New Program Achieves Early Benchmarks For Improving Patient Care Post-Discharge

When a patient is admitted to a hospital within the Mount Sinai Health System, planning for discharge begins almost immediately to ensure a smooth transition to the next level of care, whether it is at home or at a skilled nursing facility. Studies show that effective discharges lead to improved patient health, reduced readmissions, and decreased health care costs. Toward that end, the Mount Sinai Health System has established the Transitions of Care Center (TOCC), a centralized telephone-based discharge program staffed by Mount Sinai registered nurses who are specially trained in hospital discharge protocols and are led by a clinical nurse manager.

The TOCC has been tasked with improving patient satisfaction, ensuring patients have access to post-hospital care and are following discharge instructions, and preventing avoidable readmissions. Staff work from a dedicated office on East 16th Street near Union Square in Manhattan, where 11 registered nurses call Mount Sinai patients 24 to 72 hours after they leave the hospital—reviewing and addressing each patient’s unique discharge plan of care.

$4 Million Grant for Study of Sickle Cell Treatment

An inhaled treatment that might improve lung function—and reduce the painful symptoms—of patients with sickle cell disease (SCD) is being studied in a clinical trial funded by a $4 million grant from the National Institutes of Health awarded to researchers at the Icahn School of Medicine at Mount Sinai.

“Inhaled corticosteroids, a well-established treatment for asthma, offer a creative new approach to treating sickle cell disease, with the potential to dramatically improve patient outcomes,” says Jeffrey Glassberg, MD, principal investigator of the study, and Associate Professor of Emergency Medicine, and Medicine (Hematology and Medical Oncology). SCD affects about 100,000 people in the United States and is more prevalent in certain ethnic groups, such as African Americans and Hispanics.
Climate change is taking a toll not just on the environment, but also in the clinic, with a rise in asthma, cardiovascular disease, insect-borne viruses, and heat-related death. That was the urgent message of the inaugural Clinical Climate Change conference, hosted by Mount Sinai’s Institute for Exposomic Research. Panelists at the event, held on Saturday, January 12, at the New York Academy of Medicine, included environmental advocates and leaders in the study of environmental medicine and public health.

The conference aimed to provide public health professionals, policymakers, physicians, nurses, medical students, and allied health professionals with a base of up-to-date evidence to inform patient treatment and care as the global average temperature continues its steady rise. “Air pollution is a major driver of the health consequences of climate change,” said Robert O. Wright, MD, MPH, Professor and Ethel H. Wise Chair of the Department of Environmental Medicine and Public Health, and Director of the Institute for Exposomic Research, Icahn School of Medicine at Mount Sinai. “In addition to conditions you would expect to increase, such as asthma and other lung diseases, our research shows that there are many downstream effects.” For example, Dr. Wright and several other panelists focused on fine particulate matter (PM$_{2.5}$) from air pollution, which causes inflammation in the body that is associated with neurotoxicity, neurodevelopmental disorders, and increased insulin resistance.

Heat-related conditions are of particular concern for outdoor workers. Thousands become sick every year, and many die, due to these preventable illnesses, said Roberto Lucchini, MD, Professor of Environmental Medicine and Public Health, Icahn School of Medicine. “Studies show that recurrent heat exposure, with physical exertion, inadequate hydration, and exposure to chemicals, can lead to chronic kidney disease,” he said. “There is an epidemic of this disease among worker populations in Central America. We have to prepare health care workers in northern areas to be aware of the condition.”

In addition to these critical warnings, speakers presented actionable tools for clinicians both to better inform patients and to modify their practice. “Physicians can explain the importance of paying attention to heat and poor air-quality days,” said Emily Senay, MD, MPH, Assistant Professor of Environmental Medicine and Public Health, Icahn School of Medicine. “This is especially important for vulnerable patients who are elderly or chronically ill.” During a heat wave, clinicians might consider adjusting some medications, like diuretics, which reduce the ability to lose heat by sweating. And they should advise patients to close windows and use air conditioning to limit exposure to air pollution but also to be conscious of indoor pollutants like mold and fumes from cleaning products.

Physicians were encouraged to prepare for an influx of diseases previously unseen in their population, particularly those carried by insects. A warming climate will make habitats more hospitable to disease-carrying insects, such as mosquitoes and ticks, exposing a larger swath of the population to diseases such as Lyme disease, Zika virus, and dengue fever.

