DEPARTMENT OF MEDICINE ANNUAL REPORT

Beth Israel Lahey Health

Beth Israel Deaconess Medical Center | HARVARD MEDICAL SCHOOL TEACHING HOSPITAL

OUR BEST FOR BOSTON & BEYOND

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A note on photography: the photos found within this Report were taken before and after the onset of the pandemic, depicting individuals who are both masked and unmasked. Photos taken after the onset of the pandemic were done so per the safety regulations implemented by our hospital's Infection Control group, which follow State and National guidelines.

FROM **THE CHAIR**

Our latest Annual Report describes our recovery from the COVID pandemic and the restoration of our tripartite missions in the post-COVID world. Despite historic shortages of support personnel and other disruptions to the healthcare system, we have continued to provide outstanding patient care, to educate the next generation of healthcare leaders, and to perform research of the highest impact.

During this past academic year, the Department continued its tradition of providing superb, high-quality care to ever-increasing numbers of outpatients and inpatients, both on BIDMC's main campus and at an ever-growing number of community sites. We opened and moved into the Klarman Building, a state-of-the-art facility which has markedly enhanced the care of our patients. We played critical roles in launching a new cardiac transplant program and enhancing the strength of our existing programs in kidney, liver, and kidney-pancreas transplantation. We have enhanced the integration of Joslin Diabetes Center into our care and as of this writing (though not reflected in this report), we are preparing to welcome the Dana-Farber Cancer Institute into a long-term collaboration with our hospital and Department. We also anticipate ever closer affiliations and collaboration with our colleagues at Mount Auburn Hospital.

Our educators led the way in developing new curricula at Harvard Medical School and continued to recruit and train superb classes of interns, residents, and fellows. Our educators were honored repeatedly for their dedication, ingenuity, and effectiveness.

In the research arena, we highlight our efforts to enhance career development of young investigators. Our resident research course is extremely highly regarded, and we have opened the course to our fellowship trainees. We have many extremely promising investigators on K awards, and our conversion rates from K to R awards are among the highest anywhere. Led by our Chief Academic Officer, Dr. Szabo, the InSPIRE plan has strengthened our research community across BIDMC and been revamped with new benchmarks for InSPIRE 2030, and we summarize our Department's enormous participation in the development of research at BIDMC.

We hope that you will find this Annual Report to be both informative and inspirational. The ebbing of COVID left behind many challenges, and we continue to adapt and thrive in a rapidly changing healthcare and research environment. Like BIDMC and BILH, this Department's success relies heavily on altruism: our commitment to do the right thing, to behave in a righteous manner, in all of the work we do. Our people joined the healing professions to make a difference and improve the world. With the guidance of our lay boards, our tight connection to Harvard Medical School, and our close-knit teamwork with our hospital administrative colleagues, we continue to keep our promise to perform our patient care, teaching, and research missions in an exceptional and compassionate manner.

Mark L. Zeidel, MD
Chair, Department of Medicine

DEPARTMENTAL ORGANIZATION

Administration

Mark Zeidel, MD
Department Chair

Kevin Maguire, MS
Chief Administrative Officer

Donald Cutlip, MD
Vice Chair, Clinical Care in the Community

Barbara Kahn, MD
Vice Chair, Research Strategy

Peter Weller, MD
Vice Chair, Research

Howard Libman, MD
Vice Chair, Career Development and Mentoring

C. Christopher Smith, MD
Vice Chair, Education

Anjala Tess, MD
Vice Chair, Quality

Julius Yang, MD, PhD
Vice Chair, Clinical Affairs

Daniel Karnes
Executive Director, Finance and Business Operations

Paul Hart Miller
Director, Business and Network Development

Scot Sternberg, MS
Director, Quality Improvement

Clinical Divisions

ALLERGY AND INFLAMMATION

Peter Weller, MD
Division Chief

Amanda Yano-Litwin, MHA
Division Administrator

CARDIOVASCULAR MEDICINE

Robert Gerszten, MD
Division Chief

Meaghan Strob
Division Administrator

ENDOCRINOLOGY, DIABETES AND METABOLISM

Evan Rosen, MD, PhD
Division Chief

Amanda Yano-Litwin, MHA
Division Administrator

GASTROENTEROLOGY

Nezam Afdhal, MD, DSc
Division Chief

Sara Montanari
Division Administrator

GENERAL MEDICINE

Eileen Reynolds, MD
Division Chief

Meaghan McCusker
Division Administrator

GERONTOLOGY

Sarah Berry, MD, MPH
Division Chief

Brett Rubin
Division Administrator

HEMATOLOGY AND HEMATOLOGIC MALIGNANCIES

David Avigan, MD
Division Chief

Andrea Vatulas
Division Administrator

INFECTIOUS DISEASES

Christopher Rowley, MD, MPH
Interim Division Chief

Amanda Yano-Litwin, MHA
Division Administrator

MEDICAL ONCOLOGY

David F. McDermott, MD
Division Chief

Kevin Casey
Division Administrator

NEPHROLOGY

Martin Pollak, MD
Division Chief

Brett Rubin
Division Administrator

PULMONARY, CRITICAL CARE AND SLEEP MEDICINE

Richard Schwartzstein, MD
Division Chief

Jeffrey Weinstock
Division Administrator

RHEUMATOLOGY AND CLINICAL IMMUNOLOGY

George Tsokos, MD
Division Chief

Patricia Harris
Division Administrator

Research Divisions

CLINICAL INFORMATICS

Yuri Quintana, PhD
Division Chief

CLINICAL NUTRITION

Bruce Bistrian, MD, PhD, MPH
Division Chief

EXPERIMENTAL MEDICINE

Jerome Groopman, MD
Division Chief

HEMOSTASIS AND THROMBOSIS

Robert Flaumenhaft, MD, PhD
Division Chief

IMMUNOLOGY

Cornelius Terhorst, PhD
Division Chief

INTERDISCIPLINARY MEDICINE AND BIOTECHNOLOGY

Ary Goldberger, MD
Division Chief

SIGNAL TRANSDUCTION

Alex Toker, PhD
Division Chief

TRANSLATIONAL RESEARCH AND TECHNOLOGY INNOVATION

Steven Freedman, MD, PhD
Division Chief

CENTER FOR VIROLOGY AND VACCINE RESEARCH

Dan Barouch, MD, PhD
Division Chief

FROM **THE CAO**

The Department of Medicine continues to expand to meet our goals, focused on a renewed commitment to our core missions and support for our faculty and staff. The expansion can be seen in our growing workforce, in developing programs and services across our Divisions, through our new relationship with Dana-Farber Cancer Institute and closer ties with the Joslin Diabetes Center, and in physical extensions like the opening of the Klarman Building. With each step forward, we build on our foundation of past success while we strategically envision how to next meet the moment in a changing landscape across medicine.

Both Beth Israel and the Deaconess Hospital were founded with missions to provide high-caliber, accessible care for all across our community, and throughout our growth, healthcare equity has always remained a core value of the Department. We continue to focus on providing ambulatory care patients receive at our Boston campus closer to their homes, at an ever-growing number of community sites in collaboration with our BILH network. In the culmination of major collaborative efforts and work from our Division of Cardiovascular Medicine, we launched a BILH Heart Transplant program in 2024; our cardiac patients can now receive life-saving transplants and the full spectrum of care with their existing team. 2024 was also a highly successful year for our existing kidney and liver transplant programs, through the BIDMC Transplant Institute. We completed 84 kidney transplants, led by Martha Plavakis, MD, and our Transplant Nephrologists in the Division of Nephrology, and we completed 126 liver transplants, led by Michael Curry, MD, and our Transplant Hepatologists in the Liver Center and Division of Gastroenterology, Hepatology and Nutrition. Our liver transplant program is now the number one program in New England for transplant volume as well as number three in the nation for quality of successful patient outcomes.

Enhancing the faculty experience remains a top priority. We consistently ask ourselves how to optimize the trainee experience and the transition to junior faculty, and do so through thoughtful mentorship that is ingrained in our culture. We continue to ensure our researchers, at the bench and the bedside, have the resources to advance knowledge and translate findings into even greater care for our patients.

Each day, I am inspired to see what our faculty and staff can accomplish together. From providing top tier clinical care to pioneering research to educating the next generation of exemplary physicians, it is their talent, passion, and teamwork that makes our medical center what it is. It is how we show up and bring our best — for our patients, for each other, for Boston and beyond.

Kevin Maguire, MS
Chief Administrative Officer, Department of Medicine

VICE CHAIR **UPDATES**

EDUCATION

EILEEN REYNOLDS, MD
Outgoing Vice Chair, Education

C. CHRISTOPHER SMITH, MD
Incoming Vice Chair, Education

ANJALA TESS, MD
Outgoing Associate Vice Chair, Education

It's hard to encapsulate all of the progress in medical education into just a short update. Throughout the COVID-19 pandemic, our students, residents, and fellows persevered through constant COVID flexes, transitions, and stressors. We came out on the other side into a shiny new building with room to stretch out and learn. Here are some highlights from recent years:

- Dr. Jennifer Potter received AMA Foundation support to start one of the first LGBTQ+ health fellowships in the country. Combining resources from HMS, Fenway Health, and BIDMC, fellows from primary care fields will spend 12 months in intensive clinical and career development work.
- The residency program continues to focus on efforts to recruit talented learners with different backgrounds, experiences, academic accomplishments, research opportunities, and perspectives. Thanks to Drs. Daniele Ölvezcky, Ria Roberts, Pablo Quintero Pinzón, and Brittne Halford for their leadership of our recruitment and mentoring efforts. Thanks also to Dr. Lika Targan who leads our Social Justice track, designed to equip trainees to be change agents in our healthcare system and society. We are excited to see this and our additional programming on health equity progress further.
- Harvard Medicine Grand Rounds began in the Spring of 2020 as a COVID adaptation; it now continues as a monthly Grand Rounds series featuring at least one panelist speaker from each of the three major Harvard Departments of Medicine. Access is open and viewers join from around the globe.
- BIDMC Department of Medicine educators continue to advance across our system. Here are just a few examples:
  - Dr. Grace Huang, formerly the Director of the Rabkin Fellowship at BIDMC/HMS, was appointed Dean for Faculty Affairs at Harvard Medical School in July 2021.
  - Dr. Anita Vanka now leads the Harvard Medical School Course "The Practice of Medicine" across all sites at HMS, and has also been appointed as the Co-Director of the Rabkin Fellowship at BIDMC/HMS.

Similarly, the Department of Medicine's educational leadership is undergoing change. In November 2022, Dr. Tess stepped away from her educational role in order to assume her new role of Vice Chair for Quality, taking over from Dr. Mark Aronson. In July 2023, Dr. Reynolds stepped away from her role as Vice Chair for Education in order to focus on her work as Chief of the Division of General Medicine (and her new role as Faculty Dean of Leverett House, Harvard College). Dr. Smith has assumed the Vice Chair responsibilities, and will pass the Program Director title along to a new leader in the coming months. It's been a privilege and a joy for us to work together for so many years in service of the Department's Education mission.

RESEARCH

BARBARA KAHN, MD, MS
Vice Chair, Research Strategy

PETER WELLER, MD
Vice Chair, Research

Clinical, basic science, and outcomes research across many Divisions in the Department of Medicine continue to be vibrant and innovative. The Institutional Strategic Plan for Innovation, Research & Education (InSPIRE) program launched several years ago by Gyongyi Szabo, MD, PhD, Chief Academic Officer for BIDMC and Department researcher, continues to reshape and reimagine the future of research at our institution. The program will expand researchers' access to leading-edge technologies that can drive rigorous, state-of-the-art science and harness the power of clinical data to improve patient outcomes. It also emphasizes investment in and support of a diverse, inclusive, interdepartmental community that empowers faculty and facilitates mentorship. Over the past several years, three research hubs have been established at BIDMC: Neuroscience Connections; Pathogens, Immunity and Inflammation; and Systemic Effects of Metabolic Disease. The hubs have united over 350 investigators from across BIDMC Departments, bringing our leading minds together for synergistic collaborations. InSPIRE and the CAO's Office have hosted several successful BIDMC-wide research retreats. Department leaders from specialties including Endocrinology, Rheumatology, Gastroenterology, Vaccine Research, and Hematology/Oncology are playing active roles in leadership alongside investigators from other Departments (see the feature on InSPIRE on pages 20-23 to learn more).

Our research funding in the 2022 Fiscal Year was over $144 million, consisting of government, foundation, and corporate sources (see funding details on page 53). BIDMC consistently ranks as a national leader among independent medical centers in National Institutes of Health funding. The Department of Medicine plays a large role and accounts for 60% of BIDMC funding.

Our faculty continues to publish innovative and pioneering research in the world's leading scientific and medical journals, including *Nature, Lancet, The New England Journal of Medicine*, and *Cell Immunology* (see a list of selected publications on pages 46-51). Our investigators also continue to be recognized for their excellence in research, both via honors and awards from national organizations, as well as through elections to major societies (see pages 26-29 for a selected list of awards and accolades). Brad Lowell was elected to the prestigious National Academy of Sciences, joining the ranks of other Department of Medicine physician-scientists previously elected including Martin Pollak and Barbara Kahn.

Support for our young faculty and investigators continued undaunted, through the Franklin Epstein Society directed by Dr. Steve Freedman. Dr. Freedman and the society provide support to researchers at various stages of their careers, from initial grant applications to obtain mentored NIH K Grants up to Research Project (R01) Grants to launch their independent academic careers. That support has been instrumental in continued advancement of the careers of our young faculty and future leaders. The Department is home to over 30 K Grant awardees across eleven specialties, all working on innovative projects (See the full list of K Grant awardees on pages 30-31). The Department is committed to being proactive in increasing diversity in medical scientist training. Along these lines, the Department is grateful to Dr. Peter Zimetbaum, Clinical Chief of the Division of Cardiovascular Medicine and the Richard and Susan Smith Professor of Cardiovascular Medicine at Harvard Medical School, and his family for creating the Joan and Marcel Zimetbaum Endowed Fellowship in Health Outcomes, Equity, and Policy Research in their parents' honor. This fellowship supports trainees to perform mentored research in the Richard A. and Susan F. Smith Center for Outcomes Research, which has become a national leader in evidence-based research. The fellowship is directed by Dr. Rishi Wadhera, Section Head of Health Policy and Equity at the Smith Center.

The Department of Medicine continues to be successful in enabling groundbreaking scientific discoveries by supporting a vibrant, collaborative research environment. We maintain a firm commitment to outstanding research training and mentoring and to furthering diversity, equity, and inclusion at all levels of medical and research career development. The Department continues to foster a pipeline of promising junior investigators, mentored by our faculty, many of whom will be trailblazers and will make important contributions to biomedical research through productive careers at BIDMC and elsewhere.

VICE CHAIR **UPDATES**

CAREER DEVELOPMENT & MENTORING

HOWARD LIBMAN, MD
Vice Chair, Career Development and Mentoring

As the Vice Chair for Career Development and Mentoring, my primary goal is to serve the professional development needs of our faculty as they advance their careers in clinical care, education, and research. This goal will be accomplished through one-on-one academic counseling sessions, improvement of the annual review and mentorship processes in our Divisions, and implementation of a transparent and streamlined approach to academic promotion across the Department.

After assuming this role in late 2022, I met with Division leaders and other interested parties to understand the current needs in the Department. Based upon these valuable discussions, I have focused my initial work in the following areas:

One-on-One Academic Counseling
I am available to meet with individual faculty one-on-one career counseling sessions. These sessions can be used to obtain general guidance, to deal with specific questions, or to review CVs and discuss readiness for academic promotion. They are meant to supplement, but not replace, advice that our faculty may receive from mentors and/or Division leaders. Over a period of six months, approximately 20 faculty have requested such meetings.

Improvement of the Annual Review and Mentorship Process
Department faculty undergo an annual review, generally with their Division Chiefs, to discuss their accomplishments over the past year, identify areas of concern, and plan for the next few years. This task is accomplished using a structured content outline, which has been modified by some Divisions to meet the specific needs of their faculty. This exercise is also an opportunity to review the faculty member's readiness for promotion. The Division Chiefs and I plan to review the current structure of these reviews to make sure faculty needs are being optimally addressed.

Currently, mentorship across the Department takes a variety of forms. Department faculty often have clinical and academic mentors, who may be found informally or identified by Division leadership. Some Divisions have structured mentorship programs, whereas others do not. I plan to identify areas of mentorship need in the Department, expand the pool of trained mentors, and make them readily available to interested faculty to provide them with additional support for their professional growth.

Development of a Transparent and Streamlined Department Promotion Process
Once a faculty member is proposed for promotion at the Division level, the application goes to the Department Promotion Committee for review. This process can take a variable period of time based upon the quality of materials submitted and requests for letters of reference. We are establishing a tracking system to allow faculty candidates and Division leaders to determine the status of the applications on a monthly basis and to identify areas in which the Department can streamline and improve the overall process. This tracking system will also allow us to provide aggregate data to the Department as a whole regarding the number of faculty put up for promotion and the overall success rate.

In addition to these areas, we are working on identifying educational and administrative needs across the Department to support faculty professional development, establishment of a BIDMC Portal-based information resource for faculty interested in promotion, and the enhancement of collaborations between the Department, BIDMC, Harvard Medical School, and Harvard Medical Faculty Physicians in supporting our faculty. I look forward to partnering with our talented faculty in all these key areas to continue to foster growth and improve the quality of academic life in our community.

