

# ANNUAL REPORT 2022

## MOTOL UNIVERSITY HOSPITAL



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Dear Friends,

I would like to take this opportunity to summarize the most important events at Motol University Hospital (MUH) in 2022 from my perspective.

The year 2022, just like the two previous years, was full of events of global import, which intensively affected both the Czech healthcare sector and MUH. The Covid-19 pandemic faded in the spring, only to be replaced by the war in Ukraine and the need to care for Ukrainian refugees. "UA Points" were set up for the initial examination of refugees, and care was provided

throughout the hospital's specialized spectrum. The war led to a gradual rise in the prices of energy and goods and services.

Our hospital is now accustomed to the relatively extensive reconstruction, which is underway while still operating, making us quite unique in Europe in this aspect. By far the biggest reconstruction work was making a start on replacing the windows and insulating the facade on the hospital's "blue pavilion", which is for adults. It seems paradoxical that it was necessary to replace the windows and insulate the facade of a building that was approved in 1996, but the state it was in after removing the existing facade showed that it was very necessary to do so and is an unfortunate testament to the "quality" of construction work and building supervision in the early nineties in the Czech Republic.

A difficult "managerial" nut to crack was the need to carry out this reconstruction while keeping all the healthcare facilities running smoothly. I am very glad that this was done and that the hospital kept its level of performance, even when about 30% of its capacity had to be closed. It must be openly admitted that this was achieved by sometimes using some very innovative approaches. The situation was further complicated by having to prepare and reconstruct the Pneumology building (also from the 1990s) and starting reconstruction on the Long-term care building, which further reduced the bed capacity in the adult hospital.

At this point, I'd like to express my enormous gratitude to all the MUH employees who contributed to the excellent economic results. Good work was performed and the hospital, as every year, ended up in "the black".

Despite all the above-mentioned complications, the hospital forged ahead in all of its medical and scientific outputs and succeeded in consolidating its position as a center of excellence in Czech healthcare.

The hospital faces some enormous challenges in the years to come. These primarily concern two projects from the National Renewal Plan, one being the Motol Oncology Centre, including the associated Scientific and Diagnostic Oncology Centre, the other being the Simulation Centre for Intensive Medicine. The demanding preparations for these have been underway throughout 2022. One of the other challenges is to secure the funds that the hospital urgently needs to reconstruct laboratory tract G, which is crucial for the entire operation of the hospital and is in serious disrepair. I firmly believe, and the current course of all the preparations strongly suggests, that these activities will also be successful.

JUDr. Ing. Miloslav Ludvík, MBA  
ředitel FN Motol

# MANAGEMENT OF MOTOL UNIVERSITY HOSPITAL

## HOSPITAL DIRECTOR

JUDr. Ing. Miloslav Ludvík, MBA

## DEPUTY DIRECTOR FOR OPERATIONS AND TECHNICAL MATTERS

MUDr. Pavel Budinský, Ph.D., MBA

## DEPUTY DIRECTOR FOR MEDICAL PREVENTIVE CARE

MUDr. Martin Holcát, MBA

## DEPUTY DIRECTOR FOR NURSING CARE

Mgr. Jana Nováková, MBA

## DEPUTY DIRECTOR FOR ECONOMY

Ing. Jiří Čihař

## DEPUTY DIRECTOR FOR HUMAN RESOURCES

Ing. Barbara Smejkalová

## DEPUTY DIRECTOR FOR SCIENCE AND RESEARCH

Prof. MUDr. Anna Šedivá, DSc.

## DEPUTY BUSINESS DIRECTOR

Ing. Jana Bašeová

# BASIC INFORMATION AS OF 31. 12. 2022

Area of the premises (m <sup>2</sup> )	348 000
Assets (in thousands CZK)	12 661 062
Total turnover (in thousands CZK)	14 404 007
Employees (natural persons)	6 354
Employees (converted numbers)	5 616

BEDS	children	adults	TOTAL
Acute standard	466	1072	1538
Acute intensive	137	217	354
<b>ACUTE TOTAL</b>	<b>603</b>	<b>1289</b>	<b>1892</b>
Aftercare intensive	4	10	14
Long - term	-	315	315
Long - term intensive	-	20	20
<b>BEDS TOTAL</b>	<b>607</b>	<b>1634</b>	<b>2241</b>

Number of hospitalizations	78 999
Number of outpatient treatments	842 585
Number of treatment days (+ AC-LSH)	519 318
Number of anesthesiology procedures	34 969
Number of births	2 425
Death rate (+ AC-LSH)	1,5

# SCIENTIFIC BOARD OF MOTOL UNIVERSITY HOSPITAL

**Prof. MUDr. Anna Šedivá, DSc. - chair of the SC**

Department of Immunology, 2<sup>nd</sup> FM CU and MUH

**Doc. MUDr. Vladimír Beneš, Ph.D.**

Department of Neurosurgery for Children and Adults, 2<sup>nd</sup> FM CU and MUH

**Prof. MUDr. Ondřej Cinek, Ph.D.**

Department of Paediatrics, 2<sup>nd</sup> FM CU and MUH

**Doc. MUDr. Jan Bouček, Ph.D.**

Department of Otorhinolaryngology and Head and Neck Surgery, 1<sup>st</sup> FM CU and MUH

**Prof. MUDr. Pavel Dřevínek, Ph.D.**

Department of Medical Microbiology, 2<sup>nd</sup> FM CU and MUH

**Doc. MUDr. Lucie Šrámková, Ph.D.**

Department of Paediatric Haematology and Oncology, 2<sup>nd</sup> FM CU and MUH

**MUDr. Markéta Havlovicová**

Institute of Biology and Medical Genetics, 2<sup>nd</sup> FM CU and MUH

**MUDr. Martin Holcát, MBA**

Deputy for Preventive Therapeutic Care at MUH

**Prof. MUDr. Jakub Hort, Ph.D.**

Department of Neurology, 2<sup>nd</sup> FM CU and MUH

**Prof. MUDr. Alan Stolz, Ph.D., MBA**

Department of Surgery, 2<sup>nd</sup> FM CU and MUH

**Prof. MUDr. Tomáš Kalina, Ph.D.**

Department of Paediatric Haematology and Oncology, 2<sup>nd</sup> FM CU and MUH

**Prof. MUDr. Radan Keil, Ph.D.**

Department of Internal Medicine, 2<sup>nd</sup> FM CU and MUH

**MUDr. Adam Klocperk, Ph.D.**

Department of Immunology, 2<sup>nd</sup> FM CU and MUH

**Prof. MUDr. Pavel Kršek, Ph.D.**

Department of Paediatric Neurology, 2<sup>nd</sup> FM CU and MUH

**Prof. MUDr. Zdeněk Šumník, Ph.D.**

Department of Paediatrics, 2<sup>nd</sup> FM CU and MUH

**Prof. MUDr. Robert Lischke, Ph.D.**

3<sup>rd</sup> Department of Surgery, 1<sup>st</sup> FM CU and MUH

**Doc. MUDr. Štěpánka Průhová, Ph.D.**

Department of Paediatrics, 2<sup>nd</sup> FM CU and MUH

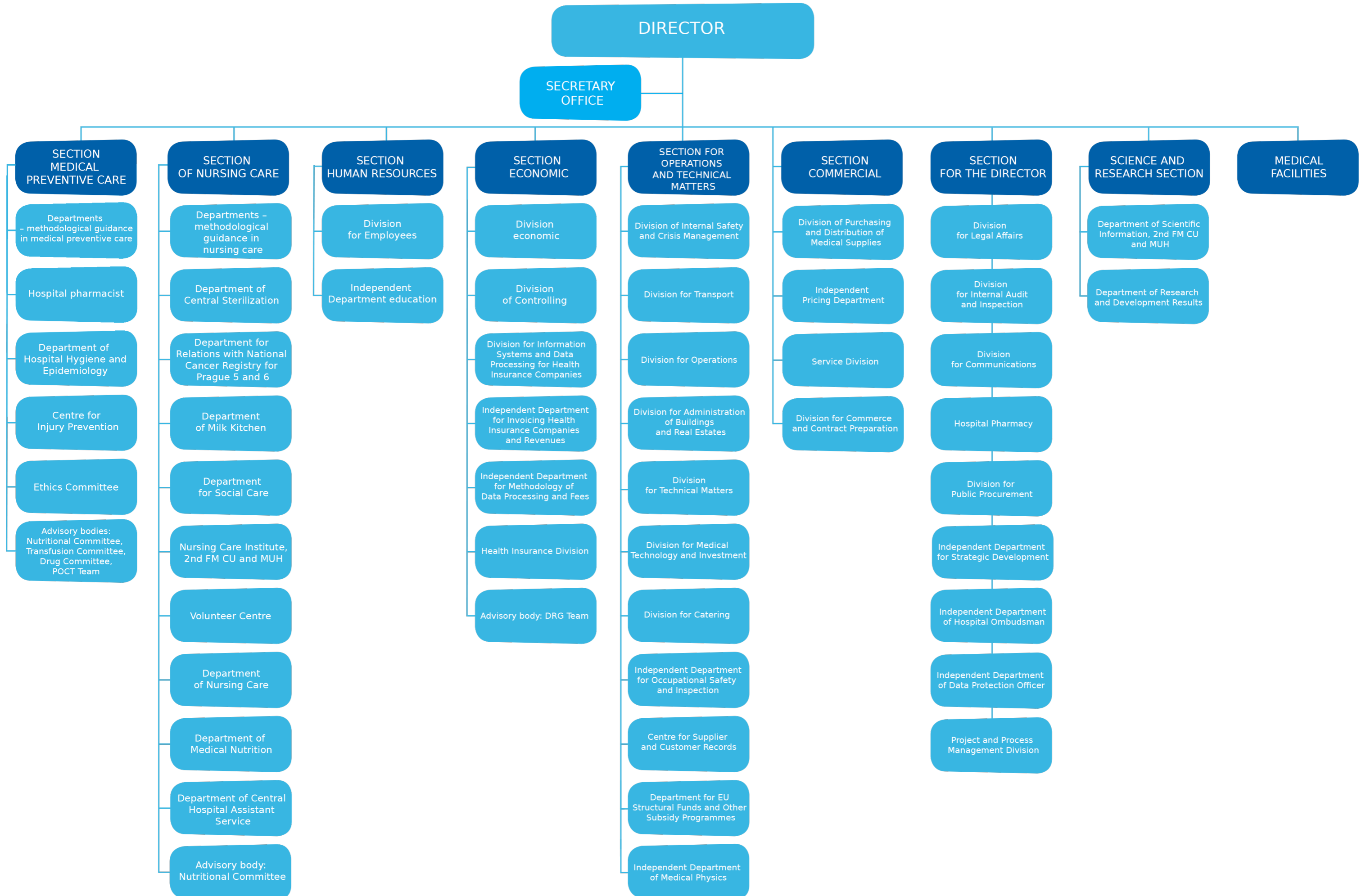
**Prof. MUDr. Josef Zámečník, Ph.D.**

Department of Pathology and Molecular Medicine, 2<sup>nd</sup> FM CU and MUH

**MUDr. Michal Zápotocký, Ph.D.**

Department of Paediatric Haematology and Oncology, 2<sup>nd</sup> FM CU and MUH

# BASIC ORGANISATIONAL STRUCTURE AS OF 31.12.2022



# LIST OF DEPARTMENTS

## Paediatric Inpatient Section

**Children's Heart Centre, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**

*Head - Prof. MUDr. Jan Janoušek, Ph.D.*

**Department of Paediatric Psychiatry, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**

*Head - Prof. MUDr. Michal Hrdlička, CSc.*

**Department of Paediatric Surgery, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**

*Head - Prof. MUDr. Michal Rygl, Ph.D.*

**Department of Paediatric Haematology and Oncology,  
2nd Faculty of Medicine, Charles University and Motol University Hospital**

*Head - Doc. MUDr. Lucie Šrámková Ph.D.*

### **- Bone Marrow Transplantation Unit**

*Chief Physician - Prof. MUDr. Petr Sedláček, CSc*

**Department of Paediatric Neurology, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**

*Head - Prof. MUDr. Pavel Kršek, Ph.D.*

**Department of ENT, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**

*Head - Doc. MUDr. Zdeněk Čada, Ph.D.*

**Department of Paediatrics, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**

*Head - Prof. MUDr. Zdeněk Šumník, Ph.D.*

## Adult Inpatient Section

**Department of Surgery, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**

*Head - Doc. MUDr. Alan Stolz, Ph.D. MBA*

**3rd Department of Surgery, 1st Faculty of Medicine,  
Charles University and Motol University Hospital**

*Head - Prof. MUDr. Robert Lischke, Ph.D.*

**Department of Internal Medicine, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**

*Head - Prof. MUDr. Radan Keil, Ph.D.*

**Department of Cardiology, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**

*Head - Prof. MUDr. Josef Veselka, CSc*

**Department of Infectious Diseases and Travel Medicine,  
2nd Faculty of Medicine, Charles University and Motol University Hospital**

*Head - MUDr. Milan Trojánek, Ph.D.*

**Department of Cardiovascular Surgery, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**

*Head - Doc. MUDr. Vilém Rohn, CSc*

**Department of Otorhinolaryngology and Head and Neck Surgery,  
1st Faculty of Medicine, Charles University and Motol University Hospital**

*Head - Prof. MUDr. Jan Plzák, Ph.D.*

**Department of Nuclear Medicine and Endocrinology,  
2nd Faculty of Medicine, Charles University and Motol University Hospital**

*Head - Prof. MUDr. Petr Vlček, CSc*

**Department of Spinal Surgery, 1st Faculty of Medicine,  
Charles University and Motol University Hospital**

*Head - Prof. MUDr. Jan Štulík CSc.*

**Department of Long-term Treatment - Aftercare Centre**  
*Senior Consultant - MUDr. Martina Nováková*

**Department of Neurology, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**  
*Head - Prof. MUDr. Petr Marusič, Ph.D.*

**Department of Oncology, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**  
*Head - Prof. MUDr. Tomáš Büchler, Ph.D.*

**1st Department of Orthopaedics, 1st Faculty of Medicine,  
Charles University and Motol University Hospital**  
*Head - Prof. MUDr. Ivan Landor, CSc.*

**- Traumatology**  
*Senior Consultant - MUDr. Jaroslav Kalvach*

**Department of Pneumology, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**  
*Head - Doc. MUDr. Libor Fila, Ph.D.*

**Department of Urology, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**  
*Head - Prof. MUDr. Marek Babjuk, CSc*

## **Common Inpatient Sites of Paediatric and Adult Sections**

**Department of Obstetrics and Gynaecology, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**  
*Head - Doc. MUDr. Roman Chmel, Ph.D.*

**- Department of Neonatology**  
*Senior Consultant - Doc. MUDr. Jan Janota, Ph.D.*

**Department of Anesthesiology, Resuscitation and Intensive Medicine,  
2nd Faculty of Medicine, Charles University and Motol University Hospital**  
*Head - Doc. MUDr. Tomáš Vymazal, Ph.D.*

**- Department of Subsequent Intensive and Long-term Intensive Nursing Care**  
*Senior Consultant - MUDr. Kateřina Čadová*

**Department of Paediatric and Adult Orthopaedics and Traumatology,  
2nd Faculty of Medicine, Charles University and Motol University Hospital**  
*Head - Prof. MUDr. Vojtěch Havlas, Ph.D.*

**Department of Rehabilitation and Sports Medicine,  
2nd Faculty of Medicine, Charles University and Motol University Hospital**  
*Head - Prof. PaedDr. Pavel Kolář, Ph.D.*

**- Department of Rehabilitation**  
*Senior Consultant - MUDr. Martina Kövári*

**- Department of Pain Research and Treatment**  
*Senior Consultant - MUDr. Jiří Kozák, Ph.D.*

**- Spinal Unit**  
*Senior Consultant - MUDr. Jiří Kříž*

**- Department of Sports Medicine**  
*Senior Consultant - Doc. MUDr. Jiří Radvanský, CSc*

**Department of Ophthalmology for Children and Adults,  
2nd Faculty of Medicine, Charles University and Motol University Hospital**  
*Head - MUDr. Martin Hložánek, Ph.D.*

**Department of Neurosurgery for Children and Adults,  
2nd Faculty of Medicine, Charles University and Motol University Hospital**  
*Head - Doc. MUDr. Vladimír Beneš, Ph.D.*

**Department of Stomatology for Children and Adults,  
2nd Faculty of Medicine, Charles University and Motol University Hospital**  
*Head - Prof. MUDr. Taťjana Dostálová, DrSc., MBA*

## Common Examination and Therapeutic Units

**Department of Radiology, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**  
Head - Prof. MUDr. Miloslav Roček, CSc.

**Department of Clinical Haematology**  
Senior Consultant - MUDr. Jitka Segethová

**Blood Bank Department**  
Senior Consultant - MUDr. Eva Linhartová

**Department of Clinical Psychology**  
Senior Consultant - Mgr. Markéta Mohaplová

**Department of Rheumatology for Children and Adults**  
Senior Consultant - Doc. MUDr. Rudolf Horváth, Ph.D.

**Department of Transplantations and Tissue Bank**  
Senior Consultant - MUDr. Jan Burkert, Ph.D.

**Institute of Biology and Medical Genetics,  
2nd Faculty of Medicine, Charles University and Motol University Hospital**  
Head - Prof. MUDr. Milan Macek, DrSc.

**Department of Immunology, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**  
Head - Prof. MUDr. Jiřina Bartůňková, DrSc., MBA

**Department of Medical Chemistry and Clinical Biochemistry, 2nd Faculty  
of Medicine, Charles University and Motol University Hospital**  
Head - Prof. MUDr. Richard Průša, CSc

**Department of Medical Microbiology, 2nd Faculty of Medicine, Charles  
University and Motol University Hospital**  
Head - Prof. MUDr. Pavel Dřevínek, Ph.D.

**Department of Pathology and Molecular Medicine,  
2nd Faculty of Medicine, Charles University and Motol University Hospital**  
Head - Prof. MUDr. Josef Zámečník, Ph.D.

## Outpatient Sector

**Department of Paediatric Dermatology**  
Senior Consultant - MUDr. Jana Čadová

**Department of Dermatovenereology for Adults**  
Senior Consultant - MUDr. Alena Machovcová, Ph.D., MBA

**Department of Central Operating Theatres for Children**  
Head Nurse - Bc. Alice Podařilová

**Department of Central Operating Theatres for Adults**  
Senior Consultant - MUDr. Zbyněk Jech

**Primary Care Department**  
Senior Consultant - MUDr. Jaroslava Kulhánková

**Emergency Department and Medical First Aid Service for Children**  
Senior Consultant MUDr. Jitka Dissou, MBA

**Emergency Department and Medical First Aid Service for Adults**  
Senior Consultant - MUDr. Lenka Kozlíková

**Department of Hospital Hygiene and Epidemiology**  
Senior Consultant - MUDr. Jarmila Rážová, Ph.D.

**Hospital Pharmacy**  
Senior Pharmacist - PharmDr. Petr Horák



# MEDICAL PREVENTIVE CARE

## Paediatric Inpatient Part

### Children's Heart Centre, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - prof. MUDr. Jan Janoušek, Ph.D.

Senior Consultant of the Department of Cardiology - Doc. MUDr. Peter Kubuš, Ph.D.

Senior Consultant of the Cardiovascular Surgery - MUDr. Roman Gebauer

Head Nurse - Mgr. Jana Matušíková

#### Basic description:

Children's Heart Centre, 2nd Faculty of Medicine, Charles University and Motol University Hospital (Children's Heart Centre) is the only comprehensive cardiovascular centre for children in the Czech Republic caring for children nationwide. The centre focuses mainly on diagnostics and treatment of congenital heart defects in children and cooperates with other facilities in treating adult patients with congenital heart defects. The preference of non-invasive diagnostic procedures (ECHO, MRI, CT) and primary correction of defects at an early age is typical for this site.

**In 2022, 530 surgeries (including 5 heart transplants) were performed with a 30-day mortality rate of 0.4%, as well as 6 open artery ligations for newborns with low birthweight at other departments, 405 catheterizations (including 313 intervention procedures), 976 patients were hospitalized (+748 accompanying persons) and 4,495 patients were treated as outpatients.** These figures represent a renewed increase in the number of operations and hospital admissions compared to previous years, despite ongoing staff shortages, especially in the non-medical health worker segment.

**The department takes part in a unique international quality control system for paediatric cardiac surgery within the European Congenital Heart Surgeons Association (ECHSA) database, which collects data on hundreds of thousands of operations from around the world and monitors early mortality as related to the complexity of the surgery. In this comparison, the Children's Cardiac Centre had an excellent early mortality rate of just 0.9% for the period 2012-2019.** The department is also a member of the **ERN GuardHeart** for rare cardiovascular diseases in childhood.

In 2022, we took part in two foreign humanitarian and development missions to Nairobi, Kenya, organized by the Ministry of Foreign Affairs of the Slovak Republic and MEDEVAC of the Ministry of Interior of the CR in cooperation with the MUH and the NUSCH a.s. in Bratislava. In all, 18 patients with congenital heart disease were successfully treated and operated on.

On another mission to Imphal, India, 5 patients with complex congenital heart disease were operated on. The agreement on cooperation in the surgical and cardiological treatment of paediatric patients with heart disease, concluded in 2017 with the University Hospital in Ljubljana, was also fulfilled in the form of regular trips by cardiac surgeons from the Children's Heart Centre (CHC) to Slovenia and by the surgical and catheterization treatment of more complex cases at the CHC at MUH.

#### Specialized outpatient units:

- clinical cardiology
- electrophysiology and cardiac stimulation
- prenatal cardiology
- connective tissue diseases
- heart failures and transplantations

#### New methods and procedures:

- The programme of long-term implantable mechanical heart support - since 2014 it has been used in 10 patients with terminal heart failure. In 2021, a beating heart transported from Slovakia in a special Transmedics transport box was successfully transplanted for the first time. Without this system, transplantation would not be possible at all due to the travel time;
- Heart transplantation in children - a total of 30 paediatric patients have had transplants since the programme was introduced in 2014. To date the 5-year survival rate after transplantation is 93%;
- The programme for tracheoplasty for congenital trachea malformations in cooperation with the tracheal team of the MUH;
- The programme for the molecular and genetic examination of families with hereditary arrhythmias and cardiomyopathies using the new generation sequencing method (NGS) in cooperation with the Department of Biology and Medical Genetics (DBMG), 2nd Faculty of Medicine, Charles University and Motol University Hospital.
- The programme of minimally invasive cardiac surgery including vascular ring surgery using the thoracoscopic technique;
- The foetal intervention programme for congenital heart disease in collaboration with the Department of Pediatric Cardiology at the Kepler University Hospital in Linz.

#### Unique equipment:

- Thoratec CentriMag/PediVas centrifugal pump for short- and medium-term mechanical cardiac support;
- Ensite Precision 3D electrophysiology navigation and mapping system;
- A KIPS clinical information and planning system with related modules for catheterization (KatAp) and echocardiography (Echolog) connected to a KIS DKC.

### Major events in 2022:

- International symposium for the 45<sup>th</sup> anniversary of setting up the Children's Cardiac Centre: Prague Symposium on Congenital Heart Disease, Prague, Břevnov Monastery, 5.11.2022.
- Dissertation defence: MUDr. Ondřej Materna, PhD, MUDr. Jan Kovanda, PhD
- The department published 21 articles in international journals with an impact factor.
- **21 articles in international journals with an impact factor:**
  - **Jičínská D, Jičínský M, Koubský K.** Does COVID-19 pose a threat for patients after univentricular palliation? Thrombosis of the Fontan tunnel. *Cardiol Young*. 2022 Oct;32(10):1698-1700. doi: 10.1017/S1047951122000348. Epub 2022 Jan 28. PMID: 35086604; PMCID: PMC8861546. **IF 1.02**
  - Shin Ono, **Jan Janoušek**, Takeshi Ikegawa, Shun Kawai, Naka Saito, Heima Sakaguchi, Hideaki Ueda, Cardiac Resynchronization Therapy Using Single Site Left Ventricular Pacing in a Tricuspid Atresia Patient With Left Bundle Branch Block, *CJC Pediatric and Congenital Heart Disease*, Volume 1, Issue 2, 2022, Pages 94-97, ISSN 2772-8129. **IF 2.33**
  - **Materna O, Kovanda J, Tomek V.** Closure of coronary artery fistula using a piccolo occluder. *Rev Esp Cardiol (Engl Ed)*. 2022 Dec;75(12):1070-1071. English, Spanish. doi: 10.1016/j.rec.2022.02.007. Epub 2022 Apr 14. PMID: 35431145. **IF 6.97**
  - **Rubáčková Popelová J,** Tomková M, Tomek J, Živná R. Long-Term Survival of Adult Patients With Atrial Septal Defect With Regards to Defect Closure and Pulmonary Hypertension. *Front Cardiovasc Med*. 2022 Apr 28;9:867012. doi:10.3389/fcvm.2022.867012. PMID: 35571174; PMCID: PMC9095928. **IF 5.84**
  - **Koubský K, Kovanda J, Ložek M, Tomek V, Jičínský M, Gebauer R, Kubuš P, Janoušek J.** Multisite Pacing for Heart Failure Associated With Left Ventricular Apical Pacing in Congenital Heart Disease. *JACC Clin Electrophysiol*. 2022 Aug;8(8):1060-1064. doi: 10.1016/j.jacep.2022.03.016. Epub 2022 May 25. PMID:35637091. **IF 6.37**
  - Adla T, Kočí M, Suchánek V, Šalagovičová Z, Polovinčák M, Mikšík L, **Janoušek J,** Roček M. Clinical Question Influence on Radiation Dose of Cardiac CT Scan in Children. *Children (Basel)*. 2022 Aug 5;9(8):1172. doi: 10.3390/children9081172. PMID: 36010062; PMCID: PMC9406619. **IF 2.83**
  - Václav Chaloupecký, Roman Gebauer, Jan Kovanda, Karel Koubský, Ioana Sus, Jan Janoušek. Electrophysiology and surgery intertwined in complex treatment of Ebstein's anomaly in childhood, *HeartRhythmCaseReports*, 2022, ISSN2214-271, <https://doi.org/10.1016/j.hrcr.2022.09.014>. (<https://www.sciencedirect.com/science/article/pii/S2214027122001919>) **IF 5.24**
  - **Materna O,** Illinger V, **Jičínská D, Koubský K, Kovanda J, Ložek M, Tax P, Reich O, Chaloupecký V, Janoušek J.** *Cardiol Young*. 2022 Jul;32(7):1021-1026. doi:10.1017/S1047951121003516. Epub 2021 Aug 31. PMID: 34462027. **IF 0.87**
  - Illinger V, **Materna O,** Slabý K, **Jičínská D, Kovanda J, Koubský K,** Pokorný J, Procházka M, Antonová P, Hoskovec A, Radvanský J, **Chaloupecký V, Janoušek J.** Exercise capacity after total cavopulmonary anastomosis: a longitudinal paediatric and adult study. *ESC Heart Fail*. 2022 Feb;9(1):337-344. doi:10.1002/ehf2.13747. Epub 2021 Dec 10. PMID: 34894102; PMCID: PMC8788045. **IF 3.20**

- **Chaloupecký V, Jičínská D, Tomek V, Materna O, Gebauer R, Poruban R,** Antonová P, Adla T, Štefánek M, Illinger V, Kotaška K, **Janoušek J.** Impact of liver fibrosis and nodules formation on hemodynamics in young adults after total cavopulmonary connection. A magnetic resonance study. *Front Cardiovasc Med*. 2022 Sep 29;9:986653. doi: 10.3389/fcvm.2022.986653. PMID: 36247450; PMCID: PMC9558211. **IF 5.05**
- Antonová P, Rohn V, **Chaloupecký V,** Simkova I, Kaldararova M, Zeman J, **Popelova J,** Havova M, **Janousek J.** Predictors of mortality after atrial correction of transposition of the great arteries. *Heart*. 2022 Nov 10;108(23):1881-1886. doi: 10.1136/heartjnl-2021-320035. PMID: 35851319. **IF 5.99**
- Fabian O, Havova M, **Gebauer R, Poruban R,** Spatenka J, Burkert J, Rohn V, **Chaloupecký V,** Komarek A, Kala T, **Janousek J.** Structural Integrity and Cellular Viability of Cryopreserved Allograft Heart Valves in Right Ventricular Outflow Tract Reconstruction: Correlation of Histopathological Changes with Donor Characteristics and Preservation Times. *Braz J Cardiovasc Surg*. 2022 Oct 8;37(5):639-47. doi: 10.21470/1678-9741-2020-0710. PMID: 35072402; PMCID:PMC9670335. **IF 1.07**
- van Nisselrooij AEL, Moon-Grady AJ, Wacker-Gussmann A, **Tomek V,** Malčić I, Grzyb A, Pavlova A, Kazamia K, Thakur V, Sinkovskaya E, Ten Harkel ADJ, Haak MC. The aorto-left ventricular tunnel from a fetal perspective: Original case series and literature review. *Prenat Diagn*. 2022 Feb;42(2):267-277. doi: 10.1002/pd.6090. Epub 2022 Jan 22. PMID: 35018638; PMCID: PMC9303731. **IF 3.24**
- **Materna O, Kovanda J, Tomek V.** Closure of coronary artery fistula using Piccolo occluder. *Rev Esp Cardiol (Engl Ed)*. 2022 Dec;75(12):1070-1071. English, Spanish. doi: 10.1016/j.rec.2022.02.007. Epub 2022 Apr 14. PMID: 35431145. **IF 6.97**
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## Department of Paediatric Psychiatry, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - prof. MUDr. Michal Hrdlička, CSc.

Senior Consultant - doc. MUDr. Iva Dudová, Ph.D.

Head Nurse - Radka Raisová

### Basic description:

The Child Psychiatric Clinic is the only independent clinical workplace in the field of child and adolescent psychiatry in the CR. It is engaged in the diagnosis, treatment and prevention of mental health disorders in childhood and adolescence. It specializes in disorders on the autistic spectrum, eating disorders, psychotic disorders, and suicidal behaviour in children and adolescents. The department also operates as a pre- and postgraduate educational institution.

**In 2022, the total number of hospital admissions was 548, of which 292 were acute. There were roughly 1,700 psychiatric consultations for adults and 660 consultations in the paediatric inpatient wards. At the Dept. of Urgent Paediatric Admissions and Medical First Aid Service (MFAS) there were nearly 1,000 children who underwent an acute psychiatric examination. There were approximately 5,300 examinations of paediatric and adult outpatients.**

In recent years, there has been a significant increase in the number of children and adolescents admitted following attempted suicide (2020 - 79; 2021 - 131; 2022 - 180) and with serious self-harm issues (2020 - 142; 2021 - 299; 2022 - 354), and the proportion of patients admitted with a combination of suicidal behaviour and self-harm is increasing (2020 - 34; 2021 - 106; 2022 - 144).

### Specialized outpatient units and centres:

- outpatient unit for child psychiatry
- outpatient unit for eating disorders
- family centre - centre for family therapy

### New methods and procedures:

- Use of the Autism Diagnostic Observation Schedule (ADOS) as the gold standard method for diagnosing autism spectrum disorders;
- Research on maternal autoantibodies and their effect on the development of autism spectrum disorders;
- Comprehensive therapy and research of eating disorders - the department's activities have national significance in this field.
- The significance of diagnostics and comprehensive therapy of psychotic conditions also exceeds the regional level.

### Unique equipment:

- Thymatron DG device for electroconvulsive therapy

### Major events in 2022:

- Doc. MUDr. Iva Dudová, Ph.D. was appointed a member of the Working Group for Child and Adolescent Psychiatry at the MoH CR.
- The grant AZV NV 18-04-00085 "The Importance of Maternal Autoantibodies in the Development of Autism Spectrum Disorders" was completed - principal researcher Mgr. Martin Balaščík, Ph.D., Dept. of Molecular Biology, Institute of Physiology of the CAS, co-investigator doc. MUDr. Iva Dudová, Ph. D.

## Department of Paediatric Haematology and Oncology, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - doc. MUDr. Lucie Šrámková Ph.D.

Senior consultant - MUDr. Petra Keslová Ph.D.

Head Nurse - Bc. Jitka Wintnerová

### Basic description:

The department focuses on diagnostics, treatment and research of tumorous diseases in children, benign blood disorders, such as anemias, bleeding disorders and congenital coagulation disorders (haemophilia). Allogeneic and autologous transplantation of hemopoietic stem cells in the treatment of high-risk leukemias, selected solid tumors, congenital immunity disorders and metabolic defects is carried out at the transplantation unit.

The clinic is the largest of its kind in the Czech Republic (CR), caring for approximately 2/3 of paediatric haematology and oncology patients in the CR, either completely or by sharing with other centres. It provides consular examinations of patients for Bohemia and, in the framework of certain diagnoses and medical procedures, for the entire Czech Republic and for other countries (Slovakia, Croatia, Poland...).

**In 2022, there were 19,432 examinations and treatments made in outpatient clinics. A total of 2,636 cancer patients and 2,856 non-cancer patients were treated. The total number of hospitalized patients was 1,977 with 1,684 accompanying persons.**

**200 children with malign solid tumours, 58 children with leukemia and myelodysplastic syndrome, 156 patients with benign tumours and 436 children with non-tumorous diseases were newly diagnosed. A total of 32 allogeneic hematopoietic stem cell transplantations were carried out, of which 24 were from unrelated donors from registries, 7 from sibling donors, 1 haploidentical transplantation and 25 autologous grafts.**

#### **Specialized outpatient units:**

- oncology outpatient unit and daycare centre
- outpatient unit for late consequences
- outpatient unit for hemangiomas and lymphangiomas
- neuro-oncology outpatient unit
- outpatient unit for Langerhans cell histiocytosis
- haematologic outpatient unit
- haematologic daycare centre
- outpatient unit for congenital coagulation defects and bleeding disorders
- outpatient unit for patients after bone marrow transplantation
- outpatient unit for palliative care

#### **New methods and procedures**

- The Paediatric Neuro-oncology Centre (in cooperation with the Neurosurgery Clinic and other MUH departments) provided a full range of cutting-edge comprehensive diagnostics and treatment for children with CNS tumours. In 2022 there were 79 children from the CR and other countries (Slovakia, Poland, Croatia, Saudi Arabia) that were diagnosed and/or treated with CNS cancer.
- A new study was opened to treat high-risk neuroblastoma (HR NBL2), including the introduction of new diagnostic molecular genetic methods for this tumour.
- Three more international studies were opened for the treatment of acute promyelocytic leukaemia, renal tumours and recurrent or refractory solid tumours.
- The DPHO took in 52 Ukrainian paediatric cancer patients with refugee status.
- The DPHO Psychosocial Team initiated coordinated activities aimed at improving and coordinating psychological and social support for paediatric cancer patients and their families, including Ukrainian refugees (paediatric patients and their accompanying persons)
- We have joined the Severe Chronic Neutropenia International Registry (SCNIR), the DPHO is the national coordinator of the registry

#### **Major events in 2022:**

- *Awards*
  - Prof. MUDr. Jan Starý DrSc - Laureate of the Neuron Award 2022 in the field of medicine for a lifetime contribution to science
  - Prof. MUDr. Tomáš Kalina PhD - "Joseph T. Trotter Leader in Cytometry Technology" award at the CYTO 2022 conference in Philadelphia, USA from the International Society for the Advancement of Cytometry
  - Doc. MUDr. Eva Froňková PhD, MUDr. Michal Svatoň PhD - the Minister of Health Award for Medical Research and Development for co-supervising the project New Prognostic and Predictive Indicators in Patients with Mantle Cell Lymphoma at Diagnosis and During Treatment
  - MUDr. Barbora Vákrmanová PhD - Vlasta Adamová Award for outstanding work in the field of oncology and haematology in 2021
- Prof. MUDr. Jan Starý DrSc - Honorary Recognition by the Minister of Health for Medical Research and Development in 2022 for the project Biology and Immunopathology of Bone Marrow Failure and Combined Autoimmune Cytopenia, co-researchers MUDr. Ester Mejstříková PhD, Doc. MUDr. Eva Froňková PhD, MUDr. Michal Svatoň PhD, MUDr. Michaela Reiterová PhD (all DPHO)
- *Publications*  
74 articles in journals with an IF, **total IF 1,023** (of which 18 first or last author).

