IMAGINE

D-H in the Community

Dartmouth-Hitchcock

2017 SUMMER

“If I am only for myself, what am I?”

HILLEL THE ELDER

The quote above speaks so eloquently of the nature of those who work across Dartmouth-Hitchcock (D-H), seeking, above all, to serve others and to embody the Culture of Caring we strive toward.

As I have often said, every person throughout the D-H health system is a caregiver, no matter their job description. From our grounds crews, who keep the parking lots plowed in winter and the gardens radiant in summer, to the kitchen staff preparing meals for patients, visitors and employees; from the appointment secretaries, who keep our clinics humming, to the engineers who keep the physical plant humming; every individual contributes to the well-being of those we serve.

In this issue of *Imagine*, you will read about how our teams are reaching beyond our walls to both provide care remotely through programs like Connected Care, and to promote health across our region through partnerships and programs within our communities.

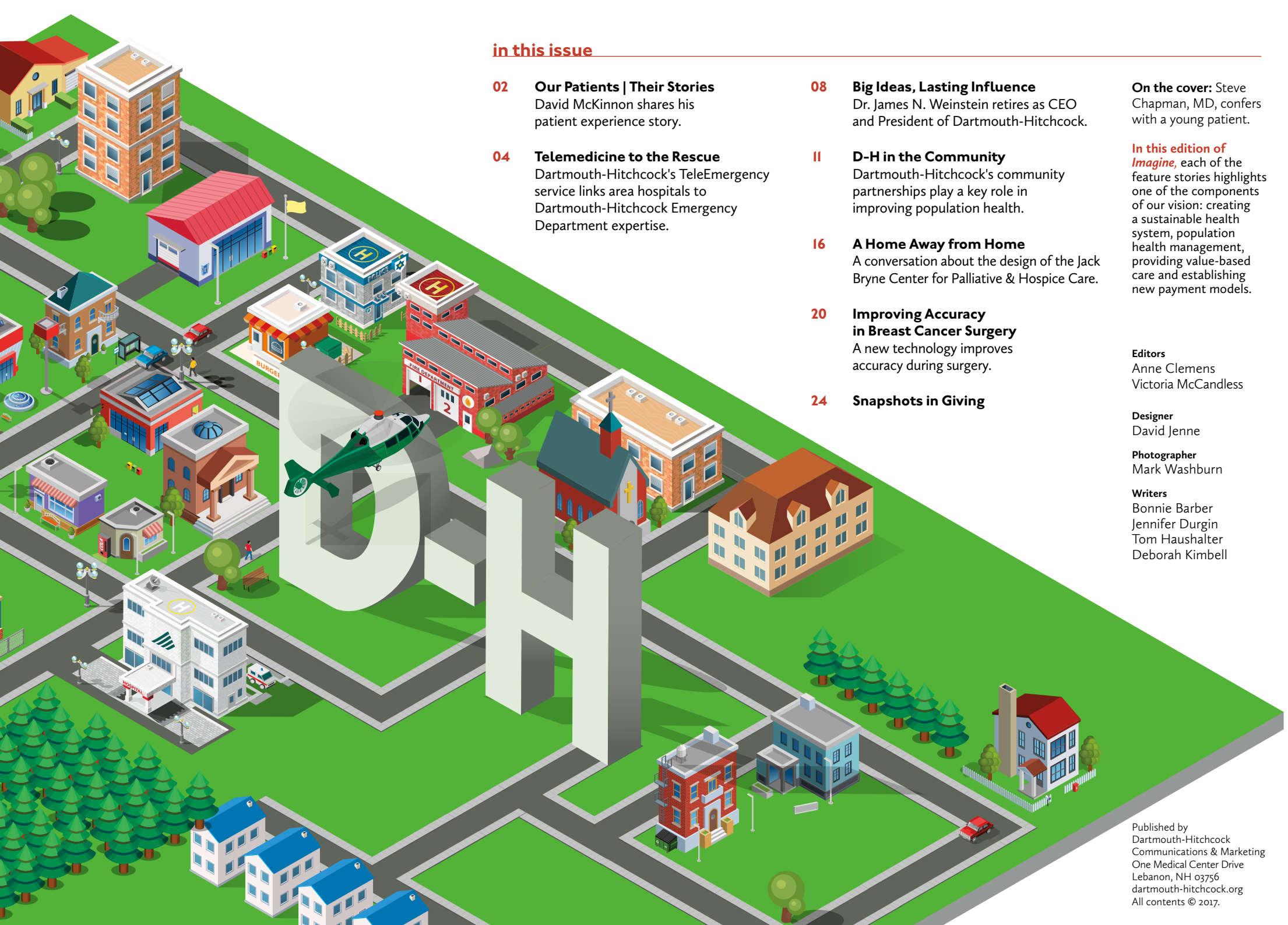
As I prepare to transition out of my role as CEO and president, I cannot help but reflect on how much has changed in medicine and in health care during my 40 years as a physician. Yet, one thing remains constant: in health care, it has been and always will be about the patient.

It’s been a privilege to lead this organization made up of incredible individuals who live to serve others. To my colleagues, I offer my heartfelt gratitude and unending respect. And to all of you across our region who honor us by entrusting D-H with your care, and who support us in so many ways, I thank you.

Jim Weinstein

Dr. James N. Weinstein
Former CEO and President

Dartmouth-Hitchcock



in this issue

On the cover: Steve Chapman, MD, confers with a young patient.

In this edition of *Imagine,* each of the feature stories highlights one of the components of our vision: creating a sustainable health system, population health management, providing value-based care and establishing new payment models.

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David

As a high school senior in the 1990s, David McKinnon scored a mind-boggling 12 goals in three playoff games on his way to leading Lebanon High School to its very first ice hockey state championship. Nobody imagined that this would be his last, proudest moment in the sport. But after an untold number of concussions through countless hours of playing, it was a knee injury at age 19 that made him realize he couldn't keep up the pace.

After he'd stopped playing hockey, his father asked him, "What else do you love, what else are you good at?" McKinnon thought: "I'm good at golf." McKinnon enrolled in college in Florida where he honed his golf game and eventually turned semi-pro. Soon, he was competing in the World Long Drive Championships, hitting distances longer than four football fields, and one year placing 75th in the world.

Since then, he has worked as a golf instructor at various country clubs. A client, watching then 35-year-old McKinnon struggle to tee up a ball, knew something was off. McKinnon had recently been slurring his words, fighting bouts of dizziness, sometimes even drooling. "You would've thought I was drunk." At his client's insistence, McKinnon finally relented and sought help.