> "I plan to identify areas of mentorship need in the Department, expand the pool of trained mentors, and make them readily available to interested faculty to provide them with additional support for their professional growth."
>
> **—Howard Libman, MD**

QUALITY

ANJALA TESS, MD
Vice Chair, Quality

We are fortunate that Quality Improvement (QI) and Patient Safety have long been a cornerstone for clinical care and innovation in the Department of Medicine. For over two decades, Quality Improvement was thoughtfully led by Dr. Mark Aronson and under his guidance, initiatives and careers have thrived. Our culture values curiosity and emphasizes collaborative problem solving with the patient and providers at the center. The COVID pandemic interrupted this routine but fostered a different kind of innovation with new operational models and clinicians serving in countless ways. The crisis required that we be nimble in our approach; it showed that when called upon, we can move quickly and with precision. In recent years, we have seen a return to normalcy in may ways, but fortunately for us, this spirit of innovation persists.

Our safety structures are robust and have flourished under the direction of Dr. David Feinbloom as our QI Director for Medicine. This team shepherds as many as 250 event reports through the STARS system every month. STARS is our event reporting system that allows frontline providers to report safety events — both with harm and possible harm. Reasons for raising a concern are varied and the most common reasons include diagnosis and treatment issues, medication issues, falls, or skin issues. Our interdisciplinary Medical Peer Review Committee continues to meet regularly to complete reviews on a subset of events and suggest corrective actions where appropriate. This committee, led by Dr. Jessica Zerillo as Senior Medical Director of Patient Safety, is an important conduit that links the reviews in the Divisions to the hospital safety structure. We have had several reviews lead to concrete system changes in the last year.

QI initiatives also continue to expand and prosper. Whether triggered by safety events, regulatory requirements, education, or research, we see a variety of projects that focus on improving care in innovative ways. Stoneman Resident work under the direction of the Patient Safety Core Faculty — Drs. Justine Blum, Brittne Halford, Hans Kim, Alexa Triot, and Gila Kriegel — continues with project streams in improving access to interpreter services and safer processes for transfers. The 2023 QI Retreat focused on improving transitions of critically-ill patients from the ICU to the medical floor, with a focus on reducing trauma and improving physical recovery, alongside the medical management. This has already led to residents partnering with patients and the ICU team to provide better educational material for patients and families.

Each clinical Division has areas of focus that address local needs or help bridge operations and research. There are too many to mention, but we share just a sample of projects to highlight the breadth and creativity of our faculty and fellows. Please also see the publication list for more examples of scholarly work.

The Center for Humanizing the ICU
Led by Dr. Molly Hayes, Dr. Somnath Bose, and Ms. Elaine Klatt, this program focuses on holistic care of the critically-ill patient beyond survival by attracting community engagement and supporting survivorship research. Innovations include "All About Me" posters for the patient rooms, ICU Diaries, and the 3 Wishes Project. Their program received an Honorable Mention for the Schwartz Center Corman Impact Award.

Diabetes and Disparities in Healthcare Associates
Led by Drs. Jonathan Li and Maelys Amat in HCA, and with Dr. Leonor Fernández at BILH, this project has identified inequities in Hispanic and Black patients with diabetes with both incomplete data and poor outcomes. Working with Dr. Phillip Wilson and Ms. Katherine Tighe, the team's innovations include point-of-care testing with text messaging in different languages, nutrition as medicine, and equity dashboards.

Using Artificial Intelligence to Support High Reliability in Gastroenterology
Drs. Joseph Feuerstein, Sarah Flier, and Tyler Berzin have been working with Dr. Arvind Ravi to incorporate AI into workflows. Current applications include improving the adenoma detection rate, and identifying patients at high risk of loss to follow-up, including those with iron deficiency and pancreatic cysts.

Finally, as we look forward to the next year, we will be focusing on setting standards across Divisions for adverse event identification, review, and referral of cases to the hospital. We will work with Divisions to identify core measures of quality that link to evidence-based recommendations, regulatory needs, or physician performance. We will support the change management of QI and aim to incorporate as many trainees as possible. With our transition to Epic as our EHR in 2024, we continue to find ways to leverage our new system interface to propel QI and safety even further.

The Department remains active with new and varied ways in which the faculty and trainees, alongside our administrative staff, are working every day to improve the care of our patients. I am honored to take on the role of Vice Chair and will be working hard with Scot Sternberg and others to continue Dr. Aronson's cultural legacy.

VICE CHAIR **UPDATES**

CLINICAL AFFAIRS

JULIUS YANG, MD, PHD
Vice Chair, Clinical Affairs

Having been a member of the Department of Medicine for over 25 years, I'm honored to work alongside our Department Chair Mark Zeidel and our Chief Administrative Officer Kevin Maguire in support of our faculty and staff towards our shared mission of delivering consistently outstanding care to all our patients. As Vice Chair for Clinical Affairs, much of my work is helping to align the incredible talent, skills, expertise, and effort of our extraordinary group of clinicians with the operational goals of our medical center and network. This ensures we can best serve the healthcare needs of our community and region in an ever-changing landscape of built spaces, digital tools, organizational relationships, and payment models.

With the opening of the Klarman Building, we now have a state-of-the-art inpatient facility that prepares us well for access and growth in key tertiary care service lines going forward. Designed to facilitate the best possible care experience for both patients and providers, the building includes 128 single-occupancy med/surg rooms, 30 ICU rooms, and new procedural suites that each offer our patients and families a spacious, comfortable, and healing environment as they confront the myriad challenges of complex illness. Our cardiology faculty, fellows, and advanced practice providers, hospitalists, and internal medicine residents/interns all collaborated intensively to ensure a smooth transition of services to the new building in April 2023, and also navigated significant challenges arising from unexpected fluctuations in patient census and clinical demand in the ensuing six months. They did all this while working to ensure we maintained the highest quality care for our patients across all our units on both campuses, as clinical service patterns shifted amidst the new configuration of hospital beds at the medical center.

The adoption of Epic as our new electronic medical record system has improved care delivery as we now have integrated health records across BILH, and joined a healthcare IT community that together cares for over 70% of the U.S. population. In preparing for the transition, we knew that many of the country's leading academic hospitals currently successfully operate on Epic platforms, but also recognized that the transition to Epic from a legacy system can be incredibly challenging for clinicians and staff. As Vice Chair for the Department and in my role on our medical center's Operational Readiness Workgroup, much of my efforts in the past years have focused on working to ensure that we were well-prepared for successful implementation of this new digital platform — meeting our significant training objectives as well as anticipating and redesigning operational workflows, policies, and protocols required to fully realize the benefits of the Epic tools now available to us.

Reflecting on our shared experiences of these major undertakings has highlighted important priorities for me as we plan for future growth and developments. These include: improving contingency planning with appropriate stakeholders to be ready when our best forecasts don't consistently hold true; a commitment to more transparent communication before, during, and after implementation of this major change; and closer coordination with our medical center and network leadership to ensure appropriate staffing, support, and resources are available in tandem with the needs of both our patients and our clinicians on this new platform.

We face ongoing challenges, exacerbated by disruptions to the healthcare sector as we still continue to recover from the pandemic. These include staffing shortages in our clinics and procedural areas that ultimately limit access for our patients to needed care; barriers to discharge and throughput delays that contribute to climbing lengths of stay for our hospitalized patients; unnecessary burdens on our clinical workflows that contribute to stress and burnout amongst our colleagues; reimbursement schedules that don't seem to keep pace with rising costs in a very tight local labor market. At the same time, the horizon seems to hold tremendous promise. Our network continues to improve integration and coordination amongst our numerous sites while providing foundational resources to reduce health disparities in our communities. We are excited to see the development of potential synergies derived from our exciting new collaborations with Joslin Diabetes Center and Dana-Farber Cancer Institute. Each of these carry with them enormous complexity and the need for intensive collaboration and coordination within our Department, across BIDMC and BILH, and with our new external partners to meet the challenges and take full advantage of these opportunities.

Five years since the start of the pandemic, our mission and commitment to our patients remains unwavering. Yet I recognize that we must simultaneously redouble our mission and commitment to our clinicians to create an environment where the best outcomes for our patients can be realized by clinicians working in a system well-designed to ensure each of us can thrive, professionally and personally, as a member of this Department. As Vice Chair, I look forward to doing all that I can to make this a reality, and to learning from the insights of our faculty and staff on how we best do that together.

LEADERSHIP **TRANSITIONS**

CELEBRATING OUR INCOMING AND OUTGOING VICE CHAIRS

Our Vice Chairs in the Department of Medicine are integral leaders who each shepherd a specific area and further the core missions of our Department. This includes leading Department, BIDMC, or BILH system-wide initiatives and working with our Division Chiefs and leaders to implement them. In recent years, the leadership has transitioned in three of our Vice Chair roles including:

CAREER DEVELOPMENT AND MENTORING

Howard Libman, MD, has assumed the role of Vice Chair for Career Development and Mentoring from **Grace Huang, MD**. Having served as Vice Chair from May 2018 to June 2021, Dr. Huang is now Dean of the Office of Faculty Affairs at Harvard Medical School. A gifted educator, Dr. Huang was integral to furthering the career growth of our faculty, and she now applies her expertise to strengthening the entire faculty of medicine at HMS.

EDUCATION

Chris Smith, MD, has assumed the role of Vice Chair of Education from **Eileen Reynolds, MD**, Chief of General Medicine. A national leader in education, Dr. Reynolds served as Vice Chair from October 2015 to June 2023. Prior to her position as Vice Chair, she was the Program Director for our Internal Medicine Residency. Dr. Reynolds has spent 20+ years thoughtfully, diligently, and compassionately engaged in leading education at BIDMC and her work has significantly expanded our missions.

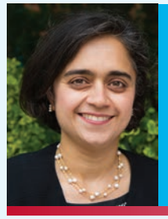
QUALITY

Anjala Tess, MD, has assumed the role of Vice Chair for Quality from **Mark Aronson, MD**. Dr. Aronson began working in QI in the 1990s and served as Vice Chair from June 2002 to September 2022. In his 20-year tenure, Dr. Aronson played a pivotal role in creating and fostering a culture of safety and quality in the Department. He oversaw the development of countless Division-based programs, supporting the career development of many operational leaders and researchers, here and across the country.

For more about our new Vice Chairs, check out their profiles in the New Leaders sections.

Please join us in thanking our outgoing Vice Chairs for all they have done to advance our missions and improve our Department, and in welcoming our incoming Vice Chairs who will build on their predecessors' legacies. All six of you are exemplary leaders!

NEW LEADERS



Anjala Tess, MD
Vice Chair for Quality for the Department of Medicine

Anjala Tess, MD, has been appointed as Vice Chair for Quality in the Department of Medicine. A national leader in healthcare quality and safety, Dr. Tess will bring great expertise, thoughtfulness, and passion to the role.

She is a practicing Hospitalist in the Division of General Medicine, Director of the HMS Masters in Healthcare Quality and Safety, and an Associate Professor in Medicine at HMS. She completed both the Rabkin and HMS Academy educational fellowships dedicating her career to developing educational programming in quality and safety from medical school through post graduate training. She developed the Stoneman QI curriculum that has trained two decades of residents and fellows here in our Department and supported our Patient Safety Core Faculty in their roles. She serves as the Co-Director and principal investigator for a $5 million training grant from CRICO for the Harvard Medical School Patient Safety and Quality Fellowship across five major HMS affiliates. Nationally she has defined the evolving expectations through guidelines for Quality Improvement and Patient Safety (QIPS) training and has served in collaboratives with the Institute for Healthcare Improvement (IHI) and the Accreditation Council for Graduate Medical Education (ACGME). She is Co-Director of The Society of Hospital Medicine's Quality and Safety Educators Academy (QSEA), a national faculty development academy. Most recently, she founded and directs the Harvard Medical School Master of Science Degree in Healthcare Quality and Safety, an international program with students from over 14 different countries.

Dr. Tess assumes the role from Dr. Mark Aronson, who began working in QI in the 1990s and has served as Vice Chair since 2003. In his tenure, Dr. Aronson played a pivotal role in creating and fostering a culture of safety and quality in the Department.

He oversaw the development of countless Division-based programs, supporting the career development of many operational leaders and researchers, here and across the country, and fostered research and training of our residents as Director of the Stoneman Center for Education and Research in Quality Improvement. Legacy initiatives have included our exemplary Medical Peer Review Process which links to hospital infrastructure and brings together physician, nursing, and pharmacy leaders to review adverse events and initiate programs to address problems that are uncovered. Dr. Aronson has been a critical consensus builder, bringing key leaders together from multiple Divisions and Departments to solve problems.

As Vice Chair, Dr. Tess will focus on creating connections across Divisions to solidify a community of QI leaders, support Divisions in identifying relevant QI metrics that inform frontline improvement, and leverage trainee and faculty development to help Divisions meet their own quality and safety goals.

Christopher Smith, MD
Vice Chair for Education for the Department of Medicine

Christopher Smith, MD, has been appointed as Vice Chair for Education in the Department of Medicine. A consummate teacher and devoted mentor, Dr. Smith has strengthened our residency program over his years as Program Director and Associate Program Director, and will now shepherd our core educational mission across the Department.

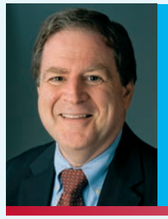
Dr. Smith is a general internist in the Division of General Medicine, Primary Care Physician in Healthcare Associates, and an Associate Professor of Medicine at Harvard Medical School. He received a BS degree in biology with presidential honors from Loyola University and his MD degree from the University of Tennessee College of Medicine. He completed a residency in internal medicine at BIDMC, earning the Lowell McGee Award for his contributions to the education of his fellow house officers, and subsequently served as Chief Medical Resident. He also completed the Rabkin Fellowship in Medical Education, a year-long fellowship designed to help establish HMS faculty as leaders in medical education through the Shapiro Institute for Education and Research.

For the last 11 years, Dr. Smith has served as Director of our Internal Medicine Residency Program and Associate Vice Chair for Education and, and for the 12 years prior as an Associate Program Director and Firm Chief. It is a tribute to his exceptional leadership that our program has continued to grow in its creativity and national prominence during his tenure and through the pandemic, while never losing sight of our core mission — to foster future leaders and talented clinicians who provide the type of care they would want their own family members to receive.

Prior to becoming Program Director and Associate Vice Chair for Education, Dr. Smith held several leadership and educational roles including as the Associate Medical Director of Healthcare Associates and Co-Director of the Rabkin Fellowship in Medical Education. He created and continues to serve as the Director of the Clinician Educator Track for residents, a novel program that helps internal medicine residents develop the skills needed to succeed as future clinician educators.

Dr. Smith has published in a variety of educational topics including teaching and assessing procedural skill, identifying predictors of success in residency training, and improving our skills as teachers and learners. He is the recipient of numerous teaching awards, including the Herrman L. Blumgart Faculty Award, the Robert C. Moellering, Jr. Award, the Society of General Internal Medicine National Award for Scholarship in Medical Education, and the prestigious S. Robert Stone Award for Excellence in Teaching from Harvard Medical School.

Dr. Smith assumes the role from Eileen Reynolds, MD, Chief of General Medicine, a national leader in education who has served as Vice Chair since 2014 and significantly expanded our missions. As Vice Chair, Dr. Smith looks forward to serving all the outstanding faculty and learners across our Department. He is committed to maintaining the Department's unwavering dedication to all its learners by continuing to foster a collegial and supportive environment, a culture of innovation and scholarship, and its reputation as a national leader in medical education.



Howard Libman, MD
Vice Chair for Career Development and Mentoring for the Department of Medicine

Howard Libman, MD, has been appointed as Vice Chair for Career Development and Mentoring for the Department of Medicine. In his new role, Dr. Libman will support the mission of the Department to foster the career growth of our faculty at all levels, accomplished through one-on-one academic counseling sessions, improvement of the annual review and mentorship processes in our Divisions, and implementation of an equitable and transparent approach to academic promotion across the Department.

Dr. Libman is a highly-regarded clinician educator in the Division of General Medicine and Professor of Medicine, Emeritus, at HMS. He came to BIDMC in 1993 from Boston City Hospital, where he developed a new model of care early in the AIDS epidemic for patients with HIV infection, which has been the clinical and academic focus of his career. In that role, he authored one of the first HIV textbooks for primary care practitioners and developed regularly updated patient education materials that were distributed nationally. He has written extensively and lectured broadly on the topic of HIV medicine.

From 2006 to 2013, Dr. Libman directed the Harvard Medical School AIDS Initiative in Vietnam, sponsored by the Centers for Disease Control and Prevention, to train and support Vietnamese clinicians to provide and teach HIV/AIDS care. The number of patients on antiretroviral therapy rose from a few thousand at the beginning of this project to over 100,000 currently. From 2012 to 2017, he served as Director of Ambulatory Residency Training in the Department of Medicine. In this role, he was tasked with reconfiguring the Primary Care Track, which resulted in development of the ambulatory long block, an innovative six-month outpatient rotation for junior and senior residents, which continues to the present day. During this same period of time, he served as Director of the HIV Primary Care Track for medical residents with an interest in training in the comprehensive care of this population. This proof-of-concept project was funded by the Health Resources and Services Administration.

Throughout his career, Dr. Libman has counseled numerous faculty, medical residents, and medical students about career development and served as a mentor for many of them. He has been a member of the Division of General Medicine Promotions Committee since 2008 and is also a designated faculty reviewer. In addition, he has served on HMS promotion committees in the past and has successfully navigated the vagaries of the promotion process himself.