#### **Department of Paediatric Surgery, 2nd Faculty of Medicine, Charles University and Motol University Hospital**

*Head - prof. MUDr. Michal Rygl, Ph.D.*

*Senior Consultant - MUDr. Luboš Zeman,*

*Head Nurse - Ilona Mayerová*

#### **Basic description:**

The Department of Paediatric Surgery is a leading European site for paediatric surgery, providing comprehensive diagnostic and therapeutic care for children from immature newborns to adolescents. The department's specializations (surgery for newborns, chest surgery, surgical oncology, proctology, urology, surgery of liver and bile ducts, congenital developmental defects and polytraumas in children) provide care for young patients from the entire CR and for patients from abroad via medical consultation.

The Department of Paediatric Surgery has the highest accreditation for specialisation training in the field of paediatric surgery in the CR and is the only department in the CR with European UEMS accreditation for specialization training in paediatric surgery. Since 2022, the Department of Paediatric Surgery has been a centre for highly specialized care in the European network for rare diseases ERNICA.

**A total of 2,959 patients were hospitalized at the department, of which 216 newborns and infants were hospitalized at the surgical intensive care unit for newborns in 2022. Surgeries were performed on 2,125 children. Specialized outpatient units treated 18,856 children and the emergency service provided care for 6,344 children.**

#### **Specialized outpatient units:**

- chest surgery
- surgery of liver, bile ducts and pancreas
- surgery for newborns, congenital developmental defects
- urology
- proctology
- paediatrics
- advisory centre for home parenteral nutrition
- prenatal consultations
- ostomy consultation

#### **New methods and procedures:**

- “Nursing - wash-out” in patients with Hirschsprung's disease
- Primary laparoscopic procedures in patients with Hirschsprung's disease
- Laparoscopic surgery for anorectal atresia
- Single port ureteronephrectomy
- Urethroplasty of sub-coronary hypospadias according to Maceda
- ERAS in paediatric surgery
- KEDA in post-operative care, including newborns
- Nursing programme “Wound Healing in Children”

#### **Unique equipment:**

- audiovisual equipment for the operating theatre - online conferences
- Karl Storz flexible fibrescope for ureteroscopy in children
- a set of mini surgical instruments for thoracoscopic and laparoscopic operations on the smallest children (newborns, infants)
- equipment for minimally invasive surgery with 3D imaging (B. Braun)
- Duet Encompass device - modern video equipment for urology and EMG of the pelvic floor with simultaneous interconnection to X-ray devices
- cystoscope with endoresector for the smallest children allowing minimally invasive surgery in small children (by Olympus/ Wolf)
- mobile pumps for children using home parenteral nutrition (by B. Braun)
- mobile pumps for home enteral nutrition (by Nutricie) laparoscopic simulators for training and simulating minimally invasive operations

#### **Major events in 2022:**

- The Department of Paediatric Surgery co-organized the 7<sup>th</sup> World Congress of Paediatric Surgery of the World Federation of Associations of Paediatric Surgeons (WOFAPS) in Prague
- The Department of Paediatric Surgery held the 33<sup>rd</sup> annual meeting of paediatric urologists and nephrologists in Milovy

- Prof. MUDr. Jiří Šnajdauf, DrSc., was awarded the Gold Medal of Charles University for lifetime achievement in the field of paediatric surgery and for his many years of scientific and pedagogical activity at Charles University
- Prof. Richard Škába CSc. and Prof. MUDr. Jiří Šnajdauf, DrSc. received the prestigious Lifetime Achievements Awards from the World Federation of Associations of Pediatric Surgeons for their lifetime contribution to the field of paediatric surgery
- MUDr. Natalie Polívka won the award for the best publication in the journal “*Rozhledy v chirurgii*” (Perspectives in Surgery)

#### *Educational and publishing activities:*

- 6 publications in a journal with IF
- 3 publications in a Czech magazine
- 71 expert lectures

### **Department of Paediatric Neurology, 2nd Faculty of Medicine, Charles University and Motol University Hospital**

*Head - prof. MUDr. Pavel Kršek, Ph.D.*

*Senior Consultant - MUDr. Věra Sebroňová*

*Head Nurse - Gabriela Pavlová*

#### **Basic description:**

The Department of Paediatric Neurology (DPN) is a reference consultation site for all neurological diagnoses in children throughout the CR and provides care for patients from abroad in certain diagnostic and therapeutic programmes (such as surgical treatment of epilepsy). We have two fully reconstructed inpatient units with a total of 40 bed, including 6 beds for lower level of intensive care and 6 beds with video/EEG and polygraphic monitoring. The department includes a polyclinic with the following specialized outpatient units, a fully equipped Electrophysiology Laboratory and a Neurogenetics Laboratory offering molecular genetic diagnostics for some neurological diseases of childhood. The DPN is also a pregraduate and postgraduate educational institute and a scientific and research centre involved in many interdisciplinary and international projects.

**In 2022, the department had a total of 1,142 hospitalized children with total hospitalization accounts coming to 1,461. A total of 18,408 outpatient examinations were performed on 7,687 patients (unique personal ID numbers). A total of 5,375 procedures were performed in the electrophysiological laboratory, of which 3,172 were EEG, 446 were EMG, 1,424 were EP and 213 were long-term video/EEG (with a total of 1,016 8-hour codes) and 120 polygraphs. The epilepsy surgery programme included 28 resection surgeries, 5 long-term intracranial video/EEG studies, 2 direct implantations and 2 vagal stimulator reimplantations. Neurogenetic laboratory: 571 samples received (unique personal ID numbers), 140x exome sequencing, 326x targeted conventional sequencing, 142x MLPA testing.**

### Specialized outpatient units:

- epileptological advisory centre
- outpatient unit for sleep disorders in children
- outpatient unit for high-risk newborns and infants
- advisory centre for neuromuscular diseases
- outpatient unit for botulinum toxin application
- advisory centre for neurocutaneous disorders
- advisory centre for inflammatory and demyelinating diseases
- neuro-oncology outpatient unit
- neuro-genetic outpatient unit
- outpatient unit for hereditary neurometabolic and neurodegenerative diseases
- psychological and neuropsychological advisory centre

### Centres with international certification:

- ERN for rare and complex epilepsies (ERN EpiCARE)
- ERN for rare neuromuscular diseases (ERN NMD)
- Centre for hereditary ataxias (under ERN RND)

### Centres recognized by the Ministry of Health CR/Czech Medical Association of J. E. Purkyně/other:

- Centre for highly specialized care for pharmacoresistant epilepsies
- Centre for sleep disorders in children
- Neuromuscular centre for paediatric patients
- Centre for highly specialized care for multiple sclerosis and neuromyelitis optica  
Epilepsy Research Centre Prague (EpiReC) - a consortium of the 2<sup>nd</sup> FM CU, the MUH, the Czech Academy of Sciences and the Czech Technical University

### New methods and procedures:

- Pilot project to screen newborns for spinal muscular atrophy (SMA) and severe combined immunodeficiency (SCID);
- A new clinical trial of an experimental treatment for children with Duchenne muscular dystrophy (exon 51 skipping);
- New methods introduced by the DPN Neurogenetics Laboratory (genomic DNA sequencing from blood; exome DNA sequencing from brain tissue samples collected during epilepsy surgery; flexible Sanger sequencing range (accreditation obtained); analysis of selected pathogenic repeat sequence expansions from massively parallel sequencing data (using the ExpansionHunter method).

### Unique equipment:

- MagCore flexible nucleic acid isolator

### Major events in 2022:

- MUH Creative Achievement for Doc. Jana Haberlova (“Introduction of Newborn Screening and Presymptomatic Treatment of Spinal Muscular Atrophy and Severe Combined Immunodeficiency (SCID) in the Czech Republic”);

- Honorary Medal from the Czech Medical Association of J. E. Purkyně (CzMA) for MUDr. Josef Kraus, CSc.;
- Epilepsia Open magazine award for MUDr. Barbora Straka, Ph.D.;
- Successful habilitation: MUDr. Dana Šafka Brožková, Ph.D.;
- Successful defence of PhD: MUDr. Hana Halmová (supervisor Dr. Zuzana Libá);
- Two new European grants from the Neuromuscular Centre: COST project (Delivery of Antisense RNA Therapeutics CA 17103), VISION DMD (development of a new type of anti-inflammatory drug for DMD);
- New grant projects for the Neurogenetics Laboratory: AZV NU22-04-00097 “Elucidation of the Causes of Neurogenetic Diseases Using the Latest Genomic Methods” (principal researcher: Doc. Šafka Brožková), NPO LX22NPO5107 “Neurodegeneration and Its Etiopathogenesis” (National Institute for Neurological Research).

### Department of ENT, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - Doc. MUDr. Zdeněk Čada, Ph.D.

Senior Consultant - MUDr. Petra Dytrych, Ph.D.

Head Nurse - Adriana Laudátová

### Basic description:

The facility focuses on diagnostics and conservative and surgical treatment of ENT diseases in paediatric patients from birth to 18 years of age. The department operates as a medical consultation facility, providing care for children with poorly diagnosable or treatable diseases from all over the CR. The Centre for Cochlear Implants for Children (CCIC) operates within the phoniatic part of the department. The department arranges surgeries on newborns with facial cleft with interdisciplinary cooperation as one of the two facilities of this kind in the CR. The facility is part of the laryngotracheal centre at MUH and holds the title of Implantation Centre 2 at MUH.

**In 2022, a total of 2,517 operations were performed and 4,009 patients were admitted. Compared to the reference year of 2019, the number of hospital admissions increased by 23%, the number of outpatient procedures by 70%, and the number of operations by 17%.**

The **Department of Phoniatics and the Centre for Cochlear Implants in Children** is part of the department. The departmental head is MUDr. Zdenka Aksenova, Ph.D. At the department, we not only perform diagnostics, but also provide aftercare and rehabilitation. The department focuses mainly on nationwide care for patients with severe hearing impairment. The CCIC arranges examination of children, prosthetic care (prior to implantation) with the subsequent rehabilitation (even after implantation). Apart from physicians and clinical speech therapists, clinical psychologists from the MUH Department of Clinical Psychology and clinical engineers (AWA) took part in the work of the CCIC.

**In 2022, a total of 1,894 examinations were performed in the outpatient clinics of phoniaticists and 2,765 examinations were performed in the outpatient clinics of clinical speech therapists.**

**Specialized outpatient units:**

- otosurgical outpatient unit
- audiology outpatient unit
- outpatient unit assessing candidates for cochlear implants and rehabilitation centre after cochlear implantation and after bone conduction implantation (BCI)
- outpatient unit for addressing developmental defects in the neck and head
- outpatient unit for monitoring nodular swelling
- phoniatics outpatient unit
- thyroidology outpatient unit
- outpatient unit for treating lymphangiomas and hemangiomas of the head and neck
- outpatient unit for GERD diagnostics
- somnology outpatient unit
- outpatient unit of plastic surgery

**New methods and procedures:**

- **Synapsys VHIT Evolution** - SY.VHITIII\_EVOLUTION A device for measuring the vestibular system using the vHIT Ulmer method in young children (this version allows complete examination of all 6 semicircular canals).
- **ICS Impulse Mono. Ocu. Ltd.**, Lateral Head Imp, LARP/RALP Head Imp, Mono. Pos., Tors. A device for examining the vestibular system by the vHIT method using glasses - includes all examination modules (video frenzel, oculomotor limited, Lateral Head Impulse, LARP/RALP Head Impulse, monocular positional, torsional module).
- Lumify Phillips diagnostic ultrasound system - portable ultrasound device
- Samoa Lite Screening System - sleep monitoring in apneics (PSG)
- Karl Storz all in one mobile ENT unit - flexible endoscope
- Karl Storz ENT mobile unit - flexible video laryngoscope
- introduction of a complete electronic ordering system - operation book

**Unique equipment:**

- plasma generator - plasma coblation
- Aeris balloon catheter - used for gentler dilation of stenosis of the respiratory tract in children
- 24h pH impedancemetr
- micro instruments for laryngeal surgery in children
- micro instruments for FESS in children
- Maico MI 34 high-frequency tympanometer
- Neo Laser with microfibre
- Bien-Air high-revolution bone cutter
- cochleaScann based on DPOAE - new objective audiometry technology
- wireless unit for perioperative measurement of impedance and NRT in perioperative measurement of the CI function, second generation
- harmonic scalpel - gently tissue preparation, UZ principle, low temperatures
- EndoCameleon - optics with variable angle

- shaver - microdebrider, technique suitable in laryngeal microsurgery and rhinology
- three-channel perioperative monitor of peripheral nerves NeuroStim 3
- VEMP module
  - Lumify Phillips diagnostic ultrasound system - portable ultrasound device
  - Synapsys VHIT Evolution
  - ICS Impulse Mono. Ocu. Ltd.
- Samoa Lite screening system - sleep monitoring in apneics (PSG)

**Major events in 2022:**

- On 19.10.2022, Doc. MUDr. Zdeněk Čada, Ph.D. implanted an auditory stem implant at the Ear, Nose and Throat Clinic of the 2nd Faculty of Medicine, Charles University and Motol University Hospital This was the first paediatric patient to be treated thus in the Czech Republic. The surgery was performed in collaboration with the Neurosurgery Clinic for Children and Adults of the 2nd Faculty of Medicine, Charles University and Motol University Hospital and was preceded by a year of preparations. Six weeks after surgery, the speech processor was successfully set and the patient is undergoing regular rehabilitation. This unique event was presented in the Czech media.
- Two doctors successfully completed their specialty training in the field of "Paediatric Otorhinolaryngology", two doctors successfully passed the ENT basics exam;
- Increase in the number of Ph.D. student supervisors; Increase in the number of PhD students by 4 new ones;
- AHR grant submission; 4x CUGA submissions;
- Continued publication in IF journals;
- Finalizing the book: "Balance Disorders in Childhood";
- Finalization of multicentre studies in the framework of Medel, AB, Cochlear;
- Active, invited participation in international conferences.

## Paediatric Department 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - Prof. MUDr. Zdeněk Šumník, Ph.D.

Senior Consultant - MUDr. Jana Tejnická, MBA

Head Nurse - Mgr. Jana Boháčová

### Basic description:

The Department of Paediatrics provides diagnostics, treatment and follow-up care for paediatric patients from various places in the Czech Republic in almost all internal medicine specializations. **A total of 5,389 patients were hospitalized and 40,981 outpatient examinations were carried out at the department during 2022. 5 patients successfully underwent a kidney transplant.**

### Specialized outpatient units:

The department's inpatient section has 6 specialized stations and a workplace for elimination methods. In the department's outpatient section, there are 21 specialized workplaces, including outpatient clinics for children following organ transplants.

### New methods and procedures:

- The Nephrology Work Group provides comprehensive care for children with kidney failure and other nephrological diseases. It cares for 21 patients on home peritoneal dialysis (the only facility in the CR that also treats infants). It provides paediatric and adult patients with elimination methods - plasmapheresis, immunoabsorption, etc.
- The pneumology team is the only facility in the CR to be dedicated to the diagnosis and treatment of patients with primary ciliary dyskinesia. It also cares for children on home non-invasive pulmonary ventilation - mostly patients with severe neurological problems (SMA). It provides endoscopic examinations for the entire paediatric section of the hospital (including newborns). It provides very demanding care for 175 patients with cystic fibrosis, 110 children are treated with the highly effective modulator therapy.
- The gastroenterological team successfully continues its intensive endoscopic programme, including the introduction of percutaneous endoscopic gastrostomy in combination with a jejunal tube (PEG-J), it carries out endoscopic balloon dilatation for oesophageal strictures.

New therapeutic agents have been introduced in the treatment of patients with IBD. The team also cares for 9 patients using home parenteral nutrition. It was the only facility in the CR to initiate a new method to treat 6 paediatric patients with short bowel syndrome with Revestive. The team referred 3 patients for liver transplantation, which were successfully carried out.

- In 2022, the diabetes and endocrinology team successfully continued in introducing new technology in the treatment of patients with type 1 diabetes - insulin pump deployment based on a semi-closed automatic insulin delivery system. In the SWEET Comparison of Centres of Excellence for the Treatment of Childhood Diabetes, this facility was among the top 3 centres in the world in 2022! This working group has been very successful in dealing with the issue of bone metabolism disorders in children, and has included a new medicamentous procedure in the treatment of indicated cases.
- Over the year the intensive care unit continued admitting patients with multi-organ failure. These patients required non-invasive ALV, elimination methods, etc. Many children with severe necrotizing pneumonia (on chest drainage), renal failure, liver failure, heart failure, etc. have passed through the workplace. Children were also admitted to this department following extensive spondylosis surgery and other surgical interventions.

### Unique equipment:

- The gastroenterology and pneumology team is currently equipped with the latest technology, including endoscopes for examining children in the lowest weight categories. The gastroenterology team acquired a sonography machine to investigate patients with IBD and a high-resolution manometer to investigate patients with bowel motility disorders. The Paediatric Clinic is the only paediatric department in the CR equipped with a simulator for endoscopic operations in the field of gastroenterology and pneumology

### Major events in 2022:

- All of the above working groups have actively participated in a number of international projects focused on their particular areas of expertise. The teams are part of the European Reference Networks (ERN). They also continued intensive international scientific cooperation in the framework of multicentre projects. The clinic's staff have published a number of original works in both international and Czech literature. The clinic's young doctors have received a number of important foreign and domestic awards for their research and publication activities.



## Common Inpatient Sites of Paediatric and Adult Sections

### Department of Anesthesiology, Resuscitation and Intensive Medicine, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head – doc. MUDr. Tomáš Vymazal, Ph.D., MHA

Senior Consultant for the adult section - MUDr. Radka Klozová

Senior Consultant for the children's section MUDr. - Jana Pavlíčková

Head Nurse for the adult section - Taťána Maňasová

Head Nurse for the children's section - Mgr. Ing. Lenka Malíková, MBA

#### Basic description:

The department provides anaesthesiology and resuscitation care in the paediatric and adult parts of the hospital in accordance with the needs and requirements of the MUH. As regards the number of physicians and other employees, as well as the extent of medical activities provided, our department is the largest facility of its kind in the CR. The department ensures specialized care for medical facilities of a lower level throughout the CR upon request. It is the managing and coordinating facility for postgraduate education of physicians and nurses and ensures tuition for anesthesiologists and physicians with other specializations. The facility has been repeatedly granted type II accreditation. The departmental head holds the position of Chairman of the Accreditation Commission at the MoH CR and Head of the AIM Department at the Institute for Postgraduate Medical Education (IPME). DARICM provides tuition to students of medicine and students in bachelor's programmes at the 2<sup>nd</sup> FM CU in the range of more than 1,200 hours/year and in the framework of IFMSA and ERASMUS international educational and research projects.

**In 2022, 1,298 patients requiring resuscitation care were admitted to the clinic's acute beds, of whom 656 were adults and 642 were children. In 2022, the FIC/LINC department admitted 96 patients. In 2022, anaesthesia was administered to 37,952 patients, of which 12,397 were children. ECMO support was provided to nearly 90 critically ill patients, and anaesthesia and intensive care was provided to 54 patients as part of the national lung transplant programme. 170 children received one type of long-term peripheral vascular access, making our department a leader in the Czech and Slovak Republics.**

#### New methods and procedures:

- In 2022, the MUH ECMO centre for adult and paediatric patients was significantly strengthened, and the establishment of an ECLS centre with registration in the European database was initiated.
- Discussion initiated at the level of the MoH on setting up a mobile ECMO team, expanded cooperation with the Prague Ambulance Service.
- Introduction of emergency thoracotomy procedures in the primary treatment of severe thoracic trauma, including organizing educational courses.

- Thanks to the unique platelet function analyser (PFA) - part of the robust implant research - this service is provided to all MUH departments.
- Simulation Medicine Laboratory - we train doctors and nurses at the MUH and organize elective courses for undergraduate students; in 2022 the laboratory was expanded with additional high-fidelity models.
- In 2022, 170 long-term paediatric peripheral catheters - PICC - were introduced, making our clinic one of the leaders in this field, not only in the CR but also in Slovakia.
- In cooperation with the Department of Surgery of the 2nd Faculty of Medicine, Charles University and Motol University Hospital, it set up the consistent application of ERAS procedures in large abdominal procedures with a clear impact on the quality of hospital admissions including publication of the results in the form of papers and workshops;
- In 2022, a record 54 lung transplant patients were admitted to DARICM, virtually all with organ-supported ECMO and no 30-day mortality.
- Extended application of regional anaesthesia with routine use of sonographic navigation.
- Routine use of the Target Temperature Management technology - targeted cooling in patients after circulation failure;
- Routine bedside coagulation examination – TEG, ROTEM for early diagnosis of coagulopathy, changes in the management of bleeding disorders with significant savings of blood derivatives; financial savings in hundreds of thousands CZK per year, procedures also implemented in the internal rules of the MUH;
- Ongoing modernization of the equipment in anaesthesiology theatres, including the use of the latest anaesthetics;
- Use of sonography for early diagnosis of bleeding into cavities in traumatized patients;
- Use of the latest video laryngoscopic techniques in the case of difficult intubation, including disposable intubation aids and instruments;
- Use of combined neuroaxial blocks in large joint replacements (hip, knee), including training for staff at specialized facilities;
- Use of peripheral blocks in US navigated paediatric and adult patients;
- Routine use of the available reliable reversal of the neuromuscular block following anaesthesia;
- Use of non-invasive ventilation techniques in the treatment of respiratory insufficiency in children and adults;
- Routine monitoring of cerebral oximetry and brain perfusion during surgeries on children and adults not only in the case of extracorporeal circulation using deep hypothermia;
- Comprehensive treatment protocol for the management of diastolic heart failure.

#### Major events in 2022:

- DARICM's paediatric inpatient section celebrated its 50<sup>th</sup> anniversary. There was a celebratory series of lectures.
- All CRRT (continuous renal replacement therapy) technologies are becoming part of routine therapy in the paediatric resuscitation unit.

- At the end of the year, a comprehensive ECLS centre registered in the European database was set up.
- DARICM has 2 ongoing grants (TAČR and MUH), 2 local academic studies (both approved by the Ethics Committee of MUH) and 3 multicentre international studies organized by the ESA (European Society of Anaesthesiology).
- 1 doctor appointed as a professor;
- 1 doctor defended their dissertation;
- Organizing pre-attestation and the core course including the relevant examinations.
- 3 monographs published, one of them awarded the Kalendova Prize as the best publication in the field.
- 26 original papers published in peer-reviewed (10) and impacted journals (16), one of which was awarded the Dvořáček Prize for the best original paper in a journal with an impact factor in the field.
- Upgraded university textbook for medics released, including English language version.

The clinic includes:

**A follow-up intensive care unit (FIC) and a long-term intensive nursing care unit (LINC)**

*Senior Consultant - MUDr. Kateřina Čadová*

*Head Nurse - Mgr. Soňa Hájková*

The workplace is one of the most modern in the country and provides medical and nursing services of the highest possible quality. The interest in admissions significantly exceeds the department's capabilities and capacity. **In 2022, the department admitted 96 patients.**

## Department of Rehabilitation and Sports Medicine, 2nd Faculty of Medicine, Charles University and Motol University Hospital

*Head - prof. PaedDr. Pavel Kolář, Ph.D.*

*Senior Consultant - MUDr. Martina Kövári, MHA (adult section)*

*Senior Physiotherapist - Kateřina Míková*

The department includes:

Department of Rehabilitation - Adult and Paediatric Section

Spinal Unit

Department of Sports Medicine

Department of Pain Research and Treatment

### 1. Department of Rehabilitation

*Senior Consultant - MUDr. Martina Kövári, MHA (adult section)*

*Senior Consultant - MUDr. Olga Dyrhonová (children's section)*

*Head Nurse - Hana Jirků*

#### Basic description:

The Department of Rehabilitation provides physiotherapy and therapeutic rehabilitation to adults and children across all medical fields. We provide care to outpatients (adults' and children's section) and hospitalized patients (at individual departments and units of the hospital's sections for adults and children). The clinic includes a section for acute inpatient rehabilitation care, both adult and paediatric.

**During 2022, a total of 422 patients were hospitalized in the clinic's adult inpatient section, 188 patients were hospitalized in the children's inpatient section, a total of 4,536 patients were treated in the outpatient section, and we provided rehabilitation care to 17,744 patients from other departments.**

#### Specifics of the facility:

Respiratory physiotherapy is one of the department's dominating activities. We are now gaining new experience in respiratory physiotherapy for patients with COVID-19, and in 2022 our adult inpatient unit also accepted patients with post-covid syndrome for rehabilitation. Additional specific procedures include treatment of spastic paresis (including applying botulinum toxin under sonographic or electrostimulation navigation), therapy of pelvic floor disorders, therapy of vestibular disorders, visceral rehabilitation, therapy and diagnosis of swallowing disorders, a lymphology programme and care of amputees.

The department also runs other special programmes, such as a specialized programme for adult and paediatric patients after surgery for congenital heart disease. Serious forms of cerebral palsy are then assessed at interdisciplinary seminars with a consultation character (for patients under 18 and separately for adults from the entire CR). We also collaborate with the neurology department in the framework of testing patients with SMA during Spinraza therapy, and help in providing comprehensive care for patients with ALS.

A diagnostic and therapeutic concept, Dynamic and Neuromuscular Stabilization (DNS), based on the principles of developmental kinesiology, was created at the department and put into practice. Professor Pavel Kolář, the head of the department is the founder of this concept. The facility is involved in lecturing on this concept in the CR and abroad.

Four years ago, a 16-bed acute rehabilitation ward for children was opened. The Kinesiology and Rehabilitation doctoral programme is also in its fourth year and several participants have already successfully completed their studies in this field.

#### **New methods and procedures:**

- The Conversation Group for adult patients with communication deficits led by clinical speech therapists is in its second year.
- A physiotherapy outpatient unit specializing in paediatric patients with respiratory problems, including patients with cystic fibrosis (CF), started its activity. A brochure focusing on physiotherapy for patients with cystic fibrosis was created. What's more, in cooperation with the Cystic Fibrosis Club, a series of videos was created for parents and patients with this disease. The videos focus on the topic of correct inhalation, respiratory handling in infants, suctioning and working with breathing simulators.
- A dynamic walkway with integrated pressure sensors and virtual feedback is used to examine and provide therapy for standing and walking disorders
- The therapy also includes the use of biofeedback devices for patients with faecal incontinence and the possibility of lending biofeedback devices for home therapy. There is a similar programme for children with pelvic floor disorders.
- The unique equipment also includes a Snoezelen room for multisensory therapy.
- With regard to the ongoing Covid-19 pandemic, the issue of pulmonary rehabilitation in patients with this disease was also elaborated.
- The newly purchased Mirror Box for Mirror Therapy is available. This technique helps patients with neurological diseases or patients that have had amputation and is used to improve the motor function of the upper limbs.

#### **Unique equipment:**

- OMNIHi5 - functional electrical stimulation of the upper limb
- The Simeox device in the children's section - for decongesting airways
- functional electrical stimulation to stimulate the n. peroneus in patients with "drop foot"
- dynamic path with integrated pressure sensors and virtual reality
- training machine for training hand function
- Balance Master device for therapy of stability disorders and vertigo conditions
- "X box" device and "Wii" system for training stability and coordination skills in children
- myofeedback and biofeedback for electrical stimulation of the pelvic floor muscles
- A sonographic device for navigating botulinum toxin application in the therapy of spastic patients with a high-frequency head and a shear-wave elastography probe
- a Dolosys pain tester

- a high-power laser, ZimmerOpton Pro 25W, for patients with complicated scars, tendinopathies, joint capsule inflammation or injuries (partial ruptures, joint distortions)

#### **Major events in 2022:**

- The first 3 successful PhD graduates in Kinesiology and Rehabilitation.
- Doc. MUDr. Kobesová was appointed Professor of Rehabilitation and Sports Medicine on 7.6.2022. She is also Vice-Dean of the 2<sup>nd</sup> FM CU for Physiotherapy and Doctoral Studies and was appointed a member of the Coordinating Board of Doctoral Studies in Biomedicine. She was appointed as an assessor for the National Accreditation Office for Higher Education.
- Professor Kolář likewise serves as Vice-Dean at the 2<sup>nd</sup> FM CU for faculty development.
- The clinic takes part in the Erasmus + international grant project Movement Activity Enhancement After the COVID19 Pandemics, project number: 2021-1-SK01-KA220-HED-000023008. We also participate in the Institutional Support from UK Cooperatio - Sport Sciences - Biomedical & Rehabilitation Medicine. Prof. Kobesová has been the Deputy Coordinator of the Board of this scientific area since 1.1.2022.
- Two conferences on Dynamic Neuromuscular Stabilization were organized in Prague and Brno under the auspices of the MUH and the 2<sup>nd</sup> FM CU.

#### **Publications**

- Sembera M, Busch A, **Kobesova A**, Hanychova B, Sulc J, **Kolar P**. Postural-respiratory function of the diaphragm assessed by M-mode ultrasonography. PLoS ONE 17(10): e0275389. <https://doi.org/10.1371/journal.pone.0275389> IF<sub>2021</sub>: 3.752 [Q2]
- Jacisko J, Ricci V, Mezian K, Güvener O, Cahng K, Kara M, **Kobesová A**, Özçakar L. Mnemonics and Metaphorical Videos for Detecting/Diagnosing Musculoskeletal Sonopathologies. Am J Phys Med Rehabil, 2022 Oct 11. doi: 10.1097/PHM.0000000000002119 IF<sub>2021</sub>: 3.412 [Q1]
- Madle K, Svoboda P, Stribny M, Novak J, **Kolar P**, Busch A, **Kobesova A**, **Bitnar P**. Abdominal wall tension increases using Dynamic Neuromuscular Stabilization principles in different postural positions. Musculoskeletal Science and Practice. 2022 Aug 14;62:102655(8):1172. doi: 10.1016/j.msksp.2022.102655. IF<sub>2021</sub>: 2.658 [Q2]
- Jacisko J, Ricci V, Mezian K, Güvener O, Cahng K, Kara M, **Kobesová A**, Özçakar L. Mnemonics and Metaphorical Videos for Detecting/Diagnosing Musculoskeletal Sonopathologies. American Am J Phys Med Rehabil. 2022 Aug 9. doi: 10.1097/PHM.0000000000002084. IF<sub>2021</sub>: 3.412 [Q1]
- Schuld C, Franz S, Schweidler J, **Kriz J**, **Hakova R**, Weidner N, Rudiger R, Nan L. Implementation of multilingual support of the European Multicenter Study about Spinal Cord Injury (EMSCI) ISNCSCI calculator. Spinal Cord 2022;60:37-44 IF<sub>2021</sub>: 2.473 [Q2]
- **Ulrichová, M.; Radvanský J.** *Eating disorders* In: Vařeková, Dařová, Nováková a kol. Žák se speciálními vzdělávacími potřebami v tělesné výchově. (A Pupil with Special Educational Needs in Physical Education.) 1<sup>st</sup> ed., Praha, Karolinum. 2022:149-158. ISBN 978-80-246-5281-8

## 2. Spinal Unit of the Department of Rehabilitation and Sports Medicine, 2<sup>nd</sup> Faculty of Medicine, Charles University and Motol University Hospital

Senior Consultant - Doc. MUDr. Jiří Kříž, Ph.D.

Head Nurse - Mgr. Hana Jirků

### Basic description:

The spinal unit ensures therapeutic and rehabilitation care for patients in post-acute stage after spinal injuries and for patients in the chronic stage after spinal injuries, who are experiencing serious health complications.

**In 2022, 66 patients with acute spinal lesion and 34 spinal patients at the chronic stage with acute complications were hospitalized, approx. 250 patients were treated in the outpatient unit as part of follow-up or due to newly developed health problems.**

### New methods and procedures:

- The first implantation of a spinal cord stimulator in the CR in a patient with a complete spinal cord lesion in cooperation with the Neurosurgery Clinic, subsequently a stimulator was implanted in a second patient;
- Successful completion of patient recruitment for the European study "Antibodies Against Nogo-A to Enhance Regeneration and Functional Recovery After Acute Spinal Cord Injury, a Multicentre European Clinical Proof of Concept Trial". H2020, PHC 15-2015;
- Baclofen pump implants were given to patients following spinal cord injury with severe spasticity in collaboration with the Neurosurgical Department for Children and Adults.
- Treatment of chronic skin defects with an amniotic membrane;
- Treatment of chronic neuropathic pain using medical cannabis;
- Continued work on the European project "European Multicenter Study about Spinal Cord Injury (EMSCI)". IFP 2001/P 66;
- In cooperation with the Paraple Centre, the project "Managing Sleep Apnoea in People with Spinal Cord Injury, Treatment Options with Oral Correctors" continued.
- In cooperation with FBMI CTU, the project "Designing and Developing a Method to Prevent Autonomic Dysreflexia in Individuals Following Spinal Cord Injury" continued

### Unique equipment:

- voice assistant for communicating with the surroundings and controlling equipment for patients with upper limb paralysis
- tablet and communicator for baclofen pump programming
- CoughAssist device for supporting cough in patients with neck spinal lesion (gift from the "Nadace Pohyb bez pomoci" foundation)
- Pony FX device for spirometry examination of lesions (gift from the "Nadace Pohyb bez pomoci" foundation)
- Misonic SonicOne device for removing necrotic material and devitalized tissue from skin defects (gift from the "Nadace Pohyb bez pomoci" foundation)

- Misonic SonicOne device for removing necrotic material and devitalized tissue from skin defects (gift from the "Nadace Pohyb bez pomoci" foundation)
- Finapres NOVA device for assessing defects of the autonomous nervous system (subsidy from the Ministry of Health, CR)
- ABPM device - pressure Holter monitor (gift from the "Nadace Pohyb bez pomoci" foundation)
- Conformat for a seated pressure map examination in individuals with spinal cord injury (donated by the "Pohyb bez pomoci" foundation)

### Major events in 2022:

- Co-organization of a day-long seminar to mark International Spinal Cord Injury Day, Paraple Centre, 5 September 2022
- ISCoS Meeting, 15-18th September 2022, Vancouver, Canada
- Hradilová I, Kříž J, Lukeš D. The sexual publication manual "Yes, we can!"
- Honzátková L, Kříž J. Obstructive sleep apnea management in people with spinal cord injury, treatment options by Mandibular Advancement Device (MAD)

## 3. Department of Pain Research and Treatment

Senior Consultant - Jiří Kozák, MD, Ph.D.

