Westchester Medical Center Health Network's New eHealth Program

Christian Becker, MD, PhD, FCCP, Associate Director of Telemedicine and eHealth, monitors ICU patients remotely from WMCHealth's eHealth Center.

Westchester Medical Center Health Network's New eHealth Program:

Reinforcing Provider Capabilities While Connecting More Hudson Valley Patients With Close-to-Home Specialty Care

MARKING THE FIRST PHASE OF A SOON-TO-EXPAND TELEMEDICINE PROGRAM, WESTCHESTER MEDICAL CENTER HEALTH NETWORK (WMCHEALTH) IS USING ADVANCED SOFTWARE AND AUDIO/VIDEO CONFERENCING CAPABILITIES IN ITS MANY ICUs TO IMPROVE PATIENT CARE, BROADEN ACCESS TO SPECIALIZED CARE AND REINFORCE PROVIDERS' CAPABILITIES.

WESTCHESTER MEDICAL CENTER'S new telehealth program — one of 400 such programs in the nation and the first of its kind in the Hudson Valley area — went live in October 2015. Using audiovisual and data links, the program is initially connecting bedside ICU professionals at Westchester Medical Center, the flagship of WMCHealth, with ICU care specialists at a newly established eHealth Center. The program, which serves an initial total of 98 ICU beds at Westchester Medical Center and

MidHudson Regional Hospital, a member of WMCHealth, will soon be expanded to include all adult ICU beds, and eventually many more WMCHealth clinical areas.

"Using eHealth gives us rich operational data to drive process improvement," says Corey Scurlock, MD, MBA, Medical Director of the WMCHealth eHealth program, who is based in Poughkeepsie. "With this data, we can standardize practices, reduce variability and improve our quality of care while reducing operational costs and improving access for patients. This allows us to care for patients

as close to home as possible and help patients connect with specialists across the Hudson Valley — all of which helps us manage our patient population of 3.5 million."

Evolving Medical Landscape Drives Change

Two years ago, Westchester Medical Center encompassed three hospitals: an adult acute care hospital, a children's hospital and a behavioral health hospital. In May 2014, Westchester Medical Center took over St. Francis Hospital, now named MidHudson Regional Hospital, in Poughkeepsie, and a year later, it entered into a partnership with Good Samaritan Hospital in Suffern, St. Anthony Community Hospital in Warwick and Bon Secours Community Hospital in Port Jervis, as well as several other associated healthcare facilities. Today, WMCHealth includes these seven hospitals, as well as nearly 300 partner organizations.

"For the last two years, we've been preparing for the Delivery System Reform Incentive Payment (DSRIP) program New York state has formed with the federal government to take care of Medicaid users and the underserved," says Marsha Casey, Executive Vice President of Professional and Clinical Services at WMCHealth. "We were the leading Performing Provider System selected, and we were awarded $275 million over five years to develop partnerships throughout the Hudson Valley. That includes our new hospitals, but it also includes the whole healthcare continuum, from prehospitalization to doctors' offices, all the way to home care."

This growth brought with it the challenge of offering comprehensive care across an eight-county service area, and system leaders began pursuing strategic partnerships to help meet growth-related needs. In June 2015, WMCHealth announced a 15-year, $500 million partnership with Royal Philips that provided a number of technological solutions for improving patient care. Given the geographic spread of WMCHealth facilities, one of the most promising of these technologies was Philips' line of telehealth offerings, which makes it possible to provide quality specialty care in areas without specialized providers.

Foundations of the eHealth Program

WMCHealth first used Philips' telehealth technology to support an ePsychiatry program that allows clinical psychiatrists at Westchester Medical Center to provide direct consultations with patients at MidHudson Regional Hospital and to connect with the Poughkeepsie facility's behavioral health staff.

"We've had overwhelmingly positive responses from patients regarding the ePsychiatry program," says Eric Amoh, Senior Vice President of Clinical Services at Westchester Medical Center. "Our patients feel they have more consistency in the clinical staff who are providing care, including the psychiatrist as the primary provider. Our no-show rates have significantly dropped: People are keeping appointments because they know they'll be seen by a provider they know and trust when they come to the clinic."