Dr. Libman assumes the role from Dr. Grace Huang, who now serves as Dean of the Office of Faculty Affairs at Harvard Medical School. A gifted educator, Dr. Huang was integral to furthering the career growth of our faculty, and Dr. Libman will build upon this success. He welcomes the opportunity to work collaboratively with faculty, as well as our Department and Division leadership, in this important endeavor.

NEW LEADERS

Sarah Berry, MD, MPH
Chief of the Division of Gerontology for the Department of Medicine

Sarah Berry, MD, MPH, has been appointed Chief of the Division of Gerontology in the Department of Medicine. As Division Chief, Dr. Berry will continue her 19-year affiliation with the Division of Gerontology and Hebrew SeniorLife. An outstanding teacher and mentor, an internationally recognized researcher, and a highly effective program leader, Dr. Berry will continue to uphold BIDMC's and Hebrew SeniorLife's reputation for clinical, teaching, and research excellence in the field of aging, while endeavoring to reach new heights.

Dr. Berry received her Bachelor of Science in biomedical sciences from Auburn University and her medical degree from the University of Alabama Medical School. She completed her medical internship and residency programs at the University of Utah Health Sciences Center, and she came to Boston in 2004 to complete BIDMC's HMS-Wide Multicampus Geriatric Medicine Fellowship. She subsequently completed a T32 postdoctoral fellowship in translational research in aging and joined the HMS faculty as an Instructor in Medicine in 2008. During her fellowships, she completed the Master's in Clinical Effectiveness program at the Harvard T.H. Chan School of Public Health. She later led the Multicampus Geriatric Medicine Fellowship program as Program Director from 2014 to 2020.

Dr. Berry is a national expert on osteoporosis and falls in older adults with multimorbidity. Her research has often focused on the strong link between medications and injurious falls, both in the community and nursing home settings. She is the author of more than 100 manuscripts. She currently chairs the American Geriatrics Society Research Committee. Her current funding includes a large, randomized clinical trial funded by PCORI to investigate the effectiveness of certain care models on rates of injurious falls in older adults with a hospitalized fracture receiving post-acute care in a nursing home. Additionally, she has received a K24 award funded by the NIA to train junior investigators in studying aging research related to injury.

In her new role as Chief, Dr. Berry will be overseeing clinicians across the Division of Gerontology and Hebrew SeniorLife as well as clinical investigators at the Hinda and Arthur Marcus Institute for Aging Research, where she is currently a senior scientist. As a clinician, Dr. Berry is an outstanding geriatrician and provides care for residents at the Hebrew Rehabilitation Center. She has been named Chair of the Age Friendly Leadership Committee, a newly formed committee at BIDMC committed to ensuring older adults receive evidence-based programs of care that include the four Ms of geriatrics: mind, medications, mobility, and what matters most. She is also currently taking part in the Linde Family Fellowship Program which is designed to equip physicians with the skills needed to become influential leaders in primary care practices.

Dr. Berry assumes the role from Lewis Lipsitz, MD, who led the Division for 25 years and will continue in his role as Director of the Marcus Institute. Dr. Lipsitz's decades-long career at BIDMC is marked by his work as a highly effective ambassador for geriatrics in our hospital, our health system, at HMS, and nationally as his work helped guide policy formation. Dr. Berry will continue his dedication to mentoring the next generation of geriatric clinicians and scientists, conducting exemplary research in the field of gerontology, and ensuring that we continue to provide excellent care for older adults.

Leonor Fernández, MD
Medical Director of Health Equity at Beth Israel Lahey Health

Leonor Fernández, MD, assumed the role of Medical Director of Health Equity at Beth Israel Lahey Health in 2022. Dr. Fernández collaborates with system and hospital-wide leaders, faculty, and staff in the development of strategies and innovations to promote more equitable health outcomes. She has a special interest and expertise in linguistic and digital access in the critical role of primary care for promoting equity. A graduate of Princeton University, she received her medical degree from Albert Einstein College of Medicine and completed her residency at Boston City Hospital. She is an Assistant Professor at Harvard Medical School and a graduate of the Linde Family Primary Care Leadership Fellowship Program and the Rabkin Medical Education Fellowship.

Dr. Fernández was drawn to the importance and challenges of achieving effective communication in healthcare early in her career. As a Latina, multilingual physician who grew up in Argentina and New York City, she often used her language skills when caring for immigrant patients. During the COVID-19 pandemic, she successfully advocated for the development of a Spanish-language line at HCA's call center, and she worked closely with BILH's Vaccine Command to lead the equity strategy for their COVID-19 vaccination campaign.

Dr. Fernández brought a health equity perspective to her teaching as Associate Firm Chief for the Tullis Firm at BIDMC from 1993 to 2015 and as a primary care clinic preceptor. Throughout her career, she has mentored scores of students and residents, including many underrepresented in medicine. Her interest in the importance of patient advocacy, language, and literacy access subsequently led her to join the OpenNotes team, conducting research on patients' perspectives on accessing their medical notes. Dr. Fernández served as Director of Patient Engagement at HCA for several years, integrating the valuable voices of patient advisors into staff working groups that made clinical decisions.

Currently, she co-chairs the BILH Quality Health Equity Committee, which brings an equity lens evaluation of quality performance. Dr. Fernández works alongside Adelline Ntatin (VP Health Equity) and under the sponsorship of Chief DEI Officer Juan Fernando Lopera and Chief Clinical Officer Rob Fields, MD. She co-leads a $1.7 million BCBS-Institute for Healthcare Improvement Grant on Improving Equity in Diabetes Care Outcomes at BILH.

Dr. Fernández's commitment to health equity has long enriched the Department of Medicine and we look forward to her continuation of this crucial work as she brings her wisdom to this system-level role.

David Avigan, MD
Director of the BIDMC Cancer Center and Senior Vice President of Cancer Services at BILH

David Avigan, MD, has been named Director of the BIDMC Cancer Center and Senior Vice President of Cancer Services at BILH. In his new role, Dr. Avigan will be responsible for setting the vision and strategic direction for cancer care, research, and education for the BIDMC Cancer Center and the BILH network.

Dr. Avigan has served as the Chief of the Division of Hematology and Hematologic Malignancies since 2018 after having served as the Section Chief for Hematologic Malignancies and Bone Marrow Transplant since 2014. In his new BIDMC role, he will serve as a visionary leader for the BIDMC Cancer Center in expanding cancer research and clinical care in support of its mission to provide extraordinary patient care supported by world-class education and research. In his BILH position, Dr. Avigan will play a leadership role in advancing system collaboration and integration to develop destination clinical programs in cancer that are nationally recognized for excellence and innovation.

Dr. Avigan earned his medical degree from the Yale University School of Medicine and completed his residency and chief residency at Columbia Presbyterian Medical Center and a fellowship in hematology/oncology at Memorial Sloan-Kettering Cancer Center. He is board certified in internal medicine, hematology, and medical oncology. A Professor of Medicine at HMS, he is highly respected as a thought leader in cancer clinical care and science, including for his groundbreaking work in cancer immunotherapy. As Director of the Hematological Malignancies and Bone Marrow Transplant Program and Chief of Hematology and Hematologic Malignancy Division, Dr. Avigan has established and grown a nationally recognized service that provides leading-edge therapies and patient-centered care.

Dr. Avigan directs a large laboratory working on personalized cancer vaccines and CAR T-cell therapies. He has led national cancer studies and heads a clinical trials program for hematological malignancies. He also established the Randi and Brian Schwartz Family Cancer Immunotherapy and Cell Manipulation Facility, which helps to treat hundreds of patients with innovative immune-based treatments. In addition, he has served as the national Principal Investigator for a first-of-its-kind, academic-led trial studying a personalized cancer vaccine supervising cell production and immune studies for 18 participating sites across the United States.

As Cancer Center Director, Dr. Avigan will foster the continued growth of BIDMC as a center of excellence for the advancement of cancer care, research, and education that holds true to our mission: To better the lives of patients with cancer through transformative science, pioneering therapies, and compassionate care accessible to all.

CELEBRATING OUR NEW PROFESSORS OF MEDICINE

AT HARVARD MEDICAL SCHOOL

Michael Curry, MD
Professor of Medicine, HMS

Division of Gastroenterology, Hepatology and Nutrition

Director, The Liver Center

Sara Fazio, MD, FACP
Professor of Medicine, HMS

Division of General Medicine

Advisory Dean and Director, Walter Bradford Cannon Society

Associate Director of Medical Education, HMS Center for Primary Care

Young-Bum Kim, PhD
Professor of Medicine, HMS

Division of Endocrinology, Diabetes and Metabolism

Principal Investigator, Kim Lab

Mark Andermann, PhD
Professor of Medicine, HMS

Division of Endocrinology, Diabetes, and Metabolism

Principal Investigator, Andermann Lab

Grace C. Huang, MD
Professor of Medicine, HMS

Division of General Medicine

Dean for Faculty Affairs, HMS

Robert W. Yeh, MD, MBA
Professor of Medicine, HMS

Division of Cardiovascular Medicine

Director, Richard A. and Susan F. Smith Center for Outcomes Research in Cardiology

Section Chief, Interventional Cardiology

Shingo Kajimura, PhD
Professor of Medicine, HMS

Division of Endocrinology, Diabetes and Metabolism

Principal Investigator, Kajimura Lab

Douglas Pleskow, MD
Professor of Medicine, HMS

Clinical Chief, Emeritus, Division of Gastroenterology, Hepatology and Nutrition

Nadine Tung, MD
Professor of Medicine, HMS

Division of Medical Oncology

Director, Cancer Genetics and Prevention Program

Mike Donnino, MD
Professor of Medicine, HMS

Division of Pulmonary, Critical Care and Sleep Medicine

Director and Founder, Center for Resuscitation Science (CRS)

Co-Director of Research, Division of Pulmonary, Critical Care and Sleep Medicine

Gyongyi Szabo, MD, PhD
Professor of Medicine, HMS

Division of Gastroenterology, Hepatology and Nutrition

Chief Academic Officer, BILH/BIDMC

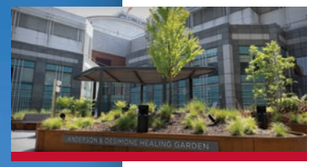
Faculty Dean for Academic Affairs, HMS

Robert Thomas, MD
Professor of Medicine, HMS

Division of Pulmonary, Critical Care and Sleep Medicine

Director, Institute of Personalized Sleep Health

Associate Program Director, Sleep Medicine Fellowship Program



128
Medical and surgical beds

4
Interventional radiology suites

30
ICU beds

12
Operating rooms

THE KLARMAN BUILDING

A PORTAL TO THE FUTURE OF MEDICINE

Our core mission is to deliver exemplary patient-centered care. Although our skillful staff have always provided high-quality, compassionate care, our patients and providers need for that care to happen in superb facilities in a healing environment. On April 1, 2023, BIDMC opened the Klarman Building, the newest inpatient building in over 20 years, on BIDMC's West Campus.

The Klarman Building is the culmination of steadfast dedication, extensive planning, and hard work of countless care providers, staff, and community members over the last several years, and will aid in the Department's continued expansion of world-class clinical care, education, and research. Built with state-of-the-art clinical and procedural equipment, the new building provides a futuristic environment for our services. Named in honor of longtime BIDMC supporters Beth and Seth Klarman, the new inpatient building was completed on time and under budget. There are 128 medical and surgical beds as well as 30 ICU beds, totaling 158 single-occupancy, family-friendly patient rooms. Additionally, 12 operating rooms and four interventional radiology suites were created to allow space for collaborative, multidisciplinary care.

"We can think of the Klarman Building as a portal to the future of medical care," said Julius Yang, MD, PhD, Vice Chair for Clinical Affairs for the Department and a Hospitalist in the Division of General Medicine. "Not only was the infrastructure built for extraordinary patient-centered care, but we also recognized the need to improve the experience of being a clinician or staff member working to deliver that care."

Conducive to innovation and healing, natural light fills the spacious rooms and common areas, and patients, visitors, and staff can find comfort in the rooftop Anderson & DiSimone Healing Garden. In recognition of frontline staff and their continuous dedication during the pandemic, the 30-bed intensive care unit was named the Healthcare Heroes ICU, supported by contributions from over 3,600 community members. The building also contains leading-edge surgical and cardiovascular medical suites and equipment and the relocation of our medical helicopter landing pad — a crucial component to equipping BIDMC as a major Level 1 Trauma Center for our region.

"While we continue to expand our specialty offerings in the communities which surround us, our clinical, educational, and research home remains at BIDMC in Longwood," said Mark Zeidel, MD, Chair of the Department of Medicine. "The Klarman Building will allow us to provide outstanding tertiary care in an environment which supports the patients, their families, and our staff as we work together to combat complex, life-threatening illnesses."

Medical centers must invest continually in new facilities to address the needs of their growing and changing patient populations. Attention to the design of operating rooms and procedural areas is key for higher-quality patient care, and the Division of Cardiovascular Medicine is one of several service lines expanding their capacity for care. In particular, hybrid rooms — rooms that can be used as an operating room, for catheterization, or an electrophysiology laboratory — will allow for multidisciplinary, versatile approaches to medical care, improving the patient's experience during their treatments and procedures. Additionally, the Klarman building has doubled the capacity of the Cardiac Critical Care Unit (CCU), enhancing BIDMC's ability to serve patients with life-threatening cardiac conditions across New England.

"It gives us the space we need to expand access to our high-quality medical and procedural services and allows us to launch our Cardiac Transplant Program," said Dhruv Kazi, MD, MSc, MS, Director of the CCU and the Associate Director of the Richard A. and Susan F. Smith Center for Outcomes Research in Cardiology. "But the new CCU is about more than increased capacity — it has been designed from the ground up with a laser focus on the needs and comfort of our patients and caregivers. The aesthetics of the space also makes for a relaxing yet efficient working environment for our physicians, nurses, and staff, and the proximity of the healing garden is a real gift."

The day our physicians and medical center staff welcomed patients into the Klarman Building began a new era for our hospital. As we imagine the future of patient-centered care and what it may entail, we see the Klarman Building as a new step for our medical center, Boston, and beyond.

"Now we have the most modern facilities to care for patients who come to us with extraordinary needs," said Robert Gerszten, MD, Chief of Cardiovascular Medicine. "This building is really for creative minds to care for our patients in ways that we would not have anticipated years ago."

> "This building is really for creative minds to care for our patients in ways that we would not have anticipated years ago."
>
> **—Robert Gerszten, MD**

PROPELLING SCIENTIFIC DISCOVERIES:

InSPIRE AND THE FUTURE OF RESEARCH AT BIDMC

Each day, across our campuses, research leaders at BIDMC innovate and envision the future of investigation in their fields. From bench science to clinical and translational research, our renowned physician-scientists, principal investigators, and their labs ask how we can push knowledge forward, recognizing that outstanding research translates into extraordinary patient care. And while they remain tirelessly at work, simultaneous innovation and envisioning have occurred at an institutional level. BIDMC has a long legacy as an academic medical center with a nationally regarded research program, but investments were needed to ensure we remained a top tier institution.

A strong vision requires strong leadership, and BIDMC and BILH took a pivotal step forward by recruiting Gyongyi Szabo, MD, PhD, as Chief Academic Officer in 2019. An accomplished physician, scientist, and mentor, Dr. Szabo joined us from UMass Chan Medical School, where she had served in numerous roles including Associate Dean for Translational Research and Vice Chair for Research in the Department of Medicine. An internationally recognized leader in the field of liver immunology and a highly regarded educator, she continues to conduct her research in the Division of Gastroenterology, Hepatology and Nutrition with a focus on the innate immunity of the liver and the gut-liver axis. Her translational and clinical investigations focus on alcoholic hepatitis, non-alcoholic fatty liver disease and fibrosis, the cellular and molecular mechanisms of inflammation, and innate immunity in liver injury to identify therapeutic targets for future therapies. She has received uninterrupted NIH grant support since 1989, including the Merit Award and several current NIH grants. In addition to her roles at UMass and among other accolades, Dr. Szabo served as President of the American Association for the Study of Liver Disease (AASLD) and as the inaugural editor of *Hepatology Communications*.

With Dr. Szabo's arrival began a review of research institution-wide and preparations for a strategic plan. In early 2021, BIDMC launched InSPIRE, the Institutional Strategic Plan for Innovation, Research, and Education. The strategic plan was the result of an extensive, multi-year planning process led by a steering committee which involved competitive benchmarking, 30 individual interviews, 13 focus group sessions, and a BIDMC-wide survey. Key goals included identifying our existing strengths, identifying barriers to greater success, and engaging the research community in the visioning process. It was important to leadership that in creating this strategic plan, the stakeholders felt engaged, involved, and excited.

When InSPIRE was launched, it was planned with yearly themes and initiatives stretching through 2026. This began with optimization and institutional alignment to build to the ultimate goal of achieving top decile status and self-sustained program success. The goals were organized into four areas: research (including basic, clinical, and translational), innovation, faculty development, and education. The five-year goals were to maximize our research and the academic mission, drive discovery, and support innovation as well as to translate biological data to improve clinical outcomes, to engage top talent in research and education, and to train the next generation of leaders in medical sciences and equitable patient care delivery.

Two of the top barriers to success identified in the InSPIRE planning process were that research and institutional resources were aligned around Departments without economies of scale and that collaborations were not more strategically cultivated. Breaking down these barriers became a top priority, leading to the creation of the Translational Research Hubs.

