

Medical News & Perspectives

Physicians in Ukraine: Caring for Patients in the Middle of a War

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Roman Kizyma, MD, director of pediatric oncology at the [Western Ukrainian Specialized Children's Medical Center](#) in Lviv, Ukraine, has spent most of his waking hours since Russia invaded his country dealing with challenges his medical training never prepared him for: transferring children who've just had a bone marrow transplant from another hospital 350 miles away in an area of heavy fighting, caring for 3 times more children with cancer than his hospital typically treats at one time, planning the evacuation of hundreds of very sick children to hospitals throughout Europe.

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Multimedia

"It is really a complicated process," Kizyma said in an interview March 10. "We never did this before. I think experience elsewhere in the world is really limited."

No matter the obstacles to ensuring that Ukrainian children with cancer get the best care possible, he said, "We are determined because we think this is our contribution for our future win over Russian aggressors."

Before that day comes, though, Kizyma could have to trade his white coat for army fatigues.

Every Ukrainian physician is an army officer or a reservist, he said. So far, Kizyma said, only those with useful battlefield skills, such as trauma surgeons and anesthesiologists, have been called up to defend the country against Russia.

But "[w]e are all ready to do so," Kizyma, a reservist, said, acknowledging that "we are skilled doctors in oncology. We are not skilled shooters."

When Health Care Becomes a Target

Even while continuing to work in hospitals and clinics, health care professionals have been on the frontlines of the Russian invasion, especially in eastern Ukraine.

As of March 15, the World Health Organization's (WHO's) [Surveillance System for Attacks on Health Care](#) had confirmed 31 attacks on health facilities, health workers, and ambulances that resulted in 12 deaths and 34 injuries.



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Marina Kalabina, MD, a pediatric anesthesiologist, was killed when Russian forces fired on her car as she was driving her wounded nephew to a hospital near Kyiv, Ukrainian Health Minister Viktor Liashko, MD, [announced](#) on his Facebook page on March 1.

Under customary international humanitarian law Rule 25, "Medical personnel exclusively assigned to medical duties must be respected and protected in all circumstances," according to the International Committee of the Red Cross.

Speaking March 10 at a press conference in Warsaw with Polish President Andrzej Duda, Vice President Kamala Harris supported calls for an international war crimes investigation of Russia, citing the bombing of a children's and maternity hospital in the port town of Mariupol the previous day, the Associated Press [reported](#).

By the end of the second week of the war, bombing had also demolished 2 Kyiv-area offices of the CSD Medical Laboratory, one of the largest pathology laboratories in Eastern Europe, Oksana Sulaieva, MD, medical director, said in an email. "Fortunately, our central lab is safe, at least for now."

The demolished offices were 2 of about 60 that the Kyiv-based CSD Medical Labo-

ratory operates throughout Ukraine to collect samples, allowing the laboratory to collaborate with some 700 state and private hospitals, Sulaieva said.

She spent the first few days of the war in an underground shelter with her 18-year-old daughter, 15-year-old son, and laboratory colleagues. Oleksandr Dudin, chief executive officer of CSD Health Care, had joined the fighting against the Russians, Sulaieva said. "Many women physicians joined volunteers for helping our defenders or working at blood transfusion stations. I have never seen such a union of Ukrainians."

On March 10, Sulaieva, her children, and about 30 of her coworkers—pathologists, geneticists, and technologists—and their families evacuated Kyiv in a caravan of CSD Medical Laboratory cars and headed toward Lviv, where they planned to establish a laboratory "to provide our patients and doctors with the diagnostics they need," Sulaieva wrote in an email while traveling west.

"It is cold," she noted, with the temperature hovering around -6°C to -4°C (about 21°F to 25°F).

Large laboratory equipment and consumable supplies needed to process samples had been loaded on to a truck, and a space



Evgeniy Maloletka/AP Images

to set up the new laboratory in Lviv had been identified, Sulaieva said.

She and her colleagues arrived in Lviv after a 14-hour journey—"we were quite lucky"—and immediately began setting up their laboratory. "The space here is much smaller than we have in Kyiv, but we will try to start as soon as possible," she said in an email March 13. "The main asset of the laboratory is its employees, their experience and competencies. We have been working for many years to gather and teach the best specialists in surgical and clinical pathology."

Evacuating the Most Vulnerable

Before the fighting began, at least 2000 Ukrainian children were receiving treatment for cancer, pediatric intensivist Asya Agulnik, MD, MPH, director of St Jude Global's Global Critical Care Program and Eurasia Regional Program, said in an interview.

