

solutions

HEALTHY AND 100

Living life to the fullest at
the century mark and beyond

COP DOC

Faroukh Mehkri seeks a life of double service – as a physician and a police officer.

SURVIVOR

Andras Lacko's Holocaust experience taught him resilience and perseverance.

WORLDLY

UNTHSC international students provide a rich diversity that opens the eyes of all.

SAVE THE DATE

**Nov.
7th 2017**



AN EVENING WITH A

**★ ★ ★
LEGEND**

★ BASS PERFORMANCE HALL ★

BENEFITING UNT HEALTH SCIENCE CENTER FOUNDATION

FROM PRESIDENT MICHAEL R. WILLIAMS



At UNTHSC we are building One University to train and prepare our students and researchers to be extraordinary team members in the delivery of health care for you and your family.

Now, we graduate scores of osteopathic physicians, dozens of physician assistants, physical therapists, scientists, public health leaders and researchers each year, and next we will graduate our first class of 82 pharmacists – a program that didn't exist five years ago. In 2019 we plan to welcome the first class of 60 MD students to the UNTHSC/TCU School of Medicine.

In the following pages are examples of how we work together and with our community partners to focus our efforts on healthier communities and the future of health care training and delivery.

Michael R. Williams

SOLUTIONS

Solutions is a publication of the Office of Communication at UNT Health Science Center.

Editor **Kerry Gunnels**

Assistant Editor **Jeff Carlton**

Art Director **Marco Rosales** • Designer **Guillermo Gómez**

Contributing Writers **Alex Branch, Jeff Carlton, Sally Crocker, Betsy Friauf and Jan Jarvis**

Photographer **Jill Johnson**

Senior Director, Marketing & Design **Amy Buresh**

Senior Vice President, Innovation & Brand **Monty Mohon**

For more information about UNT Health Science Center and its educational, research and health care efforts, go to www.unthsc.edu.

To find out how you can support Fort Worth's Health Science Center, contact the Office of Institutional Advancement, 817-735- 2254 or unthsc.edu/giving

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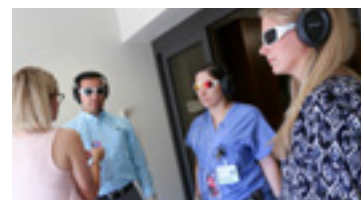
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short takes

A quick look at how UNTHSC is creating solutions for healthier communities

Protecting immune systems in space

UNT Health Science Center and Langston University have teamed with NASA on a five-year project to study the effects of reduced gravity on astronauts' immune systems during spaceflight.

The project, funded by a \$4.5 million NASA grant, also is intended to promote diversity in biomedicine, said Harlan Jones, PhD, Director of the Center for Diversity and International Programs. Students from Langston, the state of Oklahoma's only historically African-American university, have for years participated in the Health Science Center's 10-week summer internship research program.

The NASA project will focus on natural approaches that could help avoid dysregulation of astronauts' immune systems.

During space flight, some of astronauts' immune cells can become less active while others become more active, according to a 2014 NASA study. Reduced cell activity can prevent the immune system from generating appropriate responses to threats, while heightened activity can result in increased allergy symptoms or persistent rashes. On a long spaceflight, a cold or the flu can be risky business for astronauts, the study reported.



RX for exercise

Alzheimer's disease experts at UNT Health Science Center are part of a new study that could help determine whether physicians can one day write a prescription for exercise as a way to prevent or delay memory problems.

The Health Science Center, in partnership with the YMCA of Metropolitan Fort Worth, is the only site in Texas and one of about a dozen nationally participating in the EXERT study. This national, 18-month-long clinical trial is testing whether exercise can slow the progression of early Alzheimer's disease-related memory problems or mild cognitive impairment in adults 65 and older.

"We've known for a long time that physical activity can affect brain performance," said Sid O'Bryant, PhD, Professor, Center for Alzheimer's and Neurodegenerative Disease Research at UNTHSC. "What we're trying to nail down is whether there's a magic dose of exercise that would be most effective."

More than 5 million Americans are living with Alzheimer's, a figure that is expected to triple in the next 30 years. It's the sixth-leading cause of death in the United States, and the only one among the top nine that can't be cured, prevented or effectively slowed.

"Imagine if your doctor could write you a prescription for exercise that would help prevent memory problems," Dr. O'Bryant said. "That's what we're aiming at."



PREVENTING OPIOID OVERUSE



Too often patients in pain are prescribed opioids every day, around the clock, for years and years.

^ Dr. Andrew Kolodny

The result: A growing number of older patients are becoming addicted to prescription opioids, said Andrew Kolodny, MD, Chief Medical Officer of Phoenix House Foundation Inc., and Executive Director of Physicians for Responsible Opioid Prescribing.

The overuse, he said at the second annual UNTHSC Patient Safety Summit, is driving the worst drug epidemic in U.S. history.

“This is affecting people in their 40s, 50s, 60s, 70s and 80s who are developing an addiction entirely to prescription drugs,” Dr. Kolodny said. “When they get addicted, they are not having trouble finding doctors who will prescribe opioids on a regular basis.”

Experts from some of the country’s leading health care institutions gathered on the UNTHSC campus to focus on innovations in patient safety. The summit is an annual event organized by UNTHSC’s Institute for Public Safety with the goal of reducing medical errors, the nation’s third-leading cause of death.

‘Curiosity and perseverance’

Most tweens spend their free time playing video games, posting pics or taking selfies.

Ruhani Ahluwalia, 12, spends her time doing research at UNT Health Science Center that could one day lead to a better method for cancer treatment.

“I just really like science and want to learn how the body works,” said Ruhani, who lives in Arlington. “I’m interested in cancer treatment because my great aunt died from the harsh effects of chemotherapy.”

Over the summer, Ruhani worked in the lab of Andras Lacko, PhD, Professor in the Institute for Cardiovascular and Metabolic Diseases. There, she filled nanoparticles with drugs to test whether they could target cancer without harming other cells.

Ruhani, an eighth-grader at Harmony School of Innovation in Fort Worth, was inspired to find a better way to treat cancer after her great aunt died of leukemia in 2015. Soon after the death, she set out to find a way that she could diminish the deleterious side effects that accompany chemotherapy.

Her search led her to Dr. Lacko, who was impressed by the 12-year-old’s determination and knowledge.

“Students who want to be scientists have to have a strong sense of curiosity and perseverance,” he said. “And it doesn’t hurt to be brilliant, too.”

“I’m interested in cancer treatment because my great aunt died from the harsh effects of chemotherapy.”

— Ruhani Ahluwalia



Ruhani Ahluwalia >

Potential ‘game changer’ for eye disease

A novel pharmacological intervention to control retinal ganglion cell death caused by glaucoma is in preclinical development, said Katalin Prokai-Tatrai, PhD, Associate Professor in the Center for Neuroscience Discovery and the Department of Pharmaceutical Sciences in the UNT System College of Pharmacy.

“We believe that this novel therapeutic intervention will be effective for other blinding eye diseases associated with neurodegeneration, such as age-related macular degeneration,” said Dr. Prokai-Tatrai. “We are very hopeful we will generate data that shows we can prevent and stop the damage that leads to blindness.

“If it works, it will be a game-changer in terms of how neurodegenerative eye diseases are treated.”

The five-year study is funded by a \$2.1 million grant from the National Eye Institute at the National Institutes of Health.

Initially the study will target the effectiveness of the drug for glaucoma, the second-leading cause of blindness. The study will then be expanded to treat other neurodegenerative diseases impacting the brain.

A lifetime of scientific contributions



Dr. Peter Raven

Peter Raven, PhD, a UNT Health Science Center professor for almost 40 years, will receive a prestigious national award recognizing his lifetime of outstanding scientific and scholarly contributions to sports medicine and exercise science.

Dr. Raven, who recently retired as Professor of Integrative Physiology in the Institute for Cardiovascular and Metabolic Diseases, will be presented the American College of Sports Medicine's Honor Award at its annual meeting in May.

The Honor Award is the College's highest honor and is given to one individual every year.

"I very much appreciate the American College of Sports Medicine for selecting me for this honor," Dr. Raven said. "I joined the ACSM in 1971 because it offered me the opportunity to collegially interact with like-minded basic scientists, physicians, health fitness professionals and students in investigating and identifying the health benefits of exercise and sports."

Dr. Raven, a native of England, was a college rugby player before he became interested in medicine and the physiology of

Making a difference

Michael Foster, MPH, (School of Public Health '07) is an experienced public health scientist who spends half of each year overseas battling disease and health disparities.

That has led to some rough moments in the field.

During his first trip to Nigeria, he dodged gunfire, was robbed three times and fell so ill from malaria that he found himself bedridden in a sweltering hospital room.

"All this happened within 12 days of my arrival," Foster said. "I remember lying there with a 104-degree temperature and thinking it couldn't get more miserable than this."

The scientist with Global Disease Research, a nonprofit humanitarian organization, has volunteered to mentor School of Public Health students who wish to follow a similar career path.

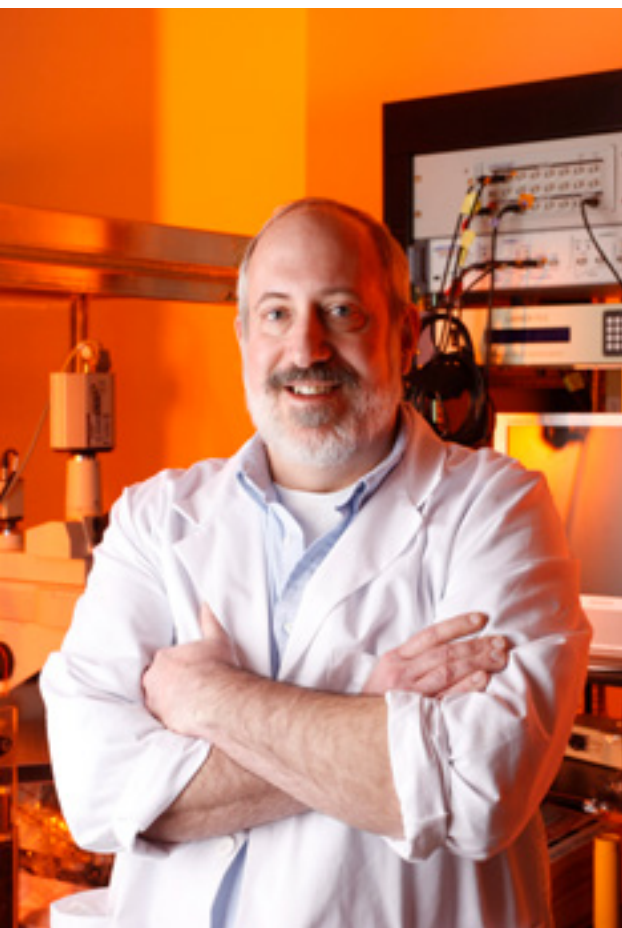
Since he co-founded Global Disease Research in 2012, Foster's projects have focused on dengue hemorrhagic fever in Mexico, co-infections of dengue, malaria and HIV in West Africa, and chikungunya in Colombia. He is collecting data on hypertension and Zika virus in Nigeria.

