



State of Oncology in Slovakia

Annual Report
2022

Compiled by
National Oncology Institute

Bratislava | 2023

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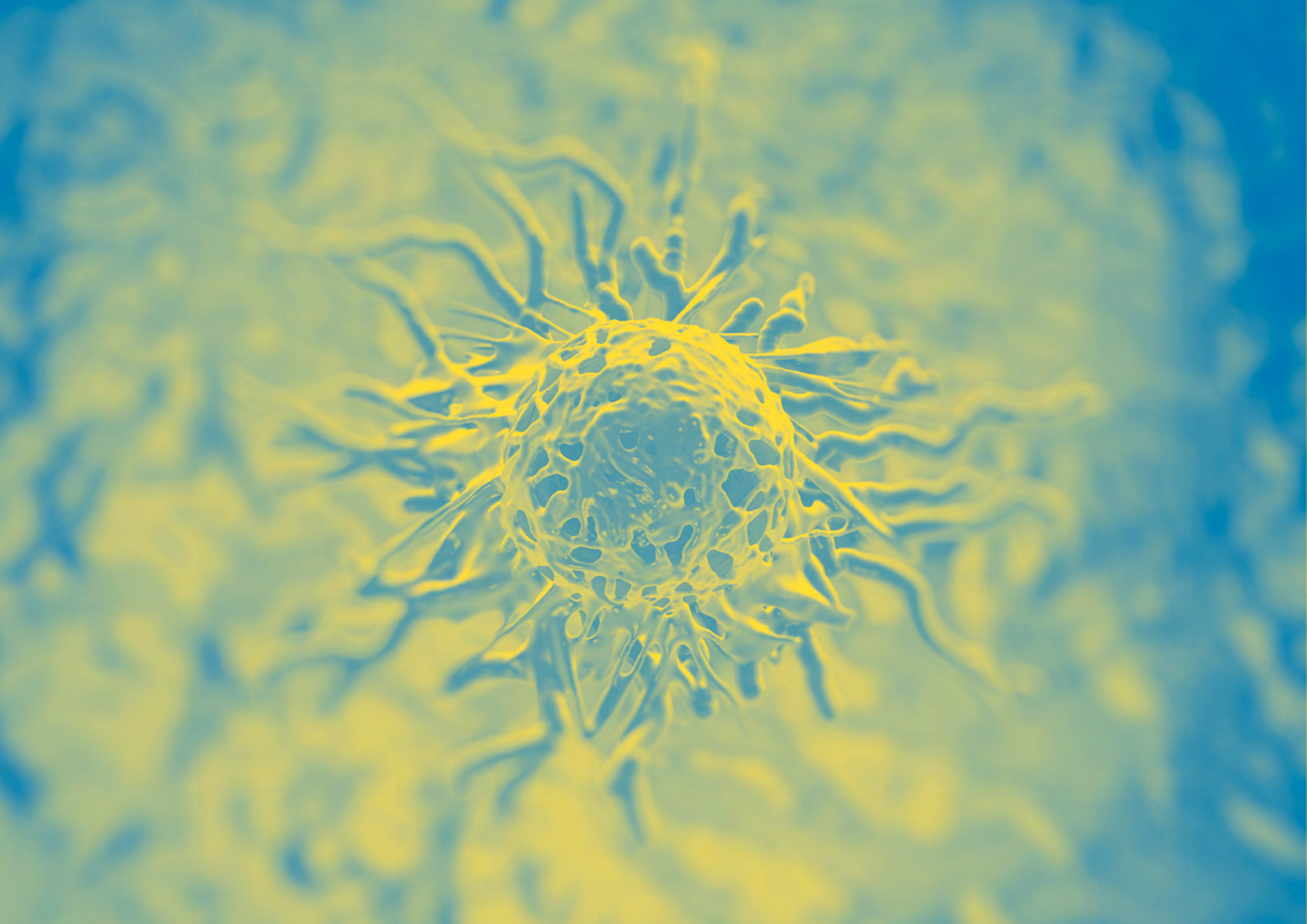
FORMAL AND LINGUISTIC REVIEW

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1. Introduction

Dear Colleagues,

As every year, we provide you with comprehensive information about the situation of oncology in Slovakia for the previous year. The number of cancer diseases increases with age, and as in other European countries, we also observe the aging of the general population and the number of cancer diseases in Slovakia. Worldwide, approximately 20 million cancer cases are diagnosed annually. By 2040, an increase to more than 30 million cases annually is expected. Based on the predictions of the National Oncological Registry, as well as the recently published analysis of the National Health Information Centre (NHIC) using data from health insurance companies, around 40,000 malignant tumors are diagnosed in Slovakia annually.

Cancer is the second most common cause of hospitalization and the second most common cause of death after cardiovascular diseases. In absolute terms, approximately 13,000 people die on average in Slovakia. Among the three most common cancer diseases in Slovakia in men are colon and rectal cancer, lung cancer, and prostate cancer. In women, breast cancer, colon and rectal cancer, and cancer of the body of the uterus predominate. Approximately 180 new cases are diagnosed in children

per year, and the most common cancer diseases are hematological malignancies and malignant brain tumors.

By following the principles of primary and secondary prevention, i.e. by avoiding the effects of risk factors and participating in screening examinations, we can slow down the increase in the number of cancer diseases, and also reduce the mortality rate from said diseases. However, mortality also depends on other influences, such as the availability of early diagnosis, and treatment options, including supportive care, not only during active cancer treatment but also as a part of the follow-up treatment. It also depends on the overall morbidity of the population, as comorbidities can affect treatment success.

The most common risk factors for cancer are smoking, obesity, low physical activity, as well as the effects of alcohol and environmental influences, such as air pollution. The search for a solution to the unfavorable situation related to the growing number of cancer diseases and the search for health-beneficial society-wide and multinational activities is therefore receiving worldwide attention and is strategically covered by

national oncology plans. Within Europe, Europe's Beating Cancer Plan was approved in February 2021 and its implementation is currently in full swing. In Slovakia, for the first time in the history of its independence, the National Oncology Program of the Slovak Republic (NOP SR) was approved with action plans for the years 2018-2020, and in 2021, it was updated for the period 2021-2025.

A significant success was the adoption of a law defining the reform of long-term, follow-up, and palliative care in Slovakia. In the past year, we have not relented in our efforts to strengthen the position of the National Oncology Institute as an important partner for fulfilling the action plans of the National Oncology Program of the Slovak Republic. The dominant activity continued to be aimed at improving the quality of oncology screening programs, including the launch of the *Improving Cancer Care Coordination and Screening in Latvia and Slovakia (ICCS)* international project of the Ministry of Health of the Slovak Republic (MoH SR) and the International Agency for Research on Cancer (IARC-WHO).

Other European projects, in which Slovakia has participated intending to fulfill Europe's Beating Cancer Plan and the National Oncology Program of the Slovak Republic are the *CraNE* Joint Action project, drafting standards and creating a network of comprehensive oncology centers, the *ECHoS (Establishing Cancer of Mission Hubs: Networks and Synergies)* project, whose task is to create an infrastructure for the improved fulfillment of the *Mission on Cancer* and the *PERCH (PartnERship to Contrast HPV)* project aimed at increasing the vaccination rates of girls and boys against HPV.

However, the action plans of the National Oncology Program of the Slovak Republic and their individual activities require continuous financial, as well as political, support, including the support of activities aimed

at continuous awareness and education with a focus on effective prevention and hygiene, including education that starts already at preschool age. The lack of availability of innovative cancer treatment continues to be a significant issue in Slovak oncology. Although the implemented activities of the MoH SR led to an increase in the number of approved cancer drugs and drug indications, this is a mere drop in the sea of the difference between the demand and actual availability. It is necessary to realize that even innovative treatment can contribute to increasing the quality of life of our population and reducing its mortality. From this perspective, it is important that the most effective drugs are added to the approved list and, on the other hand, those that no longer demonstrate effectiveness in the light of new knowledge, are taken off said list.

Another persistent issue is the uneven network of oncology facilities in terms of their geographical availability and the possibilities of providing health care. The task for the near future is to complete the construction of the National Oncology Institute, the East Slovakia Oncology Institute, and the Oncological Institute of St. Elizabeth in order to provide comprehensive cancer care, including palliative care, care for survivors and the creation of a solid infrastructure for clinical research. The challenge now is to reconcile the historical setup with demand and the optimization of the hospital network. In radiation oncology, the provision of optimum quality radiotherapy for all patients in Slovak hospitals remains an urgent need. For the effective fulfillment of national health programs, we need increased awareness on all levels of the general public, as well as a stable political situation ensuring the continuity of commenced activities.

We would like to thank all co-authors for their valuable contributions and would like to wish you a beneficial reading.

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2. Facilities Providing Oncology Care in Slovakia

2.1. Clinical Oncology Facilities

Overview of oncology facilities network in Slovakia as of 31st December 2022

Region	Regional/Chief Expert	Number of beds	Number of Clinical Oncologists	Full time Equivalent, Clinical Oncology (FTE)
Bratislava region	Klaudia Gočárová, M.D., PhD.	179 + 6TU*	69	29.8
Trnava region	Marián Streško, M.D., PhD.	30	15	12.9
Trenčín region	Branislav Bystrický, M.D., PhD., MPH	42	13	9.2
Žilina region	Assoc. Prof. Richard Hrubý, M.D., PhD., MBA, MPH	95	21	14.28
Nitra region	Juraj Detvay, M.D., PhD., MPH	81	20	15.3
Banská Bystrica region	Matej Hrnčár, M.D., PhD., MBA	98	17	10.6
Prešov region	Juraj Beniak, M.D.,	35	17	15.5
Košice region	Assoc. Prof. Igor Andrašina, M.D., PhD.	137	23	18.0
Slovakia	Prof. Michal Mego, M.D., D.Sc.	697+ 6TU*	195	125.58

*TU = transplantation unit

Location	Hospital	Department	Number of beds	Clinical Oncologists	FTE
Bratislava region – Regional Expert: Klaudia Gočárová, M.D., PhD.					
Bratislava	National Cancer Institute	2 nd Oncology Clinic, Faculty of Medicine of Comenius University and National Cancer Institute	total 87	Head of Clinic: Prof. Michal Mego, M.D., D.Sc.	13.0
		Clinical Oncology Department A	18	Head of Department: Jozef Šufliar, M.D., PhD. Andrej Jurík, M.D. Michaela Kubičková, M.D. Tomáš Minárik, M.D., PhD. Michaela Soják, M.D., PhD.	3.0
		Clinical Oncology Department D	17	Head of Department: Zuzana Syčová-Milá, M.D. Assoc. Prof. Michal Chovanec, M.D., PhD. Prof. Michal Mego, M.D., D.Sc. Jana Obertová, M.D., PhD. Dr. Patrik Palacka, M.D., PhD., MPH, MBA, LL.M. Katarína Rejlek, M.D., PhD.	2.0
		Clinical Oncology Department E	17	Head of Department: Jozef Dolinský, M.D. Róbert Godál, M.D. Silvia Jurišová, M.D. Melinda Kračalíková, M.D. Veronika Švabová, M.D., PhD.	2.0
		Clinical Oncology Department F Cancer Institute	19	Head of Department: Andrea Škripeková, M.D., PhD. Lucia Dzurillová, M.D., Katarína Jakubovits, M.D. Andrea Sysáková, M.D.	2.0
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Location	Hospital	Department	Number of beds	Clinical Oncologists	FTE
		Clinical Oncology Department – Outpatient chemotherapy	0	Head of Department: Dr. Patrik Palacka, M.D., PhD., MPH, MBA, LL.M., Barbora Dobiášová, M.D., Miroslava Malejčíková, M.D., Eva Oravcová, M.D., PhD.	2.0
Bratislava	National Cancer Institute	Oncohematology Clinic, Faculty of Medicine of Comenius University and National Cancer Institute	total 27+6TU	Head of Clinic: Assoc. Prof. Ľuboš Drgoňa, M.D., PhD., MHA, FECMM	6.0
		Oncohematology Department, I.	15+6TU	Head of Department: Andrej Vranovský, M.D., PhD. Assoc. Prof. Ľuboš Drgoňa, M.D., PhD., MHA, FECMM Radoslav Greksák, M.D., PhD. Miriam Ladická, M.D.	3.0
		Oncohematology Department II.	12	Head of Department: Eva Mikušková, M.D., PhD. Ľudmila Demitrovičová, M.D., PhD. Vanda Mikudová, M.D. Iveta Oravcová, M.D., PhD.	3.0
Bratislava	Oncological Institute of St. Elizabeth	Internal Clinic, Healthcare and Social Work College and Oncological Institute of St. Elizabeth	total 28	Head of Clinic: Prof. Stanislav Špánik, M.D., PhD.	5.0
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Location	Hospital	Department	Number of beds	Clinical Oncologists	FTE
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Bratislava	Ružinov Hospital	Clinical Oncology Clinic	0	Pavel Vojtko, M.D.	1.0
Bratislava	Antolská Hospital and Policlinic	Clinical Oncology Clinic	0	Marián Príbelský, M.D., PhD.	0.6
Bratislava	Mýtna Policlinic	Clinical Oncology Clinic	0	Ľubica Sládkovičová, M.D.	0.2
Bratislava	St. Michaels Hospital	Clinical Oncology Clinic	0	Miriám Drahokoupilová, M.D.	0.2
Total			179 + 6TU	69	29.8

Location	Hospital	Department	Number of beds	Clinical Oncologists	FTE
Trnava region – Regional Expert: Marián Streško, M.D., PhD.					
Trnava	Teaching Hospital Trnava	Oncology Clinic	30	Head of Clinic: Marián Streško, M.D., PhD. Abdul Dammak, M.D. Head of Department: Monika Dienerová, M.D., PhD. Erika Grmanová, M.D. Eliška Volochová, M.D. Viera Skarbová, M.D.	4.0
Trnava		Private Oncology Clinic	0	Assoc. Prof. Eva Kukučková, M.D.	1.0
Galanta	St. Lucas Hospital and Policlinic Galanta, (JSC)		0	Jozef Kováč, M.D.	1.0
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Senica			0	Adrian Nečas, M.D.	0.4
Skalica	Skalica Hospital and Clinic (JSC)		0	Jana Mišová, M.D. Adrian Nečas, M.D.	1.5
Dunajská Streda			0	Tibor Csoka, M.D. Juraj Kubik, M.D.	2.0
Total			30	15	12.9

Location	Hospital	Department	Number of beds	Clinical Oncologists	FTE
Trenčín Region – Regional Expert: Branislav Bystrický, M.D., PhD., MPH					
Trenčín	Teaching Hospital Trenčín	Oncology Clinic	42	Head of Clinic: Branislav Bystrický, M.D., PhD., MPH Zuzana Hatalová, M.D. Filip Kohútek, M.D., PhD. Alžbeta Kohúteková, M.D. Katarína Riedlová, M.D. Miroslava Stratená, M.D. Viliam Špánik, M.D.	4.6
Považská Bystrica	Nemocnica s poliklinikou Považská Bystrica	0	0	Andrej Rosík, M.D. Zuzana Hunčíková, M.D. Veronika Pechová, M.D.	2
Bojnice		0	0	Dušan Magdín, M.D. Mária Pastorková-Šafariková, M.D.	1.6
Partizánske		0	0	Alexandra Szabová, M.D.	1
Total			42	13	9.2

Location	Hospital	Department	Number of beds	Clinical Oncologists	FTE
Nitra region – Regional Expert: Juraj Detvay, M.D., PhD., MPH					
Nitra	Specialized St. Svorad Hospital Nitra	Clinical Oncology	35	Head of Department: Assoc. Prof. Peter Beržinec, M.D., PhD., FCCP Lucia Doláková, M.D. Gabriela Chowaniecová, M.D. Helena Kuzmová, M.D.	2.0
Nitra	Teaching Hospital Nitra	Clinical Oncology	31	Head of Clinic: Michaela Miškovičová, M.D., Ph.D. (from 1 st of September 2022) Head of Department: Juraj Detvay, M.D., PhD., MPH (till 15 th of December 2022) Zuzana Pribulova, M.D. (from 16 th of December 2022) Jana Ďurková, M.D. Rastislav Gura, M.D.	1.5
Nitra	MedCenter Dzurila		0	Rastislav Gura, M.D.	1.0
Nitra	Private Oncology Clinic		0	Anna Rábeková, M.D.	1.0
Topoľčany	Svet zdravia Hospital Topoľčany (JSC)		0	Ján Kubiš, M.D. Katarína Lepeyová, M.D. Anna Urbíliková, M.D.	1.6
Komárno	Komárno Zdravspol (LLC)		0	Eva Konkolovská, M.D.	1.0
Komárno	Agel hospital Komárno		0	Oľga Rosinská, M.D.	1.0
Levice	Levice Hospital		0	Blanka Puškárová, M.D. Lyudmyla Rudenko, M.D. Anna Urbíliková, M.D.	2.0
Levice	Private Clinic		0	Anna Urbíliková, M.D.	1.0
Nové Zámky	Teaching Hospital	Clinical oncology department	15	Pavol Demo, M.D. Ľudovít Gremeň, M.D. Oľga Szegeöová, M.D.	2.2
Nové Zámky	Private Clinical Oncology Clinic		0	Danica Horváthová, M.D.	1.0
Total			81	20	15.3

Location	Hospital	Department	Number of beds	Clinical Oncologists	FTE
Žilina region – Regional Expert: Assoc. Prof. Richard Hrubý, M.D., PhD., MBA, MPH					
Žilina	Teaching Hospital and Policlinic Žilina	Clinical and Radiation Oncology Department	40	Head of Department: Dagmar Sudeková, M.D., *(RO) Milan Krošlák, M.D., Ivan Kudera, M.D. Zuzana Štofová, M.D. Andrea Šulgan, Murínová, M.D., Alena Thomková, M.D.	2.0
Žilina	ONKOMED ZA (LLC)	Clinical Oncology Clinic	0	Assoc. Prof. Richard Hrubý, M.D., PhD., MBA, MPH	1.0
Martin	University Hospital Martin	Oncology Center	19	Head of Oncology Center: Eva Hajtmanová, M.D., PhD. *(RO), Zuzana Špaňová, M.D., Silvia Šulajová, M.D., Dagmar Šuteková, M.D., Katarína Švábová, M.D.	1.68
Martin	ONKO MARTIN (LLC)	Clinical Oncology Clinic	0	Anna Naništová, M.D.	1.0
Ružomberok	Central Military Hospital Ružomberok	Radiation and Clinical Oncology Clinic	36	Head of Clinic: Roman Podoba, M.D., PhD. Head of Department Iveta Kalinová, M.D., *(RO) Helena Česáková M.D. *(RO) Soňa Johnová, M.D., Tatiana Komová, M.D. Magdaléna Stranovská, M.D.	3.0
Liptovský Mikuláš	Hospital and Policlinic Liptovský Mikuláš	Clinical Oncology Clinic	0	Alexandra Zemančíková, M.D. Marta Bodorová, M.D. *(RO)	1.0
Dolný Kubín	Onkológia DK (LLC)	Clinical Oncology Clinic	0	Lucia Beňušová, M.D.	1.0
Námestovo	Onkológia DK (LLC)	Clinical Oncology Clinic	0	Lucia Beňušová, M.D.	0.2
Námestovo	Upper Orava Hospital	Clinical Oncology Clinic	0	Ľudmila Guspanová, M.D.	0.2
Trstená	Upper Orava Hospital	Clinical Oncology Clinic	0	Ľudmila Guspanová, M.D.	1.0
Čadca	Kysuce Hospital	Clinical Oncology Clinic	0	Pavol Lamoš, M.D.	1.0
Čadca	Šíranec (LLC)	Clinical Oncology Clinic	0	PhDr. Alojz Šíranec, M.D. MPH	1.0
Kysucké Nové Mesto	MEDICA-CARE (LLC)	Clinical Oncology Clinic	0	Dagmar Krešáková, M.D.	0.2
Total			95	21	14.28

*RO – Radiation Oncology Specialist

Location	Hospital	Department	Number of beds	Clinical Oncologists	FTE
Banská Bystrica region – Regional Expert: Matej Hrnčár, M.D., PhD., MBA					
Banská Bystrica	F.D.Roosevelt Hospital and Policlinic Banská Bystrica	Clinical Oncology	58	Head of Clinic: Matej Hrnčár, M.D., PhD., MBA Deputy Head: Anna Švidraňová, M.D. Emília Fatkulínová, M.D. Soňa Johnová, M.D. Silvia Mrázová, M.D. Alexander Savka, M.D. Lucia Venglarčíková, M.D.	4.0
Banská Bystrica	St. Agatha Mammacenter		0	Eva Pritzová, M.D. Dagmar Mazalová, M.D. Klaudia Šurmaneková, M.D.	2.0
Lučenec	General Hospital and Policlinic Lučenec, n.o.		20	Andrea Kašínská, M.D. Jaroslava Machanová, M.D.	
Rimavská Sobota	Rimavská Sobota Hospital	Clinical Oncology	20	Head of Department: Assoc. Prof. Richard Hrubý, M.D., PhD., MBA, MPH, Adela Englerová, M.D. Iveta Palková, M.D.	1.4
Rimavská Sobota	Avimed			Vincent Alakša, M.D. Adela Englerová, M.D.	1.2
Veľký Krtíš	Veľký Krtíš		0	Anna Bomborová, M.D.	1.0
Zvolen	Zvolen Hospital		0	Petronela Lalíková, M.D.	1.0
Total			98	17	10.6

Location	Hospital	Department	Number of beds	Clinical Oncologists	FTE
Prešov region – Regional Expert: Juraj Beniak, M.D.					
Poprad	POKO Poprad (LLC)		0	Head of Department: Juraj Beniak, M.D. Tatiana Albertová, M.D. Marian Kakalejčík, M.D. Lenka Medvecová, M.D. Mária Rečková, M.D., PhD. Marcela Uhríková, M.D. (from 1 st October 2022)	4.5
Prešov	J. A. Reiman Teaching Hospital and Policlinic Prešov	Oncology Clinic	35	Head of Clinic: Marek Paľo, M.D., PhD. *(RO) Head of Department: Jaroslava Lešková, M.D. Michal Milas, M.D. Lenka Kundríková, M.D. Valéria Tkáčová, M.D.	5.0
Prešov	BEKY-MED (LLC)	Oncology Clinic	0	Alena Benedikty, M.D.	1.0
Levoča	General Hospital and Policlinic Levoča (JSC)		0	Valér Kováč, PhD., M.D. Marcela Uhríková, M.D. (until 30 November 2022)	1.0
Stará Ľubovňa	Hospital and Policlinic Stará Ľubovňa – Ľubovňa Hospital		0	Martina Turčániová, M.D.	1.0
Svidník	Svidník Hospital		0	Erika Hnátová, M.D.	1.0
Sabinov	Sabinov		0	Wali Kohi, M.D.	1.0
Bardejov	St. Jacob Hospital and Policlinic Bardejov		0	Jozef Chovanec, M.D. Jozef Chovanec Jr., M.D.	1.0
Total			35	17	15.5

Location	Hospital	Department	Number of beds	Clinical Oncologists	FTE
Košice region – Regional Expert: Assoc. Prof. Igor Andrašina, M.D., PhD.					
Košice	East Slovakia Oncology Institute (JSC)	Radiotherapy and Oncology Clinic	total 55	Head of Clinic: Assoc. Prof. Igor Andrašina, M.D., PhD.	6.0
		Clinical Oncology Department – Outpatient Department	0	Head of Department: Andrea Čipková, M.D., MPH Assoc. Prof. Igor Andrašina, M.D., PhD. Eleonóra Pihúriková, M.D., Mária Višňovská, M.D. Renáta Šikrová, M.D., Monika Žák, M.D.	5.0
		Clinical Oncology Department – Inpatient Department	55	Robert Biel, M.D., Jana Jankurová, M.D. Martin Petrilák, M.D., Zuzana Pribulová, M.D. Jana Tabišová, M.D.	1.0
Košice	Outpatient care	Oncology Clinic	0	Hana Garanová, M.D.	1.0
Košice okolie	Outpatient care	Oncology Clinic	0	Helena Sárosiová, M.D.	1.0
Košice	Outpatient care	Oncology Clinic		Expert Guarantor: Tibor Packáň, M.D.	1.0
Rožňava	St. Barbara Hospital and Policlinic Rožňava	*POKO		Zlatica Šimkovičová, M.D.	1.0
Trebišov	Hospital and Policlinic Trebišov (JSC)	Oncology Clinic	0	Alica Malá, M.D.	1.0
Trebišov	Hospital and Policlinic Trebišov (JSC)	Clinical Oncology Department	25	Head of Department: Bibiana Bereš-Ziarna, M.D. Bibiana Brezinová, M.D. Peter Jarušínský, M.D. Martin Michalanský, M.D.	4.0
Michalovce	Štefan Kukura Hospital and Policlinic	Oncology Center	57	Head of Oncology Center: Gabriela Hermannová, M.D., Main Expert of Svet zdravia: Radovan Barilla, M.D., PhD., Bibiana Bereš-Ziarna, M.D. Bibiana Brezinová, M.D.	1.8
Humenné	A. Leňo Hospital and Policlinic	*POKO	0	Svetlana Šarišská, M.D.	1.0
Vranov n/Topľou	Hospital and Policlinic Vranov n/Topľou	Oncology Clinic	0	Deputy of Clinical Oncologist from Hospital and Policlinic Trebišov	0.2
Total			137	23	18

*POKO – Policlinic Department of Clinical Oncology

State of oncology facilities network in 2022

There are 3 Institutes specializing in Cancer care in Slovakia (National Cancer Institute, East Slovakia Oncology Institute, and Oncological Institute of St. Elizabeth), 13 Clinical Oncology Departments, and 2 Specialized Lung Oncology facilities.

The challenge for the near future is to build the first Comprehensive Cancer Center in Slovakia according to OECI (Organisation of European Oncology Institutes) standards, which would also be part of the creating European network of Comprehensive Cancer Centers in accordance with Europe's Beating Cancer Plan.

Another challenge is the alignment of the historical setup of the oncology facilities network with the optimization of the hospital network drafted by the Ministry of Economy of the Slovak Republic.

2.2. Centers of Specialized Oncohematology Care for adults (including a Transplantation program)

In 2022, standard diagnostic and therapeutic activities were conducted in both centers, as well as regional facilities. The hematopoietic cell transplantation program continued, and the first Slovak center (Oncohematology Clinic of the Faculty of Medicine of Comenius University and National Cancer Institute, Bratislava) was certified for the application of the CAR T-cell therapy, also thanks to the cooperation of the facility with the MoH SR, health insurance companies, the manufacturer and regulatory authorities. Due to legislative changes, the process toward greater availability of innovative treatment

options for patients with hematological malignancies has started.

The challenges for 2023 remain the correct and early diagnosis and modern therapy of hematological malignancies, the preparation of additional centers for CAR-T cell therapy in the Slovak Republic, and the correct setup of the network of facilities and their personnel and equipment provision.

Inpatient Departments (adult patients):

1. Hematology and transfusionology clinic of the Faculty of Medicine of Comenius University (FMCU), Slovak Medical University (SMU) and the University Hospital Bratislava, Antolská 11, Bratislava

www.unb.sk/klinika-hematologie-a-transfuziologie-lfuk-szu-a-unb/

2. Hematology and Oncohematology Clinic of the Louis Pasteur University Hospital, Trieda SNP 1, Košice

www.upjs.sk/lekarska-fakulta/klinika/hematologia/

3. Hematology ward, FDR Hospital with Policlinic, Nám. L. Svo-bodu 1, Banská Bystrica

www.fnsppfdr.sk/kliniky-a-oddelenia/hematologicke-oddelenie/

4. Hematology and Transfusionology Clinic, Jesenius Medical Faculty of the Comenius University and University hospital, Kollárova 2, Martin

www.unm.sk/klinika-hematologie-transfuziologie

5. Oncohematology Clinic of the Faculty of Medicine of Comenius University and National Cancer Institute, Klenová 1, Bratislava

www.nou.sk/klinika-onkohematologie-lfuk-a-nou

6. Clinical Hematology ward of the Teaching Hospital, Jána Hollého 14, Prešov

www.fnsppresov.sk/oddelenia/klinicka-hematologia/

2.3. Pediatric Oncology Facilities

Overview of pediatric facilities network in Slovakia as of 31st December 2022

Region	Head of Clinic/Department	Number of beds	Number of Pediatric Oncologists	Full-time Equivalent, Pediatric Oncology (FTE)
Bratislava	Prof. Alexandra Kolenová, M.D., PhD. Andrea Hrašková, M.D. Peter Švec, M.D., PhD.	50	14	7.0
Banská Bystrica	Eva Bubanská, M.D. Ivana Fedoráková, M.D.	18	6	1.2
Košice	Viktória Halušková, M.D.	15	4	2.0
Chief Expert in Pediatric Oncology since January 1st, 2019				
Slovensko	prof. Alexandra Kolenová, M.D., PhD.	83	24	10.2

Location	Hospital	Department	Number of beds	Pediatric Oncologists
Bratislava	National Institute of Children's Diseases	Oncology Department – small children Children's Hematology and Oncology Clinic, Faculty of Medicine of Comenius University and the National Institute of Children's Diseases	17	Head of Clinic: Prof. Alexandra Kolenová, M.D., PhD. Stanislava Hederová, M.D. Kristína Husáková, M.D. Marianna Džatková, M.D.
		Oncology Department – big children	17	Head of Department: Andrea Hrašková, M.D. Andrea Mocná, M.D. Judita Puškáčová, M.D., PhD.
		Transplantation unit	6	Peter Švec, M.D., PhD. Jaroslava Adamčáková, M.D. Ivana Boďová, M.D., PhD. Mária Fussiová, M.D. Júlia Horáková, M.D., PhD.
		Outpatient Chemotherapy Clinic	10	Andrea Hrašková, M.D.
		Oncology Clinics	0	Prof. Alexandra Kolenová, M.D., PhD. Daniela Sejnová, M.D. Judita Puškáčová, M.D.
		Transplantation Unit Clinic	0	Ivana Boďová, M.D. Júlia Horáková, M.D. Peter Švec, M.D., PhD.
		Palliative care	0	Mária Jasenková, M.D. Martina Mikesková, M.D.