Woiczechowski communicates with a bedside provider in real time through two-way audio and video conferencing.

Rattigan-Davis cares for a patient with the assistance of Woiczechowski, who serves as a second set of eyes using telehealth technology.

PROVIDER AND EXECUTIVE PROFILES

Corey Scurlock, MD, MBA, Medical Director of the WMCeHealth program, is based in Poughkeepsie and is board-certified in critical care medicine and anesthesiology. He has published more than three dozen scholarly works appearing in publications including *The Annals of Thoracic Surgery* and the *Journal of Critical Care*. He served as editor of *Critical Care Clinics* for its April 2015 issue on telemedicine.

Dr. Scurlock earned his medical degree from the University of Texas Medical School at Houston and his MBA from Cornell University. Baylor College of Medicine named him chief resident during his residency in anesthesiology, and he completed his fellowship in critical care medicine at Harvard Medical School – Massachusetts General Hospital.

Before joining WMCHealth, Dr. Scurlock spent four years as national medical director at Advanced ICU Care, overseeing a team of 55 eICU specialists and three eICU centers serving 70 hospitals in 23 states. He also spent time as the director of the Cardiothoracic Surgical ICU and director of critical care for the Department of Anesthesiology at Mount Sinai Medical Center, and as associate professor of anesthesiology and cardiothoracic surgery at Mount Sinai School of Medicine.

Christian Becker, MD, PhD, FCCP, Associate Director of Telemedicine and eHealth at WMCHealth, received a combined MD and PhD degree from Hannover Medical School in Germany. He trained in internal medicine in Germany and subsequently in the United States, followed by clinical and research fellowship training in pulmonary and critical care medicine. He comes to WMCHealth from the Icahn School of Medicine at Mount Sinai, where he was an assistant professor in the Department of Medicine and the medical director of the Respiratory Intensive Care Unit.

Marsha Casey, Executive Vice President of Professional and Clinical Services at Westchester Medical Center, is a Fellow of the American College of Healthcare Executives.

Casey attained her Master of Arts in Health Care Administration degree at The University of Texas at Tyler and earned her Bachelor of Science in Nursing degree at Ball State University.

She joined Westchester Medical Center in 2008 with 30 years of healthcare experience, including as president of Trinity Health, Michigan; president and CEO of Vincent Health; and president and CEO of Vanderbilt University Medical Center.

Patricia Wrobbel, DNP, MBA, RN, Senior Vice President for Patient Care Services and Chief Nurse Executive at Westchester Medical Center, has more than 30 years of healthcare experience and is a Certified Professional in Healthcare Quality and a Wharton Nurse Executive Fellow.

Wrobbel earned her Bachelor of Science in Nursing degree from Niagara University, her MBA from Fairleigh Dickinson University, her Master of Arts in Nursing Education degree from New York University and her Doctor of Nursing Practice degree from Case Western Reserve University.

At Westchester Medical Center, her responsibilities include developing infection prevention and control policies and overseeing nursing services. Prior to joining Westchester Medical Center in 2010, she worked in leadership roles at Mount Sinai Medical Center, Columbia-Presbyterian Medical Center, Montefiore Medical Center, and the University of Medicine and Dentistry of New Jersey University Hospital.

Eric Amoh, PA, Senior Vice President of Clinical Services at Westchester Medical Center, is responsible for the continuum of mental health and addiction services at WMCHealth's Behavioral Health Center. Amoh is a physician assistant with a clinical background in primary care and forensic health. He has spent most of his career caring for and directing programs dedicated to managing special-needs patients. Prior to joining WMCHealth, Amoh served as the regional vice president with America Service Group/Prison Health Services for the Baltimore Service Area, having multi-facility responsibility for the operation of behavioral and medical services for county and state correctional institutions.

Building the eICU

Impressed by the strength of his past experience in eICU operations, WMCHealth recruited Dr. Scurlock to help design and implement the next phase of the eHealth project using Royal Philips' technology suite. According to Dr. Scurlock, expanding telehealth to the ICUs makes sense, given the wealth of data available from established eICU programs and his experience in eICU settings. Dr. Scurlock developed an eHealth workflow around the system's ability to analyze and score patients' acuity based on vital-sign data.