He returned home to New Hampshire from Florida and began treatment at Dartmouth-Hitchcock (D-H) with neurologist Aleksandra Stark, MD. He believes Stark saved his life. "She took me under her wing. She knew exactly why I was so angry and frustrated, that I had post-concussion syndrome and didn't know how to control my symptoms."

Although no magic pill cures post-concussion syndrome, thanks to Stark's guidance, McKinnon understands the necessity of managing his condition for the rest of his life. He has the support of his tight-knit family, friends, his young daughter and his girlfriend, who is expecting their second daughter later this year.

"After an injury, you've got to let the brain heal," he says. "Parents, coaches and leagues have got to do more to recognize the dangers, and to require post-concussion treatment and healing time."

"The hardest thing to do is admit you need medical attention."

—David McKinnon—

Aleksandra Stark, MD,
with David McKinnon

our patients

their stories

4

Dartmouth-Hitchcock's TeleEmergency service links area hospitals to Dartmouth-Hitchcock's expertise.

TELEMEDICINE TO THE RESCUE

It had been a spectacular September day on Mount Washington, the perfect start to Nathan and Kristen Johnson's honeymoon. As the Massachusetts couple headed toward their next stop, Vermont's Lake Champlain, their nearly 10-month-old son napped in his car seat. But when Oskar awoke a short time later, he began to vomit repeatedly and grew increasingly lethargic. "He was as white as a ghost and his eyes were rolling back in his head," says Kristen. "It was definitely the scariest moment of my life."

KATIE KLAIBER | UNSPLASH

Kristen used the "AroundMe" app on her smartphone to locate the nearest hospital while Nathan drove them through rural northern New Hampshire. They rushed to Weeks Medical Center in Lancaster, where Oskar was quickly taken to the Emergency Department (ED). As they began their evaluation and treatment of Oskar, the ED team at Weeks—a 25-bed acute care hospital—informed the couple that they did not have a Pediatric Intensive Care Unit or a pediatric intensivist; however, they did have Dartmouth-Hitchcock's (D-H) TeleEmergency service, which links the Weeks' ED team to a D-H team via a high-definition audio-video connection to a board-certified ED physician and an experienced ED nurse. The Weeks' clinicians hit the red TeleEmergency button in their ED and immediately summoned on the television monitor D-H TeleEmergency providers Sadie Smith, RN, and Kevin Curtis, MD, MS.

CARY HAZLEGROVE

Oskar Johnson

Curtis, medical director of D-H's Center for Telehealth, recounted, "We joined a great bedside team and together, over the next three hours, we worked through the potential causes of the decreased mental status in this minimally-responsive and critically-ill child. We were also able to include Dartmouth-Hitchcock Pediatric Intensivist Dr. Matthew Braga throughout the process and offer the patient and team an even more specialized level of care. With all of us working together, we were able to continue resuscitation and institute initial therapy despite a very difficult IV access."

CONNECTED CARE

TeleEmergency provides patients with access to high-quality specialty care, regardless of geographic location, and gives local clinicians whatever assistance they may need. It is part of D-H Connected Care, which includes multiple 24/7 services for hospitals, including TeleNeurology/Stroke, TeleICU, TelePharmacy and TelePsychiatry. Connected Care provides more than 45 specialties in ambulatory and consult-based telemedicine, assisting with thousands of consults and orders every month for more than 50 hospitals nationwide. Connected Care delivers value to hospitals of all sizes by offering a multidisciplinary, one-stop solution to support care across the region.

For Oskar, the TeleEmergency team allowed the Weeks' team of Critical Care Supervisor Beth Rancloes, RN, CEN, and ED nurse Angela Moore, RN, to focus completely on Oskar and alleviated a lot of the stress associated with treating such a young patient. "When you're working with a child that size and that age in a small rural hospital, it helps immensely to have a team to consult with and answer questions about medications that we don't typically use, or walk us through procedures that we don't do very often," Rancloes says. "It also takes a weight off because we don't have to think about documenting, or looking back in our notes to see when we gave the patient that last dose or what time we called DHART [Dartmouth-Hitchcock Advanced Response Team]. The TeleEmergency team is recording all of that and providing reminders."

The two medical teams concluded that Oskar required more specialized pediatric care, so the TeleEmergency and Connected Care Center teams coordinated transfer and transport, enabling the bedside team to continue to focus on Oskar. After completing another transport, the DHART helicopter arrived at Weeks to take Oskar to Dartmouth-Hitchcock Medical Center (DHMC) in Lebanon, New Hampshire, nearly 100 miles away. "The flight team continued resuscitation and treatment en route and performed a seamless handoff to DHMC's PICU [pediatric intensive care unit] team," Curtis says.

A week later, a fully recovered Oskar returned home to Nantucket with his family. "Oskar is doing great. He received incredible care during that week at Dartmouth-Hitchcock, and

TeleEmergency

- Launched by Dartmouth-Hitchcock in **January 2016**
- Number of "activations" (calls) since launch: **400+**
- TeleEmergency's busiest times: **6 AM** and **10 PM**

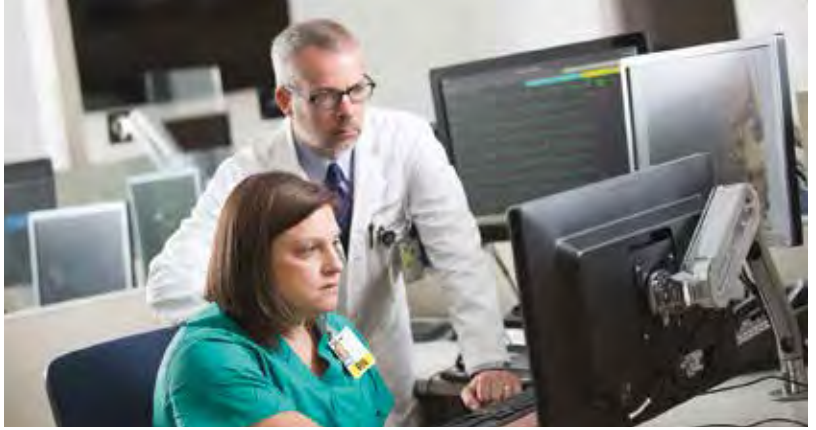
TOP FOUR TeleEMERGENCY ASSISTANCE REQUESTS:

- Trauma
- Cardiac arrest or other cardiac episodes
- Pulmonary cases, such as shortness of breath
- Neurologic or altered mental status

TeleEMERGENCY SERVICES

Clinical: Review EKGs and images, write orders for tests, write orders for medications

Non-clinical: Patient documentation/scribing, arrange patient transport or transfers to hospitals that offer higher levels of care



Above: Ian Kirit, RN, Tristan Whibey, MD, and Amanda Bubar, APRN, left to right, in the Emergency Room.

