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Pathology in medical school education

The cornerstone of medicine By Vivian Mason Uniformed Services University

Pathology is the backbone of medical education, the bridge between basic science and clinical medicine. It focuses on determining the cause, origin, and nature of disease. Testing and analyzing body tissues, organs, and fluids enable healthcare professionals to diagnose and treat patients correctly. For example, all patients with oncologic diagnoses and the majority of patients with cardiovascular disease require laboratory testing. Pathology underpins every aspect of patient care. Autopsies also help us understand the disease process, the natural history of disease, as well as the effects of treatments.

"Pathologic evaluation, including laboratory testing, impacts nearly all aspects of patient care – from diagnostic testing and treatment decisions to using cutting-edge genetic/genomic technologies for personalized medicine," says Dr. Barbara Ritschel, vice chair of Pathology Education and professor of Pathology and Emerging Infectious Diseases in the Department of Pathology at the Uniformed Services University's (USU) School of Medicine.

"As physicians," Ritschel continues, "we diagnose diseases and disorders day in and day out. We also want to help patients stay well. Knowing the disease mechanism is really central to being able to understand why it's presenting a certain way in a patient, and what mechanistically has gone wrong, as this may drive the selection of treatment."

Medical students at USU learn about the underlying mechanisms of diseases that are essential for accurate diagnosis and effective treatment of patients. A sound grasp of pathology is required in all areas of clinical practice. Studying pathology helps make medical students better physicians by helping them understand disease processes, knowing which laboratory tests to order, the advantages and limits of diagnostic modalities, and how best to approach diagnostic information in clinical practice.

Ritschel oversees all pathology education throughout the four years of medical school. USU students are introduced to pathology through various laboratory, small group, and

Naval Medical Center Camp Lejeune welcomes first baby of 2025 in Onslow County

By Riley Eversull Naval Medical Center Camp Lejeune

Naval Medical Center Camp Lejeune welcomed the first baby of 2025 for Onslow County, North Carolina. Stella Ray Esther Basham was born at 1:20 a.m. on Jan. 1.

Baby Stella weighed 6 pounds, 9 ounces and measured at 18.7 inches in length. She is the daughter of Hospital Corpsman Second Class Elisabeth Basham, a native of Olathe, Kansas, and Hospital Corpsman Third Class Timothy Basham, a native of California, Maryland. Stella's parents are both U.S. Navy Sailors at Naval Medical Center Camp Lejeune (NMCCL). Stella is the second child for the couple whose first daughter who was also born at NMCCL.

The couple said Stella's name drew inspiration from the stars with her middle name – Esther – also meaning "star." Stella's father said her original due date was later in January, but her early arrival is a "Hannukah surprise."

The family thanks the teams with Labor and Delivery and the Mother Baby Unit for caring for both Stella and her mother. NMCCL congratulates the Basham Family on Stella's birth and wishes them a safe and happy 2025!

NMCCL has provided more than 80 years of dedicated, passionate care for warfighters and beneficiaries at Marine Corps Base Camp Lejeune.

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Photo by Riley Eversul

Hospital Corpsman Third Class Timothy Basham and Hospital Corpsman Second Class Elisabeth Basham are photographed with their newborn daughter, Stella, at Naval Medical Center Camp Lejeune. The couple's child is the first baby for Onslow County, North Carolina in 2025.

Walter Reed welcomes first Nation baby of 2025 Bethe

By Carol Kaplan Walter Reed National Military Medical Center

First babies of 2025

Walter Reed National Military Medical Center, BETHESDA, MD — "Well, this is a helluva way to start the new year!" declared 21-year-old Navy Master-at-Arms Seaman Autumn Henigin, one day after giving birth to the first baby of 2025 at Walter Reed

National Military Medical Center in Bethesda, Maryland.

Little Sierra Ross made her official entrance into the world at the hospital's Mother & Infant Care Center (MICC), clocking in at 7:10 a.m. on Jan. 1. She weighed in at five pounds, 14 ounces, and measured just over 18 inches long.

Henigin sat up in bed cradling her newborn daughter while her

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Page 2 • January 2025 • Military Medical News www.militarymedical.com 911th Fitness Center recognized as top program

By Master Sgt. Jeffrey Grossi 911th Airlift Wing

For the second year in a row, the 911th Fitness Center was honored as the Air Force Reserve Command's Fitness & Sports Program of the Year, receiving the award in November at the Athletic Business Show in New Orleans. This prestigious recognition highlights the center's continuous commitment to improving health and wellness for members of the 911th Airlift Wing.

