

ALUMNI

MAYO CLINIC ISSUE 3 2019

“Often we have preconceived, antagonistic notions about people who we know perhaps only by sight. ... When we become better acquainted, we find that they are sincere, honest, and companionable, and perhaps even that their views help us to clarify and often to modify our own.”

— William J. Mayo, M.D., Dec. 14, 1925



LETTER FROM THE PRESIDENT

“One of the signs of a truly educated people, and a broadly educated nation, is lack of prejudice.” — Charles H. Mayo, M.D.

Drs. William J. Mayo and Charles H. Mayo understood the value of bringing together people with diverse talents, backgrounds and beliefs to best serve their patients. Their father, Dr. William Worrall Mayo, instructed that “No one is big enough to be independent of others.” He knew that the best patient care required a team of physicians, allied health professionals, scientists and educators working together.

What an appropriate time for this issue of *Mayo Clinic Alumni* magazine, which celebrates the diversity of Mayo Clinic and the continued commitment of our founders to attract the brightest and most diverse staff possible. This issue highlights several of the programs that have developed over the past decade and stories of some of the individuals these programs have touched.

It has been an honor and humbling experience to serve as president of the Mayo Clinic Alumni Association the past two years. The position provided an opportunity for a deeper connection with a group of extraordinary people. Mayo Clinic alumni are a worldwide family of providers and scientists who are bound by an organizational DNA of patient-centric care that is underpinned in the Franciscan values of respect, integrity, compassion, healing, teamwork, innovation, excellence and stewardship. Together we are Mayo Clinic.

I hope to see you at the 2020 International Meeting in Portugal, Sept. 10-12, in my capacity as past president!



A handwritten signature in black ink that reads "Eric Edell".

ERIC EDELL, M.D. (THD '88)

- President, Mayo Clinic Alumni Association
- Division of Pulmonary and Critical Care Medicine
- Mayo Clinic in Rochester

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About the cover: This quotation is from a larger piece William J. Mayo, M.D., wrote in 1925 for a Rochester High School publication. It was later sent to J. Pope Dyer, Eastern Tennessee Education Association in Signal Mountain, Tennessee, for use in radio talks to high school students.



‘WHEN ALL INDIVIDUALS ARE INCLUDED’



Embedding diversity and inclusion into Mayo Clinic

Mayo Clinic today is a significant national employer with increasing diversity among its staff. Across all Mayo locations, 32% of physicians and scientists are women and 26% are a race other than white. Among allied health staff, 78% are women and 13% are a race other than white.

In 2010 Mayo Clinic appointed its first medical director of Diversity and Inclusion, Sharonne Hayes, M.D. (I '86, CV '90). The diversity and inclusion goals are to provide culturally competent care to a diverse patient population; identify and eliminate health disparities; become a national leader in the science and promotion of health equity; have diversity of all kinds in the workforce and in leadership across all three “shields” — patient care, research and education; and be an organization where everyone feels included and valued.

In the last decade diversity and inclusion have become embedded in every Mayo location; in every department, division and work unit; in every classroom and lab; in every boardroom, meeting room and mailroom; and in recruiting, hiring and

promoting. Ideally, efforts in these areas will be felt by every patient.

With change come challenges. A 2015 organizational climate assessment revealed that one-third of participating employees said they didn't feel included or free to speak up in their work areas. “We're not at the ideal state yet,” says Dr. Hayes. “We continue to work toward achieving a truly inclusive workforce that reflects our patient population and the world. We've made great strides and have complete support and engagement from Mayo Clinic leadership.

“It's not enough for individuals at Mayo to simply support diversity efforts, and it's not enough just to bring in diverse people. Diversity will only make a real difference in the care of our patients and to the future of Mayo when all individuals are included — in discussions, leadership, planning, and work and personal relationships.”

Mayo Clinic has six primary goals related to diversity and inclusion. After the description of each goal are highlights of recent activities.

1.

Provide high-quality, culturally appropriate care in a welcoming environment to all patients.

- Analyzed, stratified and reported key patient care outcome metrics by race, ethnicity, gender and preferred language to identify disparities in care
- Implemented expanded demographics in Epic electronic health record — sexual orientation, gender identity, preferred name, sex assigned at birth, country of origin, military and disability status, expanded Native American/ Alaska Native subcategories
- Introduced Transgender and Intersex Specialty Care Clinic in Rochester (page 8)
- Renewed contract with Indian Health Service to provide a Mayo hematologist/oncologist on site weekly at Phoenix Indian Medical Center — a 10-year relationship — to see tribal members with new diagnoses of cancer or blood disorders
- Collaborated with New Town Success Zone, a Florida-based organization, on Wellness Rx, a community-led health disparities wellness effort



Sharonne Hayes, M.D., Mayo Clinic Office of Diversity and Inclusion

2.

Increase the diversity of Mayo Clinic patients.

- Provided clinicians with a new tool, CultureVision, for quick access to information such as diet, religious practices and cultural considerations about groups for whom they provide care
- Developed training in unconscious bias and stereotype threat
- Offered educational opportunities to employees to learn about gender transition
- Sponsor and participate in local cultural and community celebrations and festivals
- Conducted focus groups with U.S. Hispanic, African American and Asian individuals to better understand these populations' health care needs

3.

Improve inclusiveness and participation of diverse employees at all levels of the organization.

- Growing scholarship in diversity, inclusion and equity topics, both workforce issues and health equity
- Established 30+ Mayo Employee Resource Groups (MERGs), with enterprise-wide MERGS being African Descent, Latino/Hispanic, LGBTI, Disability, and Veterans; 3,700+ employees participate in MERGs
- Conducted Employee Experience Listening Sessions, an enterprise-wide initiative to bring employees together to discuss issues — including race, religion and diversity — affecting their lives within context of social unrest and change; 30+ facilitators have been trained to support employees in these conversations
- Appointed department diversity leaders to work with leadership to identify and address department-specific needs and priorities related to diversity, inclusion and health equity
- Created Gender Transitions in the Workplace policies, procedures and guidelines to support transgender employees and their colleagues through gender transition
- Developed policies, procedures and education for emerging issues including guidance for how to respond when a patient is disrespectful, harasses or refuses care from a Mayo staff person due to a personal characteristic
- Updated approach to address sexual and other harassment in the workplace

4.

Increase the proportion of women and minority students, faculty, administrators and staff where underrepresented.

- Mayo Clinic was a founding signatory of Time's Up Healthcare, an extension of Time's Up initiative, and has committed to directly address sexual harassment and gender inequity to ensure safe, fair and dignified work for all women

- Introduced four new pipeline programs in which 70+ students from 20+ states came to Rochester to experience the Mayo Clinic culture in the hope they'd see Mayo as a place for furthering academic pursuits
- Hosted faculty development programs and national educational events and training focused on expanding diversity and health equity in academic medicine
- Improved hiring processes to mitigate bias and increase diversity of candidate pools

5.

Increase the proportion of women and minorities in senior leadership.

- Focused on professional development of women consultants to improve readiness for leadership roles, including committee membership and leadership, and academic rank pursuits
- Conducted focus groups about closing the gap between women and men physicians and researchers regarding employee engagement and inclusion
- Created novel grants for faculty who are primarily responsible for caring for family members to facilitate academic appointment

“Diversity will only make a real difference in the care of our patients and to the future of Mayo when all individuals are included — in discussions, leadership, planning, and work and personal relationships.” — Sharonne Hayes, M.D.

6.



Identify and eliminate health disparities; become a national leader in the science and promotion of health equity.

- Created and recruited leadership for new Center for Health Equity and Community Engaged Research (page 6)
- Awarded \$400,000+ in direct funding to support planned and ongoing disparities research across Mayo enterprise
- Developed first-of-its-kind Native American Community Advisory Board with representatives from sovereign tribes, Native health advocates and service providers, and Mayo physicians and researchers
- Using new features in Epic to better evaluate and address gaps in receipt of recommended care by patients in various demographic groups, including gender, age and race/ethnicity
- Developed enterprise-wide collaboration to advance health of African American communities through partnerships with churches in Arizona, Florida and Minnesota
- Created Sangre por Salud Biobank in collaboration with Arizona State University and Mountain Park Health Center to support studies of special concern to Latino population, such as obesity, metabolism and diabetes; expand precision medicine research to underrepresented Latinos and enhance diversity of Mayo Clinic Biobank
- American Indian Science and Engineering Society: “Top 50 Workplace for Indigenous STEM Professionals”
- BlackDoctor.org: “Top Hospital for Diversity”
- Disability Equality Index: 100%
- DiversityInc: Top 11 Hospitals
- Forbes “America’s Best Employers for Diversity”: #5 in health care/hospitals and #45 overall
- Forbes “Best Employers for Women”: #72
- Healthcare Equality Index: “Top Performer” for all three campuses
- Indeed: #12 “Best Employer for Millennials”
- Minnesota Employer Support of the Guard and Reserve: “Above and Beyond” award
- National Organization on Disability: Leading Disability Employer

"This is a very bird's-eye view of diversity and inclusion efforts across Mayo Clinic," says Dr. Hayes. "Success in this space sometimes feels only incremental, and any progress glacial. But there are many reasons to be optimistic that the momentum of these efforts is building. Our education shield has made diversity a priority (pages 20 and 26), and their efforts have shown growth in recruitment and retention of minority students, and created an open and welcoming environment for students, faculty and staff. We've also seen a slow, steady increase of staff diversity across Mayo locations.

"We are impatient but must also recognize that achieving full equity and inclusion takes time. For instance, although almost half of all medical students have been women for almost two decades, there remains a substantial gender gap in attainment of the rank of full professor and a persistent lack of women and minorities in leadership roles. True success will require addressing systemic barriers and biases, and providing mentorship, development and preparation of diverse individuals for leadership roles (page 32)."

Dr. Hayes points out that the Mayo Clinic patient population isn't reflective of the changing demographics of the U.S. population — a multifaceted problem with multifaceted solutions.

"Encouraging and including contributions from diverse individuals is critical to Mayo Clinic's future. We will be better positioned to reach our potential and serve our increasingly diverse patients when we actively bring together individuals with diverse thoughts, ideas and backgrounds, and put them to work to create better solutions.

"In the almost 10 years since the Office of Diversity and Inclusion was created, the momentum is still building: we are talking openly about previously 'unspeakable' topics, measuring 'unmeasurables' such as inclusion, meaningfully seeking equity, setting tough goals for ourselves, and celebrating the work of so many who make Mayo a great place to work and receive care for everyone. This is an exciting time to be at Mayo Clinic, and I can't wait to see how much things change in the next decade."

Chyke Doubeni, M.B.B.S., named medical director of Center for Health Equity and Community Engagement Research

Chyke Doubeni, M.B.B.S., is medical director of the newly formed Mayo Clinic Center for Health Equity and Community Engagement Research. The center integrates the Office of Community-Engaged Research and Office of Health Disparities Research.

Primary aims of the center are to catalyze scientifically rigorous research that contributes to the development and deployment of strategies to eliminate health disparities, enhance community engagement and best meet community health care needs; and ensure that Mayo Clinic research participants are representative of diverse communities across the nation.

Dr. Doubeni came to Mayo Clinic from the University of Pennsylvania, where he was the Harrison McCrea Dickinson, M.D., and Clifford C. Baker, M.D., Presidential Professor in Family Medicine. He is a leader in community-based research and health disparities. Dr. Doubeni previously directed the Center for Community and Population Health at UPenn, which is an academic hub for research to reduce health disparities through improved access to care and collaborative initiatives.



Diversity, inclusion and equity run deep

Diversity-, inclusion- and equity-related offices, committees, subcommittees and more run deep throughout Mayo Clinic and flow from the Office of Diversity and Inclusion.



Sharonne Hayes, M.D.

Mayo Clinic Office of Diversity and Inclusion

Sharonne Hayes, M.D., medical director, Office of Diversity and Inclusion; Division of Preventive Cardiology, Department of Cardiovascular Medicine, Mayo Clinic in Rochester



Alanna Rebecca, M.D.

