KU SCHOOL OF MEDICINE

DEPARTMENT OF INTERNAL MEDICINE

EDUCATION • RESEARCH • PATIENT CARE

TABLE OF CONTENTS

MESSAGE FROM THE DEPARTMENT CHAIR

The Department of Internal Medicine at the University of Kansas Medical Center invites you to discover who we are: collaborative caregivers, educators, researchers, trainees and staff who work together to advance the power of medicine in a stimulating and supportive environment.

Our ultimate priority is to help our patients by using the top treatments and therapies available today while always seeking out and perfecting better methods for the patients of tomorrow through transformational research. We are an academic medical center, so striving to find the answers to science's unanswered questions and sharing what we've learned with the next generation of internal medicine experts is essential to our mission.

As the largest clinical department in our institution, we have a tremendous array of resources available, including state-of-the-art facilities and a roster of talented colleagues — many of whom are among the top experts in their fields. We believe collaboration across departments, schools or other institutions makes us all better. Building bridges can take us to new and exciting places that you'll never find by working in silos.

We serve in the heart of a community in the heart of America, one with a diverse patient population that brings a full spectrum of medical issues to our doors. We serve as leaders in this community, as well as in our state and the country. During the pandemic, members of our internal medicine team helped to transform patient care, complete game-changing research and deliver reliable medical information to area families. These were the some of the biggest challenges of our lifetimes and we not only rose to them, but we led the way.

Finally, we love what we do — an essential element of any job — and we cheer each other's successes in positive, collegial ways. We work hard, but we strive to balance that work with a lifestyle that ensures time to relax, do the things you enjoy and to spend time with the people you care most about.

In these pages, we present an overview of our department's work. Our divisions will all tell their stories, focusing on their specific missions, accomplishments and special contributions. We will show you why Kansas City remains one of the nation's best-kept secrets and one of the best places in America in which to live and raise a family.

While these pages will cover the wide range of what we do, the more important question of who we are will be a consistent running thread throughout: we are lifesavers and leaders; we are caregivers and collaborators; we are researchers, innovators, educators and lifelong learners.

We are the Department of Internal Medicine — and we hope you see a bit of yourself in us.

MATTHIAS SALATHE, M.D.

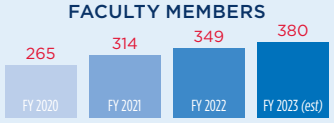
ABOUT OUR DEPARTMENT

BY THE NUMBERS

DEPARTMENT

14
DIVISIONS

FACULTY MEMBERS



125
ADVANCED PRACTICE PROVIDERS

7
VICE CHAIRS

Eyad Al-hihi, M.D., MBA
Clinical Affairs

Mario Castro, M.D., MPH
Translational and Clinical Research

Gary Doolittle, M.D.
Undergraduate Medical Education

Leigh Eck, M.D.
Graduate Medical Education

Daniel Hinthorn, M.D.
Appointments, Promotions & Tenure

Tammy Ojo, M.D.
Diversity, Equity & Inclusion

Steven Weinman, M.D., Ph.D.
Research

6
CLINICAL ADMINISTRATORS

14+
ADMINISTRATORS AND STAFF DEVOTED TO RESEARCH ADMINISTRATION AND OPERATIONS

14+
COORDINATORS AND STAFF TO SUPPORT THE CLINICAL ENTERPRISE

$7.5M
AVERAGE ANNUAL ENDOWMENT FUNDING

$7.5M
AVERAGE ANNUAL STATE FUNDING

RESEARCH

150+
ACTIVE AWARDS AND CONTRACTS

$42M
AVERAGE ANNUAL FEDERAL FUNDING*
**includes federal flow-throughs*

5
ASSOCIATED CORES, INSTITUTES & CENTERS

Diabetes Institute

Kansas Center for Metabolism and Obesity Research

Kidney Institute

Liver Center

Physical Activity and Weight Management

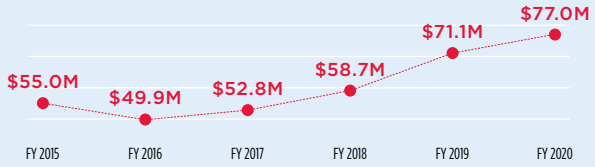
50+
FEDERALLY FUNDED PROJECTS

75+
PARTNERS
companies, universities and federal ICs

250+
ACTIVE CLINICAL TRIALS & REGISTRIES

1900+
ENROLLED PATIENTS

NIH FUNDING FOR RESEARCH AT KU MEDICAL CENTER



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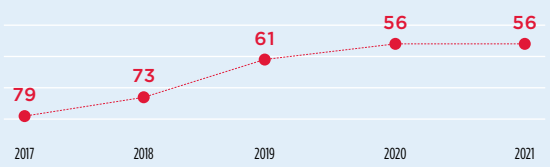
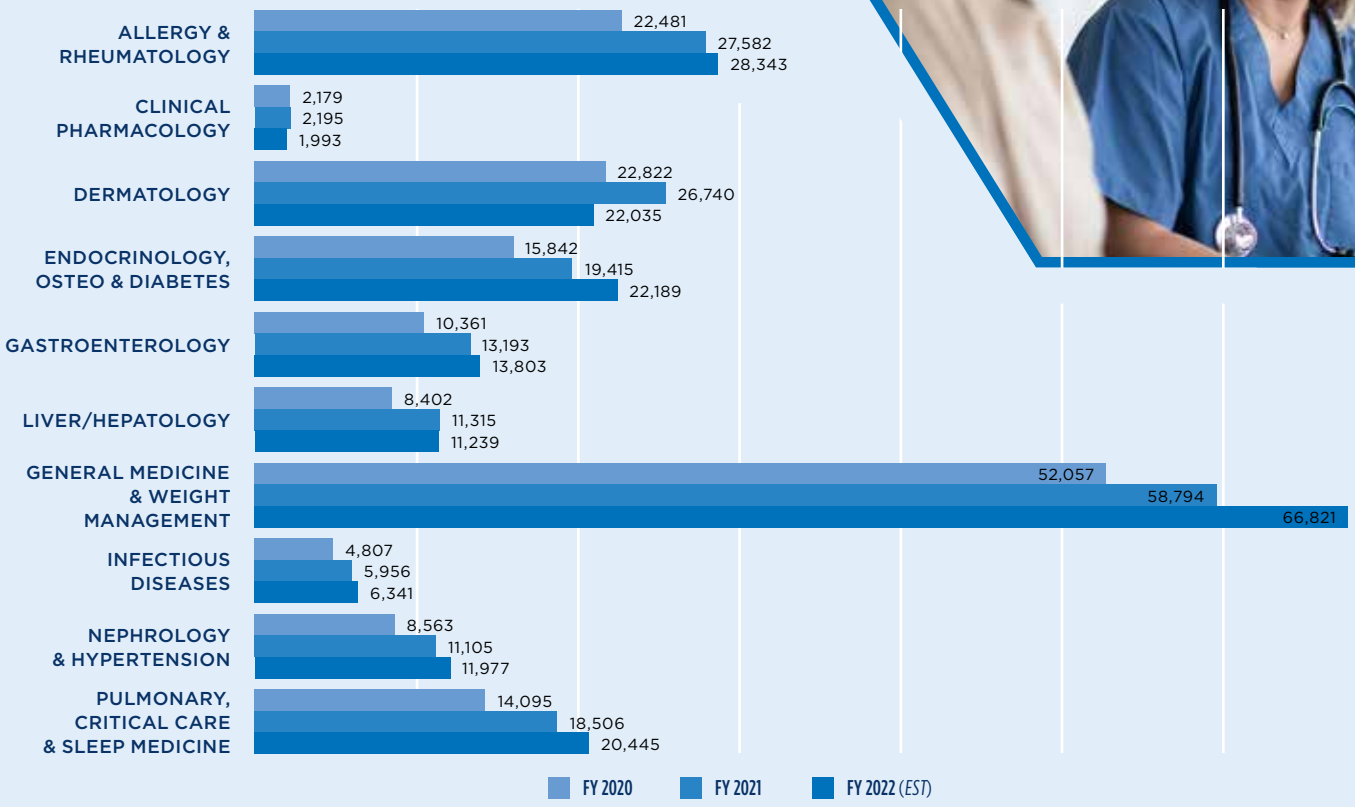
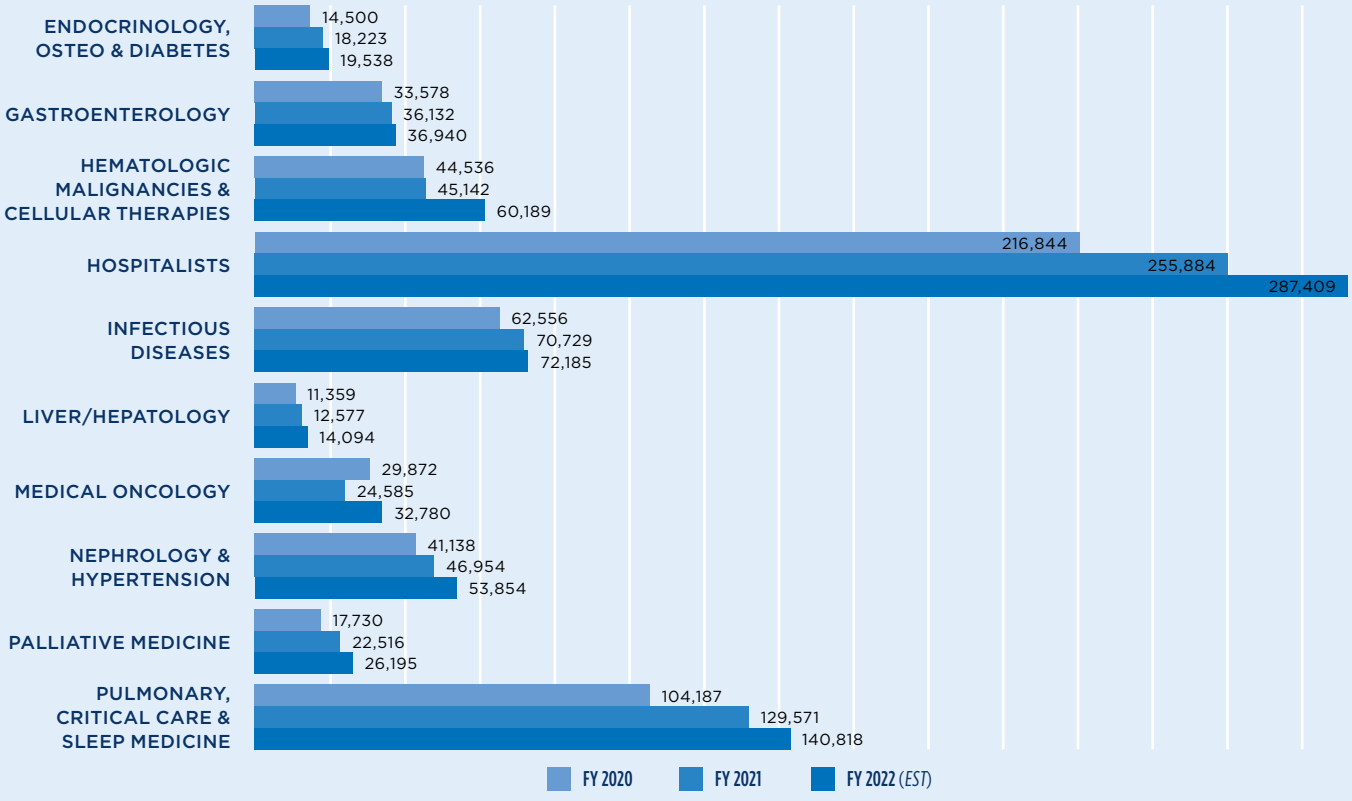


CLINICAL

OUTPATIENT VISITS



INPATIENT wRVUs



UNIVERSITY OF KANSAS MEDICAL CENTER

The University of Kansas Medical Center's mission is to improve lives and communities in Kansas and beyond through innovation in education, research and health care.

- With three campuses in Kansas City, Salina and Wichita, KU Medical Center is home to nationally ranked programs across the spectrum of health sciences. Students also have opportunities to train internationally and participate in cutting-edge research.

- KU Medical Center researchers advance the health sciences through world-class research programs. We are one of 36 public institutions in the prestigious Association of American Universities, an invitation-only organization for the nation's top research universities.

- KU Medical Center has a long-standing reputation for teaching compassionate and state-of-the-art patient care in an academic medical center environment. Patient care is primarily provided by our medical center partner, The University of Kansas Health System — one of the nation's leading health systems.

- KU Medical Center has developed award-winning outreach programs to improve the lives of individuals in underserved populations and values its commitment to bettering the health and education of all citizens.

THE UNIVERSITY OF KANSAS HEALTH SYSTEM

The University of Kansas Health System in Kansas City is part of a world-class academic medical center and destination for complex care and diagnosis. The Health System offers more options for patients with serious conditions, provided by a team with expertise and leadership in medical research and education. These physicians are expanding the boundaries of medical knowledge and discovering life-changing treatments of the future.

At The University of Kansas Health System, patients benefit from the exceptional strengths of an academic health system. The scope of knowledge, the depth of expertise, the breadth of scientific inquiry and the advanced technological resources found here are available only at the best hospitals in the nation.

U.S. News & World Report recognized The University of Kansas Hospital as the best in Kansas City and in Kansas and among the top 50 hospitals in the nation. U.S. News also ranked seven of the Health System's specialties among the nation's best.

ABOUT OUR DIVISIONS

DIVISION OF ALLERGY, CLINICAL IMMUNOLOGY & RHEUMATOLOGY

MESSAGE FROM THE DIVISION CHIEF

The late Dr. Daniel Stechschulte Sr. brought two medical specialties under one roof when he founded Internal Medicine's Division of Allergy, Clinical Immunology and Rheumatology in 1973. While the clinical practices and training programs for allergy/clinical immunology are separate from those of rheumatology, they share a common foundation — the science of immunology.

Over the past decade we have expanded our clinical practice, educational and research missions, while establishing disease-oriented subspecialty clinics. Through development of these clinical centers of excellence with multidisciplinary collaboration and a standardized and evidence-based approach to evaluating and managing our patients, we offer effective and state-of-the-art treatment protocols, while catering to specific complex diseases best manageable in an academic medical setting. We have also worked to expand and diversify our faculty. We now have 15 full-time faculty members, two thirds of whom are women.

In addition to excelling in clinical practice, the education of future physicians is also one of our division's strengths. We are deeply involved in teaching medical students and training residents and fellows. As program director for the Rheumatology Fellowship since 2011, I have made a priority of expanding both fellowships' complements of fellows, their gender and ethnic diversities, as well as their academic and clinical missions. Selina Gierer, DO, has done the same as the program director for the Allergy and Clinical Immunology fellowship.

Despite the challenging circumstances of the past few years, our division has surpassed its ambitious clinical metrics and provided the type of care our patients recommend to others. We credit this success to the hard work of a talented, compassionate and astute faculty and an environment that allows them to thrive.

MEHRDAD MAZ, M.D.

CLINICAL EXCELLENCE

Our division has developed disease-oriented subspecialty clinics that provide the premier regional referral base for complex disease. These include clinics for the management of vasculitis, scleroderma, rheumatoid and inflammatory arthritis, Sjogren's and lupus and musculoskeletal ultrasound and procedures. We are also working to establish seronegative spondyloarthropathy, food allergy and immunodeficiencies clinics. In addition to our 15 faculty members, we also have three rheumatology advanced practitioners, three clinical PharmDs, nine fellows, and many RNs, LPN and MAs to provide a wide array of exceptional patient care.

The rheumatology section has been charged by The University of Kansas Health System to oversee and support operations of the ambulatory Infusion therapy unit at South Pavilion under medical director Mehrdad Maz, M.D. In this south Kansas City, Missouri, facility, health system team members administer biologics and other noncancer therapies to patients, with a large percentage of them referred by our division's faculty and fellows.

Allergy services are also expanding to better serve patients throughout the metropolitan area, with off-campus sites in Prairie Village, Kansas, and soon-to-be-established clinics at KU MedWest and KU Gladstone, in partnership with otolaryngology. The allergy section is also launching a more comprehensive inpatient penicillin testing service to address infectious diseases and surgical specialty needs and provide better patient outcomes.

COVID-19 accelerated the health system's telehealth initiatives, and we were one of the first divisions to ramp up use of telehealth for our patients. It has been a seamless transition for us and has helped improve room allotment, enabled us to schedule additional virtual visits, and reduced clinical disruption for patient care/access while limiting exposure risk for our high-risk patient populations.

Our clinical demand is up significantly, and pending referrals for both allergy/immunology and rheumatology have substantially increased. This has enabled both sections to consistently surpass clinical goals, reaching 125% of productivity targets and 128% of visit targets, despite staff limitations and other pandemic challenges. We are also on pace to exceed visit targets in the current fiscal year. The quantity has not meant sacrificing quality, as patient evaluations consistently deliver high marks and accounts of positive experiences with our team.

BASIC AND TRANSLATIONAL RESEARCH PROGRAMS

The division's research committee aims to centralize and expand the scholarly activities. The Clinical Trials Unit (CTU), which was previously established by professor emeritus, Herbert Lindsley, M.D., and mainly focused on rheumatoid arthritis, has expanded to include many therapeutic trials in different allergy- and rheumatology-related diseases. The CTU is supported by an NP study coordinator, an RN study coordinator, a clinical study coordinator and an administrator. Much of our work involves multicenter pharmaceutical industry-sponsored therapeutic trials, which provide patients with new and novel treatment options. We have also embarked on investigator-initiated studies that explore clinical, translational and molecular mechanisms driving different diseases.