Three new Hubs were created to align individuals and resources around areas of investigation, regardless of Department, and to create space to pursue further study together. A Translational Research Hubs Task Force, composed of research leaders, was instrumental in planning the structure for each Hub and getting them off the ground. Chosen based on the areas of strength institution-wide, the Hubs established were the Systemic Effects of Metabolic Disease, Neuroscience Connections, and Pathogens, Immunity and Inflammation. All were selected based on an analysis of existing grant support and research goals, and an awareness that these were areas where we held unique strengths and could benefit from more support. Metabolic Diseases emerged as the area that already benefited from the highest amount of grant funding. Pathogens, Immunity and Inflammation was a timely selection as the Hub developed during COVID and revealed that our resources and investigators are very well-positioned to deal with any kind of emerging pathogens. Neuroscience Connections brings together so many fields where we have resources to meet the growing health needs predicted in the next decade in areas such as psychiatry, neurology, pain management, and more. These three Hubs joined the previously established Cancer Research Institute,

Gyongyi Szabo, MD, PhD, Chief Academic Officer, with George Q. Daley, MD, Dean of Harvard Medical School and Mark Zeidel, MD, Chair of the Department of Medicine.

which has a long legacy of exemplary work at BIDMC, and the Hub structure provides space and goal-setting plans to, in time, grow each Hub into an Institute.

"My approach to the institutional research support and the goal in creating the Hubs is that if we provide a research infrastructure that's strong and that supports all our investigators, then we will elevate every researcher and their capacity to be competitive in their fields," said Dr. Szabo. "Our many accomplishments to date, and our plans for the future, would not have been possible without the support of our colleagues in leadership. Mark Zeidel, MD, Chair of Medicine, in particular, is a steadfast advocate for the importance of research in advancing the academic mission of BILH. Our Hubs have benefited tremendously from the leadership provided by numerous members of the Department of Medicine."

The Hubs were also designed with a leadership structure to foster community. Each Hub has multiple Liaisons who are research leaders in their field and hold Professor appointments at HMS. Each Hub also has Co-Leaders, who are early-career or emerging leaders in their fields and have not yet reached Professor status. This allows for close collaboration between the Liaisons and Co-Leaders, while also providing mentorship opportunities. While the Liaisons provide wisdom and strategy, the Co-Leaders bring their own creativity, energy, and experiences to the Hubs.

"Dr. Szabo's vision for Research Hubs has been very valuable in creating new opportunities for collaboration and for maximizing how we benefit from the extraordinary breadth of scientific expertise at the BIDMC," said Mark Andermann, PhD, Liaison of the Neuroscience Connections Hub and faculty in the Division of Endocrinology, Diabetes and Metabolism. "The leadership structure is unique in fostering mentorship of early-stage lab heads to become connectors and leaders in their field. The Research Hubs may also provide an opportunity for us to collectively advocate for research-specific needs at the institutional level to ensure that the BIDMC remains at the forefront of innovation."

Since their launch, the Hubs have grown to memberships of 90-150 physician-scientists and researchers in the respective fields. The Hubs strive to attract engaged members into communities of scientists and collaborators and have sparked numerous collaborations and new connections across BIDMC.

"The Research Hubs have been instrumental in fostering the continued growth of the BIDMC research community, especially after the pandemic," said Zsu-Zsu Chen, MD, Co-Leader for the Systemic Effects of Metabolic Disease Hub and faculty in the Division of Endocrinology, Diabetes and Metabolism. "The Hub membership has facilitated inter-department and inter-division collaborations, and was the main catalyst for multiple institution-wide grant efforts including the successful MLSC BioDataBank Infrastructure Award and the two recent ARPA-H grant submissions focused on women's health and cancer. These achievements help to maintain the vibrant BIDMC research network and support investigators at all stages of their career to achieve their goals."

In 2022, the Translational Research Hub Spark Grant Awards were introduced

BIDMC InSPIRE 2030: How will we meet our vision?

as a unique institutional investment in collaborative research projects. Structured to encourage innovative, interdisciplinary translational research, six projects were selected to receive $50,000 each in research support. The grants are designed to bring basic and clinical scientists together, to pair senior and junior faculty, and to orchestrate meetings of the minds across fields of expertise.

"Our hope with establishing the Spark Grants is that this actually facilitates the whole research process, not only in terms of collaborations but also to bring people together along the same disease-related questions from the clinic and basic science," said Dr. Szabo.

In 2023, the Spark Grants were presented at an awards ceremony and showcase, which provided the opportunity to hear from the 2022 recipients as they reported on the findings of their projects supported in the prior year's grants as well as to gather and celebrate the 2023 recipients.

In September of 2022, BIDMC hosted the inaugural Research Retreat, which was attended by over 500 people planned by a multidisciplinary scientific committee co-chaired by Simon Robson, PhD, and Jack Lawler, PhD. In an institution of our size, there is a collective awareness of the importance of coming together to hear from each other about new and exciting work, and hopefully spark collaborations. The CAO's office envisioned the Research Retreat to directly meet these goals. The keynote presenter was George Q. Daley, MD, PhD, Dean of Harvard Medical School. There were 28 exciting talks by BIDMC scientists and 167 scientific poster presentations of work from across the medical center. The 2023 Research Retreat again held in September, was co-chaired by department members Jennifer Ho, MD, and Simon Robson, MD, PhD, and once again saw high attendance by 500 colleagues. Now an annual event, the Research Retreat is a great opportunity to come together to celebrate successes and hear updates from our research community.

As we approached the end of the originally planned timeline for InSPIRE, BIDMC found itself in a promising position: ahead of schedule. Many of the benchmarked goals had been reached. We had increased external funding and philanthropic support for research, through grants and awards. We cultivated our relationships with industry partners, widening and deepening the collaborations. We continue to focus on recruiting and fostering a diverse community of researchers and educators and understanding how disparities, race, and ethnicity impact care.

In addition, the changes in our healthcare ecosystem, including the Joslin Diabetes Center joining BILH; the pending clinical relationship with the Dana-Farber Cancer Institute; the implementation of a single electronic medical record across BILH (OneBILH Epic); and the trend among grant-funders (including NIH) in supporting large multidisciplinary, multi-institutional grants, provides new and exciting opportunities to advance the BIDMC academic mission.

The positive growth and transformed environment presented a new challenge: how do we keep pushing forward as an institution and build on that momentum? We set new goals to continue to raise the bar.

In September 2024, the institution launched InSPIRE 2030 at the annual Research Retreat. The creation of InSPIRE 2030 involved a similar planning process with stakeholder discussions, analysis of internal strengths and external competitors, and surveys of the research community. The roadmap to 2030 accounts for what we have accomplished already and what we need to prioritize in the next phase.

"I am energized by the creativity and collegiality of our BIDMC research community and optimistic that with closer collaborations with the Joslin Diabetes Center, the Dana-Farber Cancer Institute, HMS and our BILH system, BIDMC research will thrive in the entire spectrum of research from molecules to communities through the success of the Translational Research Hubs and our brilliant scientists!" said Dr. Szabo.

The heart of InSPIRE 2030 is what our research goal has always been: to propel scientific discoveries into extraordinary patient care. Having set aspirational goals for our academic mission, and with the plans and initiatives of InSPIRE 2030, the future of research at BIDMC remains bright.

DEPARTMENT OF MEDICINE LEADERS IN TRANSLATIONAL RESEARCH HUBS

PATHOGENS, IMMUNITY AND INFLAMMATION

Iannis Adamopoulos, DPhil
Division of Rheumatology and Clinical Immunology
CO-LEADER

Yury Popov, MD, PhD
Division of Gastroenterology, Hepatology and Nutrition
CO-LEADER

Dan Barouch, MD, PhD
Center for Virology and Vaccine Research & Division of Infectious Disease
HUB LIAISON

George Tsokos, MD
Division of Rheumatology and Clinical Immunology
HUB LIAISON

Translational Research Hubs

SYSTEMIC EFFECTS OF METABOLIC DISEASE

Alexander Banks, PhD
Division of Endocrinology, Diabetes and Metabolism
CO-LEADER

Malika Boudries, PhD
Center for Virology and Vaccine Research
CO-LEADER

Zsu-Zsu Chen, MD
Division of Endocrinology, Diabetes and Metabolism
CO-LEADER

Z. Gordon Jiang, MD, PhD
Division of Gastroenterology, Hepatology and Nutrition
CO-LEADER

Evan Rosen, MD, PhD
Division of Endocrinology, Diabetes and Metabolism
HUB LIAISON

NEUROSCIENCE CONNECTIONS

Anne M.J. Verstegen, PhD
Division of Nephrology
CO-LEADER

Mark Andermann, PhD
Division of Endocrinology, Diabetes and Metabolism
HUB LIAISON

CANCER RESEARCH INSTITUTE

David Avigan, MD
Division of Hematology and Hematologic Malignancies

Frank Slack, PhD
Cancer Research Institute

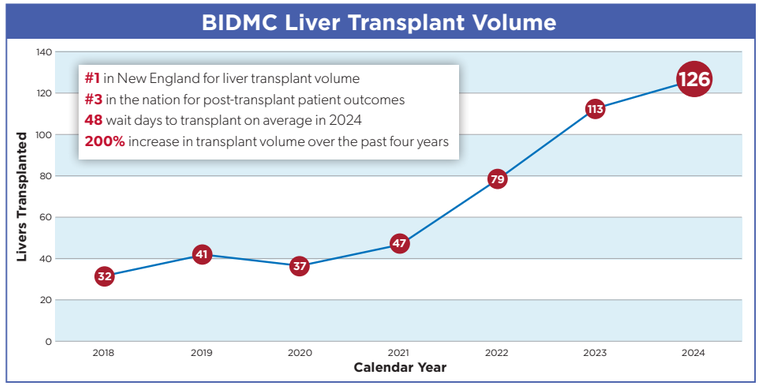
LEADING IN LIVER TRANSPLANT:

EXPANDING CARE AND OPTIMIZING OUTCOMES

For many years, our Liver Transplant program at BIDMC has provided comprehensive care for patients in need of lifesaving organ transplants and in 2024, the group made impressive expansions. Our team completed a record 126 adult liver transplants and we are now ranked #1 in New England for volume of liver transplants, and nationally ranked #3 in best post-transplant survival outcomes for our patients, who have the highest survival rates on the waitlist and the shortest wait time to transplant. Our strong partnerships with Organ Procurement Organizations across the U.S. led to a 200% increase in liver transplant rates over the past four years, giving more patients a second chance at life.

"Not only have we seen a logarithmic increase over the past years of the number of patients undergoing liver transplant, but we have also seen an improvement in outcomes and overall survival," said Nezam Afdhal, MD, DSc, Chief of the Division of Gastroenterology, Hepatology and Nutrition.

"Our focus is on quality of care and our team embraces a holistic approach, ensuring that every patient receives personalized support from the moment they walked through our doors," emphasized Alan Bonder, MD, Medical Director of Liver Transplant. "From pre-transplant counseling to post-transplant care, we are there every step of the way. Our nurses, surgeons, mental health providers, nutritionist, and support staff became more than just caregivers — they become lifelines, guiding patients through their journeys with empathy and expertise."



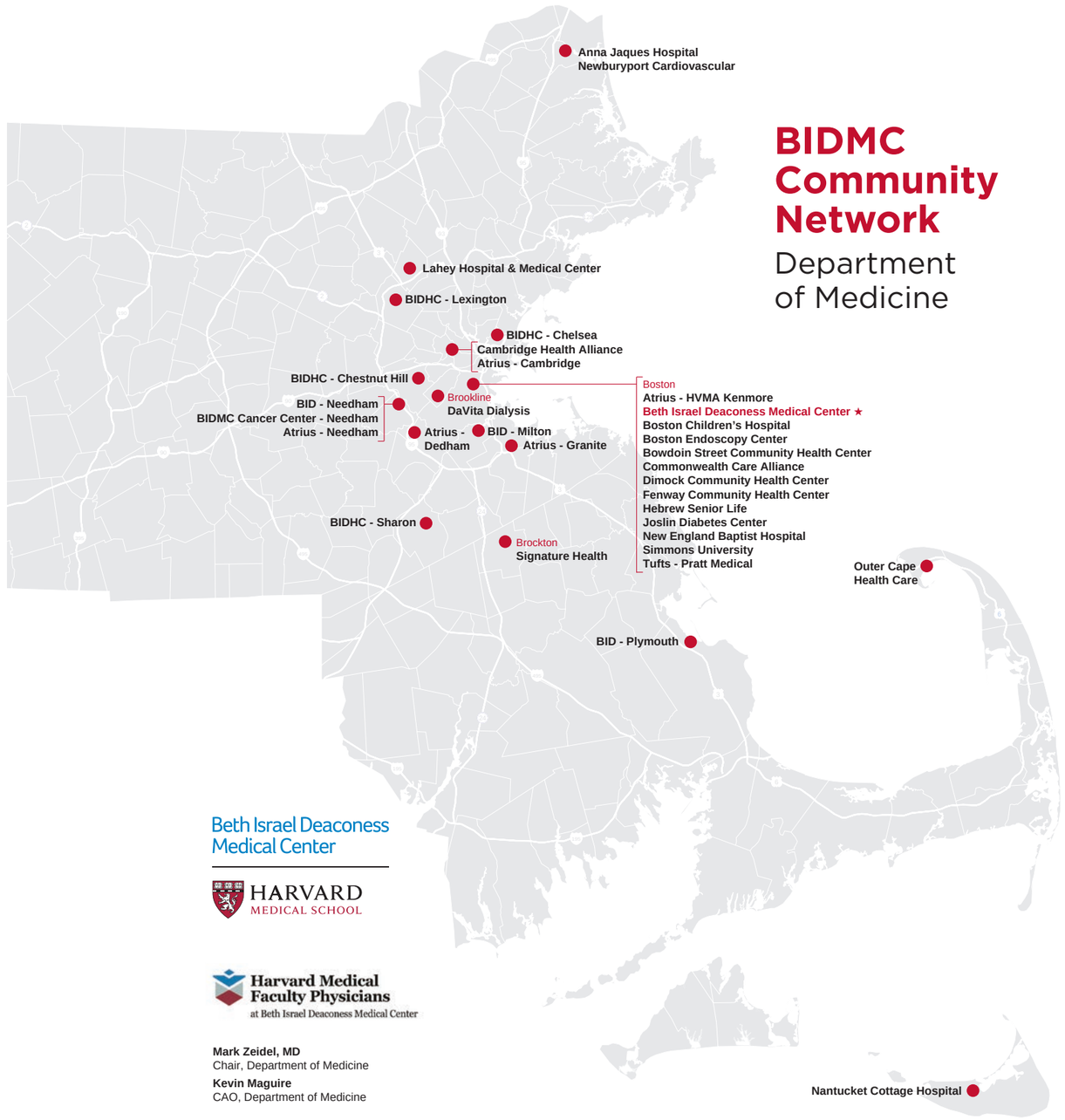
Medical management of our patients with liver diseases in need of transplant is provided by our Transplant Hepatology team in The Liver Center, part of the GI Division. The Liver Center was founded in 2000 by Dr. Afdhal, who served as the director. He was joined by Michael Curry, MD, MA, current director, in 2003, and together they have expanded the center to a clinical faculty of 14 physicians and multidisciplinary team of physician assistants, registered nurses, and pharmacists all working together for over 13,000 patient visits annually. Inpatient care for liver patients is provided through the Epstein Trey Service, founded in 2007, on Farr 10 supported by three inpatient resident teams and a dedicated inpatient team of nurses and allied health care professionals. The center also includes an internationally-recognized, robust basic and translational research program that brings cutting-edge therapeutics and diagnostics to our patients with liver disease.

"Our ability to grow our program and provide world-class care to our patients is the result of the tireless, collaborative efforts of a team of dedicated professionals committed to excellence," said Dr. Curry. "We have and will continue to expand our program beyond BIDMC with satellite clinics at BILH locations that allows us to provide care to patients closer to their homes."

The team closely collaborates with our Department of Surgery colleagues in the Transplant Institute, under the leadership of Devin Echkoff, MD. The utilization of novel technologies for organ preservation has led to a dramatic increase in the number of transplants at BIDMC. In March 2025, our surgical team became the first in Boston to perform robot-assisted liver transplants with the da Vinci system. This added capability will enable more surgeries and shorten the recovery time for donors. Zachary Fricker, MD, Medical Director for the Living Donor Transplant, has led an increase in the volume of living donor transplants performed. BIDMC has also opened the New England Donor Organ Center for organ procurement in the Farr Building, allowing for centralization of organ procurement.

Amidst all the expansion and innovation, the core goal is the same: to provide the exemplary care to improve the health of our transplant patients, and get them transplanted as quickly as possible. In 2022, our average wait time for deceased donor transplant was 350 days and this has been reduced to only 48 days in 2024.

"What once felt like an endless wait for many families has now become a matter of weeks or even days," said Dr. Bonder. "The relief and gratitude on their faces is indescribable — it is as if we can give them the gift of time itself."



BIDMC Community Network

Department of Medicine

Beth Israel Deaconess Medical Center

HARVARD MEDICAL SCHOOL

Harvard Medical Faculty Physicians at Beth Israel Deaconess Medical Center

Mark Zeidel, MD
Chair, Department of Medicine

Kevin Maguire
CAO, Department of Medicine

AWARDS & HONORS

BIDMC

Boston Magazine named more than 80 Department of Medicine faculty members to its annual 'Top Doctors' guide in 2024.