Throughout the year, the center conducted 1,325 physical fitness assessments and trained more than 60 physical training liaisons, contributing to the wing's fitness testing success rate surpassing 90%.

The center continues to run its Strive 365 program, designed to help Steel Airmen adopt and maintain healthier lifestyles. This initiative combines

cise physiologists, the Steel Airmen and encouraging a healthier base Support Team, and Perksburgh Café.

To engage the base population, the center hosted several events, including weekly 3K runs, quarterly trail runs in partnership with Outdoor Immersion, the Murph Challenge, the Bataan Death March Memorial Ruck, and a September 11th tribute workout. High-intensity interval training (HIIT) classes are also offered three 1,200 members.

Loser" competition, named after the cardiovascular room, and enhanced competition reality show aimed at losing weight through healthy diet improved safety and the overall expeand exercise, saw a surge in participation, doubling its numbers with new prizes and mid-event challenges. the center assumed responsibility for Teams competed for perks such as Outdoor Recreation, expanding its culture of health and wellness for all

efforts from the fitness center's exer- Perksburgh; fostering camaraderie their families. community.

> Intramural sports leagues, including basketball, flag football, volleyball, soccer, and softball, ran yearround. With the support of the Steel Airmen Support Team, officials were funded to ensure the success of these programs fostering year round morale and esprit de corps.

Facility improvements further times a week, benefitting more than enhanced the fitness center, with upgrades including new carpet, paint, The center's popular "Biggest LED lighting, ceiling tiles in the security cameras. These changes rience for patrons.

In addition to fitness programming, naming meals at the on base café, offerings to support Steel Airmen and Steel Airmen.

The 911th Fitness Center's efforts have earned accolades, including being named the Fitness & Sports Program of the Year for two consecutive years. Additionally, the center's exercise physiologist was recognized as a Superior Performer by the Unit Effectiveness Inspection team.

Under strong leadership and management, the \$5 million facility, athletic field, and outdoor track remain safe, operational, and accessible to more than 20,000 customers annually. The team also secured 11 new Life Fitness machines with dual-purpose capabilities as part of a five-year plan to maintain and update equipment.

The 911th Fitness Center's achievements underscore its commitment to mission readiness and fostering a

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The Pittsburgh International Airport Air Reserve Station fitness center team poses for a photo at Pittsburgh IAP ARS, Pennsylvania, Aug. 27, 2024. The fitness center team was recognized as the best A1 Fitness and Sports Program of the Year for 2022 and 2023.



www.militarymedical.com **U.S. Naval Hospital Guam transforms mental health crisis care**

By Regena Kowitz U.S. Naval Hospital Guam

In the midst of the vast Pacific Ocean, U.S. Naval Hospital Guam is revolutionizing mental health care for America's warfighters with a groundbreaking program that's already transforming lives and enhancing military readiness.

Since starting operations in March 2024 and being officially designated as a clinic on Dec. 10, 2024, the Military Health System's first Crisis Stabilization Unit, the hospital has successfully treated 246 active-duty service members experiencing mental health emergencies – with only two requiring medical evacuation and four needing mental health admission. These remarkable statistics underscore both the program's effectiveness and the hospital's commitment to delivering world-class care to service members on Guam.

"The CSU initiative is dedicated to the psychological readiness of our warfighters who deserve quality care in a timely manner no matter the platform or location," said Cmdr. Francine Segovia, director for mental health at USNH Guam.

The unit's success directly supports the hospital's mission of projecting forwarddeployed medical power and delivering high-quality care to strengthen warfighter readiness in the Pacific region.

A New Standard of Care

Before the CSU opened, service members experiencing mental health crises faced limited options: either endure long wait times in a busy emergency room or schedule an outpatient appointment that could take weeks to secure. For those requiring more intensive care, medical evacuation off-island meant spending an average of four weeks away from their unit for treatment and travel and often required a non-medical attendant, resulting in up to eight weeks of total lost operational duties.

The CSU has dramatically changed this scenario by providing an alternative possibility for treatment. Operating as a "one-stop shop" for mental health care, the unit provides comprehensive services including assessment, diagnosis, treatment planning, monitoring, referral, and transition services – all within a few hours.

"Given Guam's location, medical evacuations may take a couple of weeks, and given the operational tempo, units may not be able to afford unplanned losses," Segovia said. "The need for such a service came at the bequest of line commanders and patients who sought quality care no matter the platform or location."