To learn more about mentoring opportunities at the Health Science Center, contact Jennifer Nanni, Alumni Relations Manager, at Jennifer.Nanni@unthsc.edu



Dr. Michael Foster

Dedication to research and education



Dr. Tom Cunningham ^

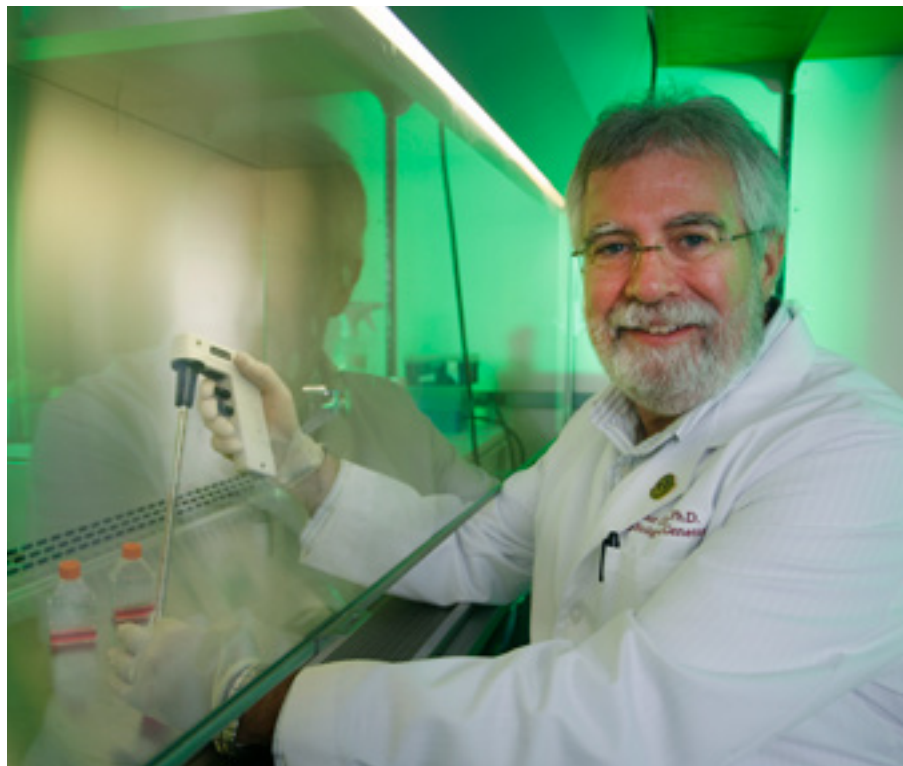
Dr. Abe Clark >

Two professors – one focused on finding a cure for glaucoma and the other working to provide a better understanding of how the brain regulates physiological processes – have been named recipients of one of UNT Health Science Center’s highest professional honors.

Abe Clark, PhD, Executive Director, North Texas Eye Research Institute, and Tom Cunningham, PhD, Professor, Institute for Cardiovascular and Metabolic Disease, have been named UNTHSC Regents Professors for their dedication to research and education.

Dr. Clark is an innovative researcher focused on understanding the biochemical, cellular and molecular mechanisms involved in the pathobiology of glaucoma and other ocular diseases. He collaborates with laboratories throughout the U.S., as well as internationally.

Dr. Cunningham joined UNTHSC to help grow the Department of Integrative Physiology. His research focuses on determining how the brain participates in the normal regulation of blood pressure and fluid balance, a process called homeostasis.



New strategies for treating strokes

When someone has an ischemic stroke – meaning a brain blood vessel is blocked – every minute counts in the race to reduce damage.

But getting the clot-busting drug tPA in time is challenging for the 800,000 Americans who experience a stroke each year, said John A. Schetz, PhD, Professor of Pharmacology & Neuroscience in the Center for Neuroscience Discovery.

“You have to get to the hospital within three to four hours – and not just any hospital but one with a certified stroke center,” Dr. Schetz said. “Only about 10 percent of stroke victims get to the right hospital in time, and only 10 to 15 percent of those who do actually benefit.”

Knowing that so few people get treated in time, two UNTHSC researchers are working on a way to provide delayed treatment between 24 hours and 48 hours after a stroke – and still prevent or reduce disabilities. And they’re doing so by studying drugs that already have been approved by the Food and Drug Administration, a strategy that reduces time and expense.

Grants from the National Institute of Neurological Disorders and Stroke and from the William and Ella Owens Medical Research Foundation are helping fund discovery and development of drugs that could be effective even when administered days after a stroke has occurred.

800,000

AMERICANS EXPERIENCE A STROKE EACH YEAR



A champion for patient safety

State Senator Jane Nelson, whose support for a culture change around safety in health care led to the creation of the Institute for Patient Safety at UNT Health Science Center, was honored with the inaugural Patient Safety Advocacy Award during this year’s Patient Safety Summit.

The Institute opened earlier this year with broad-based community support.

“I am grateful for this award – and this institute’s commitment to patient safety,” Senator Nelson said. “With such an esteemed group of founding members, I know it will succeed in its mission to promote a culture of safety.”

The Texas Legislature invested \$4 million in the Institute for Patient Safety, thanks to the advocacy of Senator Nelson.

“The growth of the Health Science Center is rooted in Senator Nelson’s advocacy for our university,” said Dr. Michael Williams, President of UNTHSC.



State Senator Jane Nelson ←

← Senator Nelson accepts the Patient Safety Advocacy Award from Tarrant County Judge Glen Whitley, who also is a UNT Regent.





CATCHING A BREATH

Innovative program keeps kids with asthma in class – and out of the ER

By Jeff Carlton

Kiasha Jones has managed her son's asthma for the last 14 years, ever since he was diagnosed at age 6 months following a bout with a respiratory virus called RSV.

Armed at home with an inhaler, a humidifier and a nebulizer that delivers medication to the lungs in aerosol form, Jones' son Derek James is mostly unhindered by his respiratory condition – and even plays football for Fort Worth's Polytechnic High.

But last year, Derek's asthma flared up at school. Such attacks would once typically trigger a call to paramedics and a trip to the emergency room.

In Derek's case, however, a nurse at Forest Oak Middle School quickly treated him in her office with a nebulizer and a low dose of the asthma-fighting medication known as albuterol. Then she sent him back to class.



^ Derek James receives a breathing treatment from Andrea Smith, RN, the school nurse at Forest Oak Middle School in Fort Worth.

The nurse was able to respond quickly and effectively thanks to an innovative pilot program led by UNT Health Science Center called “Asthma 411.” It gives school nurses the equipment, training and medical clearance to treat students’ asthma attacks in the schools, keeping children from missing class, parents from missing work and reducing costly trips to emergency rooms.

“During the school day, the nurse is going to see Derek a lot more than I do,” Jones said. “I wouldn’t have known what to do without the albuterol and the nebulizer machine being right there.”

Such a program is essential in Fort Worth and other major metropolitan areas where the percentage of children who have asthma is roughly triple the national average. The program takes a community approach to address the problem and includes collaborative partners such as the Fort Worth Independent School District, Cook Children’s Medical Center, MedStar Mobile Healthcare and JPS Health Network.

“This project reinforces what many of us already know about our community,” said Andrew Crim, Executive Director of the Office of Professional and Continuing Education

“Having an asthma attack is like drinking a thick milkshake through a straw. You are trying to inhale and exhale through these very narrow openings.”

—Leslie Allsopp, MPH

(PACE) at UNTHSC. “Fort Worth has a number of individuals willing to work together to make it a better place.”

‘A growing problem’

About 8.6 percent of children in the United States have asthma, according to the Centers for Disease Control and Prevention. But closer to 25 percent of Fort Worth children have it, a figure similar to what is seen in other urban areas, said David Sterling, PhD, Professor of Biostatistics and Epidemiology, School of Public Health.

“Of the many risk factors for asthma, we have all of them,” Dr. Sterling said.

There are three key factors that contribute to

Fort Worth’s high asthma rates, he said:

- **Geography:** Texas is awash in allergens such as ragweed and mountain cedar – much of it bothersome year round.

- **Environment:** In 2016, the American Lung Association rated the Dallas-Fort Worth metropolitan area No. 11 nationally for pollution with respect to ozone.

- **Demographics:** People with lower incomes have higher rates of asthma than other groups, often due to substandard housing and associated issues such as dust mites, cockroach droppings, mold and mildew. Lack of access to health care also is a predictor of asthma and asthma severity.

These all contribute to the region’s high asthma





^ The UNTHSC leaders behind Asthma 411 are, from left, Andrew Crim, Leslie Allsopp, David Sterling and Pam McFadden.

rates – and experiences that are truly frightening for children experiencing an attack, said Leslie Allsopp, MPH, a third-year doctoral student in the School of Public Health. During an attack, the smooth muscles of the airway contract at the same time the immune system is busy secreting mucous, further narrowing the airways.

“Having an asthma attack is like drinking a thick milkshake through a straw,” Allsopp said. “You are trying to inhale and exhale through these very narrow openings.”

‘It’s very scary’

If anyone understands the fear a child experiences during an asthma attack, it’s Andrea Smith, RN. She has spent 24 years as a nurse, the last four at Forest Oak Middle School in Fort Worth.

“You can tell from the minute they walk in the door,” she said. “The child is short of breath and can’t talk. You don’t know if their airway is going to shut down, where they can’t get any oxygen in.

“You don’t know what’s going to happen, and

it's very scary thinking about what could happen with this kid."

Before Asthma 411, Smith could check to see if the child had an inhaler stored in her office along with a signed parental consent form and a physician's order. If the proper paperwork wasn't on file, her choices were limited: Lead the child in breathing exercises. Call a parent. Or call a paramedic.

After Asthma 411, the protocol improved. For parents who provide consent, their children can now receive treatment of albuterol delivered through a nebulizer, resources that were donated to the school by Cook Children's. Critically, a blanket standing order for treatment from Jay Haynes, MD, Senior Medical Director for Employee Health and Wellness at JPS, eliminated the need for parents to go to their child's pediatrician for an order.

Tobi Jackson, a Fort Worth ISD Board of Education trustee, is a former principal who has witnessed a student suffering an asthma attack while waiting for paramedics to arrive.

"It's terrible to feel so helpless – and even worse for the kid," she said. "That's why I jumped at the chance to pilot this program in two schools in my district. I knew firsthand the difference it could make – and it has."

In a small sample size, the program has yielded dramatic results. In the 2012-13 school year, MedStar reported 19 emergency calls for asthma from the two Fort Worth ISD schools participating in the pilot program. In the following two school years, there was one such call. Asthma-related student absences dropped 51 percent over the same time period.

Nationally, asthma contributes to more than 14 million lost school days each year. Excessive school absences are a strong predictor of premature dropout rates, Dr. Sterling said.

"The bottom line is we are keeping these kids in school," said Pam McFadden, Associate Vice President of PACE. "Because we're focused on reducing 911 calls, the children can focus on their math and reading."

"It's terrible to feel so helpless – and even worse for the kid. That's why I jumped at the chance to pilot this program in two schools in my district."

— FWISD trustee Tobi Jackson

Now, and Next

The underlying concept for Asthma 411 isn't new. Indeed, Dr. Sterling ran a similar project under a CDC grant when he worked at St. Louis University School of Public Health.

What is new – and innovative – is how the project came together and the collaborations that made it possible. When attempts here to start a similar program didn't receive initial funding, Crim and McFadden in the PACE office took an interest and saw an opportunity.

They won grants from the pharmaceutical companies GlaxoSmithKline and Boehringer Ingelheim, brought in Dr. Sterling and Allsopp for their expertise and secured the cooperation of Fort Worth ISD, Cook Children's, JPS and MedStar.

They're not finished. The next phase of the project, dubbed Asthma 211, will provide more resources and supplies for families to improve the indoor conditions of their homes, offer more education and provide direct links for medication. McFadden and Crim want to see it in every Fort Worth school, as well as the programs that provide afterschool care for thousands of children.

In the meantime, the original Asthma 411 program continues to have a positive impact on school nurses – and the students they care for.

"We are with these children for eight hours a day," Smith said. "They are our responsibility, and Asthma 411 makes a big difference for us."

Experiencing old age

UNTHSC geriatrics program offers young doctors a new perspective on aging

By Jan Jarvis



^ Facilitator Jamie Cobb, left, leads a group of JPS physicians through a virtual experience that gives them an idea of what life is like for individuals with dementia.

After struggling to take her morning pill, Dr. Gillian Greer collapsed on the couch and sighed.

“I feel like I can’t focus on anything,” she said. “I can’t remember what I am supposed to be doing.”

For Dr. Greer, a physician and resident with JPS Health Network, experiencing what life is like for individuals with dementia offered insight into what many of her elderly patients face on a daily basis.

As a participant in the Second Wind Dreams Virtual Dementia Tour, Dr. Greer got a perspective on aging that physicians rarely do. UNT Health Science Center has

partnered with James L. West Alzheimer’s Center in Fort Worth to give family medicine residents from JPS and Plaza Medical Center a new perspective on aging.

The tour is part of UNT Health Science Center’s Workforce Enhancement in Healthy Aging and Independent Living, or WE HAIL, a program developed to transform geriatric care in North Texas by improving training for health professionals and caregivers. The simulation is one of five WE HAIL projects funded by a \$2.55 million grant from the Health Resources & Services Administration.

Being placed in a challenging situation

with a lot of distractions means residents experience what their patients deal with, said Subhada Prasad, WE HAIL Program Coordinator in the Center of Geriatrics at UNT Health Science Center.

During the dementia experience, trained facilitators guide participants outfitted with devices that alter their senses while they try to complete common everyday tasks and exercises. The devices – including specialized gloves, goggles and headphones – are designed to mimic loss of dexterity, and conditions such as neuropathy, blurred vision and hearing impairment.

The tour enables caregivers to experience the physical and mental challenges those with dementia face – and use the experience to provide better care.