When COVID-19 affected enrollments for our existing pharmaceutical industry-sponsored therapeutic clinical trials, our team pivoted during these difficult days to help the KU Clinical and Translational Science Institute with their investigational studies in COVID-19. With our research operations now back on track, we continue to build relationships with large trial sponsors as our patient load, pathology and CTU can support complex diseases and therapeutics and large cohorts of study subjects. Our research has also become more efficient, thanks to a growing number of online site visits and easier access to electronic records.

We continue to participate in knowledge and research dissemination through national meetings, both virtual and in person and through collaboration with research teams and peers. Dr. Maz served as a core member and content expert and was an integral part of the 2021 American College of Rheumatology (ACR)/Vasculitis Foundation (VF) Vasculitis Guideline development, which has been published and is cited in our Recent Publications section. Dr. Ghaith Noaiseh presented Peripheral Neuropathies in Sjogren's Disease to 1,000 attendees at the virtual Sjogren's Patient International Conference in 2021. Dr. Marissa Love has expanded the relationship with allergy at Northwestern University for food allergy research.

MEDICAL EDUCATION

Training the next generation of doctors is an important focus within our division. Our faculty play essential roles in the KU School of Medicine's Phase I curriculum, and these students have, in turn, voted to honor many of them with awards as their favorite lecturers in our institution.

We have a successful accredited two-year Rheumatology Fellowship, under the leadership of program D director, Dr. Mehrdad Maz, and associate program director, Dr. Megan Krause. We alternate between two and three fellows per year, for a total of five. Two are supported through a collaboration with the Veterans Administration Medical Center in Kansas City, Missouri.

Allergy/Clinical Immunology also has a successful accredited two-year fellowship under the leadership of program director, Dr. Selina Gierer, and incoming associate program director, Dr. Andrea D'Mello. This program accepts two fellows per year, for a total of four, with one supported through collaboration with the Veterans Administration Medical Center in Kansas City.

Both fellowships offer broad exposure to complex cases in both inpatient and ambulatory settings, with allergy fellows seeing both adult and pediatric patients. Virtual platforms have enabled us to host expert speakers from across the United States, enhancing the education of our fellows and faculty.

DIVISION SPOTLIGHT

COMMUNITY OUTREACH

- Selina Gierer, DO, has provided education on allergies and immune deficiency as part of the division's ongoing health maintenance efforts in the community.
- Marissa Love, M.D., provides ECHO virtual lectures to Kansas physicians and school nurses on anaphylaxis for state or rural health initiatives.
- Mehrdad Maz, M.D., participated in the Evidence-Based Rheumatology Podcast on Apple Podcasts; Vasculitis Guidelines — GCA; released on June 2, 2021.

OUTSTANDING EDUCATORS

- Selina Gierer, DO, received the Outstanding M1 Lecture Award in recognition of her teaching in the School of Medicine.
- Megan Krause, M.D., received the Mighty Punch Award and Outstanding M2 Lecture Award in recognition of her teaching in the School of Medicine.

RECENT PUBLICATIONS

Maz M, Chung SA, Abril A, Langford CA, Gorelik M, Guyatt G, Archer AM, Conn DL, Full KA, Grayson PC, Ibarra MF, Imundo LF, Kim S, Merkel PA, Rhee RL, Seo P, Stone JH, Sule S, Sundel RP, Vitobaldi OI, Warner A, Byram K, Dua AB, Husainat N, James KE, Kalot MA, Lin YC, Springer JM, Turgunbaev M, Villa-Forte A, Turner AS, Mustafa RA. 2021 American College of Rheumatology/Vasculitis Foundation Guideline for the Management of Giant Cell Arteritis and Takayasu Arteritis. Arthritis Rheumatol. 2021 Aug. Epub 2021 Jul 8.

Chung SA, Langford CA, **Maz M**, Abril A, Gorelik M, Guyatt G, Archer AM, Conn DL, Full KA, Grayson PC, Ibarra MF, Imundo LF, Kim S, Merkel PA, Rhee RL, Seo P, Stone JH, Sule S, Sundel RP, Vitobaldi OI, Warner A, Byram K, Dua AB, Husainat N, James KE, Kalot MA, Lin YC, Springer JM, Turgunbaev M, Villa-Forte A, Turner AS, Mustafa RA. 2021 American College of Rheumatology/Vasculitis Foundation Guideline for the Management of Antineutrophil Cytoplasmic Antibody-Associated Vasculitis. Arthritis Rheumatol. 2021 Aug. Epub 2021 Jul 8.

Chung SA, Gorelik M, Langford CA, **Maz M**, Abril A, Guyatt G, Archer AM, Conn DL, Full KA, Grayson PC, Ibarra MF, Imundo LF, Kim S, Merkel PA, Rhee RL, Seo P, Stone JH, Sule S, Sundel RP, Vitobaldi OI, Warner A, Byram K, Dua AB, Husainat N, James KE, Kalot M, Lin YC, Springer JM, Turgunbaev M, Villa-Forte A, Turner AS, Mustafa RA. 2021 American College of Rheumatology/Vasculitis Foundation Guideline for the Management of Polyarteritis Nodosa. Arthritis Rheumatol. 2021 Aug. Epub 2021 Jul 8.

Elwazir M, **Krause ML**, Bois JP, Christopoulos G, Kendi AT, Cooper JLT, Jouni H, Abouezzeddine OF, Chareonthaitawee P, Abdelshafee M, Amin S. Rituximab for the Treatment of Refractory Cardiac Sarcoidosis: A Single-Center Experience. J Card Fail. 2022 Feb. Epub 2021 Jul 25.

Medcalf MR, **Bhadbhade P**, Mikuls TR, O'Dell JR, Gundry RL, Funk RS. Plasma Metabolome Normalization in Rheumatoid Arthritis Following Initiation of Methotrexate and the Identification of Metabolic Biomarkers of Efficacy. Metabolites. 2021 Nov 30.

DIVISION OF DERMATOLOGY

MESSAGE FROM THE DIVISION CHIEF

I am excited to take on my new role as Dermatology Division Chief at the University of Kansas School of Medicine. I am particularly privileged to be working with an outstanding team of well-trained, caring and dedicated faculty, trainees and staff. Our faculty are actively involved in the teaching and mentorship of medical students and of our 15 dermatology residents. Our faculty experts are recognized in local, regional, national and international organizations and conferences.

We have a busy academic clinical practice and are proud to provide compassionate care to a diverse group of patients. The University of Kansas Hospital is a 1045-bed, tertiary care center, and The University of Kansas Cancer Center is the only NCI-designated Comprehensive Cancer Center in the region. The University of Kansas transplant experts perform hundreds of solid organ and hematopoietic stem cell transplants every year. This gives our faculty and trainees a unique opportunity to engage in the multidisciplinary care of patients with complex dermatological needs.

Our board-certified dermatologists see a wide range of pathologies in both outpatient and inpatient settings. We are proud to provide care to our patients with general and complex medical dermatological diseases. This includes expert care in the fields of autoimmune and autoinflammatory diseases, and dermato-oncology. Our fellowship-trained Mohs surgeons provide advanced surgical care to our patients with high-risk skin cancers. Our Dermatopathology Unit offers a full complement of diagnostic tests, including direct immunofluorescence, to support the needs of our patients. We are equally excited to grow not only the clinical arm, but also the research arm, of the division. We believe that part of our mission is to participate in the discovery of knowledge that will improve the lives of our patients.

ADELA RAMBI G. CARDONES, M.D., MHSc

CLINICAL EXCELLENCE

Our dermatology physicians and surgeons provide each patient with outstanding dermatological care. Ours is a robust academic program, and our dermatologists have advanced training in cutaneous oncology and medical dermatology. Our faculty have expertise in complex inflammatory and autoimmune medical dermatological conditions, such as psoriasis, atopic dermatitis, connective tissue disease and autoimmune blistering disorders. Our fellowship-trained Mohs micrographic surgeons provide advanced surgical options for our patients with complex skin cancer.

The combination of research, education and experience makes a high level of care possible. Patients and collaborating providers are offered a complete range of advanced tests and treatments, including phototherapy, total skin electron beam radiation therapy and extracorporeal photopheresis. Consultations are offered at the Medical Pavilion, KU MedWest, Quivira Medical Pavilion and via telehealth. Our interdisciplinary approach allows us to coordinate your treatment with other specialties, such as rheumatology and gastroenterology.

Our association with The University of Kansas Cancer Center, an NCI-designated cancer treatment center, allows us to provide exceptional care for patients with cutaneous malignancies. Our dermatologists provide expert care and treatment for melanoma and nonmelanoma skin cancers. We are also one of only 50 nationally recognized lymphoma treatment facilities by the Cutaneous Lymphoma Foundation and are the only nationally recognized facility in Kansas. We have the only melanoma program in Kansas that includes in-house dermatopathology, surgery, sentinel lymph node biopsy and a complete range of adjuvant and systemic treatments. Our expertise in transplant dermatology and dermato-oncology allows us to provide care for patients with skin diseases related to their transplant or chemotherapy.

Our dermatologists have expertise in autoimmune connective tissue and autoimmune blistering disorders.

BASIC AND TRANSLATIONAL RESEARCH PROGRAMS

Our faculty have an interest in health services research, investigating clinical outcomes and quality of life among patients with dermatologic diseases. We are excited to expand the research portfolio of the division, by adding clinical and translational research work in the field of cutaneous oncology, autoimmune skin disorders, cutaneous drug reactions and transplant dermatology.

The division will also open a clinical research fellowship program, which will further solidify KU Medical Center's role in training the next generation of experts in clinical and academic dermatology.

MEDICAL EDUCATION

We offer two major courses to help medical students learn to understand and diagnose the most prevalent skin diseases. Our two-week course includes outpatient clinic experience, tutorial sessions and additional audiovisual materials to teach students how to perform an adequate history and physical examination to make these diagnoses. Our four-week rotation provides outpatient clinic experience, tutorials and inpatient teaching rounds, along with frequent reviews of pertinent aspects of dermatological allergy, microbiology and histopathology. Medical students can also attend monthly meetings of the Kansas City Dermatological Society and regular conferences given by our dermatology residents. Some medical students will have the opportunity to spend two weeks with a dermatologist in private practice in the Kansas City or Topeka areas.

Our three-year dermatology residency program gives residents rigorous clinical and surgical experience in general, pediatric, surgical and cosmetic dermatology at The University of Kansas Hospital, Children's Mercy Hospital and the Kansas City Veterans Administration Medical Center. They work alongside Mohs-trained surgeons and learn both the surgical and pathological aspects of the procedure — to the point of being able to independently perform complex reconstructions before graduation. Our residents also give back to the community by volunteering at the free dermatology clinic for underserved and uninsured patients at the KC Care Health Care Center. We host fifteen residents — five in each class — who also attend weekly lectures, lead group didactic sessions and are expected to attend the winter session of the American Academy of Dermatology Meeting. Our program is proud of its 100% board exam pass rate.

DIVISION SPOTLIGHT

Our division has partnered with the Midwest Cancer Alliance to provide free skin cancer screenings and skin cancer education to people in communities across Kansas, including such rural areas as Salina, Coffeyville, Hays, Holton, Colby, Chanute, Elkhart, Mayetta, Kiowa, Hutchinson and Gardner. We do approximately 20 events a year and recently purchased a mobile medical van to increase our outreach.

Our faculty are also active in dermatology boards and societies, including the Melanoma Tumor Board and the Cutaneous T Cell Lymphoma Tumor Board. Ting Wang-Weinman, M.D., is the current president of the Kansas City Dermatological Society. Anand Rajpara, M.D., is president of the Kansas Dermatological Society, a member of the KC Care Health Center's Board of Directors and directs KC Care's free dermatology clinic.

RECENT PUBLICATIONS

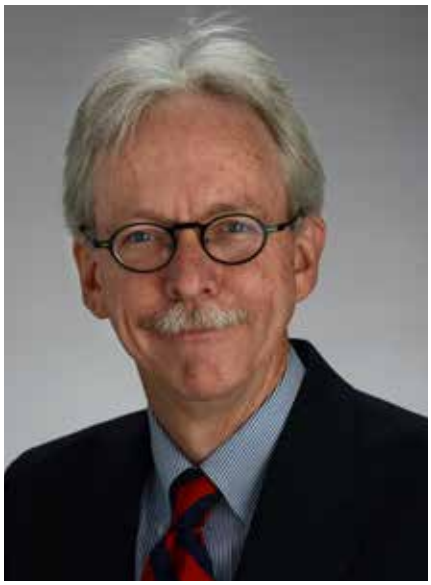
Siscos SM, Downing M, Rajpara A, **Liu D**, **Wang T**, Aires DJ. Silicone gel sheeting for continuous positive airway pressure irritation in adults. J Am Acad Dermatol. 2020 Mar. Epub 2019 Jun 18.

Cardones AR, Hall 3rd RP, Sullivan KM, Hooten J, Lee SY, Liu B, Green CL, Chao NJ, Rowe Nichols K, Banez LL, Shah A, Leung N, Palmeri ML. Quantifying Skin Stiffness in Graft-Versus-Host Disease, Morphea, and Systemic Sclerosis Using Acoustic Radiation Force Impulse Imaging and Shear Wave Elastography. J Invest Dermatol. 2021.

Belina ME, Driscoll TA, Blanchard SK, **Cardones AR**. Ruxolitinib for the treatment of steroid refractory pediatric chronic graft-versus-host disease. Pediatr Dermatol. 2022.

Jibbe A, Worley B, Miller CH, Alam M. Surgical excision margins for fibrohistiocytic tumors, including atypical fibroxanthoma and undifferentiated pleomorphic sarcoma: A probability model based on a systematic review. J Am Acad Dermatol. 2022.

DIVISION OF ENDOCRINOLOGY, DIABETES & CLINICAL PHARMACOLOGY



MESSAGE FROM THE DIVISION CHIEF

In 2021, the Division of Metabolism, Endocrinology and Genetics merged with the Division of Clinical Pharmacology to become the Division of Endocrinology, Diabetes and Clinical Pharmacology. Both divisions have a long history of excellence in our missions of clinical care, education, and research. Our division is committed to the highest quality patient care, advanced research and excellence in education and our united forces will advance each of these missions.

We have focused our clinical care and research efforts in the areas of diabetes, atherosclerosis and cardiovascular disease prevention, osteoporosis and metabolic bone diseases, thyroid cancer, and pituitary disease. Our educational missions include our endocrinology fellowship program, educating residents and medical students, and the ongoing education of our patients in their own self-care.

Our program has been recognized for its excellence in clinical care by U.S. News and World report as a Best Program or Top Performer for the past 10 years.

LELAND GRAVES, M.D.

CLINICAL EXCELLENCE

The Cray Diabetes Self-Management Clinic at The University of Kansas Health System provides comprehensive education and care for patients with diabetes mellitus. Under the direction of David Robbins, M.D., the Cray Clinic offers individual and group diabetes education and nutrition education for patients. Ten endocrinologists and five advanced practice providers provide diabetes specialty care to patients at our main campus, Gladstone and Quivira locations. The Cray Clinic is also heavily involved in educating students, residents and endocrinology fellows in diabetes care.

Clinical Pharmacology provides a nationally recognized apheresis treatment center for patients with familial hypercholesterolemia, disorders of Lpa, and other lipid disorders who do not reach treatment goals with medical care. Under the direction of Patrick Moriarty, M.D., the multidisciplinary lipid clinics work to lower cardiovascular risk in patients with complex lipid disorders and multiple cardiovascular risk factors. These patients often can be involved in one of many clinical trials with new agents aimed at lowering cardiovascular risk.

The Hiatt Osteoporosis Clinic started by Professor Emeritus Barbara Lukert, M.D., in the 1980s aims to promote bone health and to prevent fractures that are frequently associated with devastating consequences for older patients. The clinic assesses and mitigates risks for fracture and ongoing bone loss and uses medical treatments, diet, exercise and fall prevention techniques to help reduce future risks. Eric Rush, M.D., brings

special expertise, along with clinical trials in rare bone conditions such as hypophosphatemic rickets, hypophosphatasia and osteogenesis imperfecta.

Our thyroid surgeons, in partnership with radiation and medical oncologists and nuclear medicine physicians, provide multidisciplinary care in thyroid cancer and other thyroid diseases. Our multidisciplinary Thyroid Tumor Group meets monthly to review complex thyroid cancer cases in order to offer the best individualized care to each patient. Our pituitary neurosurgeons also work with radiation and medical oncologists and neuroradiologists in the monthly multidisciplinary Pituitary Tumor Group to offer the best multidisciplinary care to patients with pituitary disease.

BASIC AND TRANSLATIONAL RESEARCH PROGRAMS

Heart disease remains the leading cause of death in the United States, and the risk is much higher for our patients with diabetes. Our division's research focus has zeroed in on understanding the increased risk and exploring treatment strategies to reduce it. The KU Diabetes Institute, under the direction of David Robbins, M.D., has multiple clinical trials examining the potential cardiovascular risk reduction of such medical therapies as GLP-1 agonist and lipid-lowering agents.

