatjana Krleža

Department of Medical Rehabilitation of Cardiological Patients, Special Hospital for Medical Rehabilitation Krapinske Toplice, Croatia

ABSTRACT:

The study aims to determine whether isokinetic training, conducted in the phase II of cardiac rehabilitation at the Special Hospital for Medical Rehabilitation Krapinske Toplice, lasting an average of 21 days, could affect the recovery rate in cardiovascular patients after surgical revascularization of the myocardium using isokinetic training on the knee muscles. Isokinetic testing of knee muscles on the isokinetic system Cybex-humac norm, ergometric test on a bicycle ergometer, 6-minute walk test, and a subjective assessment of fatigue using the Borg scale were performed on a sample of 27 subjects between the ages of 40 and 66 who were divided into two groups, one experimental (14 subjects) and one control (13 subjects). All tests were performed both on the subject's arrival and discharge from cardiac rehabilitation at the Special Hospital for Medical Rehabilitation Krapinske Toplice. Contrary to the control group, the experimental group was subjected to the isokinetic training of knee muscles on the isokinetic system 2 to 3 times a week at higher speed. Isokinetic testing on the isokinetic system, which was conducted on both groups, showed that endurance training conducted in the experimental group at higher speeds significantly reduced the knee extensor deficit already after short training intervals. The ergometric test before the discharge and the 6-minute walk test performed in the experimental group showed significantly better results than results in the control group. The experiment conducted on 27 subjects confirms that the isokinetic system is highly applicable in the rehabilitation of cardiovascular patients and also accelerates the process of patient rehabilitation and recovery.

Keywords: cardiac rehabilitation, surgical myocardial revascularization, isokinetic training, isokinetic testing

Cardiovascular health – psychosocial factors and physical activity

Dubravka Kruhek Leontić

Institute for Cardiovascular Prevention and Rehabilitation, Zagreb, Croatia

ABSTRACT:

Appropriate physical activity is an integral part of the rehabilitation and secondary prevention of cardiovascular (CV) diseases, while the well-being is related to reducing the risk of disease progression, reducing mortality from cardiac diseases, better regulation of risk factors and better quality of life. Nevertheless, only 25-30% of CV patients remain physically active for 1 year after the cardiovascular rehabilitation program is completed. Considering psychological barriers and incentives for activity, we can significantly increase the proportion of physically active patients. Studies among CV patients have shown that only 10 - 20% of them will follow the advice of a physician regarding the physical activity; asymptomatic patients will be less prepared for the physical activity if they did not have it included in the usual range of behavior before the disease; the same advice on the physical activity received from different team experts will be more effective (multidisciplinary approach); individual counseling is more effective than group counseling; pressure on the patient will not be effective if he/she is not yet ready for the activity; follow-up and monitoring the patient's activities will increase persistence in this behavior. Physical activity of CV patients will be appropriate if it is of the appropriate type, intensity and duration, while being subjectively purposeful, provoking a sense of self-efficacy, stimulating the expectation of a positive outcome/result (especially if it is measurable); if a positive attitude towards the activity itself is developed; if the patient has support from his environment for doing physical activity and feels satisfied during the activity.¹⁻⁴ To conclude, if we systematically and consistently prepare a CV of patient for a physical activity by applying a multidisciplinary approach, increasing thus the proportion of physically active patients, we can expect significantly more effective secondary prevention of coronary artery disease.

Keywords: physical activity, psychosocial factors, heart disease.

Literature:

1. Cortis C, Puggina A, Pesce C, Aleksovska K, Buck C, Burns C, et al. Psychological determinants of physical activity across the life course: A "DEterminants of DIet and Physical ACTivity" (DEDIPAC) umbrella systematic literature review. *PLoS One*. 2017 Aug 17;12(8):e0182709. <https://doi.org/10.1371/journal.pone.0182709>
2. U.S. Department of Health and Human Services. *Physical Activity Guidelines for Americans*. 2nd ed. Available from: <https://health.gov/paguidelines/second-edition> (December 4, 2018).
3. Peersen K, Otterstad JE, Sverre E, Perk J, Gullestad L, Moum T, et al. Medical and Psychosocial Factors Associated With Low Physical Activity and Increasing Exercise Level After a Coronary Event. *J Cardiopulm Rehabil Prev*. 2020 Jan;40(1):35-40. <https://doi.org/10.1097/HCR.0000000000000399>
4. McKinney J, Lithwick DJ, Morrison BN, Nazzari H, Isserow SH, Heilbron B, et al. The health benefits of physical activity and cardiorespiratory fitness. *BC Medical Journal* 2016;58(3):131-7. Available from: https://www.bcmj.org/sites/default/files/public/BCMJ_Vol58_No_3_cardiorespiratory_fitness.pdf (February 10, 2020).

Preparing nurses for a leading role in cardiovascular prevention and rehabilitation

I. Kužet Mioković, M. Komosar-Cvetković, R. Mrakovčić, I. Brajković

Thalassotherapia Opatija / Specijalna bolnica za medicinsku rehabilitaciju bolesti srca, pluća i reumatizma/ Klinika za liječenje, rehabilitaciju i prevenciju bolesti srca i krvnih žila, Opatija, Croatia

ABSTRACT:

Introduction: Cardiovascular diseases continue to be the leading cause of death and disability in most European Union countries. Secondary prevention has become the foundation of treatment, but most patients do not meet the standards of guidelines that predispose them to disease progression, recurrent events, and repeated hospitalizations. Our society is changing rapidly, new trends are coming, digitalization is emerging that enters all aspects of our lives. The increasingly complex and demanding needs of patients are leading to changes that require nurses to acquire a higher level of knowledge, skills and competencies.

Elaboration: The education of cardiac nurses in developed countries has followed the development trends of modern cardiac practice. In cooperation with the health care system and professional societies, and in accordance with the requirements of clinical practice, programs and methods of implementing specialist programs for education and certification are created. In this way, nurses, in addition to the combination of skills, knowledge and attitudes they have acquired through their previous training, acquire and develop additional clinical competencies.

Conclusion: By implementing specialist programs in the educational system of nurses in accordance with the acquired competencies, and examples of cardiac nursing practice in developed countries speak in favor of this. Nurses, as the most numerous health professionals, must get a leading role in modern preventive cardiology and rehabilitation programs because they can give a great deal in reducing the burden of cardiovascular diseases.

Keywords: role and position of cardiovascular nurses, cardiovascular practice, primary and secondary prevention

Literatura:

1. World Health Organization. Cardiovascular diseases (CVD). World Health Organization. 2016
2. Haskell WL, Alderman EL, Fair JM, et al. Effects of intensive multiple risk factor reduction on coronary atherosclerosis and clinical cardiac events in men and women with coronary artery disease: the Stanford Coronary Risk Intervention Project (SCRIP). *Circulation* 1994; 89:975-90.
3. International Council of Nurses. Available at: <http://www.icn.ch>. Accessed May, 29, 2015.
4. Smith SC Jr., Collins A, Ferrari R, et al. Our time: a call to save preventable death from cardiovascular disease (heart disease and stroke). *J Am Coll Cardiol* 2012;60:2343-8.
5. Yusuf SF, Wood D, Ralston J, Reddy KS. The World Heart Federation vision for worldwide cardiovascular disease prevention. *Lancet* 2015 April 16

Men's Health in Lifestyle Medicine

Vladimir Mozetič

Community Health Centre of the Primorje-Gorski Kotar County – Urology Unit, Rijeka, Croatia

ABSTRACT:

Men's health care includes the prevention, diagnosis and treatment of physical and mental conditions that are specific to men. This care enables a better quality of life and is increasingly used with the term lifestyle. With prevention, it is possible to postpone or detect certain conditions of a benign or malignant nature at an early stage. Problems in man with urination, lower urinary tract symptoms, urinary incontinence, blood in the urine, unclear changes in the external genitalia, erectile dysfunction and / or premature ejaculation, infertility, hair loss, andropause and malignancies, and the consequences of these conditions are challenges in the field which we call andrology. Since the listed conditions are often associated or are a predictor of other health conditions: cardiovascular diseases, diabetes, depression, anxiety, hypertension, hormonal disorders, men's health care thus becomes even more important. A multidisciplinary team approach is needed to implement the above, which usually includes urologists / andrologists, cardiologists, endocrinologists, psychiatrists, psychologists, sex therapists, nutritionists, gynecologists, gerontologists, oncologist... Patients partners are also involved in the treatment and therapeutic procedures, due to the better efficiency of the procedures. Our goal is to achieve synergy and trust between the patient and the therapist by implementing optimal therapy. The term we use more and more often in the field of andrology is andropause and denotes a condition caused by hormonal changes that begin to appear in the forties of a man's life. Although the signs of andropause are often not recognized or acknowledged, the answers to the following questions clearly define it: Do you feel less strong and resilient ?, Are you more often tired without need of socialization? Are your sex drive and erection reduced ?, Are you sadder or more grumpy than usual ?, Are you dissatisfied with daily activities ?, Have you noticed reduced abilities in the sport you play ("the brain knows what to do, but the body can't") ?, Have you noticed more often present health problems?. This review presents preventive, diagnostic, and therapeutic options as a combination of medication and lifestyle recommendations in men's health care.