“This experience gives you real insight into what it is like to be an elderly patient,” said Dr. Katie Kestler, a family medicine resident at JPS. “This is really difficult and challenges your senses.”

Participants experience sensory overload and easily become very frustrated, said Jaime Cobb, Director of Community Relations at James L. West Alzheimer’s Center.

“The tour is designed to mimic someone in the moderate stages of dementia,” she said. “They may be able to follow two-step commands but remembering all five tasks is challenging.”

When the tour ends, the residents discuss how the tour affected them and ways they can use the experience to better serve their patients. The conversations reinforce the importance of focusing on the patient’s quality of life and not just worrying about their lab numbers.

Dr. Michael Castillo, a family medicine resident, said he already tries to focus on each patient’s needs, but the tour drove home the need to pay extra attention to the challenges older people face.

“When you can’t see, even the simplest tasks become really frustrating,” he said.

“When you can’t see, even the simplest tasks become really frustrating.”

— Dr. Michael Castillo



^ Dr. Katey Davis tries to open a pill dispenser wearing specialized gloves that mimic the loss of dexterity experienced by older persons.



'THIS JUST SHOULDN'T BE HAPPENING'

More Texas women die from pregnancy complications than anywhere else in the nation. UNTHSC outreach and research is trying to change that.

By Jan Jarvis



^ Nicole Purnell holds a teddy bear given to her in memory of her son Cooper, who died in childbirth.

It was 4 a.m. when a very pregnant Nicole Purnell woke up in excruciating pain, weeks before her due date.

When she arrived at the hospital, physicians couldn't find her child's heartbeat.

"The next thing I remember was my OB slapping me on my legs and telling me to just keep breathing," she said.

Purnell lost consciousness, but not before learning that her precious baby Cooper was stillborn. She, too, came dangerously close to becoming another tragic statistic.

Texas has the highest number of women dying due to complications of pregnancy in the country. In 2012, there were 121 maternal deaths, which include women who died up to a year after giving birth.

Although the United States spends more

money on health care than other nations, the maternal mortality rate of more than 30 deaths per 100,000 births in 2014 is higher than other developed countries, according to the journal *Obstetrics and Gynecology*. It contrasts dramatically to Italy's 2.1 deaths per 100,000 live births, Japan's 3.3 and France's 5.5.

In Texas, the rates are among the highest in the world when compared to developed countries at 35.8 deaths per 100,000 births in 2014. It's driving a statewide effort to find out why so many women are dying during delivery or afterward.

For Amy Raines Milenkov, DrPH., Assistant Professor of Obstetrics and Gynecology at UNT Health Science Center, the dramatic rise in deaths has made the urgency to find answers all the more intense.

At a glance ▾

THE PROBLEM

The maternal mortality rate in Texas was 35.8 deaths per 100,000 births in 2014, compared to Italy's 2.1 per 100,000 and France's 5.5.

THE CAUSES

Cardiac events following overdoses, hypertension, hemorrhage, sepsis and suicide, among others.

THE SOLUTION

Prevention, access to health care, identifying high-risk cases and preparing for them before an emergency occurs.

“You have a woman who is in a terrifying situation during what is supposed to be one of the happiest times in her life,” she said. “Just imagine the heartache for the family. This just shouldn't be happening.”

The most common causes: cardiac events followed by drug overdoses. Other causes include hypertension, hemorrhage, homicide, sepsis and suicide, said Dr. Raines-Milenkov, who serves on the Texas Department of State Health Services Maternal Mortality and Morbidity Task Force.

Hypertension/preeclampsia nearly took Purnell's life. She also suffered from hemorrhaging, which led to a five-day stay in the hospital's intensive care unit and the transfer of 14 units of blood.

Such stories deeply trouble Dr. Raines-Milenkov, largely because most are preventable.

“We really can reduce the number of women who die with changes in practices, awareness and better coordination of services,” she said. “I don't want any family to have to face the pain and life-long suffering from losing a mother, a wife, a daughter or sister to something that is preventable.”

Why women are dying

These days, death during childbirth seems like a tragedy from a different era. And even when families experience a close call with death, they often don't talk openly about it.

“It's something that stays in the family, unless of course the final event is death,” said Styliani “Stella” Goulopoulou, PhD, Assistant Professor, Institute for Cardiovascular and

“You have a woman who is in a terrifying situation during what is supposed to be one of the happiest times in her life. Just imagine the heartache for the family. This just shouldn't be happening.”

— Amy Raines Milekov, DrPH



^ Dr. Amy Raines Milekov



^ Dr. Stella Gouloupoulou

“People just don’t think about the possibility of a woman losing her life during what is considered a natural event.”

—Dr. Stella Gouloupoulou

Purnell. “Blood pressure spikes five to 10 days after delivery, which is when a lot of moms die.”

Who is at risk?

Black women bear the greatest risk of dying during childbirth.

They are three to four times as likely as white women to die during childbirth or one year postpartum. In 2011-12, only 11.4 percent of births in Texas were to Black women, and yet they accounted for 28.8 percent of all maternal deaths, according to a report by the Maternal Mortality and Morbidity Task Force.

Poverty and geographic disparities add to the risk. Lack of access to health care also plays a big part, as does obesity, hypertension and diabetes.

The largest risk factor for fetal and infant deaths in Tarrant County is a mother’s unhealthy weight, Dr. Raines-Milenkov said. All of these conditions can be managed before pregnancy to reduce the risks.

“Women have to have access to health care throughout their life,” she said.

Prevention and opportunities

Preventing maternal deaths starts before a woman ever gets pregnant and should continue long after childbirth.

But accessing health care is often challenging in Texas, where over half of births are paid for by Medicaid, totaling more than \$2.2 billion per year. Cuts made to women’s health and planning services have made it all the more difficult.

“Women have been caught in the terrifying situation where they lose coverage and access very soon after their baby is born,” Dr. Raines-Milenkov said.

Relief recently came in the form of the expansion of Healthy Texas Women, a state

Metabolic Diseases. “People just don’t think about the possibility of a woman losing her life during what is considered a natural event.”

High blood pressure and preeclampsia – which account for nearly 18 percent of maternal deaths in the United States – are recognized as risk factors in virtually every book about pregnancy. Yet much is still not known about this life-threatening condition for mothers and babies.

“We don’t know the cause, we don’t know how it happens and we don’t know how to prevent it,” said Dr. Gouloupoulou, whose research focuses on preeclampsia.

For some women, the placenta does not develop properly and the extra blood supply that should be traveling from mother to child does not get through. This leads to hypertension, swelling, kidney problems, and it can also affect the growth of the baby.

The cure has long been considered delivery, because the problems usually go away after birth. But that theory is shifting, Dr. Gouloupoulou said. In many cases, the woman goes home and then later her blood pressure rises so high that she dies before she can get to the hospital.

“Delivery is really the start of the cure,” said

program offering low-cost or free health care. The Medicaid program has been extended a year, which allows women to get treatment for hypertension, diabetes and other chronic conditions following pregnancy.

Routine care after birth opens the door to screening and referring women with depression and other mental health issues, substance abuse needs and intimate partner violence, Dr. Raines-Milenkov said.

Steps to improve outcomes before the woman leaves the hospital also prove to be successful.

Safety Bundles, a term coined by the Institute of Healthcare Improvement, provide specific steps and draw from evidence-based quality improvement processes. They are a way to identify women who are at risk and to be ready for them in case of an emergency by having medications, equipment and medical staff ready when the woman comes in the door.

To prepare for emergencies such as excessive bleeding, rapid response teams practice on mannequins so they are able to handle emergencies during childbirth. Heightened awareness of the risks of maternal mortality and the symptoms associated with preeclampsia also make a difference.

After the crushing heartbreak of losing her son, Purnell dedicated her time to bringing attention to the risks of preeclampsia. Today she stays busy as a volunteer with the Preeclampsia Foundation and chair of its annual Promise Walk.

Nearly a decade after Cooper's death, Purnell gave birth to a healthy baby girl named Lorraine. The child was born on Purnell's 33rd birthday.

"After my experience, I stumbled on to the Preeclampsia Foundation and realized finally I was not alone," she said. "There were other women out there who have been through this same thing."

▼ Nicole Purnell reads to her daughter Lorraine.





HEALTHY

AND

100

Our aging experts discuss living to a ripe old age – and enjoying it.

By Jan Jarvis





Mae Cora Peterson >

Though she's 100 years old, a little arthritis doesn't do much to slow down Mae Cora Peterson.

She lives alone, starts her day with a round of crossword puzzles and goes to church on Sunday. Sometimes she needs to be reminded to use her cane as she rambles around the Fort Worth home she has lived in for more than a half century. Until a few months ago, she drove her own car.

This long-time educator, symphony supporter and grandmother not only has lived a long life, she has lived it well. And she is the kind of role model researchers point to when they describe optimal aging.

Her blood pressure is normal, she has never had a major medical problem and she takes only two prescriptions, both of them eye drops to fend off glaucoma. Whether luck or her penchant for green salads contributed to her longevity, no one knows for sure.

"I can't explain it," she said. "But I do know I feel so blessed."

Although more than 54,000 Americans are 100 or older, how they get there varies drastically. Some credit brandy and cookies; for others it's a plant-based diet. All grew up in an era when fast foods didn't exist and exercise came in the form of chores or work.

The science behind getting older is the work

of researchers and clinicians in the Institute for Healthy Aging at UNT Health Science Center. Operating under the umbrella of the institute are three centers that integrate clinical care, research, innovative education and community engagement to create a new era of enduring quality of life. They are:

- The Center for Geriatrics, which is a North Texas leader in providing care to older adults.
- The Center for Alzheimer's and Neurodegenerative Disease Research, which takes a translational approach to research in hopes of assisting those suffering from brain diseases.
- The Center for Neuroscience Discovery, which explores the biological basis of brain disease and injury.

Whatever the approach, the goal should be to live the longest, healthiest life possible, said Kunlin Jin, MD, PhD, Professor in the Center for Neuroscience Discovery.

"I believe people can live to 150, and that's not a joke," he said.

Optimal aging doesn't have to mean a person is disease-free, said Janice Knebl, DO, Director of the Center for Geriatrics at UNTHSC and holder of the Dallas Southwest Osteopathic Physicians Endowed Chair in Geriatrics.

"It means you still have a chance to be the best you can be," she said.

The magic formula: Diet + exercise

Every night without fail, Gus and Isabella hit the road for a two-to-three mile walk.

It’s a ritual the energetic border collie-lab mixes have followed all of their lives – and for good reason.

Their owner, Michael Forster, PhD, is recognized internationally for his research on human aging. For 30 years, he has been studying how people can live healthier, longer lives.

Exercise might not be the fountain of youth, but for humans (and their canines), it might be one of the best defenses against aging.

“The bottom line is this: If you want to stay healthy for a long time, exercise regularly and don’t allow yourself to get overweight,” said Dr. Forster, Executive Director of the Institute for Healthy Aging.

Dr. Forster said he believes it’s not so much what people eat, as it is how much. He limits his calories with the goal of maintaining health and living longer. He keeps his caloric intake at 2,000 per day, walks 15,000 steps daily and takes the stairs whenever possible.

“This is just the way it works out for me to not gain weight, lead a normal life and avoid time-consuming trips to the gym,” he said.

Diet, exercise and controlling stress all matter, Dr. Knebl said. But so, too, does attitude and spirituality.

“People need to stay actively engaged,” she said. “They need to find a sense of purpose, whether that’s through volunteer work or something else.”

There’s a genetic component as well. Studies have found that the siblings and children of centenarians live longer, and when they do develop a disease, it’s later in life. Genes are believed to play a role in longevity for about 25 percent to 50 percent of people.

“But you can’t choose who your parents are, so you might as well focus on what you have control over,” Dr. Knebl said.

The science of aging

Inflammation plays a role in age-related diseases such as diabetes. By fighting inflammation, it may be possible to prevent diseases associated with aging, Dr. Forster said.

Oxidative stress and its impact on the body has long been the focus of aging research. Dr. Forster and Dr. Jin, along with Nathalie Sumien, PhD, Associate Professor in the Center for Neuroscience Discovery, have studied its role in age-associated brain dysfunction for much of their careers, but they aren’t convinced it plays a big part in getting old.

For years, antioxidants were hailed as the fountain of youth, but there’s no scientific proof that they work in humans to reduce the effects of aging, Dr. Sumien said. Of even more concern is research showing antioxidants may cancel out the beneficial effects of exercise and other interventions.