Another concern is that weather events, such as hurricanes and floods, are becoming more extreme as a result of climate change. Superstorms of recent years, like Hurricane Sandy, are leading to a shift from an “emergency response” model to a more forward-looking “risk mitigation” approach, said George Loo, DrPH, MPH, Assistant Professor of Emergency Medicine, and Population Health Science and Policy, Icahn School of Medicine. That includes moving critical infrastructure out of flood-prone areas and developing extensive logistics for managing transportation, power, security, and staffing. In addition, Dr. Loo said, “Health care workers need to first have a plan to take care of themselves and their families. Knowing that your family is safe and that you have a way to contact them will reduce stress and help you focus on your patients.”

Physicians play an important role in helping patients understand how climate affects the health of individuals and how, at a population level, humans affect the environment, Dr. Senay said. With a nuanced approach, she added, providers can improve environmental literacy and open the door to discussions about how walking more, eating a plant-based diet, and advocating for renewable energy can make both the planet and patients healthier.

**Effects of Air Pollution and Fine Particulate Matter**

<table>
<thead>
<tr>
<th>PM$_{2.5}$ Soot particle</th>
<th>PM$_{10}$ Dust particle</th>
<th>PM$_{50-70}$ Human hair</th>
<th>PM$_{90}$ Fine beach sand</th>
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Particulate matter (PM) enters the body through the nose and mouth as we breathe. The body eliminates most of it, but fine particles of 2.5 micrometers in diameter or less can penetrate deep into the lungs and lead to heart and lung disease and inflammation.

**Source:** U.S. Environmental Protection Agency
The Center initially was launched in December 2016 as a pilot program aimed exclusively at patients deemed at high risk for rehospitalization. The program quickly expanded and is now servicing patients regardless of readmission risk or diagnosis who are discharged home from The Mount Sinai Hospital, Mount Sinai Queens, Mount Sinai West, and Mount Sinai St. Luke’s. In March, the TOCC will add discharged patients from Mount Sinai Brooklyn, with a goal to expand to Mount Sinai Beth Israel in the coming months.

Nurses have made more than 40,000 phone calls, spoken to nearly 19,000 patients, and provided close to 11,000 interventions to assist patients with post-discharge care needs.

TOCC had a 16 percent lower-than-expected readmission rate. "While speaking to patients, nurses assess their health status and determine if they are adhering to their discharge care plan. They ensure that patients have filled their prescriptions and are taking their medications properly, that they have the medical equipment they need, and that they are able to attend follow-up appointments. As needed, they perform nursing triage for active symptoms, referring patients to in- and out-patient providers. They work closely with interdisciplinary care management teams at the hospital where the patient was treated and collaborate with ambulatory teams, home health agencies, and community-based service organizations."

According to TOCC data from January 2017 through November 2018, nurses had 6,290 patient interventions that involved providing educational resources and reinforcing overall discharge instructions, and 1,013 interventions that resolved medication needs. They also helped escalate the management of active symptoms for 825 patients. "No matter how well the discharge team explains next steps of care, patients often do not fully understand or remember what to do," says Claudia Colgan, Vice President, Care Coordination, Mount Sinai Health System, and Vice President, Operations, The Mount Sinai Hospital.

Since the program’s start, nurses have made more than 40,000 phone calls, spoken to nearly 19,000 patients, and provided close to 11,000 interventions to assist patients with post-discharge care needs. “The results have been positive,” says Claudia Colgan, Vice President, Care Coordination, Mount Sinai Health System, and Vice President, Operations, The Mount Sinai Hospital. “In the 12 months leading up to August 2018, patients who were contacted by the program had a 16 percent lower-than-expected readmission rate.”

Uncovering the Biology of Neurodegeneration

Ivan Marazzi, PhD, Assistant Professor of Microbiology at the Icahn School of Medicine at Mount Sinai, received $2.5 million in funding from the Chan Zuckerberg Initiative (CZI) to further the understanding of the underlying causes of neurodegenerative disorders such as amyotrophic lateral sclerosis (commonly known as Lou Gehrig’s disease), and Alzheimer’s and Parkinson’s diseases. The Initiative was established by Facebook founder Mark Zuckerberg and pediatrician Priscilla Chan, his wife. The award is part of a $64 million commitment to fund early-career investigators and collaborative science teams to launch the CZI Neurodegeneration Challenge Network, which aims to bring together basic scientists from neuroscience, cell biology, biochemistry, immunology, and genomics.