Keywords: Men's Health, Lifestyle Medicine, Urology, Andrology, Andropause

The role of hyperbaric oxygen therapy in athlete recovery and performance

Franco Marinelli^{1,2,3}, Igor Barković^{1,2,3}

¹ Center for Research and Education in Underwater, Hyperbaric and Maritime Medicine, University of Rijeka, Faculty of Medicine, Rijeka, Croatia

² Department for Underwater and Hyperbaric medicine, Clinical Medical Center Rijeka, Rijeka, Croatia

³ Department of Pulmonology, Clinic for Internal Medicine, Clinical Hospital Center Rijeka, Rijeka, Croatia

ABSTRACT:

In the 21st century the competition in professional sports has become more fierce than ever. As the standard of life improves around the world, more and more people are getting involved in sports which means that athletes who want to compete at an elite level are constantly searching for new and effective recovery modalities which will allow them to perform at the highest possible level at all times. One of those modalities is hyperbaric oxygen therapy (HBOT) which implies the inhalation of 100% oxygen applied at an ambient pressure higher than the atmospheric pressure. Although used readily and praised by some of the world's greatest athletes, true scientific evidence of it working better than a placebo and actually improving recovery and athletic performance has been scarce.

HBOT undoubtedly has many positive effects which have been extensively researched mostly on animal models and its therapeutic use has been successful in a variety of different conditions. Some of the mechanisms through which HBOT could be of use in athlete recovery is by reducing tissue oedema, minimizing hypoxia and inflammation as well as enhancing satellite cell proliferation and macrophage activation, essentially promoting the regeneration of muscle tissue¹.

A Cochrane systematic review by Bennet et al. from 2005. that included nine clinical trials which compared HBOT with no HBOT in alleviating delayed onset muscle soreness and closed acute soft tissue injury showed interesting but inconclusive and ambiguous results². Only a handful of clinical studies have been conducted on athletes which investigated the effect HBOT has on athletic performance and post-training recovery. One study conducted by Burgos et al. in 12 soccer players claims HBOT does not increase oxidative stress and that it improves endurance performance³. Another study by Woo et al. concluded that HBOT could play a part in alleviating exercise-induced inflammatory response and muscle damage⁴.

Although these studies and others show promising results, more double-blinded randomized clinical trials with larger samples need to be conducted to assess the true benefit of HBOT in athlete recovery and performance to allow its safe and effective usage.

Keywords: Athletes; Athletic performance; Hyperbaric oxygenation; Sports; Sports medicine

References:

1. Oyaizu T, Enomoto M, Yamamoto N, Tsuji K, Horie M, Muneta T, Sekiya I, Okawa A, Yagishita K. Hyperbaric oxygen reduces inflammation, oxygenates injured muscle, and regenerates skeletal muscle via macrophage and satellite cell activation. *Sci Rep*. 2018 Jan 22;8(1):1288. doi: 10.1038/s41598-018-19670-x. PMID: 29358697; PMCID: PMC5778072.
2. Bennett M, Best TM, Babul S, Taunton J, Lepawsky M. Hyperbaric oxygen therapy for delayed onset muscle soreness and closed soft tissue injury. *Cochrane Database Syst Rev*. 2005 Oct 19;(4):CD004713. doi: 10.1002/14651858.CD004713.pub2. PMID: 16235376.
3. Burgos C, Henríquez-Olguín C, Andrade DC, Ramírez-Campillo R, Araneda OF, White A, Cerda-Kohler H. Effects of Exercise Training under Hyperbaric Oxygen on Oxidative Stress Markers and Endurance Performance in Young Soccer Players: A Pilot Study. *J Nutr Metab*. 2016;2016:5647407. doi: 10.1155/2016/5647407. Epub 2016 Dec 19. PMID: 28083148; PMCID: PMC5204103.
4. Woo J, Min JH, Lee YH, Roh HT. Effects of Hyperbaric Oxygen Therapy on Inflammation, Oxidative/Antioxidant Balance, and Muscle Damage after Acute Exercise in Normobaric, Normoxic and Hypobaric, Hypoxic Environments: A Pilot Study. *Int J Environ Res Public Health*. 2020 Oct 10;17(20):7377. doi: 10.3390/ijerph17207377. PMID: 33050362; PMCID: PMC7601270.

Effect of diet on glucovariability of patient with risk of cardiovascular disease

¹Željka Mijolović, ^{1,2,3}Tamara Turk Wensveen, ¹Snežana Golubović, ¹Vesna Bajić, ¹Samir Softić, ¹Ivona Brajković

¹ Thalassoterapia Opatija / Special Hospital for Medical Rehabilitation of Heart, Lung and Rheumatism / Clinic for treatment Rehabilitation and Prevention of Cardiovascular disease, Opatija, Croatia

^{1,2,3} Department of Endocrinology, Diabetes and Metabolic Disease / Department of Internal Medicine/ University Hospital Center Rijeka

ABSTRACT:

The study was written in the Centre for Diabetes, Endocrinology and Cardiometabolism, Thalassoterapia Opatija. The collected data refer to the eating habits of patients with diabetes; they are collected with a tendency to achieve satisfactory regulation of glucovariability through continuous education about diabetes self-control in order to prevent chronic complications and cardiovascular diseases as the consequence. The study presents individual, consumed dietary regimes, presented as diet diaries in period of 14 days and all patients were wearing the Free Style Libre system. The research involved outpatients of different ages. Out of the total numbers of patients, we may conclude that 4 out of 5 (0.2%) have hyperlipoproteinemia (HLP), while 3 out of 5 (0.15%) have hypertension, smoking addiction and are overweight. Due to metabolic disorders, there are also blood fat disorders, while HLP is associated with development of diabetes and atherosclerosis, which in connection with smoking and being overweight, leave the permanent consequences. 3 out of 5 patients (0.15%) have developed chronic complications in the form of AIM, 2 out of 5 patients have sideropenic anemia (0.1%) and 1 patient (0.05%) has developed diabetic foot.

Ancient Egyptians described diabetes around 1500 BC. It is characterized by increased concentration of glucose in plasma and decreased insulin sensitivity of peripheral tissues leading to decreased insulin production. Indian doctors associate this disease with the intake of starchy foods and sugar. In the 19th century, the pancreas and its cells were studied more intensively; at that time it was discovered they are associated with this disease. In 1910, there was developed the first technique for sugar measurement, and this, together with the discovery of insulin in 1921, changed the history of treatment. In the treatment of diabetes, the aim is the better regulation of glycaemia and lipids, as well as, optimization of blood pressure in order to prevent the development of complications of diabetes, CVD and obesity. Therefore, it is recommended to have a proper diet with less fat and predefined carbohydrate intake. The dietary guidelines were changed with the discovery of hypoglycaemic. The current recommendations of the ADA Society are knowledge of food products, carbohydrates in food and counting of them. A person with diabetes should follow for them the most appropriate 'diet' for his/her lifetime, so it is important to choose a diet with a help of a nurse / dietician.

The Mediterranean diet is considered to be the golden standard and guideline in the treatment of diabetes, but each patient is approached individually with respect of his/her dietary preferences and habits with active cooperation, recommendations for self-control and physical activity.

Keywords: diabetes, glycaemia, self-control, Mediterranean diet

Literature:

1. Štimac, D., Krznarić, Ž., Bender Vranešić, D., Glišić Obrovac M.: Diet therapy and clinical nutrition, Zagreb 2014.
2. Nutrition and Dietetics Service, Clinical Hospital Center Zagreb; 2020. [Accessed June 2021.] Available at: <https://www.kbcm.hr/djelatnosti/sluzba-prehrane>
3. ADA Standards of Medical Care in Diabetes. *Diabetes Care* 2019;42(Suppl 1):S103–S123; ADA Standards of Medical Care in Diabetes. *Diabetes Care* 2019;42(Suppl 1):S124–S138

Statin induced autoimmune necrotizing myopathy – a new challenge for statin prescribers

Bojan Miletic, Geneviève Räber, Flurina Roos, Dukagjin Krasniqi, Udo Courtney

Luzerner Kantonsspital Wolhusen, Switzerland

ABSTRACT:

Learning objective

Statin-induced necrotising autoimmune myopathy (SINAM) is a relatively new term, which describes a rare and severe complication of statin therapy and, because of its clinical presentation, complicated course, and the expected increased statin use in the future, an extremely challenging phenomenon.