The Clinical Pharmacology section, led by Patrick Moriarty, M.D., has multiple clinical trials investigating different pharmacologic agents and lipid apheresis on cardiovascular risk reduction. The Hiatt Osteoporosis Clinic

DIVISION SPOTLIGHT

In 2021, Diabetes and Endocrinology at The University of Kansas Health System was ranked as a High Performing Program by US News and World Report, a distinction given to programs in the top 10% of 6,000 United States hospitals. The program regularly receives this distinction from the magazine and has, in recent years, also been included in its list of the top 50 programs in the United States.

is investigating the use of a newer bone density technique to help predict which patients in special populations — cystic fibrosis patients, for example — may most benefit from osteoporosis treatment medications to prevent fracture. Abeer Anabtawi, M.D., who directs our endocrinology care for cystic fibrosis patients, is also investigating cystic fibrosis-related diabetes and its effect on cystic fibrosis outcomes.

Our division's research has also reached deep into the Peruvian jungle. Dr. Robbins partnered with the Department of Biologic Anthropology at the University of Kansas Lawrence campus to study the emergence of diabetes among indigenous people in the Upper Amazon. In many indigenous populations, diabetes explodes as westernized foods, pollution and mechanization replace their traditional lifestyle. Dr. Robbins and Bart Dean, Ph.D., led a team of University of Kansas researchers to gather preliminary data and establish a partnership with the tribal leaders to learn more about the environmental and genetic pressures that produce diabetes. After a study that included nearly 200 volunteers, diabetes and obesity were frequently detected in the Yurimaguas region, contrary to previously published data. The team established a strong partnership with local health care providers and tribal leaders and intends to move further up river to study more isolated populations.

MEDICAL EDUCATION

In 2020, the Endocrinology Division expanded its Endocrinology Fellowship from three to four fellows. With this expansion, the classic monthly block schedule transitioned to a "3+1" model, in which our fellows attend their scheduled rotations for three weeks, followed by a week dedicated to their ambulatory continuity clinic. This model, which allows for a more focused rotational experience with fewer interruptions, has been used in residency programs, but it is uncommon in fellowship training. Different dedicated anchor faculty members are associated with each fellow's continuity clinics, diversifying faculty teaching for the fellows while providing continuity for the patients. The time during the +1 week not dedicated to continuity clinics allows our fellows to develop expanded educational opportunities that were not previously provided. This new model has been very well received by both the fellows and faculty.

The Endocrinology Fellowship began in 1958 but was inactive from 1997 to 2005. Since restarting in 2005, the fellowship has had a 100% first-time endocrinology board passage rate, 100% of positions have been filled in the match, and all fellows have completed one or more research projects that have led to presentation at national meetings and/or publication. All fellows have also been involved in quality and safety projects that led to presentations at regional or national meetings. Our fellows are actively involved in the educational mission of the division at the student, resident and interdisciplinary levels.

Educating our patients and their families is a key mission of the division. The Cray Diabetes Self-Management Clinic navigated the COVID-19 pandemic by transitioning many of the essential diabetes education activities to a virtual platform, either as individual or class encounters. The virtual format has been welcomed by patients who had busy schedules or difficulty traveling to The University of Kansas Health System. It will allow the Cray team to widen its reach to include more people with diabetes in remote and rural parts of Kansas.

RECENT PUBLICATIONS

Cristiano EA, **Miles JM**, **Worsham S**, Wiegmann PS, Sharma M, Rakhra V, Goel A, Wiegmann T, **Touza MG**. Decreased Mortality After Long-Term Treatment With Dipeptidyl Peptidase-4 Inhibitors: A Retrospective Study of U.S. Veterans With Type 2 Diabetes. Endocr Pract. 2021 Aug 8. Epub ahead of print.

Morris EM, Noland RD, Ponte ME, Montonye ML, Christianson JA, Stanford JA, **Miles JM**, Hayes MR, Thyfault JP. Reduced Liver-Specific PGC1a Increases Susceptibility for Short-Term Diet-Induced Weight Gain in Male Mice. Nutrients. 2021 Jul 28.

Szarek M, Bittner VA, Aylward P, Baccara-Dinet M, Bhatt DL, Diaz R, Fras Z, Goodman SG, Halvorsen S, Harrington RA, Jukema JW, **Moriarty PM**, Pordy R, Ray KK, Sinnaeve P, Tsimikas S, Vogel R, White HD, Zahger D, Zeiher AM, Steg PG, Schwartz GG; ODYSSEY OUTCOMES Investigators. Lipoprotein(a) lowering by alirocumab reduces the total burden of cardio-vascular events independent of low-density lipoprotein cholesterol lowering: ODYSSEY OUTCOMES trial. Eur Heart J. 2020 Nov 21.

Rush ET, Johnson B, Aradhya S, Beltran D, Bristow SL, Eisenbeis S, Guerra NE, Krolczyk S, Miller N, Morales A, Ramesan P, Sarafrazi S, Truty R, Dahir K. Molecular Diagnoses of X-linked and Other Genetic Hypophosphatemias: Results from a Sponsored Genetic Testing Program. J Bone Miner Res. 2021 Oct 11. Epub ahead of print.

Song X, Waitman LR, Yu AS, **Robbins DC**, Hu Y, Liu M. Longitudinal Risk Prediction of Chronic Kidney Disease in Diabetic Patients Using a Temporal-Enhanced Gradient Boosting Machine: Retrospective Cohort Study. JMIR Med Inform. 2020 Jan 31.

DIVISION OF GASTROENTEROLOGY, HEPATOLOGY & MOTILITY

MESSAGE FROM THE DIVISION CHIEF

The Division of Gastroenterology, Hepatology and Motility is home to excellent patient care, state-of-the-art facilities, clinical translational and molecular research and outstanding training programs.

Our faculty and staff use the most advanced diagnostic and therapeutic tools available to ensure the best results for each patient. We also have technologists, nurses, nutritionists and other dedicated staff members meeting patient needs to deliver the highest quality of compassionate care. Our liver transplantation program is consistently nationally ranked for its clinical outcomes.

Our division's research program has long maintained a tradition of excellence at the forefront of discovery. Clinical studies focus on finding new treatments for gastrointestinal disorders, as well as developing novel diagnostic technologies.

MOJTABA OLYAEE, M.D.

CLINICAL EXCELLENCE

Our division currently performs more than 26,000 endoscopy procedures, including 4,000 advanced therapeutic procedures annually. Our procedural environments include The University of Kansas Hospital's new 15,000-square-foot Endoscopy Center and the KU MedWest and Indian Creek surgical ambulatory centers. In addition to standard endoscopy, advanced procedures routinely performed include:

- Ablation of Barrett's esophagus
- Endoscopic retrograde cholangiopancreatography (ERCP)
- Endoscopic mucosal resection (EMR)
- Endoscopic ultrasound with fine needle aspiration
- Per oral endoscopic myotomy (POEM)
- Endoscopic submucosal dissection (ESD)
- Endoscopic cyst gastrostomy
- Percutaneous endoscopic gastrostomy (PEG tube placement)
- Transoral outlet reduction (TORe) for weight reduction
- Various types of luminal stents

Our first-class motility center also offers anal-rectal manometry, high-resolution esophageal manometry, Endo FLIP, *helicobacter pylori* and hydrogen breath tests, lactose and fructose intolerance tests and pH-impedance testing.

Cancer patients benefit from the extensive support that our advanced therapeutic program offers, including diagnosis, staging and treatment of early GI tract cancer by endoscopic mucosal resection or endoscopic submucosal dissection. Our inflammatory bowel disease section provides comprehensive care to complex Crohn's and ulcerative colitis patients. Our center has performed more than 1,500 liver transplantations with excellent outcomes. Other outstanding subspecialty programs in our division include the evaluation and treatment of obesity and metabolic syndrome through our bariatric endoscopy program.

BASIC AND TRANSLATIONAL RESEARCH PROGRAMS

The Division of Gastroenterology, Hepatology and Motility is home to a diverse set of investigators researching a broad range of topics. The faculty include NIH-funded basic science investigators as well as clinical and translational investigators to team with basic science departments. Area of research emphasis include:

- Liver diseases
- Gastrointestinal motility disorders
- Pancreatic disease
- GI malignancies
- Inflammatory bowel diseases

Current research projects include investigating InterStim sacral nerve stimulation therapy for bowel control, peripheral sympathetic nerve stimulation for weight reduction, SmartPill colonic transit time validation and TZP-102 to treat symptomatic gastroparesis related to diabetes mellitus.

Our Hepatology Research and Liver Center is home to a nationally recognized team involved in clinical, basic and translational research focused on pharmacology/toxicology of the liver, as well as cancer.

MEDICAL EDUCATION

The Division of Gastroenterology, Hepatology and Motility believes it is both an honor and a duty to train the next generation of physicians who will serve the patients of our region moving forward.

Our Gastroenterology and Hepatology Fellowship Program provides superior training in all aspects of clinical and endoscopic gastroenterology and hepatology. Trainees receive extensive experience in the diagnosis, treatment and prevention of gastrointestinal and liver diseases under the guidance of expert faculty members. Fellows receive at least six months of research built into the program, with additional time available for those interested in a career in clinical research or academics.

In 2010, we established the Advanced Therapeutic Fellowship, enabling trainees to gain experience in complex procedures such as endoscopic retrograde cholangiopancreatography (ERCP), endoscopic ultrasound, per oral endoscopic myotomy (POEM), endoscopic mucosal resection (EMR) and endoscopic submucosal dissection (ESD). This fellowship will prepare the next generation of therapeutic endoscopists to serve our community.

DIVISION SPOTLIGHT

The University of Kansas Medical Center has been awarded a $12 million, five-year NIH grant to establish a new research center to study human obesity and obesity-related disease. Our division's Dr. Steven Weinman leads the Kansas Center for Metabolism and Obesity Research (KC-MORE), along with internal medicine colleagues, Dr. John Thyfault and Dr. Joseph Donnelly. The center combines KU's strong research programs in nutrition, obesity, metabolism, diabetes and fatty liver disease and supports them with state-of-the-art scientific core facilities and newly trained faculty investigators. The center also aims to support and mentor specific junior faculty with dedicated funds until they obtain their first major NIH grant and to provide support, infrastructure, seminars and pilot funding for other investigators across the KU Medical Center campus. The long-term goal is to develop a critical mass of NIH-funded clinical, translational and basic researchers who will develop new approaches to prevent and treat obesity and its complications.

Division Director Dr. Mojtaba Olyaee serves as the governor of American College of Gastroenterology for Kansas. He recently visited Capitol Hill to meet with the offices of U.S. Sen. Jerry Moran, Sen. Roger Marshall and Rep. Sharice Davids to discuss global challenges to health care delivery.

RECENT PUBLICATIONS

Stravitz RT, Fontana RJ, Meinzer C, Durkalski-Mauldin V, Hanje AJ, **Olson J**, Koch D, Hamid B, Schilsky ML, McGuire B, Ganger D, Liou I, Karvellas CJ, Rule JA, Lisman T, Clasen K, Reuben A, Cripps M, Lee WM; ALF Study Group. Coagulopathy, Bleeding Events, and Outcome According to Rotational Thromboelastometry in Patients With Acute Liver Injury/Failure. Hepatology. 2021 Aug.

Gunewardena S, Huck I, Walesky C, Robarts D, **Weinman S**, Apte U. Progressive loss of hepatocyte nuclear factor 4 alpha activity in chronic liver diseases in humans. Hepatology. 2022.

Wozniak AL, Adams A, King KE, **Dunn W**, Christenson LK, Hung WT, **Weinman SA**. The RNA binding protein FMR1 controls selective exosomal miRNA cargo loading during inflammation. J Cell Biol. 2020.

Schonfeld M, Zhao J, Komatz A, **Weinman SA**, **Tikhanovich I**. The polymorphism rs975484 in the protein arginine methyltransferase 1 gene modulates expression of immune checkpoint genes in hepatocellular carcinoma. J Biol Chem. 2020.

Jani BS, Rzouq F, Saligram S, Lim D, **Rastogi A**, **Bonino J**, **Olyaee M**. Endoscopic Ultrasound-Guided Fine-Needle Aspiration of Pancreatic Lesions: A Systematic Review of Technical and Procedural Variables. N Am J Med Sci. 2016 Jan.

DIVISION OF GENERAL, GERIATRIC & HOSPITAL MEDICINE

MESSAGE FROM THE DIVISION CHIEF

The Division of General, Geriatric and Hospital Medicine is proud of our team's contribution to patient care, teaching and scholarly activities. We integrate our work into three major focus areas: ambulatory medicine, geriatrics and hospital medicine, with a mission to provide high-quality patient care through clinical service, education and scholarship. We lead the way in value-based care and innovation of care delivery.

Our ability to recruit and retain the best of the best in health care, education and research have been essential to our success. The division boasts a strong, diverse faculty with 130 doctors and 18 advanced care practitioners. We added 17 new providers in 2021, including three ambulatory physicians, one medical psychologist, one weight management physician, one geriatric physician, eight hospitalists and three new nurse practitioners. Our division's faculty members hold several leadership positions within The University of Kansas Health System, the University of Kansas School of Medicine and the local community.

EYAD AL-HIHI, M.D.

CLINICAL EXCELLENCE

Forty percent of all hospitalized patients are cared for by our hospitalists — multiple services with consult specialties such as IR, cardiology, observation, medical oncology, BMT and ICC. Many of our providers are singled out among other specialties for their collaboration with other divisions and across departments with The University of Kansas Health System.

Our division also staffs the Internal Medicine Residency Clinic, and most ambulatory physicians maintain private clinics in the Medical Pavilion on the main campus, the Medical Plaza in Overland Park, Kansas or at the Weight Management Clinic. Several of our geriatrics physicians also see patients in community-based skilled nursing facilities. Our care team includes behavioral health specialists, pharmacists and neuropsychologists. Patients who choose us for their care team also get direct access to a wide array of subspecialty areas, including cancer survivorship, diabetes and prediabetes care, memory care, transgender medicine, surgical evaluation and pediatric transition of care.

We have the largest general internal medicine practice in the Kansas City metropolitan area and one of only 14 nationally recognized comprehensive primary care plus regions and an NCQA patient-centered medical home. In 2021, our team logged 53,177 visits, either in-person at our clinics or via telehealth.

Throughout the COVID-19 pandemic, our hospitalists have been on the front lines serving patients with serious illnesses and reaching record-breaking census numbers for inpatient care. In our outpatient clinic, a post-COVID clinic was established for those patients that had lingering effects of long COVID symptoms.

BASIC AND TRANSLATIONAL RESEARCH PROGRAMS

Our faculty and residents are strongly encouraged to participate actively in scholarly research. Research support is provided to help anyone to design and carry out research projects, publish in peer-reviewed journals and submit abstracts to regional and national conferences.

Many high-quality improvement projects have been conducted by our division members, successfully improving the quality of patient care. Examples of these QI projects, each of which has been published in peer-reviewed journals, include:

- Electronic health record patient portal usage has been associated with improvement in chronic disease parameters, patient functional status and patient satisfaction. Division members implemented a QI project that successfully increased patient portal enrollment in IM resident patient panels.

- Discomfort in hospitalized patients continues to be one of the healthcare system's greatest challenges to positive patient outcomes. A QI project undertaken by division members and nursing staff increased the level of comfort reported by hospitalized patients with less emphasis on prescribed analgesic medications.

- Appropriate use of cardiac telemetry monitoring was needed greatly at our institution because of a limited number of telemetry beds. Division members implemented a QI project that successfully increased adherence to practice guidelines and sustained reductions in inappropriate telemetry use.

- Increasing the percentage of baby boomers who obtained a one-time screening test for HCV was the objective of another QI project conducted by our division members. The project identified HCV screening needs and created a visual reminder in the EMR to facilitate sustainable awareness and improvement of screening rates.

DIVISION SPOTLIGHT

- Dr. Abebe Abebe was appointed by Gov. Laura Kelly's office to become a member of the Kansas State Board of Healing Arts.
- University of Kansas Emergency Room residents honored Dr. Aram Barbaryan as the AOD Physician of the Year.
- Dr. David Becker received the Rainbow Award, a student-driven honor to recognize individuals "who exemplify the attributes of professionalism in medicine and share those qualities with the students whom they mentor."
- Dr. Jessica Kalender-Rich is a member of the Coronavirus Commission for COVID-19 in LTC and the COVID-19 State Leaders Task Force.
- Dr. Isaac Opole serves on the Diversity, Equity and Inclusion Committee, was elected to the Board of the American College of Physicians services PAC and was nominated for ACP Governance.

- Another QI project aimed to double the number of pneumococcal vaccinations given in the resident physician clinics without compromising workflow or unduly burdening the rooming nurse or resident physicians. The project, which involved several division members, resulted in doubling the number of vaccinations in the intervention group compared with the control group. Post-study interviews and surveys indicated our workflow is sustainable and amenable to wider use within the resident physician clinics.

MEDICAL EDUCATION

Faculty members are involved in the medical education leadership of both undergraduate and graduate medical education. In addition to program leadership of the third-year core Internal Medicine Clerkship and the Internal Medicine Residency programs, faculty are also integrally involved in teaching medical students and residents in both inpatient and outpatient settings.

We employ four to six chief residents each year with roles in both our inpatient hospital medicine section and our outpatient ambulatory clinic. The chiefs serve as attending physicians on the academic hospitalist services with learners, as well as taking moonlighting opportunities on the private services without learners. In the outpatient ambulatory clinic setting, the chiefs are called on to precept the resident continuity clinics and same-day care clinic.