This innovative approach is based on evidence-based guidelines from the Substance Abuse and Mental Health Services Administration, one of the premier experts in the development of crisis care in the nation. The CSU is an alternative to emergency departments and psychiatric hospitalization and provides intensive, short-term stabilization for someone experiencing a behavioral health crisis that cannot wait until a regularly scheduled appointment. The preliminary data indicates improvement in access, reduction in costs, and deflection away from the emergency room and inpatient hospitalization.

Creating a Healing Environment

Understanding that environment plays a crucial role in mental health treatment, the hospital is collaborating with Defense Health Agency facilities experts and U.S. Army Corps of Engineers mental health interior designers to create a space optimized for healing and stabilization.

"That's the first picture we want our mental health patients to experience when they come in for help," Segovia said, describing plans for the unit's carefully designed setting that avoids stark clinical aesthetics in favor of a calming, homelike atmosphere with thoughtfully chosen



U.S. Navy photos by Jaciyn Matanane/released

Above, below: Hospital Corpsman 2nd Class Fabiola Michel, a behavioral health technician at U.S. Naval Hospital Guam's mental health department, shares information about the Crisis Stabilization Unit program and services with Lt. Cmdr. Marvin Weniger.

furniture, artwork, and lighting.

Excellence in Team-Based Care

The CSU's success stems from its multidisciplinary approach and the dedication of its staff, particularly its Navy Hospital Corpsmen with advanced training as behavioral health technicians. These vital team members have expanded their roles from administrative duties to providing safety assessments, comprehensive evaluations, brief interventions, and triage under clinical supervision.

"This has in turn honed their knowledge, skills, and abilities which will help our patients get the care they need when they most need it and prepare the respective BHT's with the clinical skills they will need when deployed," Segovia said.



As USNH Guam looks ahead, the facility is exploring opportunities to expand the CSU's services. Currently serving active-duty personnel during normal business hours, future plans could include the 23-Hour Crisis Stabilization Unit model which would provide 23-hour crisis respite and observation services and extending care to dependents.

"The success of our Crisis Stabilization Unit demonstrates what's possible when we reimagine how we deliver mental health care," said Capt. Joel Schofer, director, USNH Guam. "As we look to the future, we remain focused on finding new ways to enhance the readiness and resilience of our warfighters through responsive mental health support."

This innovative approach to mental health care delivery continues to evolve as the hospital looks for ways to better serve its beneficiaries. Mental health care plays a vital role in maintaining military readiness throughout the Indo-Pacific region.

"Mental health is physical health. Mental health emergencies should be taken just as seriously as any other medical emergency," Segovia said.

Through innovative programs like the CSU, USNH Guam continues to demonstrate its unwavering commitment to delivering exceptional care that supports both individual servicemember well-being and overall military readiness in the Indo-Pacific region.

U.S. Naval Hospital Guam is a 282,000 square foot military treatment facility (MTF) that supports the joint forces and strengthens the island by projecting forward-deployed medical power, delivering high-quality care, and forging strategic partnerships. The MTF and its staff of nearly 700 offers a broad range of primary and specialty medical services in support of more than 27,000 beneficiaries.



Page 4 • January 2025 • Military Medical News www.militarymedical.com **USARIEM** is updating guidance on cold-weather injuries

By Paul Lagasse Medical Research and Development Command

FORT DETRICK, Md. - As geopolitical competition in the Arctic region continues to accelerate, senior leaders need to be confident that the Warfighters under their command will be able to operate at peak effectiveness for long periods in extreme cold. That's why experts in nutrition, physical performance, and extreme environments from the U.S. Army Research Institute of Environmental Medicine are teaming up to revise the Army's guidance on protecting the physical and psychological health of military personnel operating in below-zero environments.

In the nearly 20 years since the last edition of the Army's technical bulletin on the prevention and management of cold-weather injuries, called TB MED 508, research conducted at USARIEM has significantly improved our understanding of how humans respond and adapt to cold, how to effectively prevent and treat cold injuries, and how to inhibit performance degradation. That knowledge will be reflected in the new edition of TB MED 508.

"One of the things we teach Warfighters is that there is no 'one size fits all'

solution in cold-weather operations,' says Dr. John Castellani, a supervisory research physiologist at USARIEM and the organizer of USARIEM's Cold Weather Research and Development/ Arctic Medicine Cross-Functional Team. "Some people might need to wear an extra layer, while other people might not. Everybody's different. That being said, hands and feet are the most susceptible and we really need to try to protect them as much as possible."

