

# ЛІКАРСЬКИЙ ВІСНИК



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Українського Лікарського Товариства  
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Журнал Українського Лікарського Товариства Північної Америки (161)  
Journal of the Ukrainian Medical Association of North America (161)

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## **СЛОВО ВІД РЕДАКТОРА    ♦    WORD FROM THE EDITOR**

Повідомляємо, що 46-ий Зїзд Українського Лікарського Товариства Північної Америки (УЛТПА) відбувся в Nashville TN в днях 14-18 червня 2023р.

Зїзд завершився великим успіхом, за що належна подяка і признання всім шановним організаторам.

На зїзді делегатів обрану нову управу УЛТПА, до складу котрої входять:

Голова - др. Марта Лопатинська

Голова елект - др. Олена Гордон

Заступник голови - др. Іня Тунстал

Секретар - др. Катруся Круцеляк

Скарбник - др. Роман Козицький

Товариський суд - др. Лев Мурський, др. Богдан Піхурко

Гратулюємо і бажаємо всім новообраним членам управи УЛТПА успішної роботи і вдовolenня на нових посадах.

В науковій частині виступало 14 доповідачів. Передані доповіді (абстракти поміщені у *Віснку*), охоплювали широкий спектр тем, цікавими для присутніх лікарів різних спеціалізацій. Щира подяка всім доповідачам за їх вклад до успішної конференції,

Особливе вдовolenня принесли виступи наших молодих членів, зараз студентами і резидентами -- Христина Ленчур, Петро Ленчур, Роксолана Судик, Іван Волянський. Ми їм вдячні за те що поділилися з нами своєю цікавою роботою, помітною високим науковим рівнем. Віримо що ці початкові кроки їх професійного життя доведуть до многих майбутніх успіхів. Бажаємо Вам щастя і радіємо Вашою участю в УЛТПА.

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Ділимося сумною віскою що наш друг др. Роналд Літепло відійшов у вічність 12 го лютого 2023р. (посмертна згадка поміщена у *Віснику*) Роналд був довголітнім активним членом УЛТПА і брав участь в багатьох зїздах. Він віддано працював в українській громаді при Пласті, Науковому Товаристві ім. Тараса Шевченка, співав в хорі Думка, виступав на багатьох концертах, піддержував український музей і Український Католицький Університет у Львові. Роналд залишив в смутку своїх улюблених дружину Надію з трьома синами Андрієм, Віліям, і Данеїлом.

Завжди памятатимео його радісну усміхнену вдачу. Всі ми його любили, будемо за ним сумувати і приємно згадувати. Вічна йому памят. В честь др. Роналда Літепло, друкуємо статтю його сина Андрія.

\*\*\*\*\*

### **Point of care ultrasound training in Ukraine.**

In their article Drs. Andrew Liteplo and Tanya Bucierka, both members of UMANA, relate their experience with a medical mission to Ukraine with an opportunity to advance medical care in their ancestral homeland.

The mission was sponsored by Med Global (a Chicago-based NGO) in partnership with Razom and UMANA.

Dr. Andrew Liteplo, originally from New York City, is Chief of the Division of Emergency Ultrasound at Massachusetts General Hospital and Associate Professor at the Harvard Medical School. His academic career focuses on teaching and research related to point-of-care ultrasounds.

Dr. Tanya Bucierka is originally from Rochester, New York. She is an emergency physician in Eugene, Oregon, and Med Global's Director of Ultrasound for Ukraine. Incredibly, this was her fifth trip to Ukraine since the war with Russia began.

The mission team also included Drs. Vicki Noble, Chair of Emergency Medicine at the University Hospitals in Cleveland, Ohio, and Kevin Sze, a fellow in emergency ultrasound at HCA Florida Osceola Hospital in Orlando, Florida. The four doctors were joined by two nurses, Alicia Bean from Chicago, Illinois, and Merrill Tydings from Idaho, who also provided parallel training in Basic Life Support and in the Stop the Bleed course.

The team visited Rivne and Lviv with a mission to provide point-of-care ultrasound technology and training for physicians caring for Ukrainian soldiers wounded on the front lines.

Ultrasound imaging is an effective means for evaluation of injuries. The extent and severity of combat injuries are often uncertain due to unpredictability of bullet trajectory and depth of penetration. Unlike conventional ultrasound which is stationary due to large size and heavy weight, point-of-care ultrasound technology is a recently developed miniature version designed for use in the field. It has the advantage of portability with sensitivity that enables physicians to rapidly deliver life-saving treatment on site.

Med Global partnered with UMANA and Razom to purchase the point-of-care ultrasound equipment. For operating this complex equipment, two-day training courses were provided in Rivne and in Lviv, an integral aspect of the mission. Over 300 Ukrainian physicians participated and successfully completed the training which received outstanding reviews in Ukraine.

The success of this mission is owed to a remarkable organizational effort requiring collaboration with humanitarian organizations, raising funds for purchase and transport of medical equipment to Ukraine, organization of training courses, and recruitment of non-Ukrainian medical personnel for their expert assistance.

Beyond its practical and humanitarian value, this mission was inspirational for the motivation it gave to Ukrainian soldiers who sacrifice their lives and health in defense of their homeland. So far, Ukrainian armed forces have had remarkable success against an enemy with overwhelming superiority of weapons and manpower. We attribute their success to their powerful motivation derived from desire for freedom and love of country.

Our armed forces are defending not only Ukraine. They are also defending Europe and the Free World against Russian aggression. They sacrifice their lives and health while the rest of us, from a safe distance, are protesting, praying, and attending concerts.

Participants of this mission took great personal risks by entering a dangerous war zone to offer urgently needed medical help for our brave soldiers.

UMANA congratulates and extends the highest recognition to Drs. Liteplo and Bucierka and all participants and partners of this mission for their exceptional effort and outstanding accomplishment.

Ukraine must win this war. By the courage and sacrifice of Ukraine's fighting forces, together with our generous and unwavering support, Ukraine will win this war.

Слава Україні! Разом до перемоги!

\*\*\*\*\*

Др. Роман Бариляк, автор статті **“Бойова травма вуха у військових України - організація отолірінгічної допомоги і алгоритми лікування”** описує стан отолірінгічної і отолірінгічної допомоги українським військовим котрі отримують бойові травми вуха умовлені вибухами.

Статистика показує що 8,9% бойових травм являються у формі баротравми, у 54% випадках звязаних з перфораціями і розривами барабанної перетинки, як також і інших множинних ушкоджень слухового апарату, наприклад переломи і розєднання ланцюжка слухових кісточок, і ураження внутрішнього вуха.

Передбачений результат травм вуха -- це втрата слуху з очевидно шкідливим впливом на якість життя і працездатність людини. До запобігання втрати слуху, необхідне негайне лікування яке виконується отолірінгічним втручанням і реабілітацією. До тепер вже виконано понад 400 тимпанопластик і 200 реконструкцій барабанної перетинки і слухових кісточок.

Так довго як війна продовжується, кількість вушних травм буде зростати.

Обєм цих травм і потреб на їх лікування значно навантажує засоби надання медичної допомоги. До набуття ресурсів потрібних до цього лікування, др. Бариляк наголошує слідуючі потреби:

- Необхідно і негайно залучати позадержавні і грантові кошти, запрошувати до співпраці іноземних організацій і спеціалістів
- Створення центрів хірургічної, слухової, і вестибулярної реабілітації, лікування вушного шуму
- Необхідність обладнання мікроскопами, ендоскопами, та іншими сучасними інструментами
- Необхідність створення реабілітаційних центрів для ветеранів

Наші хоробрі військові заслуговують на всі потреби наголошених др. Бариляком. Вони заслуговують нашої щедрої і стійкої допомоги, бо захищають не тільки свою батьківщину Україну, але також і цілу Європу перед жорстокою російською агресією під керівництвом Путіна.

УЛТПА гратулює і надає високе признание доктору Бариляк за його вклад знання, досвіту, та негайно потрібної експертної допомоги нашим українським воїнам.

Слава Україні! До перемоги!

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Audiologist Daria Popowych discusses evaluation and management of hearing loss in adults.

Unlike traumatic combat related hearing loss, as discussed in this JUMANA issue by Dr. Barylak, the causes of non-traumatic hearing loss are diverse with entirely different presentations.

