

THE 25TH PRAGUE-LUBLIN SYMPOSIUM

Locomotor Apparatus Adaptation IV – Interdisciplinary Aspects

November 4, 2023 | Medical House | Sokolská 31 | Prague, Czech Republic



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Louisa, 27, roztroušená skleróza

S Exopulse Mollii Suit už zase tančím.

60 minut terapie každý druhý den může zásadně uvolnit spastické a napjaté svaly, aktivovat svaly ochablé a zmírnit chronickou bolest. A to nejen u Louisy s roztroušenou sklerózou, ale i dalších lidí trpících obdobnými problémy po cévní mozkové příhodě, při dětské mozkové obrně a jiných neurologických onemocněních.

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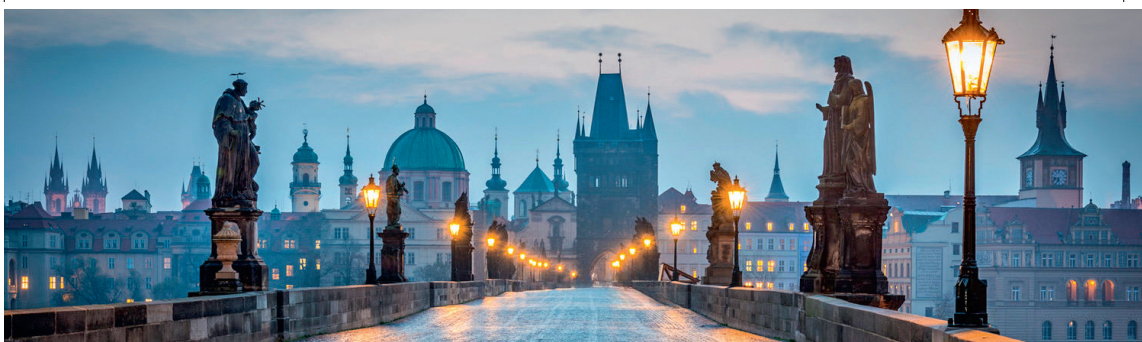
Louisa ve videu:



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 EXOPULSE

Výrobek je zdravotnickým prostředkem, určeným výhradně k slaboproudé transkutánní neurostimulaci celého těla. Přečtěte si pečlivě návod k použití.



Society For Connective Tissues CMA J.E. Purkyně & Society for Prosthetics and Orthotics CMA J.E. Purkyně
& Czech Medical Association J.E. Purkyně & Medical University of Lublin & Vincent Pol University in Lublin

invite you to

THE 25TH PRAGUE-LUBLIN SYMPOSIUM

Locomotor Apparatus Adaptation IV – Interdisciplinary Aspects

The Symposium will be held under the auspices
of the president of the Czech Medical Association (CMA) J.E. Purkyně

Professor Štěpán Svačina, MD, DSc.

&

the honorary president of the Society for Connective Tissues CMA J.E. Purkyně

Professor Josef Hyánek, MD, Dsc.

The Symposium will be held at the
Medical House, Sokolská 31, 120 26 Prague 2, Czech Republic, on November 4, 2023

This event belongs to education actions integrated into the life training system of physicians
according to professional statute No. 16 of the General Medical Council.



PROGRAMME

SATURDAY, NOVEMBER 4, 2023

8.00–9.00 REGISTRATION OF PARTICIPANTS

9.00 OPENING OF THE CONFERENCE

WELCOME SPEECHES

Professor Tomasz Karski, MD, PhD

Honorary member of the Society for Connective Tissues CMA J.E. Purkyně and the CMA J.E. Purkyně

Professor Ivo Mařík, MD, PhD

President of the Society for Connective Tissues, Czech Medical Association J.E. Purkyně

History of the 25th Prague-Lublin Symposium

Mařík Ivo

9.30–12.30 | MORNING SESSIONS

9.30 | SESSION I: RARE BONE DISEASES

Chairmen: Mařík Ivo, Kutílek Štěpán, Zemková Daniela

INVITED LECTURE

Introduction of Prof. Dr. Ali Abdul Salam Awni Al-Kaissi, DSc

Braun Martin

Skeletal disorders and the misuse of the term idiopathic (30 min.)