For example, the ability of a person to generate heat and sustain it are affected by their muscle mass, fitness level, age, and fatigue. With that in mind, USARIEM has developed the Cold Weather Ensemble Decision Aid, a computer database that allows individuals to select the headwear, gloves, boots, and upper- and lower-body gear that best suits their physical characteristics and their operating environment. Future updates to the decision aid will include cold-weather ensembles from the U.S. Air Force and other NATO countries, as well as enable users to calculate the effects of wet clothing on heat loss.

Castellani recently discussed these and other interesting developments in Arctic force health protection at the annual Anchorage Security and Defense



Photo by Espen Hofoss, FFI

Researchers meet with study participants in the field to collect diet records. U.S. Army Research Institute of Environmental Medicine researchers collaborated with the Norwegian Defence Research Establishment (FFI), the University



of Arkansas for Medical Sciences, and the Combat Feeding Division (CFD) within the US Army Combat Capabilities Development Command Soldier Center (DEVCOM-SC) to test nutritional strategies for muscle recovery and repair during cold weather military training.



Photo by Maddi Langweil

A volunteer is exposed to cold air in environmental test chamber after undergoing a treatment called ischemic preconditioning, which uses a blood pressure cuff to increase blood flow to the hands and improve manual dexterity in coldweather environments.

Conference, a two-day symposium Military Nutrition, Military Performance, co-hosted by the Ted Stevens Center for Arctic Security Studies and the Department of Homeland Security's Arctic Domain Awareness Center. For the first time, over 350 defense and security professionals from the United States, Canada, Norway, Sweden, Finland, Denmark, and other NATO countries gathered to discuss how to address the security challenges currently facing the Arctic region, including the role of cold-weather military medicine.

One of the most important developments in the treatment of cold-weather injuries, according to Castellani, is the U.S. Food and Drug Administration's recent approval of the drug iloprost for treating severe frostbite, the first approval of its kind by the FDA. Originally developed to treat pulmonary arterial hypertension, iloprost works by dilating blood vessels to improve blood flow. Research has shown that this technique is effective in treating deep frostbite that penetrates beneath the skin to affect muscle, tendon, and bone.

"The efficacy of iloprost is amazing," says Castellani. "If people can get it intravenously within 72 hours of an injury, the likelihood of amputation is severely decreased."

USARIEM's Cold Weather Research and Development/Arctic Medicine Cross-Functional Team brings together injury in the first place, and to allow researchers from across USARIEM's them to thrive rather than just survive."

and Thermal & Mountain Rescue research divisions to address science and technology gaps in cold-weather medicine and performance. Their goal is to enhance Warfighter performance and medical treatment in extreme environments. The team focuses on four broad thematic areas: developing guidance and standards, sustaining manual dexterity and peripheral blood flow, improving physical and cognitive performance, and ensuring adequate nutrition.

Research conducted by members of the cross-functional team has explored topics as wide-ranging as how energy deficits impact the body's ability to maintain muscle mass, how blood flow to the hands and fingers can be increased to improve manual dexterity, and how to map the timeline of frostbite injury recovery to help accelerate return to duty. Eventually, Castellani hopes the Army Medical Capability Development Integration Directorate will use the findings from these and other studies to develop new requirements for human performance and preventive medicine in extreme environments.

"It costs so much less to prevent an injury than it does to treat it," says Castellani. "Ultimately, the goal is to provide tools to people so that they can make informed decisions to prevent

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• Pathology (Continued from front page)

team-based learning sessions integrated about 60 pathology chairs and course into the seven pre-clerkship modules. The goal is to prepare students for their clinical years and beyond.

Throughout the pathology curriculum, key aspects of pathobiology and applied pathology practice are integrated into a program that includes disease mechanisms and processes, organ system pathology, and diagnostic medicine and therapeutic pathology. Most pathology education at USU occurs during preclerkship (the first year and a half of medical school). Students are given an opportunity to enhance their knowledge and obtain a greater understanding of the pathological basis of disease.

In pathology, there's also a compre-hensive publication, The Pathology Competencies for Medical Education, that was updated in July 2023. It consists of competencies, goals, and learning objectives deemed important for all medical students to know. USU's curriculum, like others around the country, is built on these learning objectives.

These competencies were developed as a national resource of expectations of pathology knowledge for medical students. They are composed of three major competencies: disease mechanisms and processes, organ system pathology, and diagnostic medicine and therapeutic pathology.

directors from across the United States met and pooled together all of our learning objectives. Then, we went through those to decide what the majority thought was essential for medical students to know."