Case

A 73-year-old woman was admitted to the hospital with progressive symmetrical muscle weakness in the legs. The laboratory test showed elevated liver enzymes, an elevated creatine kinase of 4830 U/L and Troponin T of 405 ng/L. The heart diagnostic and immunologic tests were negativ. MRI of the legs showed signal alterations of several muscles. The biopsy of the musculus rectus femoris was performed – the result corresponded to the morphological picture of the necrotizing autoimmune myopathy. The patient confirmed an earlier statin intake. However, the medication has been stopped 18 months before the current hospitalization because of elevated liver enzymes. The blood analysis showed positive antibodies against Hydroxy methylglutaryl-CoA-Reductase . The cortisone and immunoglobulin therapy quickly improved the patient's clinical condition.

Discussion

SINAM is a very rare form of the myopathy (approximately 2-3 cases of every 100,000 statin-patients), with potentially severe consequences and very often unrecognized symptoms, mostly present in patients above the age of 50 years¹. The mechanisms of the emergence of SINAM are still poorly understood². The timing of the onset of this disease cannot be defined - the disease manifests itself within 10-20 years of the start of statin administration. The laboratory findings showed the elevation of the creatine kinase more than 10-fold greater than normal. The finding of anti-HMG-CR antibodies is a valuable test to confirm the suspicion of SINAM. The muscle biopsy with a finding of necrotic muscle fibers and mild or absent inflammatory cell infiltration is an indispensable method, which together with anamnesis, clinical symptoms, laboratory findings, and imaging diagnostic methods fills the puzzle of diagnostic procedures³.

Keywords: Statin-induced necrotising autoimmune myopathy, cardiovascular diseases, biopsy, Hydroxy methylglutaryl-CoA-Reductase

Literature:

1. Güngör C, Wiesmann UC. Severe statin-induced autoimmune myopathy successfully treated with intravenous immunoglobulin. *BMJ Case Rep.* 2020;13(5): e234805.
2. Bouitbir J, Sanvee GM, Panajatovic MV et al. Mechanisms of statin-associated skeletal muscle-associated symptoms. *Pharmacol Res* 2020;154:104201.
3. Sharma P, Timilsina B, Adhikari J et al. Statin-induced necrotizing autoimmune myopathy: an extremely rare adverse effect from statin use. *J Community Hosp Intern Med Perspect* 2019;9:503-506.

Do we need the International Classification of Functioning, Disability and Health in practice?

Žaklina Muminović^{1,2}, Jadranka Dražić-Balov¹, Mario Ivanuša^{1,3}

¹ Institute for Cardiovascular Prevention and Rehabilitation, Zagreb, Croatia

² University of Rijeka, Faculty of Health Studies, Rijeka, Croatia

³ University of Rijeka, Faculty of Medicine, Rijeka, Croatia

ABSTRACT:

The International Classification of Functioning, Disability and Health (ICF) is a classification published by the World Health Organization in 2001.¹ The purpose of the ICF is to provide a unique, precise and unambiguous language to describe the health and health status of patients, and to define health components and certain health-related conditions. The ICF list contains three components elaborated in detail: Body Functions and Structures, Activities and Participation, and Environmental Factors. Each component consists of three different areas, and within each area there are categories that are classified and coded. These codes are a standardized language that offers a range of health information such as diagnoses, functioning and reasons for contacting health services. They are an excellent communication code, which provides better insight into health to different health professionals, health services and scientists. They can be used as a statistical, clinical, research and/or instrument in social and educational policy.^{1,2} Bachelors in Physiotherapy, as an important link of the interdisciplinary and multidisciplinary team of outpatient cardiovascular rehabilitation use a number of patient-centered clinical measures and instruments to evaluate cardiac patients.^{2,3} ICF, or Comprehensive ICF Core Set for Chronic Ischemic Heart Disease, is, among others, used to evaluate and determine physiotherapy goals and to document physiotherapy treatment.^{1,2,4} This tool proved to be excellent in providing Bachelors in Physiotherapy with a reference framework that makes it easier to them to plan physiotherapy treatment, they are better connected with all stakeholders involved in rehabilitation, and they can evaluate the effects of rehabilitation more successfully using coded, system-based, computer-accessible models.

Keywords: International Classification of Functioning, Disability and Health, Bachelors in Physiotherapy, outpatient cardiac rehabilitation.

Literature:

1. World Health Organization. International Classification of Functioning, Disability and Health. Geneva, 2001. Available from: <https://apps.who.int/iris/bitstream/handle/10665/42407/9241545429.pdf;jsessionid=D699EC83CCAB387E7AD4FB17444BC424?sequence=1> (February 26, 2020).
2. Wenzel TR, Morfeld M. Utilization of ICF in medical rehabilitation in Germany with a focus on cardiac rehabilitation. *J Cardiol and Cardiovasc Sciences*. 2018;2(2):4-7. Available from: <https://www.cardiologyresearchjournal.com/articles/utilization-of-icf-in-medical-rehabilitation-in-germany-with-a-focus-on-cardiac-rehabilitation.pdf> (February 26, 2020).
3. Muminović Ž, Brkljačić Mažuran L, Dražić-Balov J, Glavaš Vražić S, Ivanuša M. I am active, therefore I am: physiotherapy interventions in cardiovascular rehabilitation. *Cardiol Croat*. 2016;11(10-11):548-9. <https://doi.org/10.15836/ccar2016.548>
4. Cieza A, Stucki A, Geyh S, Berteanu M, Quittan M, Simon A, et al. ICF Core Sets for chronic ischaemic heart disease. *J Rehabil Med*. 2004 Jul;(44 Suppl):94-9. <https://doi.org/10.1080/16501960410016785>

Smoking cessation counselling in cardiac rehabilitation setting

Marina Njegovan

Thalassotherapia Opatija - Clinic for rehabilitation, treatment and prevention of diseases of the heart and blood vessels, Opatija, Croatia

ABSTRACT:

Facilitating lifestyle changes is one of the main tasks of a psychologist working in cardiac rehabilitation centre. The most important smoking cessation interventions are most important to reduce mortality in patients with coronary artery disease who smoke. Unfortunately, sometimes this change also seems to be the most difficult to achieve. According to available studies, smoking cessation reduces relative risk of death and nonfatal reinfarction by 36% and 32%, respectively¹. Data also show that 53% of patients who smoke, quit smoking after participating in cardiac rehabilitation program with higher number of comorbidities and higher depression scores associated with lower likelihood of quitting². There are different approaches to smoking cessation counselling that vary in their length, structure, and applied techniques. Lancaster and Stead (2017)³ found that individual counselling (provided by smoking cessation counsellor and including at least one face-to-face session lasting 10 minutes or more) was more effective than minimal contact control (brief advice, usual care, or provision of self-help materials). One type of individual counselling often implemented in cardiac rehabilitation centres is based on Cognitive-behavioural therapies and conceptualizes quitting smoking as a process rather than a discrete event. Therefore, it requires a series of actions that will be tailored and at least somewhat different for each patient in order to encompass all individual barriers and facilitators of change. This approach implies strategies for enhancing patient's motivation to quit and self-efficacy, exploration of smoking triggers, careful preparation for quitting and coping with difficulties that may arise afterwards. It also provides follow-up, importance of which is emphasized in systematic review by Rigotti et al. (2008)⁴ who found that smoking cessation counselling that begun during hospitalization and continued with follow-up for more than one month after hospitalization increased the odds of smoking cessation by 65% at 6 to 12 months compared over what is achieved by hospitalization only.