Top right: Kevin Curtis, MD, and Colleen Harrington, RN, in the Connected Care Center.

Bottom right: Matthew Koff, MD, in the Connected Care Center.

Opposite page: Nathan and Kristen Johnson at home with Oskar.

it was such a relief to know that we were connected to TeleEmergency experts in real time who could see Oskar and help the team at Weeks try to figure out what was going on," Kristen Johnson says.

"The most challenging emergency medicine is practiced at smaller hospitals with fewer resources," Curtis says. "By adding two additional emergency caregivers to the local bedside team, we can work together to optimize care, and to expedite specialty consultation and transfer to another hospital when necessary."

TeleEmergency Program Manager Colleen "Clancy" Harrington, RN, is quick to point out that, although TeleEmergency is happy to help in whatever manner the bedside team requests, "the team at the bedside makes all final decisions. While we are members of the bedside team, we're 'watching from above' and are a little bit further removed from the often adrenaline-filled moments at the bedside."

Connected Care's TeleEmergency service opened in January 2016, in partnership with Avera, a South Dakota-based health system that provides telemedicine emergency services in 10 states. Eight northern New England hospitals, including DHMC, are using TeleEmergency to date (see sidebar on page 7). If the subscribing hospitals (called "spoke hospitals") need a more specialized level of care, the Connected Care team can quickly coordinate patient transfers or transports; however, Curtis explains that about a third of patients receiving a TeleEmergency consult have been admitted to their local hospital, thereby avoiding a transfer to DHMC. "By getting involved with the patient's care early, one of our goals is to allow a significant number of patients to stay at their local hospital, since that's frequently what the patient and family want," Curtis says.

TeleEMERGENCY AT CHESHIRE MEDICAL CENTER

Cheshire Medical Center, which is an affiliate of D-H, went live with TeleEmergency at the end of June 2016, and Senior Director of Patient Care Services Amy Matthews, MS, RN, CNML, says the service has "really been a success for our team. We had about 20 activations in the first three months, and the TeleEmergency team members have become valued colleagues. Having that extra set of eyes and backup if it's needed has been well received. When things get busy, it's especially nice to have the TeleEmergency team looking over our shoulders." Cheshire Medical Center Associate Medical Director and EMS Medical Director James C. Suozzi, DO, NRP, FACEP, says he has used the TeleEmergency service several times and finds it particularly helpful for traumas and patients requiring resuscitation. "We had a motor vehicle crash with several patients at once who needed to

> It was such a relief to know that we were connected to TeleEmergency experts in real time who could see Oskar and help the team at Weeks try to figure out what was going on." ~KRISTEN JOHNSON

CARY HAZLEGROVE

be assessed pretty quickly, so I hit the button in both of our TeleEmergency-equipped rooms," Suozzi says. "In a stressful situation, it's nice to have someone looking at the global picture and available for a second opinion."

TeleEMERGENCY AS AN EDUCATIONAL TOOL

TeleEmergency is also being used for educational purposes, such as patient simulations and case re-creations. After treating Oskar, the providers at Weeks requested a TeleEmergency on-camera simulated refresher of intraosseous (IO) access during pediatric resuscitation. This entails injecting directly into the bone marrow to provide fluids and medication when intravenous access is not feasible. "We re-created the case on the camera, using a mannequin, to help them practice and increase their comfort with things none of us see that frequently," said Smith. "We make it clear that we see our role as trying to help in any way we can."

Curtis credits much of the success of individual telehealth patient encounters to the Connected Care team. "The front-line clinical personnel and program support teams are committed to working together in whatever manner is necessary to bring the resources of an academic health system to patients anywhere, anytime," he says. "That commitment, including the work that many people do behind the scene, allows our team to seamlessly join the folks at the bedside and put the needs of patients like Oskar first. It's a great feeling for all of us to have a broader impact on the region's care."

TeleEmergency

TeleEMERGENCY SUBSCRIBING HOSPITALS (AS OF MAY 2017):

- Cheshire Medical Center, Keene, New Hampshire
- Dartmouth-Hitchcock Medical Center, Lebanon, New Hampshire
- Mt. Ascutney Hospital and Health Center, Windsor, Vermont
- Southwestern Vermont Medical Center, Bennington, Vermont
- Androscoggin Valley Hospital, Berlin, New Hampshire
- North Country Hospital, Newport, Vermont
- Upper Connecticut Valley, Colebrook, New Hampshire
- Weeks Medical Center, Lancaster, New Hampshire

BIG IDEAS, LASTING INFLUENCE

- The Department of Orthopaedics.
- The multidisciplinary Spine Center.
- The landmark national SPORT study.
- The Center for Shared Decision Making.
- Patient-reported outcomes.
- The High Value Healthcare Collaborative.
- The Dartmouth-Hitchcock Health network of affiliations.
- The Jack Byrne Center for Palliative & Hospice Care.

"Like numerous other people, I owe so much to his mentorship and the encouragement he gave me along the way," Pearson says. "He had a huge impact on my career, as well as how I think about research and clinical practice."

~ADAM PEARSON, MD, MS

These are just a few of the initiatives that didn't exist before Dr. Jim Weinstein came to Dartmouth-Hitchcock (D-H) as an orthopaedic surgeon in 1996. In the years that followed, building on a vision of informed patients who are cared for by patient-centered caregivers, he and colleagues created programs, structures, practices and research projects that put patients and families first.

It's a legacy that will be carried on long after Weinstein stepped down as CEO and President of Dartmouth-Hitchcock on June 30, 2017, not only programmatically, but in the culture he created among colleagues and collaborators.

For 20 years at D-H, Dr. Weinstein's career has been marked by common themes: intellectual curiosity, determination and rigor, a drive to constantly improve, and a love of collaboration and mentoring others.

"There are no small ideas in Jim's mind. They're all big ideas," says his longtime colleague William Abdu, MD, MS. Abdu, who has worked closely with Weinstein in research and clinical care for more than two decades, and who succeeded him as medical director of the Spine Center, says those "big ideas" had a profound impact on practitioners and on patients.

Through shared decision making and the development and implementation of patient-reported outcomes, "Jim gave us a new lens into the patient. He brought the patient into the process," says Abdu. "Suddenly, we had so much better information about what was going on with that patient than we could ever get from an MRI [magnetic resonance imaging]."

Adam Pearson, MD, MS, confers with a patient.