“The research community is not fond of antioxidants, but there’s a big population out there that still believes in it,”

At a glance

Healthy aging

THE GOAL

Live the longest, healthiest life possible

THE FACTORS

Genetic history, exercise, healthy diet, stress management, attitude and spirituality, drug therapy

THE 100 CLUB

54,000 Americans are 100 or older

Dr. Michael Forster walks his dogs daily. An expert in human aging, he says exercise is key to a long life – for canines and for people.



she said. “That’s why today it is a billion-dollar industry.”

At the Second International Conference on Aging and Diseases, sponsored in part by UNTHSC, experts from around the globe explored interventions that could

add years of healthy living. One major topic at the conference: Gender makes a significant difference in whether anti-aging interventions are successful in animal studies.

On the list of “male” life extenders is

Thelma Swindell, 99



Reaching the century mark does not come without a few challenges.

For Thelma Swindell, who turns 100 in May, those challenges add up to two pacemakers, scoliosis and a few minor ills. But nothing slows her down.

“I exercise 30 hours each week – counting what I do in my apartment, in classes, on the exercises machines and walking,” she said.

She grew up on a farm and has always followed a healthy diet filled with vegetables, legumes and canned preserves in the winter. She never developed a sweet tooth.

“Everything I ate as a child was organic,” she said. “I’m sure that has helped me.”

She is a born optimist.

“I still get up every morning, open the shutters and say, ‘This is the day the Lord has made,’” she said. “When I walk out the door, I smile and tell myself it’s going to be a good day.”

She has remained resilient despite tough times. A widow at 39 with six children, she went on to earn a master’s degree, teach high school and college, sell life and health insurance and retire from United Way’s Arlington office. Her second husband died after nearly 25 years of marriage. Today she has 12 grandchildren and 13 great grandchildren.

Staying busy is one of the secrets to longevity, she said. Although she no longer drives, she still has a full schedule doing volunteer work at Trinity Terrace, where she lives.

“Volunteer work is so good for you,” she said. “It gives the day a purpose, and helping others provides a satisfying and rewarding experience.”

acarbose (an anti-diabetic drug), 17-alpha estradiol (a non-feminizing estrogen), NDGA (an antioxidant/anti-inflammatory) and aspirin. The antibiotic rapamycin has better effects in females.

Research on the widely advertised diabetic medicine Metformin also suggests it could extend the healthy lifespan. A Belgium study found that the drug caused roundworms to age slower and add about 40 percent to their lifespan. A recent study showed it helped humans live longer, too.

This year the Targeting Aging with Metformin trial will involve 3,000 people and explore whether the drug can increase lifespan. It's considered the first medication to be tested in a clinical anti-aging intervention trial.

"To be most effective, you may really need to start these interventions in your 30s or 40s to prevent long-term consequences," Dr. Forster said. "The goal of any anti-aging intervention strategy is to allow people to live longer and suffer less. No one wants to use anti-aging interventions that extend life but

increase health care costs while decreasing independence and quality of life."

Mrs. Peterson said living to 100 caught her by surprise, but she's had to sacrifice little in the way of independence and quality of life.

Married in 1947, she had three sons and became dean of girls and vice president at Fort Worth's Dunbar High School before retiring in 1980. She stayed active, supporting the Fort Worth Symphony and serving on various boards in the community.

She outlived all five of her siblings, her beloved husband James after 45 years of marriage and her oldest son. Always deeply religious, she relies on her faith to get her through the grief.

Although she has never exercised nor followed a strict diet, she does favor home-cooked meals. She's up every day by 8 a.m. to open the garage door for her aide, who helps with errands. And she takes nothing for granted.

"I'm not at the point where I can't get around," she said. "I know I'm fortunate."

Bernice Etkoff, 90

For Bernice Etkoff, staying healthy and active does not come easily.

"I work at it every day," she said.

At 90, it's clear that this gracious lady's hard work is paying off.

She exercises regularly, eats healthy foods and avoids the sweets she once loved. Despite recently breaking her wrist, Mrs. Etkoff has made up her mind to live life to the fullest. And that's exactly what she does, often dressing up to go out with her family.

"I can't give you a recipe for longevity," said Mrs. Etkoff, who describes her lifestyle as quiet and

peaceful. "I think maybe it's just the man upstairs is watching over me." Great doctors make a difference, she said, and perhaps good genes. She has a brother who is 94 and sharp as a tack.

She also has something going for her that scientists believe plays a significant role in longevity: a close, supportive family. She lives with several medical challenges, but her devoted family keeps her going.

"I'm blessed that I have an amazing family that makes me want to live forever," she said. "Just knowing they are there keeps me going."



William and Ampora Smarz, married 64 years



William and Ampora Smarz have so many children, grandchildren and great-grandchildren that it is tough keeping up with them all.

Twenty-four in total. They are, in some ways, what keeps Ampora, 84, and William, 92, going strong as they age.

They only recently started following a salt-free diet after William was diagnosed with high blood pressure. He now takes medication for that, but is otherwise healthy. Until a few years ago, he was a dedicated walker, putting in two miles every day. But he never did it for health reasons.

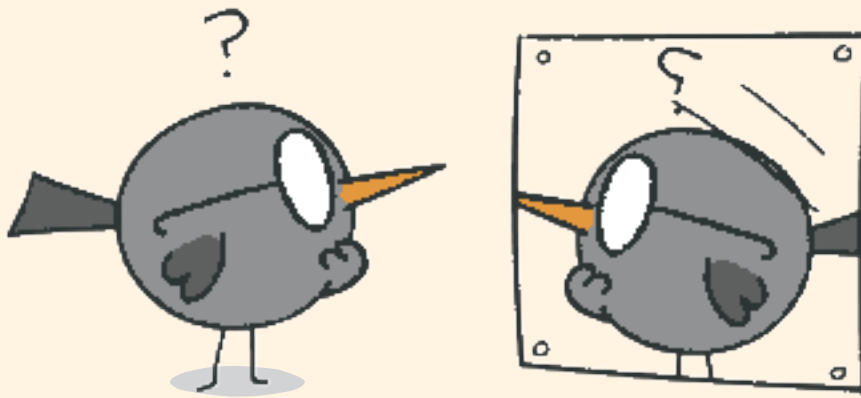
"I just walked a lot because I like it," he said.

A native of Hawaii, William retired from the Air Force after 20 years and then worked various jobs. Ampora was born in Fort Worth, and together they raised four children who went on to be well-educated with successful careers.

The couple no longer drives but have family they can rely on. They still try to stay active and have found pleasure in activities at home. She especially enjoys her indoor garden filled with ivy and cactus.

"I like to see their little branches growing," she said.





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CREAD is a clinical research study for people aged 50 to 85 who are experiencing increasing problems with their memory.

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Fort Worth, TX 76707

Barbara Harty, RN GNP - Study Coordinator
817-735-2193



'The place where it all began'

Astronaut honed his skills at UNT Health Science Center

By Alex Branch

Scientists who studied at UNT Health Science Center have taken their skills to all parts of the world. Jim Pawelczyk, PhD, took his into space.

Almost 20 years ago, he boarded space shuttle Columbia as a payload specialist on a 16-day flight devoted to the study of the brain and central nervous system. He took with him a University of North Texas banner and 2,000 rats, mice, fish, crickets and snails to study how the absence of gravity affected the creatures.

"A modern-day Noah's Ark," NBC News dubbed the 1998 shuttle flight.

"From a professional standpoint, it was like working at your desk for two weeks without ever leaving," Dr. Pawelczyk said. "From a personal standpoint, floating over to the window and looking down on earth is just as spectacular as you imagine it."

By the time Columbia landed at Kennedy Space Center on May 3, 1998, Dr. Pawelczyk and six crewmates had traveled 6.4 million miles, orbited earth 256 times and conducted 26 primary scientific experiments on themselves and their cargo.

Their innovative research advanced the scientific understanding of how the brain and central nervous system

At a glance ▲

Mission STS-90 (Neurolab)

MISSION TYPE:

Bioscience research

MISSION DURATION:

15 days, 21 hours,
50 minutes, 58 seconds

DISTANCE TRAVELLED:

6.2 million miles

SPACECRAFT:

Space Shuttle Columbia

CREW SIZE:

7

LAUNCH DATE:

April 17, 1998

LANDING DATE:

May 3, 1998

NOTABLE:

Last flight of the Spacelab research module; last daytime landing for Columbia

adapt to changes in gravity, discoveries that could be applied to help people living with Alzheimer's disease or recovering from strokes.

Many of the skills that led NASA to choose him for the mission were honed at the Health Science Center.

"It's really the place where it all began," he said.

The right skills

Dr. Pawelczyk's path to the Health Science Center began in the mid-1980s at a professional conference when he introduced himself to Peter Raven, PhD, a Health Science Center professor and internationally renowned leader in the field of cardiovascular regulation.

"By the time we finished talking, we had figured out my research dissertation," Dr. Pawelczyk recalled. "Dr. Raven is a great experimentalist who always seeks practical application of his research. That combination is somewhat rare."

From 1986 to 1989, Dr. Pawelczyk worked closely on the Fort Worth campus with Dr. Raven and other scientists, including Michael L. Smith, PhD, Professor, Institute for Cardiovascular and Metabolic Disease.

Like many kids who grew up in the 1960s, Dr. Pawelczyk dreamed of space travel. As a researcher, much of his work applied to the study of space sciences.

So when NASA announced plans for the 1998 Columbia flight, he joined a research team at UT Southwestern Medical Center that was selected to help define the mission. Dr. Pawelczyk was nominated to apply to participate as one of two researchers on the flight.

"I had the right skills, at the right time, for this particular mission," he said.

Before he started NASA astronaut training, FBI agents came to the Health Science Center to interview his colleagues as part of a background check.

"They asked me if I was aware of Jim having any plans to overthrow our government," Dr. Smith said. "Fortunately,

I managed to keep my laughter inside."

The mission

Space shuttle mission STS-90, also known as Neurolab, launched on April 17, 1998. Dr. Pawelczyk, one of seven crew members, spent up to 14 hours a day in the Space Lab, a school bus-sized laboratory in the shuttle's cargo bay.

One experiment examined how rat brains process and adapt while maneuvering through a three-dimensional track in zero gravity. Another investigated the formation of gravity sensors in crickets and snails that are similar to the structure of the inner human ear.

The astronauts themselves were tested to learn about how space travel affects humans. Immediately after space travel, two-thirds of astronauts cannot stand upright for 10 minutes without passing out. Pawelczyk inserted microelectrodes into nerves in his crewmates' legs to measure how their nervous systems controlled blood vessels that feed skeletal muscle.

Other experiments required the astronauts to play a simple game of catch to study how humans account for the absence of gravity. If someone throws a ball to you in normal gravity conditions, the ball will rise and then fall as it approaches you, decelerating and accelerating along the way. Your brain accounts for the fact that gravity affects the velocity of the ball as you prepare to catch it.

"How do we do that? We don't calculate the equations in our head," Dr. Pawelczyk said. "We are encoded with that ability. So the question becomes, 'How is this information encoded?'"

Why are those answers important? Because people who suffer strokes or develop Alzheimer's disease lose those encoded abilities.

"One day research could help develop more effective ways to help patients regain or maintain those abilities," he said.

16 days in space

In space, astronauts are trained to expect

the unexpected. That's why they spend two full years preparing for everything that could go wrong.

The shuttle's carbon dioxide scrubber – a device that removes carbon dioxide from the shuttle's air so it is safe to breathe – broke on Dr. Pawelczyk's flight. The crew worked with mission control to bypass the broken scrubber. The mission otherwise encountered few problems.

That doesn't mean Dr. Pawelczyk's family didn't worry. His wife and two children, then ages 4 and 7, awaited his return at the family's home in Indiana. His flight came 12 years after Space Shuttle Challenger broke up after takeoff and five years before Space Shuttle Columbia – the same aircraft in which Dr. Pawelczyk flew – disintegrated in midair over Texas.

"I'd talk to my kids from the shuttle by radio conference, and they'd want to know why I couldn't just come home now," he said. "They didn't quite understand how far away I was."

Sharing a small space with six other astronauts for 16 days requires creativity. During meals or when they slept, some of the crew members would sit on the ceiling or tether their sleeping bags to the ceiling to create more space for people on the floor.

Even that scenario presented intriguing questions to the scientists on board, he said.

"If I'm on the ceiling looking down at someone on the floor, and he's looking up at me, then we both appear upside down to each other," Dr. Pawelczyk said. "Who is right?"