Al-Kaissi Ali Abdul Salam

Clinic for the diagnosis of diverse forms of congenital bone disorders in children and adults Viena, Austria

kaissi707@gmail.com

Hypophosphatasia and its differential diagnosis (20 min.)

Kutilek Štěpán

Dept. of Paediatrics; Hospital Klatovy; Klatovy, Czech Republic
stepan.kutilek@klatovy.nemocnicepk.cz

Fibrillin 1 and 2 and their failure in human diseases (20 min.)

Zemková Daniela^{1,2}, Mařík Ivo^{1,3}, Maříková Alena¹, Krulišová Veronika⁴

¹ *Centre for Defects of Locomotor Apparatus; Prague; Czech Republic*

² *Department of Paediatrics, University Hospital Motol, Prague, Czech Republic*

³ *Faculty of Health Care Studies, West Bohemia University, Pilsen, Czech Republic*

⁴ *GHC Genetics, Prague, Czech Republic*

dezem@email.cz

DISCUSSION AFTER EACH LECTURE (time in brackets includes discussion)

10.40–11.00 COFFEE BREAK

11.00 | SESSION II: RARE BONE DISEASES: NEUROFIBROMATOSIS TYPE 1

Chairmen: Kraus Josef, Zemková Daniela, Mařík Ivo

Neurofibromatosis type 1 – a complex multi-system genetic based disorder, molecular genetic diagnosis (20 min.)

Krulišová Veronika¹, Renáta Michalovská¹, Vlčková Zdenka¹

¹ *GHC Genetics, Prague, Czech Republic*

krulisova@ghcgenetics.cz

A neurologist's view of Neurofibromatosis von Recklinghausen type 1 (20 min.) Neurofibromatosis von Recklinghausenem typu 1 z pohledu neurologa.

Kraus Josef

Department of Child Neurology, University Hospital Prague-Motol, Czech Republic
josef.kraus@lfmotol.cuni.cz

Neurofibromatosis type 1 – clinical, radiological and molecular diagnosis, orthopaedic treatment (20 min.)

Mařík Ivo^{1,2,5}, Zemková Daniela^{2,3}, Maříková Alena², Myslivec Radek^{2,5}, Krulišová Veronika⁴

¹ Faculty of Health Care Studies, West Bohemia University, Pilsen, Czech Republic

² Centre for Defects of Locomotor Apparatus I.l.c., Prague, Czech Republic

³ Dept. of Paediatrics, University Hospital Motol, Prague, Czech Republic

⁴ GHC Genetics, Prague, Czech Republic

⁵ Orthopaedic and Traumatology Dept. Hospital Pribram, Czech Republic

ambul_centrum@volny.cz

DISCUSSION AFTER EACH LECTURE (time in brackets includes discussion)

12.00–13.00 LUNCH

13.00–17.30 | AFTERNOON SESSIONS

13.00 | SESSION III: PALEOPATOLOGY.VARIA

Chairmen: Povýšil Ctibor, Zemková Daniela

Typhoid fever epidemics in the past (film documentary, 25 minutes)

Smrčka Václav¹, Zapletal Vít², Musilová Zdenka³

¹ Institute of History of Medicine and Foreign Languages of the First Faculty of Medicine, Charles University in Prague

² Municipal Library of Prague

³ Municipality of the Town, Letovice

sedlcany1@seznam.cz

Chondrosarcoma composed of target-like chondrocytes (20 min.)

Povýšil Ctibor¹, Hojný Jan², Kaňa Martin²

¹ Institute of Pathology, First Faculty of Medicine, Charles University and General University Hospital in Prague

² Department of Otorhinolaryngology, Head and Neck Surgery, First Faculty of Medicine, Charles University and University Hospital Motol, Prague

ctibor.povysil@lf1.cuni.cz

DISCUSSION AFTER EACH LECTURE (time in brackets includes discussion)

14.00 | SESSION IV: ADAPTATION OF LOCOMOTOR APPARATUS – NEUROMUSCULAR AND SKELETAL RELATIONS

Chairmen: Piet van Loon, Karski Jacek, Mařík Ivo

INVITED LECTURE

Introduction of Prof. Tomasz Karski, MD, Ph.D.

Braun Martin

Children and Adults. Clinical symptoms of Minimal Brain Dysfunction, Syndrome of Contracture and Deformities. Spine, Hips, Knees, Feet. Therapy. Possibility of prophylaxis. In 12 Points (15 min.)