The patient-reported outcomes were a key element of the SPORT (Spine Patient Outcomes Research Trial) study. Over 15 years, with more than $23 million in National Institutes of Health (NIH) funding, SPORT sought to answer the question of whether surgery for common conditions like a herniated disk and spinal stenosis was effective. Like Abdu, Jon Lurie, MD, MS, has been a member of the SPORT team since its inception and took over as primary investigator from Weinstein. Calling SPORT "a truly seminal study in spine surgery," Lurie says, "Eighteen years later, we continue to use the vast amount of data collected to improve the information available to patients and physicians," allowing truly informed decisions about how to manage spine conditions.

Adam Pearson, MD, MS, came to D-H first in 2003 as part of his medical student rotation, partly because of roots in the Upper Valley and partly because of Weinstein's reputation and his posi-

> “Everyone here knows my favorite word is ‘imagine.’ I’ll never stop imagining how we can make things better, for our colleagues, for the health system, for the nation, but most importantly, for the patients we are privileged to serve.” ~DR. JIM WEINSTEIN

tion as department chair. Returning as an orthopaedic resident, he soon found Weinstein to be a generous and effective mentor. “Like numerous other people, I owe so much to his mentorship and the encouragement he gave me along the way,” Pearson says. “He had a huge impact on my career, as well as how I think about research and clinical practice.”

FOSTERING CONTINUED LEARNING

Pearson was one of 25 Orthopaedic residents to benefit from a scholarship to the masters programs at The Dartmouth Institute for Health Policy and Clinical Practice (TDI). As chair, Weinstein obtained NIH funding from the U.S. Department of Health and Human Services to put two residents a year through TDI, something Pearson and Abdu say had a profound impact on the way the department approaches clinical care. “It significantly elevated our understanding of research, study design, methodology…it changed and enhanced the conversations we have in surgical and trauma conferences and grand rounds.”

Partly through a TDI Trustee Scholarship program Weinstein created, 175 former or current D-H employees have advanced through the graduate programs at TDI. A separate scholarship program funded by D-H has put 24 staff through the Masters in Health Care Delivery Science (MHCDS) program offered by the Tuck School of Business at Dartmouth College and TDI. To date, a total of 35 physicians and staff from across the D-H system have received MHCDS degrees.

Anna Tosteson, ScD, the James J. Carroll Professor in Oncology, succeeded Weinstein as director of the Multidisciplinary Clinical Research Center, which he created in 2003, and says his support was instrumental in the creation of the Comparative Effectiveness Research Program, which she also directs. “Jim’s extraordinary ability to bring diverse groups together and unite them toward a common purpose,” Tosteson says, has been a major factor in the success of SPORT and other projects he has led.

THE LEGACY HE WILL LEAVE

Reflecting on Jim Weinstein’s legacy and the programs and projects he created and led, Abdu says he realizes now it was all part of a continuum. “Looking back, I can see how it all fits together: the creation of the National Spine Network, patient reported outcomes, shared decision making, SPORT, the High Value Healthcare Collaborative. Maybe he knew this in 1996—how all these things were pieces of a puzzle that fit into place perfectly, but none of us knew it.”

As D-H CEO and President, Weinstein’s focus on creating a sustainable health system can also be added to that continuum. This initiative is built around the principles that inform all his earlier work: informed patients; appropriate treatments driven by value, not volume; transparency in sharing information and outcomes; measurement of safety and quality; and a focus on the overall health of the patient, not the delivery of health care.

For Weinstein, all his work at D-H has one common thread: the patient. “Whether it’s researching if a particular surgery is effective, improving how we gather and present information about outcomes, ensuring that our safety and quality is among the highest in the nation, or continually finding new and better ways to deliver health and health care, it’s all about doing what is best for the patient and their family,” he says. “Everyone here knows my favorite word is ‘imagine.’ I’ll never stop imagining how we can make things better, for our colleagues, for the health system, for the nation, but most importantly, for the patients we are privileged to serve.”

The Right Care in the Right Place

D-H IN THE COMMUNITY

Sometimes health care is not about medicine, it's about helping people access the services and necessities they need to live healthy lives.

This is the foundation of population health management. "We can provide the medical care, but often we don't know if someone can't get to the pharmacy, or can't get food or if they need help getting to their medical appointments," says Steve Paris, MD, regional medical director, Dartmouth-Hitchcock's (D-H) Community Group Practices: Manchester, Concord and Nashua.

Continued on page 12

Top left: A volunteer from Dartmouth-Hitchcock's Aging Resource Center provides technology advice to a local senior. Bottom three photos left: Patients and caregivers construct Fraglets Art. Above: Christopher Allen, MD, confers with patient Virginia Wood.

D-H leaders and clinicians understand that community partnerships play a key role in improving population health and people's lives. To better serve the needs of patients, their families and community organizations across the region, D-H partnered with four neighboring northern New England hospitals to conduct a joint community needs health assessment. Based on the findings, D-H is focusing on the following areas: care for those with limited resources, seniors and those with substance use or mental health issues.

CARE FOR THOSE WITH LIMITED RESOURCES

Last year, D-H provided free or reduced-cost health care services to more than 20,000 New Hampshire and Vermont residents, who lacked insurance and were unable to pay for care. D-H also provided care for more than 71,000 people enrolled in Medicaid. While the investment to provide these services is substantial (see table on page 13), it represents our commitment to provide the highest-quality health care to the region's most financially-vulnerable residents.

D-H is also collaborating with several community organizations, including the Tipping Points Grants program. Supported by Partners for Community Wellness, the community engagement arm of D-H's Community Health Department, and administered by four partner agencies, five $1,000 "tipping point" grants were awarded to each agency to help fixable life challenges, like repairing a car for getting to and from work and to medical appointments, or buying clothing that meets the requirements of a job.

When selecting partner agencies, "we looked for sophisticated organizations that serve a wide array of individuals and families and that could cover our geographic scope," says Partners for Community Wellness Director Karen Borgstrom. "For example, The Upper Valley Haven in White River Junction [Vermont] is very engaged in helping people move toward secure housing and employment. Easterseals New Hampshire, which is headquartered in Manchester, is expansive in our region and offers a broad range of services to a wide range of clients. River Valley Community College in Claremont, New Hampshire, prepares students for good-paying, stable careers. And Families in Transition focuses on the needs of homeless families in southern New Hampshire."

"Tipping Points is a great model that shares know-how across agencies while lifting up recipients and their families," says Susan Presberg-Greene, a member of the Tipping Points Steering Committee. "Tipping Points Grants are making a big difference to recipients and their families. The stories are so moving. Supporting the program is a great way to show we care."

CARE FOR OUR SENIORS

As the population of New Hampshire and Vermont ages, we have to identify new ways to support the health and well-being of older adults. D-H is teaming with community support services and making investments in communi-

ties through a variety of pilot projects. D-H's Aging Resource Center also provides patients and their caregivers with a wide array of classes, support groups and family support.