Members of our faculty are leaders and instructors in the Neis Clinical Skills Lab, which helps our learners achieve competency in patient skills, medical procedures, and interpersonal communi-

cation with patients and colleagues. Designed to mimic a clinical care facility, the NCSL features 17 out-patient suites, eight in-patient rooms, one task-trainer room, two classrooms, six debrief rooms, one out-patient lab, one in-patient lab, one SON bed lab and one home-care suite.

Our faculty also serve as leaders and instructors at the Zamierowski Institute for Experiential Learning, which provides our learners with an immersive team training experience in a wide array of simulations in a safe environment that allows for practice, reflection and innovation.

GRANTS

Our division's team members received approximately $750,000 from the National Institute on Aging to conduct the Nutrition Interventions for Cognitive Enhancement (NICE) study. This study, currently set to run through February of 2023, investigates how low-fat eating patterns, such as the Mediterranean diet, affect cognitive function and other measures in normal adults who are cognitively normal.

Recruited participants from the Kansas City metropolitan area, 65 and older, will be randomly assigned to a Mediterranean or low-fat diet for a year, as well as either an Omega-3 fatty acid supplement or placebo. They also track their eating, engage in cooking demonstrations and will have a registered dietitian monitor them. They can also pick up a bag of food that fits their assigned diet plan from a local grocery chain every week.

Tests conducted before, during and after their study period will measure changes — if any — to each participant's global cognition composite score. Additional tests will measure any changes in 29 other areas of study, including blood pressure, insulin levels, cholesterol, attention span and verbal memory.

RECENT PUBLICATIONS

Our faculty has increased its publications productivity over the past several years, and we hope this trend continues. Here are a few of the many recent publications from members of our faculty:

Lowry BN, Tsue TT, Orr WN, Khan TW. Physician and executive collaboration on rapid development of pandemic needs response to support physicians and medical staff during the COVID-19 pandemic in an academic medical center: a descriptive review. Psychol Health Med. 2021 Sep 20. Epub ahead of print.

Ranka S, Lahan S, Dalia T, **Tripathi A**, Goyal A, Sreenivasan J, Taduru S, Muhammed M, Moriarty P. Association Between Red Cell Distribution Width and Cardiovascular Outcomes — Systematic Review and Meta-Analysis. Medical Research Archives. 2021.

Zorowitz RA, Bergman C, Haimowitz D, **Kalender-Rich JL**, Polakoff DF, Steinberg K, Wright JL. Comment on: COVID-19 in Nursing Homes: Calming the Perfect Storm. J Am Geriatr Soc. 2021 Feb. Epub 2020 Dec 31.

Shafiq M, Alturkmani H, Zafar Y, Mittal V, Lodhi H, Ullah W, Brewer J. Effects of co-infection on the clinical outcomes of Clostridium difficile infection. Gut Pathog. 2020 Feb 25.

McGreevy S, McGowan C, **Gillenwater K**, **Opole R**, et al. Improving population health in resident clinics: increasing pneumonia vaccination rates in adults 65 years and older. BMJ Open Quality. 2020.

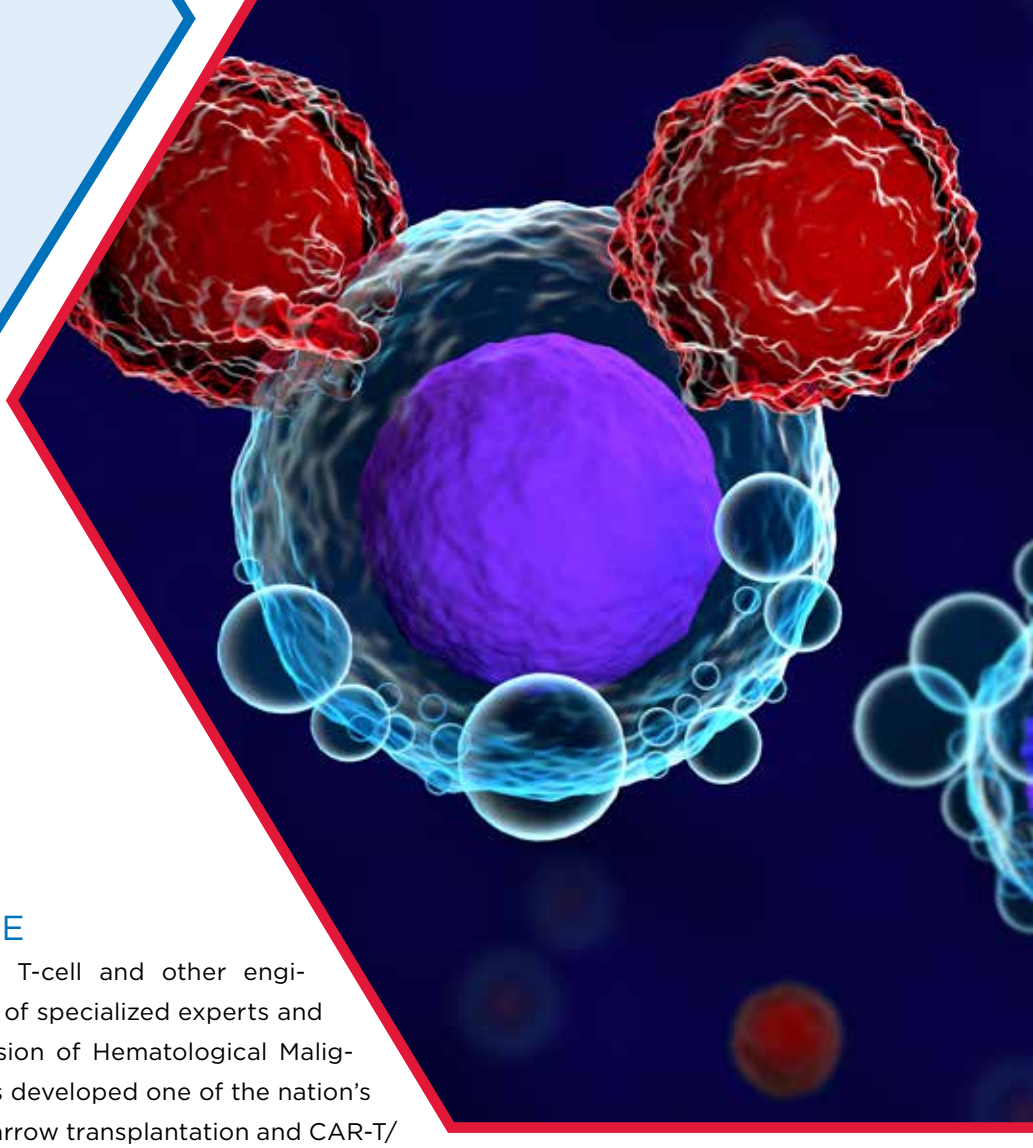
DIVISION OF
HEMATOLOGIC MALIGNANCIES & CELLULAR THERAPEUTICS

MESSAGE FROM THE DIVISION CHIEF

The Division of Hematologic Malignancies and Cellular Therapeutics (HCMT) has achieved several remarkable successes and milestones in recent years. Our volumes of inpatients, ambulatory patients and new patients are all on pace to surpass totals from the previous fiscal year. In the past year, our faculty — now 21 members strong — also had more than 100 peer-reviewed publications, 70 abstracts/posters and 30 oral presentations. In addition, our HMCT team has successfully established The University of Kansas Cancer Center as one the nation's largest and most experienced CAR T-cell therapy programs. In 2021, our center became the first in the nation to treat a multiple myeloma patient with BMS' FDA-approved CAR T therapy (Abecma™). We are currently one of only a few centers in the region certified to offer all six FDA-approved CAR T-cell treatments, and we offer an armamentarium of therapies that includes a robust portfolio of investigational CAR T/cell therapy clinical trials.

New HMCT inpatient units, located on the 8th, 9th and 10th floors of Cambridge Tower, have added 100 inpatient beds to better meet our growing clinical and research patient volumes. These state-of-the-art, 100,000-square-foot units, which opened in December 2021, include HEPA-filtered protected environments on all three floors and amenities and features unavailable at any other cancer center in the United States. The new units are made possible by a philanthropic gift from the Sunderland Foundation and represent a culmination of efforts from the HMCT and The University of Kansas Health System leadership teams. The future is now in terms of cancer medicine and our HMCT division is well-positioned to become one of the nation's leading blood cancer and cellular therapeutic programs.

JOSEPH MCGUIRK, DO



CLINICAL EXCELLENCE

Developing and administering CAR T-cell and other engineered cell therapies requires a team of specialized experts and an infrastructure to match. The Division of Hematological Malignancies and Cellular Therapeutics has developed one of the nation's leading acute leukemia, blood and marrow transplantation and CAR-T/cellular therapeutic programs. This experience and our state-of-the-art facilities are positioning The University of Kansas Cancer Center, working with our fellow NCI-designated cancer centers, to lead the charge in this new chapter of immunotherapy treatments. In 2017, the KU Cancer Center was the first of 27 sites worldwide to enroll patients in the multi-national phase 2 study, which led to the approval of the second-ever CAR T-cell therapy, Kymriah™. Just a few years later, our center is certified as a CAR T center for all six FDA-approved constructs and currently has more than 20 active CAR-T/cell therapy clinical trials to treat both liquid and solid tumors.

Our HMCT team has also successfully developed a non-malignant hematology/sickle cell program. This team is focused on developing pathways for this specialized patient population, as well as opening cell and gene therapy trials, such as CAR T and CRISPR, which have proven to be effective in treating various autoimmune disorders.

Our survivorship program, led by Nausheen Ahmed, M.D., specializes in long-term follow-up and late effects for bone marrow transplant and CAR T/cellular therapeutics patients. Dr. Ahmed spearheads a team of two advanced practice providers and a clinical nurse coordinator, who focus on quality of life, graft-versus-host disease and smoking cessation

DIVISION SPOTLIGHT

In 2021, the division formed the HMCT Culture Committee to find ways to improve communication across our interdisciplinary team, create a "best-place-to-work" environment and develop a culture of collaboration to extend across our inpatient and outpatient domains. Elizabeth Muenks, Ph.D., Clinical Director, Psychology Services for Hematologic Malignancies and Cellular Therapeutics, leads this group, which has already conducted a comprehensive survey of all HMCT-related team members and identified several top goals, including improving diversity, equity and inclusion over the coming year.

for our long-term follow-up patients. Our HMCT team is currently tracking more than 4,000 long-term follow-up patients, who represent both the successful outcomes of our HMCT team, as well as the advances in the field of blood cancers and disorders.

The growth of our clinical and research programs led to plans for a new cancer center building for our HMCT ambulatory clinics, clinical and research laboratories and our administrative offices. This proposed building will allow us to consolidate all of our HMCT clinicians and researchers in one location, significantly improving collaboration and communication across our interdisciplinary team. It should also favorably improve the overall patient experience and outcomes.

BASIC AND TRANSLATIONAL RESEARCH PROGRAMS

Due to the HMCT team's early efforts in becoming the world's first center to treat an adult CAR T patient on Novartis' (Juliet) trial for NHL: diffuse large B-cell lymphoma, we have developed one of the nation's largest and most experienced CAR T/cellular therapeutics program. Our HMCT physician-scientists now lead many investigator-initiated trials, including David Akhavan, M.D., Ph.D., who is generating CAR T-cells to target tumors in the brain. His work involves precisely routing the CAR T-cells to blood vessels feeding the tumors. These efforts give us hope in hard-to-treat cancers such as glioblastoma.

We must also find ways to overcome the rare, but potentially dangerous side effects of CAR T and other cell therapies. Researchers hope to address the toxic side effects, such as cytokine release syndrome and neurologic toxicity. At our cancer center and other select centers in the nation, we are now using healthy, off-the-shelf CAR T-cells to treat patients, while focusing on methods such as CRISPR-Cas9 gene editing to reduce the potential of the patient's body rejecting them as foreign. We were the first to enroll a patient on a multicenter, multinational trial led by Nobel Prize winner Dr. Emmanuelle Charpentier's company.

We are moving toward a future of more precise, more effective therapies than our traditional chemotherapies and radiation therapies that have been used for decades. It is truly an exciting time to be a researcher and a clinician.

MEDICAL EDUCATION

Our HMCT division plays an active role in educating learners, both clinically and mentoring, ranging from shadowing experiences with high school students to more robust fellowships. Specifically, our HMCT team collaborates with KU School of Medicine students and house staff, visiting residents and fellows, international learners and other visiting physicians. The HMCT faculty work closely with students on research projects to help them become authors on abstracts, research posters and publications, which bolsters their clinical and research experience. Heather Male, M.D., serves as the hematology/oncology associate director and Al-Ola Abdallah, M.D., serves as HMCT director of oncology fellowship & faculty communication services. Dr. Muhammad Mushtaq also works on with learners throughout the United States and internationally on multiple research projects.

Hematology/oncology fellows work closely with our faculty in both inpatient and outpatient settings, including BMT and hematology outpatient clinics and inpatient units encompassing acute leukemia, autologous & CAR T, BMT, hematology teaching service and hematology consults. Many students are assigned to HMCT faculty for mentoring and research projects. In addition, we occasionally mentor visiting fellows, usually from the University of Missouri-Kansas City, which our faculty incorporate into our inpatient and outpatient rounding.

Internal medicine residents rotate on the hematology teaching service and work with our faculty on outpatient clinical rotations. A visiting resident has focused on blood and marrow transplants in both the inpatient and outpatient clinical settings and collaborated with Haitham Abdelhakim, M.D., on a joint research project. The hematology teaching service usually has two students per 8-week rotation during their clerkship year. M4 students can choose clinical hematology, Med930, where they spend two weeks on one of our inpatient services and two weeks in outpatient clinics. Med 930 includes both KU School of Medicine and visiting students (international students were also included prior to the COVID-19 pandemic). Six weeks out of the academic year, we have two SER M2 students for career exploration in blood and marrow transplants. During these weeks each student will have 3.5 days shadowing at outpatient clinics or the allogeneic blood and marrow transplant service.

RECENT PUBLICATIONS

HMCT faculty have authored 500+ peer reviewed publications in the last 10 years, including:

Locke FL, Miklos DB, Jacobson CA, Perales MA, Kersten MJ, Oluwole OO, Ghobadi A, Rapoport AP, **McGuirk J**, Pagel JM, Muñoz J, Farooq U, van Meerten T, Reagan PM, Sureda A, Flinn IW, Vandenberghe P, Song KW, Dickinson M, Minnema MC, Riedell PA, Leslie LA, Chaganti S, Yang Y, Filosto S, Shah J, Schupp M, To C, Cheng P, Gordon LI, Westin JR; All ZUMA-7 Investigators and Contributing Kite Members. Axicabtagene Ciloleucel as Second-Line Therapy for Larg B-Cell Lymphoma. N Engl J Med. 2021 Dec 11. Epub ahead of print.

Halkidis K, Zheng XL. ADAMTS13 conformations and mechanism of inhibition in immune thrombotic thrombocytopenic purpura. J Thromb Haemos. 2022.

Cortes JE, **Lin TL**, Uy GL, Ryan RJ, Faderl S, Lancet JE. Quality-adjusted Time Without Symptoms of disease or Toxicity (Q-TWiST) analysis of CPX-351 versus 7 + 3 in older adults with newly diagnosed high-risk/secondary AML. J Hematol Oncol. 2021.

Mushtaq MU, Shahzad M, **Chaudhary SG**, Luder M, **Ahmed N**, **Abdelhakim H**, **Bansal R**, **Balusu R**, DeJarnette S, Divine C, **Kribs R**, **Shune L**, **Singh AK**, **Ganguly S**, **Abhyankar SH**, **McGuirk JP**. Impact of SARS-CoV-2 in Hematopoietic Stem Cell Transplantation and Chimeric Antigen Receptor T Cell Therapy Recipients. Transplant Cell Ther. 2021.

Fowler NH, Dickinson M, Dreyling M, Martinez-Lopez J, Kolstad A, Butler J, Ghosh M, Popplewell L, Chavez JC, Bachy E, Kato K, Harigae H, Kersten MJ, Andreadis C, Riedell PA, Ho PJ, Pérez-Simón JA, Chen AI, Nastoupil LJ, von Tresckow B, Ferreri AJM, Teshima T, Patten PEM, **McGuirk JP**, Petzer AL, Offner F, Viardot A, Zinzani PL, Malladi R, Zia A, Awasthi R, Masood A, Anak O, Schuster SJ, Thieblemont C. Tisagenlecleucel in adult relapsed or refractory follicular lymphoma: the phase 2 ELARA trial. Nat Med. 2021 Dec 17. Epub ahead of print.

DIVISION OF INFECTIOUS DISEASES

MESSAGE FROM THE DIVISION CHIEF

The Division of Infectious Diseases has been dedicated to providing excellent patient care and bench-to-bedside research since its founding in 1958 by Chien Liu, M.D., one of the physician-scientists who helped discover the etiology of primary atypical pneumonia. We want our work to not only improve outcomes for our individual patients but also lead to healthier communities across Kansas and beyond. We recognize the importance of training the next generation to understand infectious diseases.