Mayo Clinic in Arizona

Alanna Rebecca, M.D. (PLSR '05), chair, Diversity and Inclusion Committee in Arizona; chair, Division of Plastic and Reconstructive Surgery, Department of Surgery



Daniel Broderick, M.D.

Mayo Clinic in Florida

Daniel Broderick, M.D. (RD '90), chair, Diversity and Inclusion Committee in Florida; Department of Radiology



Anjali Bhagra, M.D.

Mayo Clinic in Rochester

Anjali Bhagra, M.D. (I1 '05, I '08), chair, Diversity and Inclusion Committee in Rochester; Division of General Internal Medicine, Department of Medicine



Brian Bunkers, M.D.

Mayo Clinic Health System

Brian Bunkers, M.D. (FM '18), chair, Mayo Clinic Health System Diversity and Inclusion Council; CEO, Mayo Clinic Health System SE Minnesota Region; Department of Family Medicine

Office for Diversity (education)

Ensure diversity of learners throughout Mayo Clinic College of Medicine and Science

Yonas Geda, M.D. (P '99, PCON '00, CLRS '06), associate dean for Diversity and Inclusion; director, Office for Diversity, Mayo Clinic College of Medicine and Science; Department of Psychiatry and Psychology, Mayo Clinic in Arizona



Yonas Geda, M.D.

Office of Health Equity and Inclusion (practice)

Improve data collection, identify health disparities, and address and close disparities to ensure Mayo Clinic's commitment to inclusivity and health equity for all patient populations

John Knudsen, M.D. (RD '90), medical director, Office of Health Equity and Inclusion; chair, Division of Ultrasonography, Department of Radiology, Mayo Clinic in Rochester

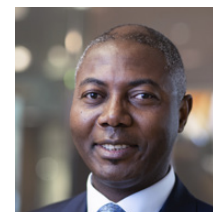


John Knudsen, M.D.

Center for Health Equity and Community Engagement Research

Support research that identifies and develops ways to eliminate health disparities

Chyke Doubeni, M.B.B.S., medical director, Center for Health Equity and Community Engagement Research; Department of Family Medicine, Mayo Clinic in Florida



Chyke Doubeni, M.B.B.S.

Office of Research Diversity and Inclusion

Strengthen workforce climate in research by identifying and addressing issues and barriers that disproportionately affect women and individuals from groups underrepresented in research

Jennifer Westendorf, Ph.D. (IMM '96), director, Office of Research Diversity and Inclusion; Department of Orthopedic Surgery, Mayo Clinic in Rochester



Jennifer Westendorf, Ph.D.



A HOME BASE



Mayo Clinic's Transgender and Intersex Specialty Care Clinic provides for mental health, hormonal and surgical needs of transgender patients and those with differences of sexual development

A sea change in transgender health care began in 2014 when, as a result of the Affordable Care Act, Medicare began covering surgical care for transgender individuals. In accordance with law making it illegal to discriminate against transgender people, private insurance companies followed suit. That same year Mayo Clinic convened a task force to examine how it managed LGBTQI and other minority populations. A resulting recommendation was to develop a multidisciplinary transgender clinic.

Todd Nippoldt, M.D. (MED '82, I '85), Division of Endocrinology, Diabetes, Metabolism, & Nutrition, was a task force member. "The transgender population faces major challenges in accessing and obtaining appropriate health care," he says. "One-quarter of transgender individuals says they've avoided going to the doctor for fear of discrimination. Mayo Clinic believes that all patients are best served with a multidisciplinary approach. I was confident we could offer transgender patients a home base for their care, where they would be appropriately cared for and respected."

Dr. Nippoldt secured Department of Medicine funding to visit four transgender clinics across the country to see how they were organized and what they provided. He found that they all provided high-quality care, but none offered truly integrated care. Rather, they were segmented into mental health, medical and surgical offerings.

In 2015 the Transgender and Intersex Specialty Care Clinic (TISCC) was established, based in the Division of Endocrinology, Diabetes, Metabolism, & Nutrition at Mayo Clinic in Rochester. Dr. Nippoldt is medical director, and Cesar Gonzalez, Ph.D., L.P. (P '14), Division of Integrated Behavioral Health, Department of Psychiatry and Psychology, is clinical director.

The clinic provides for the mental health, hormonal and surgical needs of transgender patients and those with differences of sexual development (DSD) — sometimes called intersex. Transgender or gender-nonconforming people have gender identity that doesn't conform to the sex (chromosomal or anatomical) they were assigned at birth. Gender identity can be defined as the internal sense of being



Cesar Gonzalez, Ph.D., L.P., and Todd Nippoldt, M.D.



I was confident we could offer transgender patients a home base for their care, where they would be appropriately cared for and respected.”

— Todd Nippoldt, M.D.

male, female, neither or along the spectrum between male and female. DSD includes discrepancies among sex chromosomes, genitalia, reproductive duct development and gonadal development. Conditions that can cause DSD include congenital adrenal hyperplasia and androgen resistance syndrome.

Mayo Clinic is one of the first major academic medical centers to offer multidisciplinary transgender care, including a gender-affirming surgery program. The surgical program started in 2016 with breast and facial procedures; vaginoplasty surgery was introduced in February 2017.

“Some people erroneously think transgender patients make a choice to change their gender,” says Dr. Nippoldt. “Rather, it’s about confirming their identity and wanting to live authentically. Being transgender indicates diversity, not pathology. Our goal is to relieve the distress associated with the incongruence between their gender identity and physical body. The TISCC practice is the right thing to offer to this patient population. It has enthusiastic support from Mayo Clinic’s top leadership.”

Dr. Nippoldt says Mayo Clinic deliberately eased into the surgical practice. “It’s a complicated practice, and we’re careful about making sure we can handle the demand. Mayo Clinic tends to build a practice in a way that anticipates complications; we don’t just jump in and do as many procedures as we can accommodate.”

Mayo Clinic plastic and reconstructive surgeons Jorys Martinez-Jorge, M.D. (PLS ’14), and Oscar Manrique, M.D. (PLS ’16), are surgical co-directors of the program. They perform the genital reconstruction surgery as well as breast, facial feminization, chest masculinization and other surgeries involved in gender confirmation.

Dr. Martinez-Jorge, who is from the Dominican Republic, came to Mayo Clinic in 2011 for plastic surgery training. Dr. Manrique is from Colombia and came to Mayo Clinic in 2016 after finishing a fellowship in transgender surgery at Mahidol University in Thailand. Drs. Manrique and Martinez-Jorge volunteered to be part of the practice and performed the first vaginoplasty in 2017. To hone their expertise, they visited high-volume centers in Canada and Thailand, including the practices of Pierre Brassard, M.D., from Montreal, Canada; and Kidakorn Kiranantawat, M.D., and Sukit Worathamrong, M.D., in Bangkok, Thailand, with whom Dr. Manrique trained.

“Our fellow surgeons in this field are very collaborative,” says Dr. Martinez-Jorge. “The surgeons who allowed us to train with them in Canada and Thailand did so with great excitement. Everyone is happy to share their knowledge and collaborate. We’re all aware that it’s the right thing to do for these underserved patients.

“In terms of complexity, vaginoplasty is 9 out of 10. If we can do these technically difficult, sophisticated

Terminology

- **LGBTQI:** Lesbian, gay, bisexual, trans-gender, questioning/queer, intersex
- **Sex:** Chromosomal and anatomic; female, male, intersex
- **Gender identity:** Internal sense of being male, female or along the spectrum; woman, man, gender nonbinary, gender fluid
- **Sexual orientation:** The gender(s) a person is attracted to; attracted to women, attracted to men, bisexual, asexual, pansexual
- **Gender expression:** How one manifests one’s self through social norms of masculine, feminine or variant; feminine, masculine, androgynous
- **Gender dysphoria:** Incongruence between experienced or expressed gender and primary or secondary sex characteristics along with a strong desire to be rid of one’s primary and secondary sex characteristics, to have the sex characteristics of the other gender, to be the other gender, to be treated as the other gender; a strong conviction that one has the typical feelings and reactions of the other gender; associated with clinically significant distress or functional impairment

BY THE NUMBERS

0.58%

0.58% of U.S. adult population identifies as transgender, or 1.4 million people

70%

70% of transgender individuals have had some form of maltreatment at the hands of medical providers

29%

29% of transgender individuals live in poverty — 2 times the rate in the U.S. population

78%



78% of adult patients seen for gender-related diagnoses report having depression



24%

24% of those who were out or perceived as transgender in grades K-12 were physically attacked because of being transgender

40%

Studies suggest that 40% of transgender people have tried to commit suicide — a figure 9 times higher than the general public

47%

47% of transgender individuals have been victims of sexual assault

55%



When appropriate health care has been denied to individuals who identify as transgender, the suicide attempt rate rose to 55%



Being transgender indicates diversity, not pathology. Our goal is to relieve the distress that's associated with the incongruence between their gender identity and physical body.” — Todd Nippoldt, M.D.



Oscar Manrique, M.D., and Jorys Martinez-Jorge, M.D.

“ They just want to live life like I do. We can give that to them through medical care and technologies, and it’s professionally and personally rewarding.”

— Jorys Martinez-Jorge, M.D.

procedures, nothing else is intimidating. We get to use and improve our surgical techniques at the highest level and change lives in the process.”

Drs. Martinez-Jorge and Manrique are tackling even greater complexity. They also went to San Francisco to learn phalloplasty with Bauback Safa, M.D. Phalloplasty is a multistage surgery that requires a high degree of involvement by teams including gynecology and urology. The surgery has an approximate complication rate of 50% even in expert hands at high-volume centers. Mayo Clinic plans to introduce phalloplasty in the future.

To date, the Mayo surgical team has performed approximately 150 vaginoplasties in patients ranging from their 20s to 70s. Not all transgender individuals choose to have surgical procedures to achieve gender congruence. Among transgender women, about 10% have had genital surgery, and about 70% want to have surgery. Among transgender men, about 2% of have had genital surgery, and about 20 to 30% want to have surgery.

The TISCC has two groups of patients — those who come to Mayo Clinic for all of their care, including behavioral health, hormonal therapy management and surgeries; and those who have their behavioral health and hormonal management in their local communities, and come to Mayo Clinic for surgical care.

Overall, the TISCC has seen more than 500 patients since 2015, with more than half coming from the five-state region and one-third from central and southern Minnesota.

TISCC patients see behavioral health and endocrinology providers first. Those providers evaluate and optimize any social, mental health or medical issues before commencing hormonal or surgical therapy. The exception to this process is patients who travel to Mayo Clinic from afar. If those patients come to Mayo Clinic primarily for surgery, their care is expedited to reduce the number of visits they must make. They meet with a surgeon on their first visit.

Before hormone therapy or surgery is considered, patients must meet World Professional Association for Transgender Health (WPATH) standards of care, which outline the steps necessary to achieve the best outcomes before initiating hormonal or surgical therapies. WPATH standards vary for each surgical procedure and may include letters of approval from the patient’s mental health professional, prior hormonal therapy and at least one year of living as the gender with which the patient identifies. Before any surgical procedures, each patient’s case is discussed at the multidisciplinary TISCC case conference and proceeds only after consensus that all issues have been addressed and optimized.

Treatment available in the Transgender and Intersex Specialty Care Clinic

- Behavioral health assessment and management
- Hormone therapy and monitoring
- Assistance with social and legal issues including referrals to community resources
- Fertility preservation
- Sexually transmitted infection screening and HIV pre-exposure prophylaxis
- Voice therapy
- Electrolysis and laser hair removal
- Hair transplant
- Gynecological care for transgender men
- Chaplain services
- Feminizing surgical procedures
 - Breast augmentation
 - Facial feminization
 - Body contouring
 - Tracheal shave
 - Orchiectomy
 - Vaginoplasty
- Masculinizing surgical procedures
 - Breast reduction/chest masculinization
 - Body contouring
 - Hysterectomy/oophorectomy
- Preoperative and postoperative pelvic floor physical therapy

According to Dr. Nippoldt, Mayo Clinic didn't intend to include pediatrics in the initial TISCC practice, but the demand from parents of children and adolescents has been very high. "The suicide attempt rate among individuals who identify as transgender is incredibly high and even higher when they're denied appropriate health care," he says. "How could we tell people we wouldn't see them or their children and change the potential that they would harm themselves? We've now developed expertise with pediatric patients."