Location	Hospital	Department	Number of beds	Pediatric Oncologists
Banská Bystrica	Teaching Hospital with Policlinic	Pediatric Oncology and Hematology Clinic of the Slovak Medical University	18	Head of Clinic: Eva Bubanská, M.D., PhD. Head of Department: Ivana Fedoráková, M.D. Pavel Bician, M.D. Helena Fillová, M.D. Terézia Stančoková, M.D.
		Oncology Clinic		Ivana Fedoráková, M.D. Terézia Stančoková, M.D. Pavel Bician, M.D.
		Palliative care		Terézia Stančoková, M.D. Pavel Bician, M.D.
Košice	Children's Teaching Hospital	Children's Oncology and Hematology Department	15	Head of Department: Viktória Halušková, M.D. Ladislav Deák, M.D. Natália Galoová, M.D. Milan Greš, M.D. Viktória Halušková, M.D.
		Oncology Clinic		Ladislav Deák, M.D. Natália Galoová, M.D. Milan Greš, M.D. Viktória Halušková, M.D. Igor Jenčo, M.D.

Challenges for 2023

The network of pediatric oncology centers in Slovakia is optimal and sufficient. The National Institute of Children's Diseases in Bratislava, the Children's Teaching Hospitals in Banská Bystrica, and Košice cooperate and have the same diagnostic and treatment procedures. Patient consultation is available in Bratislava at the multidisciplinary Tumor board seminar and also within the international Tumor board with the Children's Hospital of Philadelphia.

Within the optimization of the hospital network, the Children's Hematology and Oncology Clinic of the National Institute of Children's Diseases was categorized in Category 5 and the Children's Teaching Hospitals Banská Bystrica and Košice in category 5 within the network of the MoH SR.

The modernization of the diagnostic procedure for CNS tumors as per the latest 2021 WHO classification poses another challenge by introducing methylation and genomic profiling in all childhood CNS tumors. Yet another challenge is to ensure the conditions for participation in international clinical academic studies.

2.4. Radiation Oncology Facilities

Overview of radiation facilities network in Slovakia as of 31st December 2022

Region	Regional/Chief Expert	Number of beds	Radiation Oncologists and Radiation Oncologists in preparation for board-examination in RO
Bratislava region	Martin Chorváth, PhD., M.D., MPH	87	30
Trnava region	Not appointed	0	0
Trenčín region	Not appointed	42*	9
Žilina region	Eva Hajtmanová, M.D., PhD.	114	20
Nitra region	Not appointed	78*	13
Banská Bystrica region	Not appointed	98*	14
Prešov region	Not appointed	25	9
Košice region	Iveta Priateľová, M.D.	112	12
Slovakia	Assoc. Prof. Pavol Dubinský, M.D., PhD, MHA	556*	107

* Including joint beds with clinical oncology

City	Hospital	Department	Number of beds	Radiation Oncologists
Bratislava region – Regional Expert: Martin Chorváth, M.D., PhD., MPH				
Bratislava	National Cancer Institute	Radiation Oncology Department	35	Head of Department: Zuzana Dolinská, M.D. Margita Pobjíáková, M.D., PhD. Marin Džongov, M.D. Marta Fekete, M.D. Alexandra Hanicová, M.D. Andrea Huráková, M.D. Martina Kolarčíková –Lukačovičová, M.D. Mojmír Masár, M.D. Andrea Masaryková, M.D., PhD. Martina Pohrancová, M.D. Danijela Ščepanovič, M.D., PhD. Ingrid Závacká, M.D.
	Oncological Institute of St. Elizabeth (LLC)	Radiation Oncology Clinic of the Slovak Medical University and the Oncological Institute of St. Elizabeth	52	Head of Clinic: Martin Chorváth, M.D., PhD., MPH Elena Bolješíková, M.D., PhD. Head of Department: Pavol Lukačko, M.D. Head of Department: Zuzana Piňáková, M.D. Head of Department: Monika Šandorová, M.D. Dominika Hájková, M.D. (in preparation for board-examination in RO) Dana Kekešiová, M.D. Barbora Kormaníková, M.D. (in preparation for board-examination in RO) Ivana Krajčovičová, M.D., PhD. Andrea Ligačová, M.D. Martina Malá, M.D. Peter Šiška, M.D. Monika Švantnerová, M.D. Martina Vorobjov, M.D. Alena Závodská, M.D.

City	Hospital	Department	Number of beds	Radiation Oncologists
Banská Bystrica region – Regional Expert: Not appointed				
Banská Bystrica	F.D.Roosevelt Teaching Hospital with Polyclinic Banská Bystrica	Oncology Clinic of the Slovak Medical University	58 (RO + CO)	Deputy Head of Clinic: Marek Lafférs, M.D. Milan Kuvik, M.D. Andrea Martinková, M.D. Dagmar Styková, M.D.
Lučenec	General Hospital with Polyclinic Lučenec, n.o.	Radiation Oncology Department	20	Head of Department: Andrea Kašinská, M.D. Kludia Šurmáneková, M.D.
Rimavská Sobota	Svet zdravia Hospital Rimavská Sobota (JSC)	Clinical and Radiation Oncology Department	20 (RO + CO)	Head of Department: Adela Englerová, M.D. Michaela Švajdová, M.D., Iveta Pálkovácová, M.D. Beata Czeneová, M.D. (in preparation for specialization in RO), Ján Helcman, M.D. (in preparation for specialization in RO)
Košice region – Regional Expert: Iveta Priateľová, M.D				
Košice	East Slovakia Oncology Institute (JSC)	Radiation Oncology Department	57	Head of Department: Assoc. Prof. Pavol Dubinský, M.D., PhD., MHA Gabriela Barilíková, M.D., Jana Bocaková M.D. (in preparation for specialization for RO), Katarína Belánová, M.D., Marián Frivaldský, M.D., MPH, Natália Janíčková, M.D., Marek Marinčák, M.D., Daniela Nadzonová, M.D., Iveta Priateľová, M.D., Daniela Uhrincová, M.D. (in preparation for specialization in RO), Szabolcs Nagy, M.D. (in preparation for specialization in RO), Zuzana Tomková, M.D. (in preparation for specialization in RO)
Michalovce	Š. Kukura Hospital with Polyclinic Michalovce (JSC)	Clinical Oncology department	55 (RO + CO)	Head of Department: Gabriela Herman, M.D., MPH Jana Spišáková, M.D.

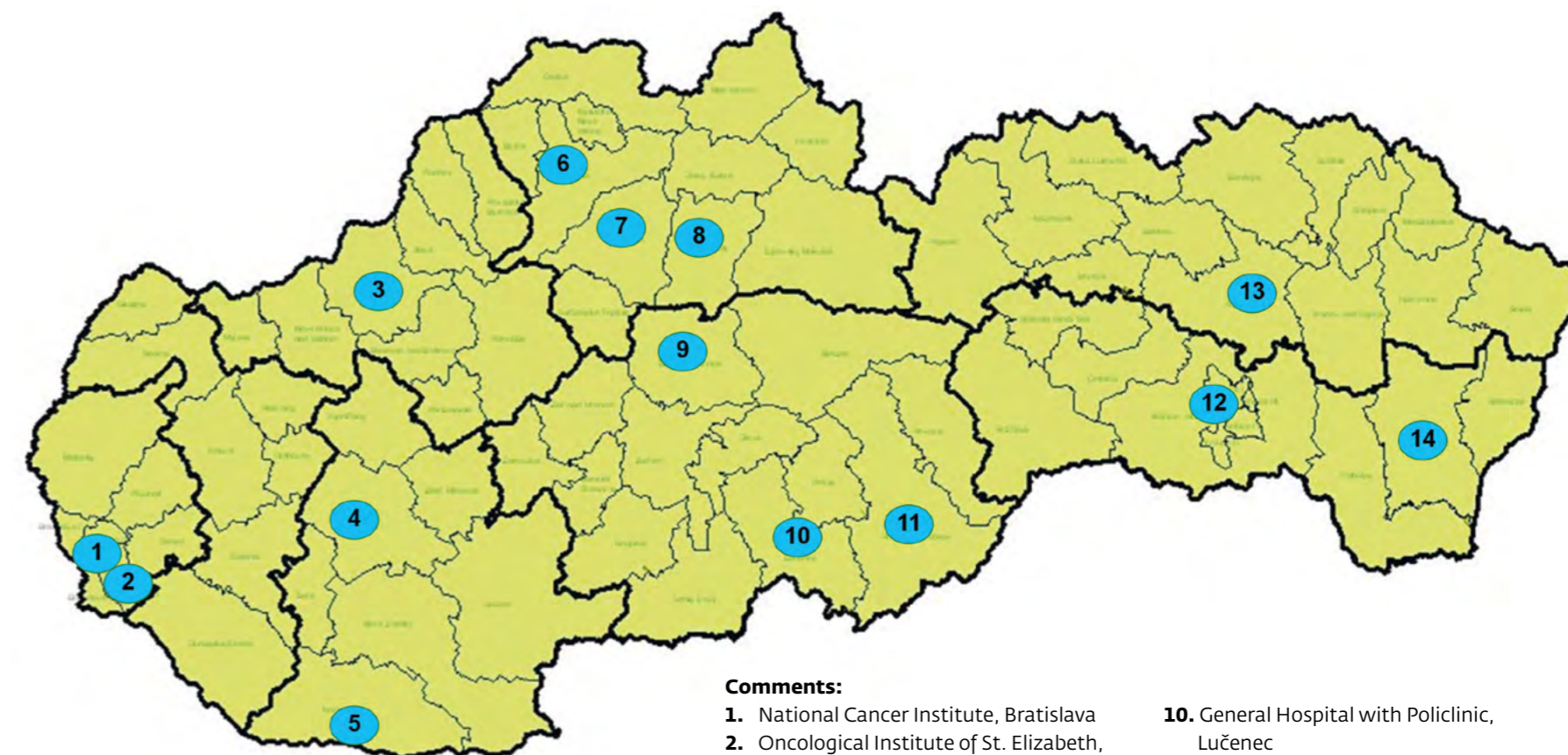
City	Hospital	Department	Number of beds	Radiation Oncologists
Nitra region – Regional Expert: Not appointed				
Komárno	AGEL Hospital Komárno	Clinical and Radiation Oncology Department	23 (RO + CO)	Head of Department: Pavel Demeter, M.D., MBA Eva Mrázová, M.D., MBA Oľga Rosinská, M.D. Krisztián Váradí, M.D. (in preparation for specialization in RO)
Nitra	Teaching hospital Nitra	Radiation and Clinical Oncology Department	55 (RO + CO)	Head of Department: Andrea Rybárová, M.D. Lea Mészáros, M.D. (in preparation for specialization in RO) Dana Lačná-Némethová, M.D. (in preparation for specialization in RO) Oľga Miklóssyová, M.D., Marta Zacharová, M.D.
Prešov region – Regional Expert: Not appointed				
Prešov	Ján Adam Reiman Teaching Hospital with Polyclinic Prešov	Radiation Oncology Department	25	Head of Department: Marek Paľo, M.D., PhD. Eva Bergendyová, M.D. Lucia Čintalanová, M.D. Barbara Guldenová, M.D. Juraj Kmec, M.D. Dorota Kolková, M.D. Viktor Rosenberg, M.D., PhD.

City	Hospital	Department	Number of beds	Radiation Oncologists
Trenčín region – Regional Expert: Not appointed				
Trenčín	Teaching Hospital Trenčín	Oncology Clinic	42 (RO + CO)	Head of Department: Branislav Bystrický, M.D., PhD., MPH Filip Kohútek, M.D., Alžbeta Kohúteková, M.D., Vladimíra Kurišová, M.D., Karol Martinka, M.D., Katarína Riedlová, M.D., Viliam Špánik, M.D., Silvia Zavřelová, M.D.

City	Hospital	Department	Number of beds	Radiation Oncologists
Žilina region – Regional Expert: Eva Hajtmanová, M.D., PhD.				
Martin	University Hospital Martin	Oncology Center	24	Head of Department: Eva Hajtmanová, M.D., PhD. Marián Ďuroška, M.D., Petronela Káčerová, M.D. Mária Kočíšová, M.D., Ľubica Kostková, Anton Malicher, M.D., PhD.
Ružomberok	Central Slovak National Uprising Military Hospital Ružomberok	Radiation and Clinical Oncology Clinic	30 (RO + CO)	Head of Department: Ivana Hulínová, M.D. Kristína Čelková, M.D. (in preparation for specialization in RO), Helena Česáková, M.D., Lucia Hrbčková, M.D. (in preparation for specialization in RO), Miroslava Oravcová, M.D. (in preparation for specialization in RO)
Žilina	Teaching Hospital with Policlinic Žilina	Clinical and Radiation Oncology Department	60 (RO + CO)	Head of Department: Dagmar Sudeková, M.D., MBA Ivan Kecskes, M.D., MBA, Peter Németh, M.D., Dáša Pazdúrová, M.D., Alžbeta Horváthová, M.D. (in preparation for specialization in RO), Roland Pomichal, M.D. (in preparation for specialization in RO), Miroslava Rosincová, M.D. (in preparation for specialization in RO), Henrieta Šlosárová, M.D. (in preparation for specialization in RO)

Notes: RO – Radiation Oncology, CO – Clinical Oncology

Radiation Oncology Facilities with technical equipment



Comments:

1. National Cancer Institute, Bratislava
2. Oncological Institute of St. Elizabeth, Bratislava
3. Teaching Hospital, Trenčín
4. Teaching Hospital, Nitra
5. General Hospital, Komárno
6. Teaching Hospital with Policlinic, Žilina
7. University Hospital, Martin
8. Central Military Hospital, Ružomberok
9. F.D.Roosevelt Teaching Hospital with Policlinic, Banská Bystrica
10. General Hospital with Policlinic, Lučenec
11. Hospital and Policlinic, Rimavská Sobota
12. East Slovakia Oncology Institute, Košice
13. J.A.Reiman Teaching Hospital with Policlinic, Prešov
14. Štefan Kukura Hospital and Policlinic, Michalovce

Technological equipment as of January 1 st , 2023						
Facility	RTG therapy device	Accelerator installed within technology modernization	Planned accelerator within technology modernization	Further installed accelerators	CT simulator *installed within technology modernization	HDR brachytherapy
National Cancer Institute Bratislava	×	×		×	×	×
Oncological Institute of St. Elizabeth (LLC) Bratislava	×			×	×	×
Teaching Hospital Trenčín	×	×			×	×
Teaching Hospital Nitra		×	×		×	×
FORLIFE n.o. General Hospital Komárno				×	×	
Teaching Hospital with Policlinic Žilina	×	×			×	
University Hospital Martin	×	×		×	×	
Central Military Hospital SNP Ružomberok	×			×	×	×
F. D. Roosevelt Hospital with Policlinic Banská Bystrica		×			×	×
General Hospital with Policlinic Lučenec, n.o.	×			×	×	
Hospital and Policlinic Rimavská Sobota	×			×	×	
East Slovakia Oncology Institute (JSC) Košice	×	×		×	×	×
J.A.Reiman Teaching Hospital with Policlinic Prešov	×	×			×	
Štefan Kukura Hospital and Policlinic Michalovce				×	×	

2.5. Palliative Care Facilities and Hospices

In Slovakia, we had 11 “brick-and-mortar” hospices registered in 2022, one hospice was closed in 2022, so only 10 hospices with a capacity of 180 beds remain in the system. The availability of a paliatologist in a brick and mortar hospice is increasing compared to 2021 (from 21.1% to 37.2%), but this may also be the result of an absolute reduction in the total number of beds in brick and mortar hospices: from 204 in 2021 to 180 in 2022.

The number of beds in palliative facilities and palliative care availability at palliative care beds did not change compared to 2021: 85

beds, of which palliative care has access to 19, which represents 22.4% of beds. In specialized ambulatory palliative care in Slovakia, a second palliative clinic was established in 2022, which represents a 100% increase compared to 2021, when there was only one palliative clinic in Slovakia. In 2021, 18 mobile hospices were registered in the NHIC. There are 4 children’s mobile hospices available in the Slovak health system, and a paliatologist is available in nine of the other 14 mobile hospices.

Overview of the availability of palliative care in the slovak healthcare system in 2022

SOPC	Capacity	Number of beds	Number of beds with palliative care available (%)
Hospices (KAHO)	11	180	67 (37.2%)
Palliative Department (PALO)	5	85	19 (22.4%)
Hospital palliative team	1		
SOPC	Capacity	Number of beds	Number of beds with palliative care available (%)
Palliative Clinic (PALA)	2		
		Mobile hospices with palliative care (%)	Children’s mobile hospices (%)
Mobile hospices	18	9 (50%)	4 (22.2%)

Notes: SOPC – Specialized outpatient palliative healthcare
SIPC – Specialized inpatient palliative healthcare

Source: NHIC, 2022; NOI

The following table shows the number of palliative care capacities since 2018 when the situation of palliative care began to be monitored. The only comprehensive facility is the teaching center of palliative medicine at the National Oncology Institute in Bratislava, where a palliative outpatient clinic and a mobile hospice are present in the acute department focused on palliative medicine. The department's team

provides advisory services for the entire National Oncology Institute. The team includes a social counselor, a nutritional counselor, and psychologists who are also available. Patients are referred to palliative care at palliative multidisciplinary seminars. The paradox is that this very department is not managed as a Palliative Department at the NHIC, but rather as an Oncology Department.

Palliative care capacities in 2018 – 2022

	Number of beds in brick-and-mortar hospices	Available Palliative care in brick-and-mortar hospices (%)	Number of beds at Palliative wards	Available Palliative care at palliative wards (%)	Palliative Clinics	Palliative children's mobile hospices	Palliative mobile hospices	Available Palliative care in Mobile hospices (%)
2022	180	67 (37.2 %)	85	19 (22.4 %)	2	4	18	9 (50 %)
2021	204	43 (21.1 %)	85	19 (22.4 %)	1	Data not available	Data not available	7
2020	218	55 (25.2 %)	78	19 (24.3 %)	Data not available	Data not available	25	5 (20 %)
2019	206	56 (27.2 %)	71	19 (26.8 %)	Data not available	Data not available	25	5 (20 %)
2018	203	56 (27.2 %)	68	19 (27.9 %)	Data not available	Data not available	22	5 (22.7 %)

Source: NHIC, own data

The change in legislation defined specialized and basic palliative care: specialized palliative care (SPC) is provided by a physician specializing in palliative medicine, and basic palliative care is provided by non-specialized physicians. Specialized palliative care in inpatient palliative care capacities is provided only on a third of the beds. The alarming deficit of beds for SPC, and thus the qualitative difference in

palliative care provided, is expressed in the table below, where there is a comparison of all palliative care capacities in 2022, SPC capacities in 2022, and SPC needs. If we were to consider the lower limit of the norm as the goal, then the availability of SPC in terms of Hospice care in Slovakia is only 23.9%, in terms of Palliative care 11.9%, in the case of Mobile hospices the availability is 16.4% and in Palliative Clinics 6.7%.

Comparison of the overall palliative care capacity and SPC capacity in 2022 and the actual need for SPC

Palliative care capacity	Available capacity in the SR	Available capacity with available SPC in the SR	Required SPC capacity	Availability in the system
Hospices	180 beds	67 beds	280 – 380 beds	23.9 %
Palliative wards	85 beds	19 beds	160 beds	11.9 %
Mobile hospices	18	9	55 – 70	16.4 %
Palliative Clinic	2	2	30 – 55	6.7 %

Notes: SPC – Specialized Palliative care



3. Cancer Treatment Availability

3.1. Situation in 2022

In 2022, we saw the expected amendment of Act No. 363/2011 Z.z. on the scope and conditions of reimbursement of drugs, medical devices, and dietetic foods based on public health insurance, in effect from 1 August 2022. The processes started at the end of 2021, together with the amendment and a different approach to the classification of drugs, brought the expected effect also for oncology therapy.

In the course of 2022, 25 original oncology drugs (Lo1) were submitted to the categorization list and 5 applications were approved. Twelve drugs requested for inclusion in the categorisation in 2021 were included in 2022.

Availability of original oncology treatment from the point of view of the availability of reimbursed drugs in 2022:

2022 (all original cancer drugs)	Amount
Submitted reimbursement dossiers	25
Approved reimbursement dossiers	5
Rejected / suspended reimbursement dossiers	2
Processed reimbursement dossiers (to be decided in 2023)	10
Repeated submissions of reimbursement dossiers	7

Source: InovaHealth, 2023

Five approved reimbursement dossiers in 2022:

ATC code	Active substance	Therapeutic area
L01XE43	Brigatinib	Non-small small cell lung cancer (NSCLC)
L01ED05	Lorlatinib	Non-small small cell lung cancer (NSCLC)
L01ED01	Krizotinib	Non-small small cell lung cancer (NSCLC)
L01FC01	Daratumumab	Multiple myeloma
L01XE45	Neratinib	Breast cancer

Twelve reimbursement dossiers filed in 2021 and approved in 2022:

ATC code	Active substance	Therapeutic area
L01EL02	Akalabrutinib	Chronic lymphatic leukemia (CLL)
L02BB05	Apalutamid	Prostate cancer
L01ED04	Brigatinib	Non-small small cell lung cancer (NSCLC)
L01FF03	Durvalumab	NSCLC
L01EX14	Entrectinib	NSCLC
L01EX13	Gilteritinib	Acute myeloid leukemia (AML)
L01EL01	Ibrutinib	CLL, Mantle cell lymphoma (MCL), Waldenstrom macroglobulinemia (WM)
L01XG02	Karfilzomib	Multiple myeloma
L01EH02	Neratinib	Breast cancer
L01EB04	Osimertinib	NSCLC

L01XY02	Pertuzumab and trastuzumab	Breast cancer
L01EX22	Selperkatiniib	NSCLC

Source: InovaHealth, 2023

EMA registered innovative drugs in 2022:

ATC code	Active substance	Therapeutic area
L01FX22	Loncastuximab tesirine	Diffuse large B cell lymphoma (DLBCL), High-grade B-cell lymphoma (HGBL)
L03AX16	Plerixafor	Mobilisation of hematopoic stem cells intended for transplantation
V10XX	Lutecium (177Lu) vipivotid tetraxetane	Prostate-specific membrane antigen (PSMA) – positive castration-resistant prostate tumor
L01XY03	Nivolumab, Relatlimab	Melanoma
L01EA06	Asciminib hydrochloride	BCR-ABL positive chronic myeloid leukemia
L01F	Teclistamab	Multiple myeloma
L01EX17	Capmatinib dihydrochloride monohydrate	Non-small small cell lung cancer
L01XC	Mosunetuzumab	Follicular lymphoma
	Ciltacabtagene autoleucl	Multiple myeloma
L02BX	Relugolix	Prostate cancer

L01FX13	Enfortumab vedotine	Urothelial cancer
L01	CD19-targeted genetically modified autologous cell-based product consisting of purified CD8+ T-cells (CD8+ cells), CD19-targeted genetically modified autologous cell-based product consisting of purified CD4+ T-cells (CD4+ cells)	Diffuse large-cell B-lymphoma, follicular lymphoma
L01	Tebentafusp	Uveal cancer
L01EX21	Tepotinib	Non-small small cell lung cancer
L01XX73	Sotorasib	Non-small small cell lung cancer

Source: IQVIA, 2023

In 2022, we saw a significant shift forward in the pharmaceutical policy, which is appreciated by both physicians and patients. The most significant contribution was made in lung cancer, where there was a distinct lack of therapeutic alternatives for multiple diagnoses. On the other hand, the innovation lagging behind the rest of the surrounding countries is only gradually starting to catch up. However, we can evaluate the trend set in 2022 as very positive compared to previous years. The necessity of including new drugs in therapy has a very positive impact on the overall economic resources of the country, including those in the health sector, from a short-term, but especially long-term perspective.

3.2. Challenges for 2023

- Transparent entry of innovations for oncology into the standard categorization based on the preservation of the basic principles of HTA (Health Technology Assessment), including adequate consideration of EBM (evidence-based medicine) and using the list of drugs with scores according to ESMO-MCBS in the NOI.
- Cooperation in defining the basic principles of drug policy in oncology based on adequate and long-term investments.
- Determining the priority of diagnoses and areas in oncology through the so-called “horizon scanning” for the present as well as for the future period in cooperation with specialists, MoH SR, payers, and the Ministry of Finance of the Slovak Republic.
- Cooperation on the adequate development of the data economy in oncology, which refers to the collection, processing, and adequate analysis of all available data, including the full launch of the National Oncology Register serving both operational and strategic decisions in this area, including the evaluation of screening oncology programs.



4. Oncology Societies and Cooperative Societies

4.1. Slovak Oncology Society

Slovak Oncology Society (SOS) is an association of physicians in various specialties who directly participate in cancer patients' care or work in experimental oncology. Slovak Oncology Society is part of the Slovak Medical Association and a member of the European Society for Medical Oncology (ESMO) which unites oncology societies from many European countries. It currently has approximately 451 members.

The governing body of SOS is the Executive Committee, which has 13 members. The SOS supervisory board has 3 members. The Executive Committee and the Supervisory Board are elected for 4 years. Elections for the next term were held in November 2022.

SOS Executive Committee in 2022:

Chair: prof. Stanislav Špánik, M.D., PhD.

Vice Chair: Branislav Bystrický, PhD., MPH

Head Secretary: Assoc. Prof. Peter Beržinec, M.D., PhD., FCCP

Treasurer: Mária Rečková, M.D., PhD.

Members:

Assoc. Prof. Igor Andrašina, M.D., PhD.

Radovan Barilla, M.D., PhD.

Assoc. Prof. Vladimír Bella, M.D., PhD.

Juraj Beniak, M.D.

Assoc. Prof. Pavol Dubinský, M.D., PhD., MHA

Jozef Chovanec Sr, M.D.

prof. Michal Mego, M.D., D.Sc.

Tomáš Šálek, M.D.

Jozef Šufliarsky, M.D., PhD.

SOS Supervisory Board in 2022:

Chair: Milada Mikulová, M.D.

Members:

Assoc. Prof. Richard Hrubý, M.D., PhD., MBA, MPH

Vanda Ušáková, M.D., PhD.

4.1.1. Activity report for 2022

1. SOS continues its efforts to stabilize its member base and, above all, to integrate all “young oncologists” into society. The Committee set conditions for incentives for “young people” – support for active participation in professional events, rewarding the best (publications, lectures), and support for study exchanges – these have not yet been implemented due to the pandemic.
2. SOS managed to stabilize professional events under its management in a “hybrid form” despite the fading pandemic situation: “News from ASCO”, “Days of Young Oncologists”, Bratislava oncology days, and in-person: SEKCAMA and Banská Bystrica Oncology Days.
3. SOS has made great efforts to improve the coordination of professional events with grant support from pharmaceutical companies, including the SOS guarantee. The professional guarantor is always a member of the SOS Committee who participates in the preparation of the program. The Committee continues to try to accumulate the events according to the content in the “spring” and “autumn” dates, but this will probably not be possible due to the competitive environment of companies.
4. SOS did not manage to establish cooperation and ensure consultations with foreign partners for joint professional events, there was even a clash of dates for the Brno and Bratislava Oncology days, which will not reoccur in the future due to an agreement of the Committees.
5. Cooperation with foreign partners, especially with ESMO – the tasks being increasing representation in the organization (more

active members from the SOS base), active participation in projects and events, and cooperation with ECRIN – SLOVACRIN – for academic clinical trials is still insufficient.

6. Despite efforts and coordination in the cooperation of SOS, NOI, and the MoH SR, it was not possible to ensure sufficient financial coverage of the NOP and NOI in general, and there is a lack of visible support from the MoH SR and the Government of the Slovak Republic in their implementation.
7. SOS tries communicating requirements at the level of the MoH SR in order to achieve support for NOI and the NOP and improve the availability of innovative treatment – in the form of letters addressed to the MoH SR and health insurance companies, as well as in the form of repeated direct negotiations on the grounds of the MoH SR with the Minister of Healthcare, the situation secretary, the general secretary of the administrative Clinic, the general director of the Section of Pharmacy and Drug Policy, the management of health insurance companies, so far unfortunately without a tangible result.
8. SOS repeatedly conducted direct negotiations and sent letters to the MoH SR and the management of NCZI regarding the revitalization of the National Oncology Register and the data connection to NOI – so far the only positive result is the digitization and simplification of reporting.
9. SOS cooperates with the Cancer League (LPR) in drafting educational materials for patients and also cooperates with patient organizations in campaigns to support the improvement of diagnosis and treatment of cancer in Slovakia.

10. SOS continued successful cooperation with the Biomedical Research Center of the Slovak Academy of Sciences in translational research, as well as active cooperation with NCI/NOI on the international project CraNE Joint Action (European Network of Comprehensive Cancer Centers).

4.1.2. Challenges for 2023

1. Stabilizing and extending the member base
2. Supporting activities of SEKCAMA and the geriatric oncology section
3. Cooperating with the Pediatric Oncology Society
4. Expert events
 - The ongoing task is the preference of events held directly by SOS over other activities
 - Coordinating events with similar ones in surrounding countries, attempting international cooperation with foreign partners
 - In case of academic events not held by pharmaceutical companies, require SOS as a Guarantee and its participation in drafting the agenda
 - In case of events with “financial grant support” from pharmaceutical companies, require a member of the Committee to act as an Expert Guarantor
 - Once again try to join events into sections – a stable number of events year ahead with fixed dates

5. Cooperation with foreign partners
 - Czech Oncology Society – mutual participation in events and the possibility of co-organization, joint research, and development projects
 - ESMO – increase representation in the organization, active participation in projects and events
 - CraNE Joint Action (European Network of Comprehensive Cancer Centers)
6. Cooperation with the MoH SR, health insurance companies and patient organisations
 - increase the activity of members in the creation of standard preventive diagnostic and therapeutic procedures
 - actively enter into direct negotiations with the MoH SR, and health insurance companies – request clear procedures in the funding of NOI, the NOP, as well as screening programs – stability of operations
 - actively demand improvement in the availability of standard treatment and innovative treatment – new, transparent, sustainable rules
 - Continue cooperating with the Cancer League and other patient organisations
7. Continue cooperating with the Biomedical Research Centre of the Slovak Academy of Sciences in translational research

Information about the activities of the Slovak Oncology Society, as well as activities within oncology in Slovakia and around the world, are continuously updated on the SOS website: <http://onkologia.sk>.