We also want to understand infectious diseases better ourselves, and our division stands at the forefront of the fast-evolving research in this area, working collaboratively with colleagues at our institution and elsewhere to make the latest cutting-edge therapies available to our patients. We maintain an active antimicrobial therapeutic clinical trials program, including investigations in HIV-1, *C. difficile* and infections in immunocompromised hosts and transplant recipients. Our research is a mix of NIH-supported work and multi-center studies of new agents or approaches that are sponsored by industry. We've helped develop diagnostic techniques and key prevention and treatment innovations. Our clinical and translational research crosses state lines and national borders.

The world may have changed since Dr. Liu's era, but our mission hasn't wavered — to learn about the underlying causes of infectious diseases and use that knowledge to improve the lives of our patients and people everywhere.

MATT M. SHOEMAKER, DO
INTERIM CO-DIVISION CHIEF

STEPHEN WALLER, M.D.
INTERIM CO-DIVISION CHIEF

CLINICAL EXCELLENCE

Our division provides care for patients covering the full spectrum of infectious diseases. The inpatient infectious diseases consultation service currently consists of eight consult teams. Each team has medical students, internal medicine residents and infectious diseases fellows rotate with them over the course of the academic year. Additionally, learners are paired with an infectious disease pharmacist and — frequently — pharmacy residents and pharmacy students.

Our consult teams care for complex infectious diseases cases including bloodstream infections, bone and joint infections and infections in critically ill patients. We also care for a significant number of immunosuppressed patients. Our teams assist in the care of recipients of bone marrow, heart, kidney and kidney-pancreas transplants, as well as CAR-T recipients. Our consult teams also provide inpatient infectious diseases telemedicine consults to our campus in Great Bend, Kansas, with the assistance of an onsite telemedicine robot with a high-definition camera and digital stethoscope.

The outpatient infectious diseases consultation service provides care for general infectious diseases and hospital follow-up for patients seen by the inpatient infectious diseases consult teams. We provide outpatient parenteral antibiotic therapy to many patients through the support of dedicated nurses who assist in transitions of care and medication monitoring.

The outpatient infectious diseases consultation service provides care for persons living with HIV in a robust Ryan White HIV clinic that serves approximately 800 patients. We have an HIV pharmacist integrated into the clinic to assist with medication monitoring, drug-drug interactions, ART compliance and retention in care. We also provide telemedicine for general infectious diseases and hospital follow-up for patients seen by the inpatient infectious diseases consult teams and for persons living with HIV. Our work includes a growing correctional medicine service.

BASIC AND TRANSLATIONAL RESEARCH PROGRAMS

Research within the Division of Infectious Diseases is broad in scope and impactful. As the division and department show robust and growing support for infectious disease research, our research portfolio has grown rapidly. Our faculty have unique focus areas ranging from CMV and fungal infections in transplant populations, to novel medical devices to improve fis-

tula healing (a common cause of recurrent, difficult to treat infections), to TB meningitis.

We continue to work with partners in academia and industry to advance care for complex infections, evaluate novel diagnostics for conditions such as sepsis and fungal infections, evaluate novel therapeutic agents for HIV, *Staphylococcus aureus* bacteremia, COVID-19 and other respiratory viruses, as well as seeking to better understand factors related to price trends for antimicrobial agents.

As an example of our innovative work, Nathan Bahr, M.D., works closely with a multi-institutional, multidisciplinary, international team in Uganda, and his NIH-funded work has led directly to WHO guideline changes in cryptococcal meningitis and TB meningitis. His work in TB meningitis has been particularly impactful in improving diagnostic capabilities from insensitive and slow to rapid and multi-faceted with significantly improved sensitivity. Dr. Bahr has pushed the field forward significantly by leading studies of novel molecular tests, antigen lateral flow assays, and by working to find immunologic biomarkers that can be used for the diagnosis of TB meningitis. Dr. Bahr also is developing new diagnostic tests and treatment paradigms for histoplasmosis in the United States and abroad and has pushed for improved recognition of histoplasmosis outside of the traditional areas that have been considered endemic. Given his expertise, he served as an external reviewer for WHO guidelines for disseminated histoplasmosis in HIV. The overarching theme for Dr. Bahr's research is to tackle diseases with poor outcomes that disproportionately affect disadvantaged populations.

MEDICAL EDUCATION

The Division of Infectious Diseases is integrally involved in all levels of KU School of Medicine medical education. At the medical student level, Jessica Newman, DO, mentors students interested in infectious diseases as the advisor for the KU School of Medicine ID Interest Group. The group conducts quarterly meetings, and several faculty have presented session topics. Dr. Newman, along with Matt Shoemaker, DO, Albert Eid, M.D., Lisa Clough, M.D., Michael Luchi, M.D., and Stephen Waller, M.D., provide large and small group content in the ACE curriculum including authoring eight case-based collaborative learning programs and countless pre-learning videocasts, capstone cases and flipped large group sessions.

Drs. Shoemaker, Newman and Ryan Kubat, M.D., serve as CBCL leaders, facilitating more than 21 sessions annually. Dr. Newman directs the KC ID SER week experience, the fourth-year ID Elective and the IM Student Chief Elective. Dr. Newman is also a co-director of the internal medicine clerkship and, starting in 2021, the division began hosting third-year IM clerkship students on ID consults as a core rotation. All divisional faculty teach rotating KU and visiting fourth-year medical students on ID and many contribute content to our division's learner web curriculum, Jayhawk Infectious Diseases.

In the realm of graduate medical education (residency and fellowship) instruction and support, Dr. Newman serves the IM Residency as the Infectious Diseases Subspecialty Education Coordinator and as IM core faculty. All faculty in the division serve as clinician educators to rotating resident and fellow learners. Faculty also give lectures and facilitate case conferences as part of the IM Core Didactic series. Our division also hosts a rotating internal medicine residency infectious diseases "Friday School" covering HIV care and antimicrobial stewardship. Dr. Clough serves the division as the ID Fellowship Director and hosts rotating family medicine residents and surgery ICU fellow experiences. Under her leadership, amidst a pandemic, the ID fellowship filled in the 2021 appointment year, despite a national 25% unfilled ID program rate.

The division hosts CME via Journal Club with the addition of a Global Health Pathway JC Series, in partnership with IM and family medicine and hosts the Kansas City Infectious Diseases Society monthly case conference, which boasts worldwide attendance.

DIVISION SPOTLIGHT

We live in a climate where misinformation about COVID-19 spreads even faster than the disease itself, but Infectious Diseases assistant professor, Kellie Wark, M.D., M.P.H., has worked in the clinical and public health arena to battle both.

In addition to her work at TUKHS, Dr. Wark works at the Kansas Department of Health and Environment (KDHE) section of Infectious Disease Epidemiology and Response, where she focuses on antimicrobial resistance and outbreak response. She also serves as KDHE's antimicrobial stewardship lead in the Healthcare Associated Infections and Antimicrobial Resistance Program.

Over the past two years, she helped develop statewide initiatives targeting critical access hospitals, ambulatory and long-term care facilities with goals to expand infection prevention and control activities. She developed Kansas's outbreak plan for novel multidrug-resistant organisms and Candida auris.

Dr. Wark is the editor in chief of the Semmelweis Newsletter, which aims to update Kansas clinicians and infection preventionists on regional antibiotic resistance threats and antibiotic stewardship opportunities. She works with the Kansas Syndromic Surveillance Program to improve clinician awareness about how their documentation can improve outbreak detection. Her work in this area has been presented at the Centers for Disease Control and Prevention and the Council for State and Territorial Epidemiologists.

RECENT PUBLICATIONS

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DIVISION OF MEDICAL EDUCATION

MESSAGE FROM THE PROGRAM DIRECTOR

The mission of our program is to train competent and caring physicians who are exceptionally prepared for their next professional step. This preparedness goes beyond clinical readiness for practice and/or fellowship training. Our goal is for each of our residents to recognize and leverage their personality strengths, to seek coaching in areas of opportunity and to possess the confidence and centeredness to be dynamic, humble and empathetic team leaders who are confident to take risks in their professional life. Finally, we strive to provide our resident physicians with the tools to ensure that their personal work/ life interface is sufficiently balanced so that they may find joy day in and day out in their service to patients.

Our goals for the Internal Medicine Residency Program are to:

- Attract the best and brightest medical students from diverse backgrounds.
- Provide a rotational framework that ensures a high level of competency in all areas of internal medicine but still allow for an individualized education plan for our residents.
- Create an educational environment that expects excellence from our educators and learners which allows our learners to rise to the environment that surrounds them.

We look to recruit physicians with a strong work ethic, a kind and empathetic personality and an internal drive towards the achievement of excellence with maintenance of humility. We look forward to meeting you, and we are confident that you will leave KU with the sense that we are the right fit for you.

LEIGH M. ECK, M.D.

We have 107 residents in five programs training within internal medicine to become the next generation of exemplary physicians, researchers, educators, advocates, innovators and leaders dedicated to caring for the rich patient diversity in the Kansas City community.

3+1 SCHEDULING SYSTEM

Our scheduling matrix allows for our residents to focus on systems-based practice in the inpatient setting in a three-week sequence — unopposed by ambulatory commitments — followed by a +1 continuity clinic week that allows them to serve and provide for their continuity clinic primary care patients. Furthermore, this scheduling system allows for needed decompression in an outpatient-based week after a potentially hectic inpatient assignment. Stress in residency must be coupled with decompression to maximize our residents' growth.

Clinical training sites:

- The University of Kansas Hospital
  Kansas City, Kansas
- Kansas City Veterans Affairs Medical Center
  Kansas City, Missouri
- Dwight D. Eisenhower Veterans Affairs Medical Center
  Leavenworth, Kansas

Educational pathways:

- Clinician educator pathway
- Research pathway
- Population health /global health pathway
- Quality improvement and patient safety pathway
- Hospital medicine pathway

13
FELLOWSHIP PROGRAMS

2
RESIDENCY PROGRAMS

INTERNAL MEDICINE
SUB-INTERNSHIP

INTERNAL MEDICINE
CLERKSHIP

69
INTERNAL MEDICINE RESIDENTS

13
preliminary internal medicine residents

9
combined internal medicine-psychiatry residents

11
anesthesia clinical-based Year-1 residents

5
neurology clinical-based Year-1 residents

6
CHIEF RESIDENTS

4
traditional internal medicine chief residents

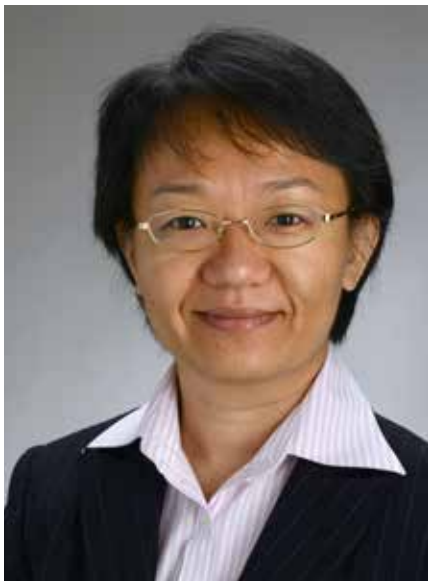
2
chief residents in quality and safety based at the Kansas City Department of Veteran Affairs

96%
THREE-YEAR ROLLING AMERICAN BOARD OF INTERNAL MEDICINE PASS RATE

National average pass rate: 88%

@KUIMCHIEFS

DIVISION OF MEDICAL INFORMATICS



MESSAGE FROM THE DIVISION CHIEF

Founded in 2010, the Division of Medical Informatics serves to design, implement, and evaluate informatics solutions that serve physicians and patients. Our faculty provide informatics expertise to support translational and clinical researchers and other health professionals at the University of Kansas Medical Center, as well as affiliated and partner organizations. We are dedicated to developing innovative informatics solutions, including data science, natural language processing, artificial intelligence and machine learning, to support and accelerate translational and clinical research.

Our faculty have expertise in big data analysis, utilizing electronic medical records (EMR), claims, behavioral, proteomic and genomic data with a clinical focus that includes — but is not limited to — outcomes and health services research, economic evaluation in medicine, sleep medicine, diabetes and kidney research and pharmacoinformatics. Our faculty research is supported by the National Institutes of Health, National Science Foundation, Patient-Centered Outcomes Research Institute and other funding agencies.

MEI LIU, PH.D.
INTERIM DIVISION CHIEF

CLINICAL EXCELLENCE

The research mission of our division is to develop innovative technologies with the goal of enhancing clinical care and improving patient outcomes. Our faculty has developed novel analytical approaches for obstructive sleep apnea phenotyping, predictive modeling and clinical decision support for cardiovascular outcomes using sleep physiological markers and clinical sleep data integration for health outcomes research. Our faculty has also developed and validated clinical risk prediction models for sepsis, chronic kidney disease in diabetic patients and acute kidney injury in hospitalized patients.

BASIC AND TRANSLATIONAL RESEARCH PROGRAMS

Our division's core research area of focus is developing informatics solutions for the following major areas:

- Data integration and harmonization (e.g., socioeconomic data, physiology data)
- Disease phenotyping with unsupervised machine learning algorithms
- Predictive modeling with machine learning and deep learning algorithms
- Federated machine learning
- Clinical risk factor identification
- Clinical decision support systems
- Clinical text processing and mining

Mei Liu, Ph.D., is the primary investigator for a National Institute of Diabetes and Digestive and Kidney Diseases-funded R01 project (2019-2022) that aims to develop novel machine learning algorithms to identify personalized risk factors of acute kidney injury using EMR data from 12 PCORnet institutions located across nine states.

She was also awarded a National Science Foundation Smart and Connected Health project in 2020 that focuses on building a secure and robust acute kidney injury prediction model with privacy-preserving federated learning from the multi-institutional EMR data.

In 2020, Diego Robles Mazzotti, Ph.D., received a Career Development Award from the American Heart Association to leverage EMR data for causal inference of CPAP utilization on cardiovascular risk.

MEDICAL EDUCATION

Medical Informatics division faculty teach PRVM 868 Biomedical Informatics Driven Clinical Research, an elective course in the Master of Science in Clinical Research (MS-CR) degree at the University of Kansas Medical Center. The course offers students hands-on experience in using EMR data for clinical research.

In addition, we also organize a quarterly Informatics meetup, where we invite researchers from multiple disciplines to speak on clinical informatics research related topics. This is an effort to engage investigators with interest in data-driven studies, providing them a platform for discussion and future collaboration.

DIVISION SPOTLIGHT

During the COVID-19 pandemic, our division has been involved in several nation-COVID-19 data initiatives such as the NCATS National COVID Cohort Collaborative (N3C). We have facilitated data ingestion to the N3C data enclave, which is now the largest COVID-19 dataset for research in the United States.

The N3C data enclave currently contains clinical data for more than 8.5 million patients, of which 2.8 million are COVID-19 positive patients. With our participation, all KU Medical Center researchers can request access to the data enclave for their research or collaborate on a national scale with other researchers in a particular domain team.

RECENT PUBLICATIONS

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Mazzotti DR, Drager LF. Opportunities for Cardiovascular Benefits in Treating OSA in the Secondary Prevention Scenario. Am J Respir Crit Care Med. 2020.

Qin H, Keenan BT, **Mazzotti DR**, Vaquerizo-Villar F, Kraemer JF, Wessel N, Tufik S, Bittencourt L, Cistulli PA, de Chazal P, Sutherland K, Singh B, Pack AI, Chen NH, Fietze I, Gislason T, Holfinger S, Magalang UJ, Penzel T. Sleep Apnea Global Interdisciplinary Consortium. Heart Rate Variability during Wakefulness as a Marker of Obstructive Sleep Apnea Severity. Sleep. 2021.

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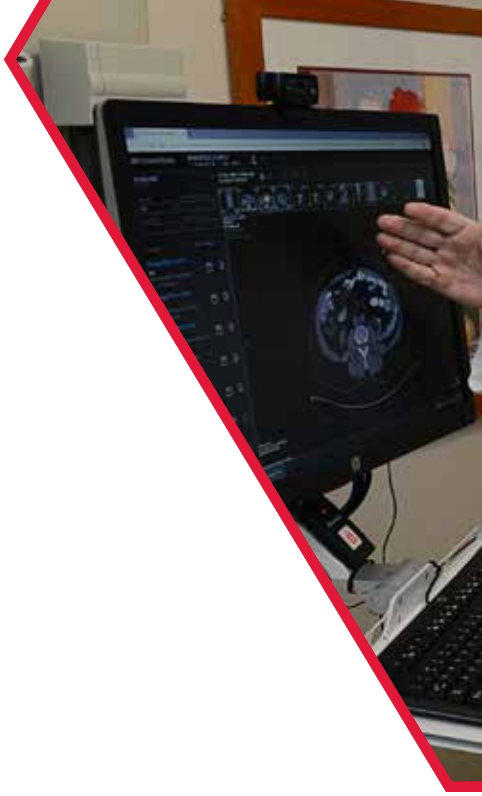

DIVISION OF MEDICAL ONCOLOGY

MESSAGE FROM THE DIVISION CHIEF

The Division of Medical Oncology has a long history of providing compassionate, personalized service, state-of-the-art medical care and novel therapeutic and treatment options to those suffering from cancers. All faculty members are experts in their disease-specific area and are recognized as leaders in their field. With the multidisciplinary approach, each patient may have access to a team of experts. We are ranked in the top 50 cancer centers in the nation. The division is comprised of approximately 40 faculty members and 30 advanced practice providers providing care throughout The University of Kansas Health System.