Head Nurse - Soňa Bašová

### Basic description:

The Department for Pain Research and Treatment (DPRT) has a multidisciplinary character in the care for chronic painful conditions. It is one of the 11 neuromodulation centres in the CR, a pregraduate and postgraduate teaching institution in pain management and neuromodulation techniques for IPME in pre-attestation courses, for teaching in the Master's programme of the Department of RHB and Sports Medicine. 2<sup>nd</sup> FM CU. The DPRT provides outpatient and inpatient care. The DPRT is a consultation facility for departments treating pain in the CR. Practical teaching in the field, cooperation with the IPME - internships.

**The number of outpatient treatments was 5,829, the number of patients admitted with chronic pain 79, the number of consultations 293, the number of single and continuous neuroaxial blockades 522 (epidural, caudal), peripheral local injections, n. blockades 498, radiofrequency operations 60. Number of neuromodulation procedures (SCS spinal cord stimulation and peripheral nerve stimulation): 17 in all - (direct implantation, replacement of generators, electrode modifications - inspection, system explantation).**

### New methods and procedures:

- Extension of radiofrequency methods and indications for RF (facet syndrome, nerve blocks, large joint areas of the upper and lower limbs)
- Nerve blocks guided by USG and neurostimulator;

- Pain testing using the Dolosys - Pain Tracker - study published; another type of study on volunteers is in preparation (Dr. Cerny);
- The neuromodulation programme continues: Peripheral nerve stimulation and spinal stimulation.
- The use of cannabis and the introduction of Methadone into pain pharmacotherapy;
- Applying Capsaicin pl. (Qutenza) in neuropathic pain and creating a new code in the List of Medical Procedures;
- Creating a new telemetry procedure during distance monitoring of neuromodulation-patients.

#### Unique equipment:

- Pain Tracker - Dolosys - a testing device for assessing the RIII reflex - pain tester
- radiofrequency generator - invasive pain treatment (thermolysis, pulsed RF)
- neurostimulator for detecting nerve structures and navigating invasions
- USG device for guiding targeted nerve and soft tissue blocks
- neurostimulation systems for implanting SCS and PNS and monitoring neuromodulation methods
- Pasha - a RF system non-coaxially tied to the inserted electrode

#### Major events in 2022:

- Postgraduate student in CLB, preparation of a publication with IF;
- Preparation of the reissue of the Methodological Guidelines for Pain Pharmacotherapy under the auspices of the professional society SSTP CzMA (co-editor doc. Kozák), to be published in 2023;
- Creating CHOPIN, a registry of neuromodulation methods - coordination of NM centres;
- Active participation - presentation at 3 scientific conferences in the CR in pain management.
- Co-organization of *Postgraduate Interventional Training* (Pain Management Centre (PMC) MUH + PMC FN KV + PMC FN Pilsen + IPME) organization of training courses + Cadaver Workshops with the practical application of interventional methods at the FNKV)
- 6. Prague Neuromodulation Day under the auspices of PMC and the RHB and Sports Medicine Clinics of the 2<sup>nd</sup> FM CU at the MUH (cinema hall) on 25.11. 2022. On 24 November, the first preconference was held attended by journalists and the public, where not only theoretical, but especially practical experience with neuromodulation techniques was presented.

#### 4. Department of Sports Medicine

Senior Consultant – doc. MUDr. Jiří Radvanský

Head Nurse - Hana Jirků

#### Basic description:

The Department of Sports Medicine is one of the department's outpatient units. It focuses mainly on functional diagnostics with at the regional level (in the case of congenital heart defects at the national level) and the subsequent mobility recommendations for patients from preschool children to seniors, targeted for example on patients with developed lifestyle diseases involving the metabolic syndrome or chronic respiratory diseases. The department conducts functional stress diagnostics of the circulatory system even in patients in wheelchairs using winch ergometry and spiroergometry, functional stress diagnostics as part of preoperative examinations before major elective and surgical procedures. The facility is the largest training centre for functional diagnostics under stress for the purposes of sports medicine and paediatric cardiac surgery in the country.

**In 2022, already significantly less affected by the Covid-19 pandemic, approximately 1,950 athletes were screened during sports check ups as were 2,250 patients with exertional complaints and pre-operative examinations. 410 patients underwent controlled movement therapy and we provided 4,100 interventions, including individually tailored movement therapy and dietary intervention, during this therapy.**

#### New methods and procedures:

- An outpatient unit was opened for female athletes with a relative lack of energy intake in sports.
- Determining the speed of blood flow in the aorta under stress in patients with coarctation of the aorta and stress changes in circulation parameters detectable by echocardiograph in other patients after surgical correction of congenital heart defects.
- The examination procedure and consultation for athletes after having had Covid-19 continued for the second year as part of the treatment and prevention activities.
- In collaboration with surgical clinics, we perform pre-rehabilitation in obese patients with hernia to improve wall strength and reduce visceral fat, and exercise therapy prior to hernia sac resection and abdominal wall reconstruction has been extended to selected poly-morbid patients.

#### Active participation at conferences:

- An interdisciplinary seminar Cardiovascular Rehabilitation and Physiotherapy of Patients with Congenital Heart Disease was held on 4-5 June 2022 in cooperation with the children's section of the rehabilitation clinic and the Children's Cardiac Centre. Apart from specialized physiotherapy, the participants received an overview of these patients' exercise regimens.

- “Longitudinal Development of Exercise Tolerance in Patients After Total Cavo-pulmonary Connection” was presented at the XXX<sup>th</sup> Annual Congress of the Czech Cardiological Society, Prague/Brno, and at the 23<sup>rd</sup> Symposium of the Working Group on Valvular and Congenital Heart Defects organized by the Czech Society of Cardiology, Hradec Králové
- Pathophysiology and Functional Fitness in Single Ventricle Circulation - the issue was published at the interdisciplinary seminar 4.-5.6.2022
- “Rehabilitation in CHD Using Mobile Apps” was presented at the ECG/ECHO course for pediatricians and paediatric cardiologists in Milovy in September 2022
- Conference of the Czech Society of Sports Medicine, Brno, “Pulse Wave Propagation Speed”

#### Publications

- Illinger, Vojtěch, et al. Exercise capacity after total cavo-pulmonary anastomosis: a longitudinal paediatric and adult study. *ESC HeartFailure*, 2022, 9.1: 337-344.
- Materna, O., Illinger, V., Jičínská, D., Koubský, K., Kovanda, J., Ložek, M., ... & Janoušek, J. (2022). Influence of fenestration on long-term Fontansurvival. *Cardiology in the Young*, 32(7), 1021-1026

### Department of Ophthalmology for Children and Adults, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - MUDr. Martin Hložánek, Ph.D., FEBO

Senior Consultant - MUDr. Milan Odehnal, MBA

Head Nurse - Jana Králíčková

#### Basic description:

The Department of Ophthalmology for Children and Adults provides comprehensive preventive diagnostics and therapeutic care to patients from birth to advanced age. In the field of paediatric ophthalmology, the clinic acts as a super-consultation centre in the region of the CR, providing consultation care to children and adults admitted to the MUH. The inpatient section is equipped with 25 beds. Part of the complement are operating theatres, organizationally falling under the Department of Central Operating Theatres, the outpatient clinics have operating theatres for minor surgical procedures and intravitreal injections. In 2022, the running of the department was affected by the replacement of windows in the MUH and the related relocation of the department's inpatient section for a period of 2 months, as well as the reconstruction of the internal areas of the adult outpatient unit, which moved to temporary premises for 5 months. In 2022, the department performed 1,107 surgeries (+2% yoy, vs 2019 +17%) and 533 minor procedures in the operating room (+17% yoy, vs 2019 +48%). Cataract surgery was the most frequent procedure (435) and surgery for strabismus (75) and examination under total anaesthesia (169). 711 patients were hospitalized in 2022.

**A total of 11,647 patients were examined in the paediatric outpatient unit (+24% yoy, vs 2019: +52%), 12,583 patients in the adult outpatient unit (+9% yoy, vs 2019: +9%) and 4,488 patients in the emergency department (+34% yoy, vs 2019: +6%). 2,163 examinations were made at the orthoptic clinics (+3% yoy, vs 2019: +29%). The clinic performed a total of 2,786 consultation examinations within the MUH (+1% yoy, vs 2019 -12%).**

#### Specialized outpatient units and counselling centres:

- orthoptic outpatient unit
- care centre for children with retinopathy in premature babies
- counselling centres for children and adults: strabological, glaucoma, cataract, oncological, vitreoretinal, diabetological, uveological, neuro-ophthalmological

#### New methods and procedures:

- Assessing retinal findings in uncooperative children using handheld, optical coherence tomography, especially in patients with retinoblastoma and retinopathy of prematurity;
- Intravitreal treatment (application to the vitreous body) in paediatric patients with retinal cancer (retinoblastoma) in collaboration with the Clinic of Imaging Methods and the Department of Paediatric Haematology and Oncology;
- Development of retinal and vitreous surgery using the stitchless technique 25g;
- Intravitreal biological therapy in children and adults;
- The introduction of new procedures and implants (PreserFlo, iStent, Onalen) into the spectrum of antiglaucoma surgery;
- Implanting toric intraocular lenses to correct astigmatism and introducing extended focus lenses during cataract surgery.

#### Unique equipment:

- OCT Envisu (Leica) - manual OCT (optical coherence tomography) for a detailed examination of individual retinal layers in uncooperative children and patients under general anaesthesia; the standard examination is performed in sitting position, so it cannot be used for patients under GA. It is the only device of its kind in the CR, it is mainly used in young children with retinoblastoma. The Národ dětem Foundation contributed 70% to the purchase of the device.

#### Major events in 2022:

- The internal premises of the outpatient ophthalmology unit for adults were completely rebuilt.
- Publication of the results from the Global Retinoblastoma Outcome Study (Lancet Global Health), data from the CR supplied by doc. MUDr. Pochop.
- MUDr. Kodetová's grant project was assessed to be one of the best by the grant agency - "exceptionally good" (GAUK, 907019, Use of Hydrogel Carriers of Chemotherapeutic Agents to Test Therapeutic Options in Retinoblastoma).
- MUDr. Kodetová, MUDr. Hložánek, MUDr. Kožner, were authors of papers in journals with a total IF of over 10.0.

- Several doctors from the department contributed to the publication of the book Children's Ophthalmology.
- MUDr. Odehnal is an expert guarantor of a research project from the Faculty of Physical Culture at the University of Olomouc on the effects of focusing attention on gait in children with visual impairment.
- Doc. MUDr. Pochop et al. successfully continue intravitreal chemotherapy in children with retinoblastoma, working on developing a hydrogel implant for the local depot effect of chemotherapy.
- Finalization of the results from the EuScreen study (MUDr. Hložánek part of the team), engaged in optimizing the screening for visual and hearing disorders in children within the EU.

### Department of Paediatric and Adult Orthopaedics and Traumatology, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - prof. MUDr. Vojtěch Havlas, Ph.D.

Senior Consultant - MUDr. Daniel Rybka

Head Nurse - Bc. Lucie Plocová

#### Basic description:

The department provides care in orthopaedics and traumatology for paediatric and adult patients not only within its region, but also throughout the CR through medical consultation. It is one of the few orthopaedic workplaces in the CR to cover the entire spectrum of orthopaedic and traumatological care.

**In 2022, a total of 1,522 children and 2,328 adult patients were admitted, which is 3,850 patients in all. 1,183 surgeries were performed on children and 2,277 on adult patients, which is 3,460 surgeries in total.**

**In the children's outpatient unit, 29,404 children were treated and 17,629 adults were treated in the outpatient unit for adults, i.e. 47,033 patients in total. The number of consultations in the children's section was 459, in the adult section 939, i.e. a total of 1,398 consultations.**

#### Specialized outpatient units:

- orthopaedic oncology outpatient unit
- scoliosis outpatient unit
- outpatient unit of sports traumatology for children and adults
- specialized outpatient unit for arthroscopic procedures
- outpatient unit for neurogenic defects
- outpatient unit for congenital skeleton defects
- outpatient unit for primary and revision endoprosthesis of the large joints
- outpatient unit for comprehensive surgeries of the shoulder joint

#### New methods and procedures:

- Utility model (36,430, 2022) and patent - Device and Kit for Preparing a Therapeutic Preparation Based On a Cell-seeded Carrier. Authors: Yuriy Petrenko, Irena Vacková, Vojtěch Havlas, Eliška Vavřínová. Owner: Institute of Physiology CAS, Institute of Experimental Medicine CAS, Charles University;
- Developing the use of magnesium implants in the treatment of fractures and osteotomies;
- Completion and publication of the results from a clinical study on the safety of stem cells in the treatment of chondral defects;
- Assessing a unique cohort of patients and publication of the results - the use of Magnezix magnesium implants in the treatment of chondral defects of the knee in children;
- National standards - replacement surgery of the anterior cruciate ligament in children with an open growth gap using a technique without disturbing the growth plate;
- The department is one of two high-volume centres in the CR for developing hip arthroscopy.
- Wider use of minimally invasive approaches to hip TEP implantation;
- Use of a new robotic navigation system for knee joint TEP implantation.

#### Unique equipment:

- 2 Canon Xario 100 Platinum and Xario 200 Platinum ultrasound machines. These are used for standard screening of hips in newborns and for specialized ultrasound examination and therapy of the locomotive system.
- SIMBIONIX ARTHRO surgical simulator for ASK operations
- an ultramodern arthroscopic mobile unit used in the department's paediatric and adult sections
- optical PC navigation - used for knee joint replacements

#### Major events in 2022:

- Prof. Havlas became chair of the Fellowship Committee of the world orthopaedic organization SICOT.
- A grant project was completed in cooperation with CAS - AHR, NV19-06-00655, Havlas et al.: The safety and efficacy of allogeneic mesenchymal stem cells isolated from umbilical cord tissue in knee cartilage defect repair.
- A new grant was obtained in cooperation with CTU - AHR, NU23-08-00043, Additive manufacturing of an NiTi alloy for applications in orthopaedics and traumatology.
- Organization of the Spring Orthopaedic Symposium conference, March 2022 - theme "Patellofemoral Joint Issues in Children" - 140 participants.
- OA-orMSCp-02vfáze I/IIa\_Autologous bone marrow-derived mesenchymal stem cells seeded on a 3D scaffold in the treatment of knee cartilage defects. Prospective open-label study to assess safety and feasibility. Study Coordinator - prof. MUDr. Havlas.

- *Publications with an impact factor:*
- Stančák A, Kautzner J, Chládek P, Adamec O, Havlas V, Trč T. Predictors of radiographic outcomes of conservative and surgical treatment of Legg-Calvé-Perthes disease. *Int Orthop*. 2022 Dec;46(12):2869-2875. doi: 10.1007/s00264-022-05584-x. Epub 2022 Sep 29. PMID: 36173477, **IF 3.479**
- Niemeyer P, **Hanus M**, Belickas J, László T, Gudas R, Fiodorovas M, Cebatorius A, Pastucha M, Hoza P, Magos K, Izadpanah K, Paša L, Vásárhelyi G, Sisák K, Mohyla M, Farkas C, Kessler O, Kybal S, Spiro R, Köhler A, Kirner A, Trattnig S, Gaissmaier C. Treatment of Large Cartilage Defects in the Knee by Hydrogel-Based Autologous Chondrocyte Implantation: Two-Year Results of a Prospective, Multicenter, Single-Arm Phase III Trial. *Cartilage*. 2022 Jan-Mar;13(1):19476035221085146. doi: 10.1177/19476035221085146. PMID: 35354310, **IF 3.117**
- Hanus M, Hudák R, Koníček P, Šťastný E, Trč T, Havlas V. Assessment of Clinical Outcomes of Surgically Treated Rockwood Type III Acromioclavicular Dislocation with or without Coracoclavicular Ligament Suture. *Acta Chir Orthop Traumatol Cech*. 2022;89(2):114-120. PMID: 35621401, **IF 0.254**
- Trč T, Šťastný E, Kopečný Z, Kos P, Přidal J, Havlas V. Our Experience with ICON Hip Resurfacing System. *Acta Chir Orthop Traumatol Cech*. 2022;89(5):323-331. PMID: 36322031, **IF 0.254**
- Bračka P, Fenclová T, Hlinková J, Uherková L, Šebová E, Hefka Blahnová V, Hedvičáková V, Žižková R, Litvinec A, **Trč T**, Rosina J, Filová E. The Preparation and Biological Testing of Novel Wound Dressings with an Encapsulated Antibacterial and Antioxidant Substance. *Nanomaterials (Basel)*. 2022 Oct 29;12(21):3824. doi: 10.3390/nano12213824. PMID: 36364600, **IF 5.719**
- Neckar P, Potockova H, Branis J, **Havlas V**, Novotny T, Lykova D, Gujski J, Drahoradova I, Ruzickova K, Kaclova J, Skala P, Bauer PO. Treatment of knee cartilage by cultured stem cells and a three dimensional scaffold: a phase I/IIa clinical trial. *Int Orthop*. 2022 Jul 19. doi: 10.1007/s00264-022-05505-y. Epub ahead of print. PMID: 35854056, **IF = 3.479**
- Karel Frydryšek, Daniel Čepica, Tomáš Halo, Ondřej Skoupý, Leopold Pleva, Roman Madeja, Jana Pometlová, Monika Losertová, Jan Koutecký, Pavel Michal, **Vojtěch Havlas**, Šimon Kraus, Dominik Ďurica, Kateřina Peterek Dědková, Marek Pagáč, Pavel Krpec and Paweł Osemlak Biomechanical Analysis of Staples for Epiphysiodesis, January 2022 *Applied Sciences* 12(2):614, DOI:10.3390/app12020614, **IF = 2.838**
- Vackova I, Vavrinova E, Musilkova J, **Havlas V**, Petrenko Y. Hypothermic Storage of 3D Cultured Multipotent Mesenchymal Stromal Cells for Regenerative Medicine Applications. *Polymers (Basel)*. 2022 Jun 23;14(13):2553. doi: 10.3390/polym14132553. PMID: 35808601; PMCID: PMC9269598, **IF = 4.937** Aggregate IF for 2022: 24.077

## Department of Neurosurgery for Children and Adults, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - doc. MUDr. Vladimír Beneš, Ph.D.

Senior Consultant - prof. MUDr. RNDr. Ondřej Bradáč, Ph.D.

Head Nurse - Bc. Tereza Drbohlavová

### Basic description:

The department focuses on specialized acute and planned neurosurgery care for children and adults and provides medical consultation in the field's entire scope. Above all in paediatric neurosurgery, it represents the most productive facility in the country. It also provides pre- and postgraduate tuition and carries out research activities. Apart from patients from the clearly defined catchment area of Prague and its surroundings, it accepts patients from all over the CR and, in the case of some specialised operations, also from abroad.

**In 2022, we managed to maintain the trend for an increase in the volume of surgery for both parts of the department, above all in the field of neuro-oncology. Similarly, we maintained the growth in inpatients and outpatients.**

Together with the Department of Paediatric Neurology and the Neurology Department for Adults, the department is part of the Centre for Highly Specialized Care for Pharmacoresistant Epilepsies and the Epilepsy Research Centre Prague (EpiReC) -a consortium of the 2<sup>nd</sup> FM CU, MUH, the Czech Academy of Sciences and the Czech Technical University In collaboration with the Neurology Department, it is part of the Centre for Highly Specialized Cerebrovascular Care. In cooperation with the DPHO, DPN and other departments and institutes, especially the hospital's paediatric section, we established a Paediatric Neuro-oncology Centre, the first in the country, and successfully promoted it in professional forums and in the media.

### Specialized outpatient units:

- outpatient unit of neurosurgery for children
- neurosurgical outpatient clinic for adults with a focus on cranial and spondylosurgical issues

### New methods and procedures:

- Establishment of the Paediatric Neuro-oncology Centre;
- Measurement of neurophysiological functions during surgeries of the brain and spinal cord using a multimodal device, perioperative stimulation of brain centres in small children;
- Implantation of baclofen pump for the treatment of generalized spasticity in children and adults continues.
- Surgical treatment of craniosynostoses, where the most complicated deformities are treated in the presence of a maxillofacial surgeon - in recent years emphasis has been put on minimally invasive endoscopic procedures contingent on early diagnosis.
- Focus on minimally invasive approaches to the treatment of degenerative spinal diseases - introduction of spinal endoscopic surgery;



- Vertebroplasty and stentoplasty in the therapy of osteoporosis fractures of the spine in cooperation with the Department of Radiology and the Department of Rehabilitation and Sports Medicine;
- Radiofrequency neuromodulation in painful conditions (vertebrogenic, peripheral nerves);
- We treat extensive lesions in the area of the cranial base and face under multidisciplinary cooperation with a maxillofacial surgeon, ENT specialist and plastic surgeon, with the resection procedure often followed by a reconstruction procedure with covering details with microvascular transfer of a free lobe.
- Use of highly specialized multimodal monitoring of the patients with craniocerebral injuries in neuro-traumatology;
- The surgical programme and endovascular techniques are developed in cooperation with the Department of Radiology as part of the neurovascular programme.
- Fine tuning and standard use of frame and frameless stereotactic procedures - application during insertion of deep brain electrodes and during brain biopsies;
- The programme for treating refractory epilepsy under the Centre for Epilepsies of the MUH. Stereotactic implantation of deep brain electrodes for subsequent long-term video and EEG monitoring for pharmacoresistant epilepsies and resection epileptic surgery procedures is carried out.
- Radiofrequency thermoablation;
- Further development of endoscopic surgery for the ventricular system - 3<sup>rd</sup> ventriculostomy, endoscopic biopsies;

#### Unique equipment:

- endoscopic CUSA - Sornic - tumour extirpation during endoscopic procedures
- exoscope - a digital microscope - Aesculap, allows 3D surgery
- Medtronic electromagnetic neuro-guidance with no need to immobilize the head (including frameless stereotactic procedures) used at central operating theatres for children
- brain neuro-guidance Brain Lab integrated with the Pentero microscope from Zeiss.
- Perioperative ultrasound machine
- M-Turbo Ultrasound System by Sonosite
- InVentendoscope (Aesculap) including instruments, endoscopic instrumentation with a wide working channel

#### Major events in 2022:

- Inclusion in the international cerebellar mutism syndrome study (CMS Study);
- Introduction of a stem implant in a child with hearing impairment (the first in the CR) in cooperation with the ENT dept. of the 2<sup>nd</sup> FM CU;
- *Notable publications:*
  - Entenmann, Ch.J., Mišove A., Holub M., Zápotocký M., Sumerauer D., Tomášek M., Koblížek M., Bradáč O., Beneš V. 3rd
  - Current management in the treatment of intramedullary ependymomas in children.
  - Child's nervous system 2023. DOI: 10.1007/s00381-022-05814-y; IF 1.532
  - Entenmann, Ch.J., Bubeníková A., Blažková J.jr., Zápotocký M., Kruseová J., Sumerauer D., Trková K., Sochová V., Koblížek M., Kynčl M., Malinová B., Bradáč O., Beneš V. 3rd
  - Evaluation of the growth rates and related prognostic factors in radiation-induced meningiomas.

- J Neurooncol 2023. DOI: 10.1007/s11060-022-04209-y; IF 4.506
- Misove A., Vicha A., Broz P., Vanova K., Sumerauer D., Stolova L., Sramkova L., Koblizek M., Zamecnik J., Kyncl M., Holubova Z., Liby P., Taborsky J., Benes V., Pernikova I., Jones D., Still M., Stancokova T., Krskova L., Zapotocky M
- Integrated genomic analysis reveals high priority actionable targets in pediatric spinal cord low-grade gliomas.
- Acta Neuropathologica Communications 2022;10:143; doi: 10.1186/s40478-022-01446-0; IF 7.578
- [Prediction of Shunt Responsiveness in Suspected Patients With Normal Pressure Hydrocephalus Using the Lumbar Infusion Test: A Machine Learning Approach.](#) Mládek A, Gerla V, Skalický P, Vlasák A, Zazay A, Lhotská L, Beneš V Sr, Beneš V Jr, Bradáč O. Neurosurgery. 2022 Jan 28. doi: 10.1227/NEU.0000000000001838.
- [From head micro-motions towards CSF dynamics and non-invasive intracranial pressure monitoring.](#) Mládek A, Gerla V, Šeba P, Kolář V, Skalický P, Whitley H, Lhotská L, Beneš V, Bradáč O. SciRep. 2021 Jul 12;11(1):14349. doi: 10.1038/s41598-021-93740-5.
- A, Skalický P, Beneš V Jr, Beneš V Sr, Bradáč O. Overview of Cerebral Cavernous Malformations - Comparison of Treatment Approaches. A Systematic Review and Meta-Analysis. Journal of Neurology, Neurosurgery and Psychiatry 2022.
- Vlasak A, Gerla V, Skalicky P, Mladek A, Sedlak V, Vrana J, Whitley H, Lhotska L, Benes V Sr, Benes V Jr, Bradac O. Boosting Phase Contrast MRI Performance in iNPH Diagnostics by Means of a Machine Learning Approach. Neurosurg Focus 2022.
- Allocating the organization of the Czech Neurosurgical Society working days for the year 2028

#### Department of Stomatology for Children and Adults, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - prof. MUDr. Taťjana Dostálová, DrSc., MBA

Senior Consultant - MUDr. Milan Hubáček

Head Nurse - Václava Kolomazníková

#### Basic description:

Stomatology for children and adolescents focusing on healthy and handicapped patients - multidisciplinary cooperation between a general dentist, paedostomatologist, periodontologist, prosthetist, orthodontist, dentoalveolar and craniomaxillofacial surgeon in the treatment of congenital and acquired developmental defects, injuries and tumors, children's centre for distraction osteogenesis of the facial skeleton as a congenital developmental defect and joint centre for endoprosthesis of the jaw joint. Diagnostics and treatment of congenital and acquired defects of the splanchnocranium, development of microscopic craniomaxillofacial surgery in cooperation with other departments and institutes (such as neurosurgery, ENT, ophthalmology, oncology, plastic surgery, biology and genetics).

**In 2022, 25,025 outpatient treatments and 672 one-day operations were performed / 307 tooth rehabilitation under total anesthesia and 365 surgical procedures/. 733 patients were admitted at the inpatient department and 755 surgeries were performed, of which 233 were tooth rehabilitation for handicapped patients under total anaesthesia.**

**Specialized outpatient units:**

- maxillofacial surgery with specification of congenital developmental defects
- defects of the jaw joint in children and adolescents
- oncology
- diseases of the salivary glands in children
- prosthetics
- implantology
- periodontology
- orthodontics
- orthodontic surgery focusing on the treatment of jaw anomalies
- for children with special needs / disabilities

**New methods and procedures:**

- augmentation of maxillary bone defects using a 3D modelled Ti-mesh
- care for patients with a cleft - /comprehensive stomatological care/
- orthognathic surgical procedures including specialized advisory centre and 3D modelling, planning and reconstruction
- dental implantology and controlled bone regeneration focusing on young handicapped patients
- care for the teeth of handicapped children under total anaesthesia or analgosedation
- surgery of the jaw joint, including subtotal endoprosthesis
- distraction of the facial skeleton in congenital developmental defects in children
- digital stomatology using an intraoral and facial scanner
- We cooperate with the following institutions on scientific research:
  - The Department of Mathematics of the Faculty of Applied Sciences to make mathematical models for facial skeleton reconstruction;
  - The Department of Computer and Control Engineering of the Faculty of Chemical Engineering on the analysis of 2D and 3D image stacking, X-ray and working models when creating virtual treatment planning, including printing the individual components;
  - The Faculty of Nuclear Sciences and Physical Engineering of the CTU to assess laser and ultrasound-based micropreparation techniques.
- We are preparing special obturation plates in cooperation with the ENT department and monitor their effect on functional reconstruction in patients with defects in the orofacial area in the form of monitoring the act of swallowing and during phonation.
- The Institute of Biology and Medical Genetics, 2nd Faculty of Medicine, Charles University and Motol University Hospital for long-term monitoring of children and adolescents with rare diseases who are then treated pursuant to a long-term treatment plan. We use an intraoral and facial scanner to monitor therapy during growth with a focus on comparison to young, healthy individuals. using CAD CAM techniques, 3 D analysis and model reconstruction we can work with virtual casts, 3 D printed models, computer-made crowns, bridges and implants. It is becoming integrated into the department's clinical dental practice.
- In clinical practice, we generate 3D models of the dental arch and jaw relationships for orthodontic, surgical and prosthetic treatment.

**Unique equipment:**

- **3D imaging system CBCT I-CAT**
- **3SHAPE Trios intraoral scanner**
- **Stereolithographic 3D printer**

**Major events in 2022:**

- In the framework of European cooperation, participation in the following studies:
  - Rare Congenital and Developmental Diseases of the Orofacial System ERN CRANIO
  - Congenital and Developmental Defects of the Orofacial System (Centre for the CR within the EU)

**Publications:****A total of 5 papers in international publications with an IF:**

- Kratochvilova L, Dostalova T, Schwarz M, Macek M Jr, Marek I, Malíková M, Míšová E. Ectodermal dysplasia: important role of complex dental care in its interdisciplinary management. Eur J Paediatr Dent. 2022 Jun; 23(2):140-146. doi: 0.23804/ejpd.2022.23.02.12. PMID: 35722846. IF: 2.327 ; Q3
- Sediva E, Dostalova T, Urbanova P, Eliasova H, Podzimek S, Misova E. Photobiomodulation Therapy After Mesiodens Surgery: Evaluation of Immunological Markers and Three-Dimensional X-Ray Analysis-Placebo-Controlled Study. Photobiomodul Photomed Laser Surg. 2022 Jul;40(7):472-479. doi: 10.1089/photob.2022.0021. Epub 2022 Jul 4. PMID: 35788146. **IF: 2.744 ; Q2.**
- Prochazka A, Dostalova T, Vysata O, Cejnar P, Marik V, Eliasova H. Computational Intelligence in Metric Analysis of the Skull in the Context of Maxillofacial Surgery. SSN: 2169-3536 , 2169-3536; DOI: 10.1109/ACCESS.2022.3222809, IEEE access: practical innovations, open solutions, 2022, Vol. 10: 122447-122453. IF: 3476 ; Q2.
- Eliasova H, Dostalova, Urbanova P. A comparison of the precision of 3D images of facial tissues from the forensic point of view. ISSN: 2666-2264, 2666-2256; DOI: 10.1016/j.fri.2021.200471 Forensic imaging. 2022, Vol. 28, p.200471. IF: 0.21 ; Q4.
- Urbanova P, Eliášová H, Dostálová T. How accurate is forensic facial identification of surgically altered faces? ISSN: 0045-0618, 1834-562X; DOI: 10.1080/00450618.2022.2032341.The Australian journal of forensic sciences. 2022, p.1-20. IF: 1.21; Q

**1 paper in the peer-reviewed international journal Scopus and WOS:**

- Dostalova T, Prochazka A, Urbanova, P, Eliasova, H. 3D stereolithography print (SLA) in clinical orthodontic and dental applications. ISBN: 9781510647558, 9781510647565; DOI: 10.1117/12.2608661. Lasers in Dentistry XXVIII, 2022, Vol. 11942, p. 1085706

**5 papers in peer-reviewed, domestic publications:**

- Hilbertová S, Dostálová T, Michálek J, Hlíňáková P. Histologické vyšetření podjazykové uzdičky u pacientů s ankyloglosií (Histological examination of the sublingual lymph node in patients with ankyloglossia). Čes stomatol Prakt zubní lék. 2022; 122(1): 4-10. doi 10.51479/cspzl.2022.001
- Nocar A, Horáček M, Dostálová T, Trojanová J. Dentální a skeletální změny maxilly po rychlé maxilární expanzi (Dental and skeletal changes of the maxilla after rapid maxillary expansion). Čes stomatol Prakt zubní lék. 2022; 122(3): 79-86. doi: 10.51479/cspzl.2022.006
- Trojanová J, Dostálová T, Horáček M, Nocar A. Rychlá maxilární expanze a její působení na skelet maxily (Rapid maxillary expansion and its effect on the maxillary skeleton). Review. Ortodoncie 2022, 31, No. 3, pp. 207-221.
- Králíčková N, Dostálová T, Eliášová E, Horáček M. Porovnání kefalometrického snímku zhotoveného různými technikami (Comparison of a cephalometric image made by different techniques). Ortodoncie 2022, 31, no. 3, pp. 192-205.

- Hilbertová S, Horáček M. Stranové srovnání délky a výšky mandibuly u pacient s jednostrannou retencí dolních druhých molárů (comparison of mandibular length and height in patients with unilateral retention of the lower second molars). *Ortodoncie* 2022, 31, no. 4, pp. 263 - 275
- Completion of postgraduate education specialization in Orthodontics: MDDr. Lenka Kratochvílová
- 2.12.2022 Paediatric Dentistry Day was held at the MUH
- 25.-26.11.2022 Interdisciplinary Days of OSPDL CzMA: Stomatology I.-III.
- Publication-Book: Eva Míšová : Zubní kaz raného dětství (Dental Caries in Early Childhood), Galén 2022

## Adult Inpatient Section

### Department of Obstetrics and Gynaecology, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - doc. MUDr. Roman Chmel, Ph.D., MHA

Senior Consultant - MUDr. Marek Pluta, Ph.D.