"Thanks to a joint Frail Senior Project between D-H Manchester and Easterseals New Hampshire, we now have a better understanding of the additional assistance needed by some of the highest-risk, elderly patients in the state's southern region," says D-H Manchester Care Coordinator Diane Flint, RN. Thirty-five Manchester area patients are enrolled in the program and receive help from licensed clinical social worker Julie Brown-Nierman, LICSW. She performs a wide range of services, such as taking patients to medical appointments, helping them find housing and enrolling them in therapy programs.

D-H is also providing free programming and support to GoodLife Programs & Activities, based in Concord. "Our mission is to be a hub in New Hampshire that compliments existing services and fosters ongoing community engagement by providing programs and activities that support the independence, health and well-being of active adults aged 50 and older in the Concord area and beyond," says Susan Greenblott, GoodLife's director of Development and Marketing. "We value our ongoing partnership with organizations like Dartmouth-Hitchcock."

D-H has sponsored GoodLife events and hosted the New Hampshire Association of Senior Centers Conference. Additionally, D-H clinicians have given free presentations at GoodLife, such as:

- ***Heart Health for Seniors***, with cardiologist Gerard Dillon, MD
- ***Parkinson's Disease: Knowing the Signs and Treatment Options***, with neurologist Maureen Hughes, MD
- ***Being Happy At Any Age***, with D-H licensed psychologist Juliana Read, PhD

Mary Ann Aldrich, RN, MS, clinical director of Community Health Improvement for D-H's CGPs, says they plan to expand their work at Goodlife, as well as at senior centers in Manchester and Nashua. The Community Health Improvement Department also recently made a $50,000 contribution to the Manchester Community Health Center, as well as a $65,000 contribution to the Good Neighbor Health Clinic in White River Junction, Vermont, which both serve primarily uninsured and low-income individuals. "As a Community Health department, we're really looking to identify opportunities where we can educate people and support access to health care in our communities for those who are most likely to experience income barriers to care," Aldrich says. "We've got a lot of great things going on in the southern region of New Hampshire, but there are also exciting partnerships ahead."

CARE FOR THOSE WITH SUBSTANCE USE AND MENTAL HEALTH NEEDS

More than 50 percent of the U.S. population will experience mental health or substance use concerns during their

Diviya Kaul, MD, leads a dance class for Parkinson's patients.

FY16 COMMUNITY BENEFITS SERVICES PROVIDED BY D-H JULY 1, 2015 TO JUNE 30, 2016

	FY15	FY16
Free and reduced-cost health care	$17,487,329	$23,496,268
Care for patients with Medicaid benefits	$124,277,380	$108,078,773
Community health programs	$2,592,040	$3,512,090
Training for new health professionals	$29,668,202	$31,760,0400
Research	$5,197,568	$3,135,925
Cash and in-kind community contributions	5,290,533	$1,310,708
Community building activities	$341,499	$1,459,098
TOTAL	$184,854,551	$172,753,262

Community members participate in a Recovery Coaches training held at Hypertherm in Lebanon, New Hampshire.

lifetime, and almost everyone has a family member or friend who has been affected by depression, mental illness or addiction. D-H is working to embed behavioral health care as part of its Primary Care services. In Lebanon, Manchester and Bedford, Children's Hospital at Dartmouth-Hitchcock (CHaD) pediatricians regularly screen their teen patients for mental health and substance use concerns, allowing clinicians to partner with teens to catch unhealthy behaviors early and to provide behavioral health care, if needed.

To help combat the growing substance use issues with teens, CHaD pediatrician Steve Chapman, MD, led a multidisciplinary team in developing a project called Adolescent and Young Adult Screening, Brief Intervention and Referral to Treatment (SBIRT). This project grew out of Dartscreening, a program originally developed by CHaD's Ardis Olson, MD. With support from a New Hampshire Center for Excellence grant, Chapman and his team began piloting the SBIRT tablet tool in October 2014. When adolescents and young adults come to D-H for their annual well-child visits, they are given a set of questions about potential substance use, depression and anxiety, which are integrated into a tablet-based screener that automatically updates in a patient's electronic medical record.

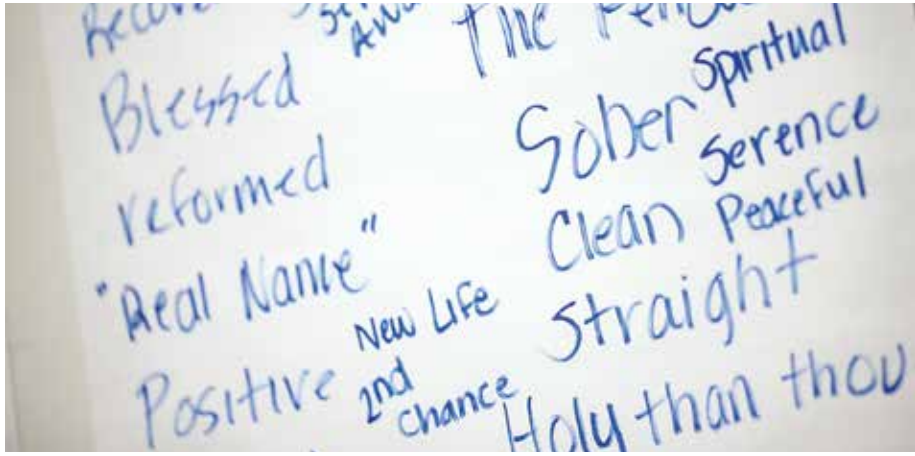
D-H Primary Care currently has SBIRT programs in Lebanon, Manchester and Bedford, and expanded the program to Concord in the spring of 2017. An expansion to Nashua is also in the planning stages, with a targeted launch date of late 2017. According to Chapman, the population health impact will ultimately be 8,400 adolescents a year.

"Part of the exciting potential is that we see these kids back at least once a year, and so these screenings are not a one-time proposition, but the beginning of an ongoing discussion as they progress through adolescence," Chapman says.

D-H is also expanding its Perinatal Addiction Treatment Program throughout the region and is subsidizing access to the Outpatient Addiction Treatment Program. As opioid use in New Hampshire and nationwide has skyrocketed, the number of infants born with neonatal abstinence syndrome (NAS) has also grown. By 2016, eight to 10 percent of newborns in the state's Upper Connecticut Valley region had been exposed to opioids in utero and many had NAS, with moderate to severe symptoms of physical dependence at the time of delivery. To help pregnant women overcome addiction and protect their babies, D-H, the Geisel School of Medicine at Dartmouth and CHaD in 2013 began offering a comprehensive program of care for pregnant and postpartum women with substance use disorders.