Thrilling innovations

Dr. Pawelczyk remains deeply involved in space life sciences. He serves on multiple NASA advisory boards and testifies before Congress on science in space, most recently advocating for increased research capabilities on the International Space Station.

The space shuttle program, however, is no more. The final flight occurred in 2011, the last of 135 missions that forever pushed the boundaries of technology and space exploration.

"The space shuttle was perfectly suited for its job," Dr. Pawelczyk said. "But I think of it like a great car that you've had for 20 years – it served you well, but at some point it's time to trade it in. As we move beyond low earth orbit to planetary exploration, we need new spacecraft."

The latest space flight innovations are thrilling, he said. Among the advancements are NASA's Orion Spacecraft and private projects like the SpaceX Dragon, Orbital Sciences Cygnus and Dream Chaser.

The sense of wonder and possibility that outer space evoked in Dr. Pawelczyk, first as a child and then at the Health Science Center, is as powerful as ever.

"I am as excited as ever about space travel," he said. "I can't wait to see what we

▼ Dr. Jim Pawelczyk





HARNESSING HUMAN MOVEMENT

Virtual reality, motion capture, eye tracking and other technologies come together to improve lives in the Human Movement Performance Laboratory.

By Alex Branch





^ Karen Esser prepares for her role in an experiment led by Dr. Rita Patterson, left, and Dr. Evan Papa in the Human Movement Performance Lab.

Preceding page: Esser, a Parkinson's patient, says she's a willing participant in the lab's work as it seeks ways to help people with Parkinson's and other diseases.

Like an actress on a science fiction movie set, Karen Esser prepares for her role surrounded by laboratory technicians attaching small bulb-like fixtures to her black Spandex suit.

Within minutes, 54 bulbs – known as reflective markers – cover her body. Esser is led to a treadmill in front of a 180-degree virtual reality screen. Red lasers shine at her feet as her shoulder harness is connected to three ceiling-mounted cables.

She is surrounded by 12 motion-capture cameras that measure her movements with accuracy down to the hundredths of a millimeter and transmit those measurements to a computer for analysis.

The 67-year-old Plano woman asks a lab technician to take her photo.

“My grandsons are going to get a kick out of this,” Esser said.

Esser isn't making a movie. She's participating in one of many cutting-edge research projects underway in the Human Movement Performance Laboratory, an innovative and collaborative workspace at UNT Health Science Center.

It is here that interdisciplinary teams of researchers pursue novel treatments for people with balance and function problems caused by illness, disabling injuries or age- and developmental-related issues.

Esser, who was diagnosed with Parkinson's disease in 2014, is taking part in an experiment led by Evan Papa, DPT, PhD, and Rita M. Patterson, PhD. Dr. Papa and Dr. Patterson study why Parkinson's disease makes people more likely to suffer falls and are trying to identify new ways to prevent them.

But their ultimate goal is the same that

At a glance ▲

HUMAN MOVEMENT PERFORMANCE LABORATORY

ITS MISSION

Develop treatments for people with balance and function problems caused by illness, disabling injuries or age- and developmental-related issues.

ITS DIFFERENCE

Unlike similar labs, the lab studies a broad range of patients – from the young to the old.

ITS GUIDING QUESTION

Can we make someone's life better?

all researchers in the Human Movement Performance Laboratory have for the individuals – amputees, children and adults with autism, stroke victims, older adults, people with diabetes – who pass through the lab doors.

Through the study of movement, they want to give them a better quality of life.

Research teamwork

The laboratory feels like the set of a James Cameron movie for good reason. It relies on the same motion-capture system that the director used to make the 2009 epic science fiction film *Avatar*.

Dr. Patterson and Nicoleta Bugnariu, PT, PhD, helped lead acquisition of technology in the laboratory after it opened in spring 2008 thanks to a gift from the Osteopathic Heritage Foundation

Today, the lab features virtual reality, motion capture, eye tracking, muscle activation, time series data analysis, biomechanics, exercise equipment and mathematical modeling technologies that attract research partners from inside and outside the Health Science Center. Collaborations are underway with Cook Children's Medical Center, Child Study Center, Fort Worth Museum of Science and History, UT Southwestern Medical Center, University of Texas at Arlington, the University of Louisville and others.

"The laboratory emphasizes team-based research," said Dr. Patterson, Director of Research for Osteopathic Manipulative Medicine. "You'll find engineers, neuroscientists, physical therapists, kinesiologists and experimental psychologists coming together to solve complex problems."

Their experiment combines physical therapy, engineering and osteopathic medicine. Esser, the Parkinson's patient, walked and stood while the treadmill simulated a trip or a backward slip. The cameras monitored how

Reflective markers, which indicate her movement to the 12 motion-capture cameras that surround her, cover Esser's body.





^ Dr. Papa provides a closer look at some of the 54 reflective markers that help cameras measure Esser's movements to within hundredths of a millimeter.

she regained her balance.

Afterward, David Mason, DO, performed osteopathic manipulative medicine – a hands-on therapy that adjusts muscles and joints – on Esser before she returned to the treadmill to perform the same exercises to see if the treatment improved her body's response.

"It's a fascinating experience," Esser said. "I'm willing to do anything I can to help them find ways to help people with Parkinson's or any other diseases."

Across the lifespan

There are laboratories similar to the Human Movement Performance Lab across the country, but the Health Science Center is unique because of the broad range of people researchers study.

"We work with people across their lifespans – from children to the elderly," said Dr. Bugnariu, Interim Dean, School of Health Professions. "Our goal is to help people live active, independent lives."

Haylie Miller, PhD, a developmental psychologist and Assistant Professor of Physical Therapy, studies why adults and children on the autism spectrum have trouble responding to their environments.

Participants wear glasses embedded with eye-tracking cameras, and they dodge virtual balls rolling toward them.

Their body and eye movements are studied to help determine whether participants struggle in their environments because of how they interpret what they see, how they control their bodies, or a combination of factors.

The controlled environment of the laboratory is critical to discovering the answer.

"Even if you can move to look at a person or object, if you can't focus on it long enough to get the correct information or if you are focused on the wrong part, you will not be able to respond effectively," Dr. Miller said. "In the lab, we can see what circumstances cause people to struggle so that we can find ways to help them succeed."

New devices

Ideas explored in the laboratory result in innovative new devices.

Metin Yavuz, Assistant Professor of Physical Therapy, has put his doctorate in engineering to use developing devices that protect people with diabetes from developing skin ulcers, an ailment that affects 12 percent to 25 percent of diabetics and causes 100,000 amputations annually.

Dr. Yavuz and his research team have developed working prototypes of a shoe and a wheelchair with cooling systems designed to help prevent ulcers by controlling skin temperature. By controlling temperatures, the tissue should suffer less damage.

"If we can find a way to reduce these ulcers, we can help reduce a major health problem and improve the quality of life for people with diabetes," Dr. Yavuz said.

Dr. Yavuz received three grants worth about \$900,000 from the National Institute of Diabetes and Digestive and Kidney Diseases to further his research, which has earned awards from the American Diabetes Association, the American Society of Biomechanics and the Cleveland Clinic, and has been published in *Diabetes Care*.

The potential impact of his work is clear to

people with diabetes like Rudolph Blancarte, who participated in Dr. Yavuz’s foot ulcer study in the Human Movement Performance Laboratory.

Blancarte has experienced at least two foot ulcers.

“The first time it happened, my foot swelled like a balloon and I couldn’t walk,” said Blancarte, 56, of Fort Worth. “The second time, it turned into an abscess. It’s pretty miserable.”

Making lives better

Next, improvements are coming to the laboratory. A \$65,000 grant from the Health Science Center will fund six new cameras and software that records at a faster speed and

with higher resolution.

The upgrades will allow researchers to get more precise detail to measure hand motion on projects such as a soft robotic glove that assists stroke victims and children with cerebral palsy during rehabilitation. The robotic glove is a project that HSC scientists developed with researchers at the UT-Arlington Research Institute, work currently funded by the National Science Foundation.

No matter how the laboratory changes, scientists there will continue to ask themselves the same question when considering a research idea to pursue, Dr. Patterson said.

“Can this make someone’s life better?”

▼ Dr. Patterson helps Esser climb on a treadmill in the Human Movement Performance Lab.





Medical student Faroukh Mehkri dresses for his shift as a Dallas Police officer.



As a medical student and a reserve police officer, Faroukh Mehkri has found two ways to serve others.

By Alex Branch

Faroukh Mehkri has worn two very different uniforms for the last four years.

One is the crisp white medical coat and hospital scrubs – with a stethoscope around his neck – of a medical student at UNT Health Science Center, worn while he pursues his degree as a doctor of osteopathic medicine.

The other is the crisp navy-blue uniform – with a service weapon and handcuffs on his hip – of an officer in the Dallas Police Department, worn as he patrols the neighborhoods of southeast Dallas.

The Texas College of Osteopathic Medicine prides itself on preparing all 230 students who enter the school each year for a lifetime of service through medicine. This spring Mehkri will



“Law enforcement and medicine... It’s the perfect combination of what I want to do with my life.”

— Officer, Faroukh Mehkri

earn the distinction of finishing medical school while also serving others as a reserve Dallas police officer. “Law enforcement and medicine are two things I’m passionate about,” Mehkri said. “It’s the perfect combination of what I want to do with my life.”

Following his dreams hasn’t always been easy. A typical day in medical school starts with Mehkri rising in the early morning to review notes for tests and quizzes. Then it’s off to the Health Science Center for class, lab work or perhaps a two- and-half-hour exam in renal pathology. He grabs a quick lunch, often Chick-fil-A, and makes the 35-mile drive to a southeast Dallas police substation. He hastily changes into his patrol uniform, straps on a 20-pound utility belt and, if time permits, squeezes in a few minutes of studying before his 3 p.m. patrol detail.

Before patrol, officers gather with their sergeant to review the first-shift incidents. The sergeant always completes Mehkri’s daily transition from

student to police officer with three words:

“Get to work!”

The streets

On a wet, dreary January day, Mehkri and his partner, Senior Cpl. J. Shipp, navigate a Dallas police cruiser through neighborhoods plagued by poverty and crime.

Together, the officers have dodged gunfire, chased criminals into dark alleys, kicked in doors and built relationships with residents tired of crime and hopelessness.

“Some days you find yourself in pretty intense situations; it’s zero to 100 in the blink of an eye,” Mehkri said. “But you also meet people – families – living in the most difficult circumstances, and you can empathize with them.”

The first call they respond to is a business owner’s complaint of young men selling drugs outside a convenience store. Mehkri and Shipp find two men matching the suspect descriptions

standing idly by a payphone as a third suspect disappears behind the store.

“What’s going on?” Mehkri asks, stepping out of the car.

The men shrug. They have a few minor warrants, but the officers pat them down and find no drugs or weapons. The warrants aren’t worth making arrests, so the officers ask the men to move along.

Mehkri is an excellent officer, said Shipp, who trained Mehkri on patrol in 2013. But fellow officers also like having him around during medical emergencies on the job.

Mehkri has used his medical training to treat officers injured in car crashes or in scuffles with suspects who resist arrest. He quickly recognizes overdose cases.

Once at a rural methamphetamine lab, Mehkri stopped officers from opening bags of a substance that he recognized as a poisonous organophosphate waste product of an ingredient often used in the meth cooking process. If officers had inhaled it, they could have suffered blurred vision, nausea and vomiting.

Unlike other officers, Mehkri carries three tourniquets on his utility belt.

“Most officers are trained to do basic CPR and put pressure on wounds and that’s about it,” Shipp said. “So when a medical issue arises, it is awfully nice to have Faroukh with you.”

Passion for service

Mehkri’s drive to serve others may date back to when his parents, both physicians, moved their young family from Brooklyn to South Texas.

His parents wanted to practice somewhere with a dire need for medical care, and they chose the city of McAllen near the Mexican border.

“I had been raised in New York so I got off the plane and asked my dad where all the tall buildings and taxis were,” Mehkri said. “But it was a great experience. I was in this wonderfully diverse place, and my parents took care of a lot poor families who otherwise might not get quality health care.”

After high school, Mehkri attended Rice University. Playing pool as a freshman in a dormitory game room, he saw a fellow student

suffer a seizure. Mehkri watched a team of college-age emergency medical technicians arrive and treat the student.

“Wow, I want to do that,” Mehkri thought.

Mehkri completed the required 750 hours of Advanced EMT training and spent most of his college years responding to campus 911 calls. He also rode with Houston ambulance crews and worked in the emergency room at Ben Taub Hospital in Houston.