Karski Tomasz¹, Karski Jacek², Karska Klaudia³

¹ Vincent Pol University of Lublin, Poland tmkarski@gmail.com

² Medical University of Lublin, Poland jkarski@vp.pl

³ Medical University of Lublin, Poland
clovdia@o2.pl

So-Called Idiopathic Scoliosis. Historical Dates of Discoveries. Fate and Fortune of New Knowledge. Biomechanical etiology, new classification, therapy and causal prophylaxis (10 min.)

Karski Tomasz

Professor Lecturer, Vincent Pol University in Lublin, Poland
tmkarski@gmail.com

So-Called Idiopathic Scoliosis. Historical Dates of Discoveries. Fate and Fortune of New Knowledge. Opinions of specialist from many countries (5 min.)

Karski Tomasz

University in Lublin, Poland
tmkarski@gmail.com

Fresh evidence with MRI of the effectiveness of correction of scoliosis by Thoracolumbar Lordotic Intervention (TLI).

Extension of the scoliotic spine restores disc morphology first (20 min.)

Loon P.J.M.¹, Soeterbroek A.M.², Grotenhuis J.A.³, Smit T.H.⁴

¹ Orthopedic surgeon, Proktovar, Hengelo, the Netherlands;

² Analyst, Chairman Posture Network Netherlands,

³ Em. prof. neurosurgery Radboud University Nijmegen;

⁴ Professor Tissue Engineering; Mechanobiology of development and disease; Amsterdam UMC.
pvanloon@planet.nl

Dutch Healthcare crisis in the light of discongruent Osteoneural Growth Relations. How loss of prevention-knowledge in childhood and political choices produced a socio-economic burden (20 min.)

Loon P.J.M.¹, Soeterbroek A.M.², Grotenhuis J.A.³, Smit T.H.⁴

¹ Orthopedic surgeon, Proktovar, Hengelo, the Netherlands;

² Analyst, Chairman Posture Network Netherlands,

³ Em. prof. neurosurgery Radboud University Nijmegen;

⁴ Professor Tissue Engineering; Mechanobiology of development and disease; Amsterdam UMC.

pvanloon@planet.nl

DISCUSSION AFTER EACH LECTURE (time in brackets includes discussion)

15.10–15.30 COFFEE BREAK

15.30 | SESSION V: TRAUMATOLOGY, ORTHOPAEDICS, ORTHOPAEDIC PROSTHETICS

Chairmen: Karski Tomasz, Krawczyk Petr, Mařík Ivo

INVITED LECTURE

Introduction of Prof. Hans Zwipp, MD, DSc.

Braun Martin

History of Calcaneus Fractures (30 min.)

Hans Zwipp

Professor emeritus of Universitäts Centrum für Orthopädie und Unfallchirurgie, Dresden, Germany

hans.zwipp@t-online.de

Treatment of calcaneal fractures with calcaneal nail (C-nail) (20 min.)

Pompach Martin¹, Carda Martin¹, Amlang Michael², Zwipp Hans²

¹ Department of Traumatology, Pardubice, Czech Republic

² Universitäts Centrum für Orthopädie und Unfallchirurgie, Dresden, Germany

martin.pompach@nempk.cz

New mini-invasive surgical techniques for the forefoot. (20 min.)

Holinka Martin

Orthopedic Department, Hospital Karvina – Raj, Ostrava, Czech Republic

MHolinka@seznam.cz

Active patient in orthotics

Kroupa Jan

Otto Bock CR

kroupa@ottobock.cz

Effect of early initiation of orthotic treatment in plagiocephaly (online presentation, 15 minutes)

Drastichová Klára¹, Ohnůtková Petra², Dilý Matej³

¹ *Univerzita Palackého Olomouc*

² *Plagio klinika Ostrava*

³ *Invent Medical Group, s.r.o.*

jiri@inventmedical.com

DISCUSSION AFTER EACH LECTURE (time in brackets includes discussion)

17.30 CLOSING OF THE SYMPOSIUM AND PLANNING THE 26TH PRAGUE-LUBLIN SYMPOSIUM

Ivo Marik & Petr Krawczyk & Tomasz Karski & Jacek Karski & Piet van Loon

18.00 DINNER

ORGANIZERS OF THE SYMPOSIUM

Professor Ivo Mařík, MD, PhD & Petr Krawczyk, MD, PhD & Martin Braun, RNDr., PhD

E-mails: ambul_centrum@volny.cz & krawczyk@proteorc.cz & braun@irms.cas.cz

Faculty of Health Care Studies, West Bohemia University, Pilsen &

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&

PROTEOR CZ I.I.c., Ostrava, Czech Republic, krawczyk@proteorc.cz

&

Department of Composites and Carbon Materials, Institute of Rock Structure and Mechanics.