4.1.3. SEKCAMA (SOS SLS)

SEKCAMA (SOS SLS), the section for breast cancer within the Slovak Oncological Society (SOS) and the Slovak Medical Society (SMS) was established at a meeting of the SMS board in 1996. The section was founded on the initiative of Vladimír Bella, M.D., Dušan Malatin, M.D., Jozef Hašek, M.D., and Ľubomír Bohunický, M.D. with the significant support of the chair of SOS and SLS at that time Assoc. Prof. Ivan Maňka, M.D. PhD.

The main goal of the section is to reduce mortality from breast cancer, which SEKCAMA (SOS SMS) wants to achieve as the organizer of regular work conferences based on a multidisciplinary basis since the diagnosis and treatment of breast cancer are carried out multidisciplinary. The section would also like to contribute to the decrease in mortality by improving and unifying preventive, diagnostic, and treatment procedures according to the latest knowledge of science, research, and innovation. Recently, the focus has been on the quality of life and trying to incorporate experimental oncology and especially integrative medicine into its lectures.

SEKCAMA (SOS SMS) Committee in 2022:

Chair: Vladimír Bella, M.D., PhD.

Vice Chair: Martin Sabol, M.D., PhD.

Scientific Secretary: Andrea Šimová, M.D.

Treasurer: Peter Chvalný, M.D.

Members:

Ľubomír Bohunický, M.D.

Assoc. Prof. Richard Hrubý, M.D. PhD., MBA, MPH

Zoltán Jálny, M.D.

Marián Streško, M.D.

Assoc. Prof. Mária Wagnerová, M.D., PhD.

SEKCAMA (SOS SMS) Supervisory Board in 2022:

Chair: Milada Mikulová, M.D.

Members:

Radovan Barilla, M.D., PhD.

Assoc. Prof. Elena Bolješiková, M.D., PhD.

The organisation has 110 members.

On 2 – 3 June 2022, the 27th SEKCAMA SOS SMS international conference was held at the Bratislava Hotel in Bratislava. The main topic of the event was a comprehensive view of breast cancer. The conference featured lectures on experimental oncology, pathology, prevention, diagnosis, surgical treatment, systemic therapy and radiotherapy of breast cancer, follow-up, complementary and integrative medicine. and treatment of side effects of conventional therapy.

On the first day of the conference, attended by 220 physicians, lectures focused on experimental oncology, pathology, diagnostics, and surgery were presented. On the second day of the conference, attended by 179 physicians, lectures focusing on chemotherapy and supportive therapy were presented. Overall, mainly physicians from various fields of medicine, including 31 physicians from the Czech Republic,

participated. There was a total of 45 lectures held, of which 17 came from foreign authors.

The 28th international SEKCAMA SOS SMS conference is planned for 25 – 26 May 2023 in the Hotel Lindner in Bratislava.

Information on SEKCAMA SOS SMS activities is continuously updated on the website: www.sekcama.sk.

4.1.4. Section of Geriatric Oncology (within SOS)

The Section of Geriatric Oncology (GO) was established in 2010 as part of the Slovak Oncology Society (SOS) without its own logo. The Section is a member of SIOG (International Society of Geriatric Oncology), established in 1999 with the aim of ensuring advances in science and practical activity for geriatric patients. The section has a national representative in SIOG (Assoc. Prof. Mária Wagnerová, M.D., CSc). Even after addressing the Ministry of Health of the Slovak Republic for several years, it was not possible to significantly solve the issue of GO.

The GO Section mainly focuses on “EDUCATION” and its support. As part of the long-term cooperation with SIOG, 2 publications were drafted, which were published in the professional journal Geriatric Oncology:

- SIOG 10 Priorities Initiative: First Round Questionnaire
- SIOG 10 Priorities Initiative: Second Round Questionnaire

As part of supporting education, chapters for 3 significant monographs were written:

Prof. Jurga et al: Clinical and radiation oncology

Kavcová, M.D. et al: Lung cancer

Prof. Mladosievičová et al: Cardiooncology in 2 issues

Agenda

Currently, the organization has 41 members. Within its publishing activities, the GO section prepared three issues of the specialist magazine Clinical Oncology (Klinická onkológia) 5/2012, 3/2017, and 6/2020 with a focus on geriatrics and published several presentations and articles about geriatric oncology in the Pharmacotherapy magazine (Farmakoterapia). This topic has been successfully integrated into graduate education at the Faculty of Medicine of Pavol Jozef Šafárik University and post-graduate education at the Faculty of Medicine of Comenius University. Four years ago, the GO section organized its first GO conference during Bardejov Oncology Days, which was greatly appreciated. In June 2021, the GO section successfully organized the 2nd conference with a focus on geriatric oncology during the 11th Bardejov Oncology Days, which was met with extraordinary interest from all participants. A third conference is planned for June 2023 as part of the aforementioned event.

Minutes from the session of the Election Committee of the GO section (within the SOS):

On 1 December 2022, the election commission met to evaluate the one-round correspondence elections to the GO Section Committee for the period 1 November 2022 – 31 October 2026, composed of:

Prof. Stanislav Špánik, M.D., PhD.

JUDr. Patrik Palacka, M.D., PhD., MPH, MBA, LL.M.

RNDr. Daniela Světllovská, PhD.

The following members were elected to the GO section for 1 November 2022 – 31 October 2026:

Róbert Biel, M.D., PhD.
Assoc. Prof. Peter Beržinec, M.D., PhD., FCCP
Assoc. Prof. Michal Chovanec, M.D., PhD.
Mária Rečková, M.D., PhD.
Katarína Rejleková, M.D., PhD.
Dominik Šafčák, M.D., PhD.
Assoc. Prof. Mária Wagnerová, M.D., PhD.

The following substitute was elected to the GO Section Committee:

Jozef Chovanec Sr., M.D.

The following members were elected to the Supervisory Board of the GO Section:

pProf. Michal Mego, M.D., D.Sc.
Aurélia Mojzešová, M.D.
Jana Tabišová, M.D.

No substitutes were elected to the Supervisory Board.

Chairs of the Committee and the Supervisory Board of the GO Section (subsequently elected by email communication of all new members):

Chair: Assoc. Prof. Mária Wagnerová, M.D., PhD.
Vice-Chair: Katarína Rejleková, M.D., PhD.
Scientific Secretary: Róbert Biel, M.D., PhD.
Chair of the GO Section Supervisory Board: Jana Tabišová, M.D.

Issue-solving perspectives of the GO section

- Increase awareness about geriatric oncology, epidemiological situation, and the need for a specific approach at the level of the MoH SR, expert societies, network of patient associations, and the media (for example via success stories of cured elderly geriatric cancer patients)
- Lack of specialists in geriatric oncology remains a serious issue. Some possibilities include organizing special courses (SMU) with financial subsidies, creating oncogeriatric working groups as well as a separate sub-specialty, establishing interdisciplinary geriatric oncology centers mainly in oncology institutes and teaching hospitals, incorporating Comprehensive Geriatric Assessment (CGA) including comorbidity into cancer treatment
- Solving GO issues is conditioned by a change in clinical and departmental interest, the transformation of obsolete approaches, but also the structure of the field
- – **Only if we stand against cancer united can we succeed.**

4.2. Slovak Society of Chemotherapy

Slovak Society of Chemotherapy (SSCH) was established in 1991. Its founding members were Vladimír Krčméry, M.D., D.Sc. and Jozef Šufliarsky, M.D., PhD. SSCH is a member of two international institutions – the European Federation (FESCI) and the International Society of Chemotherapy (ISC). Vladimír Krčméry, M.D., D.Sc., was elected to ISC Executive Committee in 2015 as the only representative from the

former Eastern bloc. The publication of the specialist magazine Acta chemotherapeutica also dates back to the establishment of SSCH. Since 1996, SSCH has been one of the main organizers of an important expert event – Košice Chemotherapy Days (Košické chemoterapeutické dni), which celebrated its 25th anniversary in 2021. The most important agenda of SSCH focuses mainly on education and support. SSCH cooperates with the sub-department of chemotherapy of the Slovak Medical University (SMU) in Bratislava which organizes continuous education of physicians, pharmacists, and public healthcare professionals, among others, via an annual SMU course in May. The course is focused on new chemotherapeutic agents, antibiotics, antifungals, antivirals, and biological treatment of solid tumors and tropical diseases. The course also welcomes renowned foreign colleagues from the Department of Tropical Diseases. The traditional event Košice Chemotherapy Days (23 live conferences organized so far) also hosts the Conference of Oncology Nurses (organized 15 times so far) and Patient Seminar (organized 15 times so far). The agenda includes news in antimicrobial and anti-neoplastic chemotherapy, molecular biology, immunotherapy, radiotherapy, malignant tumors diagnostics, and supportive therapy.

In 2022, the chemotherapy course of the SCHS/SLS was held in an online form.

SSCH, in cooperation with SOS, support education by their active participation in important cancer events such as Bratislava Oncology Days, Medifórum, Sekcama, Current Management of Breast Cancer, Young Oncologists' Days, Onkoforum, Onkospectrum, Slovak national ATB symposium, Immune Deficiencies Symposium. SSCH also supports the

preparation of medical research grants, such as successfully finished project Strategy of using antifungal prophylaxis and treatment of invasive aspergillosis in high-risk immuno-compromised patients in the SR with the use of biomarkers, which was subsequently successfully defended and published. In 2022, SCHS, in cooperation with SOS, managed to organize the Young Oncologists' Days and Bardejov Oncology Days in person, as part of supporting education. All events so far have been successful, and the cooperation of both SCHS and SOS in their implementation is included in the plan for future years.

In 2022, SCHS published 4 issues of the 31st edition of the professional journal Acta chemotherapeutica, focusing on the issue of infections and pandemics, which is one of the few professional journals that has survived since the “Velvet” revolution. The journal, in which guest editors participated, was distributed thanks to SLS to all SCHS members.

SCHS Committee in 2022:

(June 2020 – June 2024 term)

President: Prof. Vladimír Krčméry, M.D., D.Sc.
Vice-president: Prof. Pavol Jarčuška, M.D., PhD.
Scientific Secretary: Jozef Šufliarsky, M.D., PhD.

Members:

Assoc. Prof. Luboš Drgoňa, M.D., PhD., MHA, FECMM
Assoc. Prof. Andrea Demitrovičová, M.D. PhD.
Assoc. Prof. Peter Beržinec, M.D., PhD., FCCP
Assoc. Prof. Richard Hrubý, M.D. PhD., MBA, MPH

Mária Višňovská, M.D.

Tatiana Stančoková, M.D.

SCHS Supervisory Board in 2022

Juraj Beniak, M.D.

Aurélia Mojzešová, M.D.

Eleonora Pihuriková, M.D.

Currently, the organisation has 78 members. During the pandemic situation in 2020, 2021, and 2022 both members of the presidency of SSCH, Prof. Vladimír Krčméry and Prof. Pavol Jarčuška, cooperated significantly with the government of the SR and the Ministry of Health in order to overcome the corona crisis. Assoc. Prof. Mária Wagnerová, PhD., after 12 years of being the Chair, remained as an Honorary Chair of the SCHS.

In 2022, planned activities of an educational nature continued with: “Tropical medicine courses” – every other Wednesday, Innovation course in chemotherapy – in June, conference “Krčméry’s day of fighting ATB resistance” – in November, Nitra medical days “Multidisciplinary approach in patient management in the period of COVID-19 – in November. During 2022, several members of SCHS worked under the leadership of Prof. Vladimír Krčméry, M.D., D.Sc. at several humanitarian activities within the Slovak Republic. Groups of physicians, nurses and social workers worked in the following areas: Vyšné Nemecké – February, a large-capacity center for humanitarian medical aid to refugees from Ukraine in Michalovce – March to June, a tent camp for refugees from Syria in Kúty – October to December.

In December 2022, Prof. Vladimír Krčméry, M.D., D.Sc. died suddenly, which is an exceptional loss for SCHS, but life must go on. Within the society, it is necessary to supplement the membership of the SCHS Committee and elect a new SCHS president. The activity of the SCHS will continue according to the current practices. The work plan for the next period includes the organization of 2 educational, credited activities (Tropical Diseases Course and Košice Chemotherapy Days). SCHS plans to continue participating in the preparation of many other professional activities in Slovakia.

4.3. Slovak Society of Pediatric Oncologists and Hematologists

Main areas of activity

- Qualification to enter international clinical trials all over Slovakia
- Update of protocols and standard diagnostic and treatment procedures
- Funding of difficult diagnostic procedures (molecular diagnostics of subgroups of CNS tumors, genomic analysis of resistant and relapsing tumors, etc.)
- Drafting joint procedures for treatment abroad
- Drafting regulations for COVID-19 patients according to international procedures

The Committee in 2022:

Chair: Prof. Alexandra Kolenová, M.D., PhD.

Members:

Eva Bubanská, M.D., PhD.

Ivana Fedoráková, M.D.

Ladislav Deak, M.D.

Viktória Halušková, M.D.

Andrea Hrašková, M.D.

Peter Švec, M.D., PhD.

4.4. Slovak Society of Radiation Oncology

Slovak Society of Radiation Oncology, which unites specialists in treatment by ionizing radiation, was established in 1990 under the name Society for Radiation Oncology, Radiobiology and Radiophysics (SROBF) as a part of the Slovak Medical Association. Its name was changed to the Slovak Society of Radiation Oncology (SSRO) in 2011. It has around 120 members, mostly radiation oncologists and physicians working at Departments of Radiation Oncology.

SSRO has organized bi-annual scientific conferences for its member associations since 2012. Committee meetings still focus mainly on the technological provision of treatment, reimbursement of procedures in radiotherapy, specialty curriculum, education, and quality assessment of treatment.

SSRO Committee in 2022:

Chair: Assoc. Prof. Pavol Dubinský, M.D., PhD., MHA (2019 – 2022 term)

Vice-Chair: Branislav Bystrický, M.D., PhD., MPH

Scientific secretary: Pavol Lukačko, M.D.

Members:

Jozef Grežďo, M.Sc., PhD.

Martin Chorváth, M.Sc., PhD.

Dr. Martin Jasenčák

Marek Lafférs, M.D.

Peter Muríň, M.Sc., PhD.

Silvia Zavřelová, M.D.

SSRO Supervisory Board in 2022:

Chair: Milan Kuvik, M.D.

Members:

Anna Križanová, M.Sc., PhD.

Monika Šandorová, M.D.

Information on SSRO activities is continuously updated on the website: www.radiacnaonkologia.sk.

4.5. Slovak Society for Palliative Medicine

The Slovak Society of Palliative Medicine (SSPM) is part of the Slovak Medical Society. Since 2016, SSPM has been organizing an annual conference. In 2022, the 6th year of the conference was held, which was mainly devoted to legislative and resulting hopeful implementation changes.

4.6. Cooperative Groups

4.6.1. Slovak Cooperative Oncology Group

The Slovak Cooperative Oncology Group (SCOG) was established on 14 June 2019, as a working group within the National Oncology Institute. SCOG currently has 25 members and is a formal association of professionals working together on conducting academic and industry-initiated cancer clinical trials in the Slovak Republic.

The mission of SCOG is to interconnect academic sites, other oncology clinical facilities, and pharmaceutical and biotechnological companies in order to conduct coordinated oncology research in Slovakia with the final goal to improve cancer patients' care in Slovakia.

Activity report for 2022

In 2022, the preparation of an academic clinical trial in patients with prostate cancer continued in cooperation with the French Cooperative Group for Genitourinary Malignancies (GETUG), PEACE-6, while the finalization of the preparations mainly related to the part under the PRESTO acronym. This is a phase III academic clinical trial using stereotactic radiotherapy in the treatment of patients with oligometastatic hormone-sensitive prostate cancer. In the past year, the preparations of a part of the trial called PEACE-Unfit, a "Double-blind randomised phase III trial evaluating the efficacy of +/- darolutamide in androgen deprivation therapy in patients with de novo metastatic prostate cancer with frail functional capacity who

were not selected for docetaxel treatment, were initiated or medicines".

In 2022, a multicentre academic-led trial was completed and drafted for publishing under Prof. Michal Mego, M.D., D.Sc. and Assoc. Prof. Ľuboš Drgoňa, M.D., PhD., MHA, FECMM, titled "Prevention of irinotecan induced diarrhea by probiotics. A phase III study".

SCOG cooperated on the fulfilment of the following important activities in the 4th Action Plan of the National Oncology Program for 2021 – 2025:

Activity 7: Setup of cooperation within the network of clinical trials facilities (SCOG) and preparing conditions enabling full and associated membership, including an amendment of the SCOG Article of Association.

Activity 14: Strengthening the functional infrastructure of existing and potential academic clinical research by supporting the coordination of clinical research directly in the centers of clinical trials, specifically in the East Slovakia Oncology Institute in Košice, Teaching hospital with policlinics in Trnava, Trenčín, and Prešov, but also at the facilities of pediatric oncology, National Institute for Children's Diseases Bratislava, and the Children's Oncology Clinics in Košice and Banská Bystrica.

SCOG Committee in 2022:

Chair: Mária Rečková, M.D., PhD.

Vice-Chair: Branislav Bystrický, M.D., PhD., MPH

Secretary: Juraj Beniak, M.D.

Members:

Assoc. Prof. Igor Andrašina, M.D., PhD.

Juraj Beniak, M.D.

Assoc. Prof. Peter Beržinec, M.D., PhD., FCCP

Assoc. Prof. Pavol Dubinský, M.D., PhD., MHA

Jozef Chovanec, M.D.

Prof. Michal Mego, M.D., D.Sc.

Prof. Stanislav Špánik, M.D., PhD.

Jozef Šufliarsky, M.D., PhD.

Assoc. Prof. Mária Wágnerová, M.D., PhD.

SCOG member oncology facilities:

Clinical facility	Coordinator / contact person
National Cancer Institute, Department of Clinical Trials	Dr. Daniela Světlovská, PhD.
Oncological Institute of St. Elizabeth	Zuzana Zamutovská, M.Sc.
East Slovakia Oncology Institute	Dr. Jana Koperďáková, PhD., Miroslava Miroslava Fecková, DVM, PhD.
University Hospital with Policlinic Milosrdní bratia (LLC), Department of Clinical Oncology	Head of Department: Vladimír Václav, M.D.
Ružinov Hospital, Department of Clinical Oncology	Head of Department: Milada Veselá, M.D.
Teaching Hospital Trnava, Oncology Clinic	Dr. Veronika Mitašová, MBA
Teaching Hospital Trenčín, Oncology Clinic	Dr. Ľuboslava Hírešová

Specialised Hospital of St. Zoerardus Zobor, Nitra, Department of Clinical Oncology	Head of Department: Assoc. Prof. Peter Beržinec, M.D., PhD., FCCP
Teaching Hospital Nitra, Department of Radiation and Clinical Oncology	Head of Department: Juraj Detvay, M.D., PhD., MPH until 15 th of December 2022, Zuzana Pribulová, M.D. from 16 th of December 2022
Komárno Zdravspol (LLC)	Peter Konkoľovský, M.D.
Teaching Hospital with Policlinic Nové Zámky, Department of Clinical Oncology	Head of Department: Pavol Demo, M.D.
Teaching Hospital Žilina, Department of Radiation and Clinical Oncology	Head of Department: Dagmar Sudeková M.D.
Slovak national uprising Central Military Hospital Ružomberok (ÚVN SNP) – Teaching Hospital, Radiation and Clinical Oncology Clinic	Head of Department: Roman Podoba, M.D., PhD.
F. D. Roosevelt Teaching Hospital with Policlinic in Banská Bystrica, Oncology Clinic of the SMU	Head of Department: Matej Hrnčár, M.D., PhD. MBA
Hospital with Policlinic Rimavská Sobota, Department of Radiation and Clinical Oncology	Head of Department: Assoc. Prof. Richard Hrubý, M.D. PhD., MBA, MPH
POKO Poprad (LLC)	Lenka Lesná, M.D.
J.A. Reiman Teaching Hospital with Policlinic Prešov, Department of Clinical Oncology	Katarína Kožuchová, M.Sc.
General Hospital with Policlinic Levoča, Oncology Clinic	Valér Kováč, M.D., PhD.
St. Jacob Hospital with Policlinic, n.o. Bardejov, POKO	Jozef Chovanec Sr, M.D.

Teaching Hospital with Policlinic Trebišov, Department of Clinical Oncology	Bibiana Žiarna, M.D.
Štefan Kukura Hospital with Policlinic Michalovce, Oncology Centre	Gabriela Hermanová, M.D., MPH
Nemocnica na okraji mesta, n. o. Partizánske, Clinical Oncology Clinic	Alexandra Szabová, M.D.
Mammacentre of St. Agatha, Banská Bystrica, Oncology Clinic	Eva Pritzová, M.D.
Hospital with Policlinic Antolská, Bratislava, Clinical Oncology Clinic	Marián Pribelský, M.D.
University Hospital Martin, Oncology Centre	Zuzana Špaňová, M.D.

Challenges for 2023

- Active participation in the fulfillment of AP 4 NOP activities in clinical research, including closer cooperation between SCOG centers
- Continuous cooperation with GETUG
- Forming a platform for cooperation with other international oncology cooperative groups, such as the Hoosier Oncology Group

4.6.2. Lymphoma Group of the Slovak Republic (NGO)

The Lymphoma Group of the Slovak Republic (LySK) is an interdisciplinary association of physicians, other specialists, and paramedical staff involved in research, diagnostics, and treatment of lymphoproliferative disorders. The objectives of LySK include the unification of

diagnostic criteria and standardization of treatment of malignant lymphomas (ML), implementing new findings in diagnostics and treatment of ML in clinical practice, reporting of patients with ML, cooperation to organize clinical trials focused on ML topics, participation in graduate and post-graduate education of healthcare professionals and education of the general public about ML. The first edition of the publication Strategy of Treatment of Malignant Lymphomas (Stratégia liečby malígnych lymfómov) was released in 2007. It includes the principles of classification, diagnostics, and treatment of malignant lymphomas. The third revised edition of the recommendations was released electronically in 2018 (<https://lysk.sk/wp-content/uploads/2018/11/strategia-liecby.pdf>), the chapter about the Hodgkin lymphoma was revised in 2020.

A further key activity of the association is keeping a register of patients with ML and subsequent analysis of incidence and prevalence trends as well as effective assessment of therapy used in the treatment of ML in Slovakia. For this purpose, the Slovlymp Project was created to collect and analyze the data of patients with ML in Slovak centers. The Lymphoma Group of the Slovak Republic has been organizing regular meetings of specialists working in diagnostics and treatment of lymphoproliferative disorders, the Lymphoma Forum, since 2004 (www.lyfo.sk). In 2022, the 17th year took place with the main theme “Chronic Lymphocytic Leukemia”, in a hybrid form – due to the coronavirus pandemic. LySK has traditionally prepared 2 blocks in the program of all-Slovak events – Košice Hematology Days and Controversies in Oncohematology.

The association also provides phone consultations and online counseling for patients with ML via its website <https://lysk.sk/>, which is also open to the public interested in the topic of ML. LySK closely cooperates with patients’ organisation reuniting patients with ML, Lymphoma a Leukemia Slovensko (www.lyl.sk). The group also actively participates in international clinical trials researching new medicaments or new types of treatment for patients with ML. It was possible to present the output from the LySK grant – prognostically and predictively relevant stratification of large cell lymphomas of B-origin using FISH diagnostics.

The structure of LySK consists of a Board of Trustees and a Supervisory Board.

LySK Board of Trustees in 2022:

Chair: Assoc. Prof. Ľuboš Drgoňa, M.D., PhD., MHA, FECMM

Members:

Prof. Lukáš Plank, M.D., PhD.

Milena Surová, M.D.

Assoc. Prof. Peter Szépe, M.D., PhD.

Andrej Vranovský, M.D., PhD.

Alexander Wild, M.D., PhD.

LySk Supervisory Board in 2022:

Tomáš Balhárek, M.D., PhD.

Eva Králiková, M.D.

Martin Petrilák, M.D.

Challenges for 2023

- Regular updates of recommendations for diagnostics and treatment of ML
- Implementation of CAR T-cell therapy in 2 centers in Slovakia – National Institute of Children’s Diseases and National Cancer Institute in Bratislava
- Continuation of the SlovLymph project, professionalization of data collection
- Continuation of the Prognostically and Predictively Relevant Stratification of Large B-cell Lymphomas via FISH Diagnostics (Prognosticky a prediktívne relevantná stratifikácia veľkobunkových lymfómov B-pôvodu pomocou FISH diagnostiky) in Consultation Centre for Bioptic Diagnostics of Hemopoietic Disorders at the Institute of Pathologic Anatomy of Jessenius Faculty of Medicine Comenius University and University Hospital Martin (LySK grant support)
- Organisation of the 18th Lymphoma Forum with the main topic: News in the diagnostics and treatment of malignant lymphoma

4.6.3. Slovak Head and Neck Cancer Cooperative Group (NGO)

The Slovak Head and Neck Cancer Cooperative Group has been active since April 2018. The objective of this group is the multidisciplinary cooperation of individual specialists working in the treatment of head and neck cancer. The organisation is governed by its mem-

ber base meeting and the Committee. The Committee is a governing body of NGO that governs its activities and is accountable to the member base meeting. The Committee has 5 members elected for a 5-year term.

The Committee in 2022:

Chair: Patrik Štefanička, M.D., PhD., ENT and Head and Neck Clinic, FMCU and University Hospital, Bratislava

Vice-Chair: Assoc. Prof. Pavol Dubinský, M.D., PhD., MHA, Department of Radiation Oncology, ESOI, Košice

Members:

Milan Almáši, M.D., PhD., ENT Department, ESOI, Košice

Klaudia Gočárová, M.D., PhD., Internal Medicine Clinic of St.

Elisabeth Healthcare and Social Work College and Oncological

Institute of St. Elizabeth, Bratislava

Andrea Ligačová, M.D., Radiation Oncology Clinic of SMU and SECI, Bratislava

Current Situation

The NGO had 24 regular members; information is available at the website: <https://kooperativnaskupina.sk>.

After a one-year break, the 3rd conference of the Slovak Head and Neck Cancer Cooperative Group took place under the auspices of the civic association on 1 and 2 April 2022 in Liptovský Mikuláš. One of the main topics of the conference was a patient follow-up after the completion of curative treatment, and thus the preparation of the

Slovak Head and Neck Cancer Cooperative Group consensus for patient follow-up commenced.

Objectives and Challenges for 2023

- Support multidisciplinary teams within hospitals in order to improve diagnostics and treatment of patients with head and neck cancer
- Draft a consensus for patient follow-up after curative treatment
- Continue and develop the cooperation with Czech Head and Neck Cancer Cooperative Group

4.6.4. Pediatric Leukemia Group

The Pediatric Leukemia Group (PLG) unites physicians, professionals, and paramedic staff working in research, diagnostics, and treatment of leukemia in childhood. The objective of PLG is to unify diagnostic criteria and standardize the treatment of leukemia in childhood, implement new findings from diagnostics and therapy in clinical practice, ensure registration of children with ALL, AML, and CML in Pediatric Oncology Register, launch and manage clinical trials for leukemia in childhood.

The Pediatric Leukemia Group has been meeting once or twice a year at a Slovak seminar called “Blastshow” since 2010. During this event, the participants analyze each newly diagnosed patient with ALL or AML, relapses of leukemia, transplant patients, and deaths in the induction, remission, and progression of the disease. Since 2010, the role of PLG has been to ensure quality assessment and fulfillment

of diagnostic and treatment criteria necessary for inclusion in international academic clinical trials. ALL and AML diagnostics have been centralized (morphology, flow cytometry, cytogenetics, molecular genetics) in Bratislava since 2012.

In 2013, the Pediatric Leukemia Group was accepted by the international AML BFM group led by Prof. Dirk Reihardt. PLG was also accepted into the ALL BFM/AEIOP group led by Prof. Martin Schrappe in 2016 thanks to cooperation with the Czech Republic, namely the Childhood Leukemia Investigation Prague laboratory at the Department of Pediatric Hematology and Oncology at University Hospital Motol which examines minimal residual disease within the monitoring of ALL patients. Based on the acceptance of international groups, it is possible to register and treat patients with ALL and AML in international academic trials.

Challenges fulfilled in 2022

- Continued recruitment of patients to ALL academic clinical trial (trial medicament Blinatumomab) with the administrative support of SLOVACRIN funded by the resources from the National Oncology Program
- Continued reimbursement of minimal residual disease examination for ALL patients from health insurance
- Blastshow Seminar Slovensko – April and November 2022
- Continued LBL academic clinical trial with the administrative support of SLOVACRIN funded by the resources from the National Oncology Program

- Update on the diagnostics and treatment of AML
- Participation in Umbrella study for Wilms’ tumor
- Initiation of Phase II of the clinical trials for Ewing sarcoma and Hodgkin lymphoma

Challenges for 2023

- Introducing SNP arrays into ALL diagnostics
- Implementation of methylation into the diagnostics of CNS tumors
- Introduction of molecular diagnostics with a focus on the targeted treatment of relapses of solid and CNS tumors
- Participation in “Interfant study” for children under 1 year of age
- Blastshow Slovakia
- Publication of result analysis of relapsed patients with ALL



5. National Oncology
Institute

5.1. Activity report for 2022

The National Oncology Institute (NOI) was established under the National Cancer Institute on 1 August 2018. The main mission of NOI is to serve as a clinical research, academic, and educational cooperation platform for the implementation of activities that help fulfill the National Oncology Program. NOI is an individual organisational unit within National Cancer Institute (NCI) subordinate to the section of the Director General. The activities of NOI are managed by the director of NOI with their working team and governed by separate statutes (<https://www.noisk.sk/o-nas/poslanie>).