CARDIOVASCULAR MEDICINE

The HMS Office for DICP recognized the Richard A. and Susan F. Smith Center for Outcomes Research in Cardiology as a recipient of the 2022 Program Award for a Culture of Excellence in Mentoring (PACEM) at Harvard Medical School.

Ernest V. Gervino, ScD, FACSM, received the 2022 Lifetime Professional Achievement Award from Boston University's Sargent College, Department of Health Sciences.

Jennifer Ho, MD, was presented with the 2023 A. Clifford Barger Excellence in Mentoring Award from HMS.

Eric A. Secemsky, MD, MSc, received a 2023 Vascular Career Advancement Award from the Vascular InterVentional Advances (VIVA) Foundation.

Jordan Strom, MD, was recognized with the 2021 Medical Student Training in Aging Research (MSTAR) Program Mentor of the Year award.

ENDOCRINOLOGY, DIABETES AND METABOLISM

Barbara B. Kahn, MD, was the recipient of the 2021 Naomi Berrie Diabetes Center Award for Outstanding Achievement in Diabetes Research from Columbia University.

Shingo Kajimura, PhD, received the 2022 Richard E. Weitzman Outstanding Early Career Investigator Award from the Endocrine Society, and was named a 2022 Howard Hughes Medical Institute Investigator.

Christos S. Mantzoros, MD, DSc, was recognized with the 2021 Korean Society of Nutrition Award from the Korean and American Society of Nutrition, and the 2020 E.V. McCollum Award from the American Society of Nutrition.

GASTROENTEROLOGY, HEPATOLOGY AND NUTRITION

Joseph Feuerstein, MD, received the 2021 American Gastroenterological Association Outstanding Service Award, which honors an individual who has contributed significantly to the AGA's health and welfare.

Sarah Flier, MD, has been named the 2021 Rising Healthcare Leader in IBD by the New England Chapter of the Crohns and Colitis Foundation of America (CCFA).

Ciaran Kelly, MD, received the inaugural J. Thomas LaMont Chair of Gastroenterology at BIDMC.

Vilas R. Patwardhan, MD, was selected for the 2023 Rabkin Fellowship in Medical Education through the Shapiro Institute for Medical Education and Research.

Lev Perelman, PhD, received the inaugural Mary Tolan and Edward Grzelakowski Chair in Medicine at BIDMC.

GENERAL MEDICINE

Neal Biddick, MD, was the recipient of the 2022 Robert Stone Award for Excellence in Teaching from Harvard Medical School.

Grace Huang, MD, was presented with the 2021 Award for Excellence in Teaching from the Society of Hospital Medicine.

Ted Kaptchuk was the 2022 recipient of the William Silen Lifetime Achievement Award in Mentoring from Harvard Medical School.

Emmanuel Mensah, MD, received the 2022 Charles McCabe, MD Faculty Prize for Excellence in Teaching from Harvard Medical School.

Todd Pollock, MD, was awarded the Certificate of Merit for Outstanding Achievement in Care and Treatment of HIV/AIDS from the Republic of Vietnam Minister of Health.

Adam Rodman, MD, was selected for the Humanism in Medicine Award from the American College of Physicians Massachusetts Chapter.

Mara Schonberg, MD, MPH, received the 2022 A Clifford Barger Award for Excellence in Mentoring from Harvard Medical School.

Shreya Trivedi, MD, was recognized as the 2023 Mary O'Flaherty Horn Scholar in General Internal Medicine.

Amy Weinstein, MD, MPH, received the 2023 CDIM Louis N. Pangaro, MD, Educational Program Development Award.

GERONTOLOGY

Marian T. Hannan, DSc, MPH, is the recipient of the 2022 American College of Rheumatology's (ACR) Association of Rheumatology Professionals' (ARP) Lifetime Achievement Award, for sustained and lasting contribution to the field of rheumatology.

Sharon Inouye, MD, MPH, is the recipient of the 2022-23 American College of Physicians (ACP) John Phillips Memorial Award. She has also been named the Editor in Chief of *JAMA Internal Medicine*.

Dae Hyun Kim, MD, ScD, was presented with the 2023 American Geriatrics Society's (AGS) Thomas and Catherine Yoshikawa Award for Outstanding Scientific Achievement for Clinical Investigation.

Douglas P. Kiel, MD, MPH, has been invited to serve as part of the National Advisory Council on Aging to review the NIA Division of Geriatrics and Clinical Gerontology.

Dr. Mark Zeidel was recognized by the Boston Red Sox as a Red Sox Medical All-Star during their 2022 season.

AWARDS & HONORS

HEMATOLOGY AND HEMATOLOGIC MALIGNANCIES

In 2022, the Division was awarded a grant from the American Society of Hematology (ASH) Hematology-Focused Fellowship Training Program (HFFTP), which will provide funding support for the training of five fellows, each in a three-year program that includes two years of hematology-focused research training.

Kenneth A. Bauer, MD, received the 2022 Esteemed Career Award from the International Society on Thrombosis and Haemostasis (ISTH).

Jacalyn Rosenblatt, MD, was named the inaugural recipient of the Myrna and Roger Landay Chair in the Hematology and Hematologic Malignancies at BIDMC.

Ralph Scully, PhD, MBBS, received an R35 Outstanding Investigator Award from the National Cancer Institute of the National Institutes of Health.

Matthew Weinstock, MD, was the recipient of the 2022 Katherine Swan Ginsburg Humanism in Medicine Award from the Internal Medicine Residency at BIDMC.

INFECTIOUS DISEASES

Wendy Stead, MD, was selected by the Infectious Diseases Society of America as a Featured Educator in October 2022.

Ruvandhi Nathavitharana, MD, MPH, was presented with a 2022 National Institutes of Health NIH Director's New Innovator Award, as well as the Stephen Lawn TB HIV Research Leadership Prize from the London School of Hygiene and Tropical Medicine.

Dana Pepe, MD, graduated from BIDMC's Physician Leadership Program in 2022.

MEDICAL ONCOLOGY

Daniel Costa, MD, PhD, received an R37 MERIT Award from the National Cancer Institute at the National Institutes of Health.

David McDermott, MD, was the recipient of the 2022 Eugene P. Schonfeld Award from the Kidney Cancer Association in recognition of Lifetime Achievement in Medical Oncology.

Nadine Tung, MD, was elected as a Fellow of the American Society of Clinical Oncology (FASCO).

NEPHROLOGY

Melanie Hoenig, MD, received the Donald W. Seldin award for Excellence in Clinical Nephrology from National Kidney Foundation.

Sylvia E. Rosas, MD, MSCE, was elected President of the National Kidney Foundation (NKF) beginning her term in 2022, and she received the 2022 Distinguished Leader Award from the American Society of Nephrology.

Robert Stanton, MD, was awarded the 2022 Excellence in Ambulatory Student Teaching in Subspecialty Medicine by the BIDMC PCE HMS Class.

Joshua Waitzman, MD, PhD, and **Melanie Hoenig, MD**, won the 2022 Innovations in Kidney Education Contest from the American Society of Nephrology.

PULMONARY, CRITICAL CARE AND SLEEP MEDICINE

Virginia Brady, MD, received the 2021 Herrman Blumgart Award from the Internal Medicine Residency and Department of Medicine.

David Furfaro, MD, was presented with an 2021 Abstract Fellowship from the American Thoracic Society.

Nicholas Nassikas, MD, was presented with a 2021 Association of Pulmonary and Critical Care Medicine Program Directors Award for Medical Education Research.

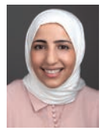
Mary Rice, MD, MPH, delivered the Distinguished Service Keynote Series Lecture at the American Thoracic Society International Conference in May 2022.

Richard M. Schwartzstein, MD, was the 2021 John W. Middleton Lecturer in Pulmonary Medicine at the University of Texas Medical Branch at Galveston.

RHEUMATOLOGY AND CLINICAL IMMUNOLOGY

Lisa Fitzgerald, MD, was the recipient of the 2019 Marian Ropes Award from the Arthritis Foundation of New England.

Iannis Adamopoulos, DPhil, was inducted to the Scientific Advisory Board of the Arthritis National Research Foundation.



Fatima Alduraibi, MD, PhD, received the Distinguished Fellow Award from the American College of Rheumatology.

CLINICAL INFORMATICS

Alexa McCray, PhD, was awarded the 2022 ACMI Distinguished Fellow Award from the American College of Medical Informatics.

CLINICAL NUTRITION

Bruce R. Bistrian, MD, PhD, MPH, was recognized by The American Society of Parenteral Nutrition who have established the Bruce R. Bistrian Nutrition Mentorship Award and Lecture in honor. The first lecture will be presented at their Annual Clinical Congress in 2023 and will be awarded on an annual basis subsequently to an invited speaker determined by a selection committee.

HEMOSTASIS AND THROMBOSIS

Robert Flaumenhaft, MD, PhD, was the 2022 Walter H Seeger lecturer in Blood Coagulation Research at Wayne State University in Detroit, Michigan.

Alec Schmaier, MD, PhD, received a 2022 award from the Eleanor and Miles Shore Faculty Development Awards Program.

Sol Schulman, MD, PhD, received a 2022 Long COVID Cardiovascular Award from the American Heart Association to study mechanisms of thrombosis in COVID-19.

Moua Yang, PhD, received a 2021 ASH Scholar Award from the American Society of Hematology.

INTERDISCIPLINARY MEDICINE AND BIOTECHNOLOGY

Griffin Weber, MD, PhD, was elected as a 2020 Fellow of the American College of Medical Informatics (FACMI).

Madalena D. Costa, PhD, was a 2022 Featured Alumna at the 30-year celebration of the Institute of Biophysics and Biomedical Engineering, Faculty of Sciences at the University of Lisbon.

Dr. Dan Barouch was honored at the opening night of the Boston Celtics with a Heroes Among Us Award, in front of a sold-out crowd of 20,000 people in October of 2021.

SIGNAL TRANSDUCTION

John Asara, PhD, received a 2022 Capital Equipment Award from BIDMC to fund a Thermo Exploris 480 Mass Spectrometer. He was also named a Highly Cited Researcher of 2022 by Clarivate.

Alex Toker, PhD, was selected as the recipient of the 2022 Avanti Award in Lipids from the American Association of Biochemistry and Molecular Biology. He was elected as a Fellow of the American Society for Biochemistry and Molecular Biology in 2022, and was elected as President of the American Association of University Pathologists in 2023. He will assume the position in 2026 for a one-year term.

TRANSLATIONAL RESEARCH AND TECHNOLOGY INNOVATION

Steve Freedman, MD, PhD, was the Plenary Keynote Speaker for the 2020 North American Cystic Fibrosis Conference, speaking on "Advancing the GI Frontier for People with CF." He was the 2021 State of the Art Speaker at the Australian CF SHIFT international meeting. He was the 2022 recipient of the Clinical Innovation in Gastroenterology Award from the Division of Gastroenterology, Hepatology and Nutrition.

Anna Johansson, PhD, developed a website of resources, which includes a step-by-step guide for investigators conducting community engaged research, funded by and in collaboration with Harvard Catalyst and the BIDMC Clinical Research Center.

CENTER FOR VIROLOGY AND VACCINE RESEARCH

Dan Barouch, MD, PhD, was the recipient of the George Ledlie Prize from Harvard University in 2021. He was named to Bloomberg's 50 Most Influential People by *Bloomberg Businessweek 2020*. He was recognized with a Heroes Among Us Award by the Boston Celtics in 2021. He was a 2021 Bostonian of the Year from *Boston Globe Magazine*. He received the 2022 Daniel Jick Excellence in Leadership Award from BIDMC, and the 2023 King Faisal Prize in Medicine from the King Faisal Foundation.

Sizun Jiang, PhD, received the 2022 National Institute of Allergy and Infectious Diseases (NIAID) DP2 New Innovator's Award.

K GRANT FUNDED INVESTIGATORS

National Institutes of Health Career Development (K) Awards are designed to further the development of researchers to the point where they are empowered to conduct their research independently and are competitive for major grant support. The Department of Medicine is proud to be home to many K funded investigators as supporting the growth and advancement of our talented researchers is at the core of our mission. Below are the members of the Department with current Mentored Research Scientist Development Award (K01), Mentored Clinical Scientist Research Career Development Award (K08), Mentored Patient-Oriented Research Career Development Award (K23), the NIA Beeson K76 which supports early stage clinician-investigators who have begun to establish research programs and demonstrate leadership in the field of aging research, and K99 awards are intended to foster the development of a creative, independent research scientist who can establish and sustain a strong, independent research program.

Eric Osborn, MD, PhD (K08)
Division of Cardiovascular Medicine

Project title: *Intravascular Molecular-Structural Imaging of Coronary Stent Pathobiology*

Rishi Wadhera, MD, MPP, MPhil (K23)
Division of Cardiovascular Medicine

Project title: *Explaining Rising Heart Failure Mortality in Medicare*

Jeremy Robbins, MD (K23)
Division of Cardiovascular Medicine

Project title: *DMGV and the AGXT2 pathway in chronic exercise-induced cardiometabolic adaptations*

Zsu-Zsu Chen, MD (K23)
Division of Endocrinology, Diabetes and Metabolism

Project title: *Phosphatidylcholine and cholesterol ester biomarkers of type 2 diabetes and preventive treatment effects*

Alec Schmaier, MD, PhD (K08)
Division of Cardiovascular Medicine

Project title: *Regulation of endothelial cell phosphatidylserine in thrombosis*

Margo Emont, PhD (K01)
Division of Endocrinology, Diabetes and Metabolism

Project title: *Investigating the Regulation of Distinct Human Adipocyte Subpopulations*

Aarti Asnani, MD (K08)
Division of Cardiovascular Medicine

Project title: *CYP1 Inhibition as a New Therapeutic Strategy for Doxorubicin Cardiomyopathy*

Eric Secemsky, MD, MSc (K23)
Division of Cardiovascular Medicine

Project title: *Shared Decision-Making to Improve the Health Status of Patients with Claudication: Developing and Implementing Strategies to Individualize Treatment Decisions*

Anna Santoro, PhD (K01)
Division of Endocrinology, Diabetes and Metabolism

Project title: *Mechanisms for the regulation of novel lipids in vivo*

Mark Benson, MD, PhD (K08)
Division of Cardiovascular Medicine

Project title: *The Role of PPM1G in Apolipoprotein E Biology and Atherosclerotic Cardiovascular Disease*

Jordan Strom, MD, MSc (K23)
Division of Cardiovascular Medicine

Project title: *Identification of the Components of Frailty Using Administrative Data and Metabolite Profiling*

Ismail Syed, PhD (K01)
Division of Endocrinology, Diabetes and Metabolism

Project title: *A Novel Class of Lipids as Potential Therapeutic Agents to Promote Pancreatic Beta cell Survival and Prevent Type 1 Diabetes.*

Daniel Cruz, MD (K01)
Division of Cardiovascular Medicine

Project title: *Admixture Mapping of Coronary Heart Disease and Associated Metabolomic Markers in African Americans*

Usman Tahir, MD (K08)
Division of Cardiovascular Medicine

Project Title: *The Role of SECTM1 in Monocyte Biology and Atherosclerosis*

Gregory Westcott, MD (K08)
Division of Endocrinology, Diabetes and Metabolism

Project title: *Lymphatic-adipocyte interactions in obesity and lymphedema*

Stephen Xingjie Zhang, PhD (K99)
Division of Endocrinology, Diabetes and Metabolism

Project title: *Competing effects of AgRP and POMC neurons on cAMP signaling in downstream neurons in vivo*

Corey Fehnel, MD, MPH (K23)
Division of Gerontology

Project Title: *Intensive Palliative Care: Improving the Process of Palliative Ventilator Withdrawal Among Critically Ill Older Adults*

Peter Czarnecki, MD (K08)
Division of Nephrology

Project title: *Novel signaling pathways in the ciliary inversin compartment*

Gordon Jiang, MD, PhD (K08)
Division of Gastroenterology, Hepatology and Nutrition

Project title: *Adenosine deaminase 2 regulates macrophage phenotype and liver fibrosis in nonalcoholic fatty liver disease*

Darae Ko, MD, MSc (K23)
Division of Gerontology

Project title: *Risk-Guided Atrial Fibrillation Surveillance in Ischemic Stroke*

Di Feng, PhD (K01)
Division of Nephrology

Project title: *The interaction between mechanical forces and cytoskeletal impairments in podocyte mediated kidney disease*

Timothy Anderson, MD (K76 - Paul B. Beeson Emerging Leaders Career Development Award in Aging)
Division of General Medicine

Project title: *Optimizing prescribing decisions for hospitalized older adults with chronic conditions*

Amy Lo, PhD (K01)
Division of Gerontology

Project title: *Modulating brain networks to reduce gait variability in older adults at risk of falling*

Joshua Waitzman, MD, PhD (K08)
Division of Nephrology

Project title: *Structure and mechanism of the kidney disease-causing protein APOL1*

Stephen Juraschek, MD, PhD (K23)
Division of General Medicine

Project title: *Vitamin D, Subclinical Cardiovascular Disease, and Orthostatic Hypotension in Older Adults*

Junhong Zhou, PhD (K01)
Division of Gerontology

Project title: *Cortical mechanisms and modulation of somatosensation in older adults with foot sole somatosensory impairments*

Mary Linton B Peters, MD, MS (K08)
Division of Medical Oncology

Project title: *Cost Effectiveness of Germline Genetic Testing in Pancreatic Cancer*

Kristen Kraemer, PhD (K23)
Division of General Medicine

Project title: *Understanding components of mind-body exercise for physical activity engagement in metabolic syndrome*

Moua Yang, PhD (K99)
Division of Hemostasis and Thrombosis

Project title: *Oxidative Cysteine Modification by Thiol Isomerases in Sickle Cell Disease*

Andrew Synn, MD (K23)
Division of Pulmonary, Critical Care and Sleep Medicine

Project title: *Pulmonary Vascular Pruning on Computed Tomography and Interstitial Lung Disease Outcomes*

Sarinnapha Vasunilashorn, PhD (K01)
Division of General Medicine

Project title: *Shared Pathophysiology of Postoperative Delirium and Alzheimer's Disease and Related Dementias*

Ruvandhi Nathavithrana, MD, MPH (K23)
Division of Infectious Diseases

Project title: *Optimizing Diagnostic Strategies for TB Transmission Control in Health-Care Facilities*

Rhea Bhargava, MD (K99)
Division of Rheumatology

Project title: *IgG glycosylation in lupus nephritis*

COLLABORATE. INNOVATE. ELEVATE.