The long list of causes of non-traumatic hearing loss includes (1) genetic hearing loss, typically isolated, early onset in infancy or childhood, familial, mostly autosomal recessive, caused by numerous mutations that control the development of the inner ear (2) syndromic, with multiple associated congenital anomalies, often genetic. Some examples include syndromes Treacher Collins, oto-palatal-digital, branchio-oto-renal, Usher, Pendred, Alport, and many others (3) Structural developmental defects such as microtia and enlargement of the vestibular aqueduct (4) ototoxicity, caused by various medications, among them aminoglycoside antibiotics (5) Infections, usually recurrent or chronic otitis media (6) Persistent middle ear effusion, often allergy related (7) tumors such as acoustic neuroma (8) foreign bodies (9) cerumen (10) age related hearing loss.

Hearing loss with onset in infancy or childhood, as often is the case, typically presents as speech delay with limited response and localization to sound.

Newborn hearing screening is practiced in all states, which allows for early detection and intervention for attainment of normal speech development.

Age related hearing loss is relatively common but subtle in its early stages for which reason it can often go undetected for a long period of time. When suspected, hearing loss should be evaluated and treated so that patients can resume normal daily activities and social interaction. This is discussed in detail by Daria Popowych in her article.

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Dr. Uliana Pidvalna is an Associate Professor of Anatomy at the Danylo Halytsky National Medical University in Lviv, Ukraine. In her article “From Civilian Practice to the Frontlines – Ukrainian doctors answer the call to serve, sacrifice, and save lives” she gives an account the dedicated work of her husband together with two other surgeons, Drs. Roman and Andriy Sobko who are brothers.

Dr. Douglas Davis of UMANA Illinois Chapter provides the introduction to her article:

*What follows is an invited article written by Dr. Uliana Pidvalna, the wife of Ukrainian cardiothoracic surgeon Dr. Dmytro Beshley. Dr. Beshley and his colleagues make up just one of the groups of frontline trauma teams that have been supported by our chapter's medical relief efforts since the war began. We've watched their incredible work from afar via social media posts and communications on messaging apps like Viber and WhatsApp. I had the chance to meet with Dr. Beshley, Dr. Roman Sobko, and Dr. Pidvalna in Lviv this past February just before the first anniversary of Russia's full-scale invasion. Their story along with the conditions and operational tempo at which they practiced over the first year was staggering and compelling. To witness the volume and complexity of cases that they've faced tirelessly with virtually no respite was frankly mind blowing. We asked Dr. Pidvalna to provide a brief chronicle of this remarkable team and their service and sacrifice, as Dr. Beshley and Drs. Sobko promptly returned to the battlefield. This story is just one example of the courage and selflessness that Ukrainians have shown the whole world, but it is part of the larger and very important written and oral history that deserves to be recorded and heard.*

# ABSTRACTS FROM THE XLVI UMANA SCIENTIFIC CONFERENCE

Nashville. TN    June 15-16, 2023



## **Robert Buly MD**

Chief Emeritus of the Hip Preservation Service Hospital for  
Special Surgery.  
New York, NY

### ***“3D Printing and Planning for Orthopaedic Surgery Applications”***

Failed hip and knee replacements present a staggering, reconstructive problem when there is extensive bone loss. 3-D printing of orthopaedic implants allows for enhanced bone ingrowth fixation and a custom fit when off the shelf implants would be insufficient. 3-D printing is also an excellent technique for the planning and execution of challenging hip preserving surgery due to anatomic deformities.



## **Borys Buniak MD FACP**

Director of the Heartburn Center  
St. Joseph's Hospital Health Center  
Syracuse, NY

### ***“Power of the Microbiome”***

The **microbiome** is the community of microorganisms (such as fungi, bacteria and viruses) that exist in a particular environment. In humans the term is often used to describe the microorganisms that live in or on a particular part of the body, such as the skin or gastrointestinal tract. These groups of microorganisms are dynamic and change in response to a host of environmental factors, such as exercise, diet, medication use, geography and other exposures.

In addition to the potential therapeutic benefits of manipulating the microbiome, there are also concerns about the negative consequences of disrupting the delicate balance of bacteria in the body. There is growing recognition that altered microbiome appears to play an important role in the development of many chronic illnesses such as obesity, behavioral disorders, diabetes, and autoimmune diseases. This has led to an increased interest in understanding how the microbiota can be regulated in order to prevent or treat these conditions.



**Myron S. Czuczman MD**

Chief Medical Office and Executive Vice President  
Citius Pharmaceuticals, Inc

***Transforming Future Cancer Therapy:  
From Skin Biopsy to “Off-the-Shelf”  
Cancer Therapeutic”***

In 2017, the US FDA approved tisagenlecleucel (Kymriah), the first “autologous” (uses patient’s own cells) CAR T-cell therapy for patients with relapsed/refractory B-cell ALL (up to 25 years of age). Today, the FDA has approved a total of six autologous CAR T-cell therapies, all for hematologic cancers: 4 target CD19 and 2 target BCMA. Although these “living cell” therapies have demonstrated the potential to be curative in a subset of relapsed/refractory patients, greater than 50% of patients do not respond and/or do not attain durable complete remissions (ie not cured). In addition, the current CAR T therapies have additional limitations that include significant toxicities, complicated manufacturing processes, and high costs. In addition, ongoing clinical trials have not demonstrated any significant/meaningful activity in patients with solid tumors. In response to the aforementioned limitations, current research efforts are directed in developing “allogeneic” (using a normal donor other than “self”) cell-based therapies. Globally, medical research is extensively evaluating a variety of novel cellular therapeutics: CAR T-cells> CAR NK-cells> CAR Macrophages (most recent). The sources of these allogeneic cells vary from donor-derived (ie collection of the immune cells from normal donors or from umbilical cord blood sources) or from a skin biopsy from a validated healthy donor; fibroblasts derived from this skin biopsy can be used to create uniform induced pluripotent stem cell (iPSC)-derived mature cell types (eg T-cells, NK cells, macrophages, etc) which can be utilized as a cancer therapeutic.

My lecture will give an overview of the status (pros/cons) of current cell-based cancer therapies; describe exciting developments in the use of “gene-editing” to significantly improve killing and persistence of cell therapies in vivo; the potential importance in the selection of novel CARs (to improve targeting of unique surface cancer proteins); the implementation of recent translational research findings in an attempt to improve anti-tumor activity against solid tumors; streamlining manufacturing to make a uniform, highly effective “off-the-shelf” cell therapeutic (ie iPSC-derived gene-edited CAR NK cell). In conclusion, the field of “cell-based” cancer therapeutics is still in “early days,” but as additional advances continue to be made and implemented it will likely revolutionize the future treatment of cancer patients by providing a highly- effective and less-toxic alternative to current cancer treatments.



**Daniel Hryhorczuk MD MPH**

Professor Emeritus of Environmental and Occupational  
Health Sciences and Epidemiology  
University of Illinois School of Public Health  
Chicago, IL

***“Polyfluoroalkyls (PFAS) the Forever Chemicals”***

Per- and polyfluoroalkyl substances (PFAS) are a class of chemicals that includes over 12,000 different compounds with various chemical properties. PFAS have been used in thousands of products, such as water and stain proof fabrics, non-stick cookware, and firefighting foams. They are called “forever chemicals” because they are resistant to biodegradation. An estimated 2,854 locations in the US have some level of PFAS contamination. Widespread human exposure to PFAS in water, food, and air, coupled with long biological half-lives, have led to measurable PFAS in blood in nearly the entire population in developed countries. Epidemiological studies have revealed associations between exposure to specific PFAS and a variety of health effects, including altered immune and thyroid function, liver disease, lipid and insulin dysregulation, kidney disease, adverse reproductive and developmental outcomes, and cancer. There is sufficient evidence to link PFAS exposure to decreased antibody response, dyslipidemia, decreased infant and fetal growth, and increased risk of kidney cancer. The clinical approach to managing patients with PFAS exposure is based on obtaining an occupational and environmental exposure history and testing for PFAS in blood. Patients likely to have an elevated exposure to PFAS include those who have worked with PFAS or served as a firefighter; those who live in communities where public health authorities have documented PFAS contamination; and those who live in areas where PFAS contamination may have occurred, such as near commercial airports, military bases, and waste treatment facilities. Clinicians should use serum or plasma concentrations to inform clinical care using the following guidelines:

Adverse health effects related to PFAS exposure are not expected at less than 2 ng/mL;

There is a potential for adverse effects, especially in sensitive populations, between 2 and 20 ng/mL;

There is an increased risk of adverse effects above 20 ng/mL.

Management includes encouraging PFAS exposure reduction if the source of exposure is identified, especially for pregnant persons, and screening for potential health effects among those with elevated PFAS blood levels.