Head Nurse - Iveta Oravcová

#### Basic description:

The Department of Obstetrics and Gynaecology provides nationwide care in the entire spectrum of gynaecology and obstetrics, including specialized diagnostic examinations and surgical procedures in gynaecological oncology and gynaecological urology, treatment of sexual dysfunctions and treatment of sterility using assisted reproduction techniques. The department is a Perinatology Centre of the highest category, including comprehensive care for delivering extremely premature newborns and delivering foetuses with congenital developmental defects.

**In 2022, 6,429 patients were hospitalized at the department and a total of 3,764 surgeries and 66,015 outpatient treatments were carried out. A total of 2,485 births took place at the department, including 46 twin births.**

#### Specialized outpatient units:

- centre of reproductive medicine
- gynaecological oncology and colposcopy
- gynaecological urology
- sexology
- outpatient unit for paediatric gynaecology
- endocrinology
- centre for ultrasound diagnostics and foetal medicine

#### New methods and procedures:

- Participation in a multidisciplinary study to validate a non-established treatment for sterility using uterine transplantation in women with uterine agenesis and a neovagina

- Since 2019, there have been 80 robotic surgeries for gynecological malignant tumours

#### Unique equipment:

- Operations on a surgical, robotic micromanipulator
- A surgical laser for treating premalignant epithelial lesions of the vulva

#### Major events in 2022:

- The department's doctors were authors and co-authors of a total of 10 publications in journals with an IF.
- The 2 most important published scientific papers with first or correspondence authorship:
  - Balko J, Novackova M, Skapa P, Pastor Z, Chmel R Jr, Zamecnik J, Chmel R. Histopathological examination of the ectocervical biopsy in non-transplanted uteri: A study contributing to the provisional scoring system of subclinical graft rejection after uterus transplantation. *Acta Obstet Gynecol Scand* 2022;101(1):37-45. **IF 4.544**
  - Pastor Z, Chmel R. Female ejaculation and squirting as similar but completely different phenomena: a narrative review of current research. *Clin Anat* 2022;35(5):616-625. **IF 2.414**

Part of the Department of Gynaecology and Obstetrics, 2nd Faculty of Medicine, Charles University and Motol University Hospital is

### The Department of Neonatology with Intensive and Resuscitation Care Unit (IRCU)

Senior Consultant - doc. MUDr. Jan Janota, Ph.D.

Head Nurse - Bc. Renata Jungmannová

#### Basic description:

The Neonatal Unit with an IRCU is an integral part of the Type III Perinatology Centre - Perinatology Intensive Care Centre - with a supra-regional scope. The facility provides standard, intermediate and intensive resuscitation care to the full extent, including controlled whole-body hypothermia, nitric oxide administration and all modules of conventional and unconventional artificial pulmonary ventilation. In collaboration with other paediatric fields, it provides comprehensive care for newborns with congenital developmental defects and metabolic disorders. The department provides specialized intensive and resuscitation care for premature babies, in particular to extremely premature babies and all critically ill newborns regardless of their gestational age. Care for physiological newborns, especially under the rooming-in regime, is standard.

**In 2022, there were 2,519 live births at the centre, and 53 newborns with birth weights below 1,500g and 240 with birth weights below 2,500g were treated at the department. Intensive, resuscitation or intermediate care was provided to a total of 393 newborns, of which 22% were born outside MUH and transported after birth. In 2022 the institutional early neonatal mortality rate without congenital developmental defects was 1.6 per mille.**

### Specialized outpatient units:

- outpatient unit for perinatally endangered children

### New methods and procedures:

- As part of a programme focused on safe transport, a procedure was initiated to stabilize newborns with extremely low birth weight (below 1000 g) by providing venous access prior to transport to the IRCU.
- In cooperation with the Ear, Nose and Throat Department of the 2nd Faculty of Medicine, Charles University and Motol University Hospital, the programme for early correction of a cleft lip in newborns is ongoing.

### Unique equipment:

- comprehensive equipment for all artificial pulmonary ventilation devices with automatic FiO<sub>2</sub> control depending on HbSat (PRICO)

### Major events in 2022:

- Opening of a new Intermediary Specialized Care Unit (adult part of Building 5B) with a maximum capacity of 21 beds (6 of which in the rooming-in system) fully equipped for the individualized care of premature newborns and newborns with congenital developmental defects prior to discharge to home care.
- Holding and organizing European Resuscitation Council Neonatal Life Support Courses.

### Publications:

- Straka B, Vičková M, Libá Z, Heřmanovská B, Kynčl M, Dorňáková J, Táborský J, Kršek P, Musilová A, **Janota J**, Balašáková M. COL4A1 mutation-related disorder presenting as fetal intracranial bleeding, hydrocephalus, and polymicrogyria. *Epilepsia Open*. 2022 Dec 12. doi: 10.1002/epi4.12681. Epub ahead of print. PMID: 36504316.
- Giannoni E, Dimopoulou V, Klingenberg C, Navér L, Nordberg V, Berardi A, El Helou S, Fusch G, Bliss JM, Lehnick D, Guerina N, Seliga-Siwecka J, Maton P, Lagae D, Mari J, **Janota J**, Agyeman PKA, Pfister R, Latorre G, Maffei G, Laforgia N, Mózes E, Størdal K, Strunk T, Stocker M; AENEAS Study Group. Analysis of Antibiotic Exposure and Early-Onset Neonatal Sepsis in Europe, North America, and Australia. *JAMA Netw Open*. 2022 Nov 1;5(11):e2243691. doi: 10.1001/jamanetworkopen.2022.43691. PMID: 36416819; PMCID: PMC9685486.
- Berka I, Korček P, **Janota J**, Straňák Z. Neonatal Sequential Organ Failure Assessment (nSOFA) Score within 72 Hours after Birth Reliably Predicts Mortality and Serious Morbidity in Very Preterm Infants. *Diagnostics (Basel)*. 2022 May 28;12(6):1342. doi: 10.3390/diagnostics12061342. PMID: 35741152; PMCID: PMC9221565.
- Henry CJ, Semova G, Barnes E, Cotter I, Devers T, Rafee A, Slavescu A, Cathain NO, McCollum D, Roche E, Mockler D, Allen J, Meehan J, Klingenberg C, Latour JM, van den Hoogen A, Strunk T, Giannoni E, Schlapbach LJ, Degtyareva M, Plötz FB, de Boode WP, Navér L, Wynn JL, Küster H, **Janota J**, Keij FM, Reiss IKM, Bliss JM, Polin R, Koenig JM, Turner MA, Gale C, Molloy EJ; Infection, Inflammation, Immunology and Immunisation (I4) section of the European Society for Paediatric Research (ESPR). Neonatal sepsis: a systematic review of core outcomes from randomized clinical trials. *Pediatr Res*. 2022 Mar;91(4):735-742. doi: 10.1038/s41390-021-01883-y. Epub 2022 Jan 7. PMID: 34997225; PMCID: PMC9064797.

## Department of Internal Medicine, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - prof. MUDr. Radan Keil, Ph.D.

Senior Consultant - MUDr. Jindra Lochmannová

Head Nurse - Mgr. Kateřina Lisová

### Basic description:

The Department of Internal Medicine provides comprehensive diagnostics and therapeutic care in the entire range of internal medicine to hospitalized patients and outpatients from the region and medical consultation services to patients from the entire CR. The department provides pregraduate tuition for Czech and foreign students in grades 3 - 6 at the 2<sup>nd</sup> FM CU, and postgraduate tuition in the framework of the specialization.

The department is a training centre for physicians prior to postgraduate certification in internal medicine, gastroenterology, diabetology/endokrinology, nephrology, intensive metabolic care and parenteral and enteral nutrition. The department is a teaching centre for candidates of endoscopic methods and also a course of abdominal sonography with the subsequent possibility of being licenced, guaranteed by the Czech Medical Chamber (CMC).

**In 2022, 41,221 patients were treated in the outpatient section and 5,038 patients were admitted. The department carries out over 6,500 endoscopic procedures per year. In the field of ERCP, our facility has the highest number of procedures among adult and paediatric patients in the entire CR.**

### Specialized outpatient units:

- general internal medicine (including medical consultation)
- gastroenterology (including endoscopy and sonography)
- 24-hour service for urgent endoscopic procedures (ERCP, gastroscopy, colonoscopy)
- diabetology
- podiatric
- cardiology (including ECHO)
- angiology (including DUS examination of arteries and veins)
- nephrology (including peritoneal dialysis)
- nutritional
- lipidology
- endocrinology
- Centre for vascular access
- Centre for the biological treatment of non-specific intestinal inflammation
- Centre for treating viral hepatitis
- Outpatient unit for the treatment of obesity (newly established)

### New methods and procedures:

- The unique "Jesenius" project was launched, enabling online transmission from an autopsy.
- Weekly multidisciplinary seminars (oncoboards) were set up to effectively manage care for patients with complex issues.
- Working with the Department of Pneumology, we have joined a programme of comprehensive patient screening before putting them on the waiting list for lung transplantation.
- We started working with the Department of Ophthalmology, to launch a programme of therapeutic rheopheresis in patients with age-related macular degeneration (AMD),
- Working with the Department of Radiology, we provide inpatient facilities and organize the preparation and post-procedural treatment for patients with absent or malfunctioning vascular access for haemodialysis. These are new methods (Wavelinq, Surfacor) and translumbar catheters.

### Unique equipment:

- In Body 970 - precisely determines the amount of skeletal muscle and subcutaneous fat in the body as well as accurately measuring visceral fat content, distinguishes between intra and extracellular water

### Major events in 2022:

- The Endoscopy Unit at the Department of Internal Medicine gained the status of Digestive Endoscopy Centre from the Ministry of Health of the CR
- Another "Prague Autumn Gastroenterology Days" congress was held on 3 - 4 November 2022, this time at the Clarion Hotel. The whole event was organized under the auspices of the Gastroenterological Association of the CR by the Association's president, Prof. MUDr. Radan Keil, Ph.D., and vice president Prof. MUDr. J. Špičák, CSc. as well as colleagues from both departments.
- Publication of a book by the department, the main author being MUDr. M. Souček Emergencies from an Internist's Perspective (nominated by the Grada Publishing House for the Josef Hlávka Prize for 2022).
- MUDr. Ondřej Hloch, Ph.D. successfully completed his postgraduate studies.
- MUDr. Jan Brož, Ph.D. successfully completed his postgraduate studies in Human Physiology and Pathophysiology at the 2<sup>nd</sup> FM CU defending his dissertation on Hypoglycaemia as a Limitation to Treating Diabetes Mellitus (IX/2022).

### Notable publications:

- SOUČEK, Martin, Jan MASOPUST and Dana MOKRÁ. Emergencies from an Internist's Perspective: Practical Procedures. Prague: Grada, 2022, 239 pages: ISBN 978-80-271-3336-9. book
- Brož J, Urbanová J: How to Treat Hypoglycaemia ing. Slávka Wiesnerová; 2022, 1<sup>st</sup> ed., 22 p. ISBN 978-80-904-809-5-7. Publication 66 book
- Brož J, Campbell M D, Souček M, Masopust J, Hloch O: Re: Hyperkalemia in the emergency department: Epidemiology, management and monitoring of the treatment outcomes. Emergency Medicine Australasia 2022;34(5): 843-845. ISSN: 1742-6723. **IF: 2.279**. public 19. PMID: 35760579.

- Wasserbauer M, Hlava Š, Trojánek M, Šťovíček J, Milota T, Drábek J, Koptová P, Čupková A, Pichlerová D, Kučerová B, Coufal Š, Keil R: Efficacy and safety of SARS-CoV-2 vaccination in patients with inflammatory bowel disease on immunosuppressive and biological therapy: Prospective observational study. PLoS ONE 2022;17(9):e0273612. public 21. PMID: 36054100. **IF: 3.608**: ISSN: 1932-6203. Grant 64203.
- Wasserbauer M, Hlava Š, Drábek J, Šťovíček J, Minaříková P, Nedbalová L, Drašar T, Zádorová Z, Dolina J, konečný Š, Kojecký V, Koželuhová J, Černíková P, Pichlerová D, Kučerová B, Coufal Š, Keil R: Adalimumab biosimilars in the therapy of Crohn's disease and ulcerative colitis: Prospective multicentric clinical monitoring. PLoS ONE 2022;17(8):e0271299. public 20. PMID: 35939424. **IF: 3.608**. ISSN: 1932-6203. Grant 64203.

## Department of Surgery, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - doc. MUDr. Alan Stolz, Ph.D, MBA

Senior Consultant - MUDr. Filip Pazdírek, Ph.D.

Head Nurse - Bc. Jitka Kabrnová

### Basic description:

The department provides comprehensive care in the field of general surgery, oncosurgery, with a focus on abdominal surgery, coloproctology, endocrinology, breast surgery and reconstructive and plastic surgery. Emphasis is placed on minimally invasive surgery, laparoscopic and robotic surgery.

The department provides a non-stop surgical emergency service for all urgent surgical diseases including thoracic and abdominal trauma. The department includes a plastic surgery division, which performs a wide range of operations in the field of plastic and reconstructive surgery on an outpatient basis, as inpatients in the department's wards and also, as part of interdisciplinary care, at the workplaces of other surgical fields. Interdisciplinary care is primarily used when handling serious conditions. The department cooperates closely with a number of workplaces: Department of Internal Medicine and the Endoscopy Centre, Oncology Department, Urology Department, Gynaecology Department, 1<sup>st</sup> Orthopaedic Department, Spinal Unit of the Rehabilitation Department, Paediatric Surgery Department, Dermatology Department and Radiology Department.

Colorectal surgery has seen a significant increase in minimally invasive procedures compared to previous years. The amount of robotic surgery, laparoscopy and TEM (transanal endoscopic microsurgery) is increasing. In surgery for rectal cancer, the use of minimally invasive procedures is 85%. Besides rectal tumours, the robotic system is now also used in the surgical treatment of colon tumours. In 2022, the department became an international training centre for robotic colorectal surgery.

The rise in minimally invasive procedures and the introduction of multimodal perioperative care (ERAS) are behind the improvement in short-term treatment outcomes (faster recovery, reduced incidence of complications, shorter hospital stay). The department takes part in the international system of quality control for care in colorectal surgery as part of the European Society of Coloproctology (ESCP) audits. The department takes part in training ostomy nurses within the region of the Czech Republic.

The surgical department is the only centre in the CR and Slovakia to provide comprehensive surgical treatment including differential diagnosis of lymphatic drainage disorders.

The number of breast surgeries, including reconstructive surgeries, is gradually increasing. In 2022, there was an increase in the number of patients in the single-day surgery programme. The department is involved in pregraduate and postgraduate tuition and is actively involved in research projects.

**In 2022, 21,546 patients were treated within the outpatient section and 4,665 patients were treated in AED, 3,859 patients were hospitalized and surgeries were performed on 3,623 patients. There was a significant increase in all parameters compared to 2021.**

#### Specialized outpatient units:

- proctological advisory centre
- advisory centre for ostomates - educational and training centre for ostomates
- advisory centre for diseases of the pancreas and bile duct
- advisory centre for malignant melanomas
- advisory centre for endocrinological surgery
- breast cancer advisory centre
- advisory centre for lymphedema
- endoscopy, anorectal manometry
- plastic surgery

#### New methods and procedures:

- robotic resection of the rectum for tumour
- robotic resection of the colon for tumour
- the technique of microscopically sutured lymph node anastomosis has been introduced, preparation for lymph node auto-transplantation
- ERAS in colorectal patient care

#### Unique equipment:

- taking part in using the DaVinci robotic system for surgery on rectal and colon tumours
- LigaSure - use in conventional and laparoscopic surgery
- scintillation probe for identification of the sentinel node during surgeries of the breasts and malignant melanomas
- ultrasonic dissector
- surgical rectoscope with microsurgical instruments
- DG HAL set
- surgical method for anastomotic perfusion control, ICG
- system for functional examination of the anorectum

#### Major events in 2022:

- The department became an international training centre for robotic colorectal surgery;
- The MUH project “Modern Technologies” - nanofibre technology continued;
- Continuation of the ERAS project (protocol for multimodal perioperative care in colorectal surgery). It is planned to extend it to pre-hospital care with the aim of standardizing preoperative preparation. Emphasis is placed on improving nutrition, correcting anaemia, increasing cardiovascular capacity and educating patients before the planned procedure). Following the modification of the ERAS protocol, there is a plan to build a colorectal surgery training centre.
- The clinic received the GAUK 256322 / 2022 grant Use of Liquid Biopsy for Non-invasive Monitoring and Prediction of Efficacy of Neoadjuvant Therapy in Advanced Breast Cancer.

#### Publications

- Pazdírek, F., Vjaclovský, M., Grega, M., Hoch, J. Treatment options for rectal cancer. *Onkologie*, 2022, 16(1), pp. 33-37
- Lohynská, R., Pazdírek, F., Čejková, J. Advances in the treatment of anal squamous cell cancer. *Onkologie*, 2022, 16(6), pp. 317-321
- Kralovic J, Vjaclovský J et al. Nanofiber Fractionalization Stimulates Healing of Large Intestine Anastomoses in Rabbits. *Int J Nanomedicine*. 2022;17:6335-6345
- Bocková M, Pashchenko A et al. Low Concentrated Fractionalized Nanofibers as Suitable Fillers for Optimization of Structural-Functional Parameters of Dead Space Gel Implants after Rectal Extirpation. *Gels*. 2022;8:158

#### Monography:

- Lukáš K, Kautzner J and Hoch J. *Bolesti na hrudi (Chest Pain)*. Grada 2022
- Lohynská R. et al., *Anální spinocelulární karcinom (Anal Squamous Cell Carcinoma)*. *Chirurgická léčba (Surgical Treatment)*. Maxdorf, 2022



**3<sup>rd</sup> Department of Surgery, 1st Faculty of Medicine,  
Charles University and Motol University Hospital  
Centre for Cardiovascular, Thoracoabdominal and Transplant Surgery, MUH**

Head - prof. MUDr. Robert Lischke, Ph.D.

Senior Consultant - MUDr. Jiří Tvrdoň

Head Nurse - Mgr. Ida Šmolíková

**Basic description:**

The department is the largest facility focusing on chest surgery in the CR - a high excellence centre providing comprehensive care in chest surgery (surgery of the lungs, trachea and airways, chest wall and deformities of the chest, oesophagus (the largest centre in the CR), mediastinum, myasthenia gravis, diaphragm). **The department is the only centre in the CR performing lung transplantation. Since 2018, it has been providing lung transplants for the Slovak Republic. It is the only centre with accreditation for grade II chest surgery. The centre provides care in abdominal surgery in the entire spectrum** of activities (surgery of gastroesophageal reflux, diaphragmatic hernia, esophageal achalasia, surgery on the stomach and small intestine, liver, bile ducts and pancreas, surgery on the large intestine and rectum, hernia surgeries, minimally invasive laparoscopic techniques, traumatology of the chest and abdomen and endocrine surgery).

**The department centralizes patients with soft tissue sarcomas. In 2022, 3,141 surgeries were carried out, 3,044 patients were admitted and 25,581 patients were treated in the outpatient section. There were 54 lung transplants (a high-volume centre, of which there are only 6 in Europe).**

**Specialized centres:**

- National Lung Transplantation Centre for the Czech and Slovak Republics
- Centre for Highly Specialized Pneumo-onco-surgical Care
- Centre for the Treatment of Soft Tissue Sarcomas, MUH
- Centre for Cardiovascular, Thoracoabdominal and Transplant Surgery, MUH

**Specialized outpatient units:**

- outpatient unit for lung transplantation
- outpatient unit for diseases of lungs, mediastinum and chest wall
- outpatient unit for diseases of esophagus and stomach
- outpatient unit for surgery of soft tissue sarcomas
- outpatient unit for diseases of liver, bile duct and pancreas
- outpatient unit for diseases of the bowel and rectum
- outpatient unit for endocrine surgery
- outpatient unit for diseases of lower limb veins
- internal medicine outpatient unit

**New methods and procedures:**

- Preparation and introduction of the Ex vivo pulmonary perfusion and reconditioning programme in the clinical practice, method leading to increased number of suitable grafts for lung transplantation;
- Lung transplantation programme from DCD donors (donors with circulation failure);
- Heart-lung block transplantation programme in cooperation with IKEM;
- Introduction of endoscopic application of absorbable stents for diseases of esophagus, stomach and airways.
- Robotic surgery of the lungs, thymus and oesophagus - the only workplace in the CR, robotic surgery of the colon and rectum

**Unique equipment:**

- ECMO and Ex vivo perfusion of the lung
- DaVinci robotic system
- dissection and electrocoagulation techniques, including harmonic scalpel and LigaSure in conventional and laparoscopic surgery
- 3D instruments - for laparoscopic and video-assisted thoracoscopic surgery
- ICG laparoscopy tower

**Major events in 2022:**

- In 2022, we continued with an international study led by a Canadian research centre (University of Alberta) that has developed a new diagnostic system, a Molecular Microscope, which can be used to interpret transbronchial biopsies after lung Tx based on molecular phenotype. The results were presented at the Congress of the International Society for Heart and Lung Transplantation and published in prestigious journals.
- 600<sup>th</sup> lung transplant carried out.
- The first robotic oesophageal resection to be carried out in the CR.
- 22.12.2022 marks 25 years since the first lung transplantation in the CR.

**Department of Cardiology, 2nd Faculty of Medicine,  
Charles University and Motol University Hospital**

Head - prof. MUDr. Josef Veselka, FESC, FSCAI, FICA

Senior Consultant - MUDr. Jiří Vejvoda, MHA

Head Nurse - Jana Kovalčíková

**Basic description:**

The facility provides comprehensive cardiological care to hospitalized patients and outpatients. It is linked directly to the unit of heart surgery and angiosurgery.

**In 2022, more than 20,000 patients were treated in the outpatient section and almost 4,500 patients were admitted.**

**2,873 selective coronary catheterizations, 829 percutaneous coronary interventions, 477 catheterization examinations of peripheral arteries, 116 catheterization implantations of aortic valves, 7 catheterization corrections of mitral insufficiency (MitraClip), 7,720 radiofrequency ablations of arrhythmia, 353 catheterization isolation of pulmonary veins, 203 implantations of permanent cardiac stimulators, 136 implantations of ICD and 2,362 duplex ultrasound examinations of peripheral veins were performed.** Even in this exceedingly challenging year, we managed to keep the care we provide to our patients at a very high professional level.

#### **Specialized outpatient units:**

- outpatient unit for acquired and congenital heart defects
- outpatient unit for heart failure
- outpatient unit for hypertrophic cardiomyopathy
- outpatient unit for electrophysiology and cardiac stimulation
- angiology outpatient unit
- lipidology outpatient unit

#### **New methods and procedures:**

- Catheterization implantation of a biological valve for aortal position;
- Catheterization correction of mitral insufficiency (MitraClip);
- Mechanical circulation support (ECMO - extra-corporal membrane oxygenation)
- UV disinfectors for ultrasound probes (Antigermix);
- Cardiology information system allowing continuous access to the ECG database, records (MUSE);
- Optic coherent tomography;
- Intravascular spectroscopy;
- Alcohol septal ablation - the largest set in the CR;
- Carotid stenting - the largest set in the CR;
- Catheterization occlusion of ventricular septum defects and patent foramen ovale;
- Catheterization closure of the left ventricle;
- Catheterization occlusion of paravalvular leaks;
- Comprehensive solution of rhythm dysfunctions using 3D electroanatomic mapping;
- Selective left brachial artery pacing and His bundle pacing during a permanent pacemaker implantation;
- High-density mapping using multipolar catheters;
- Expanding the catheterization programme for atrial fibrillation;
- Subcutaneous cardioverter/defibrillator implantation;
- Extraction of the stimulation system;
- Development of telemedicine, remote monitoring of patients with cardiac stimulators and defibrillators;
- A unique method for a genetic examination of patients with cardiomyopathy using new generation sequencing allowing the simultaneous examination of a large number of genes

#### **Unique equipment:**

- UV disinfectors for ultrasound probes (Antigermix)
- Optic coherent tomography
- CARTO, ensite Velocity - 3D electroanatomic mapping
- Echocardiographic device with the option of 3D oesophageal echocardiography
- Echocardiographic device with the option of intracranial echocardiography
- Qlab 13 - modern echocardiography software
- Intravascular ultrasound with infrared spectroscopy
- a device for measuring peripheral blood pressure Huntleigh Dopplex Ability
- AIRVO 2 Nasal High flow - non-invasive ventilation support
- continuous renal function replacement - the multifiltratepro Fresenius system
- Olympus bronchoscopy device for intensive care
- a modern spiroergometric device

#### **Major events in 2022:**

- We published 19 articles, 17 of them in journals with an IF (14 times the 1<sup>st</sup> author was from our clinic).
- Prof. Veselka, MUDr. Honěk, MUDr. Horváth, MUDr. Štěchovský, MUDr. Hnát, MUDr. Hnáťová, MUDr. Kala and MUDr. Chabová gave their presentations at the XXX Annual Congress of the Czech Society of Cardiology.
- Doctors from our department presented 3 out of 14 papers entered in the competition The Best of Czech Cardiology held at the XXX Annual Congress of the Czech Society of Cardiology. MUDr. Hoňek's publication "Screening and Risk Strategy Reduced Decompression Sickness Occurrence in Divers With Patent Foramen Ovale" (JACC Cardiovasc Imaging, IF 16,051) came third in this section.
- In the Competition of Young Cardiologists, organized within the XXX Annual Congress of the Czech Society of Cardiology, we gave three presentations, MUDr. Kala won the first place for the paper "The Effect of Epoxyeicosatrienoic Acid Analogue Therapy on the Course of Chronic Heart Failure: a preclinical study in hypertensive rats with an aortocaval fistula."
- We organized the "HotCardiology" webinar with lectures and live streams from the catheterization room.
- On 17.6.2022 we organized Prague Intervention XVI, an annual interdisciplinary conference.
- On 15.6.2022 , we co-organized the seminar "A Practical View of Chronic Venous Disease".
- On 11.11.2022 a workshop "Catheterization Treatment of Arrhythmias" was held at the department.
- MUDr. Honěk successfully gained his habilitation.
- MUDr. Kala defended his dissertation.
- MUDr. Fulínová passed the cardiology attestation.
- Under the leadership of the head nurse, Mgr. Kovalčíková, a national 15<sup>th</sup> specialized educational conference of the Czech Cardiological Society, Working Group of Cardiology Nurses and Related Professions Focused on Current Cardiological Issues (Listopadka) with the active participation of the department's nurses.



## Department of Infectious Diseases and Travel Medicine 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - MUDr. Milan Trojánek, Ph.D.

Senior Consultant - MUDr. Martin Tulach

Head Nurse - Mgr. Milena Chybová

### Basic description:

The department provides comprehensive medical and preventive care in the field of infectious and travel medicine. The department provides acute and specialized outpatient care and consultative services over the entire range of infectious medicine (except HIV infection), based on a modern concept of the field inspired by the position of infectious medicine abroad. The department has a 23-bed capacity for adult patients with communicable or difficult-to-treat infections. The department is involved in teaching students of bachelor and master study programmes at the 2<sup>nd</sup> FM CU and serves as a teaching workplace of the Institute for Postgraduate Education in Health Care. **In 2022, 560 patients were admitted and 5,528 patients were treated as outpatients.**

### Specialized outpatient units:

- Vaccination Centre
- Travel Medicine Centre
- Infection Centre for Drug Addicts
- Centre for Treating Viral Hepatitis

### New methods and procedures:

- Setting up the new department has expanded the range of care provided in travel and tropical medicine. A new programme for the diagnosis and therapy of malaria and selected imported arboviruses was launched at the MUH. The department started to provide post-exposure antirabic prophylaxis.
- In October 2022, the department, together with the Institute of Medical Microbiology and clinical pharmacists, introduced a programme of bedside consultations on antibiotics. The programme's guarantor is MUDr. Štefan, MBA.
- Cooperation was initiated in the form of regular joint antibiotic visits with the Department of Oncology of the 2nd Faculty of Medicine, Charles University and Motol University Hospital, the Department of Paediatric and Adult Neurosurgery of the 2nd Faculty of Medicine, Charles University and Motol University Hospital and the Department of Paediatric and Adult Orthopaedics and Traumatology, 2nd Faculty of Medicine, Charles University and Motol University Hospital.

### Major events in 2022:

- As of 1 September 2022, the department became independent of the Department of Internal Medicine of the 2nd Faculty of Medicine, Charles University and Motol University Hospital.
- The department is actively involved in the humanitarian aid programme and organizing medical internships in the tropics. In October 2022, MUDr. Lukáš Kohout took part in a volunteer mission at the Itibo health facility in western Kenya.

## Department of Cardiovascular Surgery, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - doc. MUDr. Vilém Rohn, CSc.

Senior Consultant - MUDr. Radovan Fiala, Ph.D.

Head Nurse - Mgr. Barbora Kolářová, MSc.

### Basic description:

The department provides comprehensive care in cardiac surgery and vascular surgery. It provides non-stop surgical emergency service for all urgent diseases of the cardiovascular system, including traumas and thoracic and abdominal aortic surgery. The department includes an organ perfusion team that provides extracorporeal circulation including ECMO (extracorporeal membrane oxygenation) for the entire hospital in the adult section.

The department is further developing a programme to treat critical limb ischemia by means of vascular graft transplantation during vascular reconstructive surgery in cooperation with the Department of Transplantations and Tissue Bank at MUH and the Tissue Bank at Hradec Králové. In close cooperation with the Radiology Department, it is increasing the number of combined (hybrid) revascularizations. The department cooperates with the Neurology Department in the management of carotid artery disorders, and in cooperation with the Third Surgical Department, the Department of Paediatric Surgery and both orthopaedic departments, the department is involved in the comprehensive care of oncology patients and sarcoma centre patients.

In 2022, as in previous years, the department was assigned to caring for patients with the most severe COVID-19. Patients with respiratory insufficiency on artificial pulmonary ventilation or ECMO support were admitted to the department's ICU.

**5,626 patients were treated as outpatients in cardiovascular surgery and a total of 947 operations were carried out, including 287 heart operations (including congenital heart disease in adults) and 545 vascular operations. The department's perfusion team performed a total of 355 extracorporeal membrane oxygenations (of which 271 extracorporeal circulations during cardiac surgery, 50 extracorporeal circulations during lung transplantation and 34 ECMO).**

### Specialized outpatient units:

- cardiology outpatient unit
- cardiac surgery outpatient unit
- vascular outpatient unit
- paediatric vascular outpatient unit
- outpatient unit for dialysis AV shunts
- outpatient unit for congenital heart defects in adulthood

**New methods and procedures:**

- minimally invasive procedures in full-spectrum cardiac surgery (selected congenital defects, valve surgery)
- reconstructive (salvage) aortic valve surgery including reconstruction using the Ozaki technique
- use of extra-aortic stents in patients with connective tissue disorders
- surgery on thoracoabdominal aortic aneurysms
- plastic and salvage surgeries on the aortic valve
- treatment of critical limb ischaemia, hybrid revascularization, vascular graft transplantation
- establishing dialysis AV shunts by artificial vascular prosthesis and transposition of v. basilica
- amniotic membrane application for chronic non-healing defects

**Unique equipment:**

- devices for ECMO – PLS and HLS devices allowing non-stop mechanical cardiac or pulmonary support

**Major events in 2022:**

- We published 10 papers in peer-reviewed journals, including 8 papers in foreign journals with an impact factor.
- MUDr. Frank Antonová, Ph.D., MBA successfully completed her postgraduate studies.
- The department took part in the AHR grant “Amniotic Membrane Application in the Treatment of Long-term Non-healing Wounds”.

**Department of Nuclear Medicine and Endocrinology, 2nd Faculty of Medicine, Charles University and Motol University Hospital**

Head - prof. MUDr. Petr Viček, MHA

Senior Consultant -MUDr. Kateřina Táborská

Head Nurse - Jana Richterová

**Basic description:**

The Department of Nuclear Medicine and Endocrinology is an interdisciplinary facility of nuclear medicine and endocrinology focusing on standard diagnostics using radioisotope methods, as well as diagnostics, treatment and follow-up of differentiated thyroid carcinoma, serious forms of thyroidal orbitopathy and on therapy of <sup>131</sup>I-MIBG from the entire CR. The department is also an educational facility - it is accredited for endocrinology and diabetology and nuclear medicine. **An endocrinology outpatient unit specializing in differentiated carcinoma of the thyroid, the unit is following up on more than 18,600 patients (one of the largest sets worldwide).**

The department is a centre for the treatment of thyroidal autoimmune orbitopathy with growth hormone inhibitors, diagnostics and therapy of advanced forms of differentiated carcinoma of the thyroid using human recombinant TSH (Thyrogen) and for the treatment of neuroendocrine tumors using radiopharmaceutical <sup>131</sup>I-MIBG (as the only centre in the Czech Republic).

**Specialized outpatient units:**

- endocrinology
- advisory centre for micro-carcinomas of the thyroid (MDTC)
- advisory centre for medullary thyroidal carcinoma (MTC)
- advisory centre for thyroidal autoimmune orbitopathy (TAO)
- outpatient unit for nuclear medicine

**New methods and procedures:**

- Diagnostics using the hybrid method combining X-ray (CT) and isotope (SPECT) imaging;
- Implementation of individual dosimetry in diagnostic and therapeutic procedures in paediatric and high-risk patients with advanced carcinoma of the thyroid;
- The department ensures in cooperation with the Department of Oncology, 2nd Faculty of Medicine, Charles University and Motol University Hospital targeted biological treatment of radio-iodine refractory thyroidal carcinomas;
- Arranging genetic examination for patients with the familial form of medullary thyroid carcinoma and patients with papillary thyroid carcinoma in cooperation with the Institute of Endocrinology in Prague;
- In cooperation with the Department of Paediatric Haematology and Oncology at MUH and Brno UH, patients with high-risk neuroblastomas were treated with the combination <sup>131</sup>I-MIBG according to the MATIN protocol with full-body dosimetry.
- Introduction of the application of alpha emitters in the treatment of patients with castration resistant prostate cancer.
- Reconstructing and modernizing the inpatient ward's storage containers for radioactive waste.

**Major events in 2022:**

- A great success was the introduction of a new therapeutic method: administering LUTATHERA 177Lu-DOTATATE (oxodotretotide) a radiopharmaceutical to treat inoperable or metastatic, progressive and well-differentiated (G1 and G2) gastroenteropancreatic neuroendocrine tumour (GEP-NET) that progresses on treatment with somatostatin analogues.

## Department of Otorhinolaryngology and Head and Neck Surgery, 1st Faculty of Medicine, Charles University and Motol University Hospital

Head - prof. MUDr. Jan Plzák, Ph.D.