The D-H Perinatal Addiction Treatment Program currently treats more than 50 pregnant and postpartum women, and has received national media coverage for its innovative, one-stop approach to substance abuse treatment. Since its inception, the program has demonstrated positive outcomes for its participants, including increased participation in prenatal care, term delivery, fewer newborns requiring treatment for NAS and increased patient satisfaction.

Thanks to a $127,000, three-year grant from the March of Dimes New England Chapter, D-H is facilitating the regional delivery of comprehensive services for pregnant women with substance use disorders. Daisy Goodman, an advance practice nurse with a specialty in midwifery, who works closely



> “Part of the exciting potential is that we see these kids back at least once a year, and so these screenings are not a one-time proposition, but the beginning of an ongoing discussion as they progress through adolescence.” ~STEVE CHAPMAN, MD

Steve Chapman, MD, center, and colleagues discuss a patient case.

with the women in the Perinatal Addiction Treatment Program, will serve as the investigative leader in developing the regional toolkit over the next three years. The toolkit will address the challenges of coordinating care between maternity and addiction treatment providers, as well as between the inpatient and outpatient settings.

Goodman has also been instrumental in helping to bring more nutritious food to the mothers participating in the program. Through a partnership with the Upper Valley Haven, volunteers stock the food pantry and refrigerator of the Perinatal Addiction Treatment Program clinic with staples like eggs, produce, milk and cereal. They also prepare healthy “grab and go” snack bags of fruit and veggies, and casseroles for patients to take home after participating in recovery groups. Kristen Coats, the Haven’s program coordinator of food and wellness programs, explains that this pilot nutrition program was started after she met with Chapman to discuss food insecurity, which is when a household has limited or uncertain access to adequate food. “He talked about how powerful it was to have resources co-located in the same building,” she says.

"And for these young mothers, it’s one less car ride or bus ride they have to take.”

Together all of these programs are part of an overall system that D-H is implementing to improve population health in northern New England, says D-H Director of Community Health Greg Norman. "Dartmouth-Hitchcock has a commitment to work with others to meet the needs of the communities we serve. These projects, and others that we are working on, represent our commitment to partner our people, expertise and resources wiht human service organiations and others to address conditions that affect health in our communities," Norman says.

Terri LaRock, MSW, LICSW, pictured at left, leads a women's counseling group.

A HOME AWAY FROM HOME

A conversation about the design of the Jack Bryne Center for Palliative & Hospice Care

When designing a new building, Dartmouth-Hitchcock (D-H) has a long history of involving the building's future users in the process. The Jack Byrne Center for Palliative & Hospice Care was no exception. "My job was to bring the right people to the table with the architect," says Gail Dahlstrom, a senior health care consultant with HDR Architecture in Chicago. "One challenge was finding the right balance between the spaces for patients, families and staff."

Working with lead architect Charles Rizza Jr., and his team from E4H Architecture in Portland, Maine, they focused on ensuring that the facility was:

- **Home-like—a welcoming place to live and be with family**
- **Personalized—making it feel like patients' homes**
- **Family-oriented—comfortable for daily living**
- **Connected—to nature, family, other people and spirituality**
- **Flexible—understanding that needs will change over time**
- **Operational—for family caregivers, staff and volunteers**

When completed later this year, the center will feature 12 spacious inpatient rooms; respite areas for families and staff; multidisciplinary staff workspaces; and areas to eat and prepare food, exercise, and enjoy art and music. D-H palliative care physician Ellen Bassett, MD, who has been the lead physician in the center's development, says, "Our hope is that the building will be extraordinary and the people who use it will be able to get excellent care in a setting that makes this time less difficult."

Imagine spoke with Dahlstrom, who is the former vice president of Facilities for D-H, and Rizza to learn more about their collaboration on this state-of-the-art facility, and how it was designed architecturally and programmatically to support patients, families and staff.

DAHLSTROM: One of Dartmouth-Hitchcock's main objectives is caring for patients in the right place at the right time. For this patient population, it's been hard to get them in the right place. They have either been at home or in a residential setting with caregivers who are often not able to handle the type of symptom management they need. Or they have received intensive care that was potentially unnecessary or unwanted in an acute or critical care bed in a hospital. What these patients really need is a whole different set of services. In some cases, they need technical clinical skills because their medications need to be managed well. And they may want a massage, or quiet or family time, or any number of things that can only be provided in a home-like environment and not in an institutional setting. So we worked on providing a place for the patient and his or her family to be cared for from a

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These artist renderings, pictured on both pages, illustrate the philosophy behind the center's design to create a personalized, home-like setting to support patients, family and staff.

QUILTS OF CARING

Dartmouth-Hitchcock nurses, employees, volunteers and community members find another way to extend care to patients.

Once a month, a conference room at Dartmouth-Hitchcock (D-H) fills with sewing machines, cutting boards and quilts in various stages of production. The nurses and Upper Valley residents who have attended these Saturday gatherings since December 2016 are volunteering to create quilts for the new Jack Byrne Center for Palliative & Hospice Care.

The goal is to make 24 quilts—one for each twin bed in the center, plus a spare, says former D-H Nursing Project Specialist Darlene Saler, RN, who organized the project. With nearly 45 D-H nurses, employees, retirees and community members making quilts, the group will exceed their goal. They are also making lap quilts, and have completed nearly a dozen already, which Saler says they hope to send home with patients.

"Quilters love to donate to charity and this is a great way to show support for something that has such meaning to the community," says Saler. "The quilts will make the Jack Byrne Center even more homelike for the patients who receive care there."

Quilters from left to right: Terry Malec, RN, Mary Catherine Rawls, RN, Darlene Saler, RN, Kimberly Poirier, Kayla Denny, RT, Bonnie Fiorelli, Deirdre Muller, Paulette Fraser, RN, and Susan Schneider.

Clinical Nurse Specialist Mary Catherine Rawls, MSN, RN, views the quilts as a way to further extend care to patients. "As a nurse, I give patients comfort in many ways," she says. "So if I'm not there, I hope my quilted creation will give someone some comfort."

Rawls was one of the quilters whom Sheila Tanzer met when she visited a quilting session. A longtime supporter of D-H's Palliative Care program and the widow of Radford Tanzer, MD, who led D-H's Section of Plastic Surgery for many years, Tanzer was eager to meet the quilting volunteers after donating $2,400 to cover the cost of quilt batting.

"Their willingness to give generously of their time to create each beautiful, one-of-a-kind quilt is a gift of unselfish love," says Tanzer, a writer and gardener. "The presence of these artistic gifts in each room at the Jack Byrne Center will surely bring a measure of joy to those who stay there."