The NOI Scientific Council is an advisory board for the activities of NOI which assesses important scientific questions in the fields of research, development, cancer care in clinical and radiation oncology and in other interdisciplinary specialties, participates in updates of the National Oncology Program and concepts of cancer care in Slovakia and proposes priority areas of clinical research in Slovakia for assessment. It also evaluates NOI grant applications. The activities of

the Scientific Council are regulated by separate statutes (<https://www.noisk.sk/o-nas/vedecka-rada-noi>).

The Slovak Cooperative Oncology Group (SCOG) was established on 14 June 2019, as a working group within the National Oncology Institute. SCOG currently has 27 members and is a formal association of professionals working together on conducting academic and industry-initiated cancer clinical trials in the Slovak Republic. **The mission of SCOG** is to interconnect academic sites, other oncology clinical facilities, and pharmaceutical and biotechnological companies in order to conduct coordinated oncology research in Slovakia with the final goal to improve cancer patients' care in Slovakia. All information is available in the SCOG articles of association: (<https://www.noisk.sk/lekar/vyskum-a-vyvoj/slovenska-kooperativna-onkologicka-skupina>).

The National Oncology Program of the Slovak Republic is a public health, healthcare, and patient security plan whose primary objective

is to reduce the incidence and mortality of cancer diseases and improve the quality of life of cancer patients by the systematic and fair implementation of evidence-based strategies focused on prevention, diagnostics, treatment, supportive, palliative and end-of-life care, as well as research focused on innovative solutions and assessment of results. The NOP is based on the needs and conditions in Slovakia and complies with the objectives and tasks of the World Health Organization (WHO) and the European Commission.

The European Commission approved **Europe's Beating Cancer Plan** in February 2021 as a strategic plan for the fight against cancer in the countries of the European Union. Europe's Beating Cancer Plan is a political pledge to act against cancer and a springboard towards a strong European Health Union and a safer, better prepared, and more resilient Europe. The objective of Europe's Beating Cancer Plan is to focus on four key areas in which the EU can bring the greatest value:

1. Prevention
2. Early detection
3. Diagnostics and treatment
4. Quality of life of cancer patients

The plan focuses on research and innovations and the leverage of potential offered by digitization and new technologies. Europe's Beating Cancer Plan is a key pillar of a strong European Health Union. In July 2021, the government of the Slovak Republic approved updated National Oncology Program Action Plans (AP) for 2021 – 2025 which are divided into five areas:

1. Primary prevention
2. Secondary prevention, i.e. screening
3. Diagnostics and treatment including supportive and end-of-life care
4. Research, development, and education
5. Health data and information

By approving the NOP Actions Plans, Slovakia became one of the countries which constantly increase political support for cancer prevention and control.: <https://www.noisk.sk/about-us/national-oncology-program>

The extraordinary nature of the National Oncology Institute stems from its key role in the implementation of many NOP activities throughout the NOP and its updates. The primary role of NOI lies in the **coordination and evaluation of organized oncology screening programs** in Slovakia. In 2022, NOI also participated in the support of important primary cancer prevention activities. In 2022, NOI once again participated with other stakeholders, including the NHIC and the Ministry of Health of the Slovak Republic, in activities aimed at updating the National Oncology Register and finding ways to improve the timeliness of data, their adequate collection and provision of data. This data is meant for stakeholders/experts who can evaluate them relevantly and take positions on the issues arising from the data evaluation.

The National Oncology Register is under the administration of NCZI, and NOI publishes **epidemiological results** from the available da-

ta of NCZI on its website. In diagnostics and treatment, also in 2022 and on a monthly basis, OI also updated **the list of innovative cancer drugs**, registered by the European Medicines Agency (EMA) and approved by the Ministry of Health of the Slovak Republic, indicating the clinical benefit based on the ESMO-MCBS score, i.e. the scoring system developed by the ESMO (European Society for Medical Oncology). In medicine in general even more so in oncology, we are witnessing a rapid increase in new knowledge, which often proves and recommends changes in clinical practice.

UpToDate is a database of current medical knowledge, the availability of which can contribute to quick orientation in recommended procedures and news and significantly contribute to high-quality clinical practice. Therefore, in 2022, as part of NOI, access to this database was provided for Heads of Oncology Departments, as well as the Chief and Regional Experts in Clinical Oncology and the Chief Experts in Pediatrics, Radiation Oncology, and Palliative Medicine, and institutional access was granted to the National Cancer Institute, which is the reference center for oncology healthcare in Slovakia. These experts have the highest competencies within clinical decision-making processes, and thus, until a solution of general availability of the database of current medical knowledge in Slovakia is provided, this form ensures at least partial access to the most up-to-date medical knowledge.

In research, development, and education, in 2022 the NOI was intensely involved in the support of the **infrastructure of clinical trials**, helping with the placement and training of clinical trial (CT)

coordinators in 7 clinical trial centers. Communication with CT sponsors continued with the aim of increasing the amount of CT in Slovakia, including a monthly update of the **Register of Oncology Clinical Trials**. In 2022, NOI continued to cover the activities of the Slovak Cooperative Oncology Group (SCOG), while in the past year, a joint academic clinical trial led by Prof. Michal Mego, M.D., D.Sc. and Assoc. Prof. Ľuboš Drgoňa, M.D., PhD., MHA, FECMM titled “Prevention of irinotecan induced diarrhea by probiotics. A phase III study” was completed and prepared for publishing. The preparation of the PEACE-6 academic clinical trial, namely the part under the acronym “PRESTO” and “PEACE-Unfit”, in cooperation with the French Unicancer Tumor Group – GETUG, also continued in 2022.

Two calls for **NOI grants** for short-term foreign internships were announced in 2022 and NOI grants were awarded to three applicants. In the past year, NOI also worked intensely with the Committee of the Slovak Oncology Society and participated in the organization of the nationwide **oncology expert events** Bratislava Oncology Days and News from ASCO. At the same time, based on the cooperation agreement signed between the National Cancer Institute (NCI) in Bratislava and the IU-SCCC (Indiana University Simon Comprehensive Cancer Centre) in Indianapolis, USA, NOI participated in the organization of the first joint symposium held by the NCI, titled “**Conversations about Lung Cancer – 1st Joint Symposium**”, which took place on 10 August 2022. The topic of lung tumors was discussed comprehensively, from primary and secondary prevention to innovative treatment. The event was attended by an expert in lung tu-

mor treatment from IU-SCCC, Prof. Nasser Hanna, as well as Slovak experts in the field.

As part of **international cooperation**, NOI has been cooperating with the Institute of Biostatistics and Analysis of Masaryk University in Brno since its establishment. In 2022, NOI joined three international projects, IARC-ICCCS, CraNE, and ECHoS. The goal of the **IARC-ICCCS** (Improving Cancer Care Coordination and Screening in Latvia and Slovakia) project is to improve the quality of oncology screening programs. The **CraNE** Joint Action aims to create standards and a EU Network of Comprehensive Cancer Centers. The goal of the **ECHoS** (Establishing Cancer of Mission Hubs: Networks and Synergies) project, which is financed by Horizon Europe, is to create a network of centers for improved fulfillment of the Cancer Mission in individual EU member states.

NOI also serves as an **educational platform for the professional and general public**. It publishes ESMO patient brochures in cooperation with ESMO in the Slovak language as well as other educational materials for patients and the general public. In cooperation with 2nd Oncology Clinic of the Faculty of Medicine of Comenius University and the National Cancer Institute, NOI also participated in the **Slovak School of Oncology** (SSO) in 2022, whose mission is to increase the quality of specialized studies in clinical oncology. Its goal is continuous teaching during the entire course of study in the form of educational modules. All essential information is regularly updated on the NOI website in Slovak and English, and news is shared

on the NOI's Facebook page or through media outlets. **Publications and presentations** are published by NOI on its website in the section: About us/Publications and presentations: <https://www.noisk.sk/about-us/we-publish>.

NOI staff as at 31st December 2022:

Director:

Mária Rečková, M.D., PhD.

Specialist, Economist:

Kristína Bublíniová, M.Sc.

Communication and Awareness Specialist:

Patrícia Kubicová, M.Sc.

Lawyer:

Dr. Pavel Štukovský, B.Sc.

Screening Coordinator:

Dr. Jana Trautenberg Ricová

Research and Education Project Coordinator:

Dr. Soňa Čierniková, PhD.

Clinical Trials Coordinator:

Timea Farkašová, M.Sc.

Analytic team:

Dr. Zuzana Bárđyová, PhD., MPH

Michaela Laktišová, M.Sc.

Roman Novota

Adam Štrbavý, M.Sc.

Expert Consultants for Cancer screening programs:

Breast cancer screening:

Alena Kállayová, M.D.

Zuzana Behúnová, M.D.

Cervical cancer screening:

Oliver Sádovský, M.D., PhD.

Lucia Kocová, M.D.

Colorectal cancer screening:

Rudolf Hrčka, M.D., PhD.

Andrej Orságh, M.D.

Lung cancer screening:

Dominik Juskaňič, M.D., EDiNR

Consultant for the Cancer Clinical Trials Register:

Dr. Katarína Staněk

Consultants for Innovative cancer treatment:

Gabriela Gogová, M.D., EMBA

Dagmar Hroncová, MBA, M.Sc.

Epidemiology Consultants:

Prof. Alexandra Bražinová, M.D., PhD.

Ľudmila Kutáková, M.D.

Pharmacoeconomy Consultant:

Prof. Dr. Róbert Babelá, PhD., MBA, M.Sc. (HTA)

Individual NOI activities in 2022 are elaborated on in more detail below.

Cancer screening

In 2022, the National Oncology Institute continued to accomplish the role of coordinator and evaluator of cancer screening programs in an effort to fulfill the tasks arising from the NOP in the part of secondary prevention (2nd action plan). As part of the coordination of population screening programs, NOI continues to cooperate with the Ministry of Health of the Slovak Republic – the Guarantor of Oncology Screening Programs. It cooperates primarily with the Department of Public Health, Screening and Prevention and the Communications Department of the Ministry of Health of the Slovak Republic, as well as other interested entities, such as health insurance companies, professional societies, the NHIC and patient organisations.

The National Oncology Institute serves as a professional platform for the development and updating of professional methodologies used in screening. It cooperates in the creation and updating of standard procedures for individual screenings not only in the general popu-

lation, but also in the high-risk population. As part of the legislative changes, at the turn of 2021/2022, NOI experts, in cooperation with the Ministry of Health of the Slovak Republic, in cooperation with members of working groups for individual oncology screenings, began to work on amending Act No. 577/2004 Z.z. with the aim of clearly defining and harmonizing the prevention part with facts based on medical evidence.

Under the leadership of the MoH SR Cancer Screening Committee, currently, 6 working groups have been established.

Breast cancer screening:

Prof. Jana Slobodníková, M.D. PhD., Head of the working group

Colorectal cancer screening:

Prof. Tibor Hlavatý, M.D., PhD., Head of the working group

Cervical cancer screening:

Oliver Sadvský, M.D., PhD., Head of the working group

Lung cancer screening:

Dominik Juskaňič, M.D., EDiNR, Head of the working group

Screening media support work group:

Miroslav Staník, M.Sc., Head of the working group, Deputy:
Dr. Tatiana Kmecová

Data working group:

NHIC representative (not yet appointed due to the change in NHIC management)

The main goal of screenings is to reduce mortality and morbidity from screened cancer diagnoses by means of early detection of asymptomatic diseases in a potentially curable stage. However, the condition is sufficient participation, ideally over 75% of the target population, including efficient organization of screening, high quality of screening processes, collection and evaluation of data for regular evaluation and subsequent updating, as well as correct, efficient setup of screening programs.

To raise awareness of secondary prevention and improve participation in screenings, the screening media support work group developed a **new communication strategy** last year with a new headline: **“Get a cancer check-up and find out whether you are OK”**. On 10 October 2022, representatives from the patient organisations Pink Ribbon (Ružová stužka), No Cancer Patient Organisation (NIE RAKOVINE), Slovak League Against Cancer (LIGA PROTI RAKOVINE), representatives from health insurance companies and NOI jointly presented the new unified and comprehensible communication line to the general public at a press conference on the grounds of the Ministry of Health of the Slovak Republic. The name “screening” was replaced by the word “cancer check-up” (onkokontrola) in communication for the general public. For this purpose, the website www.onkoskriningy.sk was renamed to www.onkokontrola.sk, where reg-

ularly updated information is available in the form of leaflets, brochures, and short videos.

An important task of the NOI is evaluating the screenings and submitting the results to the warrant – the Ministry of Health of the Slovak Republic. 2022 can be evaluated based on data available from health insurance companies, which will be provided only after the year is completely closed, and also based on clinical data from screening mammography centers. However, it will still not be possible to evaluate even the basic indicators of quality assessment, as there has been a long-term absence of effective data collection on screening, which would serve as a basis for the screening register. Due to this situation, which reflects the low participation in screenings and the non-existent screening register, the Ministry of Health of the Slovak Republic, in cooperation with NOI, decided in January 2022 to establish a two-year **cooperation with the IARC (International Agency for Research on Cancer)**, which is part of the WHO (World Health Organization) on the **ICCCS (Improving Cancer Care Coordination and Screening)** project.

The ICCCS project is supported by the EU within the framework of the Technical Support Instrument (TSI) program, which is implemented in cooperation with the Directorate General of the EC for the Support of Structural Reforms (GR REFORM). It is a collaboration between national and international experts in an effort to develop strategic plans to improve participation and reduce inequities in cancer screening.

In Slovakia, the project deals with the challenges identified by the Ministry of Health of the Slovak Republic and other key stakeholders, one of them being NOI. This project will help reform healthcare infrastructure and services, with a particular focus on improving the information system used to identify and invite the target population for screenings and create a framework for regular data collection to monitor cancer screening programs. At the same time, the project will also provide know-how in communication strategy to increase awareness of the importance of screening as secondary prevention before the onset of cancer to increase participation in oncology screenings. In 2022, IARC representatives completed two work visits to Slovakia, where they got to know in detail the current situation, the overall organization, data collection methods, as well as the comprehensive evaluation of screenings. In addition, several online meetings were held. As part of the ICCCS project, NOI is involved in the **“Training of Trainers”** course, which provides training for screening professionals at various levels.

The nationwide organized screening program for breast cancer (so-called mammographic screening) began in September 2019 with the active invitation of asymptomatic women aged 50-69, who meet the inclusion criteria for being invited for screening, by a health insurance company. **The target population in Slovakia in 2022 was 720,061 women aged 50-69** (source: Statistical Office of the Slovak Republic). Screening mammography can only be performed at verified screening mammography facilities, which ensure high-quality and efficient comprehensive management of detected malignan-

cies at a high professional level, in accordance with the requirements of the valid Standard Procedure for the Implementation of Medical Radiation and the Performance of Prevention – Screening mammography <https://www.standardnepostupy.sk/prevensia-onkologicky-ochoreni/>.

There are currently 20 certified screening mammography facilities which were verified by the working group commissioned by the Committee of the Ministry of Health of the Slovak Republic for Quality Assurance in Radiodiagnostics, Radiation Oncology, and Nuclear Medicine. This Committee takes care of ensuring the quality of well-established facilities and also ensures the verification of potentially newly established facilities that would like to declare their technical equipment, readiness for operation as well as professional competence.

In 2022, one of the successes of mammographic screening was the **acceptance of a change** in the second revision of the Standard Procedures by all three health insurance companies – **a radiologist can examine a woman who meets the criteria for screening and report this examination to the insurance company as screening**. This change has had a significant positive impact on the inclusion of women in the screening program who have not been invited by health insurance companies, or who do not visit a gynecologist regularly, but meet the inclusion and exclusion conditions for said screening. Another success was the conclusion of a contract related to the development, delivery, and subsequent warranty service, as well as

the creation of documentation for **the special software product called “Mamolight”**, the purpose of which is to ensure the technical implementation of the statistical collection of selected data from mammography examinations at screening mammography facilities. This will greatly simplify the collection and evaluation of data for this screening. The working group, as part of the amendment of the wording of Act no. 577/2004 Z.z., agreed to propose a change in the age limit of the target population for mammographic screening from the current 50-69 years to 45-75 years following the current European recommendations.

The working group also agreed to omit ultrasonography (USG) of the breasts once every 2 years as a screening examination in the gynecological examination. As evidence-based medicine, as well as application practice, prove that, if not conducted as a follow-up examination of the screening mammography, USG examinations are redundant examinations. The goal is to reduce the iatrogenization of patients as well as the burden on the health system with examinations that are not medically justified, taking into account the use of human potential. In this case, it concerns not only radiologists but also the financial resources of health insurance companies where there is a clear medical indication and need for it.

The nationwide cervical cancer screening was launched in August 2021 with an active invitation of asymptomatic women aged 23-64 who do not undergo a preventive check-up at a gynecologist at regular intervals and who meet the inclusion criteria for being invited to

the screening by the health insurance company. **The target population in Slovakia in 2022 was 1,565,008 women aged 23-64** (source: Statistical Office of the Slovak Republic).

Participation in preventive gynecological examinations in the age group of 23 to 64 years was only 38% in 2022. High attendance rates are one of the key success factors of screenings.

Considering the etiopathogenesis and the gradual emergence of invasive cancer through precancers, cervical cancer is one of the few malignancies that can be almost completely prevented by secondary prevention. The screening program can significantly reduce the mortality and incidence of cervical cancer. To ensure the high quality of screening, it is necessary to achieve adequate education of gynecologists, who in the screening process will ensure that abnormal cytological findings from cervical cancer screening with expert colposcopy are dealt with. **It is also necessary to ensure a sufficient network of medical facilities where expert colposcopy can be performed is present**. Therefore, in 2022, the working group developed Expert Guidelines of the Ministry of Health of the Slovak Republic for the Performance of Expert Colposcopy for Cervical Cancer Screening in the Slovak Republic, which is awaiting approval and publication in the Journal of the Ministry of Health of the Slovak Republic.

Considering the proven benefit of implementing hrHPV DNA testing, it is desirable to modify the screening program in Slovakia as well. **The immediate goal of the working group is to introduce a screening hrHPV DNA test**, which will be performed simultaneously with

cytological examination in specific age groups, in women aged 36 (+364 days) and 45 years (+364 days). The proposal for updating the screening program was presented by NOI at the Session of the Committee for Cancer Screening Programs in the Slovak Republic. The given age groups were selected according to the recommendations of the WHO and also the example of the Czech Republic, where the benefit of introducing HPV co-testing along with cytological screening at the age of 35 and 45 has already been confirmed. The age groups are adapted to the established interval of cytological screening in Slovakia. With a one-year interval at the beginning of the screening and subsequent three-year intervals after the previous two negative cytological findings with the start of screening at the age of 23, screening is carried out at the age of 36-45.

A screening hrHPV DNA co-test should also be performed at the same time. The HPV test will continue to be performed as a triage test in case of non-conclusive cytological findings. In connection with the aforementioned planned change, **it is necessary to introduce new performance codes for both the screening and triage HPV tests** (specific performance codes for negative and positive results of the screening HPV test and negative and positive results of the triage HPV test), which would be reported by the laboratories performing the HPV test. At the same time, **it is necessary to determine which HPV tests shall be used**. If a decision is made to introduce primary HPV testing into an existing population-based cervical screening program, comprehensive planning, feasibility testing, and pilot programs should be conducted prior to routine introduction to ensure

that the transition to primary HPV screening strikes an appropriate balance between benefits and damage, including effective and efficient use of resources [Karsa L, Arbyn M, De Vuyst H, et al. European guidelines for quality assurance in cervical cancer screening. Summary of the supplements on HPV screening and vaccination. Papilloma-virus Res. 2015 Jun 30;1:22–31. doi: 10.1016/j.pvr.2015.06.006. PMID: PMC5886856].

A nationwide screening program for colorectal cancer (CRC) was launched in Slovakia in the first phase (January 2019 – October 2019) on a sample of 20,000 people aged 50-75. From September 2021, the second phase continues, in which health insurance companies send a screening test for hidden (occult) bleeding in the stool to those insured who meet the inclusion criteria for being invited to a screening by a health insurance company. **The target population in Slovakia in 2022 was a total of 1,688,804 men and women aged 50-75** (source: Statistical Office of the Slovak Republic).

Screening for CRC in the general risk population in Slovakia has been carried out for more than 10 years using tests for hidden (occult) bleeding in the stool during regular check-ups at a general practitioner followed by a colonoscopy in case of a positive test result. An alternative procedure is a primary screening colonoscopy (without a previous test for hidden (occult) bleeding in the stool), which is also indicated as a screening examination in the case of a high-risk population. This type of screening is anchored in Act No. 577/2004 Z.z.. Data on performed colonoscopy examinations are collected and

evaluated using the web interface www.krca.sk, which is provided by the head of the working group for colorectal cancer screening at the Slovak Gastroenterology Society (SGS), led by Rudolf Hríčka, M.D., PhD. In recent years, they have also been supplemented with data from health insurance companies. In an effort to increase participation in screening and in accordance with the recommendations of the European Commission, an invitational, organized screening was introduced in Slovakia under the management of the Ministry of Health of the Slovak Republic and the coordination of NOI.

In 2021 and 2022, based on available data from health insurance companies, **313,309 and 410,967 tests** for hidden (occult) bleeding (a year-on-year increase of 31%). If this would also be the number of tested individuals, it would correspond to the participation of approx. **37.9%, or 49.5% in 2022** (if we consider the population aged 50-75, which, however, was not reduced by the prevalence of CRC, or high-risk groups of patients). However, this is the absolute number of all reported tests for hidden (occult) bleeding procedures (i.e. if one patient had an examination performed and reported to the health insurance company repeatedly, it is found in the system more than once), therefore the percentage values of population participation based on these data are not accurate. A positive finding was recorded in 2022 in 8.9% of tests for hidden (occult) bleeding.

In 2021 and 2022, in the age group 50-75 years, **39,400 / 47,572 pan-colonoscopies**, of which **8,445 / 11,804 were reported by screening codes**, which was a year-on-year increase of 39.8%. In the CRC system, 8,315 / 11,186 valid forms were filed.

Currently, this screening is facing several questions in the following four basic areas:

1. Low attendance rate of the general population on the screening, including the general organization of the screening,
2. Alignment of tests for hidden (occult) bleeding provided at adult's general practitioners' offices and sent by health insurance companies,
3. Reporting of test and diagnose codes and their payment,
4. Collection and evaluation of data.

These issues, which overlap in all screenings, are currently being addressed by working groups for individual screenings. However, some of them are related to legislative changes, therefore their solution is currently not possible due to the unstable political environment with the absence of long-term, continuous prioritization of the topic of secondary prevention as the most effective tool for reducing cancer incidence and mortality.

Lung cancer screening

Lung cancer is the main cancer mortality reason in Slovakia and the EU.

In Slovakia, in 2012, lung cancer was the second most frequently diagnosed cancer in men and the fifth in women. In December 2022, the European Commission approved the key document “Council Recommendation on strengthening prevention through early detection: A new EU approach on cancer screening”, which replaces the previous EC recommendation 2003/878/EC. Part of this document is an explicit

it **recommendation for the implementation of a screening program for the early detection of lung cancer**, and its recommendations are implemented in the upcoming Standard Procedure for the performance of lung cancer prevention by the method of screening risk groups – lung cancer screening.

In 2022, the working group for lung cancer screening under the auspices of NOI and the Ministry of Health of the Slovak Republic, as well as the Screening Committee of the Ministry of Health of the Slovak Republic, with the participation of representatives of the NHIC and health insurance companies, met continuously. An important step was specifying and stabilizing the patient's path through the screening program, completing the preparation of the Standard Procedure for the performance of lung cancer prevention by the method of screening risk groups – lung cancer screening, and also the preparation of documents for the amendment of the catalog of health procedures related to screening.

Following the specification of the patient path, a pilot project was initiated to support the creation of a software screening module for office and hospital information systems. This project will automate the collection and sending of data to the future screening register and will be compatible with the NHIC data system. It is assumed that this project will create solid foundations for the future significant simplification of data supervision over the screening program, which will make the screening program long-term sustainable, with the possibility of continuous improvement.

Experience and data from countries where programs for early detection of lung cancer screening in conjunction with programs to support smoking cessation are already underway have shown the feasibility of implementing these processes in Slovakia as well.

Prostate cancer screening

In Slovakia, prostate cancer is the third most frequently diagnosed cancer in men. At the end of 2022, NOI representatives had an initial discussion about the introduction of prostate cancer screening with the president of the Slovak Urological Society, Assoc. Prof. Ivan Minčík, M.D., PhD. In the ideal case, similar to other screenings, a working group should be created, the task of which should primarily be the development of the pilot phase of prostate cancer screening with a thorough understanding of all possible risks and the development of the Standard Procedure for the performance of prostate cancer prevention. The start of preparatory work is planned for 2023.

Research, development, and education

The advisory body for the activities of NOI is the **Scientific Council** of NOI, which assesses fundamental scientific issues in research, development, and education, oncology care clinical and radiation oncology, as well as in other interdisciplinary fields. It participates in the updating of the National Oncology Program and concepts of oncology care in the Slovak Republic and proposes priority areas of clinical research in Slovakia for consideration. It also reviews applications for the award of NOI grants for short-term foreign internships at renowned oncology sites around the world.

The activity of the NOI Scientific Council is governed by a separate statute (<https://www.noisk.sk/about-us/noi-scientific-council>). In 2022, issues regarding legislation on clinical research and securing the activities of Clinical Trial Coordinators in Slovakia, the existence of Translational research units in University hospitals, and the setting of rules for SCOG members that would distinguish them from other centers were addressed at the sessions of the VR NOI. The issue of improving the availability of financially demanding innovative treatment was a highly discussed topic. The concepts of clinical and radiation oncology were updated, while the concept of clinical oncology, which also mentions the possibility of sending patients in long-term remission after completing cancer treatment for further follow-up by a general practitioner for adults, has already been finalized by the Ministry of Health of the Slovak Republic and published in its Journal. The Concept for Clinical and Translational Research was developed, which was sent to the Ministry of Health of the Slovak Republic for processing.

NOI Scientific Council in 2022:

Chair:

Mária Rečková, M.D., PhD., NOI Director

Secretary (until 1st May 2022):

Kristína Bubelínyová, M.Sc., Specialist, NOI

Secretary (from 2nd May 2022):

Dr. Soňa Čierniková, PhD., Research and Education Project Coordinator, NOI

Members:

Assoc. Prof. Ľuboš Drgoňa, M.D., PhD., MHA, FECMM, Chair of the NCI Scientific Council

Assoc. Prof. Pavol Dubinský, M.D., PhD., MHA, Chief Expert of the Ministry of Health of the Slovak Republic for Radiation Oncology
Assoc. Prof. Dr. Daniela Kallayová, PhD., MPH, Ministry of Health of the Slovak Republic Nominee

Prof. Alexandra Kolenová, M.D., PhD., Chief Expert of the Ministry of Health of the Slovak Republic for Pediatric Oncology

Prof. Michal Mego, M.D., D.Sc. Chief Expert of the Ministry of Health of the Slovak Republic for Clinical Oncology

Prof. RNDr. Silvia Pastoreková, D.Sc., Director, Biomedical Research Center of the Slovak Academy of Sciences

Prof. Lukáš Plank, M.D., PhD., Chief Expert of the Ministry of Health of the Slovak Republic for Pathology

Prof. Stanislav Špánik, M.D., PhD., SOS President

Due to the change in the Statute of the Scientific Council of NOI, the director of the NOI appoints the members of the Scientific Council of NOI as his advisory body, and the chairperson is elected from among the members of the advisory body. At the same time, as of 1 January 2023, the Vice-president of SCOG, Branislav Bystrický, M.D., PhD., MPH, and the Chief Expert of the Ministry of Health of the Slovak

Republic for Surgery, Prof. Juraj Pechan, M.D., PhD. have become new members of the Scientific Council of NOI.

Twice a year, the National Oncology Institute announces a call for **NOI grants**, which until now have been intended for short-term foreign internships for physicians working in oncology in Slovakia. The Scientific Council of NOI, which assesses applications for the award of the NOI grant, decided in 2022 that with effect from 1 January 2023, non-medical health workers (for example, clinical psychology, clinical physicists, and nurses) who provide health care at clinical oncology facilities in Slovakia will be able to apply for NOI grants as well. The aim is to support the opportunity to obtain and subsequently share current medical knowledge in oncology, support research and development, and establishment of international cooperation. In total, since 2019, the NOI has announced eight calls, and 12 applicants have been awarded.

Two calls for NOI grants were announced in 2022, with three successful applicants:

Zuzana Országhová, M.D.

National Oncology Institute, Klenová 1, 833 10 Bratislava

NOI Grant No.: 20220914/SVKNOI/12

Topic: Late toxicity of germ-cell tumor treatment.

Institution: Indiana University Simon Comprehensive Cancer Centre, IU School of Medicine, 935 Barnhill Dr, Indianapolis, IN 46202, USA
Supervisor: Nabil Adra, M.D.

Bibiana Vertáková Krakovská, M.D., PhD.

Oncological Institute of St. Elizabeth , Heydukova 10, 812 50 Bratislava
NOI Grant No.: 20220429/SVKNOI/10

Topic: Histopathological parameters of malignant tumors of the breast (HR, Ki67, HER2 status, TILs) and their fusion with MRI signs in initial imaging exam by magnetic resonance imaging in the decision process on neoadjuvant chemotherapy indication in locally advanced breast cancer.

Institution: Breast Unit of the Champalimaud Clinical Centre, Lisboa, Portugal

Supervisor: Prof. Fatima Cardoso

Lucia Vanovčanová, M.D., PhD.

Oncological Institute of St. Elizabeth , Heydukova 10, 812 50 Bratislava
NOI Grant No.: 20220429/SVKNOI/11

Topic: Prediction of response of tumorous process in the breast to neoadjuvant chemotherapy based on identification of specific MRI parameters.