Senior Consultant - MUDr. Jan Kluh

Head Nurse - Jitka Hovorková

### Basic description:

The department provides the full spectrum of examinations and treatments of diseases from the ENT specialization. Surgical procedures are carried out in the full extent, including the most specialized procedures, which are performed in many cases for the entire Czech Republic.

**In 2022, 2,810 surgical procedures were performed at the department, 275 of these surgeries were on patients outside the department's operating theatres. Conventional subjective tonal audiometry was carried out on 3,062 patients. Objective audiometry was performed on 166 patients. There were 820 examinations of the balance system.**

**The examination for an indication of rehabilitation of hearing using hearing aids or alternation of the existing rehabilitation was carried out on 240 patients and 61 hearing aids were issued.**

### Specialized outpatient units:

- oncology outpatient unit
- cophosurgery outpatient unit
- rhinology outpatient unit
- endocrine surgery outpatient unit
- otoneurology outpatient unit
- outpatient unit for correction of hearing defects - hearing aids
- laryngeal and phonosurgical outpatient unit
- outpatient unit for rehabilitation of voice - voice prostheses
- outpatient unit for sleep disorders and snoring
- sonography outpatient unit
- outpatient unit for diseases of the salivary glands
- outpatient unit for swallowing defects
- outpatient unit of neurosurgery and diseases of the cranial base
- phoniatics outpatient unit

### Specialized centres:

- centre for laser surgery
- centre for surgery of the thyroid and parathyroid glands
- centre for cochlear implants
- centre for oncological surgery of the head and neck
- centre for rehabilitation of patients after total laryngectomy
- centre for electronic hearing replacements
- centre for salivary gland diseases
- centre for treatment of sleep insufficiency
- centre for swallowing disorders with multidisciplinary cooperation
- centre for robotic assisted surgery in head and neck oncology therapy

### New methods and procedures:

- Use of the Montgomery salivary bypass tube after resection and reconstruction procedures following oncological procedures due to tumors in the head and neck;
- Augmentation of the vocal cords with Radiesse;
- Treatment of patients with sleep apnea using the DISE method (Drug Induced Sleep Endoscopy);
- Endoscopic approaches to removal of tumors in the inner ear canal;
- Perioperative neuromonitoring;
- Fiberoptic endoscopic evaluation of swallowing with functional assessment (FEES);
- Extended microsurgery of tumors in secondary nasal cavities and cranial basis using guidance;
- Examination of myogenous vestibular potentials /VEMP/ in patients with balance disorders;
- Endoscopic surgery of esophageal diverticulum;
- Endoscopic diagnostics of tumors in airways and swallowing system using NBI;
- Endoscopic examination of the salivary glands and endoscopic treatment of the sialolithiasis;
- Use of an exoscope in posterior cranial fossa surgery, phonosurgery and traditional ear surgery;
- Rehabilitation of patients after total laryngectomy with synthetic voice recording in cooperation with the West Bohemian University in Pilsen - department of cybernetics;
- Introduction of robotic assisted surgery in head and neck oncology therapy;
- Robotic cochlear implant surgery.

### Unique equipment:

- CO2 Laser, Dioxo Laser, Thulium laser, argon plasma coagulation
- harmonic scalpel, radiofrequency scalpel, shaver
- endoscopic equipment for minimally invasive procedures on the thyroid and in surgeries of the cranial base and the inner ear canal
- video-stroboscopy, video ENG
- NBI in early diagnosis of tumors
- neuronavigation
- video-endoscopy of the salivary glands
- micro-shaver and laser for stapedial ear surgery
- Interacoustics EyeSeeCam vHIT
- the ICS Chartr 200 system for an examination with infrared glasses (VNG vestibulometry), as well as detecting nystagmus with electrodes (ENG vestibulometry).
- Surgical exoscope

### Major events in 2022:

- The department organized or co-organized a number of events in which, among others, undergraduate and postgraduate students actively participated, e.g. 3 - 4.11.2022 International Course - Medical Expert Training in the Clinical Benefits of NBI Diagnostic Endoscopy in Laryngology.

### Awards/education obtained:

- Prof. MUDr. Jan Betka, DrSc. - Ambassador Awards, the Prague Mayor Award "For Long-standing Contribution to the Congress Industry" on 6 September 2022.
- Prof. Betka received the state decoration for merit in the field of science "Medal of Merit of the First Degree". In addition, the Minister of Health Award for Medical Research and Development for 2022 for achieving outstanding results in an applied medical research and development project: "Interaction of Tumour Microenvironment Cells as a New Tool to Predict the Efficacy of Head and Neck Cancer Therapy".
- Prof. MUDr. Jan Plzák, Ph.D. - was elected to the position of: President-Elect Confederation of European Otorhinolaryngology - Head and Neck Surgery as well as the corresponding member of the German Society of Otorhinolaryngology, Head and Neck Surgery.
- Doc. MUDr. Jan Bouček, Ph.D. was elected to the Executive Board Politzer Society.
- MUDr. Vladimír Koucký successfully completed his doctoral studies and thus obtained the academic-scientific title Ph.D.

## Department of Spinal Surgery, 1st Faculty of Medicine, Charles University and Motol University Hospital

Head - prof. MUDr. Jan Štulík

Senior Consultant - MUDr. Jan Kryl

Head Nurse - Dagmar Šeborová

### Basic description:

Specialized department with national operation for the treatment of injuries and diseases of the spine, including consequences in children and adults (acute spinal fractures and addressing their consequences, primary and secondary tumors, degenerative defects, inflammatory diseases, congenital and acquired deformities). **In 2022, 1,522 patients underwent surgery, 1,612 patients were admitted, 13,994 patients were treated in the outpatient unit for spondylosurgery and the Centre for Conservative Therapy treated 2,343 patients.**

### Specialized outpatient units:

- outpatient unit for treatment of spinal injuries and diseases
- scoliotic advisory centre for children
- centre for conservative therapy

### New methods and procedures:

- total spondylectomy of the second cervical vertebra

### Unique equipment:

- EOS exoscope
- EOS full-body scanning
- Mini drill - a drill for working on small bones and spines

### Major events in 2022:

- 3<sup>rd</sup> May Spondylosurgical Symposium, Prague
- XX Congress of the Czech Spondylosurgical Society, Prague
- Annual Congress of the Czech Society for Orthopaedics and Traumatology (CSOT), Prague (organizer of the section on spines)
- gained European Accreditation in the field of Spondylosurgery
- gained European Accreditation in advanced Spondylosurgery
- IG 6026 -Serious instabilities and their complex spondylosurgical treatment
- KDP-AZV-44 - Surgical treatment of degenerative spine conditions
- a chapter in the book Chest Pain (Grada)
- ŠTULÍK, J., GERI, G., BARNA, M, KLÉZL, Z.: High-grade high-dysplastic lumbosacral spondylolisthesis in children treated with complete reduction and single-level circumferential fusion: a prospective case series. Brain and Spine, Volume 2:100871, 2022.

## Department of Long-term Treatment - Aftercare Centre

Senior Consultant - MUDr. Martina Nováková

Head Nurse - Lucie Kubová

### Basic description:

The Department of Long-term Treatment - Aftercare Centre specializes in geriatric issues and in aftercare for patients following traumas, surgeries, prolonged internal diseases, strokes, etc., with no age restrictions. The department specializes in wound healing, nutrition, physiotherapy and ergo-therapy. It has an emergency outpatient unit and a geriatric outpatient unit. It has **353 beds, but as of 1.9.2022, 180 beds are temporarily closed due to the reconstruction of the building and from 1.4.2022, 30 beds will be transferred to the Department of Internal Geriatric Medicine.** The 10<sup>th</sup> inpatient ward, with 24 beds, is specialized for hospitalization of patients requiring more intensive care or care corresponding to an acute internal ward. The 14<sup>th</sup> inpatient ward, with 29 beds, located in Pavilion 22 outside the main building, focuses mainly on aftercare for patients in the chronic haemodialysis programme and works closely with the Fresenius Haemodialysis Centre.

**In 2022 the total number of admissions was 644 and the number of procedures in the geriatric outpatient unit was 316.**

#### **Specifics of the facility:**

The facility has 1<sup>st</sup> degree accreditation for tuition in geriatrics and is involved in postgraduate education for physicians in geriatrics, tuition in internal medicine and bachelor's studies for nurses and physiotherapists. The AC department also runs training courses for paramedics, students of social issues and massage therapists. It has ongoing cooperation with the CTU in teaching paramedics. Close cooperation with the palliative care consultation team (PCCT) for the adult section of MUH continues.

#### **Unique equipment:**

- Extremiter 2010-better future + CO2 therapy for vacuum-compression therapy (for wound healing)
- 2 x weight machine - resistance training to prevent and treat sarcopenia
- combined electro and magnet therapy
- Siemens ultrasound machine with colour Doppler and probes for abdominal US and DUS
- a tablet with special speech therapy programs (Alfaslovník, Gotalk, Gridplayer)

#### **Major events in 2022:**

- Cooperation with the newly set up Department of Geriatric Internal Medicine (DGIM) enabled us to use the DGIM's equipment - a new Xario sonographic device, continuous glucose monitoring using the Frestyle Libre device and use of spirometry. This has significantly increased patient comfort.
- 2022 was still affected by the waning Covid pandemic - a Covid isolation station was set up for our patients.
- In October 2022, 3 doctors successfully passed the internal medicine exam and a new doctor with expertise in psychiatry (0.4 vacancies) joined the team.
- *Publications and active participation in congresses:*
- Nováková, M. Svět praktické medicíny, 1/2022, pp. 1-5, Má stoletý inzulín budoucnost? (Does century-old insulin have a future?)
- Nováková, M. Acta Medicinæ, Diabetologie, Přínos terapie gliptiny u seniorních diabetiků (The Benefit of Gliptin Therapy in Elderly Diabetics)
- Nováková, M. Farmakoterapeutická revue, 1/2022, str. 57-61, Současné postavení gliptinů v léčbě diabetu (Current Status of Gliptins in the Treatment of Diabetes), Tiskárna Polygraf, Turnov, ISSN: 533-6878, registration number MK CR E 22430
- Geriatrie a gerontologie (10/2021): Midline Catheters for Geriatric Patients in Postacute Care 2/2022
- Acta medicinae, Nováková, M.: Specifikace péče o seniorní diabetiky (Care Specifications for Elderly Diabetics) ( 4/22)
- Acta medicinae, Nováková, M.: Křehký geriatrický pacient (The Fragile Geriatric Patient) ( 4/22)
- Kazuistiky v diabetologii: Nováková, M. Semaglutid- jednoduché řešení časté překážky intenzifikace léčby inzulínem (Semaglutide- a simple solution to a common obstacle to insulin treatment intensification), 9/22

- Nováková, M.: Výhledy a výzvy diabetologie: Vliv křehkosti pacientů s DM II na intenzivní antihypertenzní léčbu (Effect of Frailty in DM II Patients on Intensive Antihypertensive Treatment), 9/22
- Nováková, M.: Healthcare Forum: Péče o seniory, následná péče z pohledu geriatra, (Care for the Elderly, Aftercare from the Perspective of a Geriatrician) 10/22
- The GENERACE Project - lecture series ending with a national congress - active participation of Dr. Nováková
- Bžizová L., Kraft, M. Cooperation Between a Doctor and a Speech Therapist, Experience from the MUH Aftercare Centre (National Geriatric Congress Hradec Králové, April 2022)

### **Department of Neurology, 2nd Faculty of Medicine, Charles University and Motol University Hospital**

*Head - prof. MUDr. Petr Marusič, Ph.D.*

*Senior Consultant - doc. MUDr. Aleš Tomek, Ph.D., FESO*

*Deputy for Science and Research - prof. MUDr. Jakub Hort, Ph.D.*

*Head Nurse - Hana Chvátalová*

#### **Basic description:**

The Department of Neurology provides comprehensive diagnostics and treatment for patients with nervous system diseases. The main programmes developed at the highest achievable level in the CR include the cognitive, epileptological, neurootological, neuromuscular, neuroimmunological and neurovascular programmes. Besides caring for patients from the region, medication consultation is also provided selectively to patients from the entire CR.

**In 2022, the department's outpatient section examined more than 40,000 patients. A total of 2,309 patients were admitted.**

#### **Centres providing highly specialized care accredited by the Ministry of Health of the CR:**

- Centre for highly specialized cerebrovascular care
- Centre for highly specialized care for pharmacoresistant epilepsies
- Centre for highly specialized care for multiple sclerosis and neuromyelitis optica

#### **Centres of the European Reference Network for Rare Diseases (ERN):**

- ERN EpiCARE-European Reference Network for Rare and Complex Epilepsies
- ERNRND-European Reference Network for Rare Neurological Diseases
- ERN EURO-NMD-European Reference Network on Neuromuscular Diseases

#### **Specialized centres accredited by professional societies:**

- Cognitive centre
- Neuromuscular centre
- Centre for Parkinson's disease and other extrapyramidal defects
- Centre for hereditary ataxias
- Neuro-otological centre
- Centre for headache

**Specialized outpatient units:**

- advisory centre for neurocutaneous disorders
- vertebrogenic and myoskeletal advisory centre

**New and unique methods and procedures:**

- Advanced EEG assessment in intracranial EEG and high-density scalp EEG, as well as implementation of the protocol for examination and mapping of cognitive functions from intracranial electrodes is carried out in cooperation with the Academy of Sciences CR and the Czech Technical University.
- The department cooperates on the international project E-PILEPSY, which has allowed for the introduction of a methodology for assessing sources of EEG signals (Electrical Source Imaging) and postprocessing in neuro-imaging (advanced processing of PET image and its coregistration, 3D Slicer).
- Under the longitudinal study Czech Brain Ageing Study (CBAS), homocysteine, oxidative stress markers, and pathological protein (TDP-43, phosphorylated tau and beta-amyloid) levels in the serum and in the liquor are analyzed. Genetic examination was expanded by determination of polymorphism for TOMM, BDNF-met. and TDP-43.
- The set of samples from patients with limbic encephalitis was further expanded and examination of neutralizing antibodies in patients with MS was carried out. The set of patients treated with donepezil, from whom liquor was collected, was expanded by the set of patients with rivastigmine and memantine.
- In the field of multiple sclerosis, there is a significant increase in patients treated with DMD and their scientific processing, including registries.
- The cognitive centre innovated the tests for examining preclinical and prodromal Alzheimer's disease, including a new examination battery of spacial cognition with testing in virtual reality.
- Liquor laboratory (in cooperation with the Department of Immunology, 2nd Faculty of Medicine and MUH) - introduction of the immunoanalytical methodology for determining intrathecal synthesis of anti-GAD antibodies. The existing diagnostic panel of autoimmune encephalitis - examination of antibodies against well characterized onconeural antigens Hu, Yo, Ri, Ma2 (Ta), CV2 (CRMP5), amphiphysin using the Western Blot method with subsequent automated semiquantitative evaluation; examination of antibodies against membrane and synaptic antigens (NMUDr.AR, AMPA1R, AMPA2R, GABABR, caspr-2, LGI-1) using indirect immunofluorescence on cells transfected with genes for the relevant antigens was expanded by Zic4, Tr (DNER), SOX1, Ma1.
- A unique electrochemical method of body fluid fingerprinting was introduced in laboratory differential diagnostics of neurodegenerative diseases.
- Routine monitoring of video EEG and brain perfusion using TCD at the Intensive Care Unit;
- Expansion of the personalized medicine program with antithrombotic drugs in secondary prevention of cerebrovascular diseases in cooperation with the Laboratory of Molecular Diagnostics of the Na Homolce Hospital and the Pharmakl laboratory by measurement of the effectiveness of new oral anticoagulants;
- Endovascular treatment of acute ischemic strokes as a routine therapeutic procedure (cooperation with the Department of Radiology, 2nd Faculty of Medicine, Charles University and Motol University Hospital);

- Method for rehabilitation of patients with chronic vertigo conditions and balance defects during hospitalization unique in the CR continues to be used. The method uses a visual biological feedback with a power platform and a tablet. Our department contributed to the development of this system.
- Creation of programmes for rehabilitation of strabismus, amblyopia and functional programme version of the Hess canvas in cooperation with the Department of Cybernetics of the Czech Technical University and the Department of Ophthalmology for Children and Adults, 2nd Faculty of Medicine, Charles University and Motol University Hospital
- Examination of the otolith system using the cervical myogenic evoked potential method, introduction of the pupillometry method - expansion of the options in examination with the existing equipment for video-oculography (VOG).
- Examination of the working of the vestibulo-ocular reflex using the ICS Impulse device by Otometrics. This device makes it possible to examine the working of individual semi-circular canals and detect incomplete vestibular lesions.
- Testing thin fibers of the peripheral nerves with thermic threshold determination using the Peltiér cell.
- Neurophysiological diagnostics of thin nerve fibre defects (A delta, C fibres) in patients with peripheral and autonomous neuropathy.
- Quantitative electromyography as part of myopathy diagnostics (computer processing of the EMG signal - power spectrum analysis, peak ratio, number of small segments).

**Unique equipment:**

- Simoa analyser - automated device for detecting immunological markers in cognitive and autoimmune brain diseases
- laboratory for augmented virtual reality
- 256-channel high-density EEG
- ICS Impulse device by Otometrics for examining the function of individual semi-circular canals
- telemetry with central monitor Philips IntelliVue M3150 for 9 patients
- ultrasonography device RIMED Intraview with a helmet for long-term monitoring
- Canon Aplio 500 ultrasonography device for examining transcranial and extracranial arteries and peripheral nerves with 3D imaging along with the MR/CT data
- 128-channel EEG system NicoletOne for video-EEG monitoring
- NYDIAK rotating chair for electronystagmography - ENG examination
- FAN Study system allowing comprehensive evaluation of the function of the autonomous nervous system, including test on a sloping surface
- Somedic thermal tester, Sweden - electrodiagnostic device evaluating the function of thin fibres A delta + C fibres
- digital algometer Somedic, Sweden - electrodiagnostic device for research into deep neuropathic pain
- experimental laboratory for examining spacial memory and spacial orientation (Blue Arena)

### Major events in 2022:

- Co-organization of a number of domestic congresses and seminars (Czech and Slovak Neurological Congress 2022, 80<sup>th</sup> jubilee congress). Czech and Slovak Cerebrovascular Congress, Epileptology Congress (and several others);
- The department's team is active in the leadership of Czech scientific societies - Prof. Marusič is the chair of the Czech Neurological Society CzMA, Doc. Tomek is the chair of the Cerebrovascular Section of the CNS

#### Publications:

68 scientific publications, of which 54 in foreign impacted journals including repeated articles with an IF above 10: Nature genetics IF 41,4, 3x Neurology IF 12,3, JAMA Neurology IF 29,9, 2x , Sci Total Environ IF 10.8, 3x Alzheimers and Dementia IF 16.7, JACC CI IF 16,1, Stroke IF 10.1, plus 3 articles in peer-reviewed foreign journals, 2 articles in domestic impacted journals, 2 in peer-reviewed domestic journals and 1 domestic monograph.

## 1<sup>st</sup> Department of Orthopaedics, 1st Faculty of Medicine, Charles University and Motol University Hospital

Head - prof. MUDr. Ivan Landor

Senior Consultant - prof. MUDr. Stanislav Popelka, CSc.

Senior Consultant - MUDr. Jaroslav Kalvach - traumatology

Head Nurse - Petra Sklenářová, Dis

### Basic description:

The department provides conservative and surgical care for adult patients throughout the entire spectrum of orthopaedic procedures. It provides services under traumatology of the locomotor system with the exception of spine and paediatric orthopaedics. The department has 129 beds in total, of which 14 beds for intensive care for aseptic patients and 2 beds for intensive care for septic orthopaedics, 30 traumatology and 20 septic beds.

**In 2022, a total of 4,315 patients were hospitalized and 45,144 patients were treated in the outpatient unit. A total of 4,382 surgeries were performed.**

### Specialized outpatient units:

- joint replacements
- surgery of large joints
- surgery of the hand and foot
- arthroscopy of the shoulder, wrist, knee and ankle
- sports traumatology
- septic orthopaedics
- rheumatology
- oncology
- general traumatology

### New methods and procedures:

- Research and development of new joint implants in cooperation with local and foreign partners;
- New techniques for wrist surgeries;
- The expansion of minimally invasive surgical techniques for addressing hallux valgus;
- The laboratory determination of alpha defensin in the diagnostics of joint replacement infection;
- The fast determination of alpha defensin synovasure (lateral flow test) in the perioperative diagnostics of joint replacement infection;
- Introduction of the leukocyte esterase test in the diagnostics of joint replacement infection;
- An endoscopic method of medulloscopy in the treatment of chronic osteomyelitis;
- The Masquelette technique when treating infected pseudoarthrosis;
- Vacuum therapy in the treatment of infected defective wounds;

### Major events in 2022:

- As. MUDr. Vladislav Barták PhD successfully completed the habilitation procedure by defending his thesis on the topic: "MTP Joint Replacement of the Big Toe".
- *Publications:*
  - Melicherčík, P., Kotaška, K., Jahoda, D., Landor, I., & Čeřovský, V. (2022). Antimicrobial peptide in polymethylmethacrylate bone cement as a prophylaxis of infectious complications in orthopedics—an experiment in a murine model. *Folia Microbiologica*, 1-7. IF 2.629, Q 3
  - Melicherčík, P., Klapková, E., Nyč, O., Kotaška, K., Neščáková, M., Landor, I., & Jahoda, D. (2022). Antimicrobial efficacy and activity perseverance in arthroplasty of calcium sulfate beads containing vancomycin prepared ahead of time and stored in ready-to-use formula. *Folia Microbiologica*, 67(1), 63-69. IF 2.629, Q 3
  - Fulin, P., Daniel, M., Walder, J., Grzelecki, D., & Pokorny, D. (2022). Impact of the COVID-19 pandemic on orthopaedic and traumatological care in Prague, the capital of the Czech Republic. *PloS one*, 17(6), e0269164. IF 3.752, Q 1
  - Mazura, M., Kachlik, D., Blankova, A., Malikova, H., Whitley, A., Landor, I., & Dzupa, V. (2022). A Morphologic Analysis of the Pubic Symphysis Using CT and MRI. *JAAOS-Journal of the American Academy of Orthopaedic Surgeons*, 10-5435. IF 3.545, Q 1
  - Barták, V., Heřt, J., Štědrý, J., Popelka Jr, S., Popelka, S., & Hromádka, R. (2022). Long-term results of total joint arthroplasty and phalangeal hemiarthroplasty of the first metatarsophalangeal joint using the ToeFit Plus™ system. *Foot and Ankle Surgery*, 28(1), 56-61. IF 2.84 Q 2
  - Mazura, M., Goldman, T., Stanislav, P., Kachlik, D., & Hromádka, R. (2022). Calcaneal osteotomy due to insertional calcaneal tendinopathy: preoperative planning. *Journal of Orthopaedic Surgery and Research*, 17(1), 1-5. IF 2.359, Q 2
  - Daniel, M., Eleršič Filipič, K., Filová, E., Judl, T., & Fojt, J. (2022). Modelling the role of membrane mechanics in cell adhesion on titanium oxide nanotubes. *Computer Methods in Biomechanics and Biomedical Engineering*, 1-10. IF 2.188, Q 3

- Grzelecki, D., Grajek, A., Dudek, P., Olewnik, Ł., Zielinska, N., Fulin, P., ... & Kowalczewski, J. (2022). Periprosthetic Joint Infections Caused by Candida Species—A Single-Center Experience and Systematic Review of the Literature. *Journal of Fungi*, 8(8), 797. IF 5.724 Q 1
- Gajdosova, V., Strachota, B., Strachota, A., Michalkova, D., Krejcikova, S., Fulin, P., ... & Slouf, M. (2022). Biodegradable Thermoplastic Starch/Polycaprolactone Blends with Co-Continuous Morphology Suitable for Local Release of Antibiotics. *Materials*, 15(3), 1101. IF 3.682, Q 2
- Fulín, P., Šlouf, M., Gajdošová, V., Němeček, P., Krejčíková, S., & Pokorný, D. (2022). Opakovaná sterilizace artikulačních komponent kloubních náhrad etylenoxidem nemá vliv na strukturu a vlastnosti UHMWPE. (Repeated sterilization of articulating components of joint replacements with ethylene oxide does not affect the structure and properties of UHMWPE.) *Acta Chirurgiae Orthopaedicae et Traumatologiae Cechoslovaca*, 89(2), 121-128. IF 0.531 Q 3
- Pokorný D., Fulín P., Heřt J., Walder J., Štefan J., Sosna A.: Stemless SMR® shoulder hemiarthroplasty: surgical technique and a summary of six years of experience. *Acta Chirurgiae Orthopaedicae et Traumatologiae Cechoslovaca*, 89(6), 395-405 IF 0.531 Q 3
- Jaganjac E., Vlček M. (2022). Válečná poranění v Sarajevu (War Injuries in Sarajevo), *Rozhl Chir.* 2022;101:Supplementum 1/2022:20–24
- Fulín, P., Landor I.: *Orthopaedics in Bolest na hrudi (Chest Pain)* (Lukáš K., Kautzner J., Hoch J.) (2022), str.471-486, Grada Publishing a.s., 2022 Praha
- Teaching at clinical workplaces - new programmes and new teaching aids and conditions for teaching, e-learning.

## Department of Oncology, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - doc. MUDr. Tomáš Büchler, Ph.D.

Senior Consultant - MUDr. Zdeněk Linke

Head Nurse - Renata Limaxová

Senior Radiology Assistant - Alena Čuprová

### Basic description:

The department provides comprehensive care for oncological patients in antitumor pharmacotherapy and radiation treatment. It is one of the Comprehensive Cancer Centres in the Czech Republic, where highly specialized care is provided. The clinic was designated as one of two National Cancer Centres (NCC) in the Czech Republic at the end of 2019. The facility is accredited for specialized education in clinical oncology and radiation oncology.

**In 2022, a total of 238,545 outpatient check-ups, treatments and examinations were performed at the Oncology Department of the MUH, of which 1,615 were by multidisciplinary teams and 4,761 were lymphatic drainage procedures.**

**In 2022, a total of 2,133 new patients were admitted to the Oncology Department of the MUH. A total of 1,735 patients were hospitalized at the MUH Oncology Department in 2022.**

**In 2022, the parenteral administration of chemotherapy/biological treatment came to 9,152 cycles of anticancer treatment**, a result higher than in 2019, 2020 and 2021. This result shows a 50% rise in the number of systemic treatment applications over the last 3 years and reflects both the process of centralization of treatment in oncology, and, in particular, the significant development and breadth of indications for biological therapy and immunotherapy.

**In 2022, the total number of patients on external beam radiotherapy came to 982 - including 31 pediatric patients.. In 2022, the number of irradiated fields was 68,633 (59,114 in 2021), the number of irradiation fractions came to 21,689 (20,988 in 2021).** All these figures were also higher than in previous years.

**In 2022, the brachytherapy department carried out 701 applications to a total of 124 patients.** The number of patients the brachytherapy department treated was comparable to 2021.

### Specialized outpatient units:

- outpatient unit for follow-up care for patients after completion of antitumor treatment
- outpatient unit for checking patients during chemotherapy
- outpatient unit for checking patients during teletherapy
- outpatient unit for chemotherapy application
- outpatient unit for checking patients during brachytherapy
- outpatient unit for palliative and symptomatic care
- outpatient unit for lymphatic drainage
- newly opened outpatient unit for observation of genetic mutation carriers

### New methods and procedures:

- Periodic adjustment of standard protocols for the treatment of malignant tumors with the introduction of new biological treatment molecules, new cytostatic drugs, and new combinations of cytostatic drugs and biological treatment. A major share in creating the therapeutic outcomes of the drug registries in the CR.
- Introduction of central vascular accesses (ports) and peripheral PICCs or midline practices in all patients with the application of parenteral chemotherapy and biological treatment or immunotherapy for a large proportion of patients.
- Cooperation with genetic facilities in searching for families with a genetic high risk with regard to the occurrence of malignant tumors, recommended prophylactic therapeutic measures and follow up of healthy carriers of high-risk mutations with regard to the origination of oncological diseases.
- Cooperation with the Department of Immunology and the Department of Urology at the MUH in the application of the SNP01 preparation - Centre for Treatment of Prostate Cancer.
- Full use of the IMRT (intensity modulated radiotherapy) technique allowing for a higher dose of radiation in the target volume while avoiding irradiating healthy tissue. 40 % of patients are irradiated with this technique.
- Implementation of the IGRT (image guided radiotherapy) technique based on



- checking the current settings of the patient's position during radiotherapy and option of correcting this position according to the reference position. Use of localization grains (fiducial markers) for more precise targeting of the target volume in patients undergoing radiotherapy of prostate cancer.
- Option of merging images from MRI and CT diagnostic measurement with planning CT images for more accurate determination of the target volume

#### Unique equipment:

- Three Truebeam linear accelerators, Varian Medical Systems, enabling 3D patient imaging with CBCT and Respiratory Management System. Besides IMRT (Intensity Modulated Radiotherapy), they also allow VMAT (Volumetric Modulated Arc Therapy). All three accelerators are fitted with a system for controlling the patient's breathing movements during irradiation – Respiratory Management System. Two of the accelerators are equipped with a Millenium120 multi-blade collimator with a 5 mm blade width in the central part of the irradiation field and the third accelerator has a High Definition MLC multi-blade collimator with finer resolution and a 2.5 mm blade width. Apart from standard photon beams, the two Truebeam accelerators also produce beams without a homogenizing filter, the so-called FFF beams (Flattening-Filter Free).
- stereotactic body radiotherapy (SBRT)
- Visual coaching during breathing for respiration-controlled radiotherapy - 4D radiotherapy
- MR based IGABT (Image-Guided Adaptive Brachytherapy)
- Gammamed Plus iX, Varian Medical Systems, a HDR brachytherapy afterloader
- CT device Brilliance Big Bore, from Philips, for planning treatment.

#### Major events in 2022:

- As of 1.10.2023, the long-standing head, Doc. MUDr. Jana Prausová, Ph.D., MBA, was replaced by Doc. MUDr. Büchler.
- During the autumn of 2021 and at the beginning of 2022, the construction of a new complex for the National Cancer Centre at the MUH was finally approved.
- The department's membership in the OECl (Organization of European Cancer Institute) was confirmed, which allowed the department to take part in researching new innovative drugs, access to such drugs in academic clinical trials and preferential and paid educational programmes for our physicians.
- Continued membership in the Sarcoma Group EORTC and it contributes to academic clinical studies (such as Survival Outcomes in Adolescent and Young Adults with Colorectal and Pancreatic Cancer).
- Ongoing grant. NU22-08-00281 "A Multiomics Approach to Developing Biomarkers to Predict Breast Cancer Resistance 2022-25" - Principal Researcher: NIPH/Mgr. Viktor Hlaváč, Ph.D., Co-director of the Department of Oncology MUH/MUDr. Kateřina Kopečková, Ph.D.
- In 2022, physicians actively took part in international ASCO, ESMO and ESTRO events with expert presentations, abstracts and posters.
- From 8.12.-9.12.2022, the department organized a unique educational event in Prague for oncologists, the first Best of Oncology. This event ties in to 5 years of Best of ASCO events.

- The department took part in organizing and giving lectures at the 13<sup>th</sup> Prague Onco Colloquium in January 2022, the Urooncological Symposium and at other important Czech symposia.
- The work on the pilot study of the impact of genetic factors on the effects of therapy and survival of patients with pancreatic cancer continues (in cooperation with the National Institute of Public Health (NIPH), the Department of Surgery of the 2nd Faculty of Medicine, Charles University and Motol University Hospital

#### Department of Pneumology, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - doc. MUDr. Libor Fila, Ph.D.

Senior Consultant - MUDr. Lucie Valentová Bartáková

Departmental Manager - MUDr. Dmitry Rakita, CSc.

Head Nurse - Jana Zelenková

#### Basic description:

The Department of Pneumology focuses on diagnostics, treatment and research of diseases of the lower respiratory tract and the lungs. The department has three inpatient stations with a total of 76 standard beds and an ICU with 14 beds. The main programmes focus on lung transplantation, pneumooncology, adult cystic fibrosis, interventional bronchology and interventional bronchology. The department is part of the Prague Lung Transplantation Programme, the Centre for Highly Specialized Pneumo-Onco-Surgical Care at MUH and the CF Centre at MUH (in the framework of ERN-LUNG and ECFS-CTN). The department is accredited at level 3 for postgraduate education in pneumology and phthisiology and organizes IPME courses in bronchology for beginners and in cystic fibrosis in adulthood. The department houses the Sub-department of Pneumology and Phthisiology of the IPME (headed by Prof. MUDr. Miloslav Marel, CSc.).