"In setting up the eHealth program, I really wanted us to focus on culture, communication and enforcing best practices — things that help with collecting data around process and quality improvement," Dr. Scurlock says. "There were certain work flows on our campuses that I thought were very important in terms of nurse-to-nurse communication, doctor-to-doctor communication or doctor-to-nurse communication."

At the core of the eHealth program are the 5,500-square-foot eHealth Center and its staff of specialized ICU physicians and critical care nurses, led on-site by Christian Becker, MD, PhD, FCCP, Associate Director of Telemedicine and eHealth at WMCHealth. They have access to 20 multimedia stations with vital-sign monitoring and two-way audio and video connections to the beds in the Westchester Medical Center and MidHudson Regional Hospital ICUs, allowing them to speak directly with bedside physicians, nurses and patients. The system also allows the remote specialists to instantly review patients' vital signs, blood work, imaging and medications without ever leaving their stations.

The System in Action

"If bedside providers assessing a patient want someone to double-check their work, they can consult with the staff in the eHealth Center," says Patricia Wrobbel, DNP, MBA, RN, Senior Vice President for Patient Care Services and Chief Nurse Executive at Westchester Medical Center. "The cameras can zoom in and have such high resolution we're able to visually assess a patient. We can see pupillary changes when they shine a light in a patient's eyes. That kind of capability

gives the bedside team extra confidence in the assessments they make."

While bedside providers can reach out to the remote specialists 24/7, the staff in the eHealth Center is just as likely to contact the bedside team. According to Dr. Becker, the eICU computer system, which incorporates an algorithm that pulls real-time patient information from sources including electronic medical records, lab results and pharmacy processes to identify any trending patterns, alerts the eHealth Center staff when the likelihood of an adverse event increases. Because these alerts go directly to the eHealth Center, Dr. Becker's staff there can further reduce workload for the bedside staff by identifying and filtering out false alarms.

For example, the eHealth software tracks patients' blood sugar levels, and if a patient has more than two high blood sugar readings in a 12-hour period, it alerts the care team in the eHealth Center. The remote specialists can then pass the information along to the bedside care team to determine the cause of the problem and rectify it on the spot. The system also generates reminders on best practices and quality reports for every shift to help ensure adherence to medication and treatment plans.

Esther Mayz, RN, and Cheryl Cafone, MSN, MBA, RN, CCRN, Senior Director of Nursing, TeleHealth, review patient information at a pod in the eHealth Center.

Dr. Becker says it's important to remember that although telehealth can help reduce healthcare costs, the doctors and nurses in the eHealth Center represent a way to improve bedside patient care, not replace it. Bedside providers still have the final say in patient care, and their patients at WMCHealth ICUs will receive bedside care of the same quality and extent under the new system. The eHealth Center staff is simply a new layer of care and safety available to assist as needed in times of crisis.

Maintaining Patient Privacy

Despite the audio and video capabilities, patients and their referring physicians don't have to worry about privacy. Just as a bedside doctor or nurse would knock on the door to a patient's room before entering, doctors and nurses in the eHealth Center are able to alert patients before monitoring them. Vital-sign monitoring is always on, but bedside microphones are turned off and the camera faces the wall when not in use. When the eHealth

eICU ADOPTION BENEFITS PATIENTS, PROVIDERS AND FACILITIES ALIKE

A GROWING NUMBER of studies and reports have confirmed the value of eHealth programs, particularly eICU initiatives.

+ In a study published in *Chest Journal*, the official publication of the American College of Chest Physicians, the authors examined the cases of nearly 120,000 patients in 56 ICUs. Compared to the control group, patients in eICU programs had lower mortality rates, as well as reduced lengths of stay.

+ A study published in the *Journal of the American Medical Association* found eICU implementation significantly reduced rates of preventable complications and improved adherence to best clinical practices for cardiovascular protection as well as prevention of deep vein thrombosis, stress ulcers and ventilator-associated pneumonia.

+ A study published in *Critical Care* reported the addition of an eICU reduced variable cost per patient.

+ According to The Agency for Healthcare Research and Quality report "Using Telehealth to Improve Quality and Safety," providers surveyed before and after eICU implementation reported improvements to teamwork and the culture of safety. Nurses reported the most significant increases.