"We're dealing with war, and we're dealing with the...most vulnerable of the most vulnerable: kids with cancer," Carlos Rodriguez-Galindo, MD, director of St Jude Global, said in an interview. "You can't deliver good cancer care in these circumstances."

With the help of pediatric oncologist Kizyma and other partners on the ground, approximately 400 pediatric patients with cancer have been transferred from Ukraine to hospitals in other European countries, Agulnik said. "Our goal overall is to provide continuity of cancer care for these children despite the challenges of war."

Currently, the plan is to transfer only patients who are receiving active treatment,

Kizyma said. "A really challenging question for us is should we just send every patient to the European Union?" Even if that was the goal, though, elderly grandparents, parents' jobs, and siblings would keep many in Ukraine, he pointed out.

Still, pediatric patients with cancer from all over Ukraine, including some recovering from a bone marrow transplant, are being transferred to Kizyma's hospital, where they are stabilized and readied to make the approximately 50-mile trip to the Polish border. Moving patients who are recovering from a bone marrow transplant "can be very harmful to their chances of survival," Kizyma noted, "but we hope we can do it."

Physicians from Kyiv, Kharkiv, and other big cities in the south of Ukraine have volunteered to help care for the children in his hospital, which has also hired nurses from other cities, Kizyma said. Seeing familiar faces from the hospitals where they used to be treated helps comfort young patients far from home, he added.

Kizyma is a member of the team of physicians who travel with the patients, while his mother, also a pediatric oncologist, is on the team that cares for the children still hospitalized in Lviv.

"You can't put all of these kids in one bus," he explained. Between patients and their mothers and siblings—men 18 to 60 years of age must remain in Ukraine in case they are needed to fight—a convoy could consist of up to 200 people and 5 to 7 ambulances, each with a physician, he said.

Only children with medical emergencies or close family ties remain in Poland, and that's not many, Agulnik said. Most travel to other European countries, such as Germany, Italy, or Spain, which have agreed to provide free care through their national health systems and assist their families with housing and other necessities, she said.

"Obviously, we need to start thinking what role we can play in North America," said Rodriguez-Galindo, who is also executive vice president of St Jude Children's Research Hospital in Memphis, Tennessee. "We are ready to bring patients at any time."

War Casualties off the Battlefield

The war in Ukraine is likely contributing to illness and death far from the frontlines.

Besides conflict-related trauma and injuries, public health concerns in Ukraine include risk of excess illness and death from noncommunicable diseases such as cardiovascular disease, diabetes, and cancer due to disruptions in medical supply lines and health services, according to a [WHO report](#) published March 11.

In addition, the WHO expressed concern about the risk of the emergence and spread of infectious diseases such as measles, polio, COVID-19, and other respiratory infections because of such factors as destruction of water and sanitation infrastructure, inadequate vaccination coverage, movement of significant numbers of people, and overcrowding.

Oksana Zayachkivska, MD, PhD, DSc, chair of the physiology department at Lviv National Medical University, told of a newborn who died of pneumonia after spending time in a shelter and then traveling with family to flee the fighting.

"It's impossible that babies in the 21st century die from pneumonia," she said.

One of Zayachkivska's other roles is editor in chief of *Medical Sciences: Proceedings of the Shevchenko Scientific Society*, founded in 1898, making it the oldest Ukrainian medical journal, she said. The journal publishes in June and December, in Ukrainian and in English. An [article](#) in the most recent issue is titled "The Role and Place of Damage Control Surgery in Military Medical Evacuation Doctrine During Hostilities in Modern War."

Cardiologist Nelya Oryshchyn, MD, PhD, an assistant professor at the Lviv National Medical University, described the case of an adult who, as a result of traveling by train from Kyiv to Lviv, developed a pulmonary

embolism. The displaced person had spent the entire trip crammed with a dozen other people into a train car meant to hold 4, Oryshchyn explained in an interview March 11.

She said she has seen people wait 3 days before seeking care for myocardial infarction. Some were fleeing the fighting in eastern Ukraine and didn't have a chance to see a physician when their chest pain began, Oryshchyn said, but even patients living in Lviv are delaying care because of gas shortages and other concerns about being able to drive to the hospital.