**In 2022, a total of 1,857 patients were hospitalized, of which 249 were in the ICU. 14,100 patients were treated as outpatients, 1,354 bronchoscopies were performed and 1,234 chemotherapy treatments were administered.**

#### Specialized outpatient units:

- pneumology outpatient unit
- transplantation outpatient unit
- outpatient unit for interstitial pulmonary diseases
- outpatient unit for cystic fibrosis
- outpatient unit for poorly treatable asthma
- outpatient unit for breathing disorders in sleep
- outpatient unit for treatment of tobacco addiction
- focal outpatient unit

### New methods and procedures:

- Treating COVID-19 patients using new antivirals (molnupiravir, nirmatrelvir/ritonavir) and monoclonal antibodies (casirivimab/indevimab, tixagevimab/cilgavimab)
- Biological treatment of bronchogenic carcinoma (lorlatinib, durvalumab, ipilimumab), cystic fibrosis (elexacaftor/tezacaftor/ivacaftor) and bronchial asthma (dupilumab)
- Expanded indication for antifibrotic therapy (nintedanib) for progressive fibrotic interstitial pulmonary processes (non-IPF)
- Treatment of cancerous pleural effusions using a tunneled catheter that reduces the risk of infectious complications and allows chemotherapy to be administered

### Unique equipment:

- Olympus ESG-300 argon plasma coagulation device

### Major events in 2022:

- The department participates in the Programme for Early Detection of Lung Cancer in the Population at Risk organized by the National Screening Centre of the Institute of Health Information and Statistics of the Czech Republic (IHIS CR)
- Dr. Martina Šterclová successfully defended her habilitation thesis at the 1<sup>st</sup> FM CU
- In 2022, in cooperation with Surgical Department III, a record 54 patients were able to receive lung transplants.
- **Notable publications:**
- Halloran K, Mackova M, Parkes MD, Hirji A, Weinkauff J, Timofte IL, Snell GI, Westall GP, Lischke R, **Zajacova A**, Havlin J, Hachem R, Kreisel D, Levine D, Kubisa B, Piotrowska M, Juvet S, Keshavjee S, Jaksch P, Klepetko W, Halloran PF. The molecular features of chronic lung allograft dysfunction in lung transplant airway mucosa. *J Heart Lung Transplant*. 2022 Dec;41(12):1689-1699. doi: 10.1016/j.healun.2022.08.014. **IF 13.569**
- Parkes MD, Halloran K, Hirji A, Pon S, Weinkauff J, Timofte IL, Snell GI, Westall GP, Havlin J, Lischke R, **Zajacová A**, Hachem R, Kreisel D, Levine D, Kubisa B, Piotrowska M, Juvet S, Keshavjee S, Jaksch P, Klepetko W, Halloran PF. Transcripts associated with chronic lung allograft dysfunction in transbronchial biopsies of lung transplants. *Am J Transplant*. 2022 Apr;22(4):1054-1072. doi: 10.1111/ajt.16895. **IF 9.369**
- Podrazil M, Taborska P, Stakheev D, Rataj M, Lastovicka J, **Vlachova A**, Pohunek P, Bartunkova J, Smrz D. Effectiveness and Durability of mRNA Vaccine-Induced SARS-CoV-2-Specific Humoral and Cellular Immunity in Severe Asthma Patients on Biological Therapy. *Front Immunol*. 2022 May 20;13:892277. doi: 10.3389/fimmu.2022.892277. **IF 8.787**

## Department of Urology, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - prof. MUDr. Marek Babjuk, CSc.

Senior Consultant - MUDr. Marek Schmidt, FEBU

Head Nurse - Mgr. Sandra Dvořáková

### Basic description:

The Department of Urology provides therapeutic and preventive care in the entire spectrum of adult urology nationwide and internationally. The site specializes in surgical treatment of cancers of the urogenital tract including the subsequent oncological treatment. It is one of the top facilities for the treatment of lithiasis and laparoscopy. The facility is the only site for surgical gender conversion in the CR. As of 2018, it has had the da Vinci robotic operating system. In 2022, there were 309 robotic urological surgical procedures. **In 2022, there were 25,851 outpatient examinations, 2,155 admissions and 2,082 surgical operations.**

### Specialized outpatient units:

- oncology outpatient unit
- outpatient unit for treatment and metaphylaxis of lithiasis and chronic infection
- andrology outpatient unit
- outpatient unit for dysfunction of lower urinary tract
- centre for treatment and research of prostate cancer (in cooperation with the Department of Radiotherapy and Oncology and the Department of Immunology)
- centre for surgical treatment of transsexualism
- Centre for Robotic Surgery of the MUH

### New methods and procedures:

- Advanced laparoscopic procedures - cystectomy, radical prostatectomy, reconstructive surgeries, retroperitoneal lymphadenectomy, kidney resection, solution of vesicovaginal fistulas, Boari reconstruction;
- Improvement of endoscopic treatment of lithiasis - percutaneous mini-nephrolithotomy technique, percutaneous nephrolithotomy in supine position, flexible ureteroscopy, laser lithotripsy, etc.;
- Improvement of derivative surgeries after cystectomy;
- Use of new imaging methods for diagnostics of tumors of the bladder (NBI = "narrow band imaging") in regular practice;
- Percutaneous neurostimulation in the treatment of urgent symptomatology of the bladder
- Introduction of surgical implantation of sacral neuromodulator for the treatment of idiopathic hypoactivity of the bladder;
- Intradetrusor application of neurotransmitter blockers in the treatment of hyperactive bladder;
- Use of Ho:YAG laser in surgical procedures;
- Transurethral enucleation of the prostate using a morcellator;
- MRI/USG fusion prostate biopsies;
- Implantation of artificial urethral constrictor in severe incontinence.
- Robotic operations - radical prostatectomy, kidney resection, pyeloplasty, radical cystectomy, nephroureterectomy, robotic occlusion of vesicovaginal fistula, ureteral reimplantation

**Unique equipment:**

- Ho:YAG laser
- instruments for NBI (“narrow band paging”), fluorescence cystoscopy
- instruments for miniPNL
- 3D laparoscopic system Einstein Vision
- endoscopic morcellator Piranha
- Toshiba Aplio 500 sonographic device for MRI/USG fusion biopsies of the prostate
- The daVinci Xi robotic system
- COMBAT BRS /COMBined Antineoplastic ThermoTherapy Bladder Recirculation System/ for hyperthermic intravesical chemotherapy of bladder tumours.
- The daVinci Xi robotic system

**Major events in 2022:**

- Organization of the conference Comprehensive News in Oncology 13.5 - 14.5.2022, Prague

## Common Examination and Therapeutic Units

### Department of Radiology, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - prof. MUDr. Miloslav Roček, CSc., MBA, FCIRSE, EBIR

Senior Consultant of the adult section - MUDr. Vojtěch Suchánek

Senior Consultant of the paediatric section - MUDr. Irena Buksakowská, Ph.D.

Senior Radiological Assistant of the adult section - Mgr. Tomáš Schilla

Senior Radiological Assistant of the children's section - Alice Jará

**Basic description:**

**In 2022, a total of 236,098 patients were screened in the adult section of the Department of Radiology and 343,954 examinations were made.** Overall, this is about a 5% increase in the number of examinations. There was a higher number of CT scans and MRI scans. The number of conventional skiagraphs was also slightly higher compared to 2021. The number of interventional procedures also increased. **The number of outpatients was 168,550, inpatients 67,548. In 2022, a total of 64,483 patients were examined in the children's section of the Department of Radiology (DoR) and 87,302 examinations were carried out,** which is a growth of 11.4%. The largest increase, 24.9%, was in the polyclinic. There was a 10.7% increase in inpatient skiagraphy, a 5.5% increase in MRIs and a 7.7% increase in dental x-rays. There was a decrease of 2.4% in ultrasound and 12.4% in CT. **The number of outpatients was 47,391 The number of inpatients was 17,092.**

An IKA was performed at the Department of Radiology. IQs continued to be monitored at regular intervals, always showing a positive result. There is a persistent shortage of RA staff at the Department of Radiology. The adult section currently lacks 3 RAs. The Department of Radiology is lacking one nurse. A new RA Bc was taken on at the Department of Radiology.

Social facilities at the Department of Radiology are consistently satisfactory. Some of the windows in the medical rooms were replaced in 2022 and work will continue in 2023. In 2022, construction work began on a new EOS skiagraphy workplace, which will once again raise the quality of the services provided.

**Unique equipment:**

- the latest CT device Somatom Force allowing examination with a low dose of radiation, also used for children
- additional CT – 2 devices with 64 rows of detectors, CT Toshiba Aquilion One with 320 rows
- magnetic resonance – 4 devices: examination in the full range of spectroscopy, including a 3T MR MAGNETOM Vida
- Toshiba Infinix, Ultimax-i (DREX-UI80/E2) for angiographies
- mammography, mammary sonography, stereotaxis, vacuum bioptome
- sonography for children and adults, doppler sonography
- 6x fully digitized skiagraphy, 2 state-of-the-art skiagraphs for traumatology Adora from Canon
- Hologic, Horizon QDR densitometer

**New methods and procedures:**

- CT angiography, 3D VR visualization, CT cardio, CT coronarography;
- CT generation of Vol data for neuronavigation, ENT navigation and stomatology;
- MR – new options for examination of the veins, functional examination of the heart, tractography, T2 relaxometry, examination of non-cooperating patients, spectroscopy;
- Thanks to the new Siemens VIDA 3T MRI, the DoR's capacity for MRI examinations has expanded by approximately 220 adult and child patients per month. This has led to a certain shortening of waiting times for some examinations. The main benefit of the new device, apart from better quality images, is the introduction of advanced techniques (MRS, fMRI, whole body MRI) that can be used both in routine practice and for research purposes. The accuracy of diagnosing pelvic tumours and pathologies of the musculoskeletal system has also seen great progress. With the delivery of a mobile MR-compatible ventilator, patients requiring general anaesthesia can now also be examined on 3T MR;
- Prenatal US and MR diagnostics;
- MAMO SONO site – ductography, puncture of cysts and core cut biopsy under US control, puncture with the Vacora device;
- Radiofrequency ablation and chemoembolization of metastasis in the liver, lungs;
- Implantation of aortal stent grafts (also fenestrated), brain thrombectomy, subintimal recanalization of the peripheral arteries, treatment of acute and chronic deep vein thrombosis, treatment of vascular accesses for hemodialysis;

- Treatment of brain malformations in children and adults;
- Intervention in the bile duct, spondyloplasty and vertebroplasty;
- Intervention under CT skiascopy;
- US devices Toshiba Aplio with SW allowing diagnostics with the use of contrast medium, in particular for dynamic diagnostics of focal lesions especially in the liver, we also examine the liver with elastography;
- Expanded use of dictation systems;
- Conferences and consultations also take place outside the CR;
- Conference system allowing for monitoring surgical procedures was involved;
- Arterial spin labeling as a recent method for imaging brain perfusion;
- Software for Toshiba Aplio 500. SMI (Super Microvascular Imaging) allowing precise detection of the microvascular architecture of the tissue.
- Catheter treatment of retinoblastoma introduced for the first time in the CR;
- The Horizon QDR densitometer has expanded the range of services offered by the DoR. The device can also be used by other clinics at MUH.

#### Major events in 2022:

- After being the president of the Section of Paediatric Radiology of the CzMA, Vice-president and Scientific Secretary of the Czech Society of Interventional Radiology of the CzMA, Prof. MUDr. Miloslav Roček, CSc. also became president of the Czech Radiological Society of the CzMA
- In 2022, in cooperation with Yoav Dori, MD, PhD (Children's Hospital of Philadelphia) and Theodor Adla, MD (MUH, IKEM), the MRI department of the adult section of the MUH performed a contrast examination of malformations of the lymphatic system of the chest and abdomen in two paediatric patients with their subsequent endovascular treatment. It was probably the first time this had been done in the Czech Republic.
- The spectrum of pelvic oncology diagnostics has been expanded by a protocol evaluating the extent of bladder cancer (VI-RADS) and, in cooperation with the Urology Dept. at the MUH, the protocol for prostate cancer examination was further improved in preparation for the planned screening programme.
- In cooperation with the MUH Department of Rehabilitation, a course of videofluoroscopy for external participants was held on 9.3. and 11.3. 2022 as an accredited event via the CMC and the Association of Clinical Speech Therapists, and on 10.5. as an internal event for MUH radiologists and speech therapists.
- The Department of Radiology actively participated in the CSIR Working Symposium in Špindlerův Mlýn 22-24.5.2022.
- Active participation at the 43<sup>rd</sup> Czech Radiological Congress in Olomouc 12-16.10.2022

### Institute of Biology and Medical Genetics, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - prof. MUDr. Milan Macek, DrSc., MHA

Senior Consultant - MUDr. Markéta Havlovicová

Head Nurse - Mgr. Hana Strouhalová

Quality Manager - RNDr. Tereza Stříbná, Ph.D.

#### Basic description:

The department (further the DBMG) provides a wide spectrum of preventive and diagnostic medical care in medical and molecular genetics also through medical consultations throughout the Czech Republic. The DBMG diagnoses selected congenital defects, hereditary tumors, neurodegenerative diseases in children and adults, rare diseases including mental development disorders in prenatal and postnatal period. **In 2022, the institute's outpatient units provided specialized consultations to 5,738 families as part of postnatal and prenatal care, there were a total of roughly 13,000 outpatient examinations. The DBMG laboratories carried out 6,000 molecular genetic tests of various types, ranging from targeted testing for a single gene variant to testing for a clinical exome.**

The DBMG laboratories are accredited by the Czech Institute for Accreditation and registered in the Register of Clinical Laboratories of the National Authorization Centre for Clinical Laboratories at the CzMA (NASKL.cz) and hold a Certificate of Compliance with the Conditions of Audit I for Expertise in Clinical Biochemistry and Medical Genetics.

The National Coordination Centre for Rare Diseases, Centre for Diagnostics and Treatment of Paediatric and Adult Patients with Cystic Fibrosis was established under the DBMG and the site is also part of the national research infrastructure - "National Centre for Medical Genomics".

The DBMG works on a number of European Commission projects (Horizon 2020 - Solve-RD.eu, RD-code.eu; Horizon Europe - Screen4Care), Norway Grants (second call for the National Coordination Centre for Rare Diseases - www.nkcvo.cz), and coordinates 16 European Reference Networks for Rare Diseases at the Motol UH.

#### Specialized outpatient units:

- prenatal genetic advisory centre
- neurogenetic advisory centre
- oncogenetic advisory centre
- genetic advisory centre for sensory defects and non-syndrome deafness
- cardiogenetic advisory centre
- genetic advisory centre focusing on dysmorphology
- genetic advisory centre for couples with reproduction problems
- genetic advisory centre for patients with intellect insufficiency and defects of the autistic spectrum
- genetic advisory centre for thrombophilia
- genetic advisory centre for gastroenterology and hereditary pancreatitis
- genetic advisory for CF/CF screening in newborns in cooperation with the Centre for Cystic Fibrosis of the MUH genetic counselling for hereditary nephropathy

**New methods and procedures:**

- The diagnosis of new microdeletion syndromes using the FISH and aCGH methods as well as diagnosis without the need for direct culture of amniotic/chorionic cells continues has been further expanded.
- The “custom” platform (4x180K CGH+SNP) is introduced under the array CGH method for examination of patients with isolated heart defects or severe combined complex congenital heart defects.
- The SNP array method implemented on the Illumina platform is now accredited.
- A new cytogenetic database was put into practice in 2022.
- Classification of variants is improved by the use of new database instruments and updating evaluation algorithms of the software for data analysis. Apart from the passive use of the international Decipher database, the results of the array CGH have been fed into it since last year, i.e. we are involved in creating this database.
- Accreditation of ČIA 15189 is granted for all cytogenetic and molecular cytogenetic methods and international EQA is carried out regularly.
- A national Czech array group for the improving chip diagnostics has been set up. Our colleagues hold expert positions in it.
- DNA diagnostics using the Sanger DNA sequencing method or using the fragmentation analysis method on more than 120 genes responsible for genetically conditioned syndromes with intellectual impairment, defects of the autistic spectrum, ataxia, dystonia, muscular dystrophy, myopathy, growth defects, osteochondrodysplasia, craniosynostosis, defects of gender development, syndromes with a cancer predisposition, organ and sensory defects, thrombophilia, rare diseases and genetic syndromes are still ongoing.
- We also examine for imprinting defects in PWS/AS and BWS/RSS syndromes and MLID.
- Gene deletions/duplications or microdeletion syndromes are examined using the MLPA, whilst the use of CE IVD kits is increasing.
- In diagnostic practice, we use gene panel testing using NGS methods. In 2022, we routinely used these methods to screen patients with suspected hereditary breast and ovarian cancer, patients with suspected HNPCC, neurofibromatosis, RASopathy, and some other selected hereditary diseases: familial multiple cerebral cavernous malformations, Gorlin syndrome, holoprosencephaly, Treacher-Collins syndrome, and Duchenne/Becker muscular dystrophy.
- We introduced the Clinical Exome Solution (CES) by Sophia Genetics into our diagnostic practice and replaced the previously used Kardio and CID panels with virtual panels.
- On the basis of CES, we have newly designed, tested and launched our own virtual diagnostic panels responsible for all types of cardiomyopathies (389 genes), arrhythmogenic syndromes (327 genes), aortopathies and collagenopathies (371 genes), which allows a more accurate and faster diagnosis of genetically determined heart diseases. We examined some of the panels from 504 individuals and did a targeted examination on 460 relatives.
- On the basis of CES, we introduced germline mutation testing into diagnostic practice in a virtual panel of 602 genes associated with mental retardation and autism. We examined 200 individuals and did a targeted examination on over 100 relatives.
- For rare, unclear and diagnostically complex cases of genetically conditional diseases, the CES data are filtered according to the proband’s clinical symptoms. 193 subjects were examined for clinical exome.

- In the most diagnostically complex cases, roughly 100 families, i.e. parents and child, had a trio test using the WES (Whole Exome Sequencing) method.
- Once again, we successfully met the requirements of an external interlaboratory quality control for molecular genetic EMQN and RfB laboratories for 14 different diagnoses, Sanger’s DNA sequencing and NGS.
- By using VarAFT, VarSome Clinical and Franklin (Genoox) programs, we continue to improve the filtering and prioritization of NGS data and give a more accurate interpretation of variants of a-priori unclear significance.
- We screen newborns for cystic fibrosis throughout the Czech Republic in cooperation with the University Hospital in Vinohrady and the General University Hospital in Prague (approx. 50,000 newborns), we also take part in the Pilot Project focused on SMA and SCID screening.

**Unique equipment:**

- Labogene Scanlaf Mars laminar biohazard box for sterile tissue culture work
- Safe Fast Light laminar box for processing tissue culture
- PHCbi controlled atmosphere incubator for long-term tissue cultivation
- Carousel for Zeiss Axioscope fluorescence microscope
- SZS 902 LED Stereomicroscope (CVS preparation)
- Leica DM 2500LED light microscope (karyotyping, ZCA)
- Applied Biosystems 3500 Genetic Analyzer
- Applied Biosystems SeqStudio Flex 8
- HiSeq 550 by Illumina for NGS
- Veriti 96-Well Thermal Cycler
- New centrifuge for the andrology laboratory

**Major events in 2022:**

- Clinical applications of NGS in neurogenetics, cardiogenetics and dysmorphology, often associated with intellectual disability and autism spectrum disorders, and also in hearing disorders.
- In 2022, the CUGA grant focused on endophenotyping patients with PAS continued, a publication focusing on the identification of clinically distinctive subgroups of autism by geometric morphometry based on cluster analyses is currently in progress, likewise a CUGA grant focusing on assessing the facial features of patients with a proven pathogenic variant in the PKD1 and PKD2 genes, concerning individuals diagnosed with polycystic kidney disease.
- Prof. MUDr. Macek, Head of the DBMG, as coordinator of the National Coordinating Centre for Rare Diseases, ensured and continues to guarantee a large number of MUH departments are included in the European Reference Networks (ERN) for Rare Diseases. During the Czech Presidency of the Council of the European Union, Prof. MUDr. Macek organized the international conference “Towards a New European Policy Framework: Building a Future for Rare Diseases”.
- At the same time, also as part of the Czech Presidency of the Council of the European Union, Prof. Macek co-organized a workshop looking at developing screening for newborns “Early Diagnosis of Patients With Rare Disorders in the EU: the Crucial Role of Newborn Screening”, as well as a satellite workshop to celebrate the 200<sup>th</sup> anniversary of the birth of G. J. Mendel in Brno

## Department of Medical Chemistry and Clinical Biochemistry, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - prof. MUDr. Richard Průša, CSc., EuSpLM

Senior Consultant - MUDr. Jana Čepová, Ph.D., MBA

Head laboratory technician - Mgr. Martina Bunešová, MBA

### Basic description:

The laboratory of the DMCCB provides 195 different laboratory examinations. Annually, we processed biological material from 100,254 unique national ID nos. - 6% more than the previous year. Every day (including Saturdays, Sundays and bank holidays) the laboratory examines an average of 3,000 biological samples, i.e. 798,000 examinations per month, in a non-stop three-shift operation. Many examinations (MTX, cyclosporine A, tacrolimus, sirolimus, lead, platinum, antimycotics, busulfan, IGF-1, gentamycin,  $\alpha$  defensin, ganciclovir, isavuconazonium etc.) are also carried out for other external medical facilities. Examinations are also carried out for self-payers and veterinary medicine.

**In 2022, a total of 9,088,751 laboratory tests were performed, of which 56% were immediate.**

The DMCCB has specialized outpatient units focusing on the issues related to hyperlipoproteinemia, bone metabolism defects, nutritional defects in the sense of obesity and malnutrition. **In 2022, there were 5,200 patients treated in the outpatient section.**

### Specialized outpatient units:

- outpatient unit focusing on the treatment of hyperlipoproteinemia
- outpatient unit focusing on bone metabolism issues
- outpatient unit focusing on nutritional issues

### New methods and procedures:

- 2019 - AMH - change of reference limits  
17 - 17-OH progesterone - method changed due to restandardization
- 2020 - ganciclovir
- 2020 -  $\alpha$  defensin
- 2021 - introduced a method for determining isavuconazole in plasma by LC-MS (since 1.9.2021)
- 2021 - converting a-Tg, a-TPO methods from chemiluminescence to electrochemiluminescence
- 2021 - converting procalcitonin and NT-proBNP methods from electrochemiluminescence to chemiluminescence
- 2021 converting the myoglobin method from immunoturbidimetry on chemiluminescence on microparticles

- 2021 - AAS
  - For the method of copper and zinc in serum on flame AAS, the ratio of serum to dilution solution was adjusted to accommodate the use of the autosampler and also the need for repeat analysis of the sample/control/calibrator.
  - For the urinary copper method, the method and calibration settings were adjusted to more accurately measure low concentrations ( $<1 \mu\text{mol/l}$ ).
  - For the serum selenium method on AAS with a graphite cuvette, the amount of sample and reagents pipetted into the cuvette were optimized to refine individual measurements.
- 2022 Conversion of methods: PSA, free PSA from Roche (electrochemiluminescence) to Siemens (chemiluminescence)
- 2022 biobanking introduced in the AQUA system - monitoring the archiving of biol. material processing
- 2022 - isavuconazole

### Unique equipment:

- 2019 - installation (renewal) of two Atellica 1500 urinalysis lines (chemical determination + sediment), replacement of the old one
- 2019 - installation of Stat Strip a new network glucose meter from Nova Biomedical for ward 2 inpatient station/ICU I. orthopaedic clinic of the 1<sup>st</sup> FM CU
- 2019 - 2 new OsmoPRO osmometers
- 2019 - electrothermal atomization absorption spectrometer and flame atomization absorption spectrometer Agilent 200 Series AA Spectrometer 240FS AA
- 2019 - Cobas Integra 400plus analyzer (replaced the old one)
- 2020 - POCT- installation of a new network glucose meter
- 2020 - Stat profile Prime,  $\text{Ca}^{++}$ ,  $\text{Mg}^{++}$  analysis
- 2020 - POCT -installation and subsequent responsibility for 6 x ABR analysers
- 2020 - new biochemical analyser - Atellica - 3, fundamental change in basic biochemical operation
- 2021 - 2 new AtellicaIM1600 immunochemical analyzers, a major change in laboratory operation
- 2021 - the existing Cobas6000 was replaced with a new one
- 2021 - the number of osmometers was expanded by a new OsmoPRO osmometer
- 2021 - 2 new, cooled, large capacity BeckmanCoulter centrifuges
- 2021 - 2 new decappers
- 2021 - replacing the biochemical AtellicaDL with AtellicaSH (+sample handler)
- 2021 - POCT
  - The Dept. of Anaesthesiology and Resuscitation (DAR) replaced five acid-base analysers with the newer ABL800 FLEX PLUS type.
  - Two AQT90 FLEX immunochemical analyzers were replaced at the adult emergency department (AED).
  - A new ABL800 FLEX PLUS replaced the acid-base analyzer at the Department of Paediatric Surgery.
  - New ABL800 FLEX PLUS acid-base analyzer installed at the Dept. of Surgery.
  - Stat Profile pHox Ultra acid-base analyzer installed at the Paediatric Dept.
  - Stat Profile pHox Ultra acid-base analyzer installed at the Paediatric Sampling Centre.

- Throughout the MUH departments a total of 33 net strip glucose meters were replaced with new StatStrip glucose meters of the same type.
- 2022 - Two new Siemens Rapidlab 1245 acid-base analyzers installed
- New ABL90 FLEX PLUS acid-base analyzer installed at the AED.
- ABL800 FLEX PLUS replaced the acid-base analyzer at the Dept. of Surgery.
- Two carousel glucose meters replaced with new SensoStar GL30 Touch at the Pediatric Internal Medicine Dept.
- Throughout the MUH departments a total of 42 net strip glucose meters were replaced with new StatStrip glucose meters of the same type.
- 2022 - New immunochemical analysers installed: Architect 4000 in i2000SR+i2000SR configuration (Abbott);
- 2022 - installation of the AQUA system - pre-analytical phase of the lab examination;
- 2022 - 2 new, cooled, large capacity BeckmanCoulter centrifuges;
- 2022 - the number of osmometers was expanded by a new OsmoPRO osmometer;
- 2022 - the number of LC - MS increased;
- 2022 - HPLC system Agilent Technologies Agilent 1260;
- 2022 - ELISA reader SUNRISE RC;
- 2022 - air conditioning in ceiling;
- 2022 - Installation of AU 480 ( Beckman Coulter ), replaced with Cobas Integra 400 from Roche s.r.o.

#### Major events in 2022:

- Menhir profesora Masopusta 2022 conference
- BIOLAB2022, national congress of biochemical lab technicians
- publications

#### Publications:

Total number of publications: 22, of which 8 with an IF, 6 peer-reviewed papers, 6 popular science articles, 2 chapters in monographs.



## Department of Immunology, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - prof. MUDr. Jiřina Bartůňková, DrSc., MBA

Senior Consultant - prof. MUDr. Anna Šedivá, DSc.

Head laboratory technician - Mgr. Jarmila Grecová

#### Basic description:

The Department of Immunology provides comprehensive care for paediatric and adult patients with immunopathological conditions, including clinical and laboratory examination and follow-up care. Besides outpatient examinations and treatment in the full range of allergology and clinical immunology, the Department of Immunology also provides a specialized outpatient clinic for vaccinating patients at risk, as well as regular therapy and application by infusion for indicated drugs for severe immune disorders in the daycare centre for children and adults. Clinical trials in the field of immunotherapy are also conducted in the outpatient clinics and laboratories of the Department of Immunology. The department is the base for pregraduate and postgraduate tuition in immunology and carries out research in the same field. The Department of Immunology provides highly specialized care in immune disorders, immunodeficiencies and autoimmune diseases, including neuro-immunology, autoinflammatory disorders and severe forms of allergic diseases and focuses on the immunology of tumorous diseases. The department operates nationally in these areas of highly specialized care, sometimes even internationally.

**In 2022, there were 16,945 patients examined in outpatient clinics, 272 163 examinations were performed in laboratories on 48,943 patients, and a further 270,326 examinations were performed in the liquorological laboratory.**

#### Specialized outpatient units:

- outpatient unit for immunodeficiency
- outpatient unit for allergies, autoinflammatory and autoimmune diseases
- daycare centre for the therapy of immunopathological conditions for children and adults
- outpatient unit for application of antitumor vaccines under clinical studies
- outpatient unit for vaccinating children at risk

#### Specialized laboratory:

- liquor laboratory (under clinical cooperation with the Department of Neurology)

#### Centres:

- Centre for the treatment of difficult-to-treat asthma
- Centre for the treatment of hereditary angioedema
- Centre for diagnostics and treatment of immunopathological conditions - part of the Federation of Immunological Societies' Centres of Excellence

**New methods and procedures:**

- Extended options for diagnosis of severe immune disorders especially in methods for examining cell immunity;
- Functional examination of parameters of congenital and acquired immunity;
- Introduction of diagnostic algorithms for immune disorders as part of a pilot SCID screening project in the Czech Republic;
- Intracellular examination of anti-inflammatory cytokines;
- Extension of the cell immunity panel (proliferation test ki-67, examination of Th17 and T regulating lymphocytes);
- Optimization of autoantibody investigation panel - introduction of Bio-flash methods;
- Introducing new methods in the context of the COVID-19 pandemic, determination of IL-6, sIL2R and antibodies against SARS-CoV-2 virus, new comprehensive solution of COVID-19 immunology with a KleeYa chemiluminescence-based analyzer
- Extended daycare centres in supervision of home application of subcutaneous immunoglobulins
- Clinical studies of immunoglobulin preparations
- Clinical studies of modern targeted treatment of immunopathological conditions
- Clinical trials to treat hereditary angioedema
- Clinical studies of immunopathology of tumors

**Unique equipment:**

- comprehensively equipped laboratory for flow cytometry including a sorter with another new cytometer in 2022
- microscopic facility including a confocal microscope and scanning cytometer
- automated equipment for ELISA methods including a new automatic device
- equipped with automated chemiluminescence apparatus for antibody detection

**Major events in 2022:**

- Organizing and holding the Congress of Czech and Slovak Clinical Immunologists and Allergists (October 2022, 02 Universum, Prague);
- Continued individual administration of unregistered preparation DCVAC under the hospital exception for modern therapy pharmaceuticals Sections 49b) and 49c) of the Act on Pharmaceuticals;
- Operation of an immunodeficiency centre as part of the global network of centres of the Jeffrey Modell Foundation, USA; a grant from this foundation was resolved;
- Work on projects of Institutional Support of the MUH and work on grants from the AHR and TACR;
- Work on immunopathology diagnosis projects in the Modern Therapies scheme;
- Clinical study of a rare disease Activated PI3 Kinase Syndrome with a Specific Inhibitor CCDZ173X2201; an FDA review of this clinical trial;
- Publication activities - 21 original foreign impacted publications, a book - Immunodeficiency.
- The L'Oréal Women in Science Award for MUDr. Zuzana Strížová, Ph.D.;
- Hlávková Award for RNDr. Zuzanu Paračkovou, Ph.D.;
- The Minister of Health Award for Research Activities for the AHR grant Modern Approaches to Primary Immunodeficiencies (investigator Prof. Šedivá);
- Several national awards for publications and awards for creative achievement of MUH.

**Department of Medical Microbiology, 2nd Faculty of Medicine, Charles University and Motol University Hospital**

Head - prof. MUDr. Pavel Dřevínek, Ph.D.

Senior Consultant - MUDr. Otakar Nyč, Ph.D.

Senior Laboratory Technician - Bc. Vilma Klemensová

**Basic description:**

The department provides laboratory diagnostics of bacterial, viral, mycotic and parasitic infections. It provides consultation in ATB therapy, differential diagnostics of infections and infection complications. The department cooperates on monitoring the occurrence of nosocomial infections and monitors the occurrence of extraordinary profiles of ATB resistance. The site contributes to the activities of the Independent Quality Control Department by preparing, presenting, implementing and assessing audits focused on rational use of ATB and other medication in the hospital. It is connected to the European system of surveillance of ATB resistance and a European study for monitoring the incidence of infections caused by *Clostridium difficile*.

Through its representatives in the Central Coordinating Group of the National Antibiotic programme, Subcommittee for Antibiotic Policy of the CzMA and the committee of the Society for Medical Microbiology CzMA, the department participates actively in the implementation of the antibiotic policy in the CR. Special emphasis is placed on evaluation of the latest diagnostic procedures and their implementation in the clinical practice with the aim to further improve microbiological diagnostics. Since the beginning of the COVID-19 pandemic, the department has been providing basic and specialized PCR laboratory diagnosis of this infection. In the person of the departmental head, the facility is represented in the National Institute for Pandemic Management at the MoH CR; four of the Institute's employees are on the committee of the Society for Medical Microbiology CzMA.

**New methods and procedures:**

- Comprehensive diagnostics based on extrahuman genome analysis;
- MALDI-TOF identification of bacterial agents and filamentous fungi using the international MSI database;
- Detection of virulence factors and resistance genes: *MRSA*, *PVL* and *TSST* in *S. aureus*, *mcr* genes in *Enterobacteriaceae* isolates; carbapenemases; whole genome sequencing for a detailed characterization of MDR bacteria.
- Molecular typing of *C. difficile*, *S. aureus* (for the purposes of the CR including national surveillance), *P. aeruginosa* and complex *B. cepacia* (chronic infections in patients with cystic fibrosis; CF);
- Proof of neutralizing antibodies against beta-interferon type of medication for MS centres in the CR;
- Cooperation with the MUH Department of Internal Medicine in the operation of a donor bank for the need of faecal transplantation in patients with recurrent colitis caused by *Clostridium difficile*;
- Direct PCR detection of the hepatitis B virus;
- Selective culture of *Scedosporium*, a filamentous fungus of the order Onygenales, in patients with CF or primary ciliary dyskinesia;
- POCT of respiratory infections on an ID Now (Abbott)



### Major events in 2022:

- Participation in preparing specialized seminars held by the Society for Medical Microbiology;
- Prof. MUDr. Pavel Dřevínek, Ph.D: member of the Committee of the European Cystic Fibrosis Society (ECFS), chairman of the SLM CzMA;
- Prof. MUDr. Pavel Dřevínek, Ph.D.: invited to lecture and organize the Antimicrobial Resistance session at the ECFS Basic Science Conference, 2022
- Mgr. Marcela Krůtová, Ph.D: member of the ESCMID Study Group for Clostridium difficile – ESGCD; Contribution to updating European and national guidelines for the treatment of *C. difficile* infections.
- *Publications:* 31 foreign impacted publications

### Department of Pathology and Molecular Medicine, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Head - Prof. MUDr. Josef Zámečník, Ph.D.

Senior consultant - MUDr. Petr Škapa, Ph.D.

Senior Laboratory Technician - Vladimíra Kratinová

### Basic description:

The department is involved in tissue and cellular diagnostics of diseases at the microscopic and molecular level. It uses biopsy and cytology methods that tie into other specialized laboratory examination methods (immunohistochemistry, fluorescence in situ hybridization, enzyme histochemistry, molecular analysis of nucleic acids, electron microscopy and flow cytometry). One of the department's essential service functions is peroperative biopsies, where the histopathological diagnosis is determined during the surgical procedure. An important part of the department's work is the constantly developing area of predictive pathology, which is a group of immunohistochemical and molecular methods, on the basis of which targeted biological anticancer treatment with monoclonal antibodies or low molecular weight inhibitors is indicated within the personalized medicine concept. The department has several specialized working groups focused on diagnosing the pathological conditions of individual organ systems. The department provides consultation services to other pathology departments in the CR, their primary purpose is to correct and supplement the biopsy findings of patients who will subsequently be treated at the MUH. The autopsy operation is no longer the department's dominant focus, however, it does have an educational and control function within the hospital. The department is an undergraduate and postgraduate training facility and teaches pathology for medical and non-medical students of the 2<sup>nd</sup> FM CU, it takes part in the doctoral programme in biomedicine and specialization training in Pathology.