**Lionel B Ivashkiv MD**

Chief Science Officer at Hospital for Special Surgeries  
New York, NY  
Professor of Medicine and Immunology at Weill Cornell  
Medicine  
New York, NY

***“Current Therapies and Emerging Technologies in Rheumatic  
and Inflammatory Diseases”***

The treatment of rheumatic and immune-mediated inflammatory diseases has been transformed by the advent of biological and targeted therapies, with induction of remission becoming a reality and emerging prospects for achieving cures. This lecture will cover state-of-the-art biological therapies targeting cytokines, and the rationale for molecular-based disease classification systems that link specific therapies to distinct diseases. The rationale and mechanisms of action of drugs targeting inflammatory signaling pathways, such as the Jak-STAT pathway, will be discussed. The lecture will review the exciting recent breakthrough of using chimeric antigen receptor (CAR) T cells to treat lupus, and the potential role of epigenetic mechanisms in autoimmune and inflammatory diseases. Novel approaches to targeting epigenetic regulators may enable gene-specific therapies and long-term remissions, if not cures. The relative potential benefits versus risks for epigenetic and CRISPR-based gene editing therapeutic strategies will be discussed.



**Nataliya Kovalchuk PhD**

Clinical Associate Professor, Radiation Oncology  
Stanford School of Medicine, Stanford Hospital,  
Stanford, CA

***“Radiation Therapy during the war in Ukraine  
and how to help”***

Radiotherapy in Ukraine sustained significant damages since the 2014 Russian invasion, which was exacerbated further by the full-scale invasion in 2022. After 2014 occupation of Crimea and parts of Donbas, Ukraine lost access to 7 RT centers with 18 external beam radiotherapy (EBRT) machines (17% of total). Currently, 2 additional RT centers are under occupation; 3 RT centers sustained heavy shelling and equipment damage. Despite the ongoing war, Ukrainian centers installed 3 new linear accelerators, with 14 linear accelerators pending installation. Cancer centers with newly installed linear accelerators also require support in facilitating their clinical launch in the time of war. Training the personnel, supplying them with the tools they need to treat the patients is critical in these challenging conditions. Automation tools can help simplifying and streamlining the workflow in the environment of increased patient volume and decreased staffing.

In this talk, we will describe the efforts of Help Ukraine Group (HUG) in supporting Ukrainian cancer centers and in particular radiotherapy, during the war.

### ***“Automation and Artificial Intelligence in Radiation Oncology”***

Artificial intelligence (AI) has the potential to fundamentally alter the way medicine is practiced. AI platforms excel in recognizing complex patterns in medical data and provide a quantitative, rather than purely qualitative, assessment of clinical conditions. Accordingly, AI could have particularly transformative applications in radiation oncology given the multifaceted and highly technical nature of this field of medicine with a heavy reliance on digital data processing and computer software. AI has the potential to improve the accuracy, precision, efficiency and overall quality of radiation therapy for patients with cancer. In this talk, a brief overview of AI approaches in the radiotherapy processes will be followed by the potential effects that AI is anticipated to have on each stage of the radiotherapy process. In conclusion, there will be a discussion on the difficulties in developing and implementing AI platforms in radiation oncology for clinical use and how these AI platforms can alter the roles of radiotherapy medical professionals.



**Peter Lenchur MD, PhD, FACC, FSCAI, FASNC**  
Chief Division of Cardiology,  
Trinitas Regional Medical Center, RWJBH  
Elizabeth, NJ

***“ From Bernoulli’s equation to current complex cardiology techniques: state of affairs 285 years later.”***

**Introduction:** 285 years ago, Daniel Bernoulli, Swiss physicist and physician, published the famous Bernoulli’s principle of hydrodynamics. His simplified equation currently is widely used for easy estimation of pressure gradients from velocity measured by echocardiography.

**Methods:** Review of literature and personal experience in selection, management and postprocedural care of patients with severe aortic stenosis, severe mitral regurgitation, atrial fibrillation and other common cardiac conditions.

**Results:** Prevalence of structural heart disease, both aortic stenosis and mitral regurgitation, increases with age. Transcatheter aortic valve replacement (TAVR) became a standard of care for patients with aortic stenosis. Transcatheter mitral valve repair (TEER) provides safe, durable results which improve survival and quality of life in patients with severe mitral regurgitation and heart failure. Transcatheter mitral valve replacement is being developed and current technical challenges will be resolved in the near future.

**Conclusion:** Development and wide implementation of current, modern, and complex cardiology techniques would not be possible without the application of the

simplified Bernoulli equation. TAVR , TEER, and left atrial appendage closure devices are becoming the standard of care for patients with structural heart disease.



**Marta Lopatynsky MD**

Cataract and Cornea Specialist

Morristown Eye Consultants,

Morristown, NJ

Attending Physician

Morristown Medical Center/Atlantic Health System

***The Eye-An engineering Masterpiece! Is Technology a Friend or Foe?"***

The eyes and brain process vision in an incredibly complex partnership. Some research proposes that up to eighty-five (85%) percent of our perception, learning, cognition and motor activities are processed through vision. Disruptions in the eyes from disease or brain trauma directly affects our visual abilities and can significantly impact quality of life.

This lecture will emphasize the uses and limitations of technology in diagnosing and managing diseases of the eye. Participants will understand how lasers, topographical analysis, Optical Coherence Tomography (OCT) assist in treatments as well as their risks or limitations. Cataract surgery, as the most frequently performed surgery in the USA, provides incredible benefits but depends heavily on multiple advanced technologies to achieve its high success rates. Are they truly helpful in improving outcomes? We'll explain the advances and risks of intraocular lenses. Medical diseases as well as brain trauma early or later in life can disrupt the visual system.

Technology can greatly assist in early detection and as well as monitoring for progression in a variety of diseases.



**Nelya Melnitchouk**

Program Director Colorectal Surgery Fellowship

Assistant Professor of Surgery

Harvard Medical School

Gastrointestinal and General Surgery

Boston, Massachusetts

***"HealUA mobile application for peer-to-peer consultations during the war in Ukraine."***

**Background.** Russia's invasion of Ukraine resulted in displacement of physicians and challenges with subspecialty consultations. To address this need, we created a mobile application to connect physicians in Ukraine with each other and colleagues worldwide and evaluated its impact, social media and physician champions:

internal medicine (n=13), surgery (n=11), pediatrics (n=11) oncology (n=7), other (n=36).

**Methods:** HealUA application was created based on the need of internally displaced Ukrainian physicians and pilot-tested among 10 users. The application allows for a physician, verified at registration, to submit a case without patient-identifying information, and request advice from other physicians also registered on the app. HealUA supports both Ukrainian and English, as well as image/file attachments. The first version was released on May 17, 2022 via the App Store/Play Market free of charge. HealUA was disseminated through during the war in Ukraine.

**Results:** From May 2022 to February 2023, 2,050 physicians joined HealUA. 96% users were from Ukraine and 4% from other countries. There were 27.46% internal medicine, family medicine and pediatricians; 17.95% anesthesiologists; 12% surgeons; 7.80% Ob/Gyn; 7.75% neurologists, 4.29% dermatologists; 3.80% oncologists and 18.95% other sub-specialists. 97 cases were submitted (88-Ukrainian, 9-english) and 97.93% received responses. 86.31% of responses were received within the 1st day, 5.26% between 1-2 days, and 8.42% between 3-24 days after case submission. Specialties consulted included dermatology (n=19), dermatology (n=19), internal medicine (n=13), surgery (n=11), pediatrics (n=11) oncology (n=7), other (n=36).

**Conclusions:** HealUA is a promising platform for improving access to subspecialty consultation in Ukraine during armed conflict. Additional efforts are needed to disseminate the application and encourage user engagement.



**Leo Wolansky MD**

Professor and Chair of Radiology, Section Head Neuroradiology  
UCONN Health Center,  
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### *Gadolinium: Friend or Foe?*

Because MRI relies on an extremely powerful magnetic field, a highly magnetic atom, gadolinium, has become the standard of care contrast agent. Gadolinium, in its free form is toxic, however. In order to be used clinically, gadolinium had to be chelated. The first chelate approved for human use was Gadopentetate dimeglumine in the late 1980's. In comparison with the 20% contrast reaction rate of iodinated contrast agents used for CT at the time, Gadopentetate dimeglumine seemed like "sugar water." Over the years hundreds of millions of doses were administered. In a research study patients received up to 78 dose equivalents in about two years.