Institution: Breast Unit of the Champalimaud Clinical Centre, Lisboa, Portugal

Supervisor: Prof. Fatima Cardoso

In **research, development, and education**, NOI collaborated with the SOS Committee in 2022 and actively participated in the preparation and organization of several expert events (Bratislava Oncology Days, News from ASCO). NOI representatives presented results and educational lectures at many conferences, including the Annual SUS

Conference, SMC Conference, Annual Pharmacy Conference, Mamotrends, SVLPP Conference, and Bratislava Oncology Days.

The National Oncology Institute was also represented at **the expert oncology conference titled “Modern Cancer Control: Saving Lives Through Smart Solutions”**, which was held as part of the Czech Presidency of the Council of the EU on 13 – 14 July 2022 in Brno. At this important event, more than a hundred experts from all over Europe gathered to discuss the possibilities of prevention, treatment, and data protection of oncology patients. The expert conference was focused on the **creation of Comprehensive Cancer Centers** and their integration into the EU infrastructure of Comprehensive Cancer Centers, the existence of functional oncology registries and their inclusion in the “European Health Data Space”, the **improvement of early detection of cancer diseases** and participation in the preparation of the EU screening strategy. The event was attended by the Minister of Health of the Czech Republic Mr Vlastimil Válek, Director of the Regional Office of the World Health Organization (WHO) for Europe Mr Hans Kluge, Vice President, Secretary of the Organization of European Cancer Institutes/Centres (OECI) Mr Giovanni Apolone, President of the European Cancer Patient Coalition Mr Francesco de Lorenzo and the EU Commissioner for Health and Food Safety, Ms Stella Kyriakides, spoke online.

An extraordinary event in 2022 was the organization of the first expert symposium titled **“Conversations About Lung Cancer”** as part of the two-year international collaboration between IU-SCCC (Indi-

ana University Simon Comprehensive Cancer Centre) and NCI with the participation of the globally renowned expert Prof. Nasser Hanna, M.D. from IU-SCCC. The conference, which took place in a hybrid form on 10 August 2022 at NCI, was opened by the directors of cooperating institutions, Dr. Kelvin Lee and Tomáš Alscher, M.D., MPH. Almost 120 participants showed interest in the lectures, which were focused on the issue of lung cancer, from prevention, diagnosis to treatment. During the conference, information was also heard about the upcoming fourth oncology screening program in Slovakia, which will focus on the early detection of lung cancer in smokers and people who have been abstinent for 10 to 15 years.

To support the education of oncology departments, NOI provided access to the **UpToDate** database for senior staff, chief and regional experts in clinical, radiation, and pediatric oncology, as well as institutional access to the NOI. The database is a leading information source for clinical practice and physicians can learn the latest knowledge in evidence-based medicine.

In **diagnostics and treatment**, NCI/NOI is involved in an important pan-European project with the acronym **CraNE JA**, which was approved in the joint call EU4H-2021-JA-03 of the EU4Health program. The project started on 1 October 2022 and its goal is to prepare the necessary administrative, professional, but also qualitative prerequisites to facilitate the integration of existing Comprehensive Cancer Centers into the pan-European network of Comprehensive Cancer Centers, as well as to support those member states that do not

yet have such centers and will need help with their certification. The CraNE project is a joint action involving 25 institutions from 21 EU member states, which is in line with Europe’s Beating Cancer Plan. NCI/NOI and members of the NOI Scientific Committee are involved in a work package that aims to create a common framework for the implementation of Comprehensive Cancer Centers. The specific goal is to map existing centers and identify potential candidates for new ones, as well as create consensual quality standards for research, innovation, prevention, and education among Comprehensive Cancer Centers. One of the results will also be the design of processes for active improvement of care, research, and education in those centers. The “Kick-off” meeting of the project took place on 2 – 3 November 2022 in Brussels with the participation of Dr. Soňa Čierniková, PhD., NOI Research and Education Project Coordinator.

In September 2022, NOI staff participated in submitting an application for a European grant within **the HORIZON-MISS-2022-CANCER-01-05 call**: Establishing of national cancer mission hubs and creation of network to support the mission on cancer. The primary goal of the project with the acronym **ECHoS** is to support the implementation of activities within the Cancer Mission in all EU member states and associated countries through the establishment of the so-called “Cancer Mission Hubs” operating at the national, regional, and local levels. The aim is to connect oncology through research, innovation, and policy development in ways that cannot be achieved through individual and fragmented initiatives. The established National Cancer Centres will play a key role in engaging all stakeholders,

including citizens, in political dialogues on cancer. 25 member countries and two associated EU countries are involved in the project. At the end of 2022, the project was approved by the European Commission and the preparation of documents for the purpose of concluding a grant agreement gradually began.

In **education and spreading awareness about the prevention of cancer diseases**, NOI considers the education of children and young people in health science and the prevention of serious diseases to be extremely important, which is why in 2022 it joined the program of school health workers as an expert warrant for cancer disease prevention. This is a collaboration between the Ministry of Education, Science, Research and Sports of the Slovak Republic and the Ministry of Health of the Slovak Republic, which will ensure the presence of a health professional in kindergartens, primary and secondary schools. The health worker at schools will primarily help students with disabilities, but their role will also include educational activities. In the context of the European Code against Cancer, NOI will focus on the prevention of cancer diseases, teaching children about the main risk factors associated with the development of cancer, the principles of a healthy lifestyle, proper diet, and prevention by vaccination against the HPV virus. The aim of NOI is to gradually lead to the systematic building of a generation of young people with an active and responsible approach to their health.

NOI serves as an **expert educational platform**. An important task also in 2022 was the updating of the NOI website in Slovak and English,

where experts can find the necessary information, both about the planned conferences (calendar of events on the main page), as well as links to various treatment recommendations and aids. In cooperation with 2nd Oncology Clinic of the Faculty of Medicine of Comenius University and the National Cancer Institute, NOI, on its website in the “Professional Public” section, added information and individual modules intended for **the Slovak School of Oncology (SSO)**. The mission of SSO is to increase the quality of specialized studies in Clinical Oncology. The goal is continuous teaching throughout the course in the form of educational modules.

The NOI website is also created for the **education of the general public**. In the “General Public” section, for example, general information about risk factors for cancer diseases is available, including a link to the European Code against Cancer. At the same time, in this section, ESMO patient brochures, prepared in cooperation with ESMO and Slovak patient organisations, are available in the Slovak version.

Strengthening the functional infrastructure of academic clinical research, systemic support of clinical research coordination directly in academic clinical trial centers (NOP, 4th Action Plan, Activity 14):

The strengthening of the functional infrastructure of academic clinical trials (CT) by supporting the coordination of clinical research of NOI at health care providers was conducted in the second half of 2022 by recruiting 4 full-time CT coordinators for a period of one calendar year in academic CT centers where academic CTs are currently tak-

ing place (National Institute of Children’s Diseases in Bratislava, Children’s Faculty Hospital in Košice, East Slovakia Oncology Institute in Košice, and Children’s Faculty Hospital in Banská Bystrica). The National Oncology Institute identified and approached other oncology CT centers that have the potential to implement academic clinical trials as well, but due to the lack of personal support of the CT coordinator, it was not possible to implement the academic CT. 3 facilities showed interest (Faculty Hospital in Trnava, Faculty Hospital with Policlinic in Prešov, Faculty Hospital in Trenčín), where the coordination of clinical trials was supported with a financial contribution in order to take place until the end of 2022.

During September – December 2022, CT coordinators familiarised with the National legislation (Act on Medicines and Medical Devices No. 362/2011 Z.z. and Act No. 576/2004 Z.z.) and trained in the so-called good clinical practice (ICH GCP, a set of international rules and qualitative requirements from the ethical and scientific field). Theoretical lectures and practical tasks simulating the work of a coordinator at a CT center were provided by the CT coordinator at NOI, who has been working at NOI since June 2022, Timea Farkašová, M.Sc. During this period, the coordinators also participated in 2 courses organized by the SLOVACRIN/CZECRIN platform. In clinical research, NOI is interested in continuing the continuous training of coordinators, cooperating and informing the professional and general public, including patient organisations, about clinical research, interconnecting clinical research departments in Slovak hospitals with the aim of supporting the exchange of professional experience and educa-

tion, and developing joint methodological procedures in CT within SCOG, recommend updating the healthcare providers websites with the publication of information on participation in clinical research for more transparent information of domestic and foreign CT sponsors and their representatives.

Register of Oncology Clinical Trials in Slovakia

The register of clinical oncology trials, managed by NOI, has been operating in Slovakia for four years. The register is available on the website in the professional public section: <https://www.noisk.sk/professional/research-and-development/clinical-trials> and in the general public section: <https://www.noisk.sk/patient/cancer-clinical-trials>

Regular updating of the register is supported by active communication and feedback from clinical trial sites (CTs) and members of the Association of Innovative Pharmaceutical Industries (AIFP). The source is the database of clinical trials of the State Institute for Drug Control (ŠÚKL). For the period 1 January – 1 December 2022, ŠÚKL approved 13 oncology CTs: 7 CTs from phase II. and 6 CTs from phase III. Compared to 2021, it is 7 CTs less. Clinical trials approved in 2022 for individual diseases in individual cities in Slovakia are shown in the following table.

Approved Clinical Trials (CT) according to diseases in CT centers according to cities as of 31st December 2022

Disease	Banská Bystrica	Bratislava	Košice	Martin	Michalovce	Nové Zámky	Partizánske	Poprad
Colorectal cancer; Metastatic colorectal cancer	1	2	1					1
Acute lymphoblastic leukemia		1						
Ewing sarcoma	1	1						
Follicular lymphoma		1	1	1				
Prostate cancer			1					
Classic Hodgkin lymphoma		1						
Metastatic colorectal cancer		1						1
Metastatic melanoma		1						1
Non-small cell lung cancer		1	1					
(NSCLC)	1	1	1			1		
Advanced breast cancer	1	3	2		1		1	
Triple-negative breast cancer		2	1				1	
Total	4	15	8	1	1	1	2	3

The overall situation of oncology CT in the NOI register in terms of recruitment as of 15th January 2023

Disease	Open recruitment	Finished recruitment	Finished	Waiting for opening
COVID 19			1	
Germinative testicular tumor		1	3	
Hodgkin lymphoma	1			1
Anal cancer				
Pancreatic cancer	1			
Lung cancer	5	6	2	1
Prostate cancer	5	2	1	1
Breast cancer	4	2	1	3
Ovarian cancer			1	
Cancer of the stomach and gastroesophageal junction	1			
Colorectal cancer	4	1	2	1
Leukemia	4	1	2	1
Lymphoma				1
Melanoma	1		1	1
Multiple myeloma	1		1	
Tumors	10		3	
Head and neck tumors	1			
Non-Hodgkin lymphoma	1	3	1	
Sarcoma	1			
Urothelial cancer			4	
Total	40	16	23	10

5.2. Challenges for 2023

- Continue supporting the implementation of the activities of the NOP action plans, which were updated for 2021 – 2025. The goal is to maintain the continuity of the already established activities that the NOI implements across all areas of the NOP, and also to build the organisation and expand activities with the final result of effectively fulfilling the activities of the action plans NOP.
- From the point of view of fulfilling the tasks of the NOI, it is necessary to **legislatively improve the position of the NOI**
- **In primary prevention and education**, in accordance with the updated NOP action plans for 2021-2025 (Activity 3, 1st Action Plan), NOI plans to support NGOs in support of cancer prevention education in 2023 and also plans to start education and awareness in schools through school health workers, in cooperation with the Ministry of Health of the Slovak Republic and the Ministry of Education, Science, Research and Sports of the Slovak Republic, as well as other stakeholders.
- **In secondary prevention, i.e. screenings**, NOI plans to continue efforts to set up data flow processes from NCZI to NOI and ensure their sustainability. In addition to coordination, one of the tasks of NOI is to evaluate oncology screening programs and submit the evaluation and proposal for an update to the warrant of oncology screenings – the Ministry of Health of the Slovak Republic.
- Under the auspices of the Ministry of Health of the Slovak Republic, NOI plans to continue cooperation with IARC (International Agency for Research on Cancer), with the aim of increasing the

quality of oncology screenings in Slovakia within the framework of greater participation, enhanced awareness and better data quality.

- In 2023, NOI plans to continue cooperation on the European **CraNE-JA** project, which aims to develop standards for European Comprehensive Oncology Centres (CCC) and CCC networking.
- In 2023, NOI plans to start cooperation within the **ECHoS** (Establishing Cancer of Mission Hubs: Networks and Synergies) project approved by the European Commission, aiming to create a network of centers for the effective implementation of the Cancer Mission in individual EU member states.
- In addition to participating in Slovak conferences **News from ASCO and Bratislava Oncology Days** with the Slovak Oncological Society, NOI plans to organize the 2nd annual international symposium in 2023, in cooperation with the **IU Simon Cancer Centre (IU SCC)** based in Indianapolis, USA and the National Cancer Institute (NCI). NOI will also participate in the organizational support of internships at IU SCC of physicians from NCI, thus supporting cooperation with a prestigious oncology center and indirectly, thanks to education, improving the care of oncology patients in Slovakia as well as the prestige of Slovak oncology in the international environment.
- In 2023, NOI will continue to update the list of innovative oncology drugs in cooperation with InovaHealth, in which the list is updated on a monthly basis with new categorizations of the Ministry of Health of the Slovak Republic and new EMA registrations with the addition of clinical benefit according to the ESMO-MCBS

score, either directly calculated by ESMO or in case of unavailability of the score from ESMO, calculated according to the ESMO methodology by NOI. At the same time, NOI plans to continue cooperation with IQVIA in 2023 in updating the list of all oncology drugs that are available on the NOI website: <https://www.noisk.sk/professional/diagnostics-and-treatment/lists-of-oncological-drugs>.

- NOI wants to further publish educational documents for both the professional, as well as the general public.
- In research and development, one of the important activities in 2023 is to continue supporting the improvement of the functional infrastructure of academic clinical research in the form of supporting the coordination of clinical research directly in academic clinical trial centers. In order to support CT coordination, a conference dedicated to CTs is also planned for target groups that are key to ensuring the running of CTs in CT centers (management of health care providers, coordinators, and investigators themselves), as well as CT sponsors and patient organisations.
- In clinical trials, an important task in 2023 is to take steps that would increase the increase of the number of CTs in Slovakia and set the conditions for more effective cooperation within SCOG.
- In 2023, NOI plans to continue updating the Register of Oncology CTs, which contains information about open KCT centers. In 2023, another planned task is to set up processes for the possibility of sending patients to CTs in a simpler manner by their GPs (in CT centers in Slovakia, where CTs are taking place).



6. Research
and Development

6.1. NOI Activities in Research and Development

NOI activities in research and development implemented in 2022 are listed in the previous chapter and relate to the updating of the Register of Oncology Clinical Trials, financial support for administrative costs associated with academic clinical trials in cooperation with SLOVACRIN, support of the coordination of clinical trials directly at clinical trial centers, two calls during one calendar year for awarding NOI grants for short-term foreign internships and covering the existence and development of the activities of the Slovak Cooperative Oncology Group (SCOG).

An important activity of NOI is also participating in the European CraNE-JA project, whose task is to set standards for Comprehensive Cancer Centers in Europe and their networking, while the standards also concern research, development, and education, and their connection with the provision of health care. Another important activity is the participation in the ECHoS (*Cancer Mission Hubs*) European project, which aims to improve the implementation of the Cancer Mission in the EU member states.

6.2. Translational Research

The Translational Research Unit (TRU) is a specialized facility of the 2nd Oncology Clinic of Medical Faculty of the Comenius University and NCI, which focuses on translational research, i.e. the application of findings from basic research in clinical practice, as well as retrograde solutions of clinically significant issues in oncology using experimental in vitro and in vivo approaches on TRU animal models. For more information, visit:

www.fmed.uniba.sk/pracoviska/klinicke-pracoviska/ii-onkologicka-klinika-1f-uk-a-nou/; www.nou.sk/jednotka-translacneho-vyskumu-1fuk-a-nou

In 2022, the Translational Research Unit collaborated with the Cancer Research Institute of the Biomedical Research Center of the Slovak Academy of Sciences, the Medical Faculty of the Comenius University, and the Oncological Institute of St. Elizabeth, with a focus on testicular germ cell tumors, breast cancer, colon cancer, pancreatic cancer, and bladder tumors. Research meetings between TRU, BMC, FMCU, and other facilities were held on a monthly basis, but on

a limited scale due to the Covid-19 pandemic. Intensive cooperation also took place with foreign facilities. **A Biobank was completed at the NCI** as a highly organized programmed system of collection, processing, and subsequent long-term storage of biological material obtained from patients with various diagnoses at extremely low temperatures (-80 or -196 °C), which significantly helps in the development of research.

The most significant results achieved relate to testicular tumors from germinative cells, primarily in the identification of new biomarkers as well as late toxicity (see publication activity chapter).

6.3. Experimental Oncology in Slovakia

Current situation

There are several academic and research facilities in Slovakia working with scientific research in experimental and translational oncology, including the Faculty of Medicine of Comenius University in Bratislava, Jessenius Faculty of Medicine Comenius University in Martin, Faculty of Medicine of Pavol Jozef Šafárik University (PJSU) and Slovak Medical University. Clinical facilities such as National Cancer Institute and Oncological Institute of St. Elizabeth also participate in research projects in experimental oncology.

Research facilities of the Slovak Academy of Sciences contribute significantly to cancer research, especially **institutes of the Biomedical Research Center of the SAS** which is a member of OECI (Organization of European Cancer Institutes). In research activities, it cooper-

ates with University and Clinical partners within the Slovak Republic, especially with NCI, Oncological Institute of St. Elizabeth, the Faculty of Medicine of the Comenius University in Bratislava, and the Jessenius Faculty of Medicine of the Comenius University in Martin.

It has been focusing on research in experimental oncology for a long time, particularly on the following research topics.

Institute of Experimental Oncology BMC SAS:

Molecular mechanisms of cancer diseases, tumor genetics and epigenetics, DNA damage repair and mechanisms of anticancer drug resistance, properties and therapeutic use of stem cells, tumor microenvironment, identification of biomarkers for diagnostics, prediction of treatment effectiveness and patient stratification, development of diagnostic approaches using modern technologies, translation of findings to oncology practice.

Institute of Virology BMC SAS:

Molecular mechanisms of adaptation to hypoxia and acidosis in tumor microenvironment, tumor metabolism, mechanisms of metastasis, development of new anticancer strategies.

Institute of Experimental Endocrinology BMC SAS:

Communication between the nervous system and tumor tissue, the influence of physical activity and nutrition on the health and quality of life of cancer patients within tertiary prevention, and the contribution of hormonal pathways to cancer development and progression.

Institute for Clinical and Translational Research BMC SAS:

Signaling pathways in tumor cells are regulated by ion transport and small molecules (such as hydrogen sulfide).

BMC SAS employs several internationally renowned top experts who coordinate and conduct research in experimental and translational oncology.

Projects of Biomedical Research Center of SAS (BMC SAS) within cancer research

International projects

Strategies to strengthen scientific excellence and innovation capacity for early diagnosis of gastrointestinal cancer. <http://vision.sav.sk>

Project type:	EŮ – Horizon 2020 – TWINNING
Principal investigator:	Alena Gábelová
Project duration:	1 October 2019 / 30 September 2022
Project registration number:	857381
The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS
Co-investigating institutions:	4 – Germany: 1, Spain: 1, Greece: 1, Norway: 1

A Coordination and Support Action to prepare UNCAN.eu platform

Project type:	
Principal investigator:	Miroslav Chovanec
Project duration:	1 September 2022 / 30 November 2023
Project registration number:	101069496
The organisation is the project coordinator:	No
Coordinator:	Institut National de la Sante et de la Recherche Medicale (INSERM)

New diagnostic and therapeutic tools against multidrug resistant tumor

Project type: EU – COST	
Principal investigator:	Dana Jurkovičová, BMC SAS
Project duration:	11 September 2018 / 10 September 2022
Project registration number:	CA17104
The organisation is the project coordinator:	No
Coordinator:	University of Torino, Italy

Identification of biological markers for prevention and translational medicine in pancreatic cancer

Project type:	
Principal investigator:	Božena Smolková
Project duration:	11 October 2022 / 10 October 2026
Project registration number:	CA21116
The organisation is the project coordinator:	No
Coordinator:	German Cancer Research Centre (DKFZ)

Modelling immunotherapy response and toxicity in cancer

Project type:	
Principal investigator:	Božena Smolková
Project duration:	2 November 2022 / 1 November 2026
Project registration number:	CA21135
The organisation is the project coordinator:	No
Coordinator:	Fundació Institut d' Investigació Germans Trias i Pujol

Cancer Nanomedicine – from bench to bedside

Project type: EU – COST	
Principal investigator:	Monika Šramková, BMC SAS
Project duration:	28 September 2018 / 27 September 2022
Project registration number:	CA17140
The organisation is the project coordinator:	No
Coordinator:	University of Lodz, Poland

Molecular Markers for Biological Dosimetry in Radiation Oncology, Cancer Risk, Assessment and Optimizing Cancer Therapy

Project type: IAEA	
Principal investigator:	Igor Beliaev
Project duration:	19 September 2017 / 9 July 2023
Project registration number:	IAEA Research Agreement No: 22259/R0
The organisation is the project coordinator:	No
Coordinator:	International Atomic Energy Agency

Co-investigating institutions: 27 - Argentina: 1, Brazil: 1, Canada: 1, France: 2, Great Britain: 1, Chile: 1, Indonesia: 2, India: 2, Israel: 3, Japan: 2, Lithuania: 1, Russia: 1, Saudi Arabia: 1, Singapore: 1, Thailand: 2, Ukraine: 1, Uruguay: 1, USA: 2, Vietnam: 1

Resistance under treatment in breast cancer

Project type: EU – ERANET	
Principal investigator:	Marína Cihová
Project duration:	1 August 2020 / 31 July 2023
Project registration number:	ID: 39
The organisation is the project coordinator:	No
Coordinator:	University of Oslo, Institute of Basic Medical Sciences
Co-investigating institutions:	5 - Belgium: 1, Germany: 1, France: 1, Norway: 2

Establishing an algorithm for the early diagnosis and follow-up of patients with pancreatic neuroendocrine tumors

Project type: EU – ERANET	
Principal investigator:	Božena Smolková
Project duration:	1 September 2019 / 31 August 2022
Project registration number:	NEXT-0711
The organisation is the project coordinator:	No
Coordinator:	Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., Institute for Biomedical Engineering IBMT; Germany
Co-investigating institutions:	19 - Germany: 2, Spain: 6, Greece: 6, Latvia: 5

Structural fund projects

Systemic public research institution – biobank for cancer and rare diseases

Project type: OPVaI	
BMC SAS principal investigator:	Daniela Gašperíková, Miroslav Chovanec
Project duration:	1 June 2020 / 30 June 2023
Project registration number:	313011AFG5
The organisation is the project coordinator:	No
Coordinator:	Comenius University Bratislava – Jessenius Faculty of Medicine Martin

Integrative strategy in the development of personalized medicine of selected malignant cancer diseases and its effect on the quality of life

Project type: OPVaI	
BMC SAS principal investigator:	Miroslav Chovanec
Project duration:	1 September 2019 / 30 June 2023
Project registration number:	313011V446

The organisation is the project coordinator:	No
Coordinator:	Comenius University Bratislava – Jessenius Faculty of Medicine in Martin

Long-term strategic research of prevention, intervention and mechanisms of obesity and its comorbidities

Project type: OPVaI	
Principal investigator:	Silvia Pastoreková
Project duration:	1 September 2019 / 28 February 2023
Project registration number:	313011V344
The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS

Domestic projects of the Slovak Research and Development Agency (SRDA) and MoH SR

(exclusively projects from oncology in which BMC SAS is the coordinator and receives financial support)

Suicide gene therapy mediated by mesenchymal stromal and pancreatic tumor cell-excreted extracellular vesicles in the treatment of pancreatic ductal adenocarcinoma

Project type:	
Principal investigator:	Marína Cihová
Project duration:	1 July 2021 / 30 June 2025
Project registration number:	APVV-20-0143
The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS
Počet spoluriešiteľských inštitúcií:	0

Nanomedical approach to fight pancreatic cancer via targeting tumor-associated carbonic anhydrase IX

Project type: APVV	
Principal investigator:	Lucia Csáderová
Project duration:	1 July 2021 / 30 June 2025
Project registration number:	APVV-20-0485
The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS
Co-investigating institutions:	0

Harnessing the immunological mechanisms in various subtypes of B cell lymphoma

Project type: APVV	
Principal investigator:	Dana Cholujová
Project duration:	1 July 2020 / 30 June 2024
Project registration number:	APVV-19-0212

The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS
Co-investigating institutions:	2 - Slovakia: 2

Cancer immunoediting in multiple myeloma: immune checkpoints and clinical significance

Project type: APVV	
Principal investigator:	Jana Jakubíková
Project duration:	1 August 2021 / 30 June 2025
Project registration number:	APVV-20-0183
The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS
Co-investigating institutions:	0

Is HIF-1a a master regulator of DNA repair capacity and chemotherapy response in testicular germ cell tumors?

Project type: APVV	
Principal investigator:	Dana Jurkovičová
Project duration:	1 July 2020 / 30 June 2023
Project registration number:	APVV-19-0286
The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS
Co-investigating institutions:	0

Interactions of calcium transport systems in carcinogenesis

Project type: APVV	
Principal investigator:	Oľga Križanová
Project duration:	1 July 2021 / 30 June 2025
Project registration number:	APVV-20-0176
The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS
Co-investigating institutions:	0

Molecular mechanisms of trialkyl-/triarylthio isothiocyanates' and carboxylates' antitumour properties – novel ligands of nuclear retinoid X receptors in rat mammary gland carcinomas and human tumour cell lines

Project type:	
Principal investigator:	Dana Macejová
Project duration:	1 July 2021 / 30 June 2025
Project registration number:	APVV-20-0314
The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS
Co-investigating institutions:	0

Cell-in-cell phenomena as microevolutionary processes in cancer progression: a role for hypoxia-induced carbonic anhydrase IX

Project type: APVV	
Principal investigator:	Silvia Pastoreková
Project duration:	1 July 2020 / 30 June 2024
Project registration number:	APVV-19-0098
The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS
Co-investigating institutions:	0

Targeting DNA methylation by epigenetic editing and its implementation into personalised diagnostics and therapy of uveal melanoma

Project type:	APVV
Principal investigator:	Božena Smolková
Project duration:	1 August 2018 / 30 June 2022
Project registration number:	APVV-17-0369
The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS
Co-investigating institutions:	1 - Slovakia: 1

Reprogramming pancreatic ductal adenocarcinoma microenvironment towards immunotherapy

Project type:	APVV
Principal investigator:	Božena Smolková
Project duration:	1 July 2022 / 30 June 2026
Project registration number:	APVV-21-0197
The organisation is the project coordinator:	Yes

Coordinator:	BMC SAS
Co-investigating institutions:	4 - Slovakia: 4

Cytokine profiling together with carbonic anhydrase IX immunotargeting as a promising tool in diagnostics and treatment of pancreatic cancer

Project type:	APVV
Principal investigator:	Eliška Švastová
Project duration:	1 July 2021 / 30 June 2025
Project registration number:	APVV-20-0480
The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS
Co-investigating institutions:	0

Molecular biomarkers of relapse in seminoma clinical stage I patients

Project type:	APVV
Principal investigator:	Miroslav Chovanec
Project duration:	1 October 2019 / 21 December 2022

Project registration number:	2019/57-BMCSAV-1
The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS
Co-investigating institutions:	1 - Slovakia: 1

Development of novel diagnostic and predictive high-dimensional immunophenotyping tool for hematological malignancies

Project type:	APVV
Principal investigator:	Jana Jakubíková
Project duration:	1 November 2019 / 31 December 2022
Project registration number:	2019/14-BMCSAV-9
The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS
Co-investigating institutions:	0

Role of the hydrogen sulfide in remodeling cytoskeleton in colorectal carcinoma cells; impact on activity of taxanes

Project type:	APVV
Principal investigator:	Oľga Križanová
Project duration:	1 December 2019 / 31 December 2022
Project registration number:	2019/58-BMCSAV-2
The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS
Co-investigating institutions:	0

Markers overlapping chemoresistance and metastatic potential in colorectal cancer – aldehyde dehydrogenase and its clinical relevance

Project type:	
Principal investigator:	Miroslava Matúšková
Project duration:	1 November 2019 / 31 December 2022
Project registration number:	2019/60-BMCSAV-4
The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS
Co-investigating institutions:	0

Clinical evaluation of prognostic and predictive value of tissue and serum Carbonic Anhydrase IX in breast cancer

Project type: MZ SR	
Principal investigator:	Ingeborg Režuchová
Project duration:	1 November 2019 / 31 December 2022
Project registration number:	2019/26- LFUK-14

The organisation is the project coordinator:	No
Coordinator:	Comenius University Bratislava – Jessenius Faculty of Medicine in Martin
Co-investigating institutions:	0

Checkpoint molecules and viral immunomodulators in cancer therapy

Project type: APVV	
Principal investigator:	Katarína Lopušná
Project duration:	1 September 2022 / 31 August 2025
Project registration number:	SASPRO 1136/01/02
The organisation is the project coordinator:	Yes
Coordinator:	BMC SAS
Co-investigating institutions:	0

International scientific events in 2022 (organized or co-organized by BMC)

Several expert events, invited lectures, and training for young scientific workers and students were organized in the framework of the European VISION project. All these events took place online due to the unfavorable pandemic situation. They were co-prepared by the partners of the project.

- The Fraunhofer Institute for Biomedical Engineering IBMT Germany
- Hospital Universitario Ramón y Cajal Spain
- The First Department of Propaedeutic Surgery of the Medical School of National and Kapodistrian University of Athens Greece
- Health Effects Laboratory NILU z Norwegian Institute for Air Research, Norway

In 2022, 3 online courses on ethics in biomedical research, gastrointestinal stromal tumors, and good laboratory practice were held as part of the VISION project for students and physician students. As part of the activities of the VISION project, 2 online lectures were given. Dr. Bruno Saiz lectured on tumor-associated macrophages and Prof. Stefano Bonassi focused on new approaches in the field of clinical studies.