Sharonne Hayes, M.D. (I '86, CV '90), medical director of the Mayo Clinic Office of Diversity and Inclusion, says the TISCC is a perfect example of what sets Mayo Clinic apart — a multidisciplinary, collaborative approach to care that meets all of the needs of each patient.

"In the past, many transgender and intersex individuals had to rely upon fragmented and incomplete health care," says Dr. Hayes. "Few major academic medical centers had specialty programs for advanced care. These patients now can access the Mayo Clinic Transgender and Intersex Specialty Care Clinic, where their health care teams work with them to develop the right care plan for both optimal health and being true to themselves."

In pursuit of evolving equity, diversity and inclusion, Mayo Clinic has made great efforts not just to get patient-affirmed pronouns right but also to modify the medical record — from how patient names are listed to what normal ranges are for gender-specific lab reports. "Every time we encounter a challenge in one of these areas, the attitude is, 'We can and must do this,'" says Dr. Hayes.

Mayo Clinic staff involved in the TISCC — from those who answer the phones to the physicians — complete cultural competency training. In fact, training is encouraged for staff across the institution.

"I've been pleasantly surprised by the number of staff from all levels who are interested in serving this population and want to help," says Dr. Nippoldt. "One of our chaplains came to us, asking if we needed her services for TISCC patients. Those who want to see a chaplain really appreciate her care. This program takes a village representing many areas across Mayo Clinic.

"We all continue to learn and grow in this new practice area. Transgender care wasn't brought up in medical training in my generation and has only become a topic in the last five to 10 years. When I gave a talk about transgender care at the medical school, the students were completely on board and

10 tips to become a transgender-friendly provider

Most health care providers have had little or no formal training in addressing the needs of transgender patients, which can contribute to the stress that members of the transgender community may develop through stigmatization, avoidance, discrimination and prejudice.

1. If you have a question about your patient's gender nonconformity, don't be afraid to ask.
2. Ask patients their preferred names and pronouns, and use them during the encounter. If you make a mistake, apologize and continue.
3. The preferred name and pronoun often will differ from what is in the medical record. Many transgender people haven't changed their name and gender legally. Ask the patient if you can use this preferred name and pronoun in the medical record. Many patients have access to their medical records, and your sensitivity should be reflected in the notes.

understood its importance. Our endocrine fellows and surgical and behavioral health residents rotate through the TISCC, and we get a lot of requests from other trainees to spend time in our clinic.”

The TISCC is truly three shield. In addition to curriculum being introduced at Mayo Clinic Alix School of Medicine, Mayo Clinic School of Continuous Professional Development offers a CME course, “Principles in the Care of Transgender and Intersex Patients.” TISCC providers are involved in presentations at national and international meetings, and conducting research — with more than 15 manuscripts published in the last two years. Mayo Clinic experts continue to develop content addressing transgender health care for AskMayoExpert, an electronic point-of-care resource with Mayo-vetted knowledge.

Outreach also plays a role in sharing the TISCC’s expertise. Dr. Martinez-Jorge says physicians in local communities who see transgender patients who have had gender-affirming surgery at Mayo Clinic often consult with the Mayo surgeons.

Studies show that after hormonal therapy and gender-confirming surgery, 80% of transgender individuals (not necessarily treated at Mayo Clinic) report significant improvement in their gender


dysphoria, 80% report significant improvement in quality of life, 78% report significant improvement in psychological symptoms and 72% report significant improvement in sexual function.

Dr. Nippoldt says TISCC patients are the most gratifying patient population he cares for, and Dr. Martinez-Jorge says they’re the most grateful patients he has. “They feel like they’re trapped in the wrong body, which affects all aspects of their lives,” says Dr. Martinez-Jorge. “They just want to live life like I do. We can give that to them through medical care and technologies, and it’s professionally and personally rewarding.”

Learn more about working with gender-diverse patients and colleagues:

- lgbthealtheducation.org
- transhealth.ucsf.edu
- wpath.org

4. If possible, intake forms should include an option to disclose transgender status.
5. Sensitivity training should be required for all staff members who interact with the patient. The Center of Excellence for Transgender Health at the University of California, San Francisco, has published a helpful online course transhealth.ucsf.edu/video/story.html.
6. Public restrooms should include a unisex option.
7. Have local transgender resources, such as support groups, available to help guide the patient if needed.
8. Include transgender health topics as part of medical school and training programs to increase the competence of future leaders in transgender health care.
9. Provide faculty development in transgender health. Many national and international meetings include transgender health topics, and more online resources are available.
10. Phone a friend: Be aware of qualified providers in your area who you can contact about transgender-related questions.

A person wearing a white lab coat is seated on the right side of the frame. To their left is a large, lush green plant with many ferns. The background is a solid teal color. The text is overlaid on the left side of the image.

**‘FOR THE FIRST
TIME IN MY LIFE,
I FELT NORMAL,
LIKE I WAS IN
THE RIGHT BODY’**

**GENDER-AFFIRMATION SURGERY
PATIENT STORY**



Vanessa Tennyson lives in Minneapolis, Minnesota, with her wife of four years. The couple has been together for 14 years. Tennyson was previously married for 25 years and has two adult children and a grandchild. She is becoming certified as an executive and leadership coach — an “encore career” — after running the business operations of an engineering firm for 32 years.

In February 2018 Tennyson had gender-affirmation surgery at Mayo Clinic in Rochester, concluding a process that began a decade earlier. She came out as transgender to her children, family and friends in 2014.

Her daughter’s response was, “I love you. I’ve never seen you smile before.”

Tennyson says it was a long time to go without knowing who she was. She first felt different at age 5 — a feeling that intensified in junior high. She kept busy with hockey, cross-country, track, choir and the National Honor Society in high school to try to distract from that feeling but says depression at 16 caused her to consider throwing herself in front of a bus.

Tennyson graduated from the Carlson School of Management at the University of Minnesota, where she began to understand her differences. She identified with some of the descriptions in an abnormal psychology class at the university.

“I felt like I had a disease,” she says. “I felt alone, misunderstood, like a freak. I didn’t know who I was.”

After years of hiding her feelings about her identity, Tennyson found an LGBTQ-friendly clinic in the Twin Cities. With guidance from her psychologist, Tennyson began the process of completing the

World Professional Association for Transgender Health (WPATH) standards of care for the purpose of gender-affirmation surgery in 2014. She planned to see a physician in Chicago to explore surgery until she read about Mayo Clinic’s Transgender and Intersex Specialty Care Clinic (TISCC) in a newspaper. Her first visit was in 2017.

“I chose Mayo Clinic for its world-renowned medical expertise and because patients could complete the entire process in one medical system,” says Tennyson. “None of the other gender-affirmation surgery programs I researched offered a clinic, behavioral care and hospital care team all in one. I could coordinate my care without the complication of multiple medical organizations.”

Tennyson describes the eight-month process from her first visit at Mayo Clinic until she had surgery as thorough and compassionate. “The Mayo team didn’t treat me like I had an affliction that needed fixing. They treated me like someone who needed to be made normal so I could get on with who I’ve always been. Careful consideration was evident in every step of decision-making.

“The experience was very patient-centric. The patient drives the model, engaging the medical team as they guide you through their specialties. The process is collaborative, and the communication is refreshing, empowering and personal.”

The last day of February 2018 was Tennyson’s last day in a man’s body.

“For the first time in my life, I felt normal, like I was in the right body,” she says about herself after surgery, performed by Oscar Manrique, M.D.,

“The Mayo team didn’t treat me like I had an affliction that needed fixing. They treated me like someone who needed to be made normal so I could get on with who I’ve always been.” — Vanessa Tennyson

Division of Plastic and Reconstructive Surgery.
“Before surgery, I felt confused, shameful and embarrassed. I was never truly happy. When I came out as transgender and began dressing as a woman, I felt better but not yet whole. When I look in the mirror now, I only see a woman. I feel happy and settled.”

Tennyson spent seven days in the hospital and returned to work six weeks after surgery and soon thereafter began physical therapy to exercise her pelvic floor. She serves on the TISCC Patient and Family Advisory Council, which was formed to solicit input about how to make the program run more smoothly and determine useful educational materials.

“I’m filled with profound gratitude to the Mayo Clinic staff involved in my care,” she says. “It’s extremely rare that one health care system contains so many professionals of extraordinary talent and enthusiastic, empathetic demeanor. From my very first phone inquiry to postsurgical care, I experienced nothing but respect and kindness. I could not have scripted a better health care team. They are a precious commodity in the ever-changing and complex world of health care.”





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RECRUITMENT PIPELINE

*Diverse physicians and faculty
better meet patient needs*

A priority for Mayo Clinic College of Medicine and Science is to attract and recruit diverse students to its schools, especially students underrepresented in medicine and science.

According to Fredric Meyer, M.D. (NS '88), the Juanita Kious Waugh Executive Dean for Education and the Alfred Uihlein Family Professor of Neurologic Surgery, this priority is crucial to meet the needs of patients and develop a diverse workforce and faculty.

Dr. Meyer is working with Yonas Geda, M.D. (P '99, PCON '00, CLRSH '06), associate dean for Diversity and Inclusion in the Mayo Clinic College of Medicine and Science, on this goal. Their efforts have resulted in pipeline programs to introduce students to Mayo's campuses, education programs and recruitment initiatives. Pipeline programs in Mayo Clinic Alix School of Medicine include:

Undergraduate Plummer Scholars Program:

Establish longitudinal relationships with high-potential undergraduate students from historically black colleges and other partner institutions who aspire to become physicians or scientists. Students are paired with Mayo medical students for mentorship.

William Worrall Mayo Scholars Program: Engage with diverse college students whose MCAT scores are in the upper percentiles to expand underrepresented minority applicants to Mayo Clinic Alix School of

Medicine. Includes an immersion visit to Mayo Clinic and pairing with Mayo Clinic physician and scientist mentors for guidance and advice as students plan for their medical education journey.



Wilson Scholars Program: Mentor meritorious underrepresented minority students who have completed visiting clerkships at Mayo Clinic and have met United States Medical Licensing Examination performance thresholds. Students are assigned mentors to facilitate career aspirations.

Diversity Mentoring Program:

In a yearlong pilot program, Mayo medical students in Rochester were provided with a year of individual diversity-centered mentoring from Mayo Clinic physicians who represent diversity categories. A survey of medical students revealed these desired attributes in mentors:

- African American, female leadership, cultural (African/Somali)
- Female surgeons or surgeons who are women of color, especially in cardiothoracic surgery and general surgery
- Low socioeconomic status before entering medical school
- Mothers
- LGBTQIA
- Latino
- Minority women of African descent
- Age (started practicing as a physician at age 50 or older)

From 2017 to 2018, 24 medical students participated in the Worrall Scholars Program, and four of them are now students at Mayo Clinic Alix School of Medicine. Another three are expected to become Mayo medical students.

Diverse students also can participate in these Mayo Clinic educational programs:

- **Mayo Clinic Visiting Medical Student Clerkship Program:** Career development through hands-on senior-year clinical elective and exploration of Mayo Clinic residencies; four-week rotations with year-round opportunities. More than 50 diverse visiting medical students in the past seven years were appointed to Mayo Clinic residency programs.
- **Summer Medical Student Research Fellowship Program:** NIH-funded eight- to 10-week comprehensive training program for patient-oriented research; medical students are matched with Mayo Clinic investigators.
- **Research supplement for diversity in health-related research:** Support for medical students to develop research capabilities; one-year research experience with Mayo Clinic NIH-supported investigator.
- **Mayo Clinic CARES (Career Advancement, Research, and Education Summer):** High school

students gain exposure to career opportunities across the health care workforce, emphasizing diversity, health equity, underserved and special populations; prepare students for college application process and to become leaders of the future workforce; offered on Mayo Clinic's Arizona campus.