After Mehkri was accepted into medical school at UNT Health Science Center, he thought about several older EMTs he had met who also were sworn Harris County law enforcement officers. He admired their dual service. So he called the TCOM admissions office and asked if he could delay starting medical school for one year while he entered the police academy.

“Go for it” was the answer.

Always a cop

Patrol is not all Mehkri does as a reserve officer. He also works closely with Dallas Police Deputy Medical Director Lt. Alex Eastman, who also is the chief trauma surgeon at Parkland Memorial Hospital. Lt. Eastman is a member of Dallas SWAT who also provides medical care for the specialized team of officers often in harm’s way.

Mehkri spent a month with Lt. Eastman at the Parkland Trauma Service.

“There was a weekend we worked 40 out of 48 hours between the two jobs, but it was worth it,” Mehkri said. “It is an incredible experience walking the line between two high-speed professions that care for people in their worst hours.”

But first Mehkri must finish his last semester of medical school. This spring he’ll get married and learn where he matches to fulfill a three-year emergency medicine residency.

Despite the long hours his residency will require, Mehkri already has contacted police departments in cities where he interviewed.

“Wherever I go,” he said, “my goal is to always intertwine these skills to be a good tactical medical provider.”

HOLOCAUST SURVIVOR

Andras Lacko learned resilience and perseverance in escaping Nazi genocide

By Betsy Friauf

Andras Lacko is a Holocaust survivor. From a childhood of persecution that would have crushed many, he forged a resilience and a quiet, straightforward brand of leadership. He is, quite simply, a rock of strength and stability for his students, his co-workers and future generations.

As a Jewish grade-school boy in Budapest during World War II, he was hungry, cold, sick, denied an education, crammed into a three-bedroom apartment with 61 others, separated from his parents whose jobs and rights were stripped, placed in an orphanage, bombed from the air and trapped in intense house-to-house fighting. He wasn't yet 10 years old.



Andras Személnyi

Az igazolvány tulajdonosának sajátkezű aláírása

1. Családi neve:

IGAZOLVÁNY
ACSKO

2. Utóneve:

ANDRAS GYORGY

3. Előző

(leánykori) neve:

4. Születési helye:

BUDAPEST

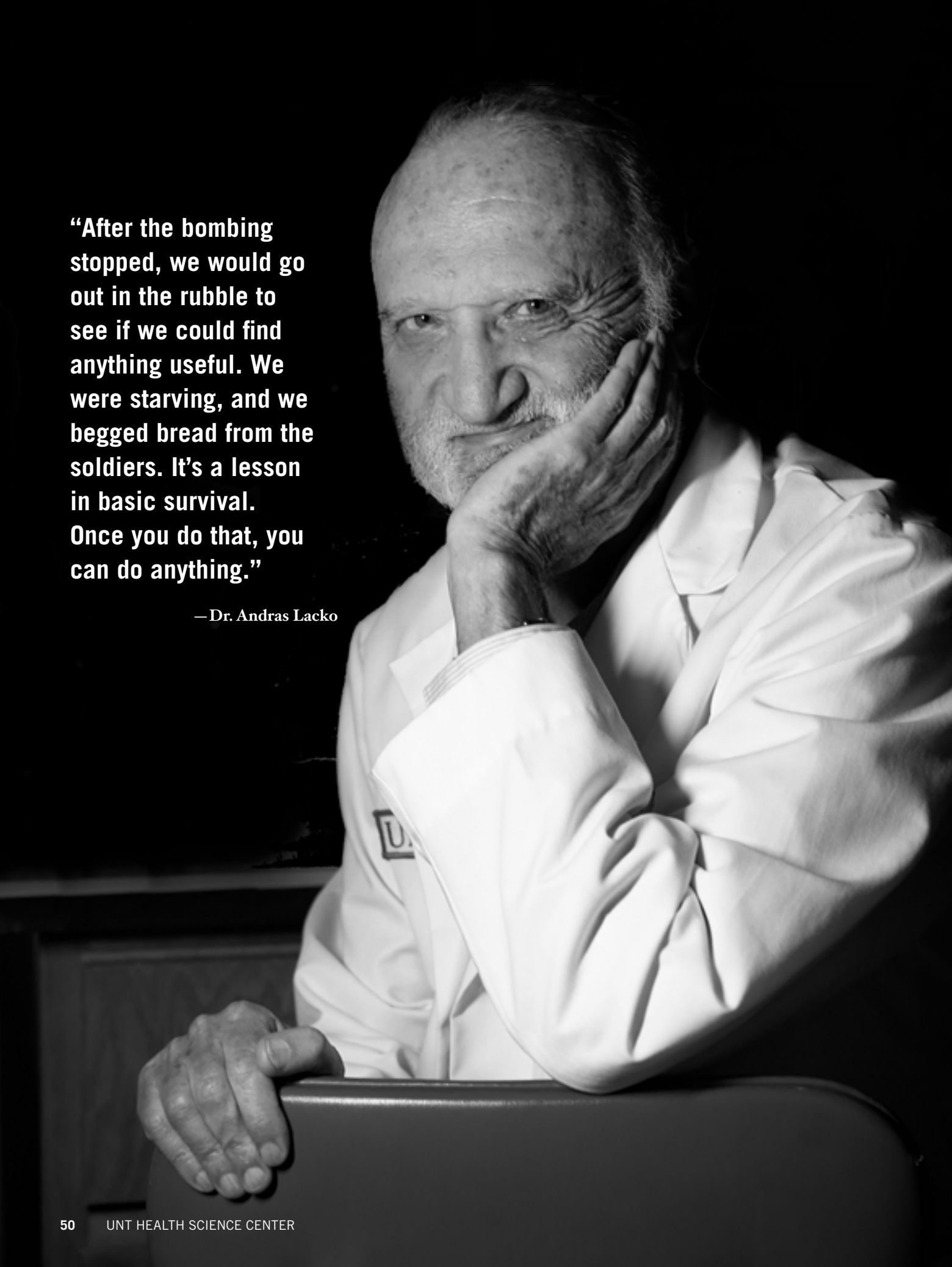
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5. Születési ideje:

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“After the bombing stopped, we would go out in the rubble to see if we could find anything useful. We were starving, and we begged bread from the soldiers. It’s a lesson in basic survival. Once you do that, you can do anything.”

—Dr. Andras Lacko

Later, at age 19, when he was an aspiring researcher, the Soviets took over Hungary and forced him into a different vocation. He left his home and family and escaped first to Austria, then Canada with only a briefcase, his high school graduation suit and a passport.

No wonder he can't be rattled.

Helping students stay optimistic

Today, as a professor in UNTHSC's Institute of Cardiovascular and Metabolic Disease, Dr. Lacko, 80, teaches the next generation of physicians and other health professionals. He also researches ways to help more people survive cancer.

"We are finding ways to make anti-cancer drugs work better," he said. "We're looking for a better delivery system, essentially a Trojan horse carrying particles that kill cancer cells."

Observed one former student, "It's a great experience when you can get even a small glimpse of his thought process."

"Dr. Lacko was always positive when I hit a roadblock with my pediatric-cancer research project," said Gaile Vitug, DO, a recent graduate of the Texas College of Osteopathic Medicine and now a pediatric resident at UT Health Science Center at San Antonio.

"He wholeheartedly wanted me to succeed, and he took time to go over solutions," she said. "I am so grateful that Dr. Lacko took me under his wing and taught me about biochemistry and pediatric cancer."

Ask Dr. Lacko's colleagues, students and his grown children to describe him, and you'll hear the word perseverance. He credits his parents' character with helping him put first things first and avoiding discouragement during setbacks.

"I grew up in a time and place where we had to be resourceful and resilient to survive," he said. "After the bombing stopped, we would go out in the rubble to see if we could find anything useful. We were starving, and we begged bread from the soldiers. It's a lesson in basic survival. Once you do that, you can do anything."

Says one of his daughters, Annette Baker, "Everything rolls right off of him."

From tragedy, resilience

In Hungary, where Dr. Lacko was born, the Holocaust started late, but it was the most brutally efficient in all of Europe. Hungary was home to 800,000 Jews when Hitler invaded in 1944. By war's end in 1945, 600,000 were gone. Dr. Lacko says he and his parents survived by a series of coincidences, "or maybe they were miracles."

His father was sent away to perform military labor, but not in one of the most brutal brigades. When Lacko was 7, he and his mother were forced from their home into a small section of Budapest where Jews lived in extremely overcrowded poverty.

Eventually, the Nazis pounded on the door and rounded up all the women between ages 18 and 40. Lacko's mother hid inside a sofa. She escaped detection once but was discovered on a later sweep. She was marched with other Jewish women to a soccer stadium. They waited under heavy guard to be registered and herded into trains that would deport them to the Auschwitz-Birkenau concentration camp. However, as the day wore on, Mrs. Lacko's group was yet to be registered. They were sent home with instructions to report the following day.

She knew she had to disappear. Instead of reporting as instructed, she cut the yellow star from her coat and Lacko's, placed her son in an orphanage and went into hiding.

Lacko was slated to be moved back into the overcrowded ghetto, but another coincidence or miracle intervened. He caught scarlet fever and was well-treated in a hospital for weeks. After recovering, he stumbled across the war-torn city with an older boy. Hitler had ordered German and Hungarian troops to hold off the invading Russians at all costs, a futile effort that cost 38,000 civilian lives. Lacko and his friend hid in a basement during close combat.

When the war ended, the Lacko family reunited, resumed their grocery business and carried on. When Lacko graduated middle school, he was given a chemistry set, "And that was it! That was what I loved." He had found his calling.

He has been a professor of molecular biology for decades and has served for 41 years on the UNTHSC faculty.



A young Andras Lucko ^
and his mother.

The most important things

Dr. Lacko is a busy man but stays focused on the most important priorities in a world where busy-ness often is confused with effectiveness. He is highly productive, having published more than 100 articles, mentored 10 students and advanced education by serving in numerous university and international professional initiatives.

He's also raised four children, all active in highly responsible corporate, small-business and government professions.

Says his son Peter, an electrical engineer and U.S. Navy veteran, "My father taught me how to play soccer and coached my team for several years. But the thing that I learned from my Dad that means the most to me is that no matter what, you should be there for your children when they need you. I wasn't the easiest kid to raise. But whenever I needed my Dad, he has been there."

Dr. Lacko also makes it a priority to help

preserve the history of the Holocaust. "I've given talks at the Dallas Holocaust Museum. I've spoken to junior high and high school students here in Fort Worth, and also to a special-education class."

He provided testimony of his Holocaust experiences during a 1997 interview conducted by the University of Southern California Shoah Foundation. The foundation has collected the testimony of more than 53,000 Holocaust survivors. Dr. Lacko says of this archive of oral histories, "It should be available to document that the Holocaust happened. There are people who deny it. All the documentation is important as a testimony to what human beings are capable of doing to each other."

Enduring legacy

Working at an age when many people have been retired for decades, he finds energy and inspiration in the company of young people. "It's important to educate everyone so they can reach their potential," he said.

Cheryl Hinze-Schmidt, a recent student who became a research technician, said Dr. Lacko has had a lasting impact on her life.

"His strong will and dedication to every aspect of life, not only work but family, fitness and health – he exercises regularly – continue to be a great role model for me," she said.

The drive is strong in him to discover new ways to help people be healthy.