Cori Bargmann, PhD, Head of Science for CZI, says: “We’re excited to welcome the first group of CZI Neurodegeneration Challenge Network grantees. Together, their work will increase our knowledge of the basic biology of these diseases—and we need that knowledge to develop better treatments.”

Dr. Marazzi studies epigenetic- and chromatin-mediated mechanisms—the heritable alterations that cause genes to turn on or off—and the cellular response to pathogens or cellular differentiation. The major focus of his research is the unique and shared molecular pathways underlying inflammatory, infectious, and neurodegenerative diseases to uncover the relationship between seemingly unrelated diseases to find effective therapeutic interventions.

Earlier work from Dr. Marazzi provided a new paradigm for how mutations can confer both susceptibility to infection and predisposition to neurodegeneration. He was the senior investigator of two groundbreaking studies published in Nature Immunology and Cell that identified a link between innate immune dysfunctions and congenital defects in two proteins controlling RNA metabolism—the RNA exosome and senataxin.

“These studies revealed how we can discover genes linked to disease—in this case, neurodegeneration—by looking at the natural symbiosis between a host and a pathogen,” says Dr. Marazzi. “Our goal is to use this discovery as a foundation to elucidate the relationship between innate immune defects and neurodegeneration to find effective therapeutic interventions.”
inherited disease is caused by a mutation in hemoglobin, a protein inside red blood cells that carries oxygen from the lungs to the rest of the body. In SCD, abnormal hemoglobin forms long rods and distorts red blood cells into a sickle shape. The repeated damage to red cells causes the blood to become inflamed and sticky, causing pain, infections, stroke, and potentially, early death. The only organs in the body that can reverse sickling are the lungs, but they are highly inflamed in SCD. That is why researchers have proposed using inhaled steroids as a treatment.

“We hypothesize that if patients take an asthma medicine that reduces inflammation in the lungs, it might improve their ability to put oxygen into their blood and make their sickle cell better,” says Dr. Glassberg, Director of the Comprehensive Program for Sickle Cell Disease at the Icahn School of Medicine. The phase II trial—Inhaled Mometasone to Promote Reduction in Vaso-occlusive Event (IMPROVE 2)—is seeking to recruit 80 patients who have sickle cell disease but do not have asthma. They will be randomized, with one group receiving a placebo and the other receiving an inhaled treatment of the steroid mometasone furoate once a day for 48 weeks. The dose will be low, 220 micrograms, to avoid side effects associated with steroids, such as weight gain or bone disorders.

The primary outcome studied will be the level of a biomarker called soluble vascular cell adhesion molecule (sVCAM). “This is something that you measure in the blood, and it correlates very well with how bad somebody’s sickle cell disease is at the time,” says Dr. Glassberg. “The sVCAM level goes up when they are sick, and it goes back down when they get better.” Patients will also keep a daily diary of their pain and quality of life, and return regularly for tests of lung function.

A prior study, IMPROVE 1, established the feasibility of the current trial, with results published in March 2017 in the American Journal of Hematology. It involved 52 patients, who took the inhaled treatment for 16 weeks. Sickle cell symptoms tend to be seasonal, with some patients reporting more pain in colder months, so Dr. Glassberg says the longer IMPROVE 2 study will provide a broader understanding of the treatment. His group is seeking to enroll 20 people a year and to complete the study in June 2023.