"In 2017 there weren't any black/African American students enrolled at Mayo Clinic Alix School of Medicine – Arizona campus," says Dr. Geda. "In 2018 there are eight black/African American students and, like the cohort of underrepresented students on the Rochester campus, both groups of students have outstanding academic achievements.

"Diversity in our student body will remain a priority for Mayo Clinic College of Medicine and Science. We hope to continue to attract and enroll outstanding underrepresented students despite challenges in recruiting them to our campuses. We're fortunate to have the support of Dr. Meyer, scores of faculty, alumni and current students to assist in these efforts. Ultimately, we want to ensure a learning environment that's rich in diversity and an enduring pipeline for future Mayo Clinic training and, ultimately, positions on our staff."

Diversity pipeline program for AI/AN students underway

In summer 2020, Mayo Clinic will introduce a program to draw American Indian/Alaska Native (AI/AN) undergraduate students to health and other STEM careers, with an aim to increase the number of students applying to medical school.

To prepare for the launch of this program, Mayo Clinic is consulting with schools that have successful AI/AN

programs as well as with Judith Kaur, M.D. (ONCL '94), medical director for Native American Programs at Mayo Clinic Cancer Center, and Jonathan Baines, M.D., Ph.D. (MDPH '04, TBIO '04, PRES '05, LABM '06, FM '09), physician lead for Mayo Clinic's AI/AN pipeline programs. Drs. Kaur and Baines are co-directors of the Mayo Clinic National

Cancer Institute-funded American Indian/Alaska Native Initiative on Cancer (Spirit of EAGLES) project initiated in 2000 to improve cancer awareness among tribal nations and organizations.

DRAWN TO MAYO CLINIC



Oluwatomilona Ifelayo: Diversity Mentoring Program enriches experience

Oluwatomilona (Tomi) Ifelayo (MED '21) is a third-year student at Mayo Clinic Alix School of Medicine – Rochester campus. She and her family moved to Texas from Nigeria when Ifelayo was 8. She decided on a career in medicine while at Baylor University in Waco, Texas. Mayo Clinic was her last medical school interview.

“I was only 20 years old and couldn’t rent a hotel room, so I had to travel with my mom for out-of-state interviews,” says Ifelayo. “My family was important to me in making the decision of where to attend medical school. Mayo was the only school to include my parents in the process. That made a huge impression. During my interviews, I also expressed the importance of my faith to me, and within a few weeks of returning home I was put in contact with the pastor of a church in Rochester, very similar to mine in Texas. It was clear then that Mayo Clinic cared about what was important to me.

“No one in my family had been eager for me to move to Minnesota — too cold and too far away.

After my interview, they wholeheartedly agreed that Mayo provided the best opportunity for me to grow as a person and student.”

At the start of Ifelayo’s second year of medical school, she participated in the Diversity Mentoring Program. She indicated her interest in a female mentor from Africa and was matched with Nirusha Lachman, Ph.D. (ANAT '07), chair, Department of Anatomy, who is from South Africa.

“In addition to career and faculty mentors, it feels wonderful to have a mentor I can relate to on an individually determined level of diversity,” says Ifelayo. “A fellow African woman in medical education understands the cultural elements of who I am on a deeper level than the immediate identifier of being a ‘black woman.’ Dr. Lachman gets me more than perhaps any other faculty on campus. She has helped me navigate challenging situations and provided motivation and encouragement.”



Adam Howard: Worrall Scholars Program attracts diverse medical students

Adam Howard (MED '22) is a second-year student at Mayo Clinic Alix School of Medicine – Rochester campus. He has had a most untraditional journey to medical school. He dropped out of high school after ninth grade to become an apprentice to a taekwondo master.

“I felt like I was doing something useful and living with a purpose,” says Howard, who says he was inspired at the taekwondo studio to better understand the human condition. He received his GED, earned an associate’s degree at a community college and was admitted to the University of Texas at Dallas, where he earned his undergraduate degree. He then received a master’s degree in medical sciences with an emphasis on population health and health systems from Brown University in Providence, Rhode Island.

On his last day of undergraduate school, Howard received an email from Mayo Clinic inviting him to Rochester, Minnesota, to explore the medical school as part of the William Worrall Mayo Scholars Program.

“It was my first contact with Mayo Clinic,” he says. “Based on my background, I didn’t expect to be recruited by anyone. Mayo Clinic’s commitment to meaningful diversity absolutely changed my life.

“I interviewed at a number of medical schools, but visiting Mayo was one of the most inspiring experiences of my life. Rather than showing off its technology or boasting about where students match for residency, dean of students Joseph Drazkowski, M.D. (N ’01, the George M. and Kristen L. Lund

Associate Dean for Student Affairs, Mayo Clinic Alix School of Medicine – Arizona campus) took us to a patient’s room, demonstrating that the true treasure of Mayo Clinic is the relationship between doctors and patients. Then, at Second Look (a scheduled revisit opportunity for students whose applications have been approved for admission to the school), we shadowed clinicians and learned about the institution’s missions. This was in direct contrast to similar events at other programs that more heavily featured social events. I thought Mayo would facilitate my growth and help me become the best servant leader and clinician I could be.”

As part of the Worrall Scholars program, Howard was paired for mentorship with Fredric Meyer, M.D. (NS ’88), the Juanita Kious Waugh Executive Dean for Education. “Dr. Meyer called me while he was on vacation and spent an hour talking to me about my nascent neurosurgical aspirations,” says Howard. “Dr. Meyer discussed the pros and cons of the various programs I was considering. He made it clear that his support wasn’t contingent upon my attending Mayo Clinic and that he hopes to see me succeed however and wherever my career develops.”

After a year on the Rochester campus, Howard says diversity at Mayo Clinic is inescapable. “I work in a lab with people from very different backgrounds, and I learn from all of them. I’m glad that Mayo honors diversity and encourages us to champion virtues of universal respect and kindness in all aspects of our lives.”



Marcus Wiggins: Worrall Scholars Program encourages nontraditional student

Marcus Wiggins (MED '22), a second-year student at Mayo Clinic Alix School of Medicine – Arizona campus, says Mayo was the only medical school to reach out to him before formal interviews began.

Through the William Worrall Mayo Scholars Program, Wiggins visited the Rochester campus during the summer of the year before he applied to medical school. “I liked the language the physicians at Mayo used,” he says. “Rather than say ‘I’ a lot, they referred to ‘our team’ and the patient. During shadowing, I was impressed with the amount of time physicians spent with patients. And during presentations, physicians talked about spending time with their families. I got the impression that physicians at Mayo were allowed to be themselves — not just doctors.”

Even though Wiggins first considered becoming a physician in high school, he didn’t enter medical school until he was 35. A native of Virginia, he graduated from Virginia Polytechnic Institute and State University (Virginia Tech) in Blacksburg. At the start of college, he was a pre-med student. But the closer he got to applying to medical school, the more impossible it felt to him.

“I was overwhelmed by the application process, the expense of school and the length of time it would be before I had an income,” says Wiggins. “Making money and being a provider is a priority for black men in particular. If you’re from a STEM background, as I am, you can go to work at a tech company and make a lot more money than you can as a physician.”

Wiggins switched his focus to business in his last two years of college and went to work for Epic, a health care software company based in Verona, Wisconsin. From there, he moved to the Washington, D.C., area and worked as an IT consultant. He earned an MBA from the University of Virginia in Charlottesville and worked as a financial analyst for seven years.

“I could have continued my career in finance and business, but I still wanted to help sick people and do something I valued more,” says Wiggins.

Four years ago, Wiggins started the process of applying to medical school and gaining the experiences he’d need to be a viable candidate. Mayo Clinic reached out to him to be part of the Worrall Scholars Program and paired him with Michele Halyard, M.D. (RADO '89), the Suzanne Hanson Poole Vice Dean, Mayo Clinic Alix School of Medicine, on the Arizona campus.

“Applying to medical school is a long, detailed, discouraging process,” says Wiggins. “Dr. Halyard helped guide me and kept me motivated and focused.”

After visiting Mayo’s Rochester campus for the Worrall Scholars Program, Wiggins interviewed on the Florida campus and entered medical school on the Arizona campus. His wife of five years, Sheena Fletcher (MED '22), also is a Mayo Clinic Alix School of Medicine student.

“At 36, I’m older than most of my classmates,” says Wiggins. “My path to medicine isn’t the traditional one, but it’s the one I needed to take to arrive here, the one I needed to take until I was ready for medicine.”



DIVERSITY ADVANCES THE BEST SCIENCE



For more than 25 years, Mayo Clinic Graduate School of Biomedical Sciences has partnered with the federal government through the National Institutes of Health (NIH) to become a training destination for aspiring biomedical research scientists from backgrounds underrepresented in science. This includes people with disabilities, black/African Americans, American Indian/Alaska Natives, Hispanic/Latinos and Native Hawaiian/Pacific Islanders.

Extramural competitive support for Mayo Clinic's three major biomedical research diversity grants totals more than \$1 million per year.

- Two awards from the National Institute of General Medical Sciences fund research training and enrichment for recent college graduates preparing for professional school, and for Ph.D. and M.D.-Ph.D. students in their first two years of graduate training. More than 90% of participants in the **Initiative for Maximizing Student Development (IMSD)** program have graduated with a Ph.D. or M.D.-Ph.D. in their intended biomedical research discipline.
- An award from the National Heart, Lung, and Blood Institute funds summer research training experiences for undergraduates and medical students.

Mayo Clinic broadens the definition of diversity to include students who represent the spectrum of nationality, ethnicity, race, gender identity, sexual orientation, physical ability, economic status and family background. In addition to the extramurally funded grants, the graduate school invests its own resources in diversity programs including:

- Support for Ph.D. and M.D.-Ph.D. students who are the first generation in their family to graduate from college.
- Support for research training and enrichment in preparation for professional school application for diverse recent college graduates in the **Post-baccalaureate Research Education Program (PREP)** through partnership with Mayo Clinic Center for Regenerative Medicine.
- Support for a cohort of underrepresented undergraduate students sponsored for admission into highly competitive Mayo Clinic Graduate School of Biomedical Sciences **Summer Undergraduate Research Fellowship (SURF)** program.
- Curriculum based on near-peer interactions in faculty-led training on topics focused on honing oral and written communication skills including self-assessment, professional skills, grant proposal composition and preparation for professional school admission.

“We succeed when our scientists better represent the patient populations who could benefit from their discoveries.”

— Louis (Jim) Maher III, Ph.D.

“In the 1990s Mayo Clinic Graduate School of Biomedical Sciences leadership decided, with the pioneering vision of then-associate dean Rick McGee, Ph.D. (PHAR ’91, now associate dean for Faculty Recruitment & Professional Development at Northwestern University’s Feinberg School of Medicine), that the leaders of the biomedical research workforce should reflect the genetic, cultural and socioeconomic diversity of our country,” says Louis (Jim) Maher III, Ph.D. (BIOC ’95), former dean, Mayo Clinic Graduate School of Biomedical Sciences, and the Bernard Pollack Professor of Biochemistry & Molecular Biology.

“Dr. McGee was passionate about developing funding mechanisms to train future researchers and dreamed that Mayo Clinic could become a destination for this type of training. He developed PREP, which the NIH made into a national program. I was fortunate to inherit these programs from him. Our team has depended on key leaders throughout the years, including Dennis Mays, Ph.D. (MPET ’93, program manager of diversity grants, Office for Diversity, Mayo Clinic College of Medicine and Science), and most recently, Jason Doles, Ph.D. (BMB ’17, Department of Biochemistry and Molecular Biology at Mayo Clinic in Rochester and a faculty member coach in the IMSD program.)



Louis (Jim) Maher III, Ph.D., and J. Luis Lujan, Ph.D.

“Dr. McGee firmly believed that lack of personnel diversity translates into lack of diversity in thinking, and studies have confirmed that diversity makes research teams more creative and productive. As a result of that vision, we are committed to recruiting students who don’t look, sound or think alike. Diverse teams learn better and conduct more meaningful scientific research for all involved. Additionally, we need scientists of color to remedy health disparities and the scarcity of racial and ethnic minorities in medical studies. We succeed when our scientists better represent the patient populations who could benefit from their discoveries.”