**In 2022, the department carried out 19,519 biopsy examinations, 1,889 peri-operative examinations, 1,802 non-gynaecological cytology examinations, 510 pulmonary cytology examinations, 1,736 molecular and hybridization examinations, 881 flow cytometry examinations and 186 autopsies.**

### Specialized laboratories:

- biopsy laboratory
- cytological laboratory
- laboratory for immunohistochemistry
- laboratory for in situ hybridization
- laboratory for molecular pathology
- laboratory for flow cytometry
- laboratory for electron microscopy
- laboratory for neuropathology and muscle biopsies
- laboratory for pulmonal cytology

### New methods and procedures:

- Developing immunohistochemical and molecular diagnostics, especially in neuro-oncology and gynaecological pathology and soft tissue tumours;
- The anti-INSM1 monoclonal antibody (insulinoma-associated protein 1; clone A-8) examination was introduced as an immunohistochemical marker of neuroendocrine tumour differentiation with the advantage of nuclear expression to improve diagnosis;
- The introduction of an antibody to determine the expression of MUC4 glycoprotein (clone EP256) to optimize the immunohistochemical diagnosis of carcinomas;
- An antibody was introduced for determining the immunohistochemical expression of the marker PHH3 (Phospho Histone H3). This is a mitotic marker to distinguish mitotic figures from apoptotic bodies for the diagnosis of a wide range of cancers;
- An immunohistochemical antibody was introduced to determine the expression of fumarate hydratase/fumarase (clone BSB-151) for the differential diagnosis of smooth muscle tumours of the uterus;
- An antibody was introduced to determine the expression of p57Kip2 (clone KP10) for the immunohistochemical diagnosis of gestational trophoblastic disease;
- A CKS1B/CDKN2C hybridization probe was introduced to investigate the presence of gains/amplifications in the chromosomal region 1q21.3-q22 (CKS1B gene) and deletions in the chromosomal region 1p32.2 (CDKN2C gene) in patients with multiple myeloma; the test is useful for predicting disease prognosis.
- An 11q gain/loss hybridization probe for haematopathology was introduced for use in patients with Burkitt's lymphoma morphology with no MYC rearrangement, detecting gains in the 11q23.3 region and losses in the 11q24.3 region. The test is aimed at diagnosing the newly defined WHO unit "High grade B-cell lymphoma with 11q aberrations";
- Developing a next-generation sequencing (NGS) methodology for cancer and introducing new diagnostic panels, especially the development of NGS testing methodology for endometrial cancer;
- Detection of mutations in the potentially targetable ACVR1 gene in patients with high-grade gliomas in the brain;

- operation in the workplace;
- Refining the differential diagnosis of T lymphoproliferations using newly introduced methods for assessing T-cell clonality (TRBC1) and CD279 sign in diagnostic flow cytometry panels.

#### Unique equipment:

- Agilent Dako Autostainer Link 48 and Agilent Dako PT Link Pre-Treatment Module for immunohistochemistry examinations,
- MiSeq Illumina sequencer for NGS methodology,
- Cobas Roche and Idylla Biocartis analysers for detecting specific gene changes and microsatellite instability (MSI),
- An IVD-certified Applied Biosystems 3500 genetic analyzer for Sanger sequencing, Quibit fluorimeter for measuring the concentration of NGS libraries and an isolator of cfDNA from plasma or fluid,
- Beckman Coulter DxFLX flow cytometer,
- JEOL JEM-1400plus electron microscope,
- Sakura Tissue-Tek staining and mounting machine for making histological slides,
- NovaVoice dictation software for converting speech to text.

#### Major events in 2022:

- There was a change in the institute's senior consultant - the institute's long-time senior consultant, MUDr. Daniela Nováková Kodetová, was replaced by MUDr. Petr Škapa, Ph.D.
- The department contributed to 31 scientific publications in impacted journals with an IF (3 papers are first-authored, 5 are senior-authored) and 6 papers in domestic peer-reviewed journals.

### Department of Clinical Haematology

Senior Consultant - MUDr. Jitka Segethová

Senior Laboratory Technician - Blanka Hájková

#### Basic description:

The department provides extended haematological care according to the criteria of the Czech Haematological Society CzMA. It is divided into two sections - the laboratory and the clinical section. The laboratory performs routine and special haematological examinations for the MUH and for requests from outside the region. The laboratory is a reference laboratory for diagnostics of acute leukemias and myeloproliferative conditions in children. The attention in adults' haematology is focused on precise morphological diagnostics of the myelodysplastic syndrome. **In 2022, the laboratory performed 950,344 procedures.**

**The clinical section includes an outpatient unit for the children's and the adults' section. 38,522 procedures were carried out in the outpatient unit in 2022.** In the adult outpatient clinic, treatment at the centre with extended haematology care also focuses on treating multiple myeloma and low grade malignant lymphoproliferative diseases. The adults' outpatient unit includes application rooms used for the application of transfusion preparations and chemotherapy.

#### New methods and procedures:

- Examination of the function of thrombocytes;
- Introducing a methodology for examining the levels of new antithrombic medicines;
- Introduction of the methodology for the examination of fibrine monomers;
- Introduction of a methodology for determining f. XIII.;
- The morphological laboratory participates in international studies of treatment of acute leukemias in children;
- The department is actively involved in the activities of the Czech MDS Group;
- The department's physicians actively participate in the Czech Myeloma Group including entries in the register of monoclonal gammopathies CMG.
- The laboratory provides practical training for students in the fields of Medical Laboratory Technician and Laboratory Diagnostics in Healthcare.

#### Unique equipment:

- SYSMEX XN 3000 - automated line for examining the blood count including digital morphology
- coagulometers (ACL) for the examination of routine and special coagulation tests.
- an ACL TOP 750 CTS coagulometer with preanalytical phase control
- STA-R Evolution - analyzer for examining fibrine monomers.
- device for functional analysis of thrombocytes (Innovance PFA 200)
- Bactec satellite incubator for receiving haemocultures
- The DCH manages the AQT90 Flex radiometer PCT machine in the Adult Emergency Department, which processes D-dimers in acute patients

#### Major events in 2022:

- The Abbott TVO Study, an international comparative study of haematology analyzers, was conducted at the department.
- A new methodology for examining Heinz bodies was introduced.
- Together with the Adult Neurology Dept., the department took part in the introduction of the CoaguChek POCT device for INR and aPTT testing directly at the patient's bedside in AED.

## Department of Clinical Psychology of MUH

Senior Consultant - Mgr. Markéta Mohaplová

### Basic description:

The Department of Clinical Psychology (DCP) has 40 clinical psychologists in various positions who provide psychodiagnostic and psychotherapeutic care to adult and paediatric patients at the MUH. **In addition to the care of patients from the core wards, 2022 saw more than 2,500 consultant-requested procedures.**

Specifically, the department provides care for paediatric and adult patients before and after organ transplantation, paediatric haemato-oncology patients and patients with chronic pain. The psychologists are further involved in complex diagnostic and therapeutic care for paediatric patients with autism spectrum disorders, eating disorders and other psychiatric diagnoses. DCP psychologists are also part of multidisciplinary teams caring for paediatric patients with chronic renal failure, cystic fibrosis and diabetes. They are also involved in caring for paediatric and adult patients in the epilepsy surgery programme, patients in the LSH Aftercare Centre, and are part of the teams focused on research and treatment for neurodegenerative diseases. Currently, the DCP also works closely with support and palliative care teams for children and adults. There is also a Family Therapy Centre within the department. The DCP also provides psychological services for MUH employees.

The department is accredited by the Ministry of Health of the Czech Republic for the theoretical-practical and practical part of specialization training in Clinical Psychology, Child Clinical Psychology and Psychotherapy.

### New methods and procedures:

- We have permanently expanded the pre-transplant evaluation and follow-up care for Children's Cardiac Centre patients who are about to undergo or have already undergone transplantation.
- Collaboration with the Department of Internal Medicine now includes a robust examination protocol for patients enrolled in the emerging bariatric programme.
- The standardization of the Children's Neuropsychological Diagnostic Battery continues under the TACR grant.

### Major event in 2022:

- Publications by DCP members were included in the annual report for the internal grant.

## Blood Bank Department

Senior Consultant - Eva Linhartová, MD

Senior Laboratory Technician - Martin Matějček

### Basic description:

The Blood Bank Department is one of the common examination and therapeutic units of the MUH. It ensured purchasing, storage and issue of all types of transfusion preparations for patients in the MUH. **In 2022, the department issued a total of 27,860 T.U. of all types of transfusion preparations**, 19,158 T.U. of erythrocytic preparations, 5,069 T.U. of plasma, 3 536 T.U. of thrombocytic preparations and 70 T.U. of granulocytic TP, 27 PK. The usage of transfusion products was virtually the same as in 2021 for platelets, higher for erythrocyte products and lower for plasma. The Blood Bank Department carries out the basic and specialized immunohaematological examinations as requested by medical facilities, prenatal examinations for the pregnancy advisory centre of the Department of Gynaecology and Obstetrics and provides transfusion preparations for intrauterine and exchange transfusion as needed.

**In 2022, 10,107 blood group examinations, 22,265 antibody screening tests, and 35,821 compatibility tests were carried out as part of the basic pre-transfusion examinations.** The number of specialized immunohaematological examinations was similar in 2022. Prenatal examinations are without any major changes. The number of transfusion product irradiations was higher than in 2021 - 10,391 irradiations in all.

At the autotransfusion and apheresis section, autologous full blood is collected mainly for patients from the Departments of Orthopaedics of the MUH, Department of Urology of the 2nd Faculty of Medicine and MUH, and for patients of the Na Homolce Hospital. **In 2022, a total of 526 autologous whole blood donations, 28 leukapheresis donations and 56 extracorporeal photochemotherapy procedures were carried out.**

The department provides teaching as part of the 2<sup>nd</sup> FM CU and for pregraduate and postgraduate students in transfusion medicine for physicians and NGO.

### Specifics of the department:

- laboratory section
- section for autotransfusion and apheresis
- irradiator for irradiation of transfusion products

### New methods and procedures:

- Separation of autologous peripheral stem cells (PBPC) is carried out for paediatric patients from the Department of Paediatric Haematology and Oncology of the 2nd Faculty of Medicine, Charles University and Motol University Hospital (DPHO)
- An extracorporeal photochemotherapy method was applied to patients of III. surgical clinic 1. FM and MUH after lung transplantation and for paediatric patients and DPHO patients after bone marrow transplantation.

**Unique equipment:**

- automated immunohaematological analyser Erytra + Eflexis
- The MacoGenic G2 irradiation device for UVA irradiation of blood cells according to the THERAFLEX ECP protocol using the “off line” technique.

**Major events in 2022:**

- In cooperation with the DPHO, international accreditation was again obtained from The Joint Accreditation Committee ISCT-EBMT (JACIE) for sampling from the peripheral stem cell separator.

**Department of Rheumatology for Children and Adults**

Senior Consultant - doc. MUDr. Rudolf Horváth, Ph.D.

Charge Nurse - Indira Jankovičová

**Basic description:**

The Department of Rheumatology for Children and Adults provides comprehensive diagnostics, treatment and follow-up treatment of paediatric and adult patients suffering from inflammatory rheumatic diseases, focusing on juvenile idiopathic arthritis, rheumatoid arthritis, ankylosing spondylitis and other forms of spondyloarthritis, psoriatic arthritis, system diseases of the connective tissue and primary vasculitis. Other cooperating fields and laboratory services contribute to the care for patients. The department actively participates in the medical advice activities of the MUH and provides medical consultancy also to other facilities nationwide.

**In 2022, the department carried out 6,749 collections and 10,426 outpatient examinations,** 3,391 minimum contacts, 672 telephone consultations, 444 specialized ultrasound examinations and 279 specialist consultations at the MUH's inpatient clinics.

**Specialized outpatient units:**

- specialized outpatient unit of rheumatology for adults
- specialized outpatient unit of rheumatology for children
- specialized outpatient unit for primary vasculitis
- specialized outpatient unit for the dg. and treatment of autoinflammatory syndromes
- clinical osteology outpatient unit
- outpatient unit of musculoskeletal ultrasonography
- centre for biological treatment of children and adults in rheumatological indications

**New methods and procedures:**

- The portfolio of biological drugs used was expanded by new IL-17 blockers in indications of ankylosing spondylitis, non-radiographic spondyloarthritis and psoriatic arthritis.
- The portfolio of biologics used has been expanded to include IL-6 inhibitors in the indications of GCA (giant cell arteritis) and PMR (polymyalgia rheumatica).
- The drug portfolio has been expanded to include small targeted synthetic molecules (JAK inhibitors) to treat RA and PsA (psoriatic arthritis) and AxSpA.
- The portfolio of biologic drugs has been expanded to include new IL-1 in indications of rare autoinflammatory syndromes.
- Bedside diagnostics and dynamic monitoring of the activity of inflammatory rheumatological diseases with musculoskeletal ultrasonography have been established.
- In collaboration with the Department of Imaging Methods of the 2nd Faculty of Medicine, Charles University and Motol University Hospital whole-body MRI (magnetic resonance imaging) is carried out in specific indications (e.g. CRMO - chronic recurrent multifocal osteomyelitis).
- As part of the MUH's institutional support projects, ultrasound examination of a wide portfolio of inflammatory and non-inflammatory rheumatic diseases has been set up.

**Unique equipment:**

- two ultrasound devices (Esaote Mylab Class C, Esaote Mylab Seven) fitted with high frequency probes
- A new VIDEOCAP 3.0 D1 capillaroscope for examining pathology in patients with SSc, SLE, MCTD and system autoimmunity

**Major events in 2022:**

- The department's employees regularly contributed to local specialized congresses organized by the Czech Rheumatological Society CzMA and foreign congresses EULAR and ACR with their lectures.
- The centre actively presents the outcomes of the ATTRA registry in the Czech Republic and at the international congresses EULAR and ACR.
- Departmental employees regularly publish in domestic and foreign periodicals. In 2022, there were 10 foreign publications published in IF journals and 2 peer-reviewed domestic publications.
- In 2022, the work on the internal grant, with institutional support from the MUH, entitled “Use of Musculoskeletal Ultrasonography in Detecting Cartilage Damage in Patients with Rheumatoid Arthritis and Osteoarthritis” continued successfully. This project was extended to investigate enthesitis in patients with spondyloarthritis.

## Department of Central Operating Theatres for Children

Head Nurse - Bc. Alice Podařilová

Supervising Physician senior lecturer - MUDr. Vladimír Mixa, Ph.D., DARICM

### Basic description:

The Department of Central Operating Theatres for Children concentrates all surgical procedures for all surgery and other fields from the paediatric part of the hospital, except for cardiac surgeries. This concerns the fields of paediatric surgery, ENT, orthopaedics, dental surgery, neurosurgery and ophthalmology. It also carries out bone marrow sampling, trepanobiopsy, the introduction of central venous and peripheral catheters PICC, Midline and SSEP examinations. Pregraduate and postgraduate tuition for physicians and other medical staff is carried out in the premises of the central operating theatres for children.

**A total of 8,310 surgical procedures were carried out in 2022. It was possible to increase the total number of procedures carried out in the Children's COT Department to 8,310, an increase of 1,273 operations compared to 2021.**

### New methods and procedures:

- The Department of Paediatric ENT, in cooperation with the neurosurgery department, implanted an auditory brainstem implant. This was the first paediatric patient to be treated thus in the CR.
- CLEFT operations on the laryngitis trachea-oesophageal area were performed on a child with oesophageal atresia.
- Coordinated multidisciplinary surgical procedures in paediatric oncosurgery.
- In the field of DARICM, children undergo the insertion of central venous catheters, PICC and Midline catheters at the COT. In 2022, the total number of operations was 170.
- In the field of transplantology, there were 5 kidney transplants and 1 cadaveric harvest.

### Unique equipment:

- Equipment for minimally invasive surgery with 3D imaging from B Braun
- LS instruments for the smallest children 3.5 mm and 5.0 mm
- Aeris balloon catheter – used for gentler dilation of stenosis of the respiratory tract in children
- operating table accessories were upgraded- head support mechanism for NCH operations
- Duet Encompass device – modern video equipment for urology and EMG of the pelvic floor with simultaneous interconnection to X-ray devices
- cystoscope with EndoResector for the smallest children allowing minimally invasive surgery in small children (by Olympus/ Wolf)
- Stelaris optic system for cataracts and front and rear segment
- Biom optic system, addition to the microscope for rear segment surgeries
- complete equipment of the central operating theatres for children with premium anaesthesiology devices by GE, series Aisys, Avance and Carestation

- Radix (Storz) 4K endoscopic unit, Olympus and B Braun
- Olympus mini ETD2 automatic endoscope disinfectant
- an ultramodern arthroscopic unit used in paediatric orthopaedics

### Major events in 2022:

- First auditory brainstem implant in a child in the CR.

## Department of Central Operating Theatres for Adults

Senior Consultant - MUDr. Zbyněk Jech

Head Nurse - Vladana Roušalová

### Basic description:

The twenty-four operating theatres at the COT department for adults is the background for surgical treatment at eight surgical departments in the adult part of the MUH: Surgical Department, Department of Paediatric and Adult Orthopaedics and Traumatology, Department of Cardiovascular Surgery, Neurosurgical Department for Children and Adults of the 2<sup>nd</sup> FM CU and the 3<sup>rd</sup> Surgical Department, 1<sup>st</sup> Orthopaedic Department, Department of Otorhinolaryngology and Head and Neck Surgery, Department of Spindylosurgery of the 1<sup>st</sup> 2<sup>nd</sup> FM CU. Anaesthetic care at the COT is provided by the Department of Anaesthesiology, Resuscitation and Intensive Medicine of the 2<sup>nd</sup> FM CU. Technical support for COT is provided by the MUH Department of Biomedical Engineering.

At the COT for Adults, individual departments perform not only highly specialized surgeries, but also routine surgical procedures. Of all the specialized procedures, these are primarily lung transplantation, operations in multidisciplinary teams for cancer patients and there is close cooperation when treating polytrauma patients. The COT provides undergraduate and postgraduate training for medical and non-medical health professionals.

Four departments use the MUH's second robotic operating system, the daVinci Xi: 1<sup>st</sup> and 3<sup>rd</sup> Surgical Department, Department of Otorhinolaryngology and Head and Neck Surgery and the Gynaecological Department. 2022 saw 388 robotic surgeries performed at the COT for Adults.

**In 2022, there were 18,724 operations performed at the COT for Adults.**

### New methods and procedures:

- Robotic surgery on the second da Vinci Xi robotic operating system for surgical departments, gynaecology and ENT

### Unique equipment:

- da Vinci Xi robotic operating system
- XVIVO perfusion system (XPS tm)
- new Aesculap/B operating instruments. Braun for the I. and II. orthopaedic depts. and traumatology
- three Maquet OTEUS 1160 operating tables were replaced
- Aeos DSM operating microscope (Exoscope in 3D view) - B.Braun

- Stealth Station S8 neuronavigation device - Medtronic
- Novaerus-Defend 1050 - two disinfection units to disinfect the air at the COT
- High-End laparoscopic tower - Olympus with 4K image resolution
- Olympus bronchoscopic tower
- replacement of coagulation devices, accessories and suction devices

#### Major events in 2022:

- The total number of operations performed rose by 952 compared to 2019 before the Covid-19 pandemic
- Two nurses completed their Post-secondary Specialization Study (PSS) in perioperative care; two hospital porters graduated from the accredited qualification course - General Hospital Porter
- Mykytynová, M.: Quality Assurance of Perioperative Care in Patients Undergoing Robotic Lung Surgery, XI. Congress of Perioperative Nurses, Pardubice 3.6.-4.6.2022
- Jech, Z.: Parastomal Hernias (invited to lecture), Working Days of the Coloproctology Section of the CSS CzMA, Prague, 7.10.- 8.10. 2022

### Department of Transplantations and Tissue Bank

Senior Consultant - MUDr. Jan Burkert, Ph.D.

Head Nurse - Anna Habrmanová, CETC, CTBS

#### Basic description:

The Department of Transplantations and Tissue Bank (DTTB) as the only facility in the CR provides a programme for collection and transplantation of organs (TC), as well as collection and transplantation of tissues (tissue facility – TF).

#### Specifics of the facility:

1) DTTB - TC creates the organizational prerequisites so that individual departments of MUH can indicate potential organ and tissue donors and, when necessary, organ and tissue donations and individual national organ transplant programmes can be implemented. These are:

- National programme of kidney transplantation in children (head physician MUDr. Jakub Zieg, Ph.D. from the Paediatric Department)
- National programme of lung transplantation in children and adults (lead physician prof. MUDr. Robert Lischke, Ph.D. from III. surg. dept.)
- National programme of heart transplantation in children (chief physician senior consultant MUDr. Roman Gebaurer (Children's Cardiac Centre)

2) The DTTB – TF ensures operation of the Specialized Tissue Bank (STB 85). It is engaged in procuring, processing, storing and distributing cardiovascular tissue from cadaveric donors, bone tissue from living and cadaveric donors and amniotic membrane from living donors. The National Bank of Allogeneic Valve Grafts also operates nationwide.

The aim is to perform as many multi-organ harvests (MOH) from cadaveric donors as possible, either in the central operating theatres of MUH or in other TCs in the CR or abroad (mainly in Slovakia). In some situations, we perform MOH at MUH from a donor indicated in another TC and transported to Motol UH.

The aim is to perform as many multi-organ harvests (MOH) from cadaveric donors as possible, either in the central operating theatres of MUH or in other TCs in the CR or abroad (mainly in Slovakia). In exceptional circumstances, we perform MOH at MUH from a donor indicated in another TC and transported to MUH.

In 2022 there were **8 multi-organ harvests (MOH) from cadaveric donors**. Calculated per million population (pmp), this is **25.68 pmp donors** (the MUH region has 310,000 inhabitants), **which is the 3<sup>rd</sup> highest donation activity in 2022 in the CR!** The total number of donors in the CR is 28.34 pmp.

Furthermore, there was **1 remote collection from a donor after circulatory death (DCD)** during remote lung collection in Brno.

There were **5 kidney transplants in children** (4 from cadaverous donors and 1 from a living donor). There were a **record 54 lung transplants in the programme**, which is the most logistically demanding, most complicated in terms of coordination and also the most expensive organ transplant programme (92.6% of them bilateral, 92.6% on ECMO).

**In total, a record 318 offers of lungs were processed! A heart was successfully transplanted into 5 children** (a total of 17 offers were considered).

The cardiovascular tissue bank **received 106 hearts** from deceased donors for processing, and a **record 147 grafts and conduits were issued for transplantation. In the National Valve Bank framework, we recorded a record number of transplants, that being 141 valve grafts and conduits.**

**13 "fresh" vascular grafts were accepted for transplantation and 6 of them were transplanted. 44 bone grafts were taken from living donors and 51 grafts were transplanted. Placentas from 13 living donors were processed and 529 amniotic membranes were prepared. There were 299 grafts issued for transplantation.**

#### Major events in 2022:

- The number of **lung transplants increased again, to a record 54, i.e. 5.2 pmp** (number per 1 million population), and MUH thus became one of the 20 largest centres worldwide that transplant on more than 50 patients per year (only 6 of them are in Europe). A record 7 Slovak patients have had a transplant so far.

## Outpatient sector

### Emergency Department and Medical First Aid Service (MFAS) for Children

Senior Consultant - MUDr. Jitka Dissou, MBA

Head Nurse - Monika Vilímová

#### Basic description:

The Emergency Department and Medical First Aid Service for Children cares for A+E paediatric patients aged 0- 17 years + 364 days. The department has the following 3 parts: Urgent admission - acute boxes, Urgent admission - outpatient unit. From 4:00 p.m. to 7:00 a.m. on weekdays and on weekends, the emergency outpatient unit works non-stop as a children's emergency room. Priority 1 and 2 patients and patients received from the ambulance service are treated in the acute emergency boxes.

POCT ABR, ECG, ultrasound, instant PCR, ID now are available directly in the department. CT, ultrasound, X-ray and MRI are located in the immediate vicinity of the emergency room.

**In 2022, there were 35,309 children treated at the Emergency Department and MFAS for Children, of which 7,782 children were treated in acute boxes.**

### Department of Dermatovenereology for Adults

Senior Consultant - MUDr. Alena Machovcová, Ph.D., MBA

Head Nurse - Helena Janoušková

#### Basic description:

This is an outpatient unit without a link to an inpatient unit within the MUH. The department provides basic and specialized care in dermatology and venereology focusing on dermatology and venereology and occupational skin defects, prevention and treatment of skin tumors and treatment of psoriasis. **In 2022, more than 7,630 patients were treated in outpatient care and almost 21,871 treatments were carried out.**

#### Specialized outpatient units:

- outpatient unit of venereology
- outpatient unit for pigment nevi and skin tumors
- outpatient unit of dermatology and outpatient unit for occupational skin defects
- corrective dermatological outpatient unit
- lymphological outpatient unit
- acne advisory centre
- outpatient unit for patients after organ transplantation
- nail advisory centre
- outpatient unit for diagnostics and treatment of nail diseases

- centre for biological treatment of psoriasis, chronic hives, hidradenitis suppurativa and atopic eczema
- lymphological daycare centre
- daycare centre for phototherapy

#### New methods and procedures:

- laser interventions in dermatology
- surgical procedures on nails (such as ingrown nails, nail plate deformation)

#### Unique equipment:

- digital dermatoscope MoleMax I plus
- high-performance laser Fotona XS Erb: YAG and Nd: YAG
- device for photodynamic treatment of skin tumors

### Department of Paediatric Dermatology

Senior Consultant - MUDr. Jana Čadová

Charge Nurse - Alena Kurešová

#### Basic description:

The Department of Paediatric Dermatology provides outpatient services in 3 - 4 outpatient units and a surgery room. It is involved in the diagnosis, treatment and observation of paediatric patients with all skin diseases. It also provides consultation services to patients in the inpatient wards of the hospital's children's section. It acts as the CR's super-consultation workplace for serious or rare diseases. It takes part in training doctors in the fields of dermatovenereology, allergology or paediatrics in the framework of postgraduate education.

**2022 saw 10,229 patients treated and 266 medical consultations were provided at the inpatient beds of the hospital's children's section.**

#### Specialized outpatient units:

The general outpatient units diagnose and treat common dermatoses, most often atopic eczema. Since 2020 we have been a centre for biological treatment with dupilumab. An integral part of the outpatient units are consulting rooms for genodermatosis, pigmented nevi (digital dermatoscopy), hemangiomas and vascular anomalies, acne treatment, advice on hair and nails, treatment of verrucas and the operating room is used for probatorial excision and total excision of small skin formations, including electrocautery. Since the start of 2022, the acute outpatient unit is open every morning, where patients with acute skin diseases who have not made an appointment are treated.

#### Unique equipment:

- A BTL-4110 Premium bio-stimulation laser - in 2019, whilst modernizing the polyclinic, the workplace was equipped with a bio-stimulation laser, which is mainly used to treat scars and acne
- Illuco IDS-3100 (Magnum+) dermatoscopic magnifier with integrated polarization; with a Wood's lamp is now used to improve the diagnosis of vitiligo and superficial mycoses
- DermoGenius ultra (Dermoscan) - continues to improve the examination of high-risk pigmented lesions with a digital dermatoscope;
- Elektrokauter Hyfrecator 2000 - to remove minor skin lesions

#### Major events in 2022:

- Employees contribute with lectures at domestic professional events and also take part in postgraduate education for CMC and IPME courses.

### Primary Care Department

Senior Consultant - MUDr. Jaroslava Kulhánková

Head Nurse - Alena Kašajová

#### Basic description:

The department provides acute and long-term preventive care for the staff, patients from outside the Motol hospital registered under individual payments, preventive check-ups for secondary school and university students, foreigners with or without insurance from the local health insurance companies, and non-standard care for persons with Czech health insurance. We screen registered patients for colorectal cancer, diabetes mellitus and hypertension, and we provide follow-up for patients with type II DM and hypertension. We work with the MUH Department of Hygiene and Epidemiology to examine and vaccinate employees in topical epidemiological situations. In the first half of 2020, we carried out smears in our department to investigate Covid 19. The department is a pregraduate and postgraduate tuition site accredited in general practice.

**In 2022, the Primary Care Unit treated 25,685 patients, 1,584 vaccinations were administered, and 3,304 adult patients and 5,477 children were also treated at the UA Point. 462 children were vaccinated.**

### Adult Emergency Department and Medical First Aid Service (MFAS)

Senior Consultant - MUDr. Lenka Kozlíková, MBA

Head Nurse - Bc. Lucie Vacková

Chief Physician of Medical First Aid Service - MUDr. Aleš Ducháček

#### Basic description:

The Adult Emergency Department (AED) specializes in basic examination, stabilization of vital functions, treatment of acute problems and decision on admission or release for all patients seeking the services of this department.

The department has an inpatient unit for emergency admissions equipped with 17 monitored beds, an acute outpatient unit of surgery, traumatology, neurology, urology and an outpatient unit for medical first aid service (MFAS), which share an additional 10 examination beds. The AED also has a triage room with one bed for examining patients with less severe complaints and an ARO box with one bed, where patients in a critical condition with various aetiologies are admitted in cooperation with the DARICM. In all there are 28 beds for the treatment of emergency patients.

**The total number of patients treated at the Adult Emergency and MFAS Department in 2022 was 71,544, of which 22,470 patients were treated in the inpatient part of the department, 4,792 and 3,688 patients were treated in the acute outpatient department of Surgery 1 and Surgery 3, i.e., 20,800 patients were treated in the acute trauma outpatient department, 5,241 patients were treated in the acute neurological outpatient department and 13,553 patients were treated in the MFAS Department.**

### Department of Hospital Hygiene and Epidemiology

Senior Consultant Epidemiologist - MUDr. Jarmila Rážová, Ph.D.

Senior Hygiene Assistant - Mgr. Jana Hrončková

#### Basic description:

The department's activities meet the legislative requirements of the acts on health services and protecting public health, namely the obligation of health service providers to establish and implement a programme to prevent and control healthcare-associated infections. In practice, this means carrying out measures to reduce the occurrence or spread of all infections in the medical and non-medical areas of the hospital depending on the specific conditions of each workplace. In 2022, this represented the department's main activity.

#### Specifics of the facility:

Even in 2022, the ongoing Covid-19 epidemic and the adoption of a number of anti-epidemic measures had an immediate impact on the running of the entire healthcare facility and fundamentally affected the department's activities.



Priority was given to anti-epidemic measures in connection with the Covid-19 outbreak, in particular quarantine and isolation measure and providing staff with protective equipment and devices, as well as carrying out emergency anti-epidemic measures in all areas of healthcare provision. Also, the situation due to the influx of refugees from Ukraine as a result of Russia's aggression has led to increased demands for the provision of health care for refugees and the adoption of anti-epidemic measures within the health facility.

**During 2022, there were 528 quarantine measures (4,036 in all as of March 2020), 1 817 employees were diagnosed with a Covid-19 infection (3,730 in all as of March 2020), and 1,817 patients were admitted with this diagnosis (4,112 patients in all from March 2020 until 31.12.2022).**

Data from the reporting of healthcare-associated infections (HAIs), called incidence rates, were continuously monitored and analysed. In 2021, the **incidence of HAI was recorded as 0.81 with a prevalence of uroinfections**. Barrier measures, including isolation if multidrug-resistant strains were found, and follow-up monitoring was ordered and monitored for all patients with reported HAI in UNIS (539 patients, 688 HAI). It should be noted that due to the epidemic situation, even in 2022, an HAI analysis was not carried out as in the years before the COVID-19 pandemic (i.e. searching in databases other than the mandatory reporting in UNIS).

Legislative requirements (Ministry of Health of the CR, SÚKL) were met, even during the epidemic, in the area of **checking the bacterial cleanliness of the environment** (297 measurements with an air sampler, or 87 control reports, 2,112 environmental swabs), **endoscopic techniques, sterilization and disinfection techniques** (469 control reports) and water quality control (including prevention of Legionella - 285 water samples were taken, of which 254 tested negative for *Legionella spp.*) There was a significant cut in the number of **audits on the hygiene and epidemiological regime (183 compared to 190 in 2021, 219 in 2020), 1,748 epidemiological investigations were carried out** (without covid-19). The severity of the epidemic situation was also reflected in the number of **room disinfections (913, 1,168 in 2021, 877 in 2020)** and also reflected in the consumption of hand sanitizers, which was **30.3 litres per 1,000 treatment days (31.5 litres per 1,000 treatment days in 2021, reaching a record 60 litres per 1,000 treatment days in 2020)**.

Regular services continued to be established in the department to ensure daily reporting of patients hospitalized with COVID-19 to the IHIS/ISIN registry, imposing isolation and quarantine and other anti-epidemic measures, and conducting ongoing analysis of staff vaccination rates.

Individual cases of isolation and quarantine measures and the PCR investigation strategies for the presence of SARS-CoV-19 in epidemiologically serious situations were continuously consulted upon.

## Hospital Pharmacy of the MUH

Senior Pharmacist - PharmDr. Petr Horák

Deputy Senior Pharmacists - Mgr. Milan Vegerbauer and PharmDr. Markéta Petrželová

Senior Pharmaceutical Assistant - Helena Bohabojová

### Basic description:

The main task of the Hospital Pharmacy of the MUH is to provide effective and safe drugs for hospitalized patients and outpatients and generally to set up and inspect all steps required in handling of drugs with an impact of the safety of patients and the outcomes of their treatment. The Hospital Pharmacy ensures the issue of drugs, as well as individual and mass production of drugs including sterile (cytotoxic substances, parenteral therapeutic preparations without antimicrobial additives and other drugs) and non-sterile drugs (individual preparations, especially for paediatric patients), acquisition of unregistered drugs and obtaining drugs for clinical studies and clinically pharmaceutical care.

The pharmacy provides consultation service to patients and medical professionals and theoretical and practical tuition including internships for pregraduate and postgraduate students.

The hospital pharmacy takes part in formulating MUH's drug policy by its methodological guidance of and participation in the Commission for Effective Pharmacotherapy. It also develops the MUH's internal regulations in the area of handling pharmaceuticals and takes part in auditing activities within the pharmaceutical quality management system.

The Hospital Pharmacy has the following specialist workplaces:

- Specialist workplace for preparing sterile medicinal products:
  - containing cytotoxic substances
  - others - without antimicrobial additives
- specialist workplace for preparing medical gases
- a specialist facility to check medicinal products and the preparation of test tubes
- a specialist unit providing information on medicines
- specialist workplace for dispensing medical devices

**In 2022, the Hospital Pharmacy - Department for Preparation of Cytostatic drug prepared 33,987 ready-to-use doses of cytotoxic drugs. The IPMP department's work included preparing 275,000 capsules and 21,000 children's suppositories and 6,000 adult suppositories. 3,300 g of medicinal cannabis were processed, mostly into capsules. We are also expanding the reconstitution of selected products in the laboratory to prepare drugs containing dangerous drugs, e.g. risdiplam for the treatment of spinal muscular atrophy (1,160 packs).**

The Sterile Medicines Preparation Dept. (SMPD) prepared a range of products not available in the form of a mass-produced medicinal product for stock (antidotes, etc.), cardioplegic solutions, etc., hydration and neonatal bags (11,477 in all), sterile eye ointments and drops. The Hospital Pharmacy prepares and provides parenteral nutrition for 22 paediatric and 22 adult outpatients.