In 2006, it was found that patients with end-stage renal disease (ESRD) developed a crippling sometimes fatal condition called nephrogenic systemic fibrosis (NSF). Pathologic specimens revealed gadolinium deposits in their skin as well as solid organs. It was determined that despite the overall benevolence of the gadolinium chelates in patients with good renal function, in patients with ESRD, the marked

inability to excrete led to slow de-chelation of the gadolinium with deposition of the toxic atom! Consequently, the FDA recommended renal function studies in all patients undergoing gadolinium enhanced MRI. In 2014, patients with normal renal function were found to have gadolinium depositions in their brain. The newest gadolinium chelates have more favorable dissociation constants and are much safer. In September 2022 a special new agent was found to have equal diagnostic value to the existing agents with half the number of gadolinium atoms. This appears to have opened up a new era of gadolinium administration without concern for NSF or brain deposition.



**Greg Zaharchuk MD**

Professor Radiology/Neuroimaging and Neurointervention  
Member Bio-X Faculty Affiliate-Institute of Human-Centered  
Artificial Intelligence (HAI)  
Stanford,CA

***“Value of AI for Medical Imaging”***

In 2012, a method based on deep convolutional neural networks won the Stanford ImageNet Challenge for computer vision object identification by a wide margin, almost halving the error rate from the previous year. Since then, excitement about the power of deep networks has pervaded all aspects of artificial intelligence, including healthcare. Radiology is a field ripe for innovation with these techniques.

In this talk, I will discuss the various ways AI, and in particular deep learning, has and will impact the radiology value chain, from the construction of new imaging machines, through image acquisition, to automated diagnosis, focusing on our recent work on deep learning-based image transformation and radiation dose reduction. Medical imaging in the future will be quite different than it is today, more valuable and more cost-efficient, and will accrue benefits for many stakeholders, including patients, radiologists, hospitals, imaging centers, and healthcare systems.

**YOUNG INVESTIGATORS PROGRAM**



**Christine Lenchur MD**

PG1 Internal Medicine  
Mount Sinai Morningside West  
Manhattan, NY

***“The Impact of Socioeconomic Status and Race on the Severity”***

**Abstract Purpose:** Systemic lupus erythematosus (SLE) is a chronic autoimmune disease that has the propensity to affect nearly any organ of the body. Patients present

with variable clinical features ranging from mild joint and skin abnormalities to life threatening kidney, hematologic, or central nervous system involvement. Women are disproportionately affected by the disease, with peak predominance during early reproductive years. The purpose of this presentation is to investigate how race and socioeconomic status can correlate to disease severity in female systemic lupus erythematosus patients.

**Methods:** A literature review was conducted which utilized 32 peer reviewed journal articles were surveyed using the research databases PubMed and Scopus.

**Results:** The main prognostic factors for the degree of disability for SLE patients were found to be low annual income, perceived stress, and depression. Research shows that mental illness, especially depression, can serve as the mechanism through which low socioeconomic status can cause increased SLE morbidity in patients in terms of lupus nephritis, skin manifestations, and joint pain **Conclusion:** The morbidity and mortality of SLE is not due to a single determining factor but is rather the result of a multifaceted interaction between socioeconomic, genetic, racial, and environmental influences. More research must be done to expand on this complex association. Since increased stress can be caused by racial discrimination and low-income lifestyle, this factor is the key mediator for SLE disease morbidity. Other factors such as environmental and occupational exposures can also cause more severe disease outcomes, and these relationships should be further elucidated.



**Peter D. Lenchur MS3**

New York Medical  
College  
School of Medicine  
Class of 2025

### *“Lithotripsy and Cardiovascular Disease”*

Lithotripsy has been used for decades in the treatment of kidney stones and gallstones, in which ultrasound shock waves generated outside of the body are used to physically break up hardened masses. In the past decade, intravascular lithotripsy (IVL), a technology developed by Shockwave Medical Inc. (Santa Clara, CA), has emerged as a novel therapy for the treatment of vascular calcification. In the coronary blood vessels, IVL modifies arterial calcium and enables percutaneous coronary interventions to be performed in a safe and consistent manner, and in the peripheral blood vessels, IVL can be used as a stand-alone therapy in the treatment of calcified plaque inpatients with peripheral artery disease (PAD).

Due to the success of the Disrupt CAD and Disrupt PAD clinical trials, IVL is now FDA-approved in the United States for use in both patients with coronary artery disease (CAD) and PAD. The widespread adoption of IVL for PAD is likely to mirror the swift uptake seen in CAD. Although questions remain regarding IVL's high cost and performance compared directly to other technologies such as atherectomy, its ease of use, speed, and safety makes its future extremely promising for the treatment of complex, heavily calcified lesions in both peripheral and coronary vessels. Despite this,

more studies are certainly needed to determine in what clinical scenarios IVL should be considered as opposed to atherectomy and if there are types of calcified lesions where IVL is best utilized (ie, concentric vs eccentric).



**Roksolana Sudyk MS-2**

Michigan State University College of Human Medicine  
Class of 2026

***“Screening for trauma in immigrant populations”***

**Background:** 1 in 5 adults experience mental illness in the United States. Recently, there is an increase in the rate of mental health related emergency department visits. Studies have shown that immigrant populations are less likely to receive mental health screenings, and thus are more likely to receive mental health services during emergency department visits. However, limited privacy, limited time, and lack of providers trained in mental health in emergency departments creates challenges in the provision of mental health services during emergency department visits. Given that 44.8 million immigrants reside in the United States, what is a more effective method of mental health screening in immigrant populations?

**Methods:** A literature review was performed in PubMed. Ten articles were included in the results, and the results were categorized into “Mental Health in Immigrant Populations,” “Barriers to Mental Health Screening in Immigrant Populations,” and “Opportunities for Mental Health Screening in Immigrant Populations.”

**Results:** In terms of mental health in immigrant populations, pre- and post-migration trauma is associated with greater risk of anxiety disorders, depressive disorders, and psychological distress. Furthermore, the experience of trauma is linked to subsequent. In terms of barriers to mental health screening in immigrant populations, cultural and lingual differences lead to disparities in mental health screening, mental health mis- and under-diagnoses, and mental health services. Moreover, medical interpreters may themselves serve as a source of error, increasing disparities in mental health screening and mental health services. In terms of opportunities for mental health screening in immigrant populations, the Refugee Health Screener-15, which screens for anxiety disorders, depressive disorders, and PTSD in refugee populations, and the Harvard Trauma Questionnaire, which screens for PTSD in refugee populations, have shown high sensitivity, specificity, positive predictive values, and negative predictive values as compared to diagnostic proxies. Moreover, the Harvard Trauma Questionnaire has shown high reliability across languages.

**Conclusions:** A more effective method of mental health screening in immigrant populations would include:

1. the implementation of screening for pre- and post-migration trauma,
2. the implementation of screening for anxiety disorders, depressive disorders, and PTSD,
3. the standardization of screening across cultures and languages
4. the standardization of screening across stages of life.



**Ivan Wolansky, MS-3**

Icahn School of Medicine at Mount Sinai  
Class of 2025

***“Applications of AI in Medicine”***

**Background:** Artificial Intelligence (AI) is continuing to evolve at a rapid pace, gaining increasing importance in many aspects of daily life. AI in medicine is one of the fields being implicated.

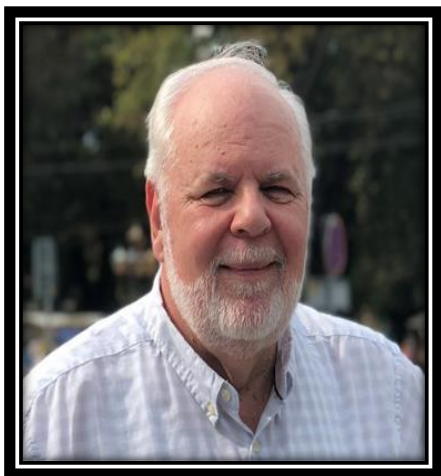
**Objectives:** Identify and elaborate on different applications of AI in medicine.

**Methods:** Literature review of different applications of AI in medicine

**Conclusions:** AI has a number of applications in medicine. Some of these include note-writing assistance, triage, personalizing treatment plans, lesion detection, word-pattern analysis in psychiatry, and precision medical education.

## Dr. Ronald Roman Liteplo, 75

May 16, 1947 - February 12, 2023



Ronald was born in New York City, on May 16th, 1947. He attended La Salle High School, Manhattan College, then New York University School of Medicine. In the 1960s, Ronald worked at Soyuzivka, a Ukrainian cultural center in upstate New York. He met his wife Nadia Pylypyszyn there and they married in 1970. They moved to Buffalo, NY where he completed residencies in internal medicine and dermatology. After his training, Ronald and Nadia moved to Hartsdale, NY, where they raised three sons: Andrew, William and Daniel. He worked in the Bronx at Montefiore Medical Center, at the Albert Einstein College of Medicine and in private practice. He was a

member of the American Academy of Dermatology and the Dermatological Society of Greater New York. He was passionate about his work, loved talking to and educating patients and creating human connections. He retired in 2018 at the age of 71.