Mini-conference: Cancer and Metabolic Disorders (Cancer and Metabolic Disorders)

Venue: KC SAV Smolenice

Participants: 50

Date: 3 October – 5 October 2022

The mini-conference was organized within the Alliance4Life_ACTIONS project aimed at sharing research ideas of intellectual origin in Central Eastern Europe countries and creating opportunities for establishing contact with the pharmaceutical and medical industry; the speakers and participants were leaders in research and development in cancer and metabolic disorders. The topic of the event was the investigation of genetic, epigenetic, and physiological mechanisms of diseases through preclinical and clinical approaches and the transfer of newly acquired knowledge to diagnostics and therapy. The program of this mini-conference reflected the current program priorities of Horizon Europe within the Cancer Mission; it included scientific lectures, information about project opportunities, networking, and discussing future cooperation. The main objective of the event was to explore opportunities for research and industry collaboration that could lead to the creation of small start-up projects that will be supported by Alliance4Life's Seed Fund.

Other activities of the Biomedical Research Center in research, development, education, and popularization of oncology

Cooperation with Slovak Cancer Research Foundation (Nadácia Výskum rakoviny, NVR)

NVR promotes and supports projects concerning cancer research, cooperation, participation of experts in specialist conferences, and public awareness about the goals and results of oncology research; it also tries to improve the level of education and skills of young scientists

in oncology through competitions and grants. Since 2016, it has been cooperating with Biomedical Research Center SAS as an individual legal entity, and its activities promote and support the Cancer Research Institute of BMC SAS, as well as, the scientific results of its employees. The foundation also financially supports the efforts to update the laboratory and diagnostic equipment of the institute. NVR in cooperation with BMC SAS organizes an annual national cycle of popularization-education seminars for high school students called Scientific Workshops – Oncology (Vedecké dielne – onkológia) <https://www.nvr.sk/akcie/vedecke-dielne-onkologia-2022/>. In 2022, The Young Oncologist Award also took place: https://www.nvr.sk/events_category/sutaz-mladych-onkologov/.

Editing of international scientific journal NEOPLASMA

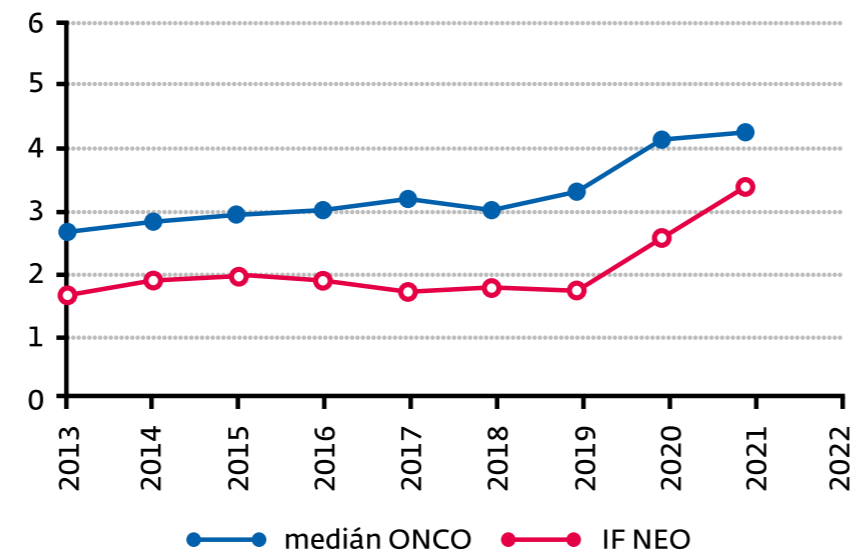
NEOPLASMA journal, which functions under the Institute of Experimental Oncology of BMC SAS, publishes scientific papers in the field of experimental and clinical oncology.

In 2022, the NEOPLASMA journal included 144 published papers in 6 issues. The number of published manuscripts went back to the 2018 – 2019 level. The average period until the first reaction was 10 days, whereas the average period of evaluation increased to 42 days, with 90% of the manuscripts being rejected. With published papers, the average period for evaluation increased by 16 days YoY compared with 2021, which seems to be related to the evaluation of manuscripts filed in 2021.

The preliminary estimate of the Impact Factor (IF) in 2022, based on citation data (papers published in 2020 and 2021), in the Clarivate da-

tabase in December 2022 is 3.1 (linear trend), which will be a decrease from IF 2021 (3.401). After an increase in the median IF of oncology journals in 2020, its value is likely to stabilize, similar to 2013 to 2019.

Development of median in category ONCOLOGY and IF of Journal NEOPLASMA in Database Clarivate



Based on citation data (papers published in 2020 and 2021) in the Clarivate database in December 2022, the preliminary estimate of Impact Factor (IF) 2022 is 3.1 (linear trend), which will be a decrease compared to IF 2021 (3.401). After an increase in the median IF of oncology journals in 2020, its value is likely to stabilize, similar to 2013 – 2019.

6.4. Report of the Institute of Research and Development of the Ministry of Health of the Slovak Republic

Translational and clinical research, including (academic) clinical trials (CTs), plays an important role in the improvement of therapeutic, diagnostic, and preventive options and contributes to the broadening of human knowledge. Patients who receive standard treatment are thus able to access potentially more effective innovative therapeutic or diagnostic procedures and products. Currently, the integration of clinical and translational research in normal clinical practice in established cancer centers around the world is a natural part of the process. These centers are also associated with university institutions as well as other scientific research facilities

The cooperation of the Ministry of Health of the Slovak Republic, the Institute of Research and Development, the National Oncology Institute, the National Cancer Institute, the Clinical Trials Department, and the national partner SLOVACRIN (member of the pan-European organization ECRIN dedicated to the development of international clinical research) is reflected – also by the National Oncology Program – in the creation of a platform for **systemic support of biomedical clinical research**. It provides support to (academic) clinical and translational cancer research including biobanking, external support of innovative biomedical research activities in the field of oncology, especially spin-off/start-up companies, research excellence teams, non-profit organizations, and mentoring and educational platform

BIOHUB SK via the Ministry of Health of the Slovak Republic and the Institute of Research and Development.

SLOVACRIN is included in the key national document titled **Roadmap of Research Infrastructures** (SK VI Roadmap 2020 – 2030) and its 1st Action Plan (approved by the Government Council for Science, Technology and Innovation on 30 January 2023), processed in a complementary relationship to European research infrastructures associated in within the framework of the European Strategic Forum for Research Infrastructures (ESFRI). SLOVACRIN supports all types of clinical research (clinical trials of human products and medicaments, clinical trials of medical devices, validation of treatment methods, observational studies), especially where **innovative medicaments and approaches** are needed, such as in the field of oncology or rare diseases. Therefore, Slovak patients have a unique opportunity to get much earlier access to innovative treatment methods as well as medicaments that are not commonly available. Innovative treatment is often very expensive, so another benefit is significant savings for Slovak health insurance companies. This approach primarily improves the quality of healthcare provision, but also the prestige and internationalization of Slovak biomedical (academic) clinical research.

The continuity of cooperation between the Ministry of Health of the Slovak Republic, the Institute of Research and Development, the National Oncology Institute, the National Cancer Institute, the Clinical Trials Department, and the national partner SLOVACRIN is also reflected in the implementation of the new National Oncology

Plan 4th Action Plan: “Research, development and education” (approved by the Slovak Government on 21 July 2021). As part of the cooperation in 2022, SLOVACRIN and the involved institutions created a **Road Map for Academic Clinical Research**, which is available at <https://slovacrin.sk/cestovna-mapa/>. This document presents a comprehensive description of the current situation of clinical research in healthcare facilities in Slovakia, defines the scientific focus of hospitals, identifies clinical trial departments, and describes available capacities, previous experience, and the range of services that the department is able to provide. This road map also describes the current needs of hospitals, clinical trial departments, and clinical trial centers. It is a prerequisite for the strengthening of translational and clinical research, which is based on the acute need to implement new, innovative products, processes, and procedures into clinical practice, which clearly leads to an increase in the quality of the provision of healthcare.

A significant part of the facilities within the roadmap is focused on ACTs in oncology. Oncology ACTs originating in Slovakia are run under the auspices of the National Cancer Institute, which is the reference center for oncology healthcare and the East Slovakia Oncology Institute, and together with SLOVACRIN, the think-tank for academic clinical research in the Slovak Republic, also require administrative support, especially in terms of external independent monitoring and insurance. In this sense, the synergy between the activities of SLOVACRIN and the National Oncology Institute, the central platform of the National Oncology Plan, is important, as part of its activities, it partic-

ipates in building a network of oncology facilities specialized in CTs in cooperation with the Slovak Cooperative Oncology Group (SCOG).

One of the main goals is to **increase the number and quality of academically initiated CTs** in Slovakia, using the available capacity and expertise of the participating facilities and with a guarantee of compliance with regulatory, legislative, and ethical requirements related to the implementation of clinical research. Based on the request, **in 2022 the Ministry of Health of the Slovak Republic supported the activities of SLOVACRIN in the total amount of EUR 100,000**, through the National Cancer Institute / National Oncology Institute, from funds allocated for the implementation of the National Oncology Program activities (2021-2025) of the 4th Action Plan (Activity 4), aimed at ensuring and strengthening the activity of the medical infrastructure for academic clinical research (project management and related services for AKS with prioritization of clinical studies in oncology).

In cooperation with the National Cancer Institute, the Ministry of Health of the Slovak Republic / the Institute of Research and Development organized 2 educational webinars funded by the National Oncology Plan (2021-2025) (4th Action Plan, Activity 5) in 2022 as part of its BIOHUB SK (www.biohub.sk) incubator expert platform. On 28 March 2022, the webinar “Ethics of biomedical research” was held, which was intended for scientific workers of physicians, pharmacists, and researchers who deal with biomedicine. The speakers were Marek Vácha from the Institute of Ethics and Humanities of the 3rd Faculty of Charles University, Anna Oleárová – clinical pharmacist and teach-

er from UNB Ružinov and Ivan Humeník – lawyer and teacher from the law firm h&h PARTNERS, as well as and Katarína Kováčová, M.Sc., an expert in clinical trials. (<https://info193542.wixsite.com/bioetika>)

On 31 March 2022, the webinar “Good Clinical Practice for Ethics Committee Members” was held, which was intended for members of Ethics Committees and anyone interested in knowledge of the Principles of Good Clinical Practice and the rules for the ethical assessment of clinical trials according to the international principles of Good Clinical Practice of the ICHGCP (R2), which are focused on the duties of the Ethics Commission, chapter 3. (<https://www.health.gov.sk/Clanok?webinar-registracia-etieckiek-komisie>)

In 2019, priority areas of research and development in Slovak cancer healthcare were reflected in a **public call** for applications for grants awarded by the Ministry of Health of the SR in the area of healthcare research and development, the so-called **ONKO Call 2019, amounting to EUR 400,000 in total for one year** (up to EUR 100,000 per project, with a duration of 3 years maximum). Six research projects were supported in the call (SAS, Jessenius Faculty of Medicine of Comenius University in Martin, MultiplexDX s.r.o.), focusing mainly on innovative diagnostic and treatment procedures and personalized/precision medicine products for cancer diseases determined in the 5th Action Plan (NOP 2018 – 2020) which were prepared based on Mission Statement of the Government of the Slovak Republic for 2016 – 2020. Apart from this support of cancer research, **two other projects have had complementary funding amounting to EUR**

335,750 in total for 3 years via the Public Call for Applications for Grants Under the Authority of the Ministry of Health of the Slovak Republic for Healthcare Research and Development, so-called **General Call 2019**.

All applications were evaluated by the expert Scientific Council of the Ministry of Health of the Slovak Republic, which is an advisory body to the Ministry in terms of research and development in healthcare (especially biomedicine) according to its statutes and Act No. 525/2010 Z.z. on Financial Subsidies within the authority of the MoH SR and consists of top domestic and international experts. **The financial continuity of all the aforementioned projects was also implemented in 2022**, but due to the lack of funds, a new Ministry of Health of the Slovak Republic “**ONKO Challenge 2022**” was not announced (4th Action Plan of the National Oncology Plan, Activity 10).

The Start-up company Glycanostics focused on innovative diagnostics of prostate cancer was the greatest success when they received a prestigious EIC grant of almost 2 million euros in 2021. This only confirms the significance and meaning of systematic and continuous support of scientific excellence by the state. This is reflected also in the cooperation of the Ministry of Health of the Slovak Republic / the Institute of Research and Development / BIOHUB SK and its platform of experts, mentoring, and networking via domestic and foreign experts in biobanking and patents. Research activities of the scientific team led by Ján Tkáč, MSc., DSc. (Institute of Chemistry

SAS) were supported by financial subsidies of the Ministry of Health of the Slovak Republic from calls for 2018 and 2019 for research and development in healthcare.

Another success of the Institute of Research and Development / BIOHUB SK supported activities for the development of applied biomedical research and clinical trials with actual results is the connection of the expertise of our top physicians / researchers in Martin with Slovak experts (Prof. Zvara and Prof. Baco) working abroad (Denmark/ USA and Norway), which resulted in a unique project **“Development of innovative minimally invasive surgical treatment of prostate cancer”**, with the potential of international importance. As part of the 2018 Research and Development Challenge of the Ministry of Health of the Slovak Republic, this project (Slovak side) was awarded a grant in the total amount of **EUR 240,000 for 3 years. This new treatment method represents a potential replacement for financially demanding treatments (e.g. High-Intensity Focused Ultrasound, which is unavailable in Slovakia: EUR 15,000 per patient) with an assumption of costs lower than EUR 1,000. per patient.** Currently, the “proof of principle” studies and preclinical research have been completed and an international clinical study is being set up (SK, DK, NO). This invention is also the subject of a patent portfolio with the prospect of exclusive rights for Slovakia, with high added value after the patent is granted in the relevant countries – thus also their enforceability, which will contribute to the sustainability and development of other research/innovative activities.

As part of the activities of the Institute of Research and Development / BIOHUB Slovakia – the incubator to support start-up / spin-off companies, several events (in an online format) were planned in 2022, with a panel of mentors made up of domestic and foreign experts, which, however, in the context of financial limitations caused by due to the pandemic situation of COVID-19 and the war conflict in Ukraine, they were not financially supported in 2022.

Biobanking, which represents a sophisticated, highly organized system of long-term storage of biological material with relevant clinical-pathological, epidemiological, and biomolecular information, **is also a prerequisite for high-quality cancer biomedical research and development**, including the acquisition of information about disease biomarkers and the discovery of new target molecules – the so-called targets in the development of innovative medicines. The absence of a biobank infrastructure limits the quality of biomedical research and development due to the lack of high-quality and validated samples of biological material, crucial for this type of research. This initiative in 2022 in oncology is reflected (new 4th Action Plan of the National Oncology Plan (Activity 9)) by the support of the Ministry of Health of the Slovak Republic / the Institute of Research and Development in the amount of **EUR 80,000** for the further development of the **National Cancer Institute biobank**, which was continuously implemented in 2019. The strategy of funding from national sources creates **synergy with two complementary projects** aimed at building a national biobank at Jessenius Faculty of Medicine of the Comenius University in Martin titled “Systemic public research

infrastructure – biobank for cancer and rare diseases” and “Creating a digital biobank to support systemic public research infrastructure”, which are funded from European Structural and Investment Funds (ESIF) within the operational program: Integrated infrastructure (in the program period 2014 – 2020) in a total amount of approximately **EUR 29,600,000:**

1. Systemic public research infrastructure – biobank for cancer and rare diseases:
<https://www.health.gov.sk/?Projekt-EU-biobanka>
2. Creating a digital biobank to support systemic public research infrastructure:
<https://www.health.gov.sk/?Projekt-EU-digi-biobanka>

The Ministry of Health of the Slovak Republic, through the Institute of Research and Development, together with the National Cancer Institute, is one of the key partners in these projects, the expected implementation of which will take place by the end of June 2023. As part of the activities of the Ministry of Health of the Slovak Republic, through the Institute of Research and Development (in addition to legislative amendments and expert support for innovative research projects connected with biobanking as part of the BIOHUB SK) was preparing **Slovakia to join the pan-European biobank consortium BBMRI-ERIC (allocations have not yet been set aside)** as well as the legislative amendment of **Acts No. 576/2004 Z.z. and 578/2004 Z.z. in the context of biobanking** (see below).

- J. Glasa, K návrhu nového zákona o biobankách ako súčasť iniciatívy na vybudovanie systému biobáňk v Slovenskej republike (2018 – 2019), (On the new draft law on biobanking as a part of in-

- initiative to build a biobanking system in the Slovak Republic (2018 – 2019)), Part I – general requirements, Abstract, Medical ethics and bioethics, ME&B 27 (1-2) 2020, ISSN 1335-0560, pp. 5 – 12
- J. Glasa, K návrhu nového zákona o biobankách ako súčasť iniciatívy na vybudovanie systému biobáňk v Slovenskej republike (2018 – 2019), (On the new draft law on biobanking as a part of initiative to build a biobanking system in the Slovak Republic (2018 – 2019)), Part II – provisions on biobanks, Abstract, Medical ethics and bioethics, ME&B 27 (3-4) 2020, ISSN 1335-0560, pp. 6 – 14

In 2022 The Ministry of Health of the Slovak Republic / the Institute of Research and Development / BIOHUB SK drafted the following:

- **update of the legislative amendment to Acts No. 576/2004 Z.z. and 578/2004 Z.z.** in the context of biobanking, which was subsequently revised by the Scientific Board of the Ministry of Health of the Slovak Republic and the biobank consortium (BIOFORD and DIGITAL BIOBANKA projects),
- **other relevant legislative amendments to Act No. 362/2011 Z.z.** (which are an indirect amendment to Act No. 576/2004 Z.z.) also aimed at supporting non-commercial clinical trials in the context of the implementation of the Clinical Trials Regulation (CTR).

The Ministry of Health of the Slovak Republic, **through the Institute of Research and Development as the manager of the domain of intelligent specialization 4: Healthy Society**, which is part of the strategic document of the updated RIS3 (so-called SK RIS3 2021+, approved by RVVTAI in November 2021), identified **re-**

search and development projects in oncology as one of the main topics within its 3 priority areas in the transformation maps of this domain, which are to be financed by EU Funds in the programming period 2021-2027 in the new EDP (the so-called enterprise determination process).

Links:

[Cestovná mapa výskumných infraštruktúr SK VI Roadmap](#)

2020 - 2030

[Cestovná mapa pre akademický klinický výskum](#)

[Vitajte - slovacrin.sk](#)

[Clinical Trials Regulation](#)

6.5. Missions in Horizon Europe

Launched in September 2021, the EU Mission on Cancer will fund a portfolio of activities aimed at tackling the cancer burden and accelerating cancer research and innovation. The main goal of the Mission on Cancer is “to improve the lives of more than 3 million people by 2030 through prevention, treatment and enabling those affected by cancer, including their families, to live longer and better”. Horizon Europe, the main EU program for funding research and innovation in Europe, will support the Mission on Cancer directly with a budget of 378 million euros for the first 3 years of the mission.

In May 2022, the European Commission announced 5 calls for cancer proposals under the Horizon Europe Mission on Cancer.

- 1. Creating the European cancer patients digital center:** The results of the project are intended to support the creation of a new virtual European Cancer Patients Digital Centre (ECPDC). ECPDC is a new initiative to be established as a federated network of patient-controlled (national) health data infrastructures enabling the voluntary exchange of patient and survivor medical data in a standardized approach for primary and secondary use.
- 2. Pragmatic clinical trials to optimize treatment for patients with refractory cancers:** Among other things, it is proposed to conduct randomized or cluster-randomized clinical trials initiated by the academic research sector to provide effective evidence-based treatment interventions to be implemented by health systems.
- 3. Improving the research capacities of Comprehensive Cancer Infrastructures:** It will support the establishment of a capacity-building program bringing together recognized National Comprehensive Cancer Centres to be established through the Europe’s Beating Cancer Plan.
- 4. Improving and expanding primary cancer prevention through implementation research:** Among other things, it addresses primary cancer prevention as well as addressing barriers that affect the effectiveness of primary cancer prevention programs.
- 5. Establishment of National centers for Mission on Cancer and creation of a network to support the Cancer Mission Hub:** This refers to the establishment of national centres of the missions on cancer to be established in EU member states and associated countries.

6.6. Research and Development – Challenges for 2023

Research and Development: Prioritization for 2022 – 2025 (also in the context of the 4th Action Plan, Activity 10: “Onco call”)

- 1. Geographic prioritisation** with the direct support of the Ministry of Health of the Slovak Republic and the Ministry of Education, Science, Research and Sport of the Slovak Republic:
 - a. in university healthcare facilities in cooperation with faculties of medicine (Bratislava, Martin, Košice)
 - b. in specialized cancer healthcare facilities (NCI, NICD, SECI, ESOI)
 - c. in research facilities (SAS, Comenius University Science Park in Bratislava, Biomed in Martin, Medipark in Košice, innovative micro, small and medium enterprises (MSME) including start-ups, spin-offs, and others)
- 2. Prioritization according to diagnoses:**
 - a. based on society-wide severity in terms of incidence (breast cancer, prostate cancer, lung cancer, colorectal cancer)
 - b. based on specific severity in Slovakia (pancreatic cancer)
 - c. based on a long tradition of research in the area (testicular cancer, CNS, malignant lymphomas)
- 3. Priority topics:**
 - a. innovative diagnostics

- b. innovative therapeutic products, processes, and methods
- c. Resistance to treatment
- d. quality of life after cancer treatment, including survivorship care for children and young adults

Other challenges:

- Broaden and strengthen international cooperation
- Implement the concept of clinical and translational research and its gradual implementation in real practice
- Continue supporting the creation of a functional infrastructure of academic clinical research in Slovakia in the form of systemic support for the coordination of clinical research directly in academic clinical trial centers
- Support science and research-related education
- Build a network of biobanks
- Participate in the European project EU4Health, CraNE-JA (Joint Action on EU Network of Comprehensive Cancer Centres)
- Participate in the European project Horizon Europe, ECHoS (Establishing Cancer of Mission Hubs: Networks and Synergies)



7. Accreditation of Study Programs and Education

7.1. Accreditation of the Clinical Oncology Study Program

Professional Guarantor of the Study Program:

prof. Michal Mego, M.D., D.Sc.

Lecturers for theoretical subjects:

Silvia Capíková, MSc. et MSc., PhD.

Assoc. Prof. Ľuboš Drgoňa, M.D., PhD, MHA, FECMM

Eva Chandogová, M.D., PhD., MPH

Assoc. Prof. Michal Chovanec, M.D., PhD.

Assoc. Prof. Jozef Mardiak, M.D., PhD.

Prof. Michal Mego, M.D., D.Sc.

Assoc. Prof. Eva Morovicsová, M.D., PhD., MPH

Prof. Dalibor Ondruš, M.D., D.Sc.

Assoc. Prof. Vojtech Ozorovský, M.D., PhD.

Tomáš Šálek, M.D.

Prof. Stanislav Špánik, M.D., PhD.

Jozef Šufliarsky, M.D., PhD.

Milada Veselá, M.D.

Lecturers for practical subjects:

Assoc. Prof. Michal Chovanec, M.D., PhD.

Assoc. Prof. Ľuboš Drgoňa, M.D., PhD, MHA, FECMM

Assoc. Prof. Viera Lehotská, M.D., PhD.

Assoc. Prof. Jozef Mardiak, M.D., PhD.

Prof. Michal Mego, M.D., D.Sc.

Dr. Patrik Palacka, M.D., PhD., MPH, MBA, LL.M.

Margita Pobjáková, M.D., PhD.

Štefan Pörsök, M.D.

Jana Obertová, M.D., PhD.

Iveta Oravcová, M.D., PhD.

Katarina Rejleková, M.D., PhD.

Tomáš Šálek, M.D.

Jozef Šufliarsky, M.D., PhD.

Milada Veselá, M.D.

Andrej Vranovský, M.D., PhD.

Committee for Board-certification

Chair:

Prof. Michal Mego, M.D., D.Sc., FMCU Bratislava

Committee Members:

Assoc. Prof. Ľuboš Drgoňa, M.D., PhD., MHA, FECMM, FMCU Bratislava

Assoc. Prof. Michal Chovanec, M.D., PhD.

Assoc. Prof. Jozef Mardiak, M.D., PhD., FMCU Bratislava

Prof. Michal Mego, M.D., D.Sc., FMCU Bratislava

Prof. Dalibor Ondruš, M.D., D.Sc., FMCU Bratislava

Tomáš Šálek, M.D., NCI Bratislava

Prof. Stanislav Špánik, M.D., PhD., FMCU Bratislava

Jozef Šufliarsky, M.D., PhD., FMCU Bratislava

Assoc. Prof. Mária Wagnerová, M.D., PhD., ESOI Košice

7.1.1. List of Associate Professors and Professors of Oncology

Assoc. Prof. Ľuboš Drgoňa, M.D., PhD, MHA, FECMM

Assoc. Prof. Lýdia Helpianska, M.D., PhD.

Assoc. Prof. Michal Chovanec, M.D., PhD.

Assoc. Prof. Jozef Mardiak, M.D., PhD.

Prof. Michal Mego, M.D., D.Sc.

Prof. Dalibor Ondruš, M.D., D.Sc.

7.1.2. Board-certified Physicians in 2022

I/ 2022

Martina Džupppová, née Gerová, M.D. Hospital with Policlinic, Prešov

Jana Gomolčáková, M.D., NCI, Bratislava

Veronika Pechová, née Šedíková, M.D. Hospital with Policlinic, Žilina

Alexander Savka, M.D., Roosevelt hospital, Banská Bystrica

Katarína Štefániková, M.D., East Slovakia Oncology Institute, Košice

Lukáš Tarbaj, M.D., Oncological Institute of St. Elizabeth, Bratislava

II/ 2022

Dominik Safčák, M.D., PhD, East Slovakia Oncology Institute, Košice

Ján Solčiansky, M.D., Hospital with Policlinic, Nitra

7.1.3. Finished Post-graduate, Habilitation, and Inaugural Proceedings in 2022

Finished PhD. studies in the Oncology Specialty:

Verona Buociková, M.Sc. – full-time (Biomedical Research Center, SAS)

Pavel Kotouček, M.D. FRCPATH – external (Biomedical Research Center, SAS)

Zuzana Piňáková, M.D. – external (Faculty of Medicine, Comenius University)

7.2. Accreditation of the Pediatric Hematology and Oncology Study Program

Professional Guarantor of the Study Program:

Prof. Alexandra Kolenová, M.D., PhD.

Lecturers for theoretical subjects:

Assoc. Prof. Emília Kaiserová, M.D., PhD., FMCU Bratislava

Prof. Michal Mego, M.D., D.Sc., FMCU Bratislava

Assoc. Prof. Martin Mistrík, M.D., PhD., FMCU Bratislava

Lecturers for practical subjects:

Monika Grešíková, M.D.

Andrea Hrašková, M.D.

Prof. Alexandra Kolenová, M.D., PhD.

Judita Puškáčová, M.D., PhD.

Daniela Sejnová, M.D.

Peter Švec, M.D.

Board-certified Physicians in 2022:

Jaroslava Adamčáková, M.D., National Institute of Children's Disease in Bratislava

Mária Fussiová, M.D., National Institute of Children's Disease in Bratislava

Milan Greš, M.D., Children's Teaching Hospital in Košice

Finished Post-graduate, Habilitation, and Inaugural Proceedings in 2022

Sine

7.3. Accreditation of the Radiation Oncology Study Program

The Radiation Oncology Clinic of the Faculty of Medicine of SMU and SECI provides post-graduate education in Radiation Oncology. Since July 1, 2021, the Head of the Clinic is Martin Chorváth, M.D., PhD., MPH, and employees are Assoc. Prof. Elena Bolješíková, M.D., PhD., Monika Šándorová, M.D., and Katarína Kozmonová, professional instructor.

The structure of post-graduate education in EU countries should follow the provisions of a document approved by the European Union of Medical Specialists (UEMS). The document includes all aspects of the 5-year specialization course and evaluation of understanding. It was published in Radiotherapy and Oncology magazine in December 2019. The European Union of Medical Specialists has also approved a new curriculum of the specialized course in Radiation Oncology.

Professional Guarantor of the Study Program:

Martin Chorváth, M.D., PhD., MPH

Lecturers for theoretical subjects:

Elena Bolješíková, M.D., PhD.

Jozef Greždo, MSc., PhD.

Branislav Bystrický, M.D., PhD., MPH

Assoc. Prof. Pavol Dubinský, M.D., PhD., MHA
Martin Chorváth, M.D., PhD., MPH
Dr. Pavol Kádek, PhD.
Dr. Karol Kleimann, PhD.
Andrea Ligačová, M.D.
Pavol Lukačko, M.D.
Monika Šandorová, M.D.
Prof. Stanislav Špánik, M.D., PhD.
Monika Švantnerová, M.D.
Martina Vorobjov, M.D.

Lecturers for practical subjects:

Elena Bolješiková, M.D., PhD.
Jozef Greždo, MSc., PhD.
Martin Chorváth, M.D., PhD., MPH
Andrea Ligačová, M.D.
Pavol Lukačko, M.D.
Vladimír Malec, M.D., PhD.
Margita Pobijaková, M.D., PhD.
Monika Šandorová, M.D.
Monika Švantnerová, M.D.
Martina Vorobjov, M.D.

Committee for Board-certification

Chair:

Martin Chorváth, M.D., PhD., MPH

Members:

Elena Bolješiková, M.D., PhD.
Jozef Greždo, MSc., PhD.
Monika Šandorová, M.D.
Prof. Stanislav Špánik, M.D., PhD.

Board-certified Physicians in 2022:

Kristína Čelková, M.D.