The NIH encourages educational institutions to increase the number of students and faculty from groups that are under-represented in biomedical

science. Traditionally, people in those groups have had less access, encouragement or opportunity to engage in science, technology, engineering and mathematics (STEM) courses in high school and college. Such students often encounter fewer undergraduate research opportunities, making graduate-level research training and long-term careers in biomedical sciences more difficult to attain.

The chances of success for underrepresented minority (URM) students in biomedical sciences are enhanced when students participate in enrichment programs such as those offered by Mayo Clinic Graduate School of Biomedical Sciences.

"We have the opportunity to transform the face of biomedical research with students from diverse backgrounds who are extremely talented and bright — who may not have had as much exposure to research but who have great potential," says Karen Hedin, Ph.D. (PHAR '95), Mayo Clinic Graduate School of Biomedical Sciences co-leader of the renewed NIH grant and a consultant in the Department of Immunology on the Arizona campus.

Today more than half of the students in Mayo Clinic Graduate School of Biomedical Sciences

programs are women, and racial diversity in some programs is approaching national averages of the U.S. population.

Assisting with making diversity goals a reality is J. Luis Lujan, Ph.D. (NS '18), the graduate school's assistant dean for Diversity and Inclusion. A native of Mexico, Dr. Lujan joined the faculty in 2013. "Diversity in leadership also is important for students from underrepresented groups to see," he says. "They need mentors and role models who can relate to what they're experiencing in pursuit of a research career."

Dr. Maher explains the pride he feels when students who have participated in enrichment programs succeed. "I reflect on conversations with students when we tried to keep them on track — when they were losing enthusiasm or saw obstacles as insurmountable. Those of us in the graduate school's leadership are so happy and proud to see those same students overcome their challenges with help from our enrichment programs. The students graduate and reproduce the spirit and support they had at Mayo Clinic at other institutions around the country, mentoring and lifting up others. In that way, our programs have even greater impact."

The Council of Graduate Schools and Duke University reported Ph.D. completion rates:

1990s: Biomedical graduate students

55-70%

1992-2010: URM students without enrichment

40-50%

Mayo Clinic Graduate School of Biomedical Sciences Ph.D. students' completion rates 1997-2010 showed similar trends but highlight the efficacy of enrichment tactics:

All students

80%

URM students without enrichment

47%

URM students with enrichment

88%



Cherisse Marcou, Ph.D.

IMSD PROGRAM PROPELS PH.D. STUDENT INTO WORLD OF GENETICS AND GENOMICS

Cherisse Marcou, Ph.D. (CV '13, MPET '13, CYTG '15, CMG '16), participated in the Mayo Clinic Graduate School of Biomedical Sciences' Initiative for Maximizing Student Development (IMSD) program during her graduate school training. A native of Nassau, Bahamas, Dr. Marcou describes the program as a blessing to her.

"Mayo has a large Ph.D. program in a large institution, so it was nice to be part of a smaller group I could lean on and connect with," she says. "A dedicated group of scientists and physicians at Mayo Clinic is focused on maximizing diversity at all levels in the sciences, which allows students to gain their footing in the field and gain confidence to pursue careers in science. The rich resources available through the IMSD program helped me succeed in graduate school."

Dr. Marcou says the IMSD program offered a way to connect with other students on the same journey. "We focused on applying for grants specified for students from diverse backgrounds, had a safe place to discuss issues related to being in a field that

historically has had underrepresentation of minority groups, provided opportunities to attend conferences and network, and had a chance to mentor others from diverse backgrounds as we advanced in our training.

"With help from grant-writing exercises in the program and help from my mentors, Larry Karnitz, Ph.D. (IMM '92, chair, Division of Oncology Research), and Michael Ackerman, M.D., Ph.D. (MDPH, '95, PHAR '95, PD '98, PDC '00, Division of Heart Rhythm Services, and the Windland Smith Rice Cardiovascular Genomics Research Professor), I received an NIH F31 Ruth L. Kirchstein National Research Service Award. Getting this award, which promotes diversity in health-related research, while I was in in graduate school was a major milestone."

After nine years of training at Mayo Clinic — a Ph.D. in Biomedical Sciences-Molecular Pharmacology and Experimental Therapeutics, and American Board of Medical Genetics and Genomics fellowships in Clinic Cytogenetics and Clinical Molecular Genetics — Dr. Marcou left Mayo for almost two years. She used her training as a senior

clinical scientist at GeneDx, a Maryland-based genomics company focused on genetic testing for rare and ultra-rare genetic disorders. In May 2018 she returned for a position in the Division of Laboratory Genetics and Genomics in the Department of Laboratory Medicine and Pathology with a joint appointment in the Department of Clinical Genomics at Mayo Clinic in Rochester.

Dr. Marcou is now a clinical laboratory director focused on the analysis and interpretation of genetic test results; managing teams that perform testing; developing assays related to the rapidly evolving field

of genetics and genomics; and educating Mayo Clinic physicians, colleagues, external providers, and the next generation of scientists and health care practitioners.

“I’m happy to be back at Mayo, where I received stellar training,” says Dr. Marcou. “I’m grateful to Mayo Clinic for its dedication to broaden the way science looks and wanting to increase diversity. Growing as a scientist involves mentoring others. I’m excited to be a role model and a face of what it’s like to be a successful woman from an underrepresented group in the sciences.”

PREP LAUNCHES FIRST-GENERATION COLLEGE STUDENT TO STANFORD FOR M.D.-PH.D.

Brian Garcia recently enrolled as an M.D.-Ph.D. student at Stanford University in Stanford, California. Born in Cuba, Garcia is Latino and in the first generation of his family to attend college. He graduated from Florida International University in Miami and spent two summers working in the Laboratory of Structural Cell Biology at Harvard Medical School in Cambridge, Massachusetts.

Garcia qualified for Mayo Clinic Graduate School of Biomedical Sciences’ Post-baccalaureate Research Education Program (PREP), which provides support for diverse students in preparation for professional school application.

“I learned about programs like PREP at a research conference a few years ago and thought I should look into them to make myself a more attractive candidate for an M.D.-Ph.D. program,” he says.

Garcia says his year at Mayo Clinic, working with Louis (Jim) Maher III, Ph.D. (BIOC ‘95), developed his capacity as a scientist. “I worked full time in the lab, participated in meetings, shadowed physicians and took a graduate school genome biology course. It felt like I was a first-year grad student. The mentorship at Mayo Clinic is excellent — some of the best I’ve seen. It can be frustrating



Brian Garcia

to map out your path if you don’t have the right mentorship to know what you need — substantive research experience, shadowing and volunteer work. Dr. Maher helped guide me.”

Garcia says he believes his PREP experience influenced Stanford’s decision. “It showed my level of preparation and ability to commit to an eight-year training program.”

PREP PREDECESSOR OPENED UP WORLD OF POSSIBILITIES FOR YOUNG FATHER

Eduardo Davila, Ph.D. (IMM '02, RHEU '03, S '05), participated in post-baccalaureate enrichment training at Mayo Clinic Graduate School of Biomedical Sciences for two years in the late 1990s.

As an undergraduate student at New Mexico State University in Las Cruces and a participant in diversity programs there, Dr. Davila presented his research findings at the Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) meeting. There, Dr. Davila met Richard (Rick) McGee, Ph.D., associate dean of Mayo's graduate school at that time, who invited him to apply for the school's post-baccalaureate training program. Dr. Davila says Mayo's was one of only two such programs at the time — "an incredibly rare opportunity."

Dr. Davila was accepted at Mayo Clinic Graduate School of Biomedical Sciences, where he was mentored in the lab of Esteban Celis, M.D., Ph.D. (IMM '97), Department of Immunology, studying tumor immunotherapy. After two years of mentored research, Dr. Davila entered the school's Ph.D. program. He received a Ph.D. in biomedical sciences – immunology and stayed at Mayo Clinic for postdoctoral research training in rheumatoid and transplantation immunology.

"Without the research opportunity and close mentoring at Mayo Clinic, I don't know where I would have ended up," says Dr. Davila. "I might have become a car mechanic like my parents wanted me to be. Dr. McGee introduced me to opportunities I never knew I had."

Dr. Davila is Mexican-American. His parents came to the U.S. illegally when his mother was pregnant with him. He says his parents worked hard, but the family still lived in poverty. Dr. Davila is in the first generation of his family to go to college.

"I really struggled the first two years" he says. "My wife and I had our first child as teenagers and had another child by the time I was in college. I attended classes full time and worked to earn money for my family. I didn't want my wife or kids to live in poverty, and education offered promise."

Today Dr. Davila is a professor in the Department of Medicine and the Amy Davis Chair of Basic Immunology Research, Human Immunology and



Immunotherapy Initiative at the University of Colorado Denver's Comprehensive Cancer Center. His research focus is cancer, T-cell research, and novel therapies. It comes as no surprise that Dr. Davila has submitted an application to start a PREP at the University of Colorado to foster the development of young minority students who aspire to be scientists. He also initiated a PREP in his previous position at the University of Maryland School of Medicine, where he was an associate professor in the Department of Microbiology and Immunology.

"I had great mentors at Mayo Clinic. Every faculty member I interacted with was dedicated to serving the student population," says Dr. Davila. "I want to give those same opportunities to others and help them have an impact in the world."

"When you come from a background like mine and don't have the right connections, you don't know what's out there. My day-to-day existence focused on survival — getting my next meal — not thinking about my grades or a career in science or medicine. Getting even a brief glimpse at those possibilities as a young student is so important. You see that there are opportunities beyond what you could imagine. PREP is much more than the NIH mandates it to be. Students are exposed to new scientific techniques, sophisticated instruments and a new level of commitment to making sure they succeed. It helped to launch me into the career I love."





GIVING WOMEN THE TOOLS TO TAKE OFF



Advancing research, patents and intellectual property projects

Jennifer Westendorf, Ph.D. (IMM '96), director of the Mayo Clinic Office of Research Diversity and Inclusion, says there's a strong need to help women advance their projects involving research, patents and intellectual property. She cites statistics from the National Science Foundation, Association of American Medical Colleges and U.S. Patent and Trademark Office, which show that:

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42%

Women receive more than half of all doctoral degrees in the U.S., and hold 42% of full-time faculty positions at U.S. medical schools but lead only 19% of departments.

19%

12%

In 2016 only 12% of inventors listed on patents were women. Patents attract venture capital.

2%

Female business founders receive only 2% of venture capital financing.

The Office of Research Diversity and Inclusion is collaborating with the Mayo Clinic Research Office of Entrepreneurship and Center for Biomedical Discovery to give women at Mayo Clinic the tools they need to advance their research for scientific excellence, entrepreneurship and innovation. The two groups have engaged a Minneapolis-based consulting company, Capita3, in this effort.

Capita3 provides the Leader Launch Program designed to enhance women leaders' confidence and effectiveness to help them deliver on their business, research or technology projects. Participants meet four times for three-hour sessions over three weeks to address the fears that hold them back from achieving their goals. They then develop a process to accomplish a near-future milestone related to an entrepreneurial or research project.

"Diversity of thought and experience are important for advancing research to application," says Dr. Westendorf, Department of Orthopedic Surgery and Department of Biochemistry and Molecular Biology at Mayo Clinic in Rochester

and the Margaret Amini Professor of Orthopedic Regenerative Medicine Research. "Teams with diverse perspectives are more productive and more likely to address problems in new ways. This program aims to provide women with the tools they need to advance their ideas."

To date 36 Mayo Clinic faculty members, post-doctoral and graduate students, and allied health staff members have participated in Leader Launch, with more cohorts planned. The Office of Research Diversity and Inclusion will track participants' outcomes to determine the program's effectiveness.

How it's helping

Senior research fellow Yuguang Liu, Ph.D. (SR '16), trained as an electrical engineer but has worked extensively on biological projects in the last few years. She hopes to transition to a junior faculty position in the biomedical engineering track in the near future. She describes Leader Launch as a self-discovery program well suited to her needs as she starts this journey.

“Teams with diverse perspectives are more productive and more likely to address problems in new ways.”