"I inherited a lot of curiosity from my mother," Dr. Lacko said. "Many people are capable and smart. Those who are curious and driven to discovery never lose their drive to solve problems. That is the heart of research. That keeps me going."

preceptor *noun*

pre·cep·tor • prĭ-sĕp'tər, prē'sĕp'tər

Definition:

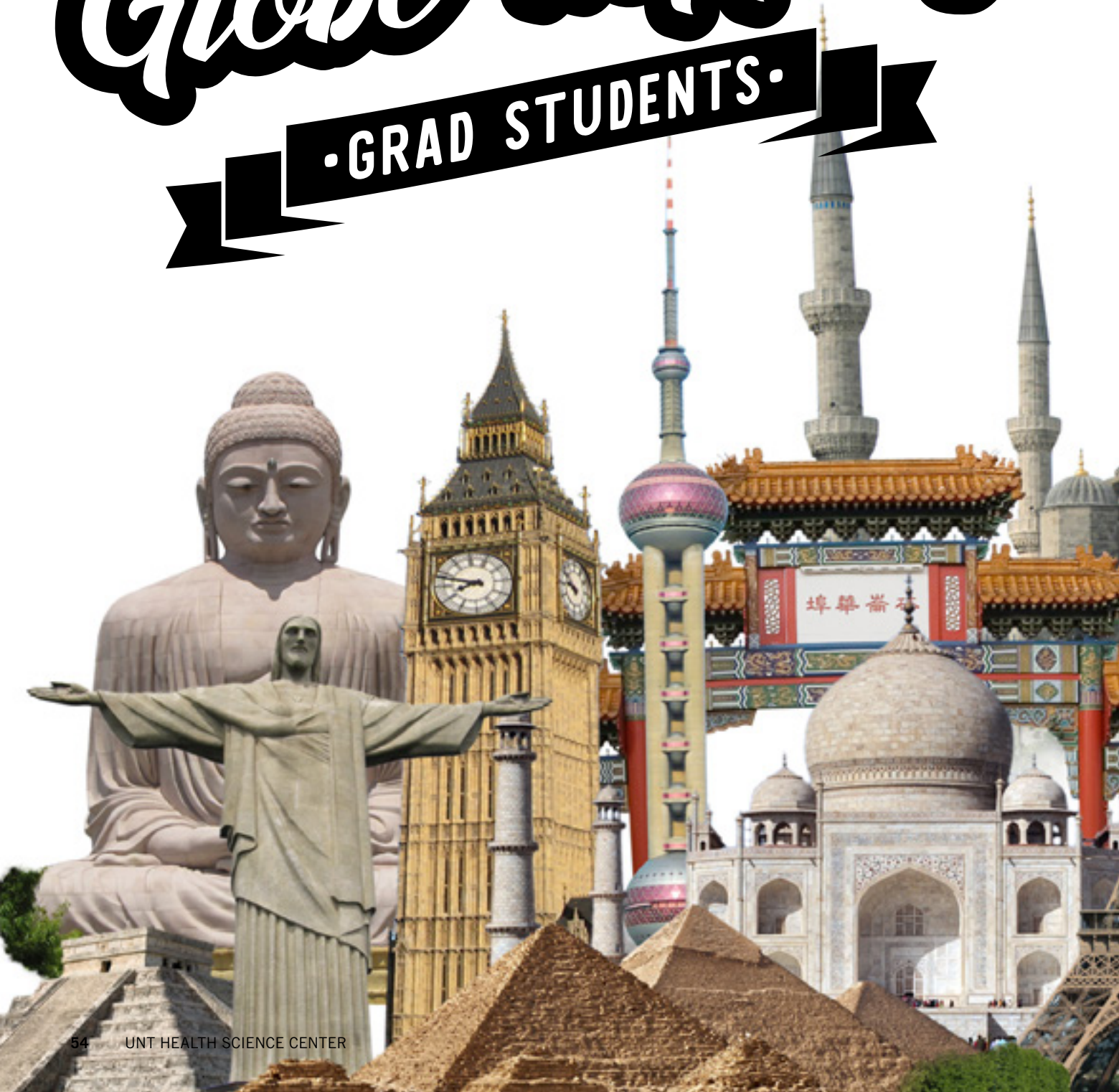
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Globe-hopping

• GRAD STUDENTS •



**More than 150 international students from 24 countries
contribute to UNTHSC's rich diversity**

By Alex Branch



▼ Rushil Acharya



A young dentist in Gandhinagar, India, packed some belongings, bid his family farewell and prepared for the first airplane flight of his life.

Rushil Acharya wasn't nervous; he was excited about the 19-hour flight to the United States. He buckled into his seat and stared out the window as the jet sliced upward through the clouds.

More than 40 years ago, his grandfather, an Indian psychiatrist, had made a similar trek to the U.S. On this day, Acharya shared not only his grandfather's destination but also his purpose – to enhance his health care skills and knowledge at an American university.

Acharya was joining more than 150 other gifted international students from across the world to study at UNT Health Science Center in Fort Worth.

“Helping one patient at a time is fine, but I came here to learn how to accomplish something bigger in my country.”

— Rushil Acharya

“I always wanted an education in the United States,” said Acharya, now a second-year Master of Public Health student. “Helping one patient at a time is fine, but I came here to learn how to accomplish something bigger in my country.”

International students generally make up about 8 percent to 10 percent of the student population. In fall 2016, students from 24 countries and five continents were enrolled at UNTHSC.

This rich diversity is cherished not only by international students who find a welcoming atmosphere on campus but also by faculty, staff and American students with whom they share classrooms, research laboratories and lounges.

“International students offer a perspective of the world that may be very different than our own,” said Thomas Moorman, EdD, Vice President of Student Affairs. “That perspective sparks dialogue and enriches the learning environment. It opens your eyes to things that you had not considered.”

At a glance ▲

HOW MANY?

International students make up about 8 percent to 10 percent of UNTHSC's student body. They come from 24 different countries.

HOW DO THEY FIND US?

Word-of-mouth among students attract most international students, who are interested in by HSC programs and our interdisciplinary approach to teaching.

WHAT DO THEY NEED?

Support networks are essential to help them navigate a strange place with strange customs.

Many international students get health care jobs and remain in the U.S. after completing their studies. Others return to their home countries equipped with abilities to improve health care systems and the quality of care for patients or prevent infectious disease.

The significance of well-trained health professionals overseas was underscored in September 2014 when a 42-year-old man from Liberia, where an Ebola outbreak raged, arrived in Dallas already infected with the deadly disease. Two nurses who cared for him were infected.

"In a global society, our health is dependent on that of our neighbors," said Thaddeus Miller, DrPH, MPH, Associate Professor of Health Management and Policy. "A key part of domestic health security is the strengthening of health care infrastructure around the world, and our graduates often take a leading role as they carry their skills back home."

A world away

How does someone 6,500 miles away become interested in a program at UNTHSC?

The Health Science Center does little international recruiting. Word-of-mouth communication among students impressed by the university's innovative education programs and emphasis on interdisciplinary training attract most international students.

That's what brought Ella A. Kasanga from Ghana. The young community pharmacist was finishing a master's program in her home country when she got a phone call from a former classmate in pharmacy school, Mavis Tenkorang.

Tenkorang was then a first-year student in the Pharmacology and Neuroscience Program in the

"She told me about all the opportunities here and what she was learning. It sounded like exactly what I wanted to do."

— Ella A. Kasanga

Graduate School of Biomedical Sciences at the Health Science Center.

"She told me about all the opportunities here and what she was learning," said Kasanga, now a first-year student. "It sounded like exactly what I wanted to do."

How did Tenkorang find out about the program? From Jude Prah, another former student at the pharmacy school in Ghana now enrolled at the Health Science Center. A fourth former pharmacy school classmate, Anthony Oppong-Gyebi, also joined them in Fort Worth.

Today, the four Ghanaians study together and share friendship outside the classroom.

"You get one person who comes and has a good experience and then tells someone back home about it," Dr. Moorman said. "We have many students who come not only from the same country as students before them but also the very same village. It's a tight network."

Support networks

Networks are crucial to international students.



^ Ella A. Kasanga

Imagine arriving for the first time in a foreign country where you will spend two, three, four or more years removed from your families and culture, said Rakia Johnson, Director of Student and Scholar Immigration Service. You are in an unfamiliar city with no idea how to get an apartment, a driver's license or even Internet service.

All international students meet with Johnson upon their arrival. She has already been in contact with them, sending information about apartments near campus and working with the school's International Student Association to arrange rides from the airport.

Students from countries with larger student populations often establish networks of support. Acharya lives with four other Indian students in an apartment near campus. They plan bus trips to the grocery store together, visit museums and rely on another Indian student with a car for rides when they need to get somewhere off the bus route.

"I had not even seen the campus before I got here," Acharya said. "If I had a question about how to do something or get somewhere, I knew all I had to do was ask and someone would help me."

Not all students have classmates from their home countries. Mia Eriksson, a first-year Texas College of Osteopathic Medicine student, is the lone student from Finland on campus.

Eriksson often Skypes with her family back home. She didn't go home for Christmas but spent it here with friends. The customs are different. In Finland most of the holiday festivities are celebrated Christmas Eve. Root vegetable casseroles and pickled fish are traditional meals.

But the Health Science Center does a tremendous job making international students comfortable, she said. Rakia Johnson guided her through immigration and visa paperwork after she was accepted.

"It is so complicated and has so many legal requirements for international students that if you make one mistake, you can get in trouble," Eriksson said. "If you don't have someone who knows what they are doing to help, then you might as well look at schools elsewhere."

Hardships

International students encounter unique hardships.

This fall, economic woes ignited a country-wide

banking crisis in Nigeria. That calamity impacted some Nigerian students studying abroad, including several at the Health Science Center. Though the students had money in their home country bank, Nigeria's restrictions made the students unable to transfer funds. So the students struggled to pay tuition.

Dr. Moorman once visited the apartment of four students from India and discovered there was not a single bed in the home. He helped them get four mattresses to put on the floor.

"They weren't complaining about it at all," Dr. Moorman said. "It is very expensive for our foreign students to come here, and they feel a lot of pressure to succeed and make it work."

"If you don't have someone who knows what they are doing to help, then you might as well look at schools elsewhere."

— Mia Eriksson

Acharya, the Indian dentist, said a cousin who lives in Irving has helped him overcome obstacles. After earning his Master's of Public Health, he hopes to apply for a one-year residency program in San Antonio that combines dentistry and public health.

Oral hygiene is a serious problem in India. Few people can pay for routine care so they only go to the dentist in emergencies. Acharya wants to help establish broad strategies to prevent oral disease.

Once he completes his education, Acharya will again pack his belongings. He will bid his friends farewell. He'll board another airplane and return home to make a difference in the world.



^ Mia Eriksson



Veteran DO's legacy lives on through TCOM scholarship

Dr. Earl Christian Kinzie's gift to benefit medical students

By Alex Branch

In the late 1930s, in a small Kansas town during the thick of the Dust Bowl, a young doctor of osteopathic medicine struggled to make his family medicine practice successful.

With a wife and two young children to support, Earl Christian Kinzie, DO, looked around at the desolate conditions and knew his family needed somewhere to make a fresh start.

He chose Texas.

After hearing that the town's physician died, Dr. Kinzie relocated his family to Lindale, Texas, a small town outside Tyler. There, he opened a medical practice and cared for generations of families for 49 years – and became known as a pioneer of osteopathic medicine in Texas.

Although he died in 2005, Dr. Kinzie's legacy continues through a new scholarship for medical students at UNT Health Science Center. The gift was made through the Kinzie Foundation, an organization founded by Dr. Kinzie and his wife, Margaret, in 1970 to support education.

"My parents started the foundation for the simple purpose of helping students get through school," said Bill Kinzie, MD. "My

father would be very pleased to know that his foundation is helping a student learn osteopathic medicine, because the field meant so much to him."

Dr. Kinzie earned his osteopathic medical degree in Kansas but was deeply involved with the Texas College of Osteopathic Medicine at UNTHSC. For years, he served as a preceptor to TCOM students on training rotations at his Lindale practice. In 1989, he was awarded the school's Founder's Medal, the highest honor given in recognition of significant contributions to osteopathic medical education.

"My father really enjoyed working with the students," Dr. Bill Kinzie said. "He believed in the school and the high quality of education and training it provides."

Dr. Kinzie shared memories of his career in an oral history created in 1984 for the UNTHSC library. Among the stories he recalled was delivering a baby boy inside the home of Bert and Ann Campbell in Tyler in March 1955. After the delivery, the boy's parents wondered aloud what to name him, and Dr. Kinzie joked they should name the boy "Earl Christian" after him.

Earl Christian Campbell grew up to win

the Heisman Trophy at the University of Texas and to enjoy a successful professional career with the Houston Oilers.

The new scholarship is not the only way Dr. Kinzie's legacy continues at UNTHSC. This year, a first-year medical student named Shelby Spaniel started school at the university. She is the great-granddaughter of Dr. Kinzie and a member of the TCOM class of 2020.

"My father would be very proud," Dr. Bill Kinzie said.



^ Earl Christian Kinzie, DO



XYZ PHARMACY #001

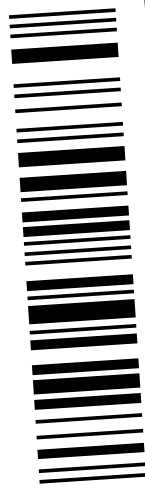
COSTLY CURES

REVOLUTIONARY TREATMENTS COME WITH A HIGH PRICE TAG

By Jan Jarvis

Rx # 100034

Qty:







^ Theresa M. Humphrey

Multiple myeloma sneaked up on Theresa M. Humphrey.