THE HEARTBEAT OF CARDIOVASCULAR MEDICINE

Since its inception, the Division of Cardiovascular Medicine has introduced collaborative, exceptional programs and treatment options, increased its research funding by $10 million over the last decade to more than $25 million annually, and educated some of the world's most prominent cardiovascular experts. Bolstered by a tremendous depth of research and hands-on education, Cardiovascular Medicine at BIDMC delivers high-caliber care to our communities in Boston and beyond.

"Within our Division, there's just a really high level of professionalism; we're always doing the right thing for our patients and for each other," said Robert Gerszten, MD, Chief of Cardiovascular Medicine. "There's a spirit of collaboration that I had not seen previously that I feel is intrinsic to BIDMC."

The spirit that has bolstered the Division has led to key growth in the programs and services we're proud to offer our patients. Collaboration, teamwork, and expertise have catalyzed cardiac care across BIDMC and the BILH system, making us a leader in cardiovascular medicine.

A. Reshad Garan, MD, Director of the Advanced Heart Failure Program, and Masashi Kai, MD, Surgical Director of the BILH Heart Transplant Program.

View "Reflections from BILH's Heart Transplant Team"

Scan the QR code to view a video from our Heart Transplant Program

BILH HEART TRANSPLANT PROGRAM: Comprehensive Care for Advanced Heart Failure

The Beth Israel Lahey Health Heart Transplant Program at BIDMC launched in late summer of 2023, marking a significant milestone for our system, medical center, and the Division of Cardiovascular Medicine. With the BILH system being the leading cardiovascular services provider in eastern Massachusetts, serving more than 5,000 patients each year across our affiliates, the Heart Transplant Program will allow BIDMC to help more patients in New England receive lifesaving care.

"With the launch of the Transplant Program, we now can offer the full spectrum of cardiac care that the patient may need," said A. Reshad Garan, MD, Director of the Advanced Heart Failure Program. "Before, the limitation was that we had everything except for heart transplant. But now I can proudly say that we can offer the patient the therapy we think is best for them to help achieve their optimum outcome."

Dr. Garan leads the program alongside Surgical Director Masashi Kai, MD, who was recruited to BIDMC for his expertise and past success in heart transplant operations. Dr. Kai has successfully completed more than 300 heart transplants over the last decade. As Surgical Director of the Heart Transplant Program at Westchester Medical Center, he helped patients receive hearts faster and recover with fewer complications than national averages. Dr. Kai was also an Associate Professor of Surgery at New York Medical College.

It has been decades since a heart transplant program was created in our region, and the launch is the culmination of much planning and stewardship from a large team of institutional leaders. With Dr. Garan, Dr. Gerszten, and Kamal Khabbaz, MD, Chief of Cardiac Surgery, the BILH Heart Transplant Steering Committee included Marwa Sabe, MD, MPH, Associate Director of the Advanced Heart Failure Program; Pablo Quintero Pinzón, MD, Medical Director of Heart Transplant; Peter Zimetbaum, MD, Associate Chief and Clinical Director of Cardiology; and Cindy Phelan, DNP, RN, Executive Director of the Cardiovascular Institute. The program has also benefited from the leadership of Meaghan Strob, MPH, Director of Operations in Cardiology, and Jessie Breed, MS, BSN, RN, Director of Heart Transplant and Special Programs. The new program is truly a testament to the work of our medical center faculty and staff, especially the multidisciplinary team members of Heart Transplant, including physicians, nurses, cardiac anesthesiologists, pharmacists, nutritionists, social workers, and more.

"We focus on what the patient wants and what's important to them and their caregivers. That's what makes our program very special," said Dr. Sabe. "Our patients have told us that they appreciate the camaraderie with the staff, as well as the continuity of care at BIDMC. We wanted to offer them all the heart failure therapies they may need under one healthcare system, a system they trust and have become comfortable in."

BIDMC electrophysiologists are internationally recognized in the management of all types of complex atrial and ventricular arrhythmia.

When Dr. Sabe arrived at BIDMC shortly after completing fellowship, BIDMC offered a wide range of heart failure therapies including ventricular assist device implantations, but did not have immediate plans for a heart transplant program. Upon Dr. Garan's arrival in 2019, he assured his colleagues that an additional heart transplant program would only help care for more patients needing the procedure while also offering BIDMC patients the opportunity to receive all their care with us. Dr. Sabe, who is the Director of the Ventricular Assist Device program, was immediately onboard to help expand the Advanced Heart Failure program.

> "We focus on what the patient wants and what's important to them and their caregivers. That's what makes our program very special. Our patients have told us that they appreciate the camaraderie with the staff, as well as the continuity of care at BIDMC." —Marwa Sabe, MD

"It's a huge responsibility; you have to be stewards for these donors and their families," said Dr. Sabe. "You have to be extremely meticulous about the management of each patient before and after transplant, but after years of growth within the Advanced Heart Failure program, we were prepared for this important addition to the program."

As the wealth of knowledge in the field of medicine and advanced heart failure continues to grow, experts develop new technologies and treatments that help patients feel better, prolong life, and keep people healthy out of the hospital. With the launch of the BILH Heart Transplant Program, staff and physicians are optimistic that each patient who seeks treatment will have the individualized and considerate care they deserve.

"When you think about the entire part of the transplant, it's humbling to think about the gift of life," said Dr. Garan. "When

> This is a rapidly evolving field; what we do now, we weren't doing five years ago." **—Timothy R. Maher, MD**

you are involved in these cases, it's hard not to be emotional reflecting on the whole process. That feeling never goes away."

ARRHYTHMIA SERVICES: Electricians of the Heart

The Electrophysiologists in Arrhythmia Services at BIDMC are specialists who manage complex atrial and ventricular arrhythmias by working with highly advanced technology for modern signal processing to provide patients with precise and effective treatments.

"Our goal is to offer safer and more effective treatments for a larger group of patients," said Andre L. d'Avila, MD, Director of Electrophysiology Research and the Harvard Thorndike Electrophysiology Institute. "The VT Center is very beneficial for our patients, the community, and for everybody that cares about this problem or suffers from this condition."

Electrophysiologists act as "electricians of the heart," meaning they help with its electrical functions. Experts within the subspecialty provide noninvasive and invasive treatment of abnormal heart rhythms, emphasizing minimally invasive approaches. Dr. d'Avila's primary research focus is the mapping and ablation of complex atrial and ventricular arrhythmias. He and his colleagues in Brazil have pioneered the field of epicardial ablation, and Dr. d'Avila was instrumental in bringing this technique to the United States. Jon Waks, MD, is also an integral member of the Ventricular Tachycardia (VT) Center with particular expertise in the development of novel electrocardiographic algorithms to identify the risk of VT.

Many procedures performed in Arrhythmia Services are catheter-based (90%) and do not require radiation, reducing exposure to patients and staff. Specific procedures allow patients to be discharged the same day, a significant improvement from 10 years ago, when patients were typically hospitalized for three to six days. Mortality rates for heart arrhythmias have also decreased because of new developments in electrophysiology, underscoring the value of translational research.

A new suite on the fifth floor of the Farr Building was designed to combine vital patient services with support for the growing Advanced Heart Failure and Transplant Cardiology staff. Photo courtesy Anton Grassl.

Marie-France Poulin, MD, Associate Director of Structural Heart Clinical Services and Associate Director of the Interventional Cardiology Fellowship, performing a procedure.

For complex diseases with multiple morbidities like cardiomyopathy and arrhythmias, multidisciplinary care is essential to treating patients effectively. To help support patients being treated for ventricular tachycardia, faculty and staff within the Division established the VT Center, which will provide streamlined treatment plans while employing multidisciplinary care to treat increasingly sick patients.

Patricia Tung, MD, oversees the three-year electrophysiology fellowship program to train the next generation of specialists. After electrophysiology fellows finish the general cardiology portion of their fellowship, they receive additional training with the opportunity to perform at least 700 procedures in close collaboration with faculty. The fellows learn approaches to managing patients with arrhythmias and understand the role of the Ambulatory Electrocardiography Laboratory, which provides 24-hour surveillance for arrhythmia diagnosis and management.

Timothy R. Maher, MD, Associate Director of VT Ablation and Cardiac Electrophysiologist, completed his electrophysiology fellowship in 2023 and has transitioned into a faculty role at BIDMC. He continues the collaborative work in advanced techniques, ventricular tachycardia, and ablation.

"This is a rapidly evolving field; what we do now, we weren't doing five years ago," said Dr. Maher. "If you fast forward to today, we're trying to take those tools to the next level to maximize patient safety and the efficiency of these procedures."

Electrophysiology fellows at BIDMC also have a wide array of research opportunities. Under the mentorship of Dr. d'Avila, Dr. Maher was involved in various investigations involving noninvasive high-resolution ECG analyses, investigational mapping systems, and advanced imaging integration into VT ablation procedures, novel arrhythmia 3D mapping techniques, and preclinical assessment of next-generation ablation tools.

"The fellows here are completely integrated into the Department's clinical services, education, and academic functions," said Dr. Maher. "Looking back and reflecting on what has been the most impactful is not learning specific techniques or reading a specific textbook or going to the conference, but it's the relationship with the mentors here."

With the clinical care, research, and community outreach in the VT Center, Drs. Maher, Waks, and d'Avila aspire to teach their expertise to others who want to do these types of procedures and contribute to the ever-growing research in electrophysiology.

"If we can get our technology even closer to the point where we can sufficiently provide safe and efficient procedures, and the anxiety leading into the procedure room goes down, then I think we can really move the needle in terms of the work we do here," said Dr. Maher. "With everything we know about medicine, so much more can be discovered and developed. We want to put the whole puzzle together."

STRUCTURAL HEART CENTER: From Minimally Invasive to Maximally Effective

In all areas, our clinicians consistently innovate around the central question of: 'Can this be done more effectively, less invasively, and with better results for the patient?' The ability to meet the needs of some of our patients with advanced cardiac conditions has grown exponentially in the past few decades with the rapid rise of noninvasive, nonsurgical treatment options. In the Structural Heart Center at BIDMC, our interventional cardiologists and cardiac surgeons expertly and collaboratively perform nonsurgical and hybrid procedures, allowing patients with structural heart conditions to be discharged sooner and recover quicker.

One procedure that has propelled care within the Structural Heart Center is the transcatheter aortic valve replacement (TAVR). The nonsurgical treatment option

> We bring such different perspectives to the table — ranging from outcomes research at the Smith Center to advanced imaging, to basic and translational work in the CardioVascular Institute."
>
> **—Jennifer Ho, MD**

is performed by inserting an artificial valve, which is usually done by guiding a catheter through an artery in the groin. The procedure only requires a small incision, and each patient with aortic stenosis is carefully evaluated by a multidisciplinary heart team. Using shared decision-making, TAVR or surgery is selected after careful consideration of all options. Nearly 90% of BIDMC patients who have undergone a minimally invasive TAVR are discharged within one day after the procedure.

"It's one of the procedures that has really changed the field," said Marie-France Poulin, MD, Associate Director of Structural Heart Clinical Services and Associate Director of the Interventional Cardiology Fellowship. "There's always newer techniques and newer devices for refining how we do things."

Our interventional cardiologists also perform MitraClip therapy, where a clip-like device is placed in the heart to hold damaged leaflets together, allowing the valves to close tightly. BIDMC was the first hospital in Boston to offer the fourth-generation MitraClip G4 device, and our Interventional Cardiology faculty have performed 5,000+ diagnostic and coronary interventional procedures annually. The procedures take place in the cardiac procedural suites, which are equipped with five catheterization laboratories and three hybrid operating rooms. Similar to TAVR, the MitraClip is also a noninvasive treatment option.

"We are enabling treatment of patients that could never be treated before," said Roger Laham, MD, Director of the Structural Heart Center and an Associate Professor of Medicine at Harvard Medical School. "We also aim to increase innovation. Developing new technologies will enable better treatment for more patients and ensure that people in underserved or underrepresented communities are not left behind."

As barriers to quality healthcare continue to be identified, our medical center physicians and staff are considering how we can make care equitable for all. With the increased ability to deliver online medical care, Dr. Laham notes that physicians recognize issues with some patients' connectivity based on certain zip codes. With the lack of internet and Zoom capabilities, it is important to acknowledge the barrier between the patient and physician communicating their health condition and treatment options. As Dr. Laham stated, "There are small things that can work on to, slowly but surely, reduce healthcare disparities so that hopefully everyone gets equal opportunities."

"I'm very proud of the work that we do and the team that we have," said Dr. Poulin. "I hope that we keep growing; that we keep being able to offer the same amazing care that we've been providing for patients."

Dr. Ho and her research laboratory team. From left to right: Mythri Ambatipudi, Juhi Parekh, Abbey Pan, Emily Lau, Dr. Ho, Athar Roshandelpoor, Ndidi Owunna, and Leah Kosyakovsky.

CARDIOVASCULAR RESEARCH: Envisioning the Future

Research has allowed medicine to evolve immensely, helping physicians pioneer innovative technology and treatments and translate that to provide exemplary care for patients. Remarkable discoveries within the Division of Cardiovascular Medicine's Research section have helped provide insights into heart health and diseases, and our team continues to dig deeper.

"There's so much amazing work in progress," said Jennifer Ho, MD, Director of Research in Cardiovascular Medicine. "Learning about what people are doing has really opened my eyes to different collaborations and different ways in which we can think together about the same problem through different lenses."

Dr. Ho has spent her career as a clinician and researcher dedicated to helping others through patient care, mentorship, and teaching. She was recruited as Director of Research in 2021 and is part of the heart failure section. For the first six months in her role, Dr. Ho focused on learning about the caliber and breadth of research being conducted by BIDMC physician-scientists so she could best foster professional development among our medical center's faculty.

"We bring such different perspectives to the table — ranging from outcomes research at the Smith Center to advanced imaging, to basic and translational work in the CardioVascular Institute. It's been successful because we have an incredible team with deep clinical and research expertise, and we all learn from each other," said Dr. Ho. "That's been really fun, and I think it has taken the level of cardiovascular research at BIDMC to another level."

Diversity in medicine is crucial to provide equal opportunities for clinicians, researchers, and educators to deliver patient-centered care. Dr. Ho and her research group, composed primarily of women researchers, are investigating how obesity interacts with HFpEF, a particular type of heart failure. In two ongoing studies, Dr. Ho and her team are exploring this type of heart failure by looking at molecular profiling in both circulating blood and cells from the inside lining of veins to help understand inflammation and potentially an underlying contributor or cause of HFpEF. One of Dr. Ho's additional projects entails an NIH grant-funded study to understand vascular dysfunction following COVID-19 in people with and without obesity and the long-term implications.

"One of the visions I've had is pulling people together across disciplines to be able to answer bigger research questions together," said Dr. Ho. "My hope is that we can create the right environment and opportunities to engage talented people across different research and clinical disciplines, to enable us to answer impactful questions that will help improve cardiovascular health."

Through those pipelines of support and connection, we are ensuring that our young researchers and faculty benefit from the mechanisms we have in place to foster growth, grant funding, collaborations, and all the other components required to establish them as successful independent investigators. Working in complement to Dr. Ho's work to bolster research across the Division, our young investigators benefit from being surrounded by a deep well of prolific senior faculty. This includes Dr. Gerszten's lab, which is one of the largest genomic groups in the country.

As Dr. Ho emphasized, "We are really dedicated to mentoring trainees here at BIDMC and supporting the next generation of physician-scientists and cardiovascular researchers as they find new and innovative ways to truly create an impact."

There is immense excitement when we imagine the future of patient care and the promising new horizons where research may lead us. Our physicians will always unite with the same goal of providing exemplary care and world-class treatments.

"BIDMC is a hospital that has tremendous depth and a well-deserved reputation as a leader in research, but it's also the hospital that I think is most focused on delivering care to the community," said Dr. Zimetbaum. "We always hear from faculty that patient care comes first; that when you're taking care of patients, they always come before anything else."

(From left to right) Robert Gerszten, MD, Chief of Cardiovascular Medicine; Jennifer Ho, MD, Director of Research in Cardiovascular Medicine; and Peter Zimetbaum, MD, Associate Chief and Clinical Director of Cardiology.