For his entire life, Ronald was an active and involved member of the Ukrainian-American community. He sang with the Ukrainian Choir "Dumka" for over 60 years. He was well-known for his deep bass voice, and performed widely, including in western Europe, Ukraine, and numerous times at Carnegie Hall. Ronald was a member of St. Michael the Archangel Ukrainian Catholic Church in Yonkers, where he was a trustee for several years. He was a member and supporter of PLAST, the Ukrainian Scouting Organization. Ronald was also a member of the Ukrainian Museum, the Ukrainian Institute of America, the Shevchenko Scientific Society, and a supporter of the Ukrainian Catholic University in Lviv, Ukraine. Ron was an active member of UMANA both at the Chapter level and National level. Ron attended many of the Scientific Conferences where he would lead the participants in song. He was always upbeat and outgoing.

Ronald was loved by all for his warm and caring spirit. He was kind, hospitable, inviting, and welcomed everyone with a smile and a big hug. He cherished family and friends above all and created close-knit circles of community everywhere. He loved laughter, storytelling, cooking, camping, and traveling. He was a role model to us all, demonstrating how to treat others through his actions, and showing us what the true priorities in life should be. He was a wonderful husband, father, and grandfather and will be sorely missed.

## POINT- OF- CARE ULTRASOUND TEACHING IN UKRAINE

*Andrew Liteplo MD*

Chief of the Division of Emergency Ultrasound at Massachusetts General Hospital  
Associate Professor at Harvard Medical School Boston, MA

*Kevin Sze MD*

Emergency Medicine Physician and Assistant Ultrasound Fellowship Director  
University of Central Florida, Orlando, FL

*Vicky Noble MD*

Chair and Professor University Hospitals  
Case Western Reserve School of Medicine  
Cleveland, OH

*Tanya Bucierka MD*

Emergency Medicine, Eugene, OR  
MedGlobal Director of Ultrasound for Ukraine

In May 2023 a team of medical volunteers traveled with MedGlobal to Ukraine to teach point-of-care ultrasound to Ukrainian frontline physicians. The call came from MedGlobal to emergency physicians across the country with training in point-of-care ultrasound. For this particular mission, MedGlobal, which is a Chicago-based non-governmental organization, partnered with UMANA and Razom to purchase portable Butterfly ultrasound probes and tablets for use on the frontlines of the Ukraine-Russia war.

Point-of-care ultrasound is a scope of practice that incorporates the technology of ultrasound with diagnostic and procedural algorithms based on emergency medicine algorithms. It is able to provide valuable and often life-saving diagnoses at the point-of-care. Traditional ultrasound involves heavier, relatively immobile cart-based machines. However, the miniaturization of technology in recent years has enabled this tool to be easily carried wherever a doctor may need to go. To use this tool for diagnosis and procedural guidance, three educational components are needed: knowledge of how to acquire images, knowledge of how to interpret images, and knowledge of how to incorporate findings into clinical care. Having access to this valuable tool on the frontlines when caring for injured soldiers can have tremendous implications and provide life-saving diagnoses, such as immediately identifying abdominal hemorrhage, pneumothorax, hemothorax, cardiac injury, fractures, and deep vein thromboses, amongst other conditions.

Two UMANA emergency physicians, Drs. Tanya Bucierka and Andrew Liteplo, traveled with MedGlobal to provide the training. Dr. Bucierka, originally from Rochester, New York, is an emergency physician in Eugene, Oregon. Incredibly, this was her fifth trip with MedGlobal to Ukraine to teach ultrasound since the war began. Dr. Bucierka is MedGlobal's Director of Ultrasound for the country of Ukraine. Dr. Andrew Liteplo, originally from New York, is the Chief of the Division of Emergency Ultrasound at Massachusetts General Hospital and Associate Professor at Harvard Medical School. His academic career focuses on teaching and researching point-of-care ultrasound. Both doctors grew up in very strong Ukrainian-American communities in their respective cities, and very much enjoyed the opportunity to



provide assistance and advance medical care in their ancestral homeland of Ukraine.

*Lt to Rt: Drs. Andrew Liteplo, Vicki Noble, Kevin Sze, and Tanya Bucierka in Rivne on a MedGlobal trip to teach point-of-care ultrasound.*

Drs. Bucierka and Liteplo were accompanied by two other emergency physicians—Dr. Vicki Noble, the Chair of Emergency Medicine at University Hospitals in Cleveland, Ohio, and Dr. Kevin Sze, an emergency ultrasound fellow at HCA Florida Osceola Hospital in Orlando, Florida. To round out the team were nurses Alicia Bean of Chicago, Illinois, and Merril Tydings of Idaho, who spearheaded parallel training in Stop the Bleed and Basic Life Support.

Training took place over six days in Rivne Oblast Clinical Hospital. A two-day course was designed and included all aspects of critical ultrasound including cardiac, lungs, trauma, resuscitation, volume assessment, abdomen, nerve blocks, vascular access, and procedural guidance. Additional lectures such as ultrasound of the bowel, gallbladder, appendix, and soft tissue were catered to the needs of the participants, which included emergency physicians, anesthesiologists, surgeons, family doctors, cardiologists, and pediatricians. The knowledge was presented partly in didactic format, and partly in a hands-on format where participants learned to scan with the Butterfly machines that had been generously donated through funds that UMANA had raised. After completion of the course, the Butterfly machines were given to the doctors who are going directly to the frontlines to use immediately in caring for wounded soldiers. All doctors in the courses treated wounded victims of the war, as hundreds of patients are transported from the frontlines by train to Rivne on a regular basis.

Over the span of six days the two-day ultrasound course was repeated twice and over 120 physicians were trained. “I was very impressed by the level of knowledge of all of the Ukrainian doctors. They are all very bright and quickly grasp the key concepts. The urgency with which they need this technology seems to spur in all of them a strong desire to fully understand and embrace this technology. It was clear that they really want to learn this technique because they really need it right now” says Dr. Liteplo.

After six days of training in Rivne, the team traveled to Lviv for another two-day course. This course was led by Dr. Vadym Vus and Dr. Stanislav Kravchuk, who run the Ukraine POCUS Society NGO in Ukraine. These doctors are family physicians and gastroenterologist, respectively, who years ago understood the importance of point-of-

care ultrasound, especially in resource-limited environments. They have since embraced this tool and have started teaching it broadly across Ukraine. Dr. Vus came to Harvard Medical School and Massachusetts General Hospital earlier this year for three months where he worked with Dr. Liteplo and many other physicians in learning advanced techniques of care that he could then bring back to Ukraine. His trip was sponsored by the Help Ukraine Group of the Harvard hospitals. MedGlobal, Razom, and Ukraine POCUS Society (formerly FOCUS POCUS) collaborated for the training in Lviv for military doctors. With funds raised by Razom, they similarly purchased 100 Butterfly machines and tablets for distribution, provided that participants successfully completed the training. The MedGlobal team worked alongside the Ukraine POCUS Society in a train-the-trainers model with the intent for them to continue monthly trainings for the military. The course in Lviv was also incredibly successful and received many positive reviews.

MedGlobal is planning future trainings in Ukraine, which are likely to include more teaching of point-of-care ultrasound, Trauma Surgical Skills, Mental Health training, Stop the Bleed, and Basic Life Support. Over 300 physicians attended at least one of these sessions this past May and are now better equipped to care for Ukraine's soldiers who are fighting for freedom. Additional training sessions will empower even more physicians to do so and help to win this war. Says Dr. Bucierka, "It is truly an honor to return to my grandparent's homeland to teach my physician colleagues who are volunteering to go to the frontlines for medical evacuations. The resilience of the Ukrainian people shone through everyone that we encountered and trained. I look forward to more trainings in Ukraine, and even more so to go back to celebrate victory with our Ukrainian colleagues."

SLAVA UKRAINI!



*Participants in a 2-day point-of-care ultrasound course at Rivne Oblast Clinical Hospital.*

# БОЙОВА ТРАВМА ВУХА У ВІЙСЬКОВИХ УКРАЇНИ: ОРГАНІЗАЦІЯ ОТОХІРУРГІЧНОЇ ДОПОМОГИ І АЛГОРИТМИ ЛІКУВАННЯ.

*Бариляк Роман, Гороляк Дмитро, Червань Ірина*

**Абстракт.** Праця присвячена проблемі лікування і реабілітації ушкоджень вуха і слуху, в першу чергу серед військових і цивільних осіб України після вибухових уражень.