Keywords: smoking cessation, cardiac rehabilitation, cbt

References:

- ¹ Reid RD, Pipe AL, Quinlan B. Promoting smoking cessation during hospitalization for coronary artery disease. *Can J Cardiol* (Internet). 2006;22(9):775-780. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2560518/pdf/cjc220775.pdf>
- ² Salman A, Doherty P. Predictors of quitting smoking in cardiac rehabilitation. *J Clin Med* (Internet). 2020;9,2612. Available from: <https://www.mdpi.com/2077-0383/9/8/2612>
- ³ Lancaster T, Stead LF. Individual behavioral counseling for smoking cessation. *Cochrane Database Syst Rev*. 2017;3(3):CD001292. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6464359/pdf/CD001292.pdf>
- ⁴ Rigotti NA, Munafo MR, Stead LF. Smoking cessation interventions for hospitalized smokers: a systematic review. *Arch Intern Med* (Internet). 2008;168(18):1950-1960. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4500120/pdf/nihms-124597.pdf>

Sexuality in Patients with Cardiac Disease

Jadranka Paun Judaš

Department of Medical Rehabilitation of Cardiological Patients, Special Hospital for Medical Rehabilitation Krapinske Toplice, Krapinske Toplice, Croatia

ABSTRACT:

The aim of this study was to analyze the sexuality of patients with primary cardiac disease (heart attack, surgical treatment of coronary artery and/or valve) and with or without concomitant diabetes, with respect to their functional status. The study included 60 patients of both sexes (40 to 75 years of age), divided in target group (with diabetes, n = 30) and the control group (without diabetes, n = 30). The independent variables were: age, sex, height, body mass, professional status, and education level. The dependent variables were all related to the functional status of patients, important for conducting their daily activities as well as for their sexual activity. The dependent variables were analyzed both at the beginning and at the end of cardiological rehabilitation by means of the following tests: ergometry test, spirometry, Borg scale after conducting aerobic training, physical exercise and bicycle-ergometry. In addition, to analyze the correlation between their disease perception and their sexuality, we devised a special "Sexuality Questionnaire".

The results were analyzed using Statistica (Version 13.5.0.17, 1984-2018 TIBCO Software Inc.) and Microsoft Excel 2010, as well as descriptive statistics (arithmetic means, standard deviations and percentages). Our results suggest that the diabetes has negative effect on sexuality in patients with cardiac disease, while the rehabilitation which leads to better physical condition improves their sexual life, especially in patients without concomitant diabetes. However, we could not successfully analyze potential sex-related differences due to the insufficient number of female patients in this study.

Keywords: sexual activity, cardiological rehabilitation, aerobic exercise.

Arrhythmogenic Right Ventricular Cardiomyopathy – Impact of Genes and Exercise

Damir Rajević

Special Hospital for Medical Rehabilitation of Heart, Lung and Rheumatic Diseases Thalassotherapia Opatija, Croatia

ABSTRACT:

Arrhythmogenic right ventricular cardiomyopathy (ARVC) is a complex genetic disease characterized by the replacement of a healthy right ventricular myocardium with fibrous and adipose tissue. In the classic form of the disease, it affects the right inflow and outflow tract myocardium its apex (so-called trigonum dysplasia). At a later stage, it also affects the left ventricular myocardium. It is a familial disease that is inherited mostly autosomal dominant. Mutations in sixteen genes known so far are responsible for the development of the disease. Nine genes encoding desmosome proteins which are responsible for the normal function of intercellular connections of myocardial syncytium. Mutations cause a change in the expression and distribution of desmosomal proteins and other intercalary disc proteins, including dysfunction of the gap-junction and ion channel proteins. These changes result in mechanical and electrical separation of myocardial cells, slowed impulse conduction, and the appearance of a blockage in conduction. These changes represent an electrophysiological substrate favor the occurrence of ventricular arrhythmias by the late potential and reentry mechanism even at the earliest stage of the disease. At a later, clinically pronounced stage, the development of fibrous-fatty tissue responsible for the change in myocardial architecture represents an additional arrhythmogenic substrate.

The prevalence of the disease in the general population ranges from 1/2500 to 1/5000 of the population and is more common in men, although the prevalence is believed to be higher due to the large number of unrecognized cases. ARVC has been recognized as the leading cause of sudden cardiac death in young athletes in Northern Italy. We distinguish three phases of the disease: concealed, overt and end stage. In the preclinical phase of the disease, imaging methods (echocardiography, heart NMR) do not yet reveal morphological or functional changes, but there are already disorders of intercellular connections, which form a clear arrhythmogenic substrate for malignant ventricular arrhythmias and sudden arrhythmic heart death.

Implantation of a cardioverter defibrillator (ICD) is the only effective method of preventing sudden cardiac death. However, the impact of physical activity on the increased risk of sudden cardiac death should be emphasized. Increased volume overload and stretching of the right ventricular myocardium increases the progression of the disease and is a trigger for the development of sudden cardiac death even in the early stages of the disease. Sports activity increases the risk of sudden cardiac death five fold. Early identification of the disease in athletes at an early stage of the disease is of paramount importance. Cardiovascular mortality of athletes in the Veneto Region of Italy has been reduced from 1/28,000 to 1/250,000 mainly due to the early identification and exclusion of athletes from ARVC.

Keywords: Arrhythmogenic right ventricular cardiomyopathy, genetics, exercise

References:

1. Marcus F, McKenna W, Sherrill D, Basso C et al; Diagnosis of arrhythmogenic right ventricular cardiomyopathy/dysplasia; *European Heart Journal* (2010) 31; 806-814
2. Gandjbakhch et al; Diagnosis, Imaging, and Genetics of Arrhythmogenic RV Cardiomyopathy/Dysplasia; *JACC Vol 7, No 7, 2018:784-804*
3. Sattar Y, Abdullah H, Neisani Samani E, et al. (August 13, 2019) Arrhythmogenic Right Ventricular Cardiomyopathy/Dysplasia: An Updated Review of Diagnosis and Management. *Cureus* 11(8): e5381. DOI 10.7759/cureus.5381
4. Basso C, Corrado D, Bauce B, Thiene G; Arrhythmogenic Right Ventricular Cardiomyopathy; *Circ Arrhythm Electrophysiol* (2012): 5:1233-1246

Diabetes mellitus and arterial hypertension in mountain activities

Lana Ružić¹, Girgis Assaf²

¹ Department of Sport and Exercise Medicine, University of Zagreb, Faculty of Kinesiology, Zagreb, Croatia

² Antonine University, Baabda, Beirut, Lebanon

ABSTRACT:

Nowadays mountain sports are available and even the trips to Kilimanjaro or Himalayas are organized in a touristic manner. Also, the lack of snow in some resorts and the possibility to reach glaciers almost the whole year, increased the number of winter sport enthusiasts at higher altitudes. Hypertension and diabetes mellitus morbidity increased in recent decades, even in younger population so a significant number of patients are frequently active in cold and in hypobaric hypoxia¹. The most of deaths in Alps recently were not related to avalanches or trauma but were caused by a cardiovascular incident².

Several factors in mountains may cause an unexpected increase in blood pressure which is otherwise well regulated. The low temperatures induce peripheral vasoconstriction thus increasing (diastolic) pressure. Hypoxia induces vasoconstriction in pulmonary capillaries (rising gradient needed for diffusion) and aerobic physical activity *per se* increases systolic pressure. In patients with diabetic complications the proteinuria and retinal microhemorrhages may worsen³. If skiing, the static contractions in large leg muscle groups lead also to the increase in diastolic pressure. To minimize that, the icy steep slopes and short turns are discouraged.

Peripheral vasoconstriction impairs delivery of free fatty acids to the muscles, so the glucose becomes the fuel even in low intensity activities in which otherwise fats would be a major source⁴. In diabetic patients it may be better to increase the carbohydrate and caloric intake, even risking mild hyperglycemia as all factors, the activity, altitude, and hypoxia would stimulate the carbohydrate turnover. The proportion of energy obtained from anaerobic glycolysis increases leading to higher blood lactate and H⁺ ions consequently limiting the intensity and volume of exercise. Not to be forgotten, the low temperatures and altitude could also alter readings of glucometers and interfere with insulin storages

Diabetes and/or hypertension pose a higher risk for an incident in mountains and may endanger health and safety of the patient but also of other members in the group. It is important that patients, but also group leaders, ski teachers and mountain guides recognize those challenges and learn to prepare, behave, and act accordingly if needed. With appropriate adjustments the long term mountain activities may improve both conditions⁴.

Keywords: diabetes mellitus; hypertension; altitude; exercise; hypoxia

Literature:

1. Faulhaber M, Flatz M, Gatterer H, Schobersberger W, Burtscher M. Prevalence of cardiovascular diseases among alpine skiers and hikers in the Austrian alps. *High Alt Med Biol.* 2007;8:245-52.
2. Niedermeier M, Gatterer H, Pocecco E, Frühauf A, Faulhaber M, Menz V, Burtscher J, Posch M, Ruedl G, Burtscher M. Mortality in Different Mountain Sports Activities Primarily Practiced in the Winter Season-A Narrative Review. *Int J Environ Res Public Health.* 2019;17:259.
3. de Mol P, de Vries ST, de Koning EJ, Gans RO, Bilo HJ, Tack CJ. Physical activity at altitude: challenges for people with diabetes: a review. *Diabetes Care.* 2014;37(8):2404-13.
4. Chen SM, Lin HY, Kuo CH. Altitude training improves glycemic control. *Chin J Physiol.* 2013 Aug 31;56(4):193-8.