The Division of Cardiovascular Medicine's leadership has been thoughtfully honed to best coordinate the skills and expertise of Drs. Gerszten, Ho, and Zimetbaum. Dr. Gerszten, an internationally renowned investigator whose translational research program examines the nexus of cardiac and metabolic diseases and leverages metabolomics and proteomic technologies, has led the Division since 2016 with a focus on growing key services and empowering our faculty as leaders and innovators. In partnership with Dr. Zimetbaum's clinical expertise and Dr. Ho's research acumen, the trifold model of leadership aligns the group around the core goals of our Division, Department, and medical center: exemplary clinical care, pioneering research, and enriching education.

FROM CURIOSITY TO DISCOVERY:

ENHANCING RESEARCH OPPORTUNITIES IN THE INTERNAL MEDICINE RESIDENCY

The long-held core goal of our Internal Medicine Residency is to foster the kind of physicians who we would want to care for our own family members. Simultaneously, we strive to create future leaders in medicine. To foster their growth as leaders, we provide time, space, and mentorship to allow our residents to thrive and succeed in a range of academic pursuits, including research. We encourage our learners to be curious innovators at the bench and in clinical and translational research at the bedside. We push our residents to ask questions that will advance their field by asking, "Why?" and "What's next?" We want them to move beyond the status quo and ask, "If this is how it has been done, how can we do it better?" "How can we positively change the paradigm and advance knowledge for the best possible care and patient experiences?"

Every Spring our residents and their mentors come together for Resident Research Night to showcase and celebrate their work. Drs. Mukamal, Samelson, and Asnani learning about a resident's project.

In transitioning from theory to daily practice, our emerging physicians are called not only to apply established medical principles but to also contribute to the ever-evolving landscape of medicine. In an era where knowledge expands at a dizzying pace, the importance of scholarly research in shaping the future of healthcare cannot be overstated. For medical residents and fellows, the integration of research into their training is not merely an academic exercise; it is a vital component of their professional development. This has driven us to successfully build and expand numerous opportunities in our curriculum to cultivate the research arm of our learner's careers, and to encourage them to find a path that supports their long-term goals.

"It is important for our residents to create a cohesive narrative about their future careers," said Chris Smith, MD, Vice Chair for Education and Program Director for the Internal Medicine Residency. "As we prepare our residents to apply for fellowships, a key element of that narrative is the academic scholarly work that they have done during residency and ensuring that it informs their future career path. All of our residents have an opportunity to be linked with mentors who care about them and help them achieve their career goals, through research of any variety."

Our residency leadership, which includes dedicated Associate Program Directors (APDs) for Research, has built the curriculum to foster our residents as researchers, providing dedicated time to accomplish their research goals. At the beginning of residency, our APDs for Research meet with each intern to discuss their potential areas of interest and connect them with future mentors. In addition, the residency has a novel two-week research course that provides residents with dedicated time, space, knowledge, and access to investigators, allowing them to fine tune their research questions and develop the knowledge and skills needed to succeed with their projects.

We welcome into our residency an impressive number of residents who have already undertaken scholarly work, as 67% of the most recent graduating class of 2024 arrived with at least one peer-reviewed publication or book chapter. As they continue to grow their research projects and publications, most of our residents publish in major journals and travel to present their work at national conferences.

"Having the opportunity to publish and present their research at national meetings not only helps jumpstart the residents' careers and academic success, but also provides them an opportunity to meet other individuals who may influence their future career both here at BIDMC and beyond," said Dr. Smith. "Frequently, the most successful projects and the most successful careers are launched through an expanding network of mentorship."

We strive to ensure our residents feel they are connected to an institution-wide network of research support, opportunities, and resources here on campus. Below you will find a snapshot of our current work in research and programming for our trainees including the Physician-Scientist Track, the Resident Research Course, three profiles of ongoing faculty and trainee collaborations, a snapshot of resident research statistics, and photos from one of our annual Resident Research Night poster sessions.

THE PHYSICIAN-SCIENTIST TRACK

We have a long standing history of supporting and fostering physician-scientists in our Internal Medicine Residency and we continue to deepen and formalize our dedicated Physician-Scientist Track (PST) with an expanding curriculum designed to maximize resident experience. While all residents have access to expansive research opportunities, the PST aims to support the research careers of MDs and MD/PhDs committed to clinical, translational, and/or basic science investigation as well as clinical practice. The program is led by Director Steven Freedman, MD, PhD, and Associate Directors Aarti Asnani, MD, and Z. Gordon Jiang, MD, PhD.

Our dedicated PST supports residents as they develop their research interests and career paths. Residents in the track benefit from the wisdom of our renowned faculty who provide mentorship, opportunities, and career guidance on key concepts for a successful career, from securing research funding to balancing research and clinical work.

"We want to create a space during residency for these individuals who are really interested in a career as a physician scientist to continue their research training. It's all about taking advantage of this time to learn new techniques, or to get exposure to new areas of research," said Dr. Freedman. "Everyone here is just so invested in our trainees being successful — clinically, in research, and in mentorship."

Dr. Freedman's commitment to mentoring is paramount as he also directs the Franklin Epstein Society and the Grant Review and Support Program (GRASP), both of which are specifically designed to foster early-career researchers, including those who transition from residency or fellowship to faculty. Both programs have been recognized by Harvard Medical School in recent years with the Program Award for Culture of Excellence in Mentoring (PACEM). Dr. Freedman has integrated the PST residents into the Epstein Society, where they are welcome to attend events and learn from the current pipeline of junior and senior investigators navigating their careers in research. These connections can provide opportunities for future collaborations. The PST residents are also often linked with investigators at the Broad Institute and in the Harvard Medical School Basic Science departments based on their areas of interest.

"While the PST faculty leadership enjoy serving as career mentors, we also prioritize introducing residents to the right research mentor within their area of expertise or area of interest," said Dr. Asnani. "This process starts during intern recruitment, where we proactively set up one-on-one meetings with investigators with whom the residents might want to work if they match with us."

The residency also connects applicants with our Department's Division Chiefs to discuss research opportunities. This lays a foundation for our applicants to better understand how BIDMC can help them achieve their career goals as they move from residency into fellowship and on

Many of our residents participate in the Resident Research Course and benefit from dedicated time to build an area-of-concentration (AOC) and hone their projects.

to junior faculty positions. The PST also ensures our residents interested in the ABIM Research Pathway (short tracking) have ample mentorship and guidance.

Two key goals for the program are to sustain our residents' excitement and enthusiasm for science, despite their busy clinical schedules, and to foster a sense of community. One way to achieve these goals is by having prominent scientists share their own career journeys and by creating time and space for residents to interact with each other and to talk about their career goals.

"Having been a resident and fellow at BIDMC myself, I know how critical the transition is from bench research to physician scientist to ultimately having an independent research career," said Dr. Jiang. "My hope for this program is to provide meaningful guidance to the trainees, building upon the lessons I learned in this journey, as we help residents to achieve their own success."

Helping residents understand how they can shape translational, bench, and basic research in their area of interest into their careers longitudinally is integral to the PST. "We want residents to understand they can do very high-end research. As clinicians at BIDMC they have access to a unique cohort of patients, samples, and data, and they can collaborate with other researchers, labs, and industry to develop major research studies with impactful outcomes, which can ultimately be published in major journals," emphasized Dr. Freedman. The PST also has mechanisms to ensure residents have resources, such as support from post-docs and research assistants, to execute their mentored research and ensure they learn new techniques in the lab.

Ultimately, it is about exploring and expanding research opportunities during residency. "I often tell incoming PST candidates that you may underestimate how much you can learn when you come into a residency program," said Dr. Jiang. "Residents understand the clinical learning ahead of them, but don't always see how much they can learn and achieve in terms of research. When I came here, I was encouraged to take the research course, and it turned out to be extremely valuable and helped my current career

Hyder Said, MD, presenting his work to Kenneth Mukamal, MD, MPH. Our leadership wants to ensure each resident can accomplish their research goals, and we work to find the right mentor for them.

tremendously. So I encourage incoming residents to try something new. This is the time — probably the last time — to really try something different. It will help them decide what they can focus on in the future."

RESIDENT RESEARCH COURSE

The Resident Research Course was first launched in 2005 and has been a part of our curriculum for 20 years. Our then Vice Chair for Education, Gordon 'Buck' Strewler, MD, and then Residency Program Director, Eileen Reynolds, MD, recognized that residents would benefit from dedicated time to build an area-of-concentration (AOC), hone a project, and begin their investigations. They brought in Kenneth Mukamal, MD, MPH, who has now been part of the Division of General Medicine's research faculty for over 30 years, to conceptualize together how we could incorporate opportunities to deepen research into the curriculum. They launched the Resident Research Course; initially a one-week course, it soon became the first multi-week residency course of its kind in the nation. It has grown into two two-week courses, which ensures that every resident has the opportunity to participate. Over the years, Dr. Mukamal, Lisa Samelson, PhD, Associate Program Director for Research who co-directs the research course, and their fellow leadership have repeatedly deepened the curriculum.

"As we continue to recruit exceptional intern classes, the number of residents who have done research already expands year after year. It's incumbent upon programs like ours to ensure our residents have a chance to experience a range of opportunities," said Dr. Mukamal. "We make it possible for residents to maintain existing research skills, learn new skills while they're here, and put those skills to good use. Continuing to grow their scholarly activity during residency enables them to achieve the jobs and fellowships that will successfully launch their careers while testing whether they want investigation to be a permanent part of their professional portfolios."

The course is designed to be both accessible and challenging, valuable for those with existing research backgrounds and those at a more novice level. The goal was that at the end of the two weeks, residents would have a clear path toward an AOC project, an identified mentor, and a feasible, interesting project to carry through their residency.

"We are always assessing how we can tailor the course to the residents. There is such a range of skill sets and we want to meet them where they are at, and to make sure they have the confidence and skills to succeed. We want to create an environment where they feel safe and willing to take risks," said Dr. Samelson.

The course itself is split into morning, lunchtime, and afternoon sessions. The mornings are didactic lectures on three core threads: 1. Basics of research methods, 2. Resources available for support, and 3. Skills that make a successful academic investigator.

For the first thread, faculty provides a bootcamp on research methods. Many residents have past research experience or master's degrees, but have not done as much hands-on research during their internship, so we refresh those skills. To the second thread, we have a strong and extensive research infrastructure at BIDMC, HMS, and beyond. Introducing residents to the resources, such as the Countway Library at HMS and contacts in our IRB, allows them to take full advantage of these key resources throughout residency. For the final thread, faculty focuses on the skills of academic research, such as: how to present a research talk; how to put together a specific aims page; how to get the most from a research meeting; and strategies for working with your mentor.

"We want them to leave the course with a toolbox — the equivalent of what used to be the medical black bag — for research. We want to jumpstart their career and to have resources that they did not have before the course with an excitement to move forward," said Dr. Samelson.

During the lunchtime sessions, leadership facilitates career talks with investigators from across BIDMC, including fellows, junior investigators, and senior investigators who share their stories from different levels.

The afternoon sessions are dedicated to hands-on work to advance their own projects. All course participants meet with biostatisticians and experienced investigators to discuss potential projects, refine their proposals, and develop solid analytical plans.

In optional small groups, the residents also have the opportunity to work with publicly available, nationally representative datasets to identify and explore research questions. This experience gives them a chance to think through a variety of questions we can ask with these large datasets: What are the necessary variables to answer my question? How do I operationalize those variables? What is my hypothesis? What is the answer to my question? During the course, residents work together to plan and then perform analyses to get results, which are routinely developed into abstracts and full-scale research papers.

"Part of the goal is to give the residents a sense of what is feasible," emphasized Dr. Mukamal. "It's very easy for our residents to open up the *New England Journal of Medicine*, look at an enormous trial, and say, 'I'll never be able to do that.' Those are some of the biggest, most difficult, and interesting studies. But there's so much research going on and it's important to be able to see themselves in that role. Giving them a chance through the research course to work on and create their own products is meaningful, because it allows them to quickly jumpstart the process."

All of these pieces culminate on the final day of the course, when each resident gives a 10 to 15 minute research talk about their project. It is always rewarding to see what they have constructed and their enthusiasm for where they will take it next.

What we ultimately strive to achieve is a space for creativity and the chance to create a vision for their own research. "BIDMC is the place that fosters collaboration, encouragement, and support — all of those features are prevalent within the research program," said Dr. Mukamal. "We want everybody who wants to do research to come in and find a way to do it. We will work to find the right mentor for them, wherever that might be and whoever that might be. If you have an interesting idea, we'll explore it with you."

It all comes down to exploration — how can we take each resident's dreams and aspirations and make them a reality.

RESIDENT RESEARCH AT-A-GLANCE

67%

of the Class of 2024 arrived with at least one peer-reviewed publication or book chapter

105

total publications by the Class of 2024 over their three years of residency

152

conference presentations from the Class of 2024 during their residency

22

average number of residents who participate in the research course annually

RESEARCH IN ACTION: ONGOING PROJECT PROFILES

As Dr. Smith emphasized, "We're fortunate to work with faculty that spans a depth and breadth of research with immense talents, abilities, and skills to help every resident achieve their goals and desired future career trajectory." Below we spotlight three faculty and trainee pairs and the work they are doing together — just a few of the countless collaborations currently underway in mentored research.

HANNA KNAUSS, MD, AND STEPHEN JURASCHEK, MD, PHD

Hanna Knauss, MD, current PGY-3, has been working closely with Stephen Juraschek, MD, PhD, Hypertension Research Director and faculty in the Division of General Medicine, on a study examining the effects of a healthy diet and risk of cardiovascular disease. Dr. Knauss was interested in preventing cardiovascular disease and the role nutrition could play in lowering long-term risk. Moreover, given that much of the evidence in support of dietary recommendations are based on observational studies, she was motivated to examine clinical trials as a rigorous form of evidence to support nutrition. Dr. Knauss showed that the combination of sodium reduction and a balanced diet rich in fruits and vegetables significantly reduced risk of cardiovascular disease over a 10-year period. She presented her results as a moderated poster at the American Heart Association (AHA) Epi/Lifestyle, and her manuscript was recently accepted by the *American Journal of Preventive Cardiology*. Her work has directly contributed to upcoming grant proposals, where Dr. Juraschek's team plans to explore the longitudinal direct effects of diet on cardiac injury.

"Working on this research project has been instrumental in my resident training and career trajectory," said Dr. Knauss. "It has been a privilege to learn from Dr. Juraschek as an investigator, mentor, and clinician. As an aspiring cardiologist, this experience has deepened my commitment to preventive care, honed my research skills, and provided valuable connections with researchers across the country. I look forward to integrating these skills and insights to my future career and scholarly pursuits as an academic cardiologist."

"As a general internist, who does a fair amount of clinical research, it is such a pleasure to share the joy of discovery and clinical research with residents," said Dr. Juraschek. "Residents at BIDMC are creative, industrious, and passionate about making an impact on their patients' lives. Mentoring such talented residents to advance patient care with evidence makes my work as a physician investigator especially rewarding. The future of clinical investigation is bright with such a talented, curious, and engaged next generation of physicians."

> "The future of clinical investigation is bright with such a talented, curious, and engaged next generation of physicians.
>
> —Stephen Juraschek MD, PhD

From left to right: Zachary Schoepflin, MD, PhD, (Chief Medical Resident), Michelle Hall, MD, Nicholas Spetko, MD, (Chief Medical Resident), and Hannah Robertson, MD.

AARON HAKIM, MD, MS, AND GORDON JIANG, MD, PHD

Aaron Hakim, MD, MS, current PGY-6 in the Gastroenterology fellowship and graduate of our IM Residency, has been working closely with Gordon Jiang, MD, PhD, faculty in the Liver Center, on several projects to understand the genetic basis of both rare and common liver diseases. During Aaron's intern year, he worked with Dr. Jiang to start a multi-institution study between the BIDMC Liver Center and Yale to advance the diagnosis and management of unexplained liver disease in adults through whole exome sequencing. The results uncovered a definitive genetic diagnosis in 17 out of 52 study participants. These results were published in *EBioMedicine*. Aaron has also worked with Dr. Jiang and mentors at the Channing Division of Network Medicine to perform genome-wide association studies across several hundred thousand individuals in two large biobanks (UK Biobank and Mass General Brigham Biobank). This work identified a novel genetic variant in a mitochondrial protein, found in 23% of the population, that is associated with increased risk of developing fatty liver disease. The results of this project were published in *Hepatology* with Dr. Hakim as first author. Currently, during his Gastroenterology fellowship, Aaron is working with both Dr. Jiang and Dr. Rajat Gupta at Brigham and Women's Hospital to perform genome-wide CRISPR knockout screens to identify new genetic drivers of fatty liver disease in cellular models. Initial results were presented at the 2024 Liver Meeting in San Diego, California.

"I am very fortunate to have found supportive scientific mentors at BIDMC who have fostered my interest in human genetics research during my Internal Medicine and Gastroenterology training," said Dr. Hakim. "We are hopeful that our efforts may lead to new therapeutic targets for chronic liver disease."

"Aaron's passion and ingenuity in genetics enabled him to tread out a unique career path during Internal Medicine Residency and GI fellowship that involves several exciting projects with mentors from different institutions," said Dr. Jiang. "I am privileged to witness his academic growth and to perform a rather simple job — to let his interest lead the way and share my expertise whenever I can."

Netana Markovitz, MD, presenting her work to Mark Zeidel, MD, Chair of Medicine. We encourage all our residents to use their research time for exploration, to try something new and different. This will help as they continue to decide what to focus on in their future careers.