7.4. Specialization in Palliative Medicine

Specialization in palliative medicine is done at the Slovak Medical University in Bratislava and the teaching base is the Department of Clinical Oncology F – Palliative Medicine at the 2nd Oncology Clinic of the Faculty of Medicine of Comenius University and National Cancer Institute. The department had been led by Kristína Križanová, M.D. since its establishment until January 1, 2019, when she was replaced by Andrea Škripeková, M.D., PhD. The pedagogic team at the department got a new member in 2021, Peter Stachura, M.D., as well as one in 2022, Lucia Dzurillová, M.D. The specialization course begins with an academic year according to the study plan. It consists of both theory and practice; the majority of education is practical. The specialization course is finished by an exam in front of a commission which includes a thesis defense. As of 2022, the written thesis comprises of preparing 10 casuistics.

In 2016, the Department of Palliative Medicine of the Faculty of Medicine of the Slovak Medical University in Bratislava was granted accreditation in the specialized field of Palliative Medicine for the medical profession of physician in 2016. In connection with the COVID-19 pandemic, the validity of the accreditation certificate was extended under Section 102 of Act No. 578/2004 Z.z. With effect from December 15, 2022, updated minimum standards were published for the further education of healthcare workers, including for the specialty field of Palliative Medicine. Subsequently, the intention is to reaccredit the Specialization Study Program. The main change in the minimum standard was the expansion of medical specializations, which can be followed by specialised studies in the specialized field of Palliative Medicine. From 15 December 2022, these include Anesthesiology and Intensive Care Medicine, Gastroenterology, Surgery, Endocrinology, Diabetology, Metabolic and Nutritional Disorders, Geriatrics, Hematology and Transfusionology, Hepatology, Infectology, Cardiology, Clinical Oncology, Otorhinolaryngology, Radiation Oncology, Nephrology, Neurology, Pediatrics, Pediatric Anesthesiology, Pediatric Hematology and Oncology, Pediatric Intensive Care Medicine, Psychiatry, Pulmonology and Phthisiology, Radiology, Rheumatology, Emergency Medicine, Internal Medicine, or General Medicine.

Education in Palliative Medicine at the Department of Palliative Medicine should be based on three principles:

A) High-quality theoretical education. Currently, a 5-day specialization course in three modules is held twice a year. The modules are

defined in the time-thematic plan, which is part of the Department's accreditation.

- B) Mentoring during practical education. It consists of an individual approach to individual case studies, taking into account the personality, particularity, and autonomy of the patient as a human being in a serious clinical situation where death is a medically relevant outcome of the given clinical situation. It creates a symbiosis with high demands on medical honesty and the provision of medical information to patients and their relatives. It determines the boundaries between medical and ethical decision-making in difficult clinical situations. It takes into account a multi-professional approach when, after physical difficulties have been alleviated, other domains of human suffering are revealed (existential, social, spiritual distress, etc.), and thus a team cooperation of health workers and helping professions (psychologist, nutritional therapist, spiritual, special or healing teachers and others).
- C) Creating a community environment for specialists with the aim of knowledge and experience sharing.

With the adoption of legislative changes in Slovakia and a change in the emphasis on the need to implement Palliative Care into the health system in the perception of political elites and the Ministry of Health of the Slovak Republic, we anticipate an increase in interest in this specialization. However, due to the implementation issues of the legal changes, it is not possible to assume that the increase will be similar to that in Germany. So far, 27 physicians have passed the specialization exam, while in 2022 a record-breaking 8 physicians

were certified. In the course of 2022, 9 physicians were enrolled in the specialization, that is, 42 physicians are still enrolled. However, only a part of the 27 certified physicians works in the health system, mainly due to the situation and payment conditions for Palliative Care.

Institute for Education in Palliative Medicine (IEPM)

The Institute for Education in Palliative Medicine (IEPM) is an NGO that aims to promote the development of palliative medicine in Slovakia. The association organizes and supports educational activities

for physicians, nurses, psychologists, social workers, and other healthcare and helps professionals involved in the care of patients with incurable, progressive, life-threatening diseases. IEPM also supports the development of mobile hospices, hospices, palliative teams, and departments in hospitals. It encourages the participation of physicians and nurses in educational events in Slovakia and abroad and provides financial and material support to mobile hospice teams. Training for community nurses focused on nursing care for dying patients at home is planned for the future.

7.5. Education

7.5.1. Domestic Expert Events supervised by SOS, SSRO, Slovak Society of Hematology, and LySK in 2022:

Date	Event	Place
18 – 19 February 2022	Current developments in Hematology	Piešťany
1 – 2 April 2022	3rd Annual Slovak Head and Neck Cancer Cooperative Group meeting	Hotel Jánošík, Liptovský Mikuláš
25 – 26 March 2022	Lymphoma forum 2022	Park Inn by Radisson Danube, Bratislava/ONLINE
8 – 9 April 2022	XXV. meeting of pediatric hematologists, transfusion specialists and oncologists	Bratislava
13 May 2022	ONKO spectrum 2022	Hotel Partizán, Bystrá – Tále
20 – 21 May 2022	5th Slovak Society of Radiation Oncology Conference	Hotel Yasmin, Košice
2 – 3 June 2022	27th SEKCAMA SOS SLS international conference	Hotel Bratislava, Bratislava
10 – 11 June 2022	Banská Bystrica Oncology Days 2022	Residence Hotel, Donovaly
24 June 2022	13th News from ASCO	Bratislava
10 August 2022	Conversations about Lung Cancer	National Oncology Institute, Klenová 1, Bratislava

13 – 16 September 2022	XXVIII. Czech-Slovak Conference on Thrombosis and Hemostasis and XX. Czech-Slovak Conference of Laboratory Hematology	Hradec Králové
22 – 24 September 2022	Young Oncologists' Days 2022	Hotel Tenis, Zvolen
13 – 14 October 2022	LIX. Bratislava Oncology Days 2022	Hotel Saffron, Bratislava
20 – 22 October 2022	Košice Hematology and Transfusion Days (KHaTD) with international participation	Košice
11 November 2022	6th Slovak Palliative Medicine Society conference	Hotel Color, Pri Starom mýte 1, Bratislava

7.5.2. Selected International Events in 2022:

Date	Event	Place
20 – 22 January 2022	ASCO Gastrointestinal Cancer Symposium	San Francisco, USA
26 – 28 January 2022	13th Prague Interdisciplinary Oncology Colloquium	Prague, Czech Republic
1 – 4 July 2022	EAU 2022	Amsterdam/ONLINE
17 – 19 February 2022	ASCO Genitourinary Cancer Symposium	San Francisco, USA
19 – 23 March 2022	EBMT Annual meeting 2022	Prague/ONLINE
31 March – 2 April 2022	XXVII. South Czechia Oncology Days 2022	Jízdárna Český Krumlov
6 – 10 May 2022	ESTRO 2022	Copenhagen, Denmark
3 – 7 June 2022	ASCO Annual Meeting	Chicago, USA
6 – 9 August 2022	World Lung Cancer Conference	Vienna, Austria
9 – 13 September 2022	ESMO Annual Conference	Paris, France
12 – 14 October 2022	46th Brno Oncology Days	Brno, Czech Republic
23 – 26 October 2022	ASTRO	San Antonio, USA
16 – 17 November 2022	European Cancer Summit 2022	Brussels/ONLINE
6 – 10 December 2022	San Antonio Breast Cancer Symposium (SABCS)	San Antonio, USA
10 – 13 December 2022	American Society of Hematology Annual Conference	New Orleans, Louisiana, USA

7.5.3. Domestic and International Expert Events in Pediatric Oncology in 2022:

Date	Event
19 January 2022	ALL International Leukemia Working group meeting
10 February 2022	Slovak Blastshow seminar
17 February 2022	Meeting of ALL/AEIOB/BFM/ centers – ONLINE
April 2022	Slovak Conference of Pediatric Hematologists, Oncologists and Transfusiologists
23 March – 25 March 2022	SIOP Europe Conference, Valencia, Spain – ONLINE
17 September – 19 September 2022	Czech – Slovak Pediatric Oncologists and Hematologists Conference, Pilsen, Czech Republic
28 September – 1 October 2022	SIOP, Barcelona, Spain
10 December – 13 December 2022	ASH, USA/ONLINE
January, March, June, October, December 2022	CHOP videoconference, USA/ONLINE

7.5.4. Other Opportunities for Education

Masterclass in Clinical Oncology

approximately 60 participants, a free interactive workshop about clinical oncology, and an overview of oncology lectured by world-renowned experts; participants must send their CV, motivation letter, case study, and recommendation from their supervisor; travel expenses are not reimbursed.

More information at: www.eso.net

ESMO Masterclass

approximately 40 participants, focused on traditional research
More information at: www.esmo.org

Methods in Clinical Cancer Research (predtým Flims Protocol Development Workshop)

approximately 80 participants, a paid workshop focused on clinical research in oncology; participants must send their CV, motivation letter, protocol proposal, and recommendation from their supervisor; travel expenses are included in the registration fee

www.event.eortc.org, www.esmo.org

Salzburg Oncology Seminar

one-week-long oncology seminar; participants must send their CV, motivation letter, and recommendation from their supervisor

<https://www.omc.sk/>

ESMO fellowships

možné prihlásenie v termínoch viac krát za rok, rôzna dĺžka stáže a zameranie

www.esmo.org

UICC fellowships

applications can be sent several times per year for fellowships of different duration and focus

www.uicc.org/what-we-do/capacity-building/grants/fellowships

NOI grant

intended for short-term fellowships abroad; calls are open twice a year (January-March, June-August), grants are awarded in a competition based on evaluation by independent NOI Scientific Council; applicants must send a motivation letter, CV, recommendation from their home institution, and acceptance letter from the receiving institution with specified dates when the fellowship will take place

www.noisk.sk/professional/research-and-development/noi-grants

Education in Oncohematology

Slovak hematology portal (www.hematology.sk)

Education in Radiation Oncology

There are now more ESTRO courses offered, covering several aspects of radiation oncology, most of the specialization curriculum, and representing an important source of information for CME. ESTRO website offers a few dozen courses, mainly online, for the time being, link:

<https://www.estro.org/Courses>.

7.6. Challenges for 2023

7.6.1. Planned Domestic Expert Events supervised by SOS and SSRO in 2023:

Date	Event	Place
TBD	Symposium based on collaboration between National Cancer Institute in Bratislava and Indiana University, Simon Comprehensive Cancer Centre in Indianapolis, USA	National Cancer Institute, Klenová 1, Bratislava
3 February – 4 February 2023	Hematology news	Bratislava
9 February – 10 February 2023	Slovak Head and Neck Cancer Cooperative Group Conference	Hotel Jánošík, Liptovský Mikuláš
10 February – 11 February 2023	14th Annual Young Hematologists	Dolný Kubín
3 March 2023	The Role of Spirituality in cancer patients	National Cancer Institute, Klenová 1, Bratislava
7 March 2023	Patient-focused continuum of scientific research	CVTI SR, Lamačská cesta 8/A, Bratislava/ ONLINE
31 March – 1 April 2023	Lymphoma Forum 2023	Park Inn by Radisson Danube, Bratislava/ ONLINE
27 April – 28 April 2023	Workshop for Oncology Clinical Trials	MoH SR, Limbová 2, Bratislava

25 May – 26 May 2023	28th International SEKCAMA Work Conference	Lindner hotel, Bratislava
14 June – 16 June 2023	Bardejov Oncology days 2023	Bardejovské Kúpele (Bardejov spa)
23 June 2023	15th NEWS from ASCO	Park Inn hotel, Rybné námestie 1, Bratislava
21 September – 23 September 2023	Banská Bystrica Hematology Days	Tále
21 September – 23 September 2023	19th Young Oncologists' Days	Grandhotel Praha, Tatranská Lomnica
4 October – 6 October 2023	LX. Bratislava Oncology Days 2023	Hotel Saffron, Bratislava
19 October 2023	Statistic Audit of Mammography Screening in Practice in 2022	MoH SR, Limbová 2, Bratislava, Conference room 152

7.6.2. Planned International Events in 2023:

Date	Event	Place
20 October – 24 October 2023	ESMO Annual Meeting 2023	Madrid, Spain
1 November – 3 November 2023	46th Brno Oncology Days	Brno, Czech Republic
16 February – 18 February 2023	ASCO Genitourinary Cancer Symposium	San Francisco, USA
10 March – 13 March 2023	EAU 2023	Milan, Italy
19 January – 21 January 2023	ASCO Gastrointestinal Cancer Symposium	San Francisco, USA

23 April – 26 April 2023	EBMT Annual meeting 2023	Paris, France + online
25 January – 27 January 2023	14th Prague Interdisciplinary Oncology Colloquium	Prague, Czech Republic
2 June – 6 June 2023	ASCO Annual Meeting	Chicago, IL, USA
9 September – 12 September 2023	World Lung Cancer Conference	Singapore
30 March – 1 April 2023	XXVII. South Czechia Oncology Days 2023	Jízdárna Český Krumlov
9 December – 12 December 2023	American Society of Hematology Annual Conference	San Diego, California, USA /ONLINE

7.6.3. Planned Domestic and International Expert Events in Pediatric Oncology in 2023:

Date	Event
16 January – 17 January 2023	ALL International Leukemia Working group meeting
20 January – 21 January 2023	Transplantation unit of KDHO Bratislava – Prague seminar
24 January 2023	CHOP videoconference, USA/ONLINE
12 February 2023	Meeting of ALL/AEIO/BFM/ centers – ONLINE
13 March – 15 March 2023	Palliative Care Seminar, Senec
31 March 2023	Slovak Conference of Pediatric Hematologists, Oncologists and Transfusiologists

24 April – 26 April 2023	Staff Education Senec – Basal stimulation – Extension course
4/2023	Blastshow seminar
23 April – 26 April 2023	EBMT, Paris, France
8 May – 12 May 2023	SIOP Europe conference, Valencia, Spain
15. May – 16 May 2023	CHOP USA CEE workshop, Bratislava
1 June – 3 June 2023	CLEAR meeting on Acute Toxicity in ALL, Copenhagen, Denmark
16 June – 18 June 2023	Midsummer meeting, Poland
21 June – 23 June 2023	Renal Tumor Group, Wroclaw, Poland
20 September – 22 September 2023	29. annual PanCare meeting
19 October – 21 October 2023	Czech – Slovak Pediatric Oncologists and Hematologists Conference, Pilsen, Czech Republic
11 October – 15 October 2023	SIOP, Ottawa, Canada
December 2023	ASH, USA
January, March, June, October, December 2023	CHOP videoconference, USA/ONLINE



8. Publication Activity in 2022

8.1. In extenso Publications in Foreign Journals with Impact Factor

	Publications <i>in extenso</i>	Abstracts at international conferences
Genitourinary malignancies	20	3
Breast cancer	4	2
Hematologic malignancies	7	0
Lung malignancies	1	0
Other	8	1
Gastrointestinal malignancies	2	0
Sarcoma	1	0

Publications in Foreign Journals Registered in Pubmed/ Medline Database

Clinical oncologist*	First / last author	Co-author	Total
Beržinec P	0	2	2
Chovanec M	4	12	16
De Angelis V	0	4	4
Drgoňa L	0	8	8
Hapáková N	2	1	3
Kašperová B	0	2	2
Leško P	1	1	2
Mardiak J	0	8	8
Mego M	12	13	25
Miskovska V	0	2	2
Mriňáková B	0	2	2
Obertová J	0	10	10
Ondruš D	0	2	2
Országhová Z	1	1	2
Palacka P	5	8	13
Rečková M	2	1	3
Rejlekova K	1	6	7
Slopovský J	0	6	6
Syčová-Milá Z	0	6	6

*Author/co-author of at least 2 papers

Genitourinary malignancies

- Chovanec M, Cheng L. Advances in diagnosis and treatment of testicular cancer. *BMJ*. 2022 Nov 28;379:e070499.
- Chovanec M, Adra N, Abu Zaid M, Abonour R, Einhorn L. High-dose chemotherapy for relapsed testicular germ cell tumours. *Nat Rev Urol*. 2022 Dec 7. doi: 10.1038/s41585-022-00683-1. Epub ahead of print.
- Hires M, Jane E, Kalavska K, Chovanec M, Mego M, Kasak P, Bertok T, Tkac J. Glycan signatures for the identification of cisplatin-resistant testicular cancer cell lines: Specific glycoprofiling of human chorionic gonadotropin (hCG). *Cancer Med*. 2022, 11(4):968-982.
- Palacka P, Gvozdjakova A, Rausova Z, Kucharska J, Slopovsky J, Obertova J, Furka D, Furka S, Singh KK, Sumbalova Z. Platelet Mitochondrial Bioenergetics Reprogramming in Patients with Urothelial Cancer. *Int J Mol Sci*. 2021 Dec 30;23(1):388.
- Timmerman DM, Eleveld TF, Sriram S, Dorssers LCJ, Gillis AJM, Schmidtova S, Kalavska K, van de Werken HJG, Oing C, Honecker F, Mego M, Looijenga LHJ. Chromosome 3p25.3 Gain Is Associated With Cisplatin Resistance and Is an Independent Predictor of Poor Outcome in Male Malignant Germ Cell Tumors. *J Clin Oncol*. 2022 Apr 20;JCO2102809.
- Kalavska K, Sestakova Z, Mlcakova A, Gronesova P, Miskovska V, Rejlekova K, Svetlovska D, Sycova-Mila Z, Obertova J, Palacka P, Mardiak J, Chovanec M, Chovanec M, Mego M. Comprehensive Assessment of Selected Immune Cell Subpopulations Changes in Chemotherapy-Naïve Germ Cell Tumor Patients. *Front Oncol*. 2022 Mar 11;12:858797.

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- Kalavska K, Sestakova Z, Mlcakova A, Gronesova P, Miskovska V, Rejlekova K, Svetlovska D, Sycova-Mila Z, Obertova J, Palacka P, Mardiak J, Chovanec M, Chovanec M, Mego M. Detection of Specific Immune Cell Subpopulation Changes Associated with Systemic Immune Inflammation-Index Level in Germ Cell Tumors. *Life (Basel)*. 2022 May 2;12(5):678
- Orszaghova Z, Kalavska K, Mego M, Chovanec M. Overcoming Chemotherapy Resistance in Germ Cell Tumors. *Biomedicines*. 2022 Apr 22;10(5):972.
- Lesko P, Chovanec M, Mego M. Biomarkers of disease recurrence in stage I testicular germ cell tumours. *Nature Reviews Urology* 2022 Aug 26.
- Hapakova N, Chovanec M, Rejlekova K, Kalavska K, Obertova J, Palacka P, De Angelis V, Svetlovska D, Sycova-Mila Z, Mardiak J, Mego M. Effects of primary granulocyte-colony stimulating factor prophylaxis on the incidence of febrile neutropenia in patients with germ cell tumors. *Oncol Lett*. 2022 Jul 13;24(3):308.

- Palacka P, Janega P, Polakova H, Slopovsky J, De Angelis V, Mego M. Pericardial malignant infiltration as the cause of sudden death of a patient with metastatic urothelial cancer treated with atezolizumab. *BMC Urol*. 2022 Jul 18;22(1):108.
- Rejlekova K, Kalavska K, Makovnik M, Hapakova N, Chovanec M, De Angelis V, Obertova J, Palacka P, Sycova-Mila Z, Mardiak J, Mego M. Factors Associated with Choriocarcinoma Syndrome Development in Poor-Risk Patients with Germ Cell Tumors. *Front Oncol*. 2022 Jun 17;12:911879.
- Mego M, Svetlovska D, Angelis V D, Kalavska K, Lesko P, Makovnik M, Obertova J, Orszaghova Z, Palacka P, Reckova M, Rejlekova K, Sycova-Mila Z, Mardiak J, Chovanec M. Phase II study of Disulfiram and Cisplatin in Refractory Germ Cell Tumors. The GCT-SK-006 phase II trial. *Invest New Drugs*. 2022 Oct;40(5):1080-1086.
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18. Schmidtova S, Udworkova N, Cierna Z, Horak S, Kalavska K, Chovanec M, Rojikova L, Vulevova M, Kucerova L, Mego M. Effect of the PARP inhibitor veliparib on germ cell tumor cell lines. *Oncol Lett.* 2022 Sep 21;24(5):392.
19. Kajo K, Benko J, Macháleková KK, Vallová M, Ondruš D. Cystic trophoblastic tumour of the testis: Case report. *Cesk Patol.* 2022 Fall;67(4):212-216.
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21. Dieckmann KP, Pokrivcak T, Geczi L, Niehaus D, Dralle-Filiz I, Matthies C, Dienes T, Zschäbitz S, Paffenholz P, Gschliesser T, Pichler R, Mego M, Bader P, Zengerling F, Heinzlbecker J, Krausewitz P, Krege S, Aurilio G, Aksoy C, Hentrich M, Seidel C, Törzsök P, Nestler T, Majewski M, Hiester A, Buchler T, Vallet S, Studentova H, Schönburg S, Niedersüß-Beke D, Ring J, Trenti E, Heidenreich A, Wülfling C, Isbarn H, Pichlmeier U, Pichler M. Single-course bleomycin, etoposide, and cisplatin (1xBEP) as adjuvant treatment in testicular nonseminoma clinical stage 1: outcome, safety, and risk factors for relapse in a population-based study. *Ther Adv Med Oncol.* 2022 Mar 31;14:17588359221086813. doi: 10.1177/17588359221086813. PMID: 35386956; PMCID: PMC8977693.

Breast cancer

1. Mego M, Vlkova B, Minarik G, Cierna Z, Karaba M, Benca J, Sedlackova T, Cholujova D, Gronesova P, Kalavska K, Pindak D, Mardiak J, Celec P. Vitamin D and circulating tumor cells in primary breast cancer. *Front Oncol.* 2022 Sep 7;12:950451.
2. Tankova T, Senkus E, Beloyartseva M, Borštnar S, Catrinou D, Frolova M, Hegmane A, Janež A, Krnić M, Lengyel Z, Marcou Y, Mazilu L, Mrinakova B, Percik R, Petrakova K, Rubovszky G, Tokar M, Vrdoljak E. Management Strategies for Hyperglycemia Associated with the α -Selective PI3K Inhibitor Alpelisib for the Treatment of Breast Cancer. *Cancers (Basel).* 2022 Mar 22;14(7):1598. doi: 10.3390/cancers14071598. PMID: 35406370; PMCID: PMC8997133.
3. Rubovszky G, Kocsis J, Boér K, Chilingirova N, Dank M, Kahán Z, Kaidarova D, Kövér E, Krakovská BV, Máhr K, Mriňáková B, Pikó B, Božović-Spasojević I, Horváth Z. Systemic Treatment of Breast Cancer. 1st Central-Eastern European Professional Consensus Statement on Breast Cancer. *Pathol Oncol Res.* 2022 Jul 11;28:1610383. doi: 10.3389/pore.2022.1610383. Erratum in: *Pathol Oncol Res.* 2023 Jan 31;29:1610954.
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Sarcoma

1. Schöffski P, Kubickova M, Wozniak A, Blay JY, Strauss SJ, Stacchiotti S, Switaj T, Bücklein V, Leahy MC, Italiano A, Isambert N, Debiec-Rychter M, Sciort R, Lee CJ, Speetjens FM, Nzokirantevye A, Neven A, Kasper B. Long-term efficacy update of crizotinib in patients with advanced, inoperable inflammatory myofibroblastic tumour from EORTC trial 90101 CREATE. *Eur J Cancer.* 2021 Oct;156:12-23. doi: 10.1016/j.ejca.2021.07.016. Epub 2021 Aug 13.

Gastrointestinal malignancies

1. Shah MA, Udrea AA, Bondarenko I, Mansoor W, Sánchez RG, Sariosiek T, Bozzarelli S, Schenker M, Gomez-Martin C, Morgan C, Özgüroğlu M, Pikiel J, Kalofonos HP, Wojcik E, Buchler T, Swinson D, Cicin I, Joseph M, Vynnychenko I, Luft AV, Enzinger PC, Salek T, Papandreou C, Tournigand C, Maiello E, Wei R, Ferry D, Gao L, Oliveira JM, Ajani JA. Evaluating Alternative Ramucirumab Doses as a Single Agent or with Paclitaxel in Second-Line Treatment of Locally Advanced or Metastatic Gastric/Gastroesophageal Junction Adenocarcinoma: Results from Two Randomised, Open-Label, Phase II Studies. *Cancers (Basel).* 2022 Feb 24;14(5):1168.
2. Safcak D, Drazilova S, Gazda J, Andrasina I, Adamcova-Selcanova S, Balazova L, Barilla R, Mego M, Rac M, Skladany L, Zigrai M, Janicko M, Jarcuska P. Inflammatory Indexes as Prognostic Factors of Survival in Geriatric Patients with Hepatocellular Cancer: A Case Control Study of Eight Slovak Centres. *J Clin Med.* 2022 Jul 19;11(14):4183.

Lung cancer

1. Chowanecova G, Berzinec P, Kosturiakova G, Plank L, Farkasova A, Sekeresova M, Juskanic D, Ondrus D. An EGFR-mutant lung adenocarcinoma that transformed into small-cell lung cancer. A case report. *Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub.* 2022 Aug 23.

Hematologic malignancies

1. Busca A, Salmanton-García J, Corradini P, Marchesi F, Cabrita A, Di Blasi R, Dulery R, Lamure S, Farina F, Weinbergerova B, Batinic J, Nordlander A, Lopez-Garcia A, Drgona L, Espigado I, Falces-Romero I, Garcia-Sanz R, Garcia-Vidal C, Guidetti A, Khanna N, Kulesekararaj A, Maertens J, Hoenigl M, Klimko N, Koehler P, Pagliuca A, Passamonti F, Cornely O, Pagano L. COVID-19 and CAR-T cells: current challenges and future directions -a report from the EPICOVIDEHA survey by EHA-IDWP. *Blood Adv.* 2021 Nov 8;bloodadvances.2021005616.
2. Stemler J, Drgona L. EHA endorsement of the global guideline for the diagnosis and management of rare yeast infections: an initiative of the European Confederation of Medical Mycology in cooperation with the International Society for Human and Animal Mycology and American Society for Microbiology Hemasphere. 2021 Sep 30;5(10):e644
3. Albasanz-Puig A, Durà-Miralles X, Laporte-Amargós J, Mussetti A, Ruiz-Camps I, Puerta-Alcalde P, Abdala E, Oltolini C, Akova M, Montejo JM, Mikulska M, Martín-Dávila P, Herrera F, Gasch O, Drgona L, Morales HMP, Brunel AS, García E, Isler B, Kern WV, Re-

tamar-Gentil P, Aguado JM, Montero M, Kanj SS, Sipahi OR, Calik S, Márquez-Gómez I, Marin JI, Gomes MZR, Hemmati P, Araos R, Peghin M, Del Pozo JL, Yáñez L, Tilley R, Manzur A, Novo A, Pallarès N, Bergas A, Carratalà J, Gudiol C, On Behalf Of The Ironic Study Group. Effect of Combination Antibiotic Empirical Therapy on Mortality in Neutropenic Cancer Patients with *Pseudomonas aeruginosa* Pneumonia Microorganisms. 2022 Mar 29;10(4):733.

4. Nemethova V, Mazancova P, Selc M, Jakic K, Uhelska L, Nemethova B, Poturnayova A, Drgona L, Babelova A, Razga F. Effective Reduction of SARS-CoV-2 RNA Levels Using a Tailor-Made Oligonucleotide-Based RNA Inhibitor Viruses. 2022 Mar 25;14(4):685.
5. Bergas A, Albasanz-Puig A, Fernández-Cruz A, Machado M, Novo A, van Duin D, Garcia-Vidal C, Hakki M, Ruiz-Camps I, Del Pozo JL, Oltolini C, DeVoe C, Drgona L, Gasch O, Mikulska M, Martín-Dávila P, Peghin M, Vázquez L, Laporte-Amargós J, Durà-Miralles X, Pallarès N, González-Barca E, Álvarez-Uría A, Puerta-Alcalde P, Aguilar-Company J, Carmona-Torre F, Clerici TD, Doernberg SB, Petrikova L, Capilla S, Magnasco L, Fortún J, Castaldo N, Carratalà J, Gudiol C. Real-Life Use of Ceftolozane/Tazobactam for the Treatment of Bloodstream Infection Due to *Pseudomonas aeruginosa* in Neutropenic Hematologic Patients: a Matched Control Study (ZENITH Study) Microbiol Spectr. 2022 Apr 27:e0229221.
6. Maertens J, Lodewyck T, Peter Donnelly J, Chantepie S, Robin C, Blijlevens N, Turlure P, Selleslag D, Baron F, Aoun M, Heinz WJ, Bertz H, Ráčil Z, Vandercam B, Drgona L, Coiteux V, Llorente CC, Schaefer-Prokop C, Paesmans M, Ameye L, Meert L, Cheung KJ, Hepler DA, Loeffler J, Barnes R, Marchetti O, Verweij P, Lamoth

F, Bochud PY, Schwarzinger M, Cordonnier C; Infectious Diseases Group; Acute Leukemia Group of the European Organization for Research and Treatment of Cancer (EORTC). Empiric versus pre-emptive antifungal strategy in high-risk neutropenic patients on fluconazole prophylaxis: a randomised trial of the European organization for Research and Treatment of cancer (EORTC 65091). Clin Infect Dis. 2022 Jul 30

7. Royo-Cebrecos C, Laporte-Amargós J, Peña M, Ruiz-Camps I, Puerta-Alcalde P, Abdala E, Oltolini C, Akova M, Montejo M, Mikulska M, Martín-Dávila P, Herrera F, Gasch O, Drgona L, Morales HMP, Brunel AS, García E, Isler B, Kern WV, Palacios-Baena ZR, de la Calle GM, Montero MM, Kanj SS, Sipahi OR, Calik S, Márquez-Gómez I, Marin JI, Gomes MZR, Hemmati P, Araos R, Peghin M, Del Pozo JL, Yáñez L, Tilley R, Manzur A, Novo A, Carratalà J, Gudiol C; IRONIC study group. *Pseudomonas aeruginosa* Bloodstream Infections in Patients with Cancer: Differences between Patients with Hematological Malignancies and Solid Tumors Pathogens. 2022 Sep 30;11(10):1132.