To learn how you can support programs and services at the Jack Byrne Center, contact Dorothy Heinrichs at 603-653-0752 or Dorothy.B.Heinrichs@Hitchcock.org. Or make a gift online at D-H.org/JackByrneCenter.

clinical and a holistic perspective that also provides significant clinical support.

RIZZA: When a patient arrives, they will enter the facility through the front door and enter into the Great Room, a large living room that has comfortable furnishings, a fireplace and a lot of natural light. From that location, much like they may experience at home, they can see into the family kitchen and a small dining area, which can be closed off for privacy. This design immediately makes them feel welcome.

DAHLSTROM: When we toured other hospice centers, one of the things we loved and wanted to replicate here was a family kitchen, a place for the family to be together while they were going through this stressful time. We put the kitchen adjacent to the Great Room so that, as Dr. Ellen Bassett says, "We can have the smell of freshly baked cookies coming into the Great Room." We also knew that we wanted to have a chapel for meditation and reflection after seeing a chapel in a Chicago-area hospice center that inspired an immediate sense of calm. There are also a couple of team stations, but the intent is when clinicians aren't with patients most of their work will take place in a collaborative, clinical work room. It will accommodate everyone who needs to be there at any point in time, and bring together doctors, nurses, social workers, chaplains and bereavement counselors. In palliative and hospice care, the team is very interdisciplinary.

RIZZA: Another strength of this facility is that it's on the Dartmouth-Hitchcock campus in a setting that's quite stunning. Looking outdoors, you'll see either a beautiful garden or the woodlands, with hiking and walking trails. In designing the building, we recognized the solitude and natural landscape as important elements for clearing the mind. All 12 of the bedrooms look out onto that natural landscape. Each has room for family and a balcony—sort of a protected little patio—that looks out onto the natural environment.

DAHLSTROM: The outdoor balconies can even accommodate a patient's bed, which is going to be wonderful for people who want to connect with nature, either with their family or by themselves. One of the driving design criteria was the question of choice both for the patient and for the family caregiver. If a patient wants to be in a patient room in the dark with no sound, we can accommodate that. If they want to have a lot of natural light, there are a lot of windows in the room. They might want to have TV, music or have their grandkids in the bed with them. We can accommodate all of that. Likewise, the family might want to be right next to the patient the whole time or they may want to take long walks outside. Family members can also sleep and shower right in the room, if they want to.

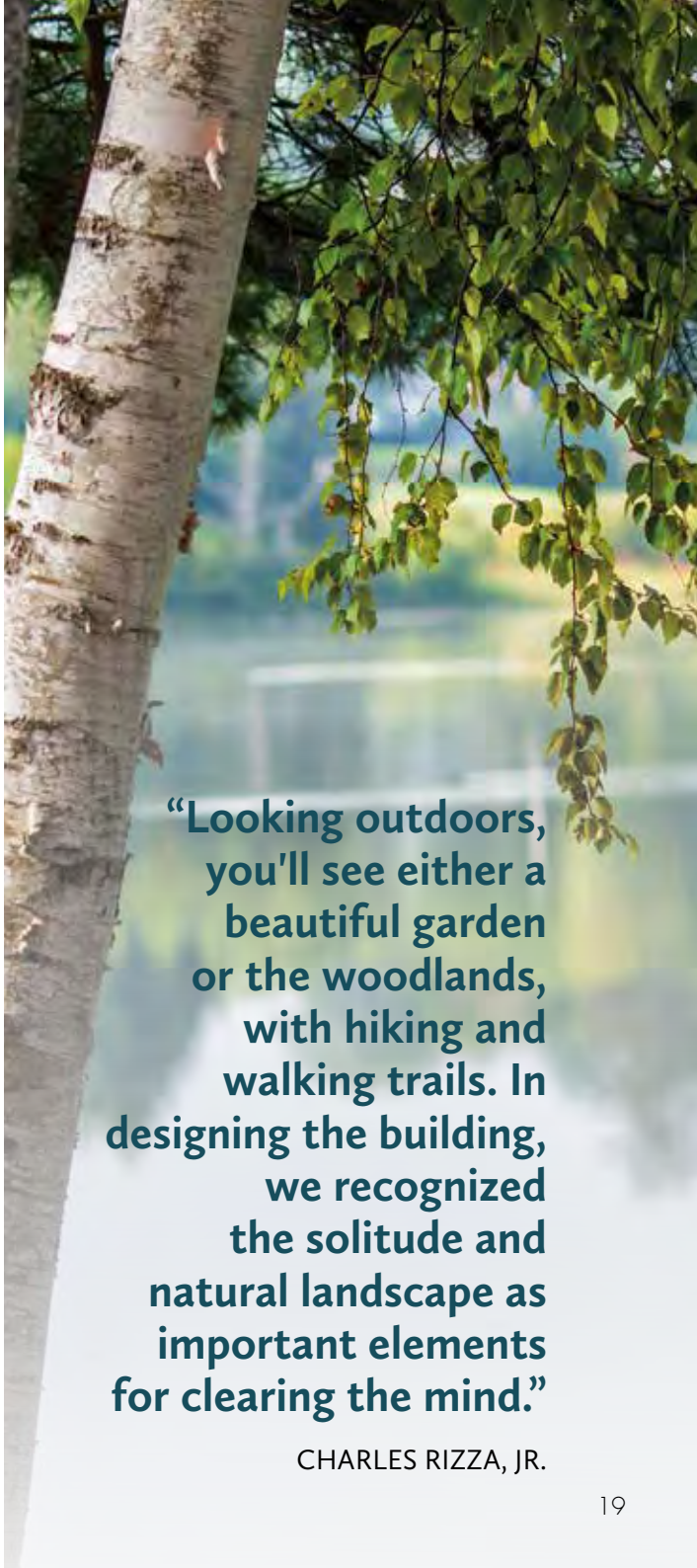
RIZZA: The center has a spa that has a special tub that's large enough for patients to be lowered into. There's also a playroom for young children and a small lounge for teenagers. The building is designed to be sustainable, with a geothermal heating and cooling system. All of the lighting is energy-efficient LED technology, and many of the products that we're putting in have either a high-recycled content or can eventually be recycled.

DAHLSTROM: One thing that makes this center unique is that we'll be able to conduct research here and provide educational opportunities. The whole field of hospice and palliative care is relatively new from a clinical specialty perspective, and we have much to learn about best practices for caring for these patients. This center provides an opportunity to incorporate research questions in a disciplined and organized way.

We've also incorporated virtual education mechanisms into the building, so if clinicians are providing care at a patient's home, we can connect virtually and provide education and support in the field.