The Czech Academy of Sciences, Prague, Czech Republic, braun@irms.cas.cz

Participants will receive the Programme and Certificate of Attendance

Abstracts of lectures will be published in Supplement 2 of the journal Locomotor System, vol. 30, 2023 (electronic version, ISSN 2336-4777, <http://www.pojivo.cz/cz/pohybove-ustrojil/>)

More recent information about the Symposium will be available on the websites:

www.pojivo.cz & www.ortoprotetika.cz

BIOAKTIVNÍ KOLAGENNÍ PEPTIDY REGENERUJÍ

Kolagen je nezbytný pro pohyblivost kloubů, stabilitu kostí, odolnost a pevnost vazů a šlach a také pro zdravé svaly a hojně se vyskytuje i v cévách, meziobratlových ploténkách, hematoencefalické bariéře a rohovce, dentinu a střevní stěně – kolagen je životně důležitá složka celého těla.



Kolagenní peptidy zvyšují syntézu kloubního kolagenu a proteoglykanů

Nejen sportovci jsou ve zvýšené míře náchylní ke kloubním problémům a léčba se u nich nijak neliší od jejího zvládnání u běžné populace. Hlavním cílem je minimalizovat bolestivost a zlepšit funkčnost kloubů. Klinická studie provedená v Penn State University testovala účinek kolagenních peptidů na studenty sportovních škol, kteří trpěli kloubními problémy v důsledku mechanické zátěže. V porovnání s kontrolní skupinou došlo u studentů, kteří užívali kolagenní peptidy, k **výraznému snížení kloubních potíží a také ke zlepšení pohyblivosti**. Tyto pozitivní účinky byly patrné zejména u účastníků s problémy kolenních kloubů pocházejících z mechanické zátěže. (Clark K., Sebastianelli W., Flechsenhar K., Aukermann D., Meza F., Millard R., Deitch J., Sherbondy P., Affiliations A., 24-Week study on the use of collagen hydrolysate as a dietary supplement in athletes with activity-related joint pain, *Curr Med Res Opin*, 2008 May;24(5):1485-96)

Významný je i vliv kolagenních peptidů na hustotu kostí, zejména u osob s osteoporózou či osteopenií, potvrzeno už v roce 2010 pilotní studií s doplňkem stravy Calcidrink®.

V této studii se řešil „Vliv suplementace kolagenními peptidy, vápníkem a vitamínem D, resp. Calcidrinkem® na úbytek kostní hmoty a remodelaci kosti u postmenopauzálních žen s osteopenií“ (Ortopedie 2010, Gabriela Šimková, *Rvmatologická ambulance 1. PP Kladno*). Výsledky byly velmi nadějně. U žádné pacientky se nevyskytly během sledovaného období jednoho roku žádné nové nízkozátěžové zlomeniny. Cílem bylo prokázat účinek pravidelného užívání přípravku Calcidrink (vitamín D, kalcium a kolagenní peptidy) na snížení úbytku kostní hmoty u postmenopauzálních žen s osteopenií. Výsledky studie tento efekt potvrdily.

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Prof. MUDr. Milan Adam, DrSc. Dr.h.c.
český revmatolog, zakladatel kloubní výživy Geladrink®



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Welcome speech to

**The 25th Prague-Lublin Symposium –
Locomotor Apparatus Adaptation IV – Interdisciplinary Aspects**

**Dear Participants of the 25th Prague-Lublin Symposium,
in Prague on 4th November 2023**

Dear Professors, Dear Doctors, Dear Colleagues, Dear Friends – participants of the Symposium – it is a big pleasure for Polish Group to attend the 25th Prague–Lublin Symposium.