Метою праці є представлення досвіду організації отологічної і ото-хірургічної допомоги в військових медичних центрах України в умовах різкого збільшення кількості пацієнтів з травмами вух і втратою слуху.

Створені центри отохірургії обладнанні основним необхідним хірургічним і діагностичним обладнанням. Представлені алгоритми лікування з пораненням вух.

Окреслені перспективи реабілітації ветеранів і цивільних з втратою слуху.

**Вступ.** Українська військова медицина зіштовхнулась з величезними викликами, пов'язаними з різко збільшеною кількістю поранених і характером ран у військових. З відкритих джерел відомо, що протягом першого року війни до 90-95% всіх поранень виникали внаслідок вибухів, а російські війська вистрілювали до 60 000 артилерійських снарядів щодня. Вибухи викликають ушкодження металевими уламками, вибуховою хвилею і звуком. Згідно праці DePalma [1], ушкодження вуха і слуху, це одне з найчастіших ушкоджень після вибухів. Кількість поранених військових з травмами вух у лікарнях значно збільшилась. З метою їх лікування реорганізовано отоларингологічні відділення в військово-медичних центрах для надання великих об'ємів отологічної й отохірургічної допомоги пораненим.

**Мета праці.** Метою праці є представлення організації спеціалізованої медичної допомоги військовим пацієнтам з післявибуховою травмою вуха. Представлено тактику й алгоритм хірургічного лікування травм вуха і скроневої кістки, особливості бойової травми вуха і хірургічного лікування. Оцінено перспективи хірургічної і післяхірургічної реабілітації військових, ветеранів після війни і цивільних людей, які отримали пошкодження слуху після вибухів.

**Матеріал праці.** Праця збудована на основі досвіду організації спеціалізованої отохірургічної медичної допомоги і лікування поранених військових з травмами зовнішнього, середнього і внутрішнього вуха у відділеннях отоларингології військово-медичних клінічних центрів України, в двох центрах що приймають найбільшу кількість поранених військових з травмами вух.

На базі відділень отоларингології створено центри отохірургії, де за період 14 місяців від кінця лютого 2022 до квітня 2023 виконано понад 400 первинних тимпанопластик з хірургічною обробкою вуха і понад 200 операцій з віддаленою реконструкцією барабанної перетинки і слухових кісточок, операції після проникаючих осколкових уражень скроневої кістки і з хронічною нетравматичною патологією середнього вуха.

Проведено аналіз друкованих праць на тему післявибухової травми вуха в MEDLINE від 1975 до 2023. Додатково використані деякі праці з референційних списків. Вдячні авторам праць за аналіз і їх досвід в цій темі.

**Методи діагностики і тактика лікування.** Реконструктивне лікування середнього вуха необхідно проводити в умовах спеціалізованих військових отоларингологічних відділень з відповідним діагностичним і хірургічним обладнанням, досвідченими спеціалістами отохірургами, діагностами, реабілітологами.

Діагностика включає обов'язкову отоендоскопію, мікроскопію вуха, тональну аудіометрію, при необхідності комп'ютерну томографію скроневих кісток.

Первинну хірургічну обробку середнього вуха необхідно провести якнайшвидше після поступлення пацієнта в відділення. Метою цієї операції, яка виконується під місцевим інфільтраційним обезболенням, є очищення слухового ходу і середнього вуха від бруду і сторонніх уламків, фрагментів шкіри, оцінці стану слухових кісточок, виведенні і фіксації фрагментів барабанної перетинки.

Уламкові рани скроневої кістки оперуються в перші години після поступлення, так як можуть бути небезпечними для життя пацієнта. Такі рани часто інфіковані, ускладнені множинними переломами скроневої кістки, ліквореєю та інтенсивною кровотечею. Віддалені операції тимпанопластичні виконуються найчастіше після 3 місяців від травми. Обезболення загальне, інтубаційне. У випадках деструкції слухових кісточок і вродання епідермісу до барабанної порожнини з пластикою барабанної перетинки операцію проводили після 2 місяців від травми.

Огляд і обстеження слуху тональною аудіометрією виконуємо перед операцією і місяць після операції. Термін обумовлений організацією військової медичної допомоги в військовий час. Обстеження в віддалених термінах утруднене через активні бойові дії.

**Обмеження праці.** Обмеження цієї праці пов'язані з військовим станом і активними воєнними діями на території України. Автори не можуть подати інформацію що є вразливою у військовий час.

## **Обговорення.**

### **Організація отохірургічної допомоги.**

Характер бойових дій обумовлює велику кількість післявибухових уражень. Війна відбувається на території України із сформованою структурою військової і цивільної медицини, яку швидко реорганізовано для вимог військового часу. Це дозволяє швидко доставляти поранених в медичні багатопрофільні і високоспеціалізовані центри. Основне навантаження приймають військово-медичні клінічні центри, а також цивільні лікарні південних і східних областей України. Далі більш стабільні пацієнти направляються в медичні заклади центральної і західної України.

Аналіз характеру травм першого місяця війни визначив пріоритети військової медицини, в тому числі отоларингології. Згідно статистичних даних військово-медичного центру акубаротравма з 24.02.2022 складає 8,9% всіх бо-

йових травм. Травма вуха стала на першому місці в відділеннях отоларингології. Серед пацієнтів відділення отоларингології 90% це пацієнти з акубаротравмою, а серед них 54% з перфораціями барабанної перетинки. Кількість поранених з акубаротравмою у 2022 виросла в 32 рази в порівнянні з 2020 роком. Відповідно реорганізовано працю спеціалізованих отоларингологічних відділень для збільшення навантаження хірургії вуха. В двох передових до лінії бойових дій військово-медичних клінічних центрах створені центри мікрохірургії вуха. Це включало в першу чергу додаткову підготовку військових медиків, залучення лікарів отохірургів волонтерів, волонтерських організацій, доброчинних фондів України, Польщі, США, забезпечення додатковим діагностичним і хірургічним обладнанням. Виникла необхідність обладнання в першу чергу сучасними операційними і діагностичними мікроскопами, ендоскопами, спеціальними отохірургічними інструментами, стерилізаторами, діагностичними аудіометрами та ін. Організовано курс діагностики слуху для середнього медичного персоналу всіх військово-медичних центрів і військових госпіталів.

Впроваджено трьохетапну схему хірургічного лікування уражень середнього вуха після вибухової травми:

I. Первинна хірургічна обробка слухового ходу, барабанної порожнини з очищенням і первинною пластикою фрагментів барабанної перетинки.

II. Віддалена тимпанопластика з реконструкцією барабанної перетинки переміщеним аутографтом і слухових кісточок.

III. Ревізія барабанної порожнини, у випадку рецидиву холестеатоми, вторинної перфорації або незадовільного ефекту слуху після віддаленої реконструкції.

Ця схема дає можливість повноцінно опікуватись пацієнтом від поступлення до одужання в умовах військового часу. Пацієнти після кожного етапу лікування проходять огляд і перевірку слуху, визначається подальше лікування і реабілітація.

#### **Особливості хірургії післявибухової травми вуха**

Вибух викликає множинні ураження вуха- розриви барабанної перетинки, переломи і роз'єднання ланцюжка кісточок, ураження внутрішнього вуха [2]. Як наслідок, втрати слуху сенсоневрального і змішаного типу. Барабанна перетинка має досить добрі властивості до загоєння. Згідно друкованих даних, від 38% до 80% [ 3, 4, 5, 6] післявибухових перфорацій закриваються самостійно. У решти залишаються стійкі перфорації, які вимагають хірургічного лікування, як і у випадках розриву слухових кісточок і ускладнень холестеатоною.

Ми ввели трьохетапне хірургічне лікування, що на нашу думку дозволяє зменшити кількість ускладнень, покращує первинну регенерацію вуха. Під час віддаленої тимпанопластики ми виявили вади кісточок у 15% оперованих і у 11% холестеатомні зміни. Холестеатомні вогнища, як ускладнення, можуть розвиватись у вухах зі стійкою перфорацією і з вже загоєною перетинкою [7]. Ці пацієнти вимагають тривалого спререження.

Особливо складні операції після уламкових уражень скроневої кістки. Обов'язковим є виконання комп'ютерної томографії для визначення поля ураження і тактики операції. Навіть маленький металевий уламок до 0,5 см спричиняє значні руйнування клітин скроневої кістки, слухових кісточок і ви-

кликає глибоку втрату слуху в внутрішньому вусі. Нерідко травмуються мозкові оболонки. Фрагменти шкіри заносяться в середнє вухо, що в подальшому може привести до ускладнень холестеатомами і рубцевим стенозом в слуховому ході. Ці пацієнти після операції вимагають реабілітації і спостереження.