Dr. Glassberg sees a future role for inhaled steroids as part of a drug “cocktail,” along with drugs like hydroxyurea that interfere with sickling. A low-dose inhaled steroid treatment would work in concert with these drugs, improving the flow of oxygenated blood. “This is especially appealing because inhaled steroids are inexpensive, widely available, and do not require sophisticated equipment, so they can be used anywhere in the world,” Dr. Glassberg says. “I think this treatment has the potential for a big health impact.”
New Neonatal Intensive Care Unit at Mount Sinai West

After a 14-month construction project, Mount Sinai West celebrated the opening of its new and expanded neonatal intensive care unit (NICU) with a ribbon-cutting on Wednesday, February 6. The NICU—which now occupies 14,000-square-feet of space and features 35 patient bays—offers families a bright, comforting environment to spend time with their preterm and high-risk newborns. The NICU also has two isolation rooms and a “nesting room” with overnight accommodations for parents who wish to stay with their infants. “This effort demonstrates our continued commitment to providing the best maternal child health patient experience for New Yorkers,” says Lisa Eiland, MD, Director of Newborn Medicine and Pediatrics at Mount Sinai West.

Celebrating Lunar New Year

Staff at Mount Sinai Downtown-Union Square, Mount Sinai St. Luke’s, and the Corporate Services Center rang in the Lunar New Year at events held in February. Based on the Chinese lunar calendar, the holiday began on Tuesday, February 5, and ended on Tuesday, February 19. Participants took pictures with red lanterns, received candy and fortune cookies, and enjoyed music. Additionally, at the Corporate Services Center, members of the Amazing Grace Dance Group performed traditional Chinese dances. The festivities were organized by Mount Sinai’s Asian Employee Resource Group and The Louis Armstrong Department of Music Therapy.

Pageantry for Charity At Drag Race Event

More than 200 people enjoyed an evening of pageantry at the Mount Sinai Charity Drag Race, an event inspired by the reality television competition RuPaul’s Drag Race, in Goldwurm Auditorium on Thursday, January 31. The event was organized by Icahn School of Medicine at Mount Sinai student chapters of two groups: the Stonewall Alliance and oSTEM (Out in Science, Technology, Engineering, and Mathematics). It raised more than $2,700 for the Ali Forney Center, a Harlem-based nonprofit dedicated to protecting homeless LGBTQ youth.

Hosted by New York City-based celebrity drag star Lagoona Bloo, the event featured four Icahn School of Medicine students, who entertained the crowd with rousing lip synchs, as well as a talent portion that included a martial arts demonstration with nunchucks and a stand-up comedy routine. Contestants were judged by Mount Sinai’s Ann-Gel Palermo, DrPH, MPH, Associate Dean for Diversity in Biomedicine; and Jerry Chipuk, PhD, Associate Professor, Oncological Sciences, and Dermatology; along with Tyler Neasloney, Special Events and Communications Manager at the Ali Forney Center.
Graduate School of Biomedical Sciences Educational Programs

Stop by to learn about the educational programs available at the Graduate School of Biomedical Sciences. A representative will be present to discuss Mount Sinai’s PhD, Masters, MD/PhD and other dual degrees, and certificate programs. Masters programs are now accepting applications for 2019.

Every Wednesday
Noon - 2 pm
Annenberg Lobby

Celebrate Brain Awareness Week

March 10 - 17

Brain Awareness Week is a global campaign created by the Dana Alliance for Brain Initiatives and the Society for Neuroscience to promote public awareness of brain research. Faculty, staff, and the public are invited to join the Icahn School of Medicine at Mount Sinai for the following activities.

7th Annual Brain Awareness Fair Learn about taste and smell connection, hold real animal brains, create “brain hats,” and participate in other interactive activities. Also, Mount Sinai’s leading brain scientists will be on hand to answer questions and dispel myths about autism, Alzheimer’s disease, drug abuse and addiction, and memory and cognition.

Tuesday, March 12
11 am - 3 pm
Program for invited New York City students
3 - 5 pm
Open to the public
Guggenheim Pavilion

4th Annual Studying the Brain: An Evening of Science Storytelling Mount Sinai scientists will explore the deeply human themes of brain research through personal stories of science. Reservations are free, but required. For more information, email Casey Lardner at casey.lardner@icahn.mssm.edu.

Monday, March 11
6:30 - 8:30 pm (Doors open at 6 pm)
El Barrio’s Artspace PS 109
215 East 99th Street

Art of the Brain Exhibition Images that celebrate the beauty of the brain as seen through the eyes of Mount Sinai researchers.

Sunday, March 10 – Sunday, March 17
Guggenheim Pavilion

Events are sponsored by Mentoring in Neuroscience Discovery at Sinai, the Center for Excellence in Youth Education, and The Friedman Brain Institute.