This time – I want to say again - every scientific progress in the area of medicine, orthopaedics, rehabilitation, physiotherapy, anthropology is only possible when exist the cooperation and “exchange of medical observations”.

We are lucky – that such friendly cooperation with Prof. Ivo Mařík and his Team is possible just for 25 years. See – please – ours Meeting had various names and were not only in Czech Republic but also in Greece, in Poland, in Russia – and I hope, that the Czech–Polish medical cooperation will be also continued in next years.

Only such Meetings like this Symposium and – publications in the *Locomotors System Journal* of “the new knowledge in medicine” make progress in therapy and in prophylaxis. It is so important and awaiting – by suffering people – our patients – not only in our countries, but also in the whole Europe and all over the World.

I wish all Participants of Symposium – good and nice time in Prague.

Prof. Tomasz Karski MD, PhD

Vincent Pol University, Lublin, Poland.
Honouree Member of Czech Purkyne Medical Association /
Societas Medica Bohemica J. E. Purkyně
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Welcome Speech to

**The 25th Prague–Lublin Symposium –
Locomotor Apparatus Adaptation IV – Interdisciplinary Aspects**

Prague, November 4, 2023

Ladies and Gentlemen, dear colleagues,

I cordially welcome you all to the 25th Prague-Lublin Symposium, which is held under the auspices of the President of the Czech Medical Association J. E. Purkyně (CMA JEP) Professor Štěpán Svačina, DrSc. and the Honorary President of the Society for Connective Tissues CMA JEP Professor Josef Hyánek, DrSc. It is a great honour for me to welcome these two important personalities of Czech medicine among us.

I am pleased to welcome a new international guest Profesor Dr. Ali Abdul Salam Awni Al-Kaissi, DSc, (Clinic for the Diagnosis of Various Forms of Congenital Bone Disorders in Children and Adults, Vienna, Austria) and other international guests Professor Hans Zwipp, MD, DSc, (Dresden, Germany), Dr. med. Piet Van Loon (Orthopaedic Surgeon, Proktovar, Hengelo, The Netherlands) and our co-organizers of this international symposium, orthopaedic surgeons Professor Tomasz Karski, MD, PhD (Vincent Pol University of Lublin, Poland) and Assist. Professor Jacek Karski, MD, PhD (Medical University of Lublin, Poland). Prof. Tomasz Karski follows online.

I also warmly welcome Professor Ctibor Povýšil, DrSc., Professor Václav Smrčka, PhD and all other colleagues, specialists from different medical disciplines, experts in biomechanics, orthopaedic anthropology, orthotics and prosthetics, physiotherapy and other participants interested in neuromusculoskeletal disorders from different perspectives.

More and more participants are taking advantage of the online form of participation.

My sincere thanks to my close colleagues, the coordinators of the symposium Petr Krawczyk, MD, PhD. (Vice-Chair of the Society for Connective Tissue Czech Medical Association J.E. Purkyně (SCT CMA JEP) and president of the Orthotic and Prosthetic Society CMA JEP) and RNDr. Martin Braun, PhD. (Scientific Secretary of SCT CMA JEP), and last but not least to the experienced team of the Medical House in Prague, especially Mr. Michal Stavinoha and Mr. Ing Josef Šubert, without whose dedication and perfect organization the symposium would not have been possible in online form. I would also like to thank the symposium partner Otto Bock and the exhibiting companies Astra-Zeneca and Swixx Biofarma.

Recently, an interdisciplinary approach to congenital and acquired skeletal deformities has been adopted as a major school of thought to recognize new relationships regarding the etiology, pathogenesis, and even causal therapy of several genetic skeletal diseases. Nowadays, new discoveries are mainly made at the interface of disciplines. I believe that the scientific lectures presented

today will also expand our knowledge for the benefit of affected patients. I wish you to enjoy the new scientific information and I hope you will establish new friendships that will help us to organize an interdisciplinary and international scientific approach to knowledge.

Finally, I would like to express my sincere thanks to Associate Professor Michael Bellemore from the New Children's Hospital in Sydney for his many years of collaboration in the field of paediatric orthopaedics. Last but not least, I would like to express my sincere thanks to Professor Mikhail Dudin (Director Emeritus of the Ogonyok Centre) and his colleagues for their active support of this traditional event in 2013–2019, when they co-organized and actively participated in the Prague-Lublin-Sydney-Petrograd symposium with original contributions especially in the field of spinal deformities (adolescent idiopathic scoliosis).