### **Проблеми реабілітації слуху.**

Розгорнені центри надають високоспеціалізовану допомогу пацієнтам з травмами вух. Частина пацієнтів направляється у невійськові лікарні в багатьох містах України де є спеціалісти з хірургії вуха. Однак, залишається ще дуже велика кількість поранених, яка з перебігом воєнних дій зростатиме. Збільшується кількість осіб з частковою або глибокою і повною втратою слуху внаслідок ураження внутрішнього вуха. Їм необхідна реабілітація слуху хірургічна і слухопротезування апаратами, а у випадках глибокої втрати слуху, кохлеарна імплантація, котра є дуже коштовним методом лікування але надзвичайно ефективним. Велика проблема реабілітації ветеранів і цивільних осіб повстане після війни. Необхідні будуть центри хірургічної, слухової, вестибулярної реабілітації, лікування вушного шуму. Такі центри необхідно створювати вже сьогодні, що частково зменшить навантаження на військових медиків, опікуватись інвалідами, військовими і цивільними з втратою слуху. В умовах війни і після її закінчення для цих проєктів необхідно залучати позадержавні і грантові кошти, запрошувати до співпраці організації і спеціалістів цивільних з України, Європи, Америки, готових допомагати. Вже сьогодні можна передбачити тисячі пацієнтів для реабілітації слуху.

**Висновки.** Реорганізацію отоларингологічної допомоги в військово-медичних центрах України для надання допомоги після вибухової травми вуха проведено в найкоротші терміни, з технічним дообладнанням, підготовкою лікарів, діагностів, реабілітологів.

Введено трьохетапну тактику хірургічного лікування післявибухової травми середнього вуха, що забезпечує повноцінну опіку над пацієнтом до видужання.

Необхідно створювати реабілітаційні центри для цивільних і військових ветеранів.

### **Подяка.**

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## WHEN TO REFER TO AN AUDIOLOGIST FOR EVALUATION AND MANAGEMENT OF HEARING LOSS.

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Hearing loss can often go undetected especially when routine wellness appointments have been delayed due to the global COVID-19 pandemic. Hearing-impaired individuals are frequently unaware of their decreased hearing sensitivity and may not understand the implications it can have on their ability to detect speech, hear environmental sounds, localize, enjoy music, and communicate in the presence of background noise (Arlinger, 2003). This makes it even more important for clinicians to be mindful of the causes, co-morbidities, and symptoms of hearing loss which would allow for early detection and prevention of long-standing damaging effects (World Health Organization, 2021).

According to the National Institute on Deafness and Other Communication Disorders, 2-3 out of 1,000 children in the United States are born with a hearing loss in both ears (NIDCD, 2021). Infant hearing screening regulations in the United States support the detection of hearing loss early in life and hearing screenings have been required at birth in the state of Illinois since 2002. The Illinois Early Hearing Detection and Intervention program works to provide screenings no later than 1 month of age and begin intervention no later than 6 months. When an infant fails a newborn hearing screening, a referral is made to an audiologist for further testing and care is coordinated to allow families to have access to audiology services (Illinois Department of Public Health, 2022).

The incidence for adults reporting decreased hearing in the United States is 15 percent in the 18 and over age group. The incidence rises to 25 percent in 65-74 year-old age group and 50 percent of individuals 75 and older (NIDCD, 2021). Adults can become vulnerable to the isolating effects of longstanding hearing loss long before it is detected. Hearing care for infants is initiated utilizing a systematic approach directed towards screenings with ongoing audiologic monitoring provided until the age of 18. In comparison, audiology services for adults are often initiated by a referral from a physician when a patient reports hearing difficulty or a friend/family member expresses concern.

Hearing loss can be caused by the following factors: noise exposure, family history of hearing loss, congenital factors, presbycusis, medications, infections, head trauma, cerumen obstruction, radiation, and tumors (Katz, 2019). Hearing loss resulting from the COVID-19 virus has also been documented in recent studies (Jafari, 2021). The links between hearing loss and cognitive decline, Alzheimer's Disease, clinical depression, diabetes, heart disease, balance issues, mortality, and falls risk have been well researched and documented, although causal relationships have not been determined at this time (Abrams, 2017). Symptoms of hearing loss can be sudden or chronic, and special attention should be directed to sudden hearing loss. Sudden sensorineural hearing loss is characterized by a rapid onset of decreased hearing sensitivity over a 72-hour period and is often associated with tinnitus and/or vertigo

(The American Academy of Audiology, 2022). Prompt attention is critical in cases of sudden hearing loss to allow for the possible preservation of hearing. A referral for audiologic evaluation should be initiated within 48 hours from onset of symptoms to obtain a baseline audiogram, determine if the hearing loss is conductive or sensorineural and refer for otologic management. The critical opportunity for medical management is within 14 days from onset of symptoms (Chandrasekhar, 2019).

The Audiological Services Referral Guide in Appendix A can be utilized as a reference to select recommended audiological tests based upon patient symptoms. A comprehensive audiologic evaluation should also be considered if a patient perceives decreased hearing in one or both ears, requests frequent repetition, is embarrassed when meeting new people, expresses feelings of frustration with family members due to hearing difficulty, has difficulty hearing when someone speaks in a whisper, needs to turn the television up louder or has difficulty hearing at restaurants (Ventry and Weinstein, 1984).

The management of hearing loss can include hearing aid selection and fitting, cochlear implant surgery and programming, and/or communication training. Hearing aid and cochlear implant technology is constantly improving with new approaches designed to process sound that include soundscape analysis, motion sensor technology, falls detection alerting systems, deep neural network technology, automated directionality, Bluetooth streaming technology and easily accessible phone apps. Although electronic devices cannot replace the damage that often occurs in the cochlea, when instruments are selected and programmed by audiologists, they can provide appropriate audibility to allow individuals to stay engaged and active in their activities of daily living. Every hearing loss diagnosis offers an opportunity for patient-centered care and with rehabilitation, hearing loss can be managed effectively.

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# FROM CIVILIAN PRACTICE TO THE FRONTLINES – UKRAINIAN DOCTORS ANSWER THE CALL TO SERVE, SACRIFICE, AND SAVE LIVES.

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The full-scale Russian invasion of Ukraine in early 2022 affected the lives of every Ukrainian. According to the International Organization for Migration, 11.3 million Ukrainians were forced to relocate since the beginning of the Russian invasion: 4.2 million left Ukraine, and 7.1 million were displaced internally. At the same time that many displaced Ukrainians were forced to evacuate West, many others headed East, towards the front lines and into harm's way. This article shares the story of three civilian physicians from Lviv, a city in Western Ukraine.

For over a year, Dr. Dmytro Beshley and Drs. Roman and Andriy Sobko worked in the Donetsk region near the battlefield. Their trio is referred to as “Dmytro and Brothers Sobko”. Their bond dates to 2014, when all three first were deployed to the Ukrainian Military Forces. That deployment lasted 14 months, with most of their time spent operating in Donetsk region, including Mariupol, Krasnoarmiysk (Pokrovsk) and Dnipro. A phone call in February of 2022 reconnected all of them yet again. As they had done in 2014, all three of them answered the call and took leave of successful medical careers, family, hobbies, and the comforts of daily living to serve Ukraine. So many Ukrainian heroes have done the same, and this article is meant to share just one story about the multitude of formerly civilian doctors who must now carry weapons over their white coats as they must practice medicine under the savagery of war.



*Dmytro Beshley*

**Dmytro Beshley, M.D.**, 39 years old, cardiovascular surgeon, MBA. Prior to February 24, 2022, Dr. Beshley operated in Lviv Regional Hospital, served as a director of the Ukrainian-Polish Heart Center “Lviv” and had an assistant professor appointment in the Department of Surgery in Lviv National Medical University. Dr. Beshley performed the full spectrum of cardiovascular surgeries: coronary artery bypass, cardiac valve repairs/replacements, aortic aneurysm repairs, heart transplantation, and the like. He also focused on minimally invasive procedures, performing the first transcatheter aortic valve replacement (TAVR) in Western Ukraine in 2020, after having already performed Ukraine’s first mini-sternotomy access for aortic valve replacement in 2015. He spearheaded the formation of the Ukrainian-Polish Heart Center “Lviv” to improve access to cutting edge healthcare. When asked about his motivations to serve, Dr. Beshley responds, “Independence is a gift that we must defend, guard and fight for. We must honor of the eternal memory of those who lost their lives while defending our country, those who lost their health, and those who continue to defend our Ukraine to this day.”