Optimization of glucose control in DM patients with cardiovascular disease

Mario Skugor

Endocrine and Metabolic Institute Cleveland Clinic, Cleveland, USA

ABSTRACT:

Diabetes and Metabolism Cardiovascular (CV) disease and type 2 diabetes mellitus (DM-2) are intricately connected. About half of the patients on cardiothoracic surgery wards have DM-2 and more than half of the patients with DM-2 will have cardiovascular disease as a cause of death. Having this in mind it is important to have medications for glycaemic treatment that are, at least, neutral in terms of CV risk and, ideally, to decrease CV risk. In 2007 the Rosiglitazone was taken off the market when it was suggested that it increases CV risk. Since 2008 American FDA requires new medications to demonstrate CV safety before approval. Looking at medications approved prior to 2008 there are data suggesting that Metformin has some degree of CV protection (UKPDS data) as well as Pioglitazone (PROactive study). New classes of medications introduced since include DPP-4 inhibitors, GLP-1 analogues and SGLT-2 inhibitors. DPP-4 inhibitors have, generally, demonstrated CV safety. GLP-1 analogues developed from human GLP molecule have demonstrated significant CV protection but those derived from exenatide have not. The SGLT-2 inhibitors are newest class and have demonstrated marked protection against hospitalization for heart failure as well as from progression of the diabetic nephropathy. These new data have influenced development of the treatment guidelines and newest 2021 American Diabetes Association guidelines suggest individualized choice of medication depending on the patient risk profile favoring SGLT-2 inhibitors and GLP-1 analogues in those with significant CV risk.

The working domain of nurses /medical technicians in cardiac diagnostics in specialized hospital Thalassotherapia Opatija

Samir Softić¹, Marija Bukvić², Snežana Golubović¹, Željka Mijolović¹, Dijana Travica Samsa^{1,2,3}, Vesna Bajić¹

¹ Thalassotherapia Opatija, Special hospital for medical rehabilitation of heart, lung and rheumatic diseases, Opatija, Croatia

² University of Rijeka - Faculty of Health Studies, Ul. Viktora cara Emina 5, Rijeka, Croatia

³ University of Rijeka - Faculty of Medicine, Croatia

ABSTRACT:

The main task of nursing as a vocation is taking care of patients and protection of healthy individuals; it includes various procedures, knowledge, and health care skills through which nurses/medical technicians help a sick or healthy individual to perform activities that contribute to health, recovery, or peaceful death. Cardiovascular diseases are the global leading cause of death, taking 17.9 million lives each year, therefore, the role of nurses is increasingly expanding from the domain of providing health care, to prevention and diagnosis. The competencies of nurses include knowledge and skills, as well as procedures of planning, organizing, conducting, and assessing the quality of the provided health care/ nurse care; they clearly determine the levels of rights, duties, and responsibilities of nurses in their field of work according to their levels of education. Thalassotherapia Opatija, *Special hospital* for medical rehabilitation of heart, lung and rheumatic diseases has been providing services for the treatment, rehabilitation, and prevention of cardiovascular diseases for more than 60 years. The professionalism of the personnel and the quality of the services provided were also recognized by the Ministry of Health of the Republic of Croatia, and in 2012 Thalassotherapia Opatija was appointed with the title of the Reference center for cardiac rehabilitation. Thalassotherapia Opatija provides services of many cardiac diagnostic methods which include ECG, spirometry, ergometry, ergospirometry, pressure holter monitoring, heart holter monitoring, clinic for electrostimulation and heart arrhythmias, room for invasive coronarography, tilt test, heart X-ray, ECHO, stress ECHO, TEE and MSCT. Also, Thalassotherapia Opatija has recognized the significant role of nurses in health care and treatment of cardiac patients, but also in diagnostics; many of the above-mentioned diagnostic methods are performed by nurses, who together with specialist doctors have a significant role in their implementation. Nurses participating in cardiac diagnostics, in addition to the basic knowledge acquired through education, must improve their knowledge of the cardiovascular system and its functioning and they must be able to recognize pathological findings of diagnostic methods to inform the doctor.

Keywords: nurses/technicians, nursing, cardiovascular diseases, diagnostics Thalassotherapia Opatija

Literature:

1. Thalassotherapia Opatija TTO. 1957. – 2007 - Monografija bolnice. Zagreb: AKD d.d.;2007.
2. Zakon o sestrinstvu Narodne novine 121/03 II Djelatnost medicinska sestra-članak 3.(2003). Dostupno na: [http://www.zakon.hr/z/407/Zakon o sestrinstvu](http://www.zakon.hr/z/407/Zakon_o_sestrinstvu)
3. Popović D. Obrazovanje medicinskih sestara - osamdeset godina tradicije, Medix, 2004; 10: 54-5.
4. Kompetencije – Wikipedija. Dostupno na: [https://en.wikipedia.org/wiki/Competence_\(human_resources\)](https://en.wikipedia.org/wiki/Competence_(human_resources))

Cardiac rehabilitation from guidelines to successful implementation

Paolo Šorić¹, Ivona Brajković¹, Jasna Stanić¹, Kristina Klasan¹, Ksenija Silić Gržinčić¹

¹ Clinic for treatment, rehabilitation and prevention of cardiovascular diseases Thalassotherapia Opatija, Opatija, Croatia

ABSTRACT:

Cardiac rehabilitation is an important component in the continuum of care for people with cardiovascular disease, providing multidisciplinary education and structured exercise and physical activity programs to reduce the risk of morbidity and mortality. Prevention of cardiovascular diseases must be carried out simultaneously at the level of health promotion, primary and secondary prevention. Unfortunately, the goals set within the national program for the prevention of cardiovascular diseases have not yet been achieved due to the lack of strategy and support of national institutions in its implementation. Although we record a continuously growing general mortality rate due to cardiovascular disease, we still have a lack of centers for the implementation of inpatient and outpatient cardiac rehabilitation in the Republic of Croatia. In the principles of cardiac rehabilitation programs we find the fact that there is no international consensus of guidelines, and differ in defining the type of exercise, intensity, duration and frequency, length of the program and the need for initial testing and professional supervision, and therefore we work according to recommendations issued by European Society of Cardiology. The sequence of physiotherapeutic procedures is an important element in creating an individualized rehabilitation plan and program for each patient. Based on the collected data and initial testing, we determine the intensity of exercise and the forms of activities in which the patient will participate in the cardiac rehabilitation program. At the end of the cardiac rehabilitation program, we evaluate the physiotherapeutic procedures, then create a physiotherapeutic conclusion which the cardiologist adds to the patient's discharge letter. The patient is given recommendations for the selection of activities to be addressed in their daily lives, according to its functional status, diagnosis and personal preferences. Experience in working with patients has shown that there are three important elements for the successful implementation of cardiac rehabilitation, and they are education, motivation and professional support. In this direction, we are developing new modern approaches through social networks as a means of informing and promoting health, digital solutions in equipment for performing physical activity and health promotion through organized local community programs. In an era where there is a growing trend towards a sedentary lifestyle and an increasing prevalence of obesity and related cardiovascular disease, promoting physical activity and regular exercise are more crucial than ever and at the forefront of priorities in the social and scientific community.

Keywords: Cardiac rehabilitation, physical activity, guidelines

References:

1. Kym JP, Brett AG, Stephen RB and Amanda CB. A review of guidelines for cardiac rehabilitation exercise programmes: Is there an international consensus? *Eur J Prev Cardiol* 2016; 23(16): 1715–1733. <https://doi.org/10.1177/2047487316657669>
2. Piepoli MF, Corra U, Benzer W, et al. Secondary prevention through cardiac rehabilitation: Physical activity counselling and exercise training: Key components of the position paper from the Cardiac Rehabilitation Section of the European Association of Cardiovascular Prevention and Rehabilitation. *Eur Heart J Suppl* 2010; 31: 1967–1974. <https://doi.org/10.1093/eurheartj/ehq236>
3. Piepoli MF, Hoes AW, Agewall S. 2016 European Guidelines on cardiovascular disease prevention in clinical practice: The Sixth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of 10 societies and by invited experts) Developed with the special contribution of the European Association for Cardiovascular Prevention & Rehabilitation (EACPR) *Eur Heart J*. 2016;37:2315–2381. <https://doi.org/10.1093/eurheartj/ehw106>
4. L Vanhees et al. Importance of characteristics and modalities of physical activity and exercise in the management of cardiovascular health in individuals with cardiovascular risk factors: recommendations from the EACPR (Part II) –*European Journal of Preventive Cardiology* 2012;19(5) 1005–1033. <https://doi.org/10.1177/1741826711430926>

„Cardiab-Protect“ Project – New Integrated Health Services in Prevention of Nutrition Associated Health Risks for Chronic Diseases

Irena Stipesevic Rakamarić¹, Karmen Kokot¹

¹ Zavod za javno zdravstvo Varaždinske županije / Public Health Institute of Varazdin County

ABSTRACT:

CARDIAB- PROTECT is a project of introducing new preventive health services on primary level to raise access to prevention of risks associated with nutrition in chronic diseases, during and after COVID-19 pandemic. It is an integrative approach carried by Public Health Institute of Varazdin County for chronic disease prevention and rehabilitation of cardiovascular diseases, type 2 diabetes, eating disorders, malnutrition, addictions, obesity and oncology patients who are all invited to use free counselling services of interdisciplinary medical team consisted of: public health doctor, psychiatrist, psychologist, nutritionist, graduated nurse- skilled in group counselling and licenced nordic walking instructor.