The OLAB department dispensed 16,565 diagnostics, and 309 various diagnostics were individually prepared in the production laboratory using recipes in line with the requirements of the hospital's laboratory facilities.

**Roughly 890,000 packs of medicines (excluding infusion solutions) prescribed on more than 48,000 requests were dispensed to the hospital. A total of 1.23 million units of medicines, medical devices and the supplementary range were issued to the public, prescribed on 330,000 prescriptions or vouchers, and, in addition, almost 28,000 units of "centre medicines" were issued to patients on more than 11,000 documents.** The pharmacy participates in all clinical assessments of drugs that are in progress at the MUH in accordance with the good clinical practice principles and good pharmacy practice principles. In all, almost 9,000 packs of medicines have been issued in clinical trials.

**Our clinical pharmacists carried out 1,820 initial medication reviews and 1,420 additional rechecks with the need for intervention, as well as 964 requested consultations.**

In the scientific and publication activities, the pharmacy focused on individual preparations for patients of specific age groups, especially paediatric patients, development of new customized formulas with suitable recipes and stability verified by validated methods, as well as research on shortages of drugs and staffing needs in the hospital pharmacy. The outputs from these activities are regularly published and presented at specialized fora in Europe and in peer-reviewed and impacted magazines.

#### **New methods and equipment:**

- The preparation of oral cyclophosphamide 10 mg/ml sol. for metronomic therapy in paediatric oncology was newly added to the portfolio in 2022.
- Laboratory equipment for the preparing and checking pharmaceuticals was renewed and strengthened: the FagronLab apparatus for preparing semi-solid pharmaceuticals up to 2 kg, the Elix Essential water purification system, the MS7-H550-PRO digital magnetic mixer.

#### **Major events in 2022:**

- There was a need to address a large number of shortages in the supply of medicines, especially in the second half of the year. The staff dealt with the individual preparation of substitute medicines - e.g. Ibuprofen suspension 40 mg/ml, Paracetamol suspension 50 mg/ml; also children's suppositories with paracetamol, ibuprofen, dexamethasone and prednisone, with domperidone.
- The pharmacy is actively involved in nationwide coordination to ensure the availability of alteplase, which is a life-saving drug for a number of acute conditions.
- Senior Pharmacist PharmDr. Petr Horák was elected Vice-Chair of the Czech Pharmaceutical Society CzMA at the end of 2023.

## **NURSING CARE**

In 2022, there was a focus on improving the quality and safety of nursing care provided to inpatients and outpatients.

### **Quality Indicators**

Monitoring nursing care indicators /pressure ulcers and falls/ is now one of the long-term priorities. In 2022, the reporting of risks and the occurrence of pressure ulcers in hospitalized patients was set up and objectified thanks to an integrated system in UNIS SW. Overall, the incidence of pressure ulcers has significantly decreased at MUH. The highest priority in patient care remains preventive actions, adherence to wound healing procedures in line with international recommendations and monitoring other controllable factors, such as the occurrence of pressure ulcers during surgical procedures or the use of medical equipment.

A team of hospital consultants are actively involved in the healing process of chronic wounds in patients. For the ninth time, the MUH took part in activities for the International STOP Pressure Ulcer Day. This public event aims to bring the issue of preventing and treating pressure ulcers to the lay and professional public.

Just as with pressure ulcers, risk reporting for falls was objectified with the prime focus on prevention and the association of falls with medication use. The number of falls dropped significantly in 2022.

### **PICC team**

The PICC team provides comprehensive vascular insertion care for inpatients and outpatients. The hospital has two teams providing care. The adult section falls under the Department of Internal Medicine and the paediatric section under the DARICM. The teams are the guarantor of continuous quality improvement in vascular insertion care. Nurses in the adult part of the PICC team take part in organizing seminars on the provision and care of vascular access. In 2022, there were 6 one-day seminars for ward and staff nurses and 6 more similar courses were held in collaboration with the Aesculap Academy. Two one-week certified courses "Comprehensive Care of Vascular Access" were held as were two one-week certified courses "Inserting PICC and Midline Catheters".

**During 2022, the nurses made a total of 2,931 vascular insertions in the adult section** (PICC 1,410, Midline 68, Minimidline 299, Long PIC 1,154). Part of patient care is also dressings and managing complications from all vascular insertions. The team treated 3,594 patients with these insertions. **In the paediatric section, both nurses and doctors carry out vascular insertion; the team inserted 80 Midline and 95 PICC catheters, of which nurses inserted 29 Midline and 5 PICC catheters. Recently, 25 long cannulas were inserted into the deep venous system using sonography.**

## Department of Medical Nutrition

On the basis of consultations, nutritional therapists visited patients with a diagnosed nutritional risk. They assisted patients in choosing the most appropriate method of nutrition with regards to their underlying disease and recommended the most suitable clinical enteral nutrition formulas. **About 2,200 bedside consultations were written out in 2022.** The number of outpatients monitored in 2022 was roughly 1,500, about 300 more than in 2021. The work with patients included education and setting up nutritional plans, dietary balances or recommendations for nutritional support.

In October 2022, the workplaces of clinical and operational nutritional therapists were merged to improve the quality of nutritional care for patients. **The catering service prepared food for 1,200 patients daily in a variety of dietary adaptations and modifications.** A new menu was introduced for above-standard meals and a breakfast buffet for the puerperium department.

## Milk Kitchen Department

The department prepares dairy-based food for newborns and children up to 2 years of age. Milk, teas and food intended for young patients are prepared here.

**In 2022, the kitchen staff prepared an average of 75 litres of dairy food per day, i.e. about 27,375 litres per year, and 18 litres of fennel tea per day, i.e. 6,750 litres per year.** The HACCP system is strictly followed, this guarantees infant food is safely prepared.

## Central Sterile Services Department

The Central Sterile Services Department ensures the reception, complete pre-sterilization preparation of medical material, its sterilization and distribution back to more than 60 workplaces at the MUH. Pre-sterilization preparation includes washing in large capacity washers, assembling and wrapping the instrument sets, containers and other medical material. Sterilization takes place in 5 steam autoclaves and 1 chemical one and 4 plasma sterilizers.

**In 2022, there was a 15-20% increase in washing and sterilization cycles. There were 27,882 washing cycles, 10,197 sterilization cycles in steam autoclaves and 2,851 cycles in chemical and plasma sterilizers.** 2022 saw the installation of 2 new large capacity dishwashers and a new Sterrad 100NX plasma sterilizer. As of December 2022, preparations are being made for scanning instrument containers for adult COT (orthopaedic clinics).

## Social Care

**The Social Department provided social care to 5,485 adult patients in 2022. Help was provided to 4,230 patients in acute beds and to 1,255 patients at the Aftercare Centre (AC).** 1,042 patients from all inpatient departments were discharged with the provision of home healthcare and 52 patients were released to home hospice care. 338 patients were released into inpatient rehabilitation aftercare and inpatient hospice care was arranged for 19 patients. 885 patients required long-term care beds.

**Once again, social work with children and their families, including newborns and children in the Department of Child Psychiatry, saw a rise to 1,479 in all.** The families were provided with social and legal counselling, psychosocial support and foundation assistance. In the interests of the children, there was collaboration as part of the social and legal protection for children.

Social Department employees continue to teach medical students at the 2<sup>nd</sup> FM CU, including students in the bachelor's degree in paediatric nursing. The practical teaching of those on the Accredited Qualification Course - Health and Social Worker continues as do lecturing activities at the Higher Vocational School of Social Law in Prague 10.

## Psychosocial Intervention Service

The Psychosocial Intervention Service team is made up of **22 specially trained hospital staff**, including a coordinator (12 interveners, 5 peers and 5 interveners and peers at the same time). The team provides continuous support and assistance to staff and patients' loved ones - **24 hours a day, 7 days a week.** In 2022, healthcare interveners provided **60** supportive interventions to patients' families or survivors, of which **42** were to parents of paediatric patients and **18** were to families of adult patients. Collegial peer support was provided to hospital staff in the form of **26** individual, anonymous interviews.

This year, the team continued its activities related to the Prevention II project - "Mitigating the Negative Impact of Mental and Physical Stress on Non-medical Healthcare Workers Through Systemic Measures", in cooperation with the National Centre for Nursing and Non-Medical Healthcare Professions (NCN NHP) in Brno. Thanks to funding from the project, additional team members were trained, two professional training events were held as were workshops for staff and certified courses at the NCN NHP. Team and individual supervision and coaching continue. The project will end with an assessment in June 2023.

## Spiritual Care

Providing spiritual care has become an integral part of supportive care for hospitalized patients. It is administered in both the children's and adult sections of the hospital. **In 2022, hospital chaplains provided care for 2,502 clients.** We provided 533 consultations to staff, 5,973 to patients and 452 to the relatives of patients. **The total number of consultations was 6,958.**

## Healthy Hospital

Our libraries were used a great deal in 2022. People walked up the stairs more, which was motivated thanks to the active movement slogans. Our beautiful motto "Patient Activation or Neurons on Alert" will remain for some years to come.

We offered activities related to promoting employee health (e.g. Health Day, weight loss psychology training) and other STOB materials were distributed to the various departments' outpatient units.

## Volunteer Centre

2022 was marked by new beginnings and new, unusual situations in connection with what was going on in society. The events were not directly related to volunteering at our hospital but have meant a drop in volunteers. Despite this, it was possible to keep the volunteer programme at a good level of quality and to cover many requests or even to start new collaborations (e.g. in the Adult Emergency Department, with the palliative care team or organizing corporate volunteering).

We organized regular clubs for patients (at the Dept. of Child Psychiatry and the AC), group events (art workshops, puppet shows, St. Nicholas Day, Christmas performances, animal afternoons), specific individual visits (baby curling, intensive patient visits). We made use of many opportunities to meet our volunteers and implemented educational activities (seminars and supervisions for volunteers, but also courses for the public). We took part in public events such as Children's Oncology Day and Nedopiknik. Canistherapy and zoo-therapy have also seen great development, with new animals (chickens, snails) visiting patients or cooperating with the Dept. of Paediatric Haematology and Oncology, where there is regular group canistherapy.

**In the end, the result for 2022 was many hours of psychological support for patients, countless smiles conjured up and great cooperation with the hospital staff. In total, it came to 3,389 volunteer hours for 3,228 patients (not counting accompanying persons), with 198 volunteers registered as of 31. 12. 2022.**

In 2022 we even celebrated the anniversary of our longest serving volunteer (20 years) and another volunteer received the Kresadlo 2021 award. Up until September 2022, the hospital was involved in the MoHCR project "Improving Efficiency in the Hospital Care System in the CR Via Volunteer Activities".

# HOSPITAL OMBUDSMAN

The Hospital Ombudsman has been working at Motol University Hospital since January 2012, now as the **Independent Department of the Hospital Ombudsman and Complaints (SONOS).**

The Department's main objectives are to protect the patients' rights, improve communication among patients, their relatives and hospital staff, and increase the quality of the medical services provided and thus patient satisfaction. The Hospital Ombudsman addresses complaints, requests, initiatives and other submissions against the Motol University Hospital's course of action while providing medical services or carrying out activities relating to the medical services provided. The ombudsman's services are especially available when a patient or a third party believe that their rights have been violated or threatened or when a conflict has or may occur and communication between the parties involved is failing and the matter needs to be addressed objectively.

A total of **481 submissions** were addressed **during 2022**, of which **449 were complaints**. Furthermore, **520 enquiries**, which often represented a precursor to a potential complaint, were addressed and responded to. A vast majority of the complaints were assessed as **unjustified complaints; there were 64 partially justified complaints and 48 justified complaints**. Corrective measures, mainly involving educating employees, were applied in the case of justified or partially justified complaints. Patients (**181 submissions**) and legal representatives of patients (**149 submissions**) were most often the submitting persons. As regards the subject of complaints, most of the submissions involved unsuitable communication (reported in **172 cases**) and the medical services provided (**138 submissions**).

All submissions are always dealt with by the pertinent management of individual facilities. Where suitable, in view of the character of a complaint, complaints are discussed orally with the participation of the management of the workplaces involved to find a suitable resolution. In the case of urgent matters, complaints are resolved with the participation of the Hospital Ombudsman directly at the medical facility. Detailed records of all processed submissions are kept in accordance with the valid legislation. Outputs of the department's activities along with proposals for adopting necessary measures are regularly presented at meetings of the hospital management and at meetings of managing staff.

SONOS deals with requests under the Freedom of Information Act. The Hospital Ombudsman carries out legal training in current areas of medical law according to the requirements of medical workplaces. The department regularly cooperates with hospital ombudsmen from other medical facilities and participates in national meetings for exchanging experience. It takes an active part in events organized by the Association of Healthcare Ombudsmen. The department's agenda also includes resolving the issue of whistleblowing.

## SCIENTIFIC RESEARCH ACTIVITIES

The Motol University Hospital's support for scientific research activities is an integral part of its activities, enshrined in its Statutes. In this sense, the Motol University Hospital is also on the national list of research organizations, <http://www.msmt.cz/vyzkum-a-vyvoj-2/fakultni-nemocnice-v-motole>. Scientific research projects are conducted throughout the entire range of specializations and almost all of the hospital's departments and institutes are involved. The close interconnection with the 2<sup>nd</sup> Faculty of Medicine, Charles University (FM CU) and the 1<sup>st</sup> FM CU and other research organizations in the CR and abroad is reflected in these activities. The MUH supports innovation and integration of research outcomes in practice in accordance with new trends in the application of outcomes of scientific research activities.

Science, research and innovation is supported in the MUH through combined financing using institutional and special purpose funds obtained mainly in the form of grants. Research teams at the MUH participate in international projects, especially within the EU, where they work on projects in the Horizon 2020 programme and other EU schemes. The Motol University Hospital's teams are also significantly involved in the European Reference Networks for Rare Diseases (ERN).

### Institutional Support for Research and Grants

- The MUH has received institutional support administered by the Ministry of Health of the CR since 2012.
- Institutional support of the research organization is organized at the MUH through a system of internal grants at the hospital's individual departments and institutes. 2022 was the eleventh year of applying to this scheme.
- **In 2022, the hospital carried out 16 projects of the Czech Health Research Council of the Ministry of Health of the CR as the principal researcher and 42 projects as the cooperating researcher. 31 internal grant projects and 2 "Junior" projects were conducted in 2022 as part of the institutional support.** The hospital likewise dealt with projects from the TACR, GACR, Horizon 2020 and ERN.
- Support of research activities is directly conditional on the outputs of scientific assessments reported to the national databases of the Research, Development and Innovation Council. The outcomes of the RIR outputs are used for comparisons within the CR and for distributing funds in the Internal Grant system to ensure that individual research facilities are supported in accordance with their performance. **In 2022, the Motol University Hospital had a total of 484 outputs in the RIR database. It also achieved another significant increase in the total impact factor, which came to 4121 points, as well as an increase in the average impact factor, which came to 8.5,** reflecting the higher quality of the papers published. In line with the 2017 Methodology, the vast majority of papers are in the first and second quartiles, and there is also significant representation in the first decile.

- In 2022, the MUH managed the following allocated and distributed funds in science and research (in CZK):

Agency	number of projects	amount (CZK)
institutional support	1	80 192 130,00
AHR-main researcher	16	40 301 000,00
AHR - cooperating researcher	42	26 839 000,00
GACR - cooperating researcher	2	1 792 000,00
TACR - cooperating researcher	4	3 214 900,00
Horizon 2020 Vision DMD	1	1 945 001,89
Czecrin	1	480 000,00
EU Crane	1	235 133,69
IDEA4RC - Horizont RIA	1	1 323 572,04
EU JANE	1	1 016 219,23
EU ECFS-Cystic fibrosis	1	1 252 463,64
EU EURR - BONE	1	29 814,89
ARC-CTN-Cystic fibrosis	1	149 846,07
Grant MoHCR Education	2	42 775,20
Palliative Care MoH CR	2	2 514 200,00

- In 2022, the Methodology17+ assessment was held, where the Motol University Hospital gained a top ranking, mainly when assessing the quality of its scientific results, with a significant proportion of its outputs in the first decile in the field of Medical Sciences.
- Priorities of the scientific research activities were gradually defined at the Motol University Hospital. Paediatric specializations appear to be the strongest directions in research. The Department of Paediatric Haematology and Oncology with its laboratory and research facility at the CLIP site is the dominating actor in research. Traditionally, paediatrics and its branches, gastroenterology, endocrinology, pneumology, nephrology, paediatric neurology and others are also strongly represented. Cardiology, neurology and urology stand out the most as concerns adult medicine. The hospital's main research activities mainly take place in the laboratory facilities of the Department of Paediatric Haematology and Oncology, the Department of Immunology and the Department of Microbiology.

## ECONOMIC ACTIVITIES

<b>BALANCE SHEET</b> (abbreviated balance sheet in thous. CZK)	status as of 1/1/2022	status as of 31/12/2022
<b>ASSETS</b>	<b>11,682,037.95</b>	<b>12,661,061.90</b>
<b>Permanent assets</b>	<b>8,946,005.53</b>	<b>9,627,008.15</b>
Long-term intangible assets	19,120.67	26,238.12
Long-term tangible assets	8,908,108.83	9,582,789.05
Long-term financial assets	0.00	0.00
Long-term claims	18,776.03	17,980.98
<b>Current assets</b>	<b>2,736,032.42</b>	<b>3,034,053.75</b>
Stock	263,737.88	301,837.99
Claims	653,901.60	1,349,578.07
Financial assets	1,818,392.94	1,382,637.69
<b>LIABILITIES</b>	<b>11,682,037.95</b>	<b>12,661,061.90</b>
<b>Own resources</b>	<b>10,214,634.38</b>	<b>10,903,631.41</b>
Assets of unit of account	8,961,644.55	9,512,174.26
Property funds	2,566,583.40	2,624,791.37
Profit/loss for current accounting period	58,540.93	80,259.35
Accumulated loss of previous years	-1,372,134.50	1,313,593.57
Profit/loss in licensing procedure	0.00	0.00
<b>Foreign resources</b>	<b>1,467,403.57</b>	<b>1,757,430.49</b>
Reserves	0.00	0.00
Long-term liabilities	111,215.77	36,880.86
Short-term liabilities	1,356,187.80	1,720,549.63
Bank assistance and loans	0.00	0.00

<b>STATEMENT OF PROFIT AND LOSS (abbreviated - in thousands CZK)</b>	status as of 31/12/2022
Material costs	6,825,005.16
Costs for repairs and services	1,002,761.08
Personnel costs	5,655,158.14
Taxes and fees	250.81
Other costs	102,430.12
Depreciation, assets sold, provisions, corrected items, small tangible fixed assets, small intangible fixed assets	735,796.78
Financial costs	2,346.04
Costs for uncontested claims on SR, TSU and SF resources	0
<b>Total costs</b>	<b>14,323,748.13</b>
Revenue from own performance and goods	13,831,049.86
Other revenues	358,918.07
Financial returns	774.53
Revenues from undisputed claims on SR, USC and SF resources	213,265.02
<b>Total revenue</b>	<b>14,404,007.48</b>
Pretax profit	80,259.35
Income tax	0.00
Additional income tax deductions	0.00
<b>Profit or loss after tax</b>	<b>80,258.35</b>

### Summary of economic indicators (in thousands CZK)

Indicator	2019	2020	2021	2022	22/21 v %
Revenues	10,348,373	11,765,066	14 230 289	14 404 007	101.22
Costs	10,317,786	11,752,218	14,171,748	14,323,748	101.07
Profit or loss	30,587	12,848	58,541	80,259	137.09
Unreimbursed loss from previous years	-1,384,983	-1,372,134	-1,313,593	-1,233,334	93.89
Tangible fixed assets	9,293,006	9,145,408	8,908,108	9,582,789	107.57
Stock	171,673	243,779	263,747	301,837	114.44
Claims	1,261,307	705,655	653,901	1,349,578	206.38
Debts	1,240,473	1,191,945	1,356,187	1,720,549	126.86
Financial assets	816,279	1,361,786	1,818,392	1,382,638	76.03
Remuneration Fund	0	0	0	0	0.00
Cultural and Social Needs Fund	73,126	93,122	78,081	44,477	56.96
Reserve fund	54,456	66,419	51,210	64,588	126.12
Asset Replacement Fund	1,942,049	2,109,132	2,437,291	2,515,755	103.21

**As of 31/12/2022, the MUH's financial position was balanced and ended with an accounting profit of CZK 80.25 million. The MUH has been economically stable on a long-term basis and has no tax arrears.**

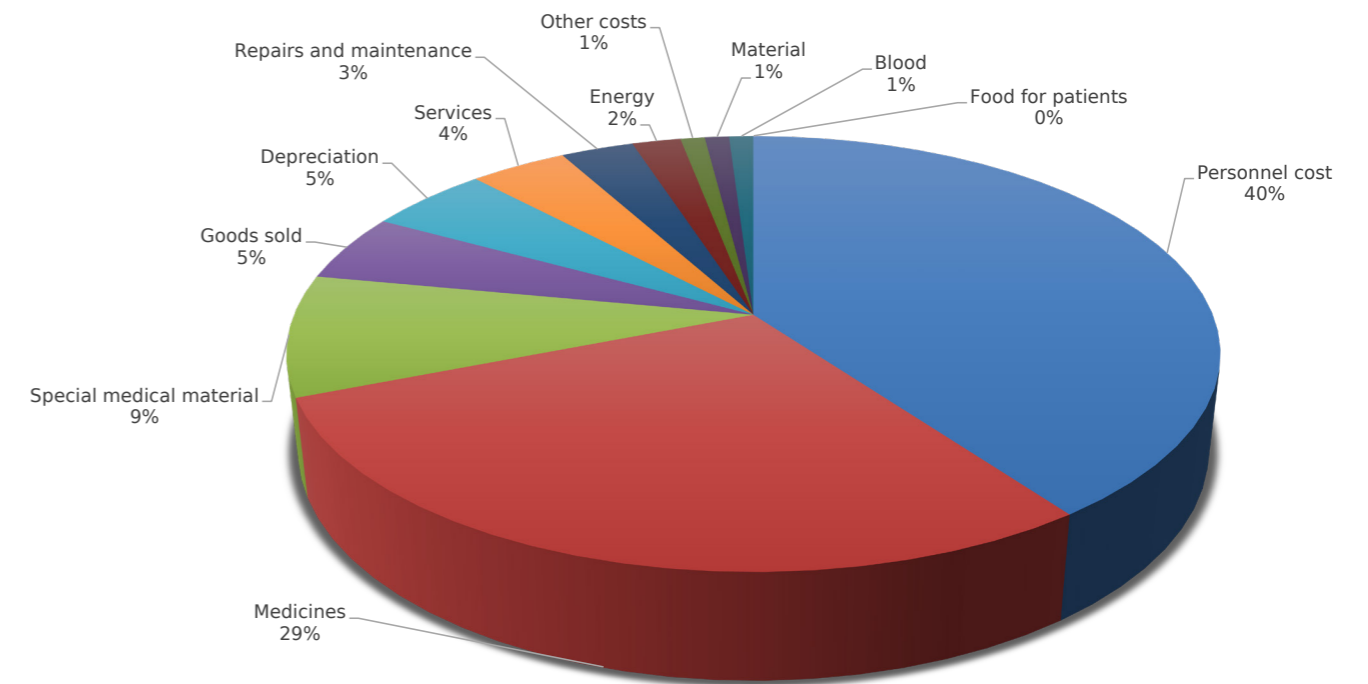
At the start of the period the economic result was still affected by the global SARS-Cov2 pandemic. The MoH CR regulation restricted elective care and at the same time there was increased morbidity among medical staff. Therefore, the start of the year saw a drop in health services and it wasn't until March that the hospital was in full operation.

The biggest impact on the hospital's economic performance, however, was the increase in energy and fuel prices and the conflict in Ukraine, which affected the whole world in February 2022. As a result, inflation skyrocketed, the prices of services and goods increased, and the hospital's costs rose significantly. In connection with the influx of Ukrainian refugees, the MoH CR issued instructions to set up a "UA-Point" in March 2022 to provide urgent assistance to Ukrainian citizens as well as the treatment and examination of paediatric patients for entry to schools. COVID 19 vaccinations were also taking place at the same time.

The hospital's financial performance was further affected by an increase in personnel costs due to a 6% increase in the tariff for medical staff from 1/1/2022, pursuant to Decree No. 531/2021 amending Government Decree No. 341/2017, and a 10% increase in the tariff for non-medical staff from 1/9/2022, pursuant to Government Decree No. 264/2022.

The hospital's economics were also affected by an increase in the cost of the highly expensive medicines provided in the hospital's centres and the reimbursement of medicines pursuant to Section 16 of the Decree to Act No. 45/1997 Coll., on Public Health Insurance. The MUH administered Zolgensma to seven patients in 2022 (price per pack CZK 56.8 mil.). The total cost of these drugs came to CZK 3,008.39 million.

## Cost overview for Motol University Hospital in year 2022

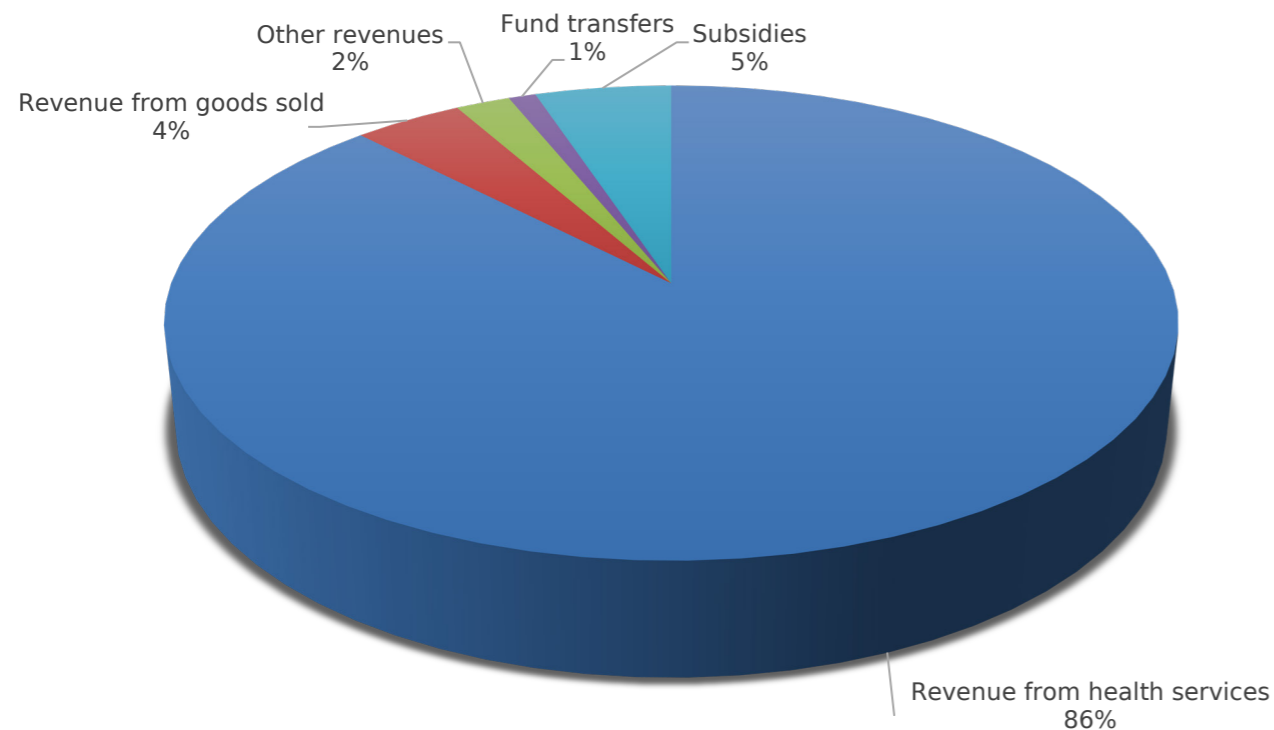


The hospital's cash flow is still influenced by the investments it has financed from its own sources, primarily for renewing medical equipment. Installments were paid for the reconstruction of the DFN and polyclinic and will be paid off in 2023.

The hospital needs to ensure asset replacement, as investing in modern technology reduces the costs for repairing and maintaining outdated equipment. REACT-EU project funding has greatly helped the MUH when renewing its medical equipment. This concerns three areas: developing and modernising workplaces in connection with the standardised network of emergency admissions, diagnostics for oncology patients and the acquisition of laboratory equipment.

The start of the year saw the launch of a project in the blue pavilion - insulation, replacing windows, electrical wiring and lighting, financed from the State Environmental Fund's "Green Savings" programme. Due to a lack of financing from the Ministry of the Environment (MoE), to date the hospital has had to finance CZK 37.5 million from its own resources. At the same time, the reconstruction of the LSH began, which will, unfortunately, cause a drop in annual production of about CZK 100 million. Furthermore, alterations were started on the Pneumology Clinic. These investments were approved with the hospital contributing CZK 162.6 million from its own resources.

## Revenues overview for Motol University Hospital in year 2022



The hospital managed to increase the number of operations. The 30,200 operations represent 105.5% of the number in 2019 and 115.2% in 2021. That is 1,585 more operations compared to 2019. There was an increase in outpatient procedures and outpatient treatments. The hospital has managed to keep its performance despite the afore mentioned reconstructions that have already started or are in the pipeline.

Motol University Hospital is the largest hospital in the country, it has high-quality, modern equipment and its staff are experts in their fields who provide healthcare on a daily basis. The Motol University Hospital's management will continue to ensure it complies with the measures to maintain a balanced economy and effective management to maintain a state-of-the-art medical workplace that provides comprehensive health care for all patients from all over the CR in the entire range of medical disciplines that the hospital offers. Together with the professional care provided by the highly erudite medical staff, the hospital is also equipped with modern operating theatres, devices and technologies that allow it to shorten the time patients spend in the hospital.

## HUMAN RESOURCE ACTIVITIES

In 2022, the Motol University Hospital (MUH) employed:

in recalculated figures: **5,616 employees, of which 4,482 were medical staff**  
 in natural persons: **6,354 employees, of which 5,177 were medical staff**

### Structure of employees' professions

(FO) average number of natural persons, (PP) average converted number

	2020	2021	2022	2020	2021	2022	INDEX 22/21	
	FO	FO	FO	PP	PP	PP	FO	PP
Total	6 134	6 276	6 354	5 461	5 573	5 616	1,01	1,01
PHYSICIANS	1 297	1 311	1 337	992	1 005	1 027	1,02	1,02
PHARMACISTS	40	41	42	37	39	38	1,02	0,97
NURSES	2 006	1 997	2 005	1 809	1 794	1 789	1,00	1,00
QUALIFIED MEDICAL STAFF	695	714	742	656	666	689	1,04	1,03
SPECIALIZED MEDICAL STAFF	271	271	285	211	210	227	1,05	1,08
SUPERVISED MEDICAL STAFF	634	663	691	607	633	659	1,04	1,04
OTHER QUALIFIED STAFF	62	78	75	52	59	53	0,96	0,90
TECHNICAL AND ECONOMIC STAFF	801	858	875	776	833	840	1,02	0,01
WORKERS	328	343	302	321	334	294	0,88	0,88

### Employees by age and gender as of 31. 12. 2022

age	men	women	total	%
20	8	38	46	0,71
21-30	315	857	1172	18,2
31-40	432	815	1247	19,37
41-50	440	1362	1802	27,97
51-60	326	1056	1382	21,46
61	259	532	791	12,28
<b>Total</b>	<b>1 780</b>	<b>4 660</b>	<b>6 440</b>	<b>100</b>
<b>%</b>	<b>27,6</b>	<b>72,4</b>	<b>100</b>	



### Employees by education and gender as of 31. 12. 2022

education achieved	men	women	total	%
basic	140	191	331	5.14
vocational certificate	288	254	542	8.42
vocational secondary	39	8	47	0.73
complete secondary education	20	49	69	1.07
complete vocational secondary education	287	1995	2282	35.43
higher vocational	63	289	352	5.47
tertiary	943	1874	2817	43.74
of which bachelors	112	580	692	
of which masters	831	1294	2125	
<b>Total</b>	<b>1,780</b>	<b>4,660</b>	<b>6,440</b>	<b>100.00</b>

### Length of employment as of 31.12.2022

duration	number	%
up to 5 years	2,698	41.89
up to 10 years	1,016	15.78
up to 15 years	699	10.85
up to 20 years	682	10.59
up to 20 years	1,345	20.89
<b>total</b>	<b>6,440</b>	<b>100.00</b>

### Qualification structure as of 31.12.2022

Achieved education among nurses and midwives	Total	%	of which with specialization	%
Secondary medical	1,080	53.20	976	90.37
Higher medical	259	12.76	78	30.12
Tertiary bachelor's	465	22.91	102	21.94
Tertiary master's	226	11.13	66	29.20
Total	2,030	100.00	1,222	60.20

1) **Medical staff pursuant to Act No. 95/2004 Coll.** = physicians, dentists and pharmacists: **total 1,409** of the 1,367 physicians in total, 385 (28%) only have a professional qualification and 982 (72%) physicians have a specialized qualification (i.e. 2nd level of postgraduate certification, additional certification, Czech Medical Chamber licence, certification from the Ministry of Health of the CR).

2) **Medical staff pursuant to Act No. 96/2004 Coll.** = medical professions other than physicians: **3,844 in total**, of which 2,030 are general nurses and midwives.

### Wages

A total of **CZK 4,075,590,699** (excluding other personnel expenses - remuneration for work performed outside employment) was expended on wages in 2022. Compared to 2021, wage resources fell by **CZK 144,049,142, i.e. by 3%**. The drop in wage resources in 2022 compared to 2021 was due to the payment of exceptional remunerations provided to staff for their work when dealing with the COVID-19 situation in 2021. These remunerations were no longer paid in 2022.

The average gross salary in the hospital as of 31.12.2022 was **CZK 60,473**. This is a 4% decrease compared to 2021. The reason for the decrease is the aforementioned payment of extraordinary remuneration when dealing with the COVID-19 pandemic in 2021, which significantly contributed to an increase in the average salary in 2021.

### Development of average salary over the last 10 years

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>TOTAL</b>	34,364	34,893	36,302	38,529	42,111	46,657	50,237	57,346	63,100	60,473
<b>PHYSICIANS</b>	65,564	66,474	68,962	71,753	76,316	81,758	85,284	92,394	101,533	101,931
<b>NURSES</b>	32,079	32,035	33,425	36,390	40,317	45,637	50,681	59,221	66,641	62,634



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*The MUH would like to thank all the donors listed above whose donation helped improve the conditions for patient care in our hospital last year. At the same time we thank all other donors, whose names could not be listed here for technical reasons, but are listed on our web pages.*

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