Professor Ivo Mařík MD, PhD and Assoc. Professor Michael Bellemore, F.R.A.C.S.



From right: Professor Ivo Marik, MD, PhD, professor Jana Pařízková, MD, DSc, Alena Marikova MD, Professor Michail Dudin, MD, DSc and his wife Tatyana Dudinova, MD.

10.10.2023 Mikhail Dudin wrote me:

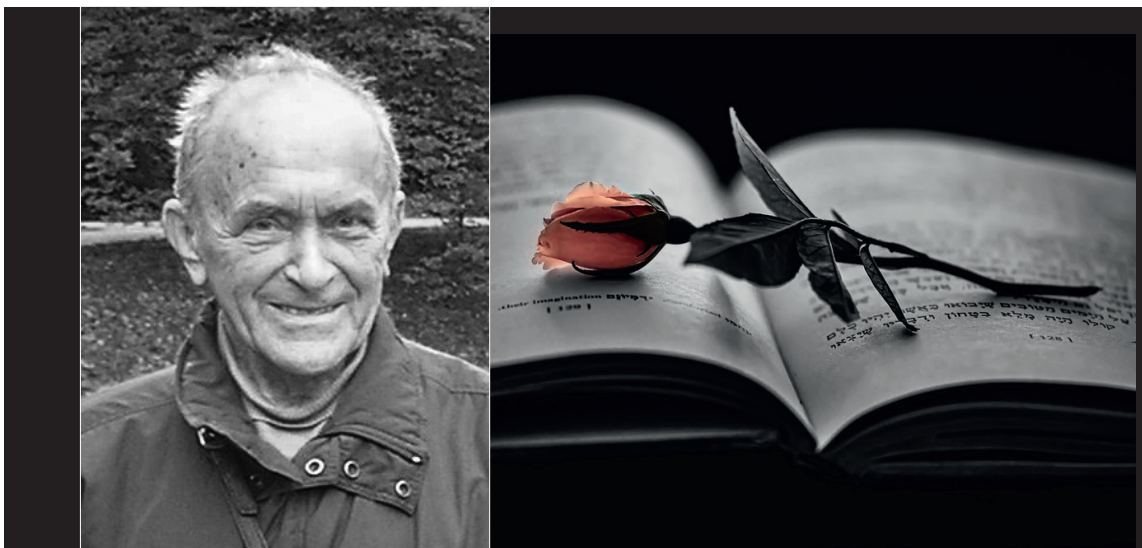
We hope that for you we remain normal Russian people with a healthy psyche. People who are categorically against the war that has made my country an outcast. Therefore, I can only afford to participate in absentia in my beloved and highly respected Symposium 2023. Best wishes to you, your family and, of course, the Symposium!

Mikhail and Tatyana

It is my sad duty to mention that the honorary member of the Society for Connective Tissues, CMA, J.E. Purkynje Assoc. Professor Dr. Med. Kazimierz S. Kozłowski (world-renowned expert in the diagnosis of bone dysplasias and bone tumors in children) died in December 2022 (6. 6.1928–11.12.22).

Honour to his memory!

See REMEMBERING ASSOC. PROFESSOR KAZIMIERZ KOZŁOWSKI, MD, M.R.A.C.R. Locomotor system, vol. 29, 2022, No 2/Pohybové ústrojí, ročník 29, 2022, č. 2, p. 278–283.



Let me present a few commemorative photos from the 24th Prague-Lublin Symposium.



Professor Ivo Mařík, MD, PhD – opening of the 24th Prague-Lublin symposium



Discussion on the 24th Prague-Lublin symposium



Presentation of the award to Assistant Professor Jacek Karski, MD, PhD (on right). From left: Professor Ivo Mařík, MD, PhD, Martin Braun, RNDr., PhD and Professor Štěpán Svačina, MD, DSc.



Participants of the 24th Prague-Lublin symposium at the Medical House in Prague.