She was more tired than usual but still able to work two jobs. By the time she learned she had cancer, it already had caused bone damage in her skull, upper arms and hips.

“Cancer was eating me alive, and I didn’t know it,” said Humphrey, 64.

There is no cure for multiple myeloma, a cancer of plasma cells. But Humphrey is among a growing number of patients whose lives have been saved by modern medicine. She recently marked four years in remission.

Survival, however, came at a price: \$10,200 a month for 21 pills of Revlimid.

“When the nurse told me the cost, I was speechless,” Humphrey said.

“That’s cancer, honey,’ was all she said.”

New cancer drugs—70 in the last five years—have given hope to thousands of patients – and driven historically high growth in the pharmaceutical industry. While biopharmaceutical research has revolutionized health care, its growth has come at a high cost.

In 2015, annual spending on specialty medicines increased 21.5 percent to \$151 billion, according to the IMS Institute for Healthcare Informatics. Total spending on prescription medicines reached \$425 billion. Most recently, a 500 percent increase in the cost of EpiPens sent consumers into a tailspin.

“You hear a lot of stories about how all the drug companies just want to do is make a lot of money, but I don’t know what’s true anymore,” Humphrey said. “All I know is I need this drug. And I hope and pray there is always a way I can get it.”

Getting a drug to market

High on the list of reasons why prices are so high: research and development.

It takes 10 to 15 years and nearly \$2.6 billion to turn a molecule into the next biological blockbuster, according to the Tufts Center for the Study of Drug Development. Most drugs in development will never make it due to safety or lack of efficacy.

Over the past decade, for example, numerous drugs created to treat Alzheimer’s disease have failed in clinical trials, said Michael Jann, PharmD, Chairman of Pharmacotherapy at UNT Health Science Center’s College of Pharmacy. Overall, less than 12 percent of drugs entering clinical trials result in an approved medicine, according to Pharmaceutical Research & Manufacturers of America.

“When you look at everything involved, each clinical trial costs hundreds of millions of dollars,” Dr. Jann said.

Time also is not on the side of drug manufacturers due to patent expirations. Patents last 20 years, but the clock starts ticking in the

lab when an application is filed. Much of that 20 years is spent in clinical trials and marketing.

“In this country a pharmaceutical company has only three to four years to recoup some of their money,” he said.

To reduce development costs, Big Pharma is turning to biotech start-ups, said Claude Longoria, Intellectual Property Management Director at UNTHSC. The early stages of drug development might be performed at an academic institution, but universities often don’t have the financial support to go further in the process. That’s where biotech businesses can step in and take the drug through clinical trials before they’re bought by Big Pharma.

“They can raise private capital to advance the development of a drug to the point that the risk to Big Pharma is reduced,” he said. “Pharma is willing to pay a premium for that reduced risk.”

No limits

In a free market economy, companies can charge whatever price the market will bear. But it really doesn’t work that way when it comes to the pharmaceutical industry, said Ray D. Page, DO, PhD, an oncologist and Director of Research at the Center for Cancer and Blood Disorders in Fort Worth.

Although 17 percent of the U.S. Gross Domestic Product is health care, the majority of the industry does not operate under free market principles, he said.

“There’s no good price control,” Dr. Page said. “So you don’t get the dynamics of supply and demand.”

Adding to the problem is a 2003 law that forbids Medicare from negotiating drug entry prices. As new drugs hit the market, Medicare is forced to pay the asking price. Without

“All I know is I need this drug. And I hope and pray there is always a way I can get it.”

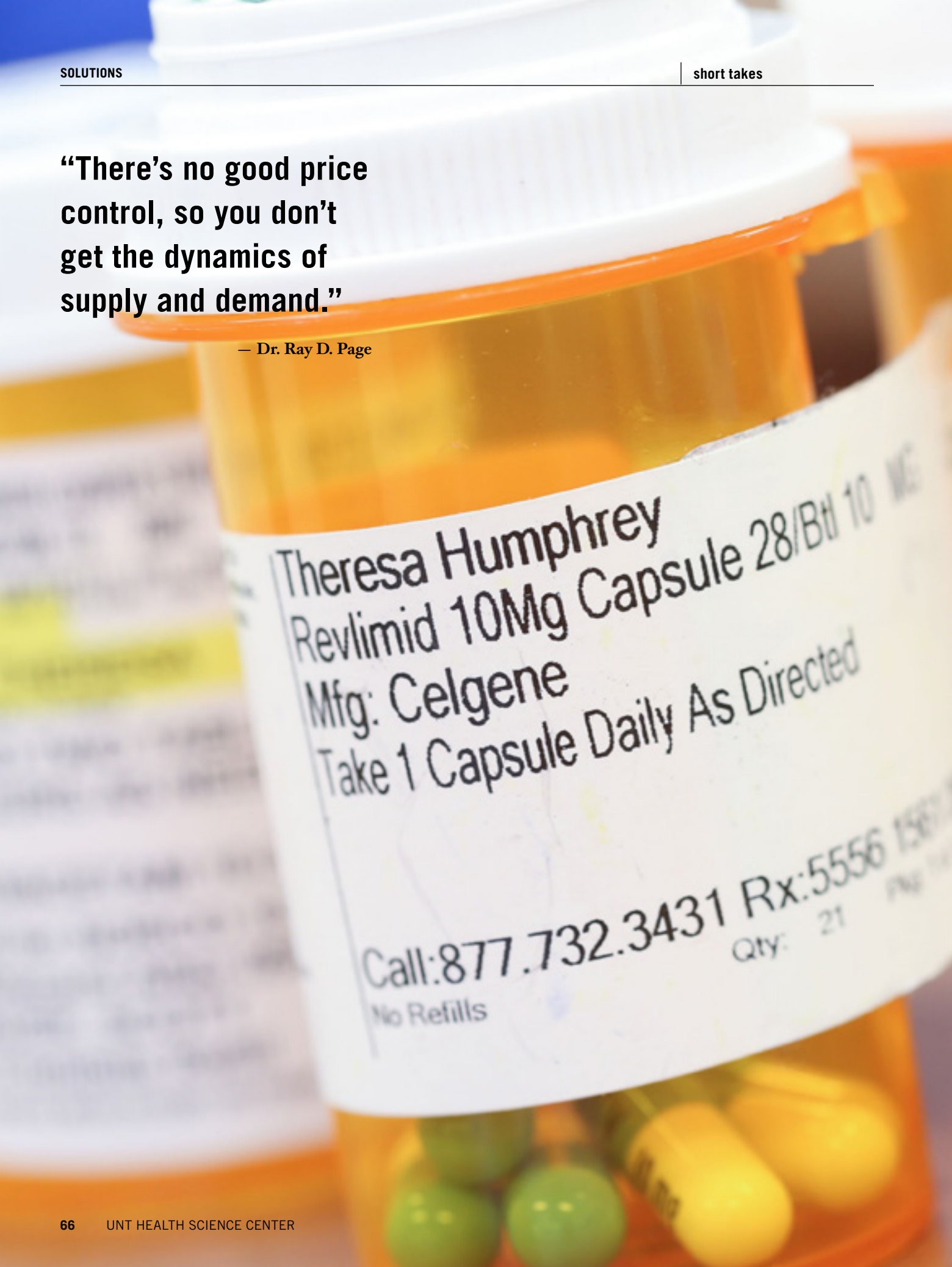
—Theresa M. Humphrey

A month’s supply of Humphrey’s cancer-fighting drug Revlimid costs \$10,200.



“There’s no good price control, so you don’t get the dynamics of supply and demand.”

— Dr. Ray D. Page



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government regulations to negotiate entry drug prices, costs continue to escalate, Dr. Page said.

That’s why chemotherapy costs \$150,000 today compared to \$10,000 a decade ago.

“The last thing we need in health care is more regulation, but it looks like it’s one of the few solutions,” Dr. Page said.

Competition, which should lead to lower prices, doesn’t really work when life-saving drugs are involved.

“It’s not like the airline industry where one company cuts the price of fares and all the others do the same thing,” Dr. Jann said. “Pharmaceutical companies do not follow that same principle.”

When the first Hepatitis C drug was developed, there was no competition. The pharmaceutical company was able to drive up the price to \$84,000 for a 12-week course of the medication. The upside: In studies of Sovaldi, nearly 95 percent of patients were cured.

“Yes it is expensive, but it actually works. It cures Hepatitis C,” Dr. Jann said. “The same cannot be said of a lot of other drugs on the market.”

What’s old is new

In 1960, Thalidomide, a drug to prevent morning sickness, was removed from the market because of a possible link to birth defects.

Nearly five decades later, Thalidomide was combined with dexamethasone to create Revlimid, a second-generation drug that treats multiple myeloma and offers a more favorable toxicity profile. It is now the preferred treatment, despite costing \$163,000 a year.

“Thalidomide found its niche, only it was for another use than originally intended,” Dr. Jann said.

Turning old drugs into new medical marvels is one way the pharmaceutical industry is able to reduce the risks that come with developing a drug from scratch. Another way is to tweak a formula and apply for a new patent.

“Drugs that cost pennies to make are put in a new delivery system such as an extended-release capsule or patch, and the drug makers can charge more,” Dr. Page said. “That’s how a drug ends up costing 100 times as much as it once did.”

Humphrey has been able to afford her medications, so far. Private insurance from her work in the retail industry – and assistance from charitable organizations – have covered the hefty costs.

For that she is grateful.

“Had I not started treatment when I did, I would have been dead by the end of the year,” she said. “I’m a walking miracle.”

A version of this story first appeared in Fort Worth Business CEO magazine.

Dr. Michael Jann says each clinical trial for a new drug can cost hundreds of millions of dollars.



Why I do what I do

Stroke patient's recovery sparked professor's passion for PT

By Dr. Nicoleta Bugnariu

I was 19 years old and fresh out of nursing school when I emigrated from Romania to Canada and took a job at a residential facility for seniors.

One of the women I cared for was a retired nun named Rita. Months after I started, she suffered a major stroke. She survived but lost feeling and movement on the right side of her body. She could no longer walk, stand, or feed and bathe herself.

As her nurse, I dressed Rita, brushed her teeth and did what she could no longer do for herself. She was essentially dependent on others for everything.

Then she started physical therapy. I was there while she spent the entire next year trying to re-learn how to do things herself.

At that time, back in Romania, physical therapy was not a profession in itself. So I knew nothing about it. I had never thought about it. This was my first exposure.

During that year, I watched Rita regain the ability to stand, walk, move her arm and start to retake control of her life. She fed herself. She brushed her teeth. At the end of that year, Rita was able to crochet a scarf for her physical therapist as a gift.

Before my eyes, Rita regained her independence. Even more, she regained her dignity. I was mesmerized. I knew physical therapy was what I wanted to do.

I went to physical therapy school, and the more I learned about rehabilitation, the more I wanted to know about brain plasticity and how it recovers from an injury; how it changes with disease or because of aging. What could we do as physical therapists to optimize that recovery, and how can we use technology to understand the neural mechanisms that facilitate movement?

To this day, these questions fuel my research interests.

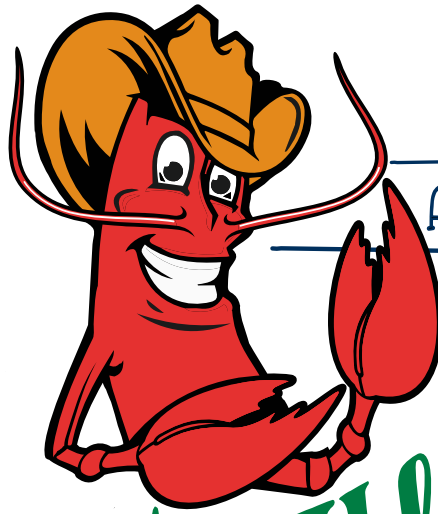
I teach a course at the Health Science Center called Integrated Movement Control. At the beginning of every semester, I tell my new students Rita's story, and how it impacted me and guided my journey into a physical therapy career. I tell them that through their practice they will have the opportunity to transform people lives.

Last year, at the end of the semester, one of my students, Brenda Kinzler, brought me a gift. It was a scarf that Brenda knitted for me, just like Rita had crocheted one for her physical therapist.

I cried.

Nicoleta Bugnariu, PhD, PT, Interim Dean of the School of Health Professions and Associate Professor of Physical Therapy, is wearing the scarf knitted for her by one of her students.





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