+ Research published in *Critical Care Medicine* suggests a correlation between adoption of eICU programs and decreases in both malpractice claims and costs.

"My experience is that the eICU technology is great, but successful outcomes require people working as a team to use it on both sides to augment patient care. Getting the remote and bedside teams to function as one is the key to making telemedicine work."

— Christian Becker, MD, PhD, FCCP, Associate Director of Telemedicine and eHealth at WMCHealth

Katherine Longo, RN, BSN, CNLM, NE-BC, Interim Senior Director of Nursing, eICU, works at her desk.

Cheryl Cafone, MSN, MBA, RN, CCRN, Senior Director of Nursing, TeleHealth, discusses telehealth capabilities outside the eHealth Center with Christian Becker, MD, PhD, FCCP, Associate Director of Telemedicine and eHealth.

TELEHEALTH TIMELINE

WMCHEALTH'S EHEALTH PROGRAM is only the latest step in a long evolution of electronic medicine. The term "telemedicine" was first used in medical literature in 1974, but the concept was already in practice even before then. Today's eHealth program is the product of more than 50 years of innovation in telecommunications and health care. Among the milestones in telemedicine:

+ 1964: The first two-way healthcare video links the Nebraska Psychiatric Institute to Norfolk State Hospital.

+ 1967: Telemedicine systems link Massachusetts General Hospital and Logan International Airport's medical station, allowing for remote patient-provider interaction and diagnosis.

+ 1975: Using technology created for medical monitoring of NASA astronauts, and with NASA assistance, the Space Technology Applied to Rural Papago Health Care program links providers in Arizona hospitals with patients on rural Native American reservations to deliver medical care.

+ 1989: In a medical first, the staff of Jewish Hospital in St. Louis defibrillates a patient by telephone after remote monitoring diagnoses sudden cardiac arrest and alerts the care team.

+ 1997: Pilot testing of Visicu's eICU system begins. Royal Philips Electronics later acquires Visicu.

+ 2015: WMCHealth and Royal Philips announce eHealth partnership.

Center staff activates this equipment to speak with a patient, a bell rings to alert the patient. After about 20 seconds, the doctor or nurse appears on camera and can speak with the patient.

Expanding Telehealth Offerings

The eHealth program will be expanded from the Westchester Medical Center campus to MidHudson Regional Hospital in January 2016, and from there, to the rest of the WMCHealth ICUs. Although the eHealth program's immediate focus is expanding the eICU's reach and making sure everyone involved in patient care understands and embraces the new system, WMCHealth will eventually use eHealth in connection with other specialties, such as acute care, oncology and stroke care.

"We're also looking at other conditions that can cause adverse reaction in patients very quickly, such as sepsis," Wrobbel says. "There's an eSepsis program that monitors literally our entire patient population for the telltale signs of sepsis."

When the time for implementing these new programs comes, Dr. Scurlock will share his expertise with specialists in the newly incorporated disciplines, helping them customize the system to meet their specific needs and those of their patients.

"My job is to help specialists in other departments across the network learn to use the software and design systems to make sure the patients get the best care and coverage," Dr. Scurlock says. "I'm not a neurologist. I'm not a cardiologist. I can't change my stripes, but I can help design systems and help analyze how to best use technology and data to achieve a common goal of excellent patient care."

For patients and primary care physicians all across the Hudson Valley, WMCHealth's investment in eHealth capabilities illustrates the network's dedication to improving access to specialist providers. This access makes it easier for patients to complete their treatment without having to choose between convenience and quality, comprehensive care. WMCHealth's overarching goal is to use technology together with its expertise so that patients can receive excellent care close to home.

For more information about Westchester Medical Center Health Network's eHealth or telemedicine programs, visit WMCHealth.org. ∎

"From the providers' perspective, telehealth provides a safety mechanism. Having an extra set of hands and eyes with us is what drives a lot of the quality improvement and positive effects on the patient's outcome, and it allows the providers to function at their highest level in a collegial manner."

— Patricia Wrobbel, DNP, MBA, RN, Senior Vice President for Patient Care Services and Chief Nurse Executive at Westchester Medical Center