COVID-19 pandemic is expected to have post-pandemic negative health effects due to decreased accessibility to health services and lack of delivered prevention measures for patients with various chronic diseases. Lockdown had negative effects on surveillance of risks for cardiovascular diseases, diabetes, obesity, and mental health, especially in reducing in-door and out- door organized physical activities and social events. Socioeconomic disturbances following pandemics will result in further deterioration of social determinants of health, increase of ill nutrition habits, addictions, obesity and reduction of physical activity, why integrating already existing health services in a new and creative manner becomes a public health priority.

In this poster, we present new county counselling health service for prevention of nutrition associated health risks during the pandemic year 2020, its team, activities and plans for future as a possible model for approaching prevention of various and different chronic diseases, with already existing human resources and minimal additional financial input, in Public Health Institutes on county level.

Keywords: nutrition, prevention, chronic diseases, integrative health services

Physical activity in cardiac rehabilitation - important dosed medicine

Dijana Travica Samsa^{1,2,4}, Viktor Peršić^{1,2}, Viktor Ivaniš¹, Tamara Turk Wensveen^{1,3}, Marijana Rakić¹, Silvija Miletić Gršković¹, Iva Uravić Bursač¹, Vesna Pehar Pejčinović^{1,2}, Gordana Laškarin^{1,2}, Rajko Miškulin^{1,2}, Damir Raljević¹

¹ Special Hospital for Medical Rehabilitation of Heart, Lung and Rheumatic Diseases Thalassotherapia Opatija, Croatia

² Faculty of Medicine, University of Rijeka, Croatia

³ Clinical Hospital Centre Rijeka, Croatia

⁴ Faculty of Health Studies, University of Rijeka, Croatia

ABSTRACT:

Physical activity is an important factor in primary and secondary prevention of cardiovascular diseases (coronary heart disease and arterial hypertension) and in prevention of various chronic diseases such as atherosclerosis, hyperlipidemias, diabetes type 2, obesity as well as in treatment and rehabilitation of cardiovascular patients. Premature atherosclerosis is the result of traditional cardiovascular risk factors, inflammatory mediators and factors specific for endothelial dysfunction such as oxidative stress that precedes to the development of atherosclerosis. Many studies confirm the existence of the benefits of regular exercise. The benefits of cardiac rehabilitation may include the improvement of risk factors for coronary heart disease, particularly functional capacity. Among the patients with detected coronary heart disease, there are evidences that physical activity decreases the process of the disease and represents the cornerstone of cardiac rehabilitation¹. In order to achieve its positive influence on the prevention and the therapy of cardiovascular disease, the physical activity should be properly dosed as any other drug. The simplest dosage method of physical activity is done according to the FITT formulas (Frequency, Intensity, Time, Type). When talking about the secondary prevention and rehabilitation, physical activity has to be in line with the patient's health conditions and individual risk level; it has to be adapted to the previously estimated individual functional capacity of the patient. The cardiopulmonary exercise test (ergospirometry -CPET) is the golden standard for assessing the functional capacity of the patient. It can be repeated, it is simple, accurate and non-invasive method that provides additional useful information to standard exercise testing and it is becoming the integral part of the growing number of recommendations and guidelines². Aerobic functional capacity can be estimated by the expiratory gas analysis. The choice of parameters depends on the type of disease that is being studied. The percentage of VO₂ peak oxygen consumption (% VO₂ peak) is the most precise method used in cardiac patients for prescribing the cardiac rehabilitation³.

Keywords: cardiac rehabilitation, endothelial dysfunction, ergospirometry (CPET), functional capacity, physical activity

Literature:

¹ Price KJ; Gordon AB; Bird SR; Benson AC. A review of guidelines for cardiac rehabilitation exercise programmes: Is there an international consensus? *European Journal of Preventive Cardiology* 2016;23(16):1715-1733. DOI:10.1177/2047487316657669

² Guazzi M, Arena R, Halle M, Piepoli MF, Myers J and Lavie CJ. 2016 focused update: clinical recommendations for cardiopulmonary exercise testing data assessment in specific patient populations. *Eur Heart J*. 2018;39(14):1144-1161. DOI: 10.1093/eurheartj/ehw180

³ Hansen D, Abreu A, Ambrosetti M, Cornelissen V, Gevaert A, Kemps H et al. Exercise intensity assessment and prescription in cardiovascular rehabilitation and beyond: why and how: a position statement from the Secondary Prevention and Rehabilitation Section of the European Association of Preventive Cardiology, *European Journal of Preventive Cardiology*, 2021; zwab007, <https://doi.org/10.1093/eurjpc/zwab007>

Sports nutrition: emerging role in translational medicine

Donatella Verbanac

University of Zagreb Faculty of Pharmacy and Biochemistry, Department of Medical Biochemistry and Hematology, Zagreb, Croatia

ABSTRACT:

Diet significantly affects athletic performance, and adopting a dietary strategy that meets an athlete's nutrition goals will maximize the possibility of competitive success. Over the years, the focus has shifted from general recommendations to a highly sophisticated, personalized approach. In the last decade, there is a growing recognition that the primary role of sports nutrition may be to promote the adaptations taking place in muscle and other tissues in response to the training stimulus. There is also significant interest in the implications of manipulation of the fat and carbohydrate content of the diet.

However, due to recent advances in system biology, biochemistry, and bioinformatics, new knowledge has developed. The role of all cells present in our body (eukaryotic and prokaryotic) is now taken into account when considering the metabolic equilibrium and nutritional needs.

In this respect, translational research that brings together fundamental (basic research) and applied (clinical research) is seeing as one of the best approaches to meeting individual personal needs. The four main pillars of this approach are prediction, prevention, personalization, and participation (known as "P4 principles"). The presentation will briefly discuss how we can introduce these elements while designing personalized sports nutrition.

Keywords: sports nutrition, prediction, prevention, personalization, translational research

Cardiovascular health in Primorsko-Goranska County

Vladimir Mićović, Helena Glibotić Kresina

Teaching Institute of Public Health of Primorsko-Goranska County

ABSTRACT:

At the last decades, the world affected an epidemic of chronic noncommunicable diseases. Between them, particularly dangerous are cardiovascular and malignant disease.

According to World Health Organization, cardiovascular disease are the world's leading cause of death, being responsible for death of 17,9million people in world; 32%of the overall mortality. At that number, 85% cases of death caused by myocardial infraction and cerebral infraction. In 2019., 17 million premature deaths caused by chronic non-communicable diseases. Between them, 38% caused by cardiovascular disease. The analysis of mortality data shows that cardiovascular diseases are the most important cause of death of population of the Primorsko-Goranska County. Cardiovascular disease was responsible for 42,4% death at Primorsko-Goranska County at 2019. Disease from this group occupy the first places on the lists of causes of death among men and women. Age standardization result show that the mortality from cardiovascular disease in Primorsko-goranska County is located between European countries with medium high rate of mortality.

Today is known, that is possible to reduce 80% of early death and disability from cardiovascular disease. Effective prevention measure require strengthening activities in the field of health promotion and education, especially in primary care, and also in specialistic and hospital health care.

Keywords: cardiovascular disease, mortality, Primorsko-Goranska County, prevention

USEFUL INFORMATION / KORISNE INFORMACIJE

FreeStyle Libre



FreeStyle
Libre

FLASH SUSTAV ZA PRAĆENJE GLUKOZE

FreeStyle Libre vodeći je sustav za kontinuirano mjerenje glukoze u svijetu, dostupan u 50 zemalja i s više od 3 milijuna korisnika diljem svijeta.

Kao glavni proizvod **Abbott diabetes care** divizije, prvi se put pojavio na europskom tržištu prije pet godina, a 2017. dobio je i odobrenje američke Agencije za hranu i lijekove.