Oryshchyn said the local hospital for adult cancer patients, where her husband works as an anesthesiologist, has had to delay the scheduling of surgeries, sometimes for up to a month, because of the fighting.

Although Lviv hadn't seen fighting yet, Oryshchyn said, bomb alarms sound 2 or 3 times a day. Each time, she said, hospitals must move patients to a safer area, either underground or, at her hospital, the first floor.

"Everybody is in stress. Everybody," said Oryshchyn, a Lviv region native. "Many people from Lviv are going to Poland."

The 500-member [Ukrainian Medical Association of North America](#) hopes to relieve some of that stress by setting up telemedicine consults for people in Ukraine, President Leo Wolansky, MD, professor and chair of radiology at UConn Health, said in an interview.

Wolansky said his organization is working to partner with a telemedicine company based in a Baltic country to provide long-distance care for Ukrainians in shelters as well as to support overwhelmed physicians. The son of Ukrainian immigrants whose father was a psychiatrist, Wolansky organized annual international radiology conferences in Ukraine until the pandemic moved them online.

Drug and Device Shortages

Epilepsy specialist Oleg Kruszyński, MD, co-founded with his wife and serves as chief executive officer of [Epi.NET](#) (Network Against Epilepsy), which includes several diagnostic centers in Ukraine.

"A Russian ballistic missile exploded not far from our diagnostic center, which is located in Bila Tserkva," a city about 45 miles south of Kyiv, Kruszyński said in an email. "Our clinic was not damaged, but many private houses were destroyed."

Kruszyński, formerly executive editor of the Ukrainian edition of *The Lancet Neurology*, and his family moved to Poland a few years ago "for reasons not related to politics or finance."

Epi.NET treats thousands of patients throughout Ukraine as well as in Russia and Belarus, he said. "Now the work is completely paralyzed, as patients, even from Ukraine, simply cannot come" to Epi.NET centers because of the fighting.

"Most of our patients are children, and now they sit in cold basements with seizures, deprived of access to lifesaving anti-epileptic drugs," Kruszyński said. "Some managed to go to another Ukrainian region or abroad, often without the necessary things and money. They live where they managed to find a roof over their heads."

Kruszyński said he is working with fellow epilepsy specialists in Ukraine and abroad to try to find and deliver antiepileptic drugs for his patients.

A shortage of supplies has forced Oryshchyn and her colleagues to simplify procedures more than they'd like. For example, she said, they can still open occluded coronary arteries with a balloon but have no stents to keep arteries open.

"It's better than nothing, of course," she said.

Kizyma worries about being able to appropriately treat all the young cancer patients arriving in Lviv. "We will run out of drugs at some point, late March or early April," he predicted. He said he is asking convoys that take patients to Poland to try to bring back anticancer medications.

Friends and Family

Zayachkivska's relatives in Kyiv escaped the city on the second day of the war.

Her cousin's wife and 2 teenaged daughters rented a car. The 19-year-old daughter, who had just received her driver's license,

drove, Zayachkivska said. Normally 6 or 7 hours, the drive took them 20 hours.

A total of 6 relatives from Kyiv are now staying with Zayachkivska and her husband in Lviv. "We are online 24/7, following the news," she said.

Sulaieva and her children are living as a community with other members of her team near the relocated CSD laboratory in Lviv.

For now, her children's classes have been suspended. "They are quite mature now and help me with overcoming the war and in the lab," Sulaieva said.

Friends of Oryshchyn's, a married couple who are both physicians, didn't leave Kyiv for Lviv until 10 days after the fighting had begun. The drive took twice as long as normal, Oryshchyn said, because a bridge on the main road had been destroyed and they had to stop and show their travel documents at many security checkpoints along the way. They are staying in Lviv as volunteers to provide medical care to displaced persons, Oryshchyn said.

The day before he spoke with *JAMA*, Kizyma escorted only 3 young children to the border: they were his own, and, along with his wife, an IT professional, they were going to spend the duration of the war with relatives in Slovakia, about 300 miles from Lviv.

On its information [page](#) for Ukrainians fleeing the war, the Slovakian government notes in boldface type: "We will take care of you."

Although the Slovakian government has set up centers at border crossings and in some cities to speed up the administrative process refugees must complete, Kizyma texted "chaos at the border—I don't know how much time I'll get stuck here" to explain why he had to postpone talking with *JAMA*.

He will miss his family, of course. But he is also relieved that he no longer has to worry about the safety of his own children and can give his undivided attention to his young patients. ■

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