*Roman Sobko*

**Roman Sobko, MD**, 44 years old, adult, and pediatric anesthesiologist. He was chief of Division of Anesthesiology and Critical Care Medicine in Lviv Regional Children's Specialized Clinical Hospital, but his support for Ukrainian freedom dates to the Revolution of Dignity. "In 2013, until the last day of the Maidan, I was staffing medic tents at Independence Square in Kyiv, where I provided urgent care to the protesters. I believed that this was a way to protect the freedom of our nation, our sovereignty and our Ukrainian voices. In 2014, I volunteered to the frontlines to defend our country. In 2015,

I was demobilized and returned to my hospital with an Honor of Bohdan Khmelnytsky. A few years later, I was elected as a division chief at Western Ukrainian Specialized Children's Medical Centre. I am proud of my accomplishment to create a hospital division for pediatric hemodialysis, which supports all the Western regions of Ukraine."



*Andriy Sobko*

**Andriy Sobko, MD**, 46 years old, oncologic surgeon. Until February 24, 2022. Dr. Sobko practiced in the minimally invasive surgical division of the Lviv Regional Cancer Center. He specialized in minimally invasive surgeries with a focus on gastrointestinal and gynecologic tumors. "This is my second time to deploy in the ongoing war between Moscow and Ukraine. My first introduction to military field surgery occurred in 2014-2015. From this experience I gained some understanding about strategies and tactics while helping the wounded. From the beginning of the full-scale Russian invasion last year, my brother and

I have been working on the same team in the Donetsk region. Our experience in 2014-2015 was a "walk in the park" compared to what we are facing right now. During the past year, we have performed numerous large scale abdominal, vascular, orthopedic and head and neck operations. We attempt to conduct these interventions following the highest standards of practice and by utilizing the newest technologies, including laparoscopy. We rely on our experience and knowledge from "civil" medicine to save Our Heroes, and continually update our practices from what we learn in the field."

Thousands of military personnel and civilians, including children and newborns, have been saved by the hands of these physicians, and doctors like them. During the first months of war, most of the civil doctors in Donestkiy region left their clinics, as they were not prepared to deal with combat trauma. At the same time, a significant portion of local populations remained in these territories, which were subjected to daily shelling and bombing. Military physicians were forced to provide medical help not only to the military, but also to the civilians. There were numerous children hurt by constant shelling: traumatic amputations, massive hemorrhages, frost bites, and burns (photo 4). Dr. Roman Sobko, as a pediatric anesthesiologist, ensured that all the children had appropriate support during surgical interventions, evacuations, and trans-

portation to other medical facilities. These doctors will not remember the names of all the children they helped, but they will never forget the traumas and procedures they performed. Nor will they forget their faces or the terror in the eyes of these children. The pleading eyes, which begged for their parents, brothers, sisters, their home... And it was actually those physicians, who would all-too-often have to deliver the worst news to the children that they managed to save. After working days and nights without rest, they often bore the burden of telling these young patients that their loved ones were lost, about the fact that there is nothing left of their past life. Nothing, except for the mental anguish these innocent children would have to carry now for the rest of their lives. So, even after healing the physical wounds of war, these doctors often stood witness to and internalized themselves the enormous psychological suffering that follows.

Even so, there have been moments of happiness and hope. On one day in June 2022, among the daily flood of wounded soldiers, there was a pregnant woman evacuated emergently from a village near the frontlines. It is very unusual to hear the cry of a newborn in this mobile military hospital unit, despite the fact that before the war this was indeed a newborn floor. Everybody remembered the name of this girl – Darynka. Her birth was one of the very rare flashes of joy amidst war – a transient moment of bliss at the start of the new life, while the rest of the time there is an ongoing battle against death. This was a rare opportunity to count blessings in the midst of tragedy.

But the toil remains, and these battles have been ongoing for over 16 months now. During this time, these doctors enjoyed only a short visit home, for 10 days in the summer of 2022. Amidst over 430 days of war, they had 10 days to spend with time with those for whom they are fighting. Their hair is growing gray, their foreheads are covered in wrinkles, their legs are swollen, as they are the last ones to leave their duties, exhausted after many hours during the day and night near the operating tables. Their scrubs, soaked in blood and sweat, are sticking to their bodies, and their feet so swollen that they need to wear shoes of larger sizes. The stains on the scrubs are permanent and do not come out with laundering.

10 days was a welcome respite, but typically the mobile military hospital has been both their home and work for the past year. For over 16 months, they have been taking 24-hour calls without breaks, days off, and on limited amounts of sleep, especially during massive attacks. Admissions during these surges often involve over 100 complex polytrauma patients over a single day or even more than 50 within just a 2-hour window. Most of these cases come from devastating blast or ballistic shrapnel wounds, and less frequently from simple gun shot wounds. Severe burns, including those from white phosphorous incendiary munitions, commonly accompany and complicate these wounds. And sadly, these surges of severe and complex cases are seen frequently.

Patient triage is critical for the most efficient work by trauma teams composed of surgeons, anesthesiologists and support staff. This triaging relies on rapid assessment of patient's stability and complexity of trauma, allowing the team to prioritize those who need immediate surgical intervention and hemodynamic stabilization (i.e., patients with intraabdominal and chest traumas, massive hemorrhages, and large open wounds) versus those who can wait. Medical transportation and support during the travel must be arranged for many patients in need of higher-level care. As such, there

are sometimes fewer physicians available in the hospital, and the team may be short-staffed while some members are traveling. At times there is only one anesthesiologist simultaneously taking care of patients with multiple operating rooms. More stable patients may have surgical interventions delayed and receive only temporizing wound care while they wait. And the aftercare for all of this is similarly daunting, since the number of wound changes and dressings may number in the thousands in this hospital.

If all this is not bad enough, the Russian invaders purposefully attack ambulances, hospitals, transfusion centers and pharmacies. Every trip to evacuate the wounded poses a great risk from snipers, artillery, rockets and mine fields. In the spring of 2022, their medical team was urgently evacuating a frontline hospital as the Russian forces were rapidly approaching and massively shelling. Healthcare workers had 10 minutes to evacuate patients, themselves and essential equipment. During this short time, they had to make agonizing decisions about what could be saved and what would be sacrificed. They had to move quickly to save their own lives and those of their patients, still knowing that every piece of equipment left behind would limit the medical help they could provide as the newly wounded came in.

War teaches people to tolerate things that were unthinkable in the past. Those on the frontlines now live without normal food, warm water, beds; they share rooms and bathrooms, in conditions that were unheard of just over a year ago. And despite all of this, they show up for work every day and continue to communicate with fellow professionals in the outside world: they share their work and experience at conferences and symposiums, they discuss patient cases with their colleagues in Lviv, they collaborate with the organizations who help ensure proper delivery of needed medical supplies to frontline military hospitals.

Medical supplies are used up rapidly on the frontlines. The needs for consumable supplies like wound care dressings, antiseptics and the like are enormous. Pain medications require constant replenishment. Medical equipment suffers from heavy use, damage from shelling and frequent transportation due to relocations. This is why humanitarian aid is essential for the functionality of these frontline medical units. These hospitals rely on a lifeline of ongoing replenishment of supplies and equipment.

With the help of volunteers and aid organizations, including UMANA, many of these needs are filled. Frontline physicians are especially appreciative of high-quality equipment such as Portable Multifunctional Monitor-Defibrillator ZOLL X Series, Portable Ventilator ZOLL EMV+, Ultrasonic scalpel High-quality diathermos-coagulation; surgical and wound care equipment (Vascular linear staplers, Hemostatic clips, Biological glue). With equipment such as this, they can decrease the number of those who will have lifelong traumas and are able to save lives not only of military personnel, but also civilian adults and children, who will hopefully return home one day. With ongoing support from volunteers, Drs. Sobko, Dr. Beshley and doctors like them, find the strength to continue their tireless work and continue to believe in victory.

These physicians practice in an environment where life ends, and hell begins. But even in the hell brought by this invasion, they perform their duties with honor. They are the ones who continue answering the call to serve and heal patients, even though they now must do so while carrying weapons of war slung over their white coats. They are Ukrainian doctors who accepted the call to protect their country and its people.

For their sacrifices for the people of Ukraine, Dmytro Beshley, Roman Sobko and Andriy Sobko received Presidential Order of Bohdan Khmelnytsky 3 grade (2015-2016), state scholarship (2018), medal "For a saved life" (2022). But the biggest award for them would be Ukrainian Victory. These three physicians, just like many others who are working on the frontlines, have the skills and experience to provide high quality healthcare to those in need. They will continue to do so for the people of Ukraine until victory is achieved.



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*Ukrainian physicians receiving UMANA-Illinois Branch  
blue bag equipment.*

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