Zahvaljujući inovativnom pristupu u skrbi šećerne bolesti koji na prvo mjesto stavlja potrebe pacijenata, svakodnevne ubode nužne za mjerenje glukoze u krvi, zamijenio je **bezbolan, praktičan i diskretan senzor** kojim se glukoza kontrolira bilo kada i bilo gdje, istovremeno pružajući bolje razumijevanje bolesti i s tim povezane **unaprijedene ishode liječenja**.

KONTAKT:



Abbott

Abbott Laboratories d.o.o.

Koranska ul. 2, 10000, Zagreb

FreeStyle Libre korisnička služba:

0800 333 344 / FreeStyleLibreCroatia@abbott.com

Web stranica:

<https://freestylelibre.hr>

MOŽETE MJERITI BEZ LANCETA¹

Zašto bockati kad možete skenirati?¹



Izvešća iz
**FreeStyle
Libre** sustava
omogućavaju
potpuni uvid u
kontrolu glikemije.



AGP Report

December 7, 2019 - December 20, 2019 (14 days)

LibreView

GLUCOSE STATISTICS AND TARGETS

December 7, 2019 - December 20, 2019

% Time CGM is Active

57%

Ranges and Targets For

Target Range 3.9-10.0 mmol/L

Below 3.9 mmol/L

Above 10.0 mmol/L

Above 15.8 mmol/L

Average Glucose

7.8 mmol/L

Glucose Management Indicator (GMI)

6.7%

Glucose Variability

31.6%

Defined as percent coefficient of variation (%CV); target <36%

TIME IN RANGES

Very High

>13.8 mmol/L

1%

(14min)

High

10.1 - 12.9 mmol/L

18%

(4h 13min)

Target Range

3.9-10.0 mmol/L

78%

(18h 43min)

Low

3.0 - 3.9 mmol/L

3%

(43min)

Very Low

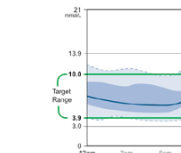
<3.0 mmol/L

0%

(0min)

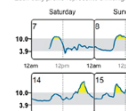
AMBULATORY GLUCOSE PROFILE (AGP)

AGP is a summary of glucose values from the report period, with median (50%) and other percentiles shown as if occurring in a single day.



DAILY GLUCOSE PROFILES

Each daily profile represents a midnight to midnight period with the data displayed in the upper left corner.



Source: Battelino, Tellez, et al. "Clinical Targets for Continuous Glucose Monitoring Data Interpretation: Recommendations From the International Consensus on Time in Range." Diabetes Care. American Diabetes Association. 7 June 2019. <https://doi.org/10.2337/dci190026>



Za više informacija posjetite
www.FreeStyleLibre.hr



1. Skeniranje senzora ne zahtijeva upotrebu lanceta. Mjerenje glukoze iz krvi jagodice prsta potrebno je: u situacijama brze promjene razine glukoze, kad razine glukoze u međustaničnoj tekućini možda ne odražavaju točne razine glukoze u krvi, u slučaju kad sustav ukazuje na hipoglikemiju ili prijetuću hipoglikemiju ili kad se simptomi ne podudaraju s očitanjima sustava.

FreeStyle, Libre i srodne trgovačke marke zaštićene su marke društva Abbott.

© 2021 ADC-28003 v 3.0 Abbott Laboratories d.o.o., Koranska 2, Zagreb.

U bolesnika s prethodnim KV događajem kojima je potrebno nešto više Neka PRALUENT® bude Vaš prvi izbor**

~90% bolesnika u ispitivanju ODYSSEY OUTCOMES primalo je visokointenzivnu terapiju statinima²

Cjelokupna
ispitivana populacija
(N=18 924)¹

MACE događaji[†]
(primarna mjera ishoda)

15%
RRR

HR 0,85 (95% CI 0,78; 0,93)
P=0,0003

Smrt zbog bilo
kojeg uzroka
(sekundarna mjera ishoda)

15%

HR 0,85 (95% CI 0,73; 0,98)
P=0,0261*

Subpopulacija s razinom
LDL-C \geq 2,6 mmol/l
(N=5629)^{2,3†}

24%
RRR

HR 0,76 (95% CI 0,65; 0,87)

29%
RRR

(post hoc analiza)
HR 0,71 (95% CI 0,56; 0,90)

P vrijednost interakcije[§]:
P=0,09

P vrijednost interakcije[§]:
P=0,12

U ispitivanju se 78% vremena primjenjivala doza lijeka PRALUENT od 75 mg²

Dizajn ispitivanja: ODYSSEY OUTCOMES bilo je randomizirano, dvostruko slijepo, placebo kontrolirano ispitivanje faze 3. U ispitivanje su bili uključeni bolesnici s nedavnim infarktom miokarda ili nestabilnom anginom koji su primali visokointenzivnu terapiju statinima (40 ili 80 mg atorvastatina ili 20 ili 40 mg rosuvastatina ili maksimalnu podnošljivu dozu jednoga od tih lijekova) +/- druge lijekove za snižavanje razine lipida, ali unatoč tome nisu postigli unaprijed definiranu ciljnu vrijednost LDL-C.²

* Uz samo nominalnu statističku značajnost utvrđenu hijerarhijskim testiranjem (HR 0,85; 95% CI 0,73; 0,98).²

† Veliki kardiovaskularni štetni događaji (MACE) = primarna objedinjena mjera ishoda koja je obuhvaćala smrt zbog KBS-a, infarkt miokarda bez smrtnog ishoda, ishemijski moždani udar sa smrtnim ishodom ili bez njega ili nestabilnu anginu koja je zahtijevala hospitalizaciju.

‡ Na temelju rezultata unaprijed specificirane analize podskupine koja je imala početnu vrijednost LDL-C \geq 2,6 mmol/l (N=5629).

§ P vrijednost za ocjenu interakcije između liječenja i početne razine LDL-C

CI = interval pouzdanosti; KBS = koronarna bolest srca; KV = kardiovaskularni; HR = omjer hazarda; LDL-C = kolesterol iz lipoproteina niske gustoće; PCSK9 = proproteinska konvertaza subtilizin/keksin tipa 9; RRR = smanjenje relativnog rizika.

1. PRALUENT (alirokumab), Sažetak opisa svojstava lijeka. Pariz, Francuska: sanofi-aventis groupe; prosinac 2020

2. Schwartz GG, Steg PG, Szarek M, et al. Alirocumab and cardiovascular outcomes after acute coronary syndrome. N Engl J Med. 2018;379(22):2097-2107, 1-40

3. Steg PG, Szarek M, Bhatt DL, et al. Effect of alirocumab on mortality after acute coronary syndromes: an analysis of the Odyssey Outcomes randomized clinical trial. Circulation. 2019;140(2):103-112, 1-35.

** PRALUENT® (alirokumab) je indiciran u odraslih bolesnika s utvrđenom aterosklerotskom kardiovaskularnom bolesti za smanjenje kardiovaskularnog rizika snižavanjem razine LDL-kolesterola, kao dodatak korekciji drugih faktora rizika u kombinaciji s maksimalnom podnošljivom dozom statina ili u monoterapiji u bolesnika koji ne podnose statine¹

SANOFI

Samo za zdravstvene radnike
Sanofi-aventis Croatia d.o.o. Heinzelova 70/II,
10000 Zagreb, Hrvatska, Tel: 01/6003-400