Division faculty lead cancer research in novel drug development, pharmacology, cancer prevention, carcinogenesis, genetics and bioinformatics with NIH grants, clinical trials and research programs throughout the KU Medical Center system. In 2020 and 2021, our clinical research programs focused on diversity and patient accrual received the specific awards (NCORP and Catchup-2020) from the National Institutes of Health and National Cancer Institute because of their leadership role in the nation.

The KU Cancer Center is currently an NCI-designated Cancer Center, and the medical oncology division has contributed significant work in the application for NCI-Comprehensive Cancer Center status. Our experts are leading and organizing national and international cooperative practice changing studies. In addition, the faculty have had more than 200 peer-reviewed publications, abstracts, posters and oral presentations in the past year. More than 50% of Kansas City Magazine's 2022 'Top Docs' of medical oncology are faculty members from the Division of Medical Oncology.

In addition to their work providing patient-centered clinical care and groundbreaking clinical research, the faculty members of the division serve as mentors to students/trainees in all stages of their academic careers. Our fellowship program offers an intensive clinical experience for the next generation of cancer experts.

WEIJING SUN, M.D.

CLINICAL EXCELLENCE

We strive to achieve three major principles in our approach to patient care:

- Provide the most upfront novel treatment and development, including clinical research studies and trials
- Engage in a multidisciplinary approach
- Demonstrate compassionate care to our patients

DIVISION SPOTLIGHT

- "Prospective Study Testing SARS-Co-V-2 Viral RNA by PCR and Anti-COVID-19 Antibody in Asymptomatic Medical and Research Staff Contacting with Cancer Patients Directly," a study led by Weijing Sun, M.D., was awarded an oral presentation at The American Association for Cancer Research's (AACR) annual meeting.
- "Immunogenicity of SARS-Co-V-2 Vaccination in Hematopoietic Stem Cell Transplant and Chimeric Antigen Receptor T-Cell Therapy Recipients," a study led by Qamar Khan, M.D., was awarded an oral presentation at the 2022 Tandem Meetings
- U.S. News & World Report ranked The University of Kansas Health System #49 in Oncology for 2022
- Seven members of our team were named to Kansas City magazine's 2022 list of the top doctors in their specialties throughout our metropolitan area: Gary Doolittle, M.D., Carol Fabian, M.D., Chao H. Huang, M.D., Joseph McGuirk, DO, Prakash Neupane, M.D., Anne O'Dea, M.D., Weijing Sun, M.D.

Throughout the COVID-19 pandemic, we were able to continue operations to support our patients without compromising clinical care.

Perhaps the best reflection of our patient commitment comes from the stories they share about their experiences:

PATIENT STORY: JOSH

Josh, a golf course superintendent from Topeka, Kansas, was diagnosed with esophageal cancer within days of his 40th birthday. He first noticed small red spots on his lips nearly two decades earlier but was reluctant to have a doctor examine them. A dental hygienist friend suggested he might have hereditary hemorrhagic telangiectasia, a genetic disorder that affects blood vessels around the nose and mouth, as well as in the digestive tract. Josh saw a gastroenterologist, whose tests revealed a small mass at the lower end of Josh's esophagus.

"We hoped it would only be superficial and they could just remove it," Josh said. "But two weeks later, as I was turning 40, I found out it was cancer."

The cancer had not yet invaded his stomach or other nearby structures and a KU Cancer Center tumor board developed a plan that included chemotherapy and radiation, followed by surgery. This initial treatment destroyed the cancer and PET scans found no evidence of active malignancy.

"He tolerated the treatment very well," said Anup Kasi, M.D., MPH, of the Medical Oncology Division. "He was very motivated to fight his battle and complete his treatment successfully."

"Dr. Kasi is an absolute genius," Josh said.

Josh later underwent an Ivor Lewis esophagectomy, replacing the cancerous portion of his esophagus with his stomach, which was formed into a tube. It meant he could only handle about one cup of food at a time, something he's been able to adjust to. Pathology results showed a complete response, and he was cancer-free two years after his diagnosis.

"I feel good now. I'm back to work and life is getting back to normal," Josh said. "The KU Cancer Center is just a very special place."

BASIC AND TRANSLATIONAL RESEARCH PROGRAMS

The Medical Oncology Division encourages faculty to pursue molecular, target-oriented immunology translational research for developing new treatment options in the clinic practice.

One of our more extensive and collaborative projects is known as the CANINE (Cancer Therapy and Immunogenicity of COVID Vaccine) study led by Qamar Khan, M.D. The study investigated how patients with cancer receiving active systemic therapy, such as chemotherapy or immunotherapy, responded to SARS-CoV2/COVID-19 vaccines. This information was needed to guide cancer patients in regard to managing the risk of breakthrough infections after vaccination, as well as the need for prioritization for additional vaccine boosters. This research had worldwide implications, especially in areas with limited vaccine resources. Our medical oncology faculty members developed a research plan and arranged for immediate funding for antibody testing right after the vaccine was available. With interdepartmental support, including hematology, pharmacy, biostatistics and computer sciences (KU Lawrence), the study was launched and conducted in record time.

The findings are in press in The findings are in press in two high-impact scientific journals. Data on immune protection and antibody kinetics among cancer patients were presented in the national meetings. Some of our other projects include:

- Jun Zhang, M.D., Ph.D., conducted translational research on biomarkers and mechanism-driven treatments in lung cancer, which led to several investigator-initiated trials.
- Joaquina Baranda, M.D., leads work on the NCI Create Access to Targeted Cancer Therapy for Underserved Populations (CATCH-UP 2020) grant to help give patients in underserved rural communities better access to early phase trials. Gary Doolittle, M.D., serves as the outreach co-leader.
- Joaquina Baranda, M.D., has also worked with Tomoo Iwakuma, M.D., Ph.D., of Kansas City's Children's Mercy Hospital, to lead translational research targeting p53 mutation in malignancy.
- Ongoing work between Weijing Sun, M.D., and Linheng Li, Ph.D., of the Stowers Institute in Kansas City, Missouri, targets colorectal cancer stem cells and the effects of modifying the micro-immune environment for treatment of colorectal cancer. Their pilot grant, Overcoming the Immunosuppressive Barrier by Targeting Crosstalk Between Tumor-Initiating Stem Cells and Its Microenvironment, has funding through The University of Kansas Cancer Center.
- Translational research into triple-negative breast cancer led by University of Kansas Cancer Center Deputy Director Andrew Godwin, Ph.D., and Priyanka Sharma, M.D., is guiding clinical research and practice.
- Priyanka Sharma, M.D., and Gary Doolittle, M.D., continue to lead the NCI Community Oncology Research Program (NCORP)

MEDICAL EDUCATION

Our division is actively involved in training the next generation of cancer specialists and researchers through our work with students at the University of Kansas School of Medicine, our post-graduate residency and fellowship experiences and through reviews and symposiums that offer our professionals continuing medical education opportunities.

First- and second-year students in the KU School of Medicine can participate in the Scholarship, Enrichment and Remediation (SER) program, a weeklong career exploration in a clinical or inpatient setting that we offer six times per year. In their fourth year, medical students can opt to take the MED 970 Elective, a four-week combined clinical and inpatient rotation that we offer year-round.

Internal medicine residents have monthly clinical rotations in outpatient oncology and participate in an inpatient oncology service as well. We also host outpatient clinic rotations for residents and post-doc fellows in oncology pharmacy, psychology, palliative medicine, head and neck surgery and breast surgery programs.

The Medical Oncology Division offers a three-year combined fellowship in partnership with the Division of Hematologic Malignancy and Cellular Therapeutics that had a record number of applications for our most recent class. This fellowship provides 1:1 faculty mentorship and encompasses both outpatient and inpatient care, with fellows spending a portion of their time at the Kansas City VA Medical Center. These fellows also teach core curriculum sessions for our internal medicine residents. We take pride in the significant research opportunities available to our fellows, many of whom have had multiple publications in peer-reviewed journals and have given oral and poster presentations at national meetings.

Our division also hosts many annual CME events, including:

- San Antonio Breast Cancer Symposium (SABCS) Review
- Multidisciplinary Symposium
- Hematology Oncology Review (formerly known as ASCO Review)
- Early Phase Symposium
- Lung Cancer and Head & Neck Cancer Symposium

RECENT PUBLICATIONS

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DIVISION OF
NEPHROLOGY & HYPERTENSION

MESSAGE FROM THE DIVISION CHIEF

The Division of Nephrology and Hypertension has a long history of outstanding clinical care and world-class basic and translational research. In fact, kidney research here predated even the emergence of nephrology as a medical specialty, tracing its ancestry all the way back to 1939. In that year, Homer Smith, a renal physiologist at New York University College of Medicine, delivered a series of lectures at the University of Kansas that later became the foundation of his book, *From Fish to Philosopher*, and influenced generations of nephrologists worldwide.

Our division is closely affiliated with the Jared Grantham Kidney Institute, a multi-departmental research institute dedicated to kidney disease research. Named after its late founder, first director and University Distinguished Professor, Jared Grantham, M.D., the institute is one of the premier disease-focused translational research programs at the University of Kansas Medical Center. Our physician-scientists, basic scientists and clinicians work collaboratively to tackle challenges in polycystic kidney disease, transport physiology, bone and mineral metabolism, glomerular disease, transplantation medicine and health outcomes and implementation research.

Our clinical program is equally strong, with master clinicians and young clinical nephrologists who are deeply committed to patient care and the education of trainees. Nephrology and Jared Grantham Kidney Institute faculty have been honored with many prestigious awards and distinctions, including two Homer Smith awardees, one American Society of Nephrology president, two National Institutes of Health MERIT awardees and five elected members of the American Society of Clinical Investigation, as well as our current medical school dean, Akinlolu Ojo, M.D.

ALAN YU, M.D.

CLINICAL EXCELLENCE

The central core of our division's clinical activities consists of four busy inpatient nephrology consult services which, between them, care for up to 15% of all the inpatients at The University of Kansas Hospital at any one time. The general nephrology services are weighted toward patients in the medical and surgical intensive care units with acute kidney injury and fluid and electrolyte disorders. A wide variety of procedures are performed, including acute hemodialysis, continuous venovenous hemodiafiltration, hemodialysis catheter placement and kidney biopsies. The transplant nephrology service cares for patients receiving kidney transplants, as well as transplant recipients readmitted for medical complications. In 2020, 211 kidney or kidney-pancreas transplants were performed, a record for the University of Kansas Medical Center, earning it a place on an elite shortlist of the top 15% of programs in the United States by volume.

In our ambulatory clinics, faculty and fellows care for patients with a broad range of chronic kidney diseases. In addition, our state-of-the-art specialty clinics provide expert multidisciplinary care and offer investigational treatments to patients with polycystic kidney disease (PKD), hypertension, glomerular diseases and kidney stones. The division also cares for nearly 300 end-stage renal disease (ESRD) patients that receive in-center hemodialysis, home hemodialysis or peritoneal dialysis at three outpatient dialysis units across the Kansas City metropolitan area, with a fourth unit in development.

DIVISION SPOTLIGHT

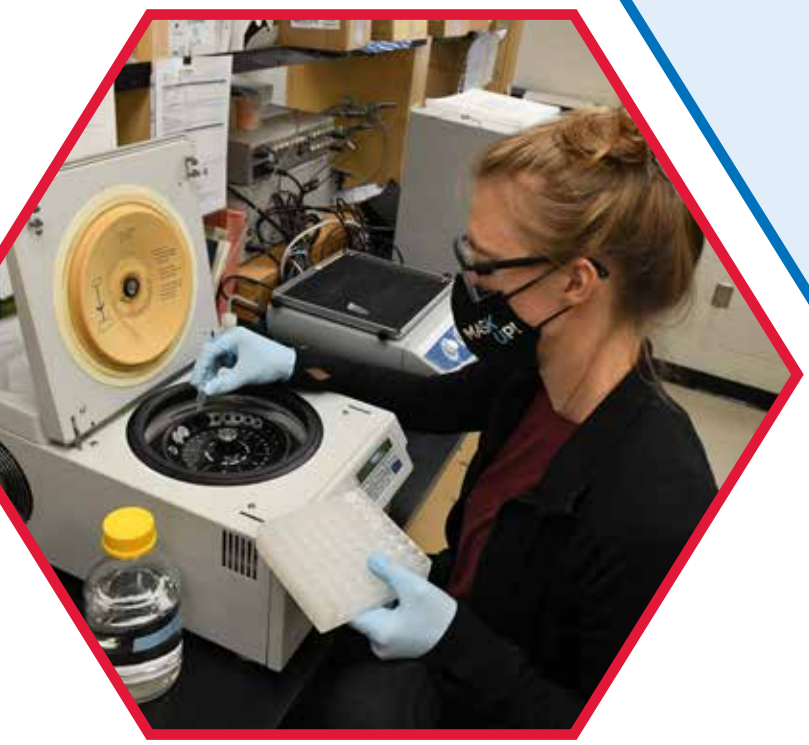
It is well-known that there has been a nationwide decline in physician-scientists over the past few decades. However, within the Division of Nephrology and Hypertension at KU Medical Center, we have been working hard to foster a supportive research environment and culture of mentorship, with the goal of restoring a pipeline of homegrown young investigators into the field.

Two of our faculty are now achieving visible success, and regional and national prominence. Jason Stubbs, M.D., an associate professor in the division, is a Jayhawk to the core, having attended the University of Kansas for his undergraduate studies and completing his medical school training, internal medicine residency and nephrology fellowship all here at KU Medical Center. He later joined our division, set up a basic and translational science lab focusing on bone mineral metabolism and chronic kidney disease, and obtained an NIH K08 career development award. His major project examines the roles of phosphate and osteopontin in the progression of PKD. His hard work was rewarded with an NIH R01 grant in 2019, which he successfully renewed in 2021.

Aditi Gupta, M.D., an associate professor now, joined KU Medical Center for residency, trained in nephrology here and stayed on as faculty. She developed a research program in collaboration with the KU Alzheimer's Disease Center (ADC) to study cognitive function in kidney disease and transplant patients and obtained an NIH K23 award. This allowed her to grow her clinical research program, and in 2020, she was awarded a large multi-investigator R33/R61 grant, in partnership with Jeffrey Burns at the Alzheimer's Disease Research Center, to conduct an implementation trial of remotely monitored hypertension control to prevent cognitive decline.

Stubbs and Gupta are a testament to the success of the Department of Internal Medicine, and of our division, in creating a fertile environment to nurture the careers of young physician-scientists and to provide hope for the next generation of biomedical researchers.

For PKD patients, the division is leading the way in revolutionizing their care. PKD is the fourth-leading cause of ESRD but, until recently, there was no treatment for this rare and devastating genetic disease. In 2018, tolvaptan became the first — and still the only — drug approved to treat PKD. Our clinic now operates one of the largest tolvaptan treatment programs nationally, providing hope to many PKD patients and to their family members. This is a source of particular pride to our division because the basic science research that led to the discovery of the beneficial effects of tolvaptan in PKD was performed here by Dr. Jared Grantham and his colleagues in the division and Kidney Institute. Tolvaptan was patented at KU Medical Center, and we also played a major role in each of the clinical trials that led to the demonstration of its clinical efficacy.

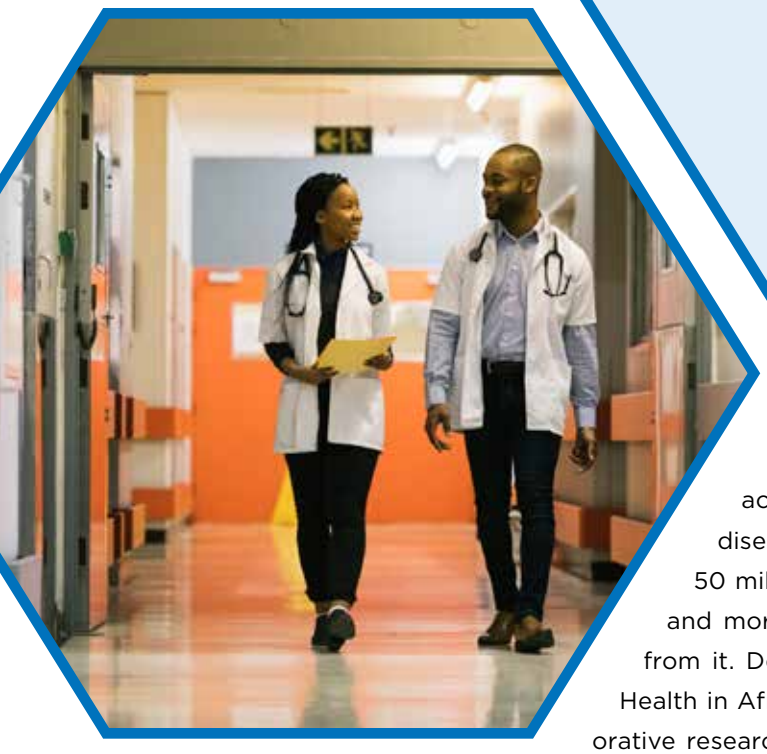


BASIC AND TRANSLATIONAL RESEARCH PROGRAMS

Our division is relatively unique within the Department of Internal Medicine in that we have both strong basic science and clinical research programs. A particular area of international renown is in PKD research. The names of Dr. Jared Grantham and the University of Kansas are synonymous with PKD research, and many of the major discoveries in the field were made here. We have one of only three NIH-funded PKD centers in the United States, and several members of the division serve as associate directors and core directors within the center.