— Jennifer Westendorf, Ph.D.



Jennifer Westendorf, Ph.D.



Yuguang Liu, Ph.D.

“The program helped me look at myself and my career goals differently, discover my strengths and weaknesses, and improve how I position my skills and abilities in the best light,” says Dr. Liu. “The knowledge I gained from the program will help as I reach out to people for faculty opportunities, present my work and approach collaborators for grant applications.”

Mayo Clinic Graduate School of Biomedical Sciences Ph.D. student Luz Cumba-Garcia (IMM '21) participated in Leader Launch to organize her journey toward a patent.

“I’m aiming to patent my research focused on a noninvasive way to diagnose brain tumors such as glioblastomas (GBM) and monitor treatment outcomes with a simple blood draw,” says Cumba-Garcia. “The technology is a diagnostic tool to analyze small particles in blood called extracellular



Luz Cumba-Garcia

vesicles that are shed from brain tumors and can be found in the plasma of GBM patients. We plan to develop a kit that anyone could use to screen for brain tumors and assess therapy outcomes. We envision that this kit also could be used to monitor other kinds of tumors. I would like to start a company around this technology.”

Cumba-Garcia says the course taught her how to be more specific in her goals, establish task deadlines and accountability measures to achieve them, identify and learn from her strengths and weakness, and be a professional leader.

“Patents can take a long time, but we’re making progress. I’m doing a lot of networking and contacting potential investors,” she says. “I feel more empowered and optimistic about my project after participating in this amazing women leadership program.”

OUT OF THE SHADOWS



Often-neglected endocrine cancers benefit from specialist integration

Crystal Hilger, Keith Bible, M.D., Ph.D., Ashish Chintakuntlawar, M.B.B.S., Ph.D., John Morris III, M.D., and Mabel Ryder, M.D.





Most medical centers and major cancer organizations arrange cancers by organ systems. Patients with advanced radioactive iodine refractory thyroid cancers have traditionally been cared for in head and neck groups, and adrenal cancers in genitourinary groups.

Unfortunately, this means that patients with endocrine cancers are embedded in groups that are home to much more prevalent cancers, seemingly relegating endocrine cancers to second-class status. For example, within medical oncology, squamous cell head and neck cancers far outnumber anaplastic thyroid cancer; prostate and kidney cancers eclipse adrenal cortical carcinoma and malignant pheochromocytoma. As a result, these less common but life-threatening endocrine cancers don't get the attention they need.

Since 2005 Mayo Clinic has bucked this traditional system by pulling endocrine cancers out of the shadows with the formation of its Endocrine Malignancies Disease Group, which spans all Mayo locations. The multidisciplinary group integrates Mayo Clinic specialists in endocrinology, medical oncology, endocrine surgery, ENT surgery, radiation oncology, pathology, radiology and nuclear medicine to focus on these often-neglected cancers.

On the Rochester campus, the disease group spawned the endocrine cancer care team, a standalone entity in the Division of Medical Oncology. Care team members include medical oncologists Keith Bible, M.D., Ph.D. (I '92, HEMO '96, PHAR '99), and Ashish Chintakuntlawar, M.B.B.S., Ph.D. (HEMO '16), and endocrinologists Mabel Ryder, M.D. (ENDO '13), and John Morris III, M.D. (ENDO '88). These physicians, along with chemotherapy nurse Crystal Hilger, combine forces to provide true sub-specialized care for patients with the most advanced and threatening endocrine cancers.

"It's challenging to gain traction for endocrine cancers when an anatomical-based medical oncology structure is dominant, leading endocrine cancers to be overwhelmed by more common cancers," says Dr. Bible, founding chair of Mayo's Endocrine Malignancies Disease Group. "The structure we've

adopted at Mayo Clinic allows us to more specifically develop the practice, clinical expertise, research and clinical trials in this previously neglected disease space."

Restructuring of how endocrine cancers are addressed at Mayo Clinic has led to:

- **Refined and integrated care across spectrum of endocrine cancers:** Achieved disease group unity across Mayo Clinic campuses; implemented biweekly video-conferenced Endocrine Cancer/Thyroid Tumor Board; developed novel therapeutic approaches for treatment of rare endocrine cancers; expanded education of providers, fellows and residents, and fostered collaborative efforts; instituted annual Endocrine Malignancies Disease Group retreat focused on improving patient outcomes with advanced cancers and unifying the practice.
- **Optimized approach to thyroid nodules:** Developed care process model for AskMayoExpert to guide evaluation of thyroid nodules across Mayo Clinic — one of the most used care models.
- **Improved overall survival in anaplastic thyroid cancer:** Increased one-year survival from 10% to 42% from 2000 to 2018 with coordinated use of surgery, chemotherapy and radiation therapy; developed and completed first-ever fully accrued randomized therapeutic clinical trial through Radiation Therapy Oncology Group with 100+ participating sites.
- **Increased clinical trial participation:** Grew from no therapeutic endocrine cancer clinical trials in 2004 to 12 completed investigator-developed and led trials in differentiated, medullary and anaplastic thyroid cancers as well as paraganglioma/pheochromocytoma and adrenal cortical carcinoma; five trials actively accruing patients in 2019; promotion of trials within cooperative trial groups.
- **Increased volume of patients with most threatening advanced endocrine cancers:** Tripled medical oncology endocrine cancer practice patient volumes between 2007 and 2009 with implementation of endocrine cancer-focused group.

“Endocrinologists and surgeons are often the frontline providers for patients with endocrine cancers, while patients with the most threatening disease are traditionally seen by medical oncologists,” says Dr. Ryder. “At many medical centers, medical oncologists who treat these patients lack expertise because they might see only one or two such patients per year, making it difficult to be up to date in this area. Complex endocrine cancers also often have life-threatening hormone-related complications of their disease, necessitating integrated endocrine oncology expertise. At most institutions there simply aren’t large numbers of advanced endocrine cancer patients, making it a challenge for any physician or practice to

have the concentration of expertise necessary to develop novel therapies for these cancers.

“In part due to Mayo Clinic’s commitment to developing and leading practice-changing therapeutic clinical trials in metastatic conditions, we’ve had a significant increase in patient referrals. We now have a high-volume advanced endocrine oncology practice. Our experience demonstrates that developing a subspecialty tumor group for uncommon malignancies offers an opportunity to build expertise, increase patient volumes, and enhance therapeutic options and clinical trials for these historically neglected cancers.”

“The structure we’ve adopted at Mayo Clinic allows us to more specifically develop the practice, clinical expertise, research and clinical trials in this previously neglected disease space.” — Keith Bible, M.D., Ph.D.

Mayo Clinic’s special expertise

Mayo Clinic is ranked No. 1 in diabetes and endocrinology in the latest *U.S. News & World Report* ranking, but Mayo Clinic’s preeminence in endocrinology dates back to its early days. Charles W. Mayo, M.D., was a groundbreaking endocrine surgeon, and Henry Plummer, M.D., was a pioneer in thyroid diseases. Mayo Clinic’s Edward Kendall, Ph.D. (BIOC ’14), and Philip Hench, M.D. (I ’25), were awarded the Nobel Prize in Physiology or Medicine in 1950 for their discoveries of the hormones of the adrenal cortex, their structure and their biological effects.

Mayo Clinic physicians and scientists continue to break new ground in endocrine cancers:

- Foster world-class expertise in interpretation of cytology specimens from thyroid nodule fine needle aspirations
- Pioneered treatment of recurrent thyroid cancer in neck with ultrasound-directed ablation, a specialized technique that reduces need for surgery
- Developed integrated multimodal approach to initial treatment of anaplastic thyroid cancer that has led to improved survival in otherwise uniformly deadly disease
- Optimized preoperative decision-making and outcomes from surgery for cancerous and benign adrenal tumors, including via robotic approaches
- Adopted novel approaches to treat endocrine cancer with radiotherapeutics:
 - Selumetinib prior to administration of radioactive iodine therapy to improve efficacy in differentiated thyroid cancer
 - Lutathera to treat chemotherapy-resistant somatostatin-avid endocrine cancers such as metastatic paraganglioma



ALUMNI EXPERIENCE LIFE-THREATENING MEDICAL ORDEAL FROM RARE ENDOCRINE TUMOR



Staci Tanouye, M.D. (OBG '12), and her husband, Amit Merchea, M.D. (S '12, CRS '13), trained at Mayo Clinic in Rochester. The couple moved to Jacksonville, Florida, five years ago. Dr. Tanouye pursued private practice obstetrics and gynecology, and Dr. Merchea joined the Division of Colon and Rectal Surgery at Mayo Clinic in Florida. They'd lived in Jacksonville for two years when Dr. Tanouye's two-year medical odyssey began.

In October 2015 Drs. Tanouye and Merchea went to Germany, where Dr. Merchea attended a medical conference. It was their first extended time away from their 18-month-old son, Niam. Almost immediately upon landing in Dusseldorf, Dr. Tanouye felt sudden chest pressure, heart palpitations and a throbbing thunderclap headache.

"I was in so much pain, I couldn't talk," she says. "I curled up in a ball in the airport until the symptoms subsided." The symptoms recurred during

the trip, sending Dr. Tanouye to a hospital. Physicians diagnosed her with a spontaneous cerebral spinal fluid leak. After four days in the hospital, they recommended she travel back to the U.S. and lie flat on the plane ride home. The trip back home included another bout of symptoms, and the couple went straight to Mayo Clinic upon arrival in Jacksonville.

Dr. Tanouye was diagnosed first with reversible cerebral vasoconstriction syndrome (RCVS) and, a year later, with supraventricular tachycardia (SVT). She was treated with medication and cardiac ablation. The symptoms abated long enough in 2018 for the couple to decide to grow their family.

"I work with maternal-fetal medicine specialists, so I was well educated about what to expect during pregnancy with my diagnosis," says Dr. Tanouye.

During her first trimester of pregnancy, Dr. Tanouye's symptoms, including very high blood pressure, returned with full force. Dr. Merchea told



Staci Tanouye, M.D., with son Kiran, who was born at Mayo Clinic in Rochester, where his mother was treated for a rare endocrine tumor.

his wife he had a feeling their baby would need to be born in Rochester. Dr. Tanouye also had a bad feeling and told her husband she feared she'd either have a stroke or die from her condition. "Every day was a struggle," she says. "I had to cut back at work. I couldn't even walk up the stairs in our house to put our son to bed."

Dr. Tanouye was in and out of the emergency department with severe headaches and very high blood pressure, resulting in changes in medication. At 28 weeks of pregnancy she was hospitalized at Baptist Medical Center Jacksonville for almost four weeks with blood pressure as high as 260/140 and an alarmingly slow heart rate. For the first time, the baby became distressed and his heart rate decreased.

"I could only focus on surviving, minute by minute," says Dr. Tanouye. "I left the worrying to Amit."

A maternal-fetal medicine specialist suggested testing for a pheochromocytoma, a rare tumor that

develops in an adrenal gland. The tumor releases hormones that cause episodic or persistent high blood pressure. Untreated, a pheochromocytoma can result in life-threatening damage to other body systems, especially the cardiovascular system.

The test revealed that Dr. Tanouye likely had a pheochromocytoma, and an MRI showed the 7 centimeter paraganglioma behind the head of the pancreas — between the aorta and vena cava.

Mae Sheikh-Ali, M.D. (ENDO '07), an endocrinologist at Baptist Medical Center, had trained at Mayo Clinic in Florida. She contacted William Young Jr., M.D. (ENDO '84), in the Division of Endocrinology, Diabetes, Metabolism, & Nutrition at Mayo Clinic in Rochester, to discuss Dr. Tanouye's diagnosis.

Simultaneously, Dr. Merchea reached out to his mentors in Rochester, Geoffrey Thompson, M.D. (S '88), Division of Breast, Endocrine, Metabolic, and Gastrointestinal Surgery; and David W. Larson,



Mayo Clinic alumni Staci Tanouye, M.D., and Amit Merchea, M.D., and sons Kiran and Niam.