Professor Ivo Marik, MD, PhD, FABI

Faculty of Health Care Studies, West Bohemia University, Pilsen, Czech Republic
 Chief of the Centre for Patients with Locomotor Defects I.I.c., Prague, Czech Republic
 President of the Society for Connective Tissue, Czech Medical Association, J.E. Purkyne
 Scientific secretary of the Society for prosthetics and orthotics Czech Medical Association J. E. Purkyne
 Chief-Editor of the journal Locomotor System – advances in research, diagnosis and therapy

A LIST OF SPEAKERS AND CO-AUTHORS OF PAPERS

Al-Kaissi Ali Abdul Salam, Professor, MD, DSc (*Viena, Austria*)
Amlang H Michael, MD, PhD (*Dresden, Germany*)
Braun Martin, Dr, PhD (*Prague, Czech Republic*)
Carda Martin, MD (*Pardubice, Czech Republic*)
Dily Matej, Eng (*Ostrava, Czech Republic*)
Drastichová Klára, BSc (*Olomouc, Czech Republic*)
Hojný Jan, Dr, PhD (*Prague, Czech Republic*)
Holinka Martin, MD, PhD (*Karviná, Czech Republic*)
Hyánek Josef, Professor, MD, DSc. (*Prague, Czech Republic*)
Kaňa Martin, MD (*Prague, Czech Republic*)
Karska Klaudia, MD (*Lublin, Poland*)
Karski Jacek, Assoc. Professor, MD, PhD (*Lublin, Poland*)
Karski Tomasz, Professor, MD, PhD (*Lublin, Poland*)
Kraus Josef, MD, Ph.D. (*Prague, Czech Republic*)
Krawczyk Petr, MD, PhD (*Ostrava, Czech Republic*)
Kroupa Jan, BCs (*Pilsen, Czech Republic*)
Krulišová Veronika, MD, PhD (*Prague, Czech Republic*)
Kutílek Štěpán, Assoc. Professor, MD, PhD (*Klatovy, Czech Republic*)
Mařík Ivo, Professor, MD, PhD (*Prague, Czech Republic*)
Maříková Alena, MD (*Prague, Czech Republic*)
Michalovská Renata, MSc, PhD (*Prague, Czech Republic*)
Musilová Zdeňka (*Letovice, Czech Republic*)
Myslivec Radek, MD (*Prague – Píbram, Czech Republic*)
Ohnůtková Petra, Eng (*Ostrava, Czech Republic*)
Piet, J. M. van Loon, MD (*Deventer, Netherlands*)
Pompach Martin, MD, PhD (*Pardubice, Czech Republic*)
Povýšil Ctibor, Professor, MD, DSc (*Prague, Czech Republic*)
Smit T.H., Professor, Eng, PhD (*Amsterdam, Netherlands*)
Smrčka Václav, Professor, MD, PhD (*Prague, Czech Republic*)
Soeterbroek, Andre M, Dr. (*Oosterbeek, Netherlands*)
Svačina Štěpán, Professor, MD, DSc (*Prague, Czech Republic*)
Vlčková Zdeňka, MD (*Prague, Czech Republic*)
Zapletal Vít, (*Prague, Czech Republic*)
Zemková Daniela, Dr, PhD (*Prague, Czech Republic*)
Zwipp Hans, Professor, MD, DSc (*Dresden, Germany*)

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DENTÁLNÍ

- Předčasná ztráta mléčných nebo
trvalých zubů³
- Abnormální chrup³
- Periodontitida⁴

MUSKULÁRNÍ / /REVMATOLOGICKÉ

- Zlomeniny metatarzů¹/ netraumatické
zlomeniny / špatné hojení zlomenin⁵
- Sekundární osteoporóza s atypickými
zlomeninami, které nereagují
na bisfosfonáty⁶
- Nemoc z ukládání pyrofosforečnanu
vápenatého (CPPD)²/ pseudodna² /
/chondrokalcinóza²

RENÁLNÍ

- Nefrokalcinóza³
- Progressivní renální poškození^{6,7}
- Renální selhání⁷

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ZJISTĚTE VÍCE

<https://hypophosphatasia.com/>

1. Beck C et al. Rheumatol Int. 2011;31(10):1315-1320.
2. Barvencik F et al. Osteoporos Int. 2011;22(10):2667-2675.
3. Rockman-Greenberg C. Pediatr Endocrinol Rev. 2013;10(suppl 2):380-388.
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ALEXION
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