Other areas of research focus include transport physiology, mineral metabolism, and glomerular disease. The five physician-scientists and five Ph.D. scientists within the division work closely with other members of the Jared Grantham Kidney Institute from biochemistry, physiology, pathology, anatomy and cell biology and other basic science departments to develop multidisciplinary translational research projects. Clinical research is also thriving, with several NIH-funded observational studies and investigator-initiated trials, as well as numerous pharmaceutical company-sponsored interventional trials.

Reem Mustafa, M.D., Ph.D., an associate professor in the division, directs the Evidence-Based Practice, Outcomes and Impact Center (EPIC), a highly productive group that conducts rigorous evaluation of published evidence and systematic development of clinical guidelines, collaborating with multiple prestigious organizations around the world, including the World Health Organization, the American College of Physicians and Kidney Diseases: Improving Global Outcomes. In the past year alone, Dr. Mustafa and her team co-authored 53 peer-reviewed research papers, a truly remarkable accomplishment. Overall, division faculty are exceptionally well-funded, serving as principal investigators on nine major NIH grants (5 R01s, one R33, one U54, one U01 and one P20 COBRE grant) and bringing in $8 million in annual total research dollars.



With the appointment of Akinlolu Ojo, M.D., to dean of the University of Kansas School of Medicine in 2019, the division acquired a major new footprint in international health. Kidney disease is a major problem in sub-Saharan Africa. An estimated 50 million people suffer from pre-dialysis chronic kidney disease and more than 500,000 individuals are estimated to die annually from it. Dean Ojo established the NIH-funded Human Heredity and Health in Africa (H3Africa) Kidney Disease Research Network, a collaborative research effort involving investigators based at 10 institutions in five African countries and four countries outside of Africa to study important kidney health problems in Africa. He is leveraging these resources to conduct an ambitious, multinational and prospective cohort study in 4,000 participants to identify genetic variants and modifiable environmental and clinical factors that cause the progression of kidney disease in Blacks, thus potentially pinpointing new screening and prevention strategies for end-stage kidney disease in both African Blacks and African Americans.

MEDICAL EDUCATION

Nephrology was the first quantitative clinical discipline, and our division continues this intellectual tradition in all of its education programs. Division faculty participate in teaching activities for learners at multiple levels, including delivering organ system lectures to the first-year medical students, leading case-based collaborative small group learning sessions and precepting medical students and internal medicine residents during their nephrology clerkships and outpatient experiences.

The flagship of our educational program is the Nephrology Fellowship, which is designed to provide comprehensive didactic and hands-on training in all aspects of nephrology practice and fully prepare our physicians, whether they decide to pursue private practice or academic careers. Particular emphasis is placed on applying fundamental physiological principles and scientific reasoning to elucidate challenging clinical problems. In lieu of the standard clinical track, fellows may choose to pursue the research track, which provides two years of basic science or clinical research training under the mentorship of one of our many research-intensive faculty, together with one clinical year, and prepares them for an investigative career in academia. Fellows may choose to specialize further by training for an additional year in our highly competitive Transplant Fellowship. We have also introduced a one-year Critical Care Fellowship for nephrology graduates, with the opportunity to obtain advanced training in the complete care of ICU patients.

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DIVISION OF
PALLIATIVE MEDICINE

MESSAGE FROM THE DIVISION CHIEF

The Palliative Care Division is a vibrant, innovative group with a history of key leadership roles at The University of Kansas Health System and on state and national levels. We are proud to promote from our fellowship program and partner with faculty from hospitalist, history of medicine, oncology and OB/GYN divisions on our campus, as well as pediatric palliative care from Children's Mercy Hospital. Our team consists of 15 faculty members, six advanced practice providers and four fellows.

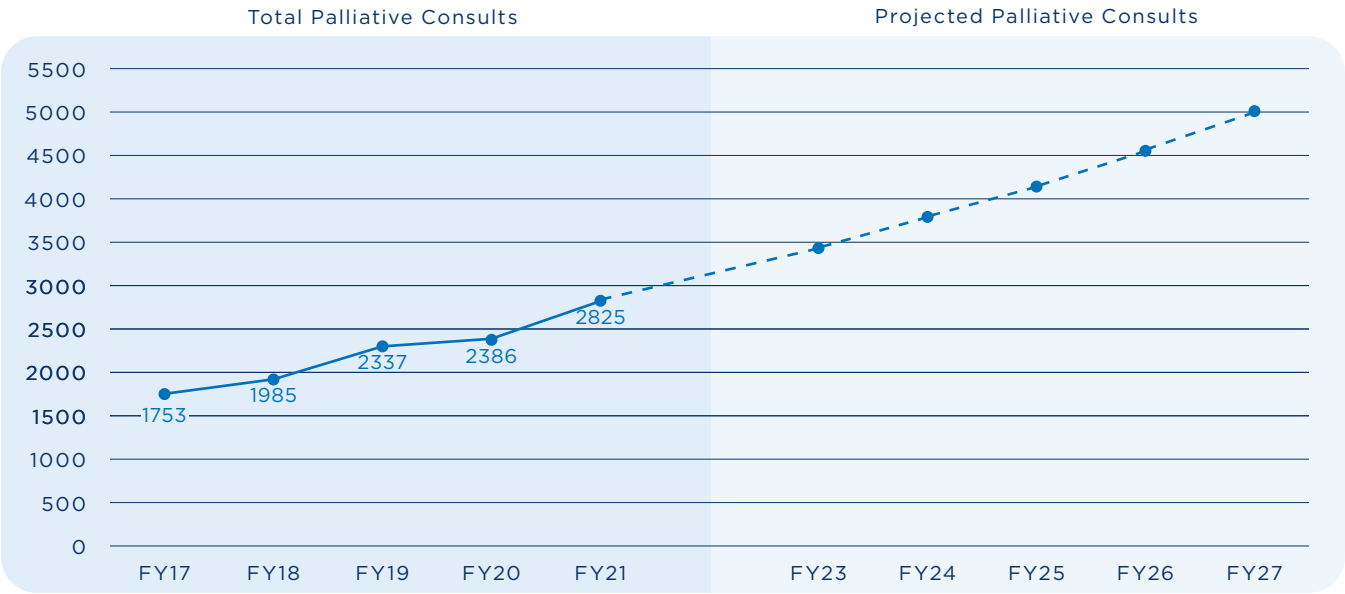
Our program sees adult and pediatric inpatients in consultation on the main Kansas City campus and Indian Creek locations. The inpatient faculty also operates The University of Kansas Health System's General Inpatient Hospice (GIP) program in collaboration with Kansas City Hospice and Palliative Care. The inpatient team also collaborates with hospitalists when caring for multi-visit population patients.

Our future vision includes a full spectrum palliative care presence across the continuum of The University of Kansas Health System's services: inpatient, outpatient, telehealth, facility and home care. This will address the needs of seriously ill patients and families to improve quality of care and impact health care utilization.

KARIN PORTER-WILLIAMSON, M.D.

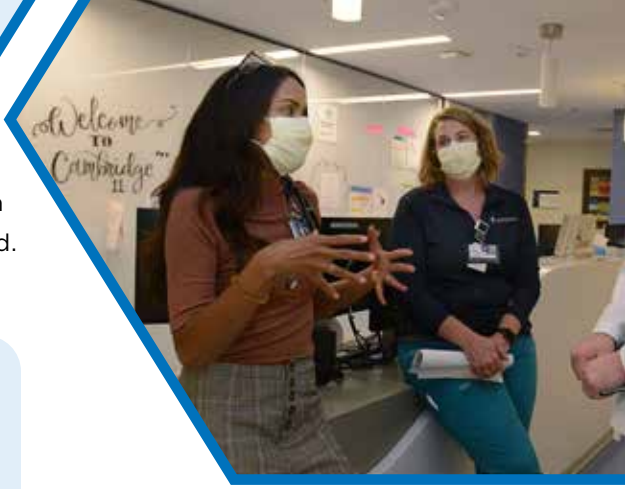
CLINICAL EXCELLENCE

We have seen a growth in our palliative care patient volume in recent years, with the number of annual palliative consults growing by more than 1,000 since FY 2017. Further, we expect to add an additional 2,000 annual consults over the next five years.



BASIC AND TRANSLATIONAL RESEARCH PROGRAMS

The Palliative Medicine Division supports scholarly activities for all of our fellows in training. They have worked on a variety of projects that relate to primary research and quality improvement in the inpatient, outpatient and hospice settings. Many fellows have presented posters at the national palliative medicine meeting in recent years. Several fellows have peer-reviewed publications that were completed during their one-year training. Our KU faculty are mentors for most of these projects, along with community-partner clinicians.



Beyond simple statistics, the work of our Palliative Medicine Division is best reflected by the cases of individual patients we have served. Here are two such cases, as told by members of our care team.

SW was a 43-year-old patient with Down syndrome referred to outpatient palliative care for support related to her recent diagnosis of vulvar cancer. SW's mother, CW, was her caregiver and served as her medical durable power of attorney.

Throughout SW's life, her Down syndrome-related cardiac issues had been her primary reason for involvement in a health care setting, and SW would tend to become anxious any time she was taken to a medical appointment. SW experienced a great deal of pain related to her cancer, but she often had difficulty expressing the pain. CW had to depend on physical cues more than SW's ability to say that her pain was worse at any given time. CW struggled with administering the opioid medications needed to manage SW's cancer pain. CW's husband had experienced opioid addiction and eventually died from an opioid overdose. This past experience complicated CW's job to decide when SW needed more pain medication.

SW was seen initially by Elizabeth Wulff-Burchfield, M.D., at The University of Kansas Cancer Center in January 2021. Dr. Wulff-Burchfield communicated closely with both SW's medical and radiation oncologist throughout her treatment. Child life development specialist Anna Seal, who works with The University of Kansas Health System's education and support program Turning Point, was consulted and contact was established with SW's mother.

SW's therapy required daily radiation for several weeks. Due to her cognitive impairment, SW would be sedated for each treatment. In order to reduce stress on both SW and her mother, weekly telehealth visits were held with Dr Wulff-Burchfield. This provided the support CW needed and allowed ongoing symptom assessment without adding additional medical appointments. SW's pain medications were titrated to maintain adequate pain control. SW completed therapy and successfully weaned off opioid pain medications. Close contact via telehealth and phone was maintained with SW and her mother.

Unfortunately, a few months after completing her therapy, SW was admitted with chest pain, due to a relapse with bony metastasis. Working closely with Dr Wulff-Burchfield, SW's oncologist, and the inpatient palliative care team, CW decided to forgo additional treatment and transition SW to hospice. An inpatient palliative care social worker assisted in obtaining the court order needed for this move to take place. SW was discharged to hospice care at her home, where she died six weeks later.

WENDY THOMAS, RN
Clinical Nurse Coordinator, University of Kansas Cancer Center

I met DH while I was covering our outpatient palliative care service. It was early during COVID times, so most visits were telehealth at that point, and this was no different. We talked through our usual symptom assessment where I learned what plagued her most often. Her cancer caused her to have regular pain and consistent fatigue to go along with it.

Despite this, regular check-ins with our team and appropriate medication adjustments afforded her the opportunity to have "mostly good days." She noted that the best medicine which helped more than anything was the exercise she was able to do because her pain was controlled. In my relatively brief encounter with her, she expressed thanks to our team for helping her feel as normal as possible and for helping her experience her best life while living with cancer.

BENJAMIN SKOCH, DO
Assistant Professor,
Palliative Medicine

DIVISION SPOTLIGHT

The American Academy of Hospice and Palliative Medicine (AAHPM) presents its Gerald Holman Distinguished Service Award every year to recognize an individual or group whose work "advances the mission of the Academy in a significant and lasting way."

As a member of the AAHPM's Entrustable Professional Activities and Curricular Milestones Workgroup, Lindy Landzaat, DO, was one of 10 people presented this award in 2021. The group recognized Dr. Landzaat and her peers for their many volunteer hours spent developing guidelines for palliative care fellowship programs.

"It's been a collaboration of some of the brightest, kindest, most committed and innovative educators within our field," Dr. Landzaat said, while accepting the honor. "We don't think we could ever top this group's bonds in terms of creativity and partnership."

MEDICAL EDUCATION

The University of Kansas Health System partners with Kansas City Hospice & Palliative Care, North Kansas City Hospital and Children's Mercy Hospital to deliver a well-rounded Hospice and Palliative Medicine Fellowship with three adult fellows and one pediatric fellow each year.

The Palliative Medicine Division also supports rotations with geriatric, pulmonary/critical care, hematology/oncology and oncology-rehabilitation fellows. In addition, many residents rotate as electives in both ambulatory and inpatient palliative care settings.

A fourth-year medical student elective supports many students in gaining competence in goals of care communication skills. Many faculty teach and facilitate in the preclinical years for our medical students. We also work with many interdisciplinary learners in nursing, social work, pharmacy and other disciplines.

RECENT PUBLICATIONS

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DIVISION OF PHYSICAL ACTIVITY & WEIGHT MANAGEMENT

MESSAGE FROM THE DIVISION CHIEF

The Center for Physical Activity and Weight Management became a division in the Department of Internal Medicine in 2017, after previously being located in the Cardiovascular Research Institute. Our major function is research and training of graduate students, post-doctoral fellows and young faculty investigators. Research is largely supported by The National Institutes of Health and spans children, adolescents and adults, including those in rural communities and individuals with physical, intellectual and developmental disabilities.

Closely aligned is the Kansas Weight Management Program (KWMP), which supports clinical research and a full clinic for the treatment of overweight individuals. KWMP offers a variety of evidence-based approaches to reduce and maintain a lower weight and to improve health and quality of life. It is staffed by physicians, dietitians, exercise physiologists and health educators. Behavioral support, available in both individual and group formats, is provided throughout treatment, either in person or over the phone or video links.

JOSEPH DONNELLY, ED.D

CLINICAL EXCELLENCE

Two out of every three adults are estimated to have obesity and overweight concerns. Providing multi-component lifestyle interventions that target nutrition, physical activity and behavioral change can assist with healthy, sustainable weight loss and weight maintenance. The KWMP provides high-quality care using a diverse team of medical providers, dietitians, exercise scientists and behavioral counselors. Patients receive evidence-based education about healthy lifestyle management, such as increasing intake of fruits and vegetables, controlling portion sizes and reducing sedentary time. The programs use in-person and remote delivery methods to support patient education, promote physical activity and offer continued support of healthy behavioral changes.

This approach, as seen through a recent case of 197 patients who completed an 18-month weight management program, has had considerable success. The program consisted of a nutrition and physical activity description, paired with educational sessions facilitated by a trained health educator. The patients self-monitored their diet, exercise and weight on a weekly basis to promote accountability. After six months, patients achieved an average body weight loss of 14.3 pounds, ± 6.6%. Additionally, clinically significant weight loss was maintained at 18 months, alongside an improvement of diet quality, as measured by the Healthy Eating Index.

The results support that the KWMP's multi-component and evidence-based lifestyle management strategy can drive successful patient outcomes. The programs serve to improve the health and lives of individuals with obesity and overweight conditions by delivering effective and sustainable weight management interventions. The team continues to grow its patient and collaborative services for optimal delivery of weight management care.

BASIC AND TRANSLATIONAL RESEARCH PROGRAMS

The KWMP was initiated at the main University of Kansas campus in Lawrence in 1997 as part of the Department of Health, Sports and Exercise Sciences. It was transferred to the University of Kansas Medical Center in 2011.

Our investigators have developed the expertise and infrastructure for research studies related to human obesity and weight loss with more than 3,000 individuals being treated using a variety of diet, physical activity, behavioral, pharmacological and endoscopic approaches. Recently, the KWMP has experienced dramatic growth, expanded its weight management services and options and increased the number of physician providers and staff.

Our research program has been supported by more than 20 National Institutes of Health R01 awards and is currently supported by eight R01s. We have developed close partnerships with faculty in the departments of Internal Medicine, Nutrition and Dietetics, Molecular and Integrative Physiology, the KU Alzheimer's Disease Research Center and the Center for Child Health and Development. Collectively, our division has developed an extensive research program around physical activity and nutrition for the prevention and treatment of obesity and overweight conditions in children and adults, including rural populations and people with intellectual disabilities, Down syndrome, physical disabilities and Alzheimer's disease.

Our division collaborated with multiple departments and groups on campus to receive a National Institutes of Health Center of Biomedical Research Excellence (COBRE) grant to create the Kansas Center for Metabolism and Obesity Research (KC-MORE).

KC-MORE will focus on treatment and prevention of obesity, the metabolic mechanisms that initiate and perpetuate obesity and the disease entities that result as a consequence of obesity. The center will focus on research projects, intensive mentorship to junior research project leaders (RPLs), supportive research cores and a center-wide education and recruitment program to further develop obesity research. Specifically, our division will oversee the Human Energy Balance core focused on measuring and modifying human energy balance components, such as nutrition, eating and physical activity behavior.

MEDICAL EDUCATION

Although the Division of Physical Activity and Weight Management is primarily a research entity, we are extensively involved in mentoring doctoral, post-doctoral and junior faculty. Since 1997, more than 40 individuals have been supported and mentored by our division's investigators.

We currently have two doctoral students, two post-doctoral fellows and five junior faculty who receive training and experience for promotion of physical activity and nutrition to impact overweight and obesity conditions and their corresponding comorbidities. The training includes laboratory and field techniques, research design and methodology, clinical trials, publication of scientific manuscripts and grant writing with the eventual goal of helping these individuals become funded independent investigators.