M.D. (S '02, CRS '03), Division of Colon and Rectal Surgery. Dr. Tanouye also reached out to her mentor in Rochester, Carl Rose, M.D. (OBG '05), Division of Maternal and Fetal Medicine. "I emailed him: 'Interesting patient; need help with a consult; it's me,'" she says.

"Dr. Rose called me and sent all the posters and papers he'd published on this tumor type," says Dr. Tanouye. "He emailed colleagues in anesthesiology and surgery to assemble a team to care for me in Rochester. In a very short time, a team had been assembled, stabilizing medications were prescribed, a plan was put in place to transfer me safely from Florida to Minnesota, and dates were set for a C-section and tumor resection."

Dr. Merchea wanted his wife's care to be in Rochester due to the many uncertainties about her condition. "At Mayo Clinic, we do complicated things

every day," he says. "We make the uncertain familiar. Rochester was the safest place to be."

It didn't hurt that Dr. Thompson has more experience with pheochromocytoma/paraganglioma than anyone else in the world.

Dr. Tanouye's symptoms would have been exacerbated by flying, so the couple made the 1,350-mile trip in a minivan, with her reclining in the vehicle. They arrived in Rochester on Dec. 4, 2018, and embarked on two weeks of consultations. A C-section was scheduled for Dec. 18 at 36 weeks' gestation.

"As I was wheeled to surgery, several of my former gynecologic oncology colleagues — Carrie Langstraat, M.D. (GYNO '11, Division of Gynecologic Surgery), Jamie Bakkum-Gamez, M.D. (OBG '06, GYNO '09, Department of Surgery), and Alexis Hokenstad, M.D. (OBG '15, GYNO '18, PLM '19, Division of Hospice and Palliative Medicine) —

“ At Mayo Clinic, we do complicated things every day. We make the uncertain familiar. Rochester was the safest place to be.”

— Amit Merchea, M.D.

were waiting outside the OR to wish me luck. It was emotional because they're like family — my Mayo family. It meant so much to know they were operating nearby and available in case anything happened during my delivery.”

Kiran Merchea was born weighing 6 pounds, 9 ounces. He and his mother were discharged after one night in the hospital. Four weeks later, Dr. Tanouye returned for resection of the tumor.

Dr. Thompson says paraganglioma can be tricky to remove because they can wrap around major blood vessels. Despite the potential complications, Dr. Thompson says his team is very comfortable managing patients with these tumors due to surgical expertise and volume they've treated.

The morning after surgery, Dr. Tanouye walked farther than she had in months. With the tumor removed, her symptoms disappeared. She was found to have a genetic mutation that predisposes her to tumor recurrence. She'll have annual checkups throughout her life.

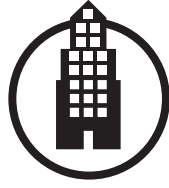
Dr. Tanouye is grateful for the seamless care she had at Mayo Clinic. “Mayo Clinic is the absolute best health care system in the world. The teamwork and our colleagues saved my life.”

Dr. Merchea says the experience has given him new understanding of what families go through in complex medical journeys and has inspired him to look for ways to help them understand and cope.

This medical odyssey also changed Dr. Tanouye. She quit her busy OB/GYN practice. “I worked long hours and was often on call or at the hospital,” she says. “After this ordeal, my family became much more important to me.” She took a new job, practicing gynecology part time and says it gives her better work-life balance. “I realized that my career is miniscule compared to everything else in life.”



Clockwise from left: William Young Jr., M.D., Geoffrey Thompson, M.D., David W. Larson, M.D., and Carl Rose, M.D.



After career of breaking glass ceiling in surgery,

HEIDI NELSON, M.D., RETIRES

Heidi Nelson, M.D. (CRS '88, S '89), retired in June after 29 years on the Mayo Clinic staff. Dr. Nelson had a number of firsts in the Department of Surgery: the first woman on staff (1990), the first woman division chair (Colon and Rectal Surgery, 1996-2006) and the first woman department chair (2013).

Although Dr. Nelson broke the glass ceiling for women surgeons at Mayo Clinic, she doesn't see herself as a pioneer.

"It was there to be done, but I didn't set out to do it and there certainly was no script for how to do it," says Dr. Nelson, the former Fred C. Andersen Professor. "I did my work and put my best effort forward. Breaking the glass ceiling was a consequence. I was, however, aware that I had to do it well so others who came after me had the same opportunities and didn't have to pay a price. The level of respect at Mayo Clinic is second to none, which made it easy to give my best and have it recognized by this excellent institution.

"Back in the day, it wasn't considered viable to be a serious surgeon in academic medicine and have a family. I thought those roles were incompatible. The women who came after me have proven that wrong.

They'll find their way by giving their best, being true to themselves and bringing the best of everyone forward to make health care better for all people."

When Dr. Nelson came to Mayo Clinic from the Pacific Northwest for a fellowship in 1987, she never intended to stay. She says she quickly realized Mayo was the place for her. "I wanted to learn from the people here and grow to become more like them."

Dr. Nelson says she'll miss the Mayo Clinic community and culture. "I identified with being a surgeon and loved my job. I had the greatest job on earth: a surgeon at Mayo Clinic — the 'A team' in surgery."

Dr. Nelson will keep her hand in medicine as director of six cancer programs of the American College of Surgeons, helping to ensure high-quality cancer care across institutions including Mayo Clinic. She says she'll spend time on pursuits she's put off — sailing, symphonies, hiking and going to plays — and helping her daughter, a high school senior, prepare for college.

"Stepping aside is an important part of the natural life cycle of leadership," says Dr. Nelson. "I walk away satisfied if I've given back to medicine, surgery and Mayo Clinic or paid it forward in some part."





MERGING MINDS TO ACCELERATE RESEARCH DISCOVERY



Mayo Clinic and Arizona State University formed the Mayo Clinic-Arizona State University Alliance for Health Care in 2010 to merge minds and accelerate research discoveries, improve patient care through innovation and transform medical education to enhance health outcomes.

Highlights of two of the joint research efforts follow. To learn more, visit mayo.asu.edu/research.

Identifying a blood-based biomarker for early-stage Parkinson's disease

- Charles Adler, M.D., Ph.D. (N '91), Department of Neurology, Mayo Clinic in Arizona
- Michael Sierks, Ph.D., School for the Engineering of Matter, Transport and Energy, ASU

Researchers know that patients with Parkinson's disease and other neurodegenerative disorders have abnormal accumulations of different proteins in the brain. In Parkinson's disease this is mainly the protein alpha synuclein. There also may be small soluble aggregates of these proteins that result in a distinct protein variant biomarker profile.

The Mayo-ASU team plans to analyze blood samples from early and advanced Parkinson's patients to see if the protein patterns change as the disease progresses. There also are plans to study individuals who may be at risk for developing Parkinson's disease to determine if the protein patterns could predict who will develop the disease. The team hopes to obtain biological samples from individuals who have donated their bodies to science and were found upon autopsy to have indicators that they may have developed Parkinson's if they had lived longer.

These samples will help researchers identify the precise abnormal form of synuclein that indicates early-stage Parkinson's disease so physicians potentially can begin testing for it.

Dr. Sierks has had success identifying biomarkers that have been used to diagnose Alzheimer's disease as early as five to 10 years before an initial diagnosis of mild cognitive impairment. He believes the same is possible for Parkinson's.



Robin Patel, M.D.



Lynda Williams, Ph.D.



Charles Adler, M.D., Ph.D.



Michael Sierks, Ph.D.

Fighting disease-causing bacteria in wounds

- Robin Patel, M.D. (I '92, INFD '95, CM '96), chair, Division of Clinical Microbiology, Department of Laboratory Medicine and Pathology; Division of Infectious Diseases, Department of Medicine, Mayo Clinic in Rochester; the Elizabeth P. and Robert E. Allen Professor of Individualized Medicine
- Lynda Williams, Ph.D., School of Earth and Space Exploration, ASU

Researchers have identified that a type of clay can kill bacteria, including many drug-resistant pathogens, and diminish populations of bacterial biofilms that make the bacteria relatively resistant to antibiotics. These biofilms appear in two-thirds of infections seen by health care providers.

Under laboratory conditions, one concentration of Oregon blue clay suspension killed bacteria including *Escherichia coli* and *Staphylococcus aureus* and strains such as carbapenem-resistant Enterobacteriaceae and methicillin-resistant *Staphylococcus aureus* (MRSA).

These results support efforts to design new antibacterial drugs using natural clays.



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Registration information: alumniassociation.mayo.edu/events

MAYO CLINIC UPDATE

Racism in medical school associated with graduates' decisions to provide care in underserved communities

A Mayo Clinic study provided evidence that racism manifested at multiple levels in medical schools was associated with graduating students' decisions to provide care in high-need communities.

Mayo Clinic researchers examined the relationship between manifestations of racism in medical school and subsequent changes in graduating medical students' intentions to practice in underserved or minority communities, compared to their attitudes and intentions when they began medical school. The study included data from 3,756 students at 49 U.S. medical schools, collected from 2010 to 2014.

Students' more negative explicit racial attitudes when they completed medical school were associated with decreased intention to practice with underserved or minority populations at graduation. Factors that increased students' intention to care for minority patients or practice in underserved communities included:

- Service learning experiences
- Curriculum focused on minority health/disparities
- Students' perceived skill at developing relationships with minority patients
- Proportion of minority students at the school
- Awareness of subtle and implicit forms of racism and discrimination in the medical school environment

Sean Phelan, Ph.D. (HSR '13), Division of Health Care Policy and Research, Department of Health Sciences Research at Mayo Clinic in Rochester, was first author on the study. Dr. Phelan says strategies are needed to identify and eliminate structural racism and its manifestations in medical school. This research is ongoing; Dr. Phelan and his colleagues continue to collect data from this cohort as its members complete residency and move into practice.



‘Introducing, Jane’

A study led by Narjust Duma, M.D. (HEMO '19), a former fellow in the Division of Hematology at Mayo Clinic in Rochester, found that gender bias can be reinforced through the use of gender-subordinating language and differences in forms of address.

Dr. Duma reviewed 781 presentations from the video archives of American Society of Clinical Oncology meetings. She found that:

- Women were less likely to receive a professional form of address and more likely to be introduced by first name only.
- Men who introduced speakers were more likely to introduce women by first name only.
- Women who introduced speakers were more likely to introduce speakers by professional title, regardless of gender.

“Our results show that unconscious bias may be present and be a driver of gender disparities in medicine,” says Dr. Duma, now at the University of Wisconsin Carbone Cancer Center in Madison.



Mayo Clinic receives \$32 million gift to advance research

A \$32 million gift from the Anna-Maria and Stephen Kellen Foundation will enable Mayo Clinic to expand its research mission with the construction of a four-story, 64,000-square-foot research building in Rochester.

Planning for the Anna-Maria and Stephen Kellen Building is underway, with groundbreaking expected in 2020 and occupancy in 2022. The building will be located just north of Mayo Clinic’s Opus Building, on the corner of Fourth St. SW and Fourth Ave. SW. The new building will add to downtown Rochester’s Discovery Square — the research, innovation and development hub of the Destination Medical Center initiative.

Anna-Maria and Stephen Kellen, now deceased, received care at Mayo Clinic for decades, Stephen Kellen was president and CEO of Arnhold and S. Bleichroeder Inc., an international investment firm based in New York, now known as First Eagle Investment Management LLC.

“Our family’s history with Mayo Clinic spans more than four decades, and the physicians and staff at Mayo have become like family to us,” says the couple’s daughter, Marina Kellen French. “We are thrilled to be able to support Mayo and be part of advancing medical research that will help patients for decades to come.”



Nobel Laureate Richard Axel, M.D., of the Howard Hughes Medical Institute, and Mortimer B. Zuckerman Mind Brain Behavior Institute at Columbia University, was commencement speaker.

Pomp and circumstance

In May, 40 medical students, 28 Ph.D. students and two M.D.-Ph.D. students from Mayo Clinic's Rochester campus participated in commencement at Mayo Civic Center (above).