Praluent®
alirokumab

MAT-HR-2100402-v1.0 07/2021

1. Naziv lijeka i sastav: Praluent 75 mg, 150 mg i 300 mg otopina za injekciju u napunjenoj brizgalici i štrcaljki. Jedna napunjena brizgalica i štrcaljka za jednokratnu uporabu sadrži 75 mg ili 150 mg alirokumaba u 1 ml otopine ili 300 mg alirokumaba u 2 ml otopine. Alirokumab je humano IgG1 monoklonsko protutijelo koje se proizvodi u stanicama jajnika kineskog hrčka tehnologijom rekombinantne DNK. **2. Terapijske indikacije:** Praluent je indiciran u odraslih osoba s primarnom hiperkolesterolemijom (heterozigotna obiteljska i stečena) ili miješanom dislipidemijom kao dodatak dijeti u kombinaciji sa statinom ili sa statinom i drugim terapijama za snižavanje lipida u bolesnika koji ne mogu postići ciljne vrijednosti LDL-C uz maksimalno podnošljive doze statina ili samostalno ili u kombinaciji s drugim terapijama za snižavanje lipida u bolesnika koji ne podnose statine ili u kojih je primjena statina kontraindicirana. Praluent je indiciran u odraslih bolesnika s utvrđenom aterosklerotskom kardiovaskularnom bolesti za smanjenje kardiovaskularnog rizika snižavanjem razine LDL-C, kao dodatak korekciji drugih faktora rizika u kombinaciji s maksimalnom podnošljivom dozom statina s ili bez drugih terapija za snižavanje lipida te samostalno ili u kombinaciji s drugim terapijama za snižavanje lipida u bolesnika koji ne podnose statine ili u kojih je primjena statina kontraindicirana. **3. Doziranje i način primjene:** Doziranje: Prije početka liječenja alirokumabom potrebno je isključiti sekundarne uzroke hiperlipidemije ili miješane dislipidemije. Uobičajena početna doza alirokumaba je 75 mg supkutano jednom svaka 2 tjedna. U bolesnika kojima je potrebno veće sniženje vrijednosti LDL-C (>60%), liječenje može započeti dozom od 150 mg jednom svaka 2 tjedna ili 300 mg jednom svaka 4 tjedna (jednom mjesečno), primijenjeno supkutano. Doza alirokumaba može se prilagoditi svakom bolesniku pojedinačno na temelju značajki poput početne vrijednosti LDL-C, terapijskog cilja i odgovora na liječenje. Vrijednosti lipida mogu se ocijeniti 4 do 8 tjedana nakon početka liječenja ili titracije doze, te se sukladno nalazu može prilagoditi doza. Ako je potrebno dodatno sniženje vrijednosti LDL-C u bolesnika liječenih sa 75 mg jednom svaka 2 tjedna ili 300 mg jednom svaka 4 tjedna (jednom mjesečno), doza se može prilagoditi na maksimalnu dozu od 150 mg jednom svaka 2 tjedna. Ako bolesnik propusti dozu, treba primijeniti injekciju što je prije moguće i zatim nastaviti liječenje prema uobičajenom rasporedu. Nije potrebno prilagođavati dozu u starijih bolesnika. Nije potrebno prilagođavati dozu na temelju tjelesne težine bolesnika. Za oštećenje funkcije jetre, oštećenje funkcije bubrega i tjelesnu težinu vidjeti cjeloviti SPC. Sigurnost i djelotvornost lijeka Praluent u djece i adolescenata mlađih od 18 godina nisu ustanovljene. Dostupni su ograničeni podaci za pedijatrijske bolesnike u dobi od 8 do 17 godina s homozigotnim oblikom porodične hiperkolesterolemije ali ne mogu se dati preporuke o doziranju. Nisu provedena ispitivanja alirokumaba u pedijatrijskih bolesnika mlađih od 8 godina. Način primjene: Alirokumab se primjenjuje kao supkutana injekcija u bedro, abdomen ili nadlakticu. Jedna napunjena brizgalica ili napunjena štrcaljka namijenjena je samo za jednokratnu uporabu. Kako bi se primijenila doza od 300 mg, potrebno je dati ili jednu injekciju od 300 mg ili dvije uzastopne injekcije od 150 mg na dva različita mjesta injiciranja. Preporučuje se mijenjati mjesto injiciranja kod svake injekcije. Alirokumab se ne smije injicirati u područja zahvaćena aktivnom kožnom bolešću ili ozljedom. Alirokumab se ne smije primijeniti istodobno s drugim lijekovima koji se primjenjuju injekcijom na istome mjestu injiciranja. Nakon što ga zdravstveni radnik pouči pravilnoj tehnici supkutanog injiciranja, bolesnik može primjenjivati alirokumab samostalno ili mu ga može injicirati njegov skrbnik. Mjere opreza koje treba poduzeti prije rukovanja ili primjene lijeka: Prije primjene treba pričekati da se otopina ugrije na sobnu temperaturu. **4. Kontraindikacije:** Preosjetljivost na djelatnu tvar ili neku od pomoćnih tvari. **5. Posebna upozorenja i mjere opreza pri uporabi:** Alergijske reakcije: U kliničkim su ispitivanjima prijavljene opće alergijske reakcije, uključujući pruritus, ali i rijetke te ponekad ozbiljne alergijske reakcije, kao što su preosjetljivost, numulami ekcem, urtikarija i hipersenzitivni vaskulitis. Angioedem je prijavljen nakon stavljanja lijeka u promet. Ako se pojave znakovi ili simptomi ozbiljnih alergijskih reakcija, mora se prekinuti liječenje alirokumabom i uvesti odgovarajuće simptomatsko liječenje. Oštećenje funkcije bubrega: Alirokumab treba primjenjivati uz oprez u bolesnika s teškim oštećenjem bubrežne funkcije. Oštećenje funkcije jetre: Alirokumab treba primjenjivati uz oprez u bolesnika s teškim oštećenjem jetrene funkcije. **6. Interakcije s drugim lijekovima i drugi oblici interakcija.** Učinci alirokumaba na druge lijekove: Budući da je alirokumab biološki lijek, ne očekuje se da će imati farmakokinetičkih učinaka na druge lijekove, niti se očekuje da će utjecati na enzime citokroma P450. Učinci drugih lijekova na alirokumab: U usporedbi s monoterapijom alirokumabom, izloženost alirokumabu pri njegovoj istodobnoj primjeni sa statinima, ezetimibom i fenofibratom smanjuje se za 40%, 15% odnosno 35%. Međutim, kada se alirokumab primjenjuje svaka dva tjedna, sniženje vrijednosti LDL-C održano je tijekom intervala doziranja. **7. Plodnost, trudnoća i dojenje.** Trudnoća: Primjena lijeka Praluent ne preporučuje se tijekom trudnoće, osim ako kliničko stanje žene ne zahtijeva liječenje alirokumabom. Dojenje: Primjena lijeka Praluent u dojilja se ne preporučuje. Plodnost: Nema podataka o štetnim učincima na plodnost u ljudi. **8. Utjecaj na sposobnost upravljanja vozilima i rada na strojevima:** Praluent ne utječe ili zanemarivo utječe na sposobnost upravljanja vozilima i rada sa strojevima. **9. Nuspojave.** Sažetak sigurnosnog profila: Najčešće nuspojave, kod preporučenih doza, su lokalne reakcije na mjestu injiciranja (6,1%), znakovi i simptomi gornjih dišnih putova (2,0%) te pruritus (1,1%). Najčešće nuspojave koje su dovodile do prekida liječenja u bolesnika liječenih alirokumabom bile su lokalne reakcije na mjestu injiciranja. Sigurnosni profil u ispitivanju ODYSSEY OUTCOMES bio je konzistentan s ukupnim sigurnosnim profilom opisanim u kontroliranim ispitivanjima faze 3. Nije primijećena nikakva razlika u sigurnosnom profilu između dviju doza (75 mg i 150 mg) koje su se primjenjivale u programu ispitivanja faze 3. Često ($\geq 1/100$ i $< 1/10$): Poremećaji dišnog sustava, psihička i sredoprsja: znakovi i simptomi gornjih dišnih putova (uključujući pretežno orofaringealnu bol, rinoreju, kihanje), Poremećaji kože i potkožnog tkiva: pruritus, Opći poremećaji i reakcije na mjestu primjene: reakcije na mjestu injiciranja (uključujući eritem/crvenilo, svrbež, oticanje, bol/osjetljivost). Prema ograničenim podacima u 18 pedijatrijskih bolesnika u dobi od 8 do 17 godina nisu uočeni novi podaci povezani sa sigurnošću primjene lijeka u usporedbi s poznatim sigurnosnim profilom u odraslih bolesnika. Za ostale nuspojave vidjeti Sažetak opisa svojstava lijeka. **10. Predoziranje.** Nema specifičnog liječenja za predoziranje alirokumabom. U slučaju predoziranja, bolesnika treba liječiti simptomatski te po potrebi uvesti potpome mjere. **11. Farmakodinamička svojstva:** Farmakoterapijska skupina: Lijekovi koji modificiraju lipide, ostali lijekovi koji modificiraju lipide, ATK: C10AX14. **12. Nositelj odobrenja za stavljanje lijeka u promet:** sanofi-aventis groupe, 54, rue La Boétie, F – 75008 Paris, Francuska. **13. Broj(evi) odobrenja za stavljanje gotovog lijeka u promet:** EU/1/15/1031/001-020. **14. Način i mjesto izdavanja:** Izdaje se na recept, u ljekarni. Detaljnije informacije o ovom lijeku dostupne su na internetskoj stranici Europske agencije za lijekove <http://www.ema.europa.eu/ema>.

Ovo je Skraćeni sažetak opisa svojstava lijeka. Sukladno Pravilniku o načinu oglašavanja o lijekovima (Narodne Novine broj 43/15) molimo prije propisivanja lijeka Praluent pročitajte zadnji odobreni Sažetak opisa svojstava lijeka i Uputu o lijeku.

Datum revizije: 12/2020



Science 4 Health

17. - 18.09.2021.

GRAND HOTEL 4 OPATIJSKA CVIJETA
OPATIJA, HRVATSKA / CROATIA
www.science4health.eu