DIVISION SPOTLIGHT

The Division of Physical Activity & Weight Management has been using remote delivery since 2011, which allowed us to easily move all of our research projects to remote delivery during the pandemic. This helped us avoid delays or pauses in our research activities.

Lauren T. Ptomey, Ph.D., RD, LP has received numerous awards for her research in recent years, including:

- Department of Internal Medicine's Outstanding Junior Investigator Award (2021)
- Department of Internal Medicine's Outstanding Researcher Award (2020)
- Frontiers Team Science Award (2020)

RECENT PUBLICATIONS

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DIVISION OF PULMONARY, CRITICAL CARE & SLEEP MEDICINE

MESSAGE FROM THE DIVISION CHIEF

The Division of pulmonary, Critical Care & Sleep Medicine integrates state-of-the-art clinical care with an extensive research program, offering access to the latest medical knowledge and techniques to both our patients and our learners. We deliver educational experiences that routinely draw exceptional evaluation scores from our students, residents and fellows. Our division currently has 41 faculty and 22 advanced practice providers who provide advanced care in our Clinical Centers of Excellence and lead advances in biomedical research.

We care for complex critically ill hospitalized patients across four medical ICUs, as well as offering inpatient procedural and consultative pulmonary services. Our ambulatory clinics treat patients with both general pulmonary problems and specific subspecialized issues. Our Clinical Centers of Excellence include airways disease — including asthma and COPD — cystic fibrosis, pulmonary hypertension, interstitial lung disease, sleep and COVID-19.

Our division has a one-of-a-kind imaging research unit where we use the latest quantitative CT scan and hyperpolarized gas MRI techniques to examine lungs in great detail and to better understand the process of diseases that affect them. Our clinical trials unit has access to onsite support services for specialized research, including pulmonary function testing, exercise testing, research bronchoscopy and sputum induction. We were successful in competitively renewing a $25 million grant from the National Institutes of Health for the Frontiers Institute for Clinical and Translational Science at the University of Kansas, and we currently have more than $10 million in research funding with another $52 million in pending grant applications.

We also contribute to the University of Kansas Medical Center's educational mission by providing guidance to our students, residents and fellows. Our fellowship programs offer comprehensive exposure to a wide array of pulmonary care practices including the Kansas City Veterans Administration Medical Center.

MARIO CASTRO, M.D., MPH

CLINICAL EXCELLENCE

We are the regional referral center for complex pulmonary, sleep and critical care medicine, and our division runs one of the region's largest intensive care units, managing between 40 and 50 complex critically-ill patients every day.

Our pulmonary clinical centers of excellence treat pulmonary hypertension, cystic fibrosis, interstitial lung disease, obstructive airway diseases and rare lung diseases. We excel in managing complex oncologic immunosuppressed stem cell transplant and solid organ transplant patients, as well as the acute respiratory distress syndrome cases that were hallmarks of the COVID-19 pandemic. We're supported by an ever-expanding pulmonary function lab and an innovative pulmonary rehabilitation program.

Our ambulatory clinics see more than 1,500 patients in a typical month, including an average of 400 new referrals. We have been ranked in the top 50 of divisions in nearly 5,000 hospitals for 12 consecutive years. Our adult cystic fibrosis care program is the largest in the Midwest.

Our sleep care program is also one of the busiest in the region, with five physicians, two nurse practitioners and a fellow seeing more than 800 patients in an average month. We have a six-bed sleep lab running seven days a week and have partnered with the Department of Neurology to develop a multidisciplinary sleep clinic to provide outstanding care for all types of sleep disorders.

BASIC AND TRANSLATIONAL RESEARCH PROGRAMS

The pandemic presented an unprecedented challenge and opportunity for our translational research. As our inpatient floors and intensive care units began to fill up with COVID-19 patients in the spring of 2020, we faced the dilemma of not fully understanding how this new virus would affect people or how best to treat them. We have launched 18 trials to date sponsored by the NIH and pharmaceutical industry that explore prevention and treatment practices for COVID infection, and our essential work in this area hasn't stopped since.

VACCINE TESTING

When the federal government and National Institutes of Health launched Operation Warp Speed to enable faster approval and production of COVID-19 vaccines, we assisted with the testing process. We enrolled 504 participants to help test the safety and efficacy of the ChAdOx vaccine, created by AstraZeneca with Oxford University. We were among the highest-enrolling sites for these tests, finding participants from across the Kansas City metropolitan area, as well as some from Wichita and areas of rural Kansas.

COVID TREATMENT OPTIONS

Our COVID group has focused on studying inpatient and outpatient treatments for COVID-19 infection, including two inpatient trials using immune modulators and anticoagulation therapy. We also tested an array of therapies for outpatient treatment of milder forms of COVID-19 infection including the use of monoclonal antibodies, some of which were able to receive Food and Drug Administration emergency use authorizations.

LONG HAUL COVID EFFECTS

Our COVID team is now working on one of its largest trials, RECOVER, which seeks to understand more about lingering symptoms and sequelae of COVID-19 infection. We are enrolling 17,600 participants across the United States for tests to learn how best to diagnose long-haul COVID issues and discover potential treatments for such symptoms as brain fog, profound fatigue, persistent cough, headaches, shortness of breath and those who develop COVID-related clots in the lungs, brain or cardiovascular system.

DIVISION SPOTLIGHT

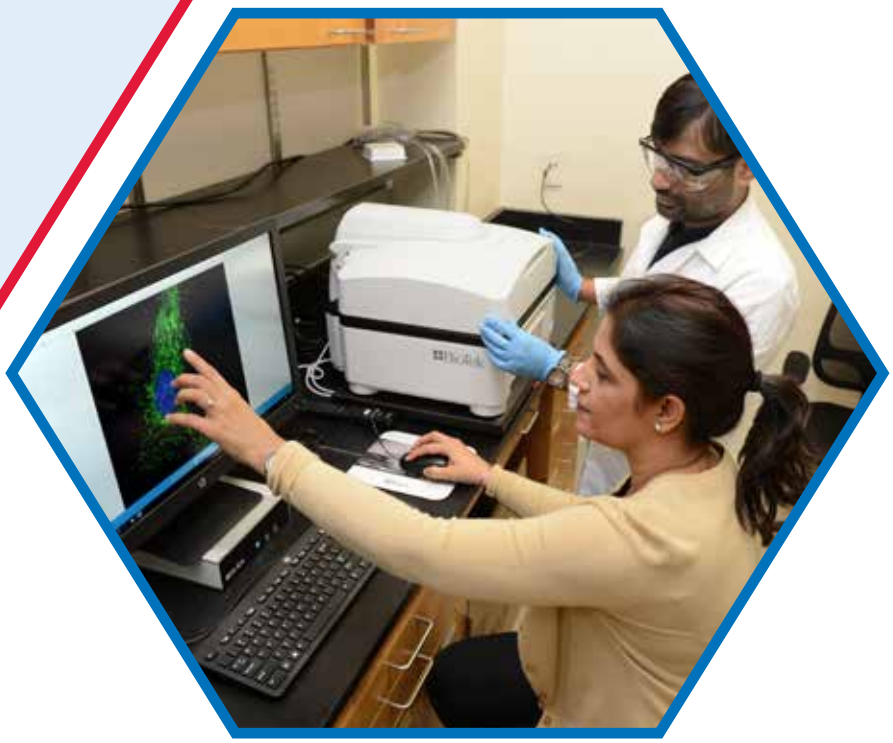
- Our division fully staffs a new bone marrow transplant ICU that opened in Cambridge Tower in late 2021, providing care for critically ill patients who have undergone bone marrow transplants, including CAR T-cell therapy.
- We now offer in-person critical care coverage during the week at St. Francis Hospital in Topeka, a model that we hope can be replicated in underserved communities across Kansas.
- We established an Interstitial Lung Disease Conference for community practitioners in 2021.
- Fellows Dr. Sahil Pandya and Dr. Brittany Little were named Fellow Educators of the Year by the Internal Medicine Residency Program in 2020 and 2021. Dr. Sonia Castillo Vega was recognized as Attending of the Year in 2021.
- Fellow Dr. Christopher Streiler won a CHEST Young Investigator honor in 2021.
- Our division is consistently represented on Kansas City Magazine's annual "Top Docs" list, which featured Dr. Mario Castro, Dr. Michael Crosser, Dr. Heath Latham, Dr. Franklin Quijano, Dr. Damien Stevens and Dr. Timothy Williamson in its 2021 edition.

MEDICAL EDUCATION

Our faculty members have extensive involvement in training the next generation of pulmonary, critical care and sleep medicine practitioners, from the first months of medical school to our three specialized fellowships.

Medical students interact with our team in the cardiopulmonary curriculum in the first two years of school. In their third and fourth years, students get exposure to bedside teaching during rotations in the inpatient service, ICU, pulmonary consultation service and in the pulmonary clinic. These rotations are considered some of the best experiences that medical students have at the University of Kansas and our division consistently scores high marks when medical students evaluate their time with us.

Several of our faculty members are part of the core faculty of the Internal Medicine Residency program, and we host residents from the internal medicine, EMT and anesthesia programs for rotations for medical ICU and inpatient pulmonary consults. We are also core



educational deliverers for the pulmonary breath block of the IM residency curriculum and our faculty also play significant roles in the development of resident simulation-based training programs. Residents value our programs highly and routinely give them high scores on evaluation surveys.

We offer a three-year Pulmonary and Critical Care Fellowship, as well as a focused one-year Critical Care Medicine Fellowship. Both are well-established training programs that balance cross-disciplinary critical care experience with a robust inpatient and ambulatory pulmonary experience and have a 100% board pass rate.

Thanks to our collaboration with the Kansas City Veterans Administration Medical Center, fellows in our three-year program get significant exposure to procedural experiences. Greater than 90% of our fellows in the past five years have been deemed competent to independently practice endobronchial ultrasound upon graduation, an additional skill beyond the normal requirements. Our program has developed innovative simulation training to enhance the competency development and assessment in high-risk pulmonary procedures, such as bronchoscopy airway acquisition, central line placement and chest tube placement. We have also worked to enhance the development of successful research projects for our three-year fellows.

Our one-year Sleep Medicine Fellowship offers extensive opportunities to explore a wide range of sleep issues across all ages. Our fellows spends time at our two on-campus adult sleep labs along with the pediatric sleep lab at Children's Mercy Hospital. Our fellows also see in-patient sleep medicine consults at The University of Kansas Hospital and attends monthly didactics, case conferences and journal reviews with sleep medicine fellows at Children's Mercy and at the University of Missouri-Kansas City.

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Krishnamachary B, Mahajan A, Kumar A, Agarwal S, Mohan A, Chen L, Hsue P, Chalise P, Morris A, **Dhillon N**. Extracellular Vesicle TGF-β1 Is Linked to Cardiopulmonary Dysfunction in Human Immunodeficiency Virus. Am J Respir Cell Mol Biol. 2021 Oct.

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ABOUT KANSAS CITY

LIVING IN KANSAS CITY

Kansas City is a diverse metropolitan area that straddles two mostly rural states, with the Kansas-Missouri line just steps away from the KU Medical Center campus. Our 2.3 million area residents enjoy many of the same amenities as the nation's largest cities, but with more manageable traffic, a friendly, laid-back lifestyle and a cost-of-living 8.4% lower than the national average[1]. Kansas City is home to more boulevards than Paris, more fountains than Rome and some of the best barbecue on the planet.

Families with children will find much to love here, including safe neighborhoods, beautiful parks and outdoor fun spaces and a vibrant arts and culture community. The suburb of Overland Park, Kansas, minutes from our campus, has been named one of the 10 best places to live in America[2], one of the nation's ten happiest communities[3] and *the* best place to raise a family[4]. Appealing school options abound here. The Blue Valley, DeSoto, Olathe and Shawnee Mission districts on the Kansas side and Blue Springs, Lee's Summit, Park Hill, North Kansas City and Liberty in Missouri all get A grades from Niche.com[5]. U.S. News and World Report's best public high school in Kansas[6], Sumner Academy, sits just seven miles from our campus.

Sources: 1. Salary.com, 2022 figures 2. Money, 2021 3. Wallethub.com, 2022 4. Livability.com, 2022 5. Niche.com 6. U.S. News & World Report, 2022

MUCH TO SEE AND DO

Few Kansas City landmarks are as iconic as the Country Club Plaza, a commercial and residential district with Spanish-inspired architecture, upscale shopping and dining and a glittering 15-block holiday light display. Crown Center, built beside Hallmark Cards' global headquarters, boasts quaint shops and eateries, an outdoor ice rink and the SeaLife, Legoland and Kaleidoscope attractions. A block away sits Kansas City's historic Union Station, which offers Science City, a planetarium, movie theater and world-class touring exhibitions.

Kansas City's free — and soon-to-expand — streetcar can take you from Union Station to the historic River Market area, home to a bustling weekend farmer's market and a museum showcasing the well-preserved cargo of the Steamboat *Arabia*, recovered after 132 years in Missouri River mud.

The *Arabia* is one of many fascinating museums to explore in Kansas City, including the impressive National World War I Museum at Liberty Memorial, the American Jazz Museum and the unrivaled experience of the Negro Leagues Baseball Museum, which tells the lesser-known stories of the sport. History buffs will also appreciate the Harry S. Truman Presidential Library or the Federal Reserve's Money Museum, where every visitor can take home a free sample!

For animal lovers, there's the Kansas City Zoo, with its popular polar bear, penguin and Africa exhibitions. For younger kids, the hands-on Deanna Rose Farmstead is a treat. Powell Gardens and the Overland Park Arboretum are just two of the many places to take leisurely strolls through nature's beauty. If you're up for theme park thrills, Worlds of Fun offers seven roller coasters and an entire adjacent water park that's included in the ticket price. For your traveling ease, Kansas City's new international airport is set to open in early 2023.

ARTS AND EVENTS

The Kauffman Center for the Performing Arts stands out for both its unique design and the tremendous talent that appears on its stages. The center is home to the Kansas City Symphony, the Lyric Opera, the Kansas City Ballet, as well as touring stage shows and concerts. Starlight Theater, an outdoor venue in Swope Park and the T-Mobile Center in downtown Kansas City's Power & Light District also host top musical acts and touring productions.

Kansas City's cultural jewel, the Nelson-Atkins Museum of Art, has oversized shuttlecocks on its lawn and a world-renowned collection of Asian art, photography and European paintings inside. Those looking for more contemporary works can find them at the Kemper Museum or the Nerman Museum in Overland Park.

On every month's first Friday, the Crossroads district transforms into an art fair/street party, especially popular in the warmer months. The Country Club Plaza's annual Art Fair is a tradition going back nine decades. Kansas City natives Paul Rudd, Jason Sudeikis, Eric Stonestreet and Rob Riggle bring dozens of their celebrity friends to town each June for the Big Slick fundraiser. Planet Comicon always touts an impressive lineup at its annual celebration of science fiction, fantasy, comic books and pop culture.

BARBECUE AND BEYOND

Kansas City's food reputation understandably begins with barbecue. There's even an app to help diners navigate more than 100 area options, including upscale eateries, historic rib joints and smokehouses off the beaten path, just waiting to be discovered. Everyone eventually finds their favorites, but the journey of discovery is half the fun.

Barbecue is our thing, but it's not our only thing. We're home to a number of James Beard Award winners and nominees, great farm-to-table options, the Best Burger in Missouri[7] and the new Taco Trail challenge in Kansas City, Kansas. Boulevard Beer was born here and throws a huge annual summertime festival of food, music and brews. Distilleries and speakeasy-inspired bars offer trendy places to sample and socialize. Christopher Elbow is an artisan chocolatier whose works are as tasty as they are beautiful.

SPORTS AND SPIRIT

We love our Super Bowl LIV champion Kansas City Chiefs and superstar quarterback Patrick Mahomes. On fall Sundays, passionate Chiefs fans turn the Truman Sports Complex parking lot into a raucous tailgate party and GEHA Field at Arrowhead Stadium into the loudest sports venue anywhere[8].

Kauffman Stadium next door remains one of Major League Baseball's most beautiful — and affordable — ballparks, and the Royals are ready to rise again with plenty of promising talent poised to move up from the minors. Our University of Kansas Jayhawks are one of the nation's elite Division I college basketball programs with six national championships, most recently in 2022. Racing fans have two local NASCAR Cup events to enjoy every year, traditionally in May and October. The national figure skating and gymnastics championships have both been held here in recent years.

We're a big soccer town, too. Major League Soccer's Sporting Kansas City is a perennial contender, and Children's Mercy Park has one of the league's most electric atmospheres. The Kansas City Current of the National Women's Soccer League has a roster built to contend and a new riverfront stadium on the way. The city is also a youth soccer hub, with world-class facilities hosting local teams and national tournaments throughout the year. In 2026, Kansas City will be a host city for the biggest soccer event of all, the World Cup.

For those with an active lifestyle, the region is packed with parks and trails for hiking, biking, boating and climbing, and unique races fill the running calendar, including the elite Hospital Hill Half Marathon and the Groundhog Run, the nation's longest race held entirely in a cave.

DISCOVER THE HEART OF AMERICA

From burnt ends and fountains to affordable housing and climate that serves a taste of all four seasons, visitors and transplants routinely embrace Kansas City's charms.

We love living here. We think you will too.

Sources: 7. Food & Wine, 2021 8. Guinness Book of World Records, 142.2 db, set in 2014

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