IVY SHI, MD, MBA, ROBERT YEH, MD, MSC, AND DHRUV KAZI, MD, MSC, MS

Ivy Shi, MD, MBA, current PGY-2, has been working closely with Robert (Bobby) Yeh, MD, MSc, Founding Director of the Smith Center for Outcomes Research in Cardiology, and colleagues Dhruv Kazi, MD, and Issa Dahabreh, MD, ScD, on the implications of GLP-1 agonist clinical trials for clinical care in the U.S. As indications for GLP-1 medications are expanding to cardiovascular disease prevention, Dr. Shi and Dr. Yeh had many questions about how this would affect the number of adults eligible for medications like semaglutide in the U.S., what the projected impact to adverse cardiovascular events might be with increased semaglutide adoption, and what the cost might be of these high-cost preventive therapies. This research is an important question that is part of broader work being done at the Smith Center to improve health and economic evaluations of novel therapeutics. As they investigated, they found that the clinical trial population differed systematically from the U.S. treatment-eligible population in ways that would likely impact the generalizability of semaglutide trials to a U.S. population. Initial work detailing this was presented at the AHA Annual Meeting last fall, and a manuscript titled "Semaglutide Eligibility Across All Current Indications for US Adults" was published in *JAMA Cardiology*. This work has grown into discussions with the semaglutide clinical trialists at the Cleveland Clinic and Novo Nordisk about pursuing novel "transportability" studies that re-weight semaglutide trial treatment effects (often derived from narrow patient population) to broader populations representative of contemporary practice, as well as studies that look more broadly at population-level eligibility of a wider set of cardiovascular-kidney-metabolic syndrome treatments.

"I'm most excited and motivated about my research when it answers the questions I hear myself and my colleagues asking each other in the workroom, which is exactly what Bobby and the team at the Smith Center are best at," said Dr. Shi. "Bobby, Kazi, and Issa have been a remarkable mentorship group, guiding our work with a keen eye on clinical relevance and statistical rigor, and I have loved learning so much from their expertise. I'm excited to continue to learn from and model a career in cardiology after these incredible mentors."

"Working with Ivy has once again reminded me of how remarkable our trainees are, and what an incredible opportunity we have as faculty to help shape their bright futures," said Dr. Yeh. "Ivy is a dynamo, merging her ample prior experience as a data scientist with a budding interest in cardiovascular clinical care, and bringing creativity, curiosity, and rigor to the work she is doing with us at the Smith Center. We've integrated Ivy into what has become one of our signatures: community mentorship — a natural extension of the highly collaborative interdisciplinary work we are leading here. I'm confident that this is just one of the many studies we will work on together that have the opportunity to shape the national discourse on how these exciting but costly new therapies should best be integrated into our practice."

MEDICAL EDUCATION **LEADERSHIP**

(2021-2022 AND 2022-2023 ACADEMIC YEARS)

Vice Chairs

VICE CHAIR FOR EDUCATION
Eileen Reynolds, MD

ASSOCIATE VICE CHAIRS FOR EDUCATION
C. Christopher Smith, MD
Anjala Tess, MD

Residency Leadership

RESIDENCY PROGRAM DIRECTOR
C. Christopher Smith, MD

PRIMARY CARE PROGRAM DIRECTOR
Kelly Graham, MD

ASSOCIATE PROGRAM DIRECTORS
Neal Biddick, MD
Virginia Brady, MD
Jonathan Crocker, MD
Jason Freed, MD
Kenneth Mukamal, MD, MPH
Daniel Ricotta, MD
Elizabeth Targan, MD
Anjala Tess, MD
Aarti Asnani, MD
Leo Celi, MD
Elizabeth (Lisa) Samelson, PhD
Julius Yang, MD, PhD

EDUCATION MANAGER
Ruth Colman, C-TAGME

PROGRAM ADMINISTRATOR
Nikki deMelo

Chief Medical Residents (2021-2022)

Maelys Amat, MD, MBA
Rebecca Angoff, MD
Anish Bhatnagar, MD
Jenna Klubnick, MD
Tyler Mehegan, MD
Staci Saunders, MD

Chief Medical Residents (2022-2023)

Laura Desrochers, MD, MPH
Brian Li, MD
Brooke Lubinski, MD
Zachary Schoepflin, MD, PhD
Nick Spetko, MD
Katie Vaughan, MD

Firm Chiefs

Blumgart Firm
Wendy Stead, MD
Jason Matos, MD

Kurland Firm
Barbra Blair, MD
Emmanuel Mensah, MD, MBA

Robinson Firm
Shani Herzig, MD, MPH
Zahir Kanjee-Khoja, MD, MPH

Tullis Firm
Deepa Rangachari, MD
Jeffrey William, MD

Undergraduate Education Leadership

CORE I CLERKSHIP
Amy Weinstein, MD, MPH
Ryan Nelson, MD
Co-Course Director

CORE II CLERKSHIP
Vilas Patwardhan, MD
Marisa Jupiter, MD
Co-Course Directors

PRACTICE OF MEDICINE CLERKSHIP
Neal Biddick, MD
Kelly Ford, MD
Co-Course Directors

PRIMARY CARE CLERKSHIP
Katherine Wrenn, MD

Our 2021-2022 Chief Medical Residents

Fellowship Program Directors

CARDIOVASCULAR DISEASE
Joseph Kannam, MD

CLINICAL CARDIAC ELECTROPHYSIOLOGY
Patty Tung, MD

INTERVENTIONAL CARDIOLOGY
Eric Osborn, MD, PhD

ADVANCED CARDIAC IMAGING
Warren Manning, MD

STRUCTURAL HEART INTERVENTION
Roger Laham, MD

CARDIO-ONCOLOGY
Aarti Asnani, MD

ADVANCED HEART FAILURE & TRANSPLANT CARDIOLOGY
E. Wilson Grandin, MD

CLINICAL INFORMATICS
Steven Horng, MD

ENDOCRINOLOGY, DIABETES AND METABOLISM
Partha Sinha, MD

GASTROENTEROLOGY
Sarah Flier, MD
Director
Ciarán Kelly, MD
Associate Director

ADVANCED ENDOSCOPY
Tyler Berzin, MD

CELIAC DISEASE
Ciarán Kelly, MD

HEPATOLOGY
Michelle Lai, MD

INFLAMMATORY BOWEL DISEASE
Sarah Flier, MD

MOTILITY
Anthony Lembo, MD

TRANSPLANT HEPATOLOGY
Michelle Lai, MD

PANCREAS
Steven Freedman, MD, PhD

GENERAL MEDICINE & PRIMARY CARE
Kenneth Mukamal, MD, MPH
Mara Schonberg, MD, MPH

GERONTOLOGY
Jeremy Whyman, MD

GLOBAL HEALTH
Jonathan Crocker, MD

HEMATOLOGY/ONCOLOGY
Deepa Rangachari, MD

HOSPICE AND PALLIATIVE MEDICINE
Jonathan Yeh, MD

INFECTIOUS DISEASES
Wendy Stead, MD
Director
Christopher Rowley, MD, MPH
Associate Director

NEPHROLOGY
Stewart Lecker, MD

PULMONARY AND CRITICAL CARE
Asha Anandaiah, MD

SLEEP MEDICINE
Eric Heckman, MD

RHEUMATOLOGY
Vasileios Kyttaris, MD

Drs. Reynolds, Zeidel, and Smith with our 2022-2023 Chief Medical Residents

PUBLICATIONS

CLINICAL DIVISIONS

ALLERGY AND INFLAMMATION

Bonjour K, Palazzi C, Silva TP, Malta KK, Neves VH, Oliveira-Barros EG, Neves I, Kersten VA, Fortuna BT, Samarasinghe AE, Weller PF, Bandeira-Melo C, Melo RCN. Mitochondrial Population in Mouse Eosinophils: Ultrastructural Dynamics in Cell Differentiation and Inflammatory Diseases. *Front Cell Dev Biol* 2022; 10:836755.

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ENDOCRINOLOGY, DIABETES AND METABOLISM

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GASTROENTEROLOGY, HEPATOLOGY AND NUTRITION

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INFECTIOUS DISEASES

Alonso CD, Kelly CP, Garey KW, Gonzales-Luna AJ, Williams D, Daugherty K, Cuddemi C, Villafuerte-Gálvez J, White NC, Chen X, Xu H, Sprague R, Barrett C, Miller M, Foussadier A, Lantz A, Banz A, Pollock NR. Ultrasensitive and Quantitative Toxin Measurement Correlates With Baseline Severity, Severe Outcomes, and Recurrence Among Hospitalized Patients With Clostridioides difficile Infection. *Clin Infect Dis* 2022; 74(12):2142-2149.

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PUBLICATIONS

CLINICAL DIVISIONS

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MEDICAL ONCOLOGY

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NEPHROLOGY

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PULMONARY, CRITICAL CARE AND SLEEP MEDICINE

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RHEUMATOLOGY AND CLINICAL IMMUNOLOGY

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RESEARCH DIVISIONS

CLINICAL INFORMATICS

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CLINICAL NUTRITION

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EXPERIMENTAL MEDICINE

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HEMOSTASIS AND THROMBOSIS

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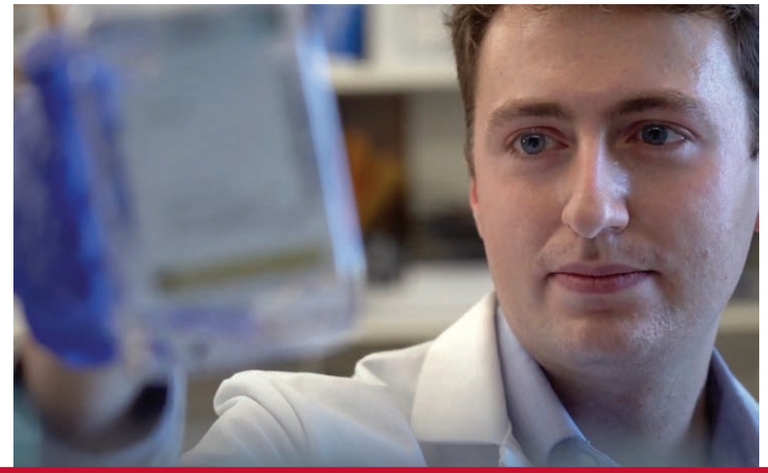

PUBLICATIONS

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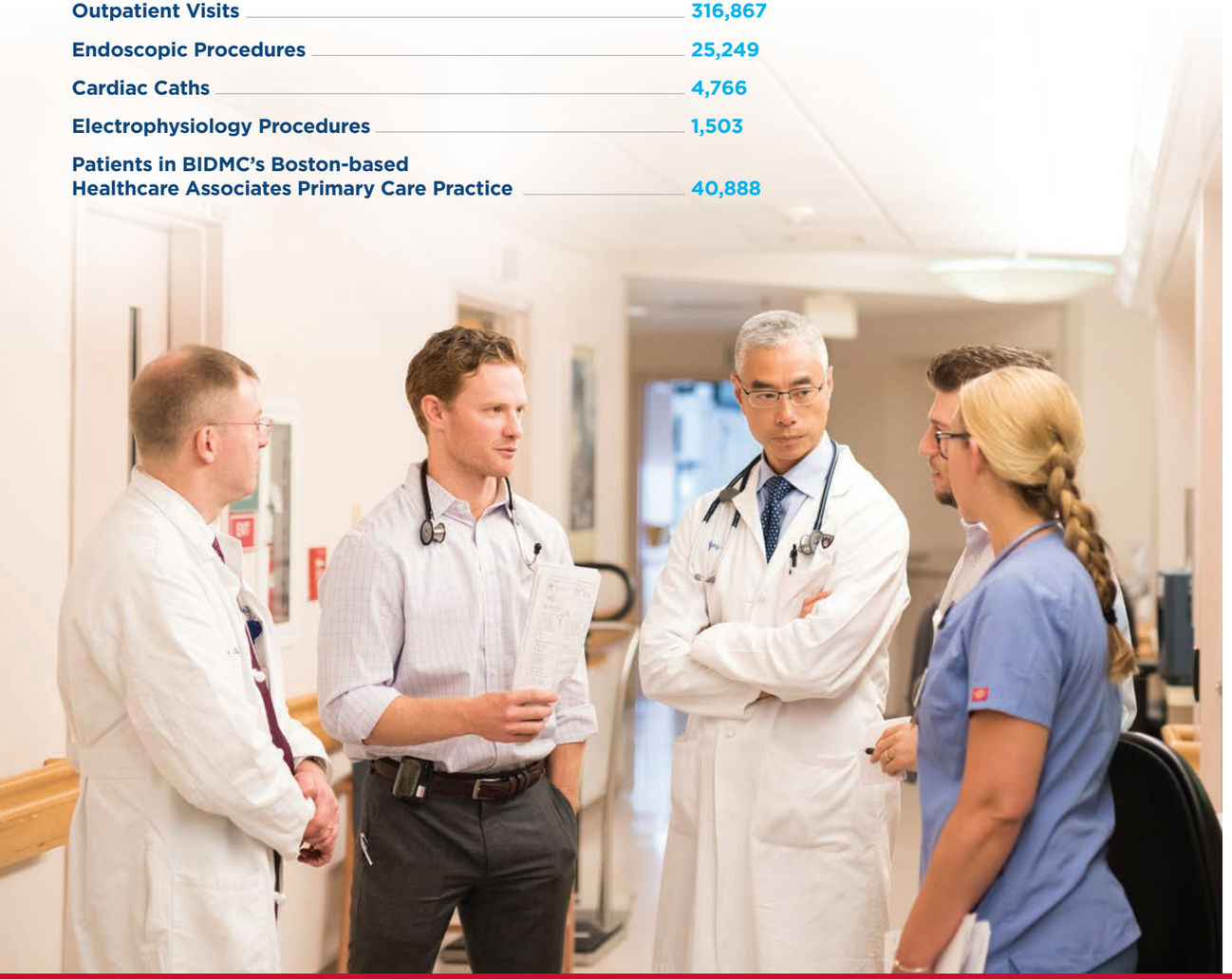
CLINICAL VOLUME AT BIDMC'S BOSTON HUB

Clinical Revenue	**$88,917,188**
Patient Days in Hospital	**129,543**
Inpatient Discharges	**15,308**
Observation Discharges	**2,928**
Work RVUs	**1,387,701**
Outpatient Visits	**316,867**
Endoscopic Procedures	**25,249**
Cardiac Caths	**4,766**
Electrophysiology Procedures	**1,503**
Patients in BIDMC's Boston-based Healthcare Associates Primary Care Practice	**40,888**



RESEARCH **FUNDING**

Division	Funding Source	Direct Award	Indirect Award
Cardiovascular Medicine	Federal	$17,584,126	$5,498,068
	Non-Federal	$1,002,848	$153,766
Clinical Informatics	Federal	$68,759	$5,501
	Non-Federal	$47,108	$11,777
Endocrinology, Diabetes and Metabolism	Federal	$11,024,197	$5,877,141
	Non-Federal	$1,917,028	$298,533
Gastroenterology, Hepatology and Nutrition	Federal	$4,667,185	$1,640,628
	Non-Federal	$2,910,491	$466,437
General Medicine	Federal	$6,908,935	$2,087,959
	Non-Federal	$4,122,945	$358,261
Gerontology	Federal	$89,570	$
	Non-Federal	$89,693	$
Hematology Oncology	Federal	$13,717,662	$6,480,248
	Non-Federal	$4,131,925	757,017
Genetics	Federal	$2,246,880	$1,551,913
	Non-Federal	$661,122	$87,877
Hematologic Malignancies	Federal	$2,835,447	$1,800,575
	Non-Federal	$1,975,947	$381,936
Hemostasis and Thrombosis	Federal	$2,170,876	$1,093,010
	Non-Federal	$431,429	$16,762
Medical Oncology	Federal	$6,464,459	$2,034,750
	Non-Federal	$1,063,427	$270,442
Immunology	Federal	$172,446	$124,167
	Non-Federal	$	$
Infectious Diseases	Federal	$1,793,634	$547,916
	Non-Federal	$76,756	$7,763
Interdisciplinary Medicine and Biotechnology	Federal	$773,705	$285,770
	Non-Federal	$280,162	$210,122
Nephrology	Federal	$3,379,759	$1,162,230
	Non-Federal	$3,021,497	$1,447,599
Pulmonary, Critical Care and Sleep Medicine	Federal	$543,673	$269,017
	Non-Federal	$1,062,483	$
Rheumatology and Clinical Immunology	Federal	$1,591,991	$1,085,042
	Non-Federal	$543,810	$53,396
Signal Transduction	Federal	$44,957	$33,293
	Non-Federal	$	$
Virology and Vaccine Research	Federal	$19,156,251	$4,637,739
	Non-Federal	$7,878,749	$1,979,855
	Total Federal **Total Non-Federal**	$81,516,850 $27,085,495	$29,734,719 $5,744,526
	GRAND TOTAL	$108,602,345	$35,479,245

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BIDMC is part of Beth Israel Lahey Health, a healthcare system that brings together academic medical centers and teaching hospitals, community and specialty hospitals, more than 4,000 physicians, and 35,000 employees in a shared mission to expand access to great care and advance the science and practice of medicine through groundbreaking research and education. BIDMC is also clinically affiliated with the Joslin Diabetes Center and Hebrew SeniorLife and is a research partner of Dana-Farber/Harvard Cancer Center and The Jackson Laboratory. BIDMC is the official hospital of the Boston Red Sox.

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