Other

1. Palacka P, Slopovsky J, Makovnik M, Kajo K, Obertova J, Mego M. A case report of a patient with inoperable primary diffuse leptomeningeal melanomatosis treated with whole-brain radiotherapy and pembrolizumab. Medicine (Baltimore). 2022;101(3):e28613.
2. Sevcikova A, Izoldova N, Stevurkova V, Kasperova B, Chovanec M, Ciernikova S, Mego M. The impact of the microbiome on resist-

ance to cancer treatment with chemotherapeutic agents and immunotherapy. Int J Mol Sci. 2022;23(1):488.

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4. Thallinger C, Berzinec P, Bicakcic E, Dan A, Fabian G, Gales LN, Kuhar CG, Janzic U, Kahan Z, Mencinger M, Penthedourakis G, Sgouros J, Simetic L, Sirbu D, Vosmik M, Wrona A, Zielinski C. Establishment of a virtual transborder tumor board for cancer patients in Central and Southeastern Europe: An initiative of the Central European Cooperative Oncology Group (CECOG) Wien Klin Wochenschr. 2022 Mar 21:1-8.
5. Vacula I, Rusiňáková Z, Čelovská D, Jackuliak P, Slopovský J, Palacka P, Moščovič M, Špánik S, Staško J, Wild A, Bátorová A, Arič JM. Prevention and treatment of cancer associated venous thromboembolism - interdisciplinary consensus. Vnitr Lek. 2022 Fall;68(4):221-226.
6. Ciernikova, S., Sevcikova, A., Stevurkova, V., Mego M. Tumor microbiome - an integral part of the tumor microenvironment. Frontiers in oncology 2022, 12, 1063100.
7. Nikolaieva, N., Sevcikova, A., Omelka, R., Martiniakova, M., Mego M., Ciernikova, S. Gut Microbiota-MicroRNA Interactions in Intestinal Homeostasis and Cancer Development. Microorganisms 2022, 11(1), 107.

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9. Reckova M, Mladosevicova B. An ongoing evolution of cardio-oncology with the rapid development of modern immunotherapy. Int J Cardiol. 2022 Jan 15;347:60-61. doi: 10.1016/j.ijcard.2021.11.028. Epub 2021 Nov 16. PMID: 34798210.

10. Danis R, Mego M, Antonova M, Stepanova R, Svobodnik A, Hejnova R, Wawruch M. Orally Administered Probiotics in the Prevention of Chemotherapy (± Radiotherapy)-Induced Gastrointestinal Toxicity: A Systematic Review With Meta-Analysis of Randomised Trials. Integr Cancer Ther. 2022 Jan-Dec;21:15347354221144309. doi: 10.1177/15347354221144309. PMID: 36567453; PMCID: PMC9806400.

11. Zomborska E, Kasperova S, Slopovsky J, Pazderová N, Kasperova B, Penz P, Nyitrayová O, Salek T, Porsok S, Mladosevicova B, Mego M. Fatal myocarditis after the first dose of nivolumab. Klin Onkol. 2022 Fall;35(6):486-492. English. doi: 10.48095/ccko2022486. PMID: 36513516.

8.2. In extenso Publications in Foreign Journals – Pediatric Oncology/Hematology

	<i>in extenso</i> publications	Abstracts at international conferences
Pediatric Oncology / Hematology	3	13

Počet publikácií v zahraničných časopisoch registrovaných v databáze Pubmed/Medline

Pediatric Oncologist / Hematologist*	First / last author	Co-author	Total
Kolenová A	0	3	3

*Author/co-author of at least 2 papers

- Achbergerová, M., Hederová, S., Hrašková, A., & Kolenová, A. (2022). Dinutuximab beta in the treatment of high-risk neuroblastoma: A follow-up of a case series in Bratislava. *Medicine*. 2022; 101(4): e28716.
- Bertrums, E. J. M., Zwaan, C. M., Hasegawa, D., De Haas, V., Reinhardt, D. N., Locatelli, F., De Moerloose, B., Dworzak, M., Buijs, A., Smisek, P., Kolenova, A., Pronk, C. J., Klusmann, J. H., Carboné, A., Ferster, A., Antoniou, E., Meshinchi, S., Raimondi, S. C., Niemeyer, C. M., Hasle, H., van den Heuvel-Eibrink M.M., Goemans, B. F. Guideline for management of non-Down syndrome neonates with a my-

eloproliferative disease on behalf of the I-BFM AML Study Group and EWOG-MDS. *Haematologica*. 2022; 107(3): 759–764.

- Ugrayová, S., Švec, P., Hric, I., Šardzíková, S., Kubáňová, L., Penesová, A., Adamčáková, J., Pačesová, P., Horáková, J., Kolenová, A., Šoltys, K., Kolisek, M., & Bielik, V. Gut Microbiome Suffers from Hematopoietic Stem Cell Transplantation in Childhood and Its Characteristics Are Positively Associated with Intra-Hospital Physical Exercise. *Biology*. 2022; 11(5): 785.

8.3. Publication Activities of BMC SAS in Oncology in 2022

Chapters in scientific monographs published in foreign publishing houses

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9. International Cooperation

9.1. Current situation

In 2022, we continued the existing international cooperation, in which foreign internships were successfully completed and new cooperation with other foreign workplaces was established. The 2nd Oncology Clinic of the Faculty of Medicine of Comenius University and NCI collaborated with the **University of Texas, MD Anderson Cancer Centre** in Houston, Texas, USA, in research on circulating tumor cells in breast cancer. In the field of germinal testicular tumors, the collaboration with **Erasmus MC, University Medical Centre** in Rotterdam, the Netherlands, which is aimed at identifying new biomarkers, treatment targets, and mechanisms of resistance to chemotherapy, continued. In this area, cooperation also took place with the **Istituto Scientifico Romagnolo per lo Studio e la Cura dei Tumori (IRST)** in Meldola.

Another cooperation focused on testicular cancer was conducted with the **Indiana University Melvin and Bren Simon Cancer Centre, Indiana, USA**. This cooperation focused on sharing knowledge about

the implementation of life-saving high-dose chemotherapy with peripheral blood stem cell transplantation. In connection with this project, a physician from NCI completed an educational internship at **Indiana University** in 2022. By signing the memorandum, formal international cooperation between Indiana University and the **National Cancer Institute** for the purpose of bilateral educational activities began. Pursuant to this memorandum, the 1st international conference on lung tumors was held, at which the leading expert, Prof. Nasser Hanna of Indiana University held a lecture.

National Cancer Institute applied for membership in the **Hoosier Cancer Research Network** cooperation group which conducts investigator-initiated clinical trials. Acceptance into the group was negotiated and pledged, and legal documents for signature are now in preparation. Research on testicular cancer with unfavorable prognosis continued in cooperation with the **Memorial Sloan Kettering Cancer Centre, New York, USA**. The preparation of a multicentre

study to identify biomarkers of lung damage in choriocarcinoma syndrome continued, where several workplaces from all over the world promised to participate in the multicentre study. Cooperation with the Hillman Cancer Centre at the University of Pittsburgh Medical Centre, USA, in the field of genitourinary malignancies, malignant melanoma, and stool transplants continued as well. Participation in joint research projects and clinical trials was agreed upon. The international cooperation project in the International Germ Cell Cancer Collaborative Group (IGCCCG) consortium also continued.

The National Cancer Institute joined the European Oncology Institute (ECI) EuonQoL project, the aim of which is to develop a standardized questionnaire battery for assessing the quality of life of cancer patients. 18 countries participated in the project. Academic cooperation was also established with the RECETOX laboratory at Masaryk University in Brno. The goal is in-depth analyses of the mechanisms of treatment-associated late toxicity in germ cell tumors.

NOI awarded 3 scientific-research grants designed to support short-term fellowships abroad, which took place at the Fondazione MBBM, Monza, Italy, at the Indiana University Cancer Centre, Indianapolis, USA, and at the Fondazione IRCCS Istituto Nazionale dei Tumori di Milano, Italy. In 2022, additional grants were awarded for short-term fellowships in 2023, which will take place at the Champalimaud Clinical Centre, Lisbon, Portugal, and at the Indiana University Cancer Centre, Indianapolis, USA.

In 2022, international hematooncology cooperation was as follows:

1. within the EORTC Lymphoma Study Group (represented by the Head of Department Andrej Vranovský, M.D., PhD.)
2. the cooperation with the European Hematology Association continued on the Epicovideha project.

The Slovak Society of Radiation Oncology is involved in communication with the European Society of Radiation Oncology for various projects focused on radiotherapy infrastructure, the quality of healthcare provision, clinical audits, and specialized education. Cooperation with the IAEA (International Atomic Energy Agency) continues in the field of workshops, webinars, and international fellowships. A joint project of the Oncological Institute of St. Elizabeth and the East Slovakia Oncology Institute is planned, focusing on the education of clinical physicists in radiology and the implementation of clinical audits in radiation oncology.

The Slovak Society of Radiation Oncology cooperates with the Turkish Society of Radiation Oncology (TROD), with which a memorandum of cooperation was signed.

In 2022, the National Oncology Institute participated in three international activities:

1. **IARC-WHO ICCCS** (Improving Cancer Care Coordination and Screening in Latvia and Slovakia) project aimed at improving the quality of oncology screening programs in Slovakia.
2. **CraNE- JA** (Joint Action on EU Network of Comprehensive Cancer Centres) project aimed at creating standards and a network of Comprehensive Cancer Centers in EU member states.

3. Preparing the **ECHoS** (Establishing Cancer of Mission Hubs: Networks and Synergies) project aimed at creating a network of centers for an efficient implementation of the Mission on Cancer in EU member states.

NOI continued its active cooperation with experts from the **Institute of Biostatistics and Analyses at the Faculty of Medicine of Masaryk University in Brno** on the preparation and evaluation setting of screening programs. In 2022, NOI awarded 3 NOI grants for short-term international fellowships at prestigious facilities for educational and research purposes.

NOI participated in the signing of the **Cooperation Agreement between the National Oncology Institute and the Indiana-University Simon Comprehensive Cancer Centre** (IU-SCCC), the priority content of which is exchange internships between the two institutions, the organization of a joint conference and the building of cooperation at various levels resulting from current needs.

9.2. Výzvy pre rok 2023

- Strengthen ongoing and initiated cooperation with facilities abroad
- Support short-term international fellowships (1 – 3 months) via NOI grants
- Support international multi-disciplinary seminars via online streams

- Support international foreign projects in order to further establish research and education in oncology, including the participation of foreign experts in Slovak educational events
- Cooperation with selected international facilities: IU-Simon Comprehensive Cancer Centre, Masaryk Oncology Institute, Ohio State University Comprehensive Cancer Center, and Richard L. Solove Research Institute
- Cooperation between SCOG and International Cooperative Oncology Groups
- Accession of Slovak institutions to cooperative groups (EORTC)

9.3. International Cooperation – Pediatric Oncology/Hematology

- Cooperation with the Czech Republic (annual conferences with oncologists from the Czech Republic, diagnostics of minimal residual disease)
- Cooperation with Austria: St. Anna Kinderspital, Vienna, joint solving of complicated patient cases within “tumor board” meetings
- Cooperation with Children’s Hospital of Philadelphia, USA: videoconference once in two months as a “tumor board” meeting; an annual workshop for young Pediatric Oncology/Hematology fellows
- Cooperation with Princess Maxima Centre for Pediatric Oncology in the Netherlands

- Cooperation with SIOP – The European Society for Pediatric Oncology
- Cooperation with I-BFM – International study group for treatment of pediatric leukemia and lymphomas
- Cooperation with COG – Children Oncology Group, USA
- Cooperation with pediatric oncology and surgery – Paris, France

9.4. International Cooperation – Palliative Medicine

Due to the insufficient number of specialists in palliative care in Slovakia and the disproportionate overload in providing access to health care, international cooperation in palliative medicine is poor. In 2021, the SSPM conference was held with the participation of the president of the European Association of Palliative Care (EAPC) Prof. Christoph Ostgathe. The space for creating international cooperation is available, but the priority remains to deal with implementation issues in the Slovak health sector

10. Europe's Beating Cancer Plan

The National Oncology Program (NOP) of the Slovak Republic is a public health, healthcare, and patient security plan whose primary objective is to reduce cancer incidence and mortality, and improve the quality of life of cancer patients by the systematic and fair implementation of evidence-based strategies focused on prevention, diagnostics, treatment, supportive, palliative and end-of-life care, as well as research focused on innovative solutions and assessment of results.

NOP is based on the needs and conditions in Slovakia and complies with the objectives and tasks of the World Health Organization (WHO) and the European Commission. In July 2021, the government of the Slovak Republic approved **updated National Oncology Program Action Plans (AP) for 2021 – 2025** which are divided into five areas:

1. Primary prevention
2. Secondary prevention, i.e. screening
3. Diagnostics and treatment including supportive and end-of-life care

4. Research, development, education
5. Health data and information

The primary objective of the National Oncology Plan (NOP) is to reduce incidence and mortality of cancer diseases and improve the quality of life of cancer patients by systematic implementation of evidence-based strategies. NOP also aims to improve quality of life, rationalize expenses, optimize the development and implementation of new findings in practice as well as increase health literacy. The NOP is based on the needs and conditions in Slovakia and complies with objectives and tasks of the World Health Organization (WHO) and the European Commission

Europe's Beating Cancer Plan – principles, activities, and opportunities in 2023

Europe's Beating Cancer Plan is a political commitment to turn around cancer-related development and a stepping stone to a strong

European Health Union, a safer, better prepared, and more resilient EU. The estimated incidence of cancer in Slovakia is higher than the EU average, especially in the case of prostate cancer, breast cancer, colon and rectal cancer, and lung cancer. Mortality from cancer is also among the highest in the EU, especially from colon and rectal cancer and cervical cancer. Cancer mortality is the third highest in the EU, while there are regional and socio-economic inequalities (OECD, 2023)

On 20 September 2022, the European Commission (EC) presented a new approach to support member states in increasing the rate of use of cancer screening with the aim of having more screenings and better implementation. In line with the proposed recommendation, a new approach is being introduced to improve cancer screening in the EU, replacing the current recommendations. These have been in use for 20 years and are therefore in urgent need of updating to reflect the latest available scientific developments and evidence. To facilitate more targeted screening, the Commission's recommendation expands the target group for breast cancer screening to include women aged 45-74 (compared to the current age group of 50-69). It also recommends that women aged 30-65 be tested for human papilloma-virus (HPV) every 5 years or more to detect cervical cancer, taking into account the HPV vaccination status. The EC also calls for colorectal cancer triage in people aged 50-74 years through immunochemical testing for occult bleeding in the stool and follow-up through colonoscopy. The Commission has updated its advice on cancer screenings. The aim of the proposed recommendation is to increase the number of screenings to include more target groups and more can-

cer types. It also suggests expanding organized cancer screening programs to include screening for lung, prostate, and, under certain circumstances, stomach cancer (if the country has a high incidence and mortality rate).

We have an opportunity for sustainable synergies to bridge existing gaps in research, policy, and practice. However, cancer prevention and control still remain a challenge in the Slovak Republic. Financial support from the EC is available for the introduction of new recommendations. Approximately EUR 38,500,000 has been allocated under the EU4Health program and EUR 60,000,000 under the Horizon Europe program in 2022. In addition, the EC proposes additional funding for cancer screening under the EU4Health program also in 2023. Further support can also be provided from the European regional, cohesion and social funds. For the period 2021 - 2027, EUR 5,300,000,000 have been allocated from the EU4Health program. The 2023 work program is available online at https://health.ec.europa.eu/publications/2023-eu4health-work-programme_en. Funding is provided by the executive decision of the EC of 21 November 2022 on the funding of the European Union's action program in the field of health (EU4Health program), and its annex consists of the work program for 2023, which defines priorities and activities, including financial resources for implementation. The work program for 2023 allocates EUR 187,300,000 to cancer.



11. Identification of Main Problems in Oncology in Slovakia



11.1. Main Problems in Clinical Oncology

The annual report maps the actual situation and activities in Slovak oncology for the previous year. Also in 2022, an important task in oncology in Slovakia was to fulfill the goals of the National Oncology Program (NOP) with its action plans for the years 2021 – 2025, thus contributing to the reduction of morbidity and mortality from cancer.

Cancer is considered a modern global epidemic, to which it is necessary to pay due attention, and which resonates at the European level in the European plan to fight cancer and the activities resulting from it. Even though many stakeholders in Slovakia have made and are making huge efforts to fulfill the activities defined in the action plans of the NOP for the years 2021 – 2025, there is no systematic financial and political support.

Even though the topics of prevention, whether primary, secondary or tertiary, or adequate and dignified palliative care and end-of-life care, as well as the importance of providing treatment and diagnos-

tic procedures that would be in line with relatively quickly changing international recommendations, are more discussed by the general public, it is necessary to invest much more human and financial potential in all these activities. Of course, this also concerns the need to ensure adequate continuous education, conditions for carrying out clinical research and development.

Change in human awareness occurs gradually, through frequent repetition and subliminal signals, which must be applied in society. We must also focus activities constructively so that an individual, as a biopsychosocial-spiritual being, and their health are at the center of directed societal efforts. According to the World Health Organization, health is defined as a state of complete physical, mental, and social well-being, and not just the absence of disease or weakness. The individual in the center of interest is the one who not only receives help but is active in what maintains their health or brings him closer to it. From this point of view, the Enlightenment has an inestimably important meaning.

Setting up processes so that society can take care of people in need, not only at the time of the cancer diagnosis and during the cancer treatment but also after it ends, is another important task that society should not forget. After the end of the therapy, the patient often has many needs that result from antitumor treatment with possible long-term or late toxicity. Even in the case of recovery, the patient may be affected by a persistent deficit in the socio-social or financial area. In the foreground is the importance of adequately set options in society so that such a person can fit into social, work, and personal life and live the best quality of life possible within their possibilities.

Challenges for the coming period:

1. Act according to the unified concept of primary prevention which will be feasible and effective with the active participation of not only the health sector but also the education, social affairs, labor and family, and environmental sectors. The unified concept states that it is necessary to create conditions for healthy lifestyles from early childhood in order to shape healthy everyday lifestyle habits.
2. Increase the quality of organized cancer screening programs on all levels, include innovative processes in the existing programs, and implement new cancer screening programs in practice according to European evidence-based recommendations.
3. Use all available options to ensure the availability of innovative cancer diagnostics and treatment so that also patients in Slovakia can be treated according to European and global standards. Besides the availability of adequate diagnostics and treatment, the unambiguously clear path of the patient in the system without

undue delays is very important for successful treatment, as well as adequate supportive care in terms of psychological support, nutritional therapy, and rehabilitation. Another necessary step is ensuring adequate palliative care, end-of-life care, and survivorship care intended for people with a cancer diagnosis, whether in active treatment or after it.

4. Strengthening clinical and translational research infrastructure is an important task in research, development, and education, along with the creation of conditions not only for commercial but also for academic clinical research and international cooperation.
5. As for health data and information, the revitalization of the National Oncology Register is essential, as is the creation of the National Screening Register and sharing the health data and information with experts with the potential to correctly process and interpret the data.

11.2. Main Problems in Pediatric Oncology

- Pathological diagnostics of rare tumors, classification of subgroups (CNS tumors) – methylation
- Integration of Departments of Pediatric Hematology and Oncology into intermediate care group, reinforcing staff numbers in nursing care
- Second opinion on pathological findings
- Molecular diagnostics of rare tumors (with the adequate international quality assessment)

- Funding of rare disease diagnostics abroad
- Second opinion of radiology
- Availability of expensive innovative treatment / immunotherapy
- Administrative and financial support for academic clinical trials
- Inadequate financial remuneration via DRG
- Funding of education of physicians (international fellowships)

Challenges for 2023 – Pediatric Oncology

- Preparation of funding models for expensive custom genetic oncological diagnostics
- Preparation of funding models for expensive innovative cancer treatment in order to improve its accessibility to patients
- Qualification to enter international clinical trials – solid tumors, CNS tumors
- Development of scientific and research activities within international cooperation
- Qualification for cell therapy of pediatric cancers

11.3. Main problems in Radiation Oncology

The development of the specialty has been influenced by completing the technology modernization project of the Ministry of Health of the Slovak Republic, thanks to which the radiotherapy infrastructure in the Slovak Republic was extended by 17 new linear accelerators and 7 CT stimulators. We have adhered to the recommendation of European Society for Radiotherapy and Oncology for Slovakia which states that 5 linear accelerators should be available per 1 million citizens for the treatment of malignant tumors. Therefore, all patients have potential access to modern radiotherapy which is able to be administered without undue delay between radiotherapy indication and administration of the first radiation fraction. The pandemic has affected radiotherapy dose fractionation with a preference for hypofractionation, which represents a more effective treatment option in a situation with fewer workers and less frequent patient hospital visits. Mild hypofractionation and stereotactic extreme hypofractionation (radiation in 1 – 5 fractions) have not been implemented in all facilities in spite of recommendations by international expert societies. New interventions, cranial and extracranial stereotactic radiotherapy, have been included in the outpatient reimbursement list.

In 2021, technological radiotherapy equipment in Slovakia became comparable to any EU country. Besides the good geographic availability of standard radiotherapy, patients have the option to undergo stereotactic cranial radiotherapy in SECI and ESOI and spine radiosurgery in ESOI. It is still necessary to supplement technologies for

cranial and spinal radiosurgery in at least two other workplaces, preferably at NCI and at the Roosevelt Hospital in Banská Bystrica.

Challenges for 2023

The provision of radiotherapy of optimal quality for all patients in Slovak hospitals remains an immediate challenge. All departments must master the new complex technologies and provide quality assurance. Health insurance companies should reimburse new procedures, such as cranial and extracranial stereotactic radiotherapy, and also provide adequate reimbursement for other radiotherapeutic procedures in order to ensure that the modernization of equipment can be done regularly in the future.

It is also crucial to standardize clinical practice in radiation oncology via standard operating procedures (SOP) for planning and administering radiotherapy which were approved by the Standard Diagnostic and Treatment Procedures Committee. The main task for 2023 will be to organize and perform clinical audits at individual facilities along with their evaluation focused on technological means and adherence to SOPs and international recommendations for radiotherapy planning. The clinical audits should be coordinated by the Committee for Quality Assurance in Radiodiagnosics, Radiation Oncology, and Nuclear Medicine. The final objective is to provide radiotherapy in an adequate timeframe and quality for every patient. In 2023, the project of the Ministry of Health of the Slovak Republic should be completed, which concerns the selection procedure for the supplier of technology for the auto-segmentation of risk organs for 12 departments of radiation oncology in the Slovak Republic.

11.4. Main problems in Palliative Medicine

Palliative medicine (PM) is, like pediatrics, geriatrics, genetics, or intensive care medicine, a cross-sectional medical specialization. Its focus is, according to the definition of the International Association for Hospice and Palliative Care, to improve the quality of life of patients and their families who are facing a potentially fatal illness by using all means to prevent and alleviate suffering. Early diagnosis, evaluation and precise treatment of pain and other problems are applied: physical, psychosocial, and spiritual. A potentially fatal disease means that death is a relevant outcome of the given clinical situation after an honest medical evaluation.

Defining a palliative patient is the basis for admitting patients to specialized palliative care. A palliative patient is a patient with an incurable progressive disease, high intensity, and/or complexity of symptoms, while the goal of treatment is to alleviate suffering. Palliative medicine was based on the concept of the hospice movement, which arose as a reaction to dying associated with severe symptoms, a feeling of indignity, and psychological, existential, and spiritual suffering expressed in each patient to a different degree. Psychosocial, existential, and spiritual suffering has become a challenge for PM, which is revealed when physical suffering is removed and it is also possible to minimize it. This is also one of the reasons why PM has become a medical specialty in the USA and in many European countries, including Slovakia.

However, the implementation of Palliative Medicine in the health-care system is very slow in Slovakia, for several reasons:

1. Identifying a palliative patient in the system is not a standard part of medical thinking in Slovakia
2. Prognostication of a terminally ill patient and especially communication of prognosis is difficult and is not identified (and covered) as an important medical aid
3. Palliative care capacities are not available, even if the patient is correctly identified and communicated.

Changes in the concept of palliative medicine

A milestone in 2022 was the approval of Act No. 267/2022 Z.z., which introduces definitions of palliative care, general and specialized palliative care as well as drafts of related and implementing regulations. It remains an important task to incorporate legislative changes into the concept of palliative medicine.

General palliative care (GPC) includes treatment procedures for patients with advanced incurable diseases which are provided within regular healthcare in specialties other than palliative medicine (for example oncology, internal medicine, geriatrics, neurology, etc.). **Specialized palliative care** is care provided by a physician specialized in palliative medicine. It is usually provided in a multidisciplinary team with several specialists. It is intended for patients whose needs (somatic, mental, social, existential, and spiritual) are too complex and intense for the possibilities and/or abilities of general palliative care providers.

Recovery and Resilience Plan of the Slovak Republic

Long-term care is also part of **the Recovery and Resilience Plan of the SR** approved by the European Commission in 2021, particularly Component 13 (available good long-term social and health care). For the expansion and renewal of the network of mobile hospices, a call was announced by the Ministry of Health of the Slovak Republic, where EUR 2,388,246 excl. VAT was allocated. Conditions for the next two calls for expanding and renewing the capacities of residential palliative care – expanding and renewing brick-and-mortar hospices and expanding and renewing the capacities of palliative care departments.

The Recovery Program of the SR milestones for Component 13 should also mean an extension and renewal of capacities of palliative care wards, inpatient palliative care, and regular hospices as well as broadening and renewal of the hospice network by 2026.

The National project of improving long-term care

It is a project from the Human Resources Operational Program, the responsible authority being the Ministry of Labour, Social Affairs and Family of the Slovak Republic, and the recipient of the project is the Ministry of Health of the Slovak Republic. Users are home nursing care agencies (ADOS) and mobile hospices. The aim is to strengthen the personnel capacities of nurses and physiotherapists in ADOS and the jobs of physicians, nurses, and assistant professionals in mobile hospices. Personnel wages are paid based on the amount specified in the call and lump sum. Lump sum expenses include costs incurred

during the provision of the service, such as fuel consumption, share of operating costs, education, and material security. EUR 40,000,000 is allocated for this project, which lasts until 31 December 2023. The responsible specialist is Andrea Škripeková, M.D., PhD.

We have summarized the problems with the availability of palliative care for the coming period in points which will serve as the basis for implementation strategies and reforms:

- **Incorporating legislative changes into the concept of palliative medicine** remains an important task.
- As for long-term care, there is a serious shortage of capacities in community care and home care in Slovakia even though **as many as 89% of Slovak residents would prefer to receive care at home**, whether with the support of family members, professional nursing service or in combination with outpatient care
- **Investment in the renewal and creation of new capacities** is necessary for the development of required services.
- **The palliative services network for patients in terminal stages of chronic diseases is insufficient.** Furthermore, there are significant regional disparities at the moment.
- **Shortage of field palliative services significantly limits the choice of the place where to end one's life for terminally ill patients.** There are 18 mobile hospices in Slovakia at the moment, however, most of them do not offer the services of a specialist in palliative care, only nursing care. According to EAPC recommendations, Slovakia should have around 55 mobile hospices (10 mobile hospices per 1 million inhabitants).
- **However, because of low reimbursements by health insurance companies, providing palliative services is not very attractive.** The majority of providers are non-profit and religious charity organizations whose main sources of income are donations and out-of-pocket payments from clients. That is why these services are often not available for patients with lower incomes.
- **Palliative services in residential and home care is unprofitable for the providers.** Reimbursements by health insurance companies are considerably lower than the actual expenses. Therefore, the providers must cover the missing resources by increasing client payments or by donations.
- **Low reimbursements by health insurance companies discourage public providers from establishing their own mobile palliative services and hospices.** This causes a rupture of patient care continuity.
- Providers of home nursing care feel the issue of low reimbursements by health insurance companies as well. For instance, the reimbursements do not take into account travel expenses to get to the patient.
- Social service providers also feel the issue of low reimbursements by health insurance companies.
- **Brick-and-mortar hospices do not receive payments for dealing with the social vulnerability of dying patients.**

12. Currents Trends in Oncology Around the World

1. Multidisciplinary approach to decision-making about diagnostic and therapeutic management.
2. Research and development of innovative processes in diagnostics, treatment, and prevention of cancer diseases.
3. Provision of preventive measures, including recommended population screening programs and specific prevention processes in high-risk populations.
4. Personalised approach to diagnostics and treatment of cancer diseases and fair provision of standard recommended treatment procedures across different populations.
5. Holistic approach to the patient and their environment – understanding the individual from a biopsychosocial and spiritual point of view.
6. Supportive therapy at each level of care of the sick or recovered person and their environment, including help with the reintegration of survivors into active life.
7. Motivating work environment and education for healthcare professionals.
8. Awareness campaigns with the objective to educate the lay public about all diverse aspects of oncology from prevention, research, development, diagnostics, and treatment to supportive care, care for long-term survivors, or end-of-life care.
9. Access to up-to-date data for regular continuous checks and evaluation of clinical-epidemiological or cost aspects of cancer care.

Within the framework of current trends, building procedures using **artificial intelligence and digitization** dominates in all areas. Within oncology treatment, however, **the issue of financial toxicity** of oncology treatment is resonating worldwide, which is becoming unsustainable even in countries with a significantly higher contribution from the state budget to health care than in Slovakia, which makes the innovative treatment generally less accessible for oncology patients worldwide.

The issue of the importance of equality in providing the education in health, preventive, and health care within regions in countries or within countries of the world, but also within different population groups, also resonates. Equality is also transferred to clinical research and development, where, for example, in the framework of clinical trials (CTs), there is a strong appeal to create such conditions that minority groups of the population can also be included in CTs. The **principle of solidarity** is also important at the moment, which we perceive when implementing Europe's Beating Cancer Plan, for example specifically in the CraNE-JA project, within which the aim is to support the building of Comprehensive Cancer Centers in each member state EU country so that, as declared in the EBCP, 90% of patients who require treatment in a complex oncology center have access to it. Solidarity is also manifested in the principles of building close cooperation between individual CCCs, for example in the case of diagnosis and treatment of rare malignancies, or specific diagnostic and treatment modalities.

Annual Report for 2022

State of Oncology in Slovakia

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