Mayo Clinic is among 'Top 50 Workplaces for Indigenous STEM Professionals'

Mayo Clinic was selected as one of the "Top 50 Workplaces for Indigenous STEM Professionals" by the American Indian Science and Engineering Society in recognition of overall diversity recruitment efforts and recruiting within indigenous populations for occupations within science, technology, engineering and math (STEM) fields.



Refer-a-friend

Alumni can refer friends and family who are not their patients through a handy new referral tool. These referrals receive priority attention. alumniassociation.mayo.edu/resources/refer-a-friend

Richard Gray, M.D., named CEO of Mayo Clinic in Arizona



The Mayo Clinic Board of Trustees elected Richard Gray, M.D. (S '00), as CEO of Mayo Clinic in Arizona. He succeeds Lois Krahm, M.D. (MED '89, P '93, PCON '94), who served as interim CEO after CEO Wyatt Decker, M.D. (MED '90, I '93), retired in December 2018.

Dr. Gray is a professor of surgery in the Mayo Clinic College of Medicine and Science. He was recognized as Mayo Clinic Distinguished Educator of the Year in 2013. His research focuses on breast cancer, sarcomas, melanoma, and reducing pain in treatment and recurrence after treatment.

Dr. Gray came to Mayo Clinic in Arizona in 1995 as a surgical intern and completed his residency and fellowship in surgical oncology at Mayo Clinic in Arizona. After a second fellowship in surgical oncology at the Moffitt Cancer Center in Tampa, Florida, Dr. Gray joined the Mayo Clinic staff in 2001.

Mayo Clinic and other experts name Alzheimer's-like disease and issue urgent call for research

Mayo Clinic researchers are part of a working group that has established a name for a degenerative brain disease that affects elderly people and mimics features of Alzheimer's disease. The group describes limbic-predominant age-related TDP-43 encephalopathy, or LATE, as an underrecognized risk for public health and calls for an urgent focus on research to improve prevention, diagnosis and treatment of the disease.

Age-related TDP-43 proteinopathy has been known to clinicians for more than a decade, but common terminology was lacking. Naming the disease is an important step for future research.

Dennis Dickson, M.D. (PATH '97), Department of Neuroscience at Mayo Clinic in Florida and the Robert E. Jacoby Professor of Alzheimer's Research, and colleagues identified the first pathological manifestations of LATE in 13 elderly patients with dementia and brain changes in 1994. Other groups built and expanded on his and others' early work. "We have been studying this protein for many years and now have a common goal to target," says Dr. Dickson.



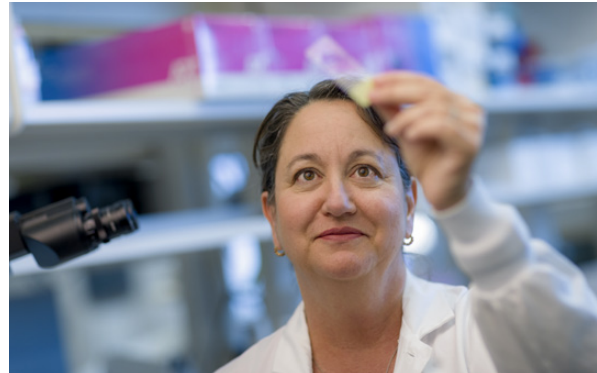
The working group recommends that TDP-43 testing be performed as part of routine autopsy evaluation in all older patients. More investigation is needed to test for memory and nonmemory symptoms that distinguish LATE from other degenerative disorders. No diagnostic tests exist to identify patients with LATE. Further research is needed to develop biomarkers such as brain imaging, with the goal of revealing the disease as early as possible so that when disease-modifying therapies are developed, the right patients can be targeted.

Less-invasive mastectomy is safe option for more breast cancer patients

A Mayo Clinic study has demonstrated that less-invasive mastectomy that leaves the surface of the breast intact has become a safe option for more patients, including those whose breast cancer has spread to nearby lymph nodes or who have risk factors for surgical complications. The procedure, nipple-sparing mastectomy, involves removing breast tissue; leaving the skin, nipple and areola; and immediately rebuilding the breasts.

In the study of 769 women who had the procedure, complications within 30 days after surgery declined from 14.8% in 2009 to 6.3% in 2017. At the one-year mark after surgery, reconstruction was considered a success in about 97% of cases.

Tina Hieken, M.D. (S '11), Division of Breast, Endocrine, Metabolic, and Gastrointestinal Surgery at Mayo Clinic in Rochester, was senior author on the study. "Offering enhanced aesthetics as a result of these surgeries to women who have had a devastating diagnosis is rewarding," she says. "Today breast cancer patients who are not offered nipple-sparing procedures should ask their surgeons why. These surgeries are proving safe for a broad patient base."



New genetic test classifies lymphomas

Current diagnostic tools don't provide a clear distinction between primary mediastinal large B-cell lymphoma and diffuse large B-cell lymphoma. This can lead to diagnostic inaccuracy and leave physicians guessing about the best course of therapy for patients.

A team of Mayo Clinic researchers led by Lisa Rimsza, M.D. (HEMP '15), Division of Hematopathology, Department of Laboratory Medicine and Pathology at Mayo Clinic in Arizona, launched a new genetic test, Lymph3Cx, which distinguishes between the two types of lymphoma. The new test can help physicians determine the correct classification of lymphoma and improve therapeutic decision-making.

"The Lymph3Cx test offers a glimpse into the biology happening inside the cells, painting a picture for what cannot be seen with a microscope, providing yet another piece of the diagnostic puzzle," says Dr. Rimsza.

Treating smoldering disease may delay onset of multiple myeloma symptoms



The largest randomized trial involving smoldering multiple myeloma suggests that the cancer drug lenalidomide may delay the onset of myeloma symptoms, according to Mayo Clinic researchers. The study was conducted by the Eastern Cooperative Oncology Group and funded by the National Cancer Institute.

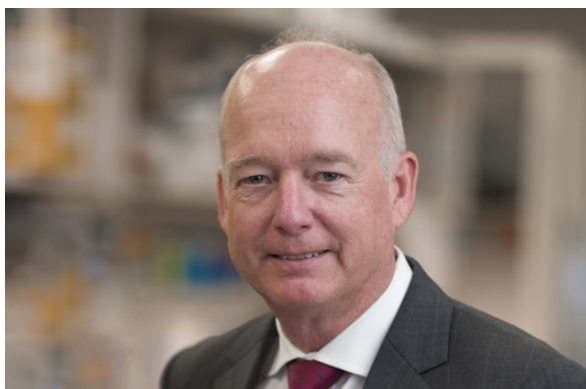
S. Vincent Rajkumar, M.D. (HEMO '99), Division of Hematology at Mayo Clinic in Rochester and the Edward W. and Betty Knight Scripps Professor of Medicine in Honor of Dr. Edward C. Rosenow, III, and senior author of the trial, says the trial, in combination with the findings from a 2015 Spanish study, may support a change in clinical practice. "The standard of care for smoldering multiple myeloma has been observation without therapy. We found that treatment of smoldering myeloma delays progression to symptomatic myeloma and can prevent damage to organs that occurs in multiple myeloma. We show that it is possible to delay progression to multiple myeloma by early therapy administered when the disease is still symptomatic."

Mouse model predicts efficacy of drugs in humans with multiple myeloma

Researchers on Mayo Clinic's Arizona campus have developed a transgenic mouse model of multiple myeloma that is faithful to what happens in tumor development in human disease. This finding enables researchers to rapidly screen compounds in the mouse to prioritize drugs for clinical trial. The cellular machinery that causes the mutation in the mice is the same cellular machinery thought to cause the mutation in people.

Researchers gave the mice several multiple myeloma drugs that had already undergone clinical trials. Drugs that were known to be effective in humans also reduced myeloma tumors in the mice, and drugs that hadn't worked in humans also failed in the mice.

Leif Bergsagel, M.D. (CANRG '04), Division of Hematology and Medical Oncology at Mayo Clinic in Arizona and the David F. and Margaret T. Grohne Professor of Novel Therapeutics for Cancer Research, says that's valuable information for guiding decisions about which drugs should proceed to clinical trial. "It's almost unheard of in cancer to have a model this predictive. It's very helpful for patients not to have to go through treatment with drugs that have a low likelihood of working."





Mark McNiven, Ph.D., and Lewis Roberts, M.B., Ch.B., Ph.D.

Mayo Clinic researchers receive first hepatobiliary cancer SPORE grant

A team of researchers from the Mayo Clinic Cancer Center was awarded a five year, \$11.5 million Specialized Program of Research Excellence (SPORE) grant in hepatobiliary cancer. It is the only National Cancer Institute-funded SPORE focused on cancers of the liver.

Principal investigators for the new SPORE grant are from Mayo Clinic in Rochester: Mark McNiven, Ph.D. (GI '89), Division of Gastroenterology and Hepatology, and the George M. Eisenberg Professor; and Lewis Roberts, M.B., Ch.B., Ph.D. (I '95, GI '98), Division of Gastroenterology and Hepatology, and

the Peter and Frances Georgeson Professor of Gastroenterology Cancer Research. Collaborators include researchers from the Rockefeller University and University of Pittsburgh.

Researchers are conducting four translational research projects in liver cancer. The SPORE funds also are being used to develop a world-class biorepository for liver cancer specimens and create a statistical core to provide analyses on research projects and an administrative core to manage projects.

Obituaries

Onyekwere Akwari, M.D. (S '78), died April 14, 2019.

Dr. Akwari was a founder of the Society of Black Academic Surgeons. See alumniassociation.mayo.edu/people/obituaries for story.

Robert Altman, M.D. (I '69), died May 30, 2019.

Philip Dahlberg, M.D. (NEPH '77), died June 21, 2019.

Samuel Gillis, M.D. (S '65), died July 10, 2017.

H. Clark Hoagland, M.D. (I '66, HEM '70), died June 2, 2019.

Ellias Manoles, M.D. (PATH '64), died May 21, 2018.

Patrick Moulton, M.D. (I '70), died Aug. 7, 2018.

Daggett Royals, M.D. (OR '68), died Dec. 16, 2018.

Marc Shampo, Ph.D. (PUBL '62), died April 25, 2019.

Thomas Stillwell, M.D. (U '88), died May 8, 2019.

Craig Stump, M.D., Ph.D. (I '00, ENDO '03), died May 4, 2019.

Harry Webb, M.D. (PLS '62), died April 6, 2019.

Complete obituaries and alumni news:

alumniassociation.mayo.edu/people

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Mayo Clinic has again been ranked as the nation's best hospital in *U.S. News & World Report's* 2019-20 Best Hospitals rankings. Mayo Clinic Hospital – Rochester has been at or near the top of U.S. hospitals throughout the history of *U.S. News & World Report's* Best Hospitals reports. In addition to its No. 1 overall ranking, Mayo Clinic Hospital – Rochester has more No. 1 rankings in medical subspecialty areas than any other medical center.

Other highlights

- Mayo Clinic is the No. 1 hospital in Minnesota and Arizona.
- Mayo Clinic in Jacksonville, Florida, is No. 1 in Jacksonville and No. 3 in Florida.
- Mayo Clinic Hospital in Phoenix, Arizona, tied for No. 18 on the Honor Roll of top 20 hospitals in the nation.
- Mayo Clinic Health System in Eau Claire ranked nationally as High-Performing in Gastroenterology and GI Surgery, is ranked No. 4 among all Wisconsin hospitals and is recognized as a Best Regional Hospital in Northwest Wisconsin.

Mayo Clinic Hospital – Rochester is ranked No. 1 in five specialty areas

- Diabetes and endocrinology
- Ear, nose and throat
- Gastroenterology (GI) and GI surgery
- Nephrology
- Urology

No. 2 in six specialty areas

- Cardiology and heart surgery
- Geriatrics
- Gynecology
- Neurology and neurosurgery
- Orthopedics
- Pulmonology and lung surgery

No. 3 in:

- Cancer

Mayo Clinic Alumni magazine is published quarterly and mailed free of charge to physicians, scientists and medical educators who studied and/or trained at Mayo Clinic, and to Mayo consulting staff. The magazine reports on Mayo Clinic alumni, staff and students, and informs readers about newsworthy activities throughout Mayo Clinic.

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