Pathology knowledge is closely tied to clinical skills. Good clinical reasoning grows from a solid understanding of pathology and how diseases and disorders present. What is most important is that students understand pathology's impact on clinical reasoning. This, in turn, plays a key role in creating physicians who think logically and scientifically when diagnosing and managing their patients-ultimately improving patient care. Exposure to a foundational pathology curriculum gives medical students the framework to think about how best to use the information in clinical practice.

There are common misperceptions about pathologists - that they don't do patient care. "We run into that all the time," says Ritschel. "Pathologists are key to patient care because we're driving the diagnosis. We may not be in the examination room with the patient, but we are key to patient care by making sure the patient has the right diagnosis at the right time."

Ritschel continues, explaining that "Initially," says Ritschel, "a group of pathologists also run the clinical labora-

tory and do all of the laboratory testing. "For the doctor," she says, "it's really about understanding and knowing that the tests you ordered are giving you the correct results. Those tests have to be interpreted within the context of the patient.'

Understanding how pathologists diagnose conditions and how clinical pathologists support lab diagnostic testing enables students to know who to contact with questions when they rotate on the ward or take care of patients.

Medical students have to take the USMLE (United States Medical Licensing Examination). It consists of three exams or steps, with Steps 1 and 2 taken while in medical school and Step 3 taken during the first year of internship or residency. On the Step 1 exam, approximately 50% of the questions are pathology related. This underscores the importance of understanding disease processes and mechanisms for keeping patients safe, as well as how treatment can affect or change the disease process.

Pathologists can focus on an organ system in surgical pathology – such as neuropathology, gastrointestinal pathology, or gynecologic pathology – or they can specialize in blood banking, molecular pathology, or forensics. "In USU pathology education," notes Ritschel, "we focus on disease processes. In patients, especially those with cancer, the diagno-

sis is made by the pathologist. This specialist obtains the genetic and genomic testing and studies that are pertinent to appropriately subclassify and stage the disease. This allows the patient to receive the most precise and optimal therapy."

"For example, it's important to know exactly what type of lymphoma a patient has and the molecular changes in those tumor cells. This may alter the prognosis as well as the treatment for that patient. If a patient has a specific molecular mutation in the cancer cells, we may be able to treat it with targeted chemotherapy or immunochemotherapy that may have fewer side effects than broad chemotherapeutic agents. This in turn would most likely increase the patient's quality of life during and after treatment.'

Ritschel oversees the entire pathology curriculum at USU, which includes innovative interdisciplinary teaching methods, such as small group sessions, problem-based learning, and recorded lectures. The goal is to instill an understanding of disease mechanisms, diagnostic processes, and therapeutic approaches in medical students. As a result, USU students are well-prepared for both their clinical years and their future careers.

"As a pathologist and a leader in pathology education," says Ritschel, "I chose pathology because it's fascinating and challenging. There is so much more in testing and what we know about disease processes than when I started in pathology decades ago. It's great to be on that cutting edge of knowledge and diagnosis every single day. We can never forget that every slide or lab result we evaluate is for a patient and is an important part of their care. Patient care is central to everything we do."

Help Wanted



• **Babies** (Continued from front page)

husband, 20-year-old Navy Master-at-Arms Seaman Apprentice Latrell Ross sat next to her, gazing at his new baby adoringly. Sierra is the couple's second daughter. (The firstborn girl, ironically named Navy before Henigin even joined the service, is 2.)

Baby Sierra was one of five babies born in the MICC on New Year's Day all of them induced.

"I knew I was gonna give birth on January 1st, but I didn't think I'd be first," Henigin said.

Indeed, it was a busy day for the unit's team.

Army Capt. (Dr.) Emily Ferraro, attending pediatrician at the MICC, says, "Everyone on staff was so happy to bring in the new year by welcoming five new babies."

Meantime, as the little one yawned and stretched her arms, a gentle knock on the door breaks the quiet.

Three MICC nurses enter, carrying the traditional first-baby-of-the-year gift basket, complete with a card signed by the entire unit.

"Well, aren't you something!" coos one of them, peering behind the blanket covering part of Sierra's face.

"This is so nice," Ross says. Inside the gift basket are tiny baby booties, a blanket, a soft, cuddly toy, and assorted knick-knacks that all newborns need.

What a way to start the new year, indeed.



21-year-old Navy Master-at-Arms Seaman Autumn Henigin and her proud husband, 20-year-old Navy Master-at-Arms Seaman Apprentice Latrell Ross, celebrate the birth of their daughter, Sierra Ross, at Walter Reed National Military Medical Center in Bethesda, Maryland. Sierra was the first baby of 2025 to be born at the hospital.

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CIVILIAN MEDICAL OPPORTUNITIES

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Physician







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