Another key difference is driven by D-H's palliative care philosophy. People will pass away while they're here, but our purpose is symptom management for living well. People might come for a few days and have their symptoms managed so they can go home again if they prefer.

RIZZA: The underlying premise for end-of-life care is for patients and their families to be comfortable. There are still many hospitals that have a couple of rooms that are considered their hospice rooms, but you're still in the hospital. You're not in an environment that's home-like. This is a time when you want to be removed from the rest of the world, and you want to be in a very comfortable, private and nurturing environment. Until you've been in this situation, you don't recognize how important this is. I see this center setting a new benchmark for palliative and hospice care.



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CHARLES RIZZA, JR.

Improving Accuracy in Breast Cancer Surgery

Mastectomy or lumpectomy? What will my breast look like after surgery? Will my surgeon get all of the cancer on the first attempt? These are just a few of the many questions patients with breast cancer face. A new technology developed at Dartmouth-Hitchcock's (D-H's) Norris Cotton Cancer Center (NCCC) holds promise for answering such questions with more certainty, less stress and a lower overall cost.

The Breast Cancer Locator gives surgeons the ability to remove tumors more accurately, reducing the need for second surgeries, and preserving the shape and appearance of the breast. The Breast Cancer Locator, which is a 3-D printed plastic form, was invented a year ago by D-H surgeon Richard Barth, MD, in collaboration with engineers from Dartmouth's Thayer School of Engineering—Keith Paulsen, PhD, the Robert A. Pritzker Professor of Biomedical Engineering, and Venkataramanan Krishnaswamy, PhD, now chief technology officer at CairnSurgical, LLC. Barth is also a professor at the Geisel School

of Medicine at Dartmouth and a recipient of the 2015 Dartmouth SYNERGY Clinician-Entrepreneur Fellowship. This, along with the generosity of donor Charlotte Metcalf, provided him with resources and dedicated time to develop and study the commercial potential of the Breast Cancer Locator.

"The Breast Cancer Locator lets a surgeon know exactly where the tumor is located," says Paulsen. Mammograms, ultrasounds and MRIs are good at imaging tumors within the breast, but it has always been a challenge for surgeons to precisely locate and identify the margins of a tumor during surgery because of the way soft tissue can change shape.

Custom printed for each patient based on an MRI scan, the Breast Cancer Locator is designed to help surgeons more accurately remove non-palpable tumors—cancerous tissue that cannot be distinguished by touch. The current standard method, wire localization, results in a complete removal only 70 percent of the time. Currently, 30 percent of women who undergo a lumpectomy need a second surgery to remove cancerous tissue that was missed the first time.

Each Breast Cancer Locator is fabricated at the Dartmouth Regional Technology Center. The Breast Cancer Locator is placed on the patient's breast at the start of an operation. Openings in the surface of the Breast Cancer Locator allow the surgeon to draw the tumor edges on the breast surface. The surgeon then injects blue dye through cylindrical ports on the Breast Cancer Locator surface to mark the edges of the cancer within the breast and places a wire in the center of the tumor. Part of the Breast Cancer Locator package is software that gives surgeons in the operating room a three-dimensional picture of the breast cancer, so they also know the precise distance of the cancer from the skin surface and the underlying chest wall.

To test the accuracy of the Breast Cancer Locator , Dartmouth investigators (including Barth, Krishnaswamy, Paulsen, radiologist Tim Rooney, MD, pathologist Wendy Wells, MD, and surgical oncologist Christina Angeles, MD) are first using the Breast Cancer Locator in patients whose cancers can be felt. In a clinical study of 18 patients at NCCC, the Breast Cancer Locator perfectly localized the cancer in 17 cases. The researchers modified their technique slightly after one sub-optimal localization, and all subsequent tumors have been perfectly localized. Barth recently presented the results of this study at the American Society of Breast Surgeon's annual meeting in April 2017.

Left: Venkat Krishnaswamy, PhD, with a Breast Cancer Locator just after being printed in the lab. Below: Richard Barth, MD, Keith Paulsen, PhD, and Venkat Krishnaswamy, PhD, (left to right) confer about a patient.

> "We think eventually any surgeon in the country will be able to remove a patient's breast cancer in a single surgery with the Breast Cancer Locator." ~RICHARD BARTH, MD

LOW COST, HIGH VALUE

As a breast cancer survivor, Charlotte Metcalf knows firsthand what such an advance could mean for patients, and that's why she made a generous gift in support of the Breast Cancer Locator clinical trials.

"The seed money I provided will further their chances of securing federal grants to establish the Breast

Above: Charlotte Metcalf's generous donations provided Richard Barth, MD, and his colleagues with the time and resources needed to develop the Breast Cancer Locator. Right: Richard Barth, MD, and colleagues discuss a case.

Cancer Locator as a means to enable all women who have been diagnosed with breast cancer to avoid a second invasive procedure," says Metcalf, who has supported breast cancer research at NCCC for the past 10 years.

The team has begun a broader clinical study involving patients at several New England hospitals, designed to demonstrate that the technology can be used at other facilities to accurately localize breast cancer. If all goes well, the team hopes to receive a federal Small Business Innovation Research grant and will work toward approval by the U.S. Food and Drug Administration (FDA).

"The next phase is to directly compare the effectiveness of the Breast Cancer Locator to wire localization" in a large multicenter randomized prospective trial, says Barth. "We hope to begin a year from now. We expect that the Breast Cancer Locator procedure will reduce the need for a second surgery, which is a significant burden on patients and health-care costs." Conservative estimates suggest that the Breast Cancer Locator has the potential to save in excess of $300 million annually by avoiding repeat surgeries.

> "The seed money I provided will further their chances of securing federal grants to establish the Breast Cancer Locator as a means to enable all women who have been diagnosed with breast cancer to avoid a second invasive procedure."
>
> ~CHARLOTTE METCALF

The Breast Cancer Locator is the research team's second generation technology, as they attempt to more accurately localize breast cancer during breast-conserving surgery. In 2014, they began a clinical trial, funded by the National Institutes of Health, testing an image-guided technique that allowed NCCC surgeons to make precise tumor excisions using a three-dimensional MRI-derived image. The preliminary results are promising, demonstrating the benefits of being able to better visualize the cancer location in the operating room; however, the first-generation technique was more complicated, which would likely limit its general use. The group then created the relatively low-tech Breast Cancer Locator form, which can easily and quickly be used to localize breast tumors.

"We think eventually any surgeon in the country will be able to remove a patient's breast cancer in a single surgery with the Breast Cancer Locator," says Barth. That's welcome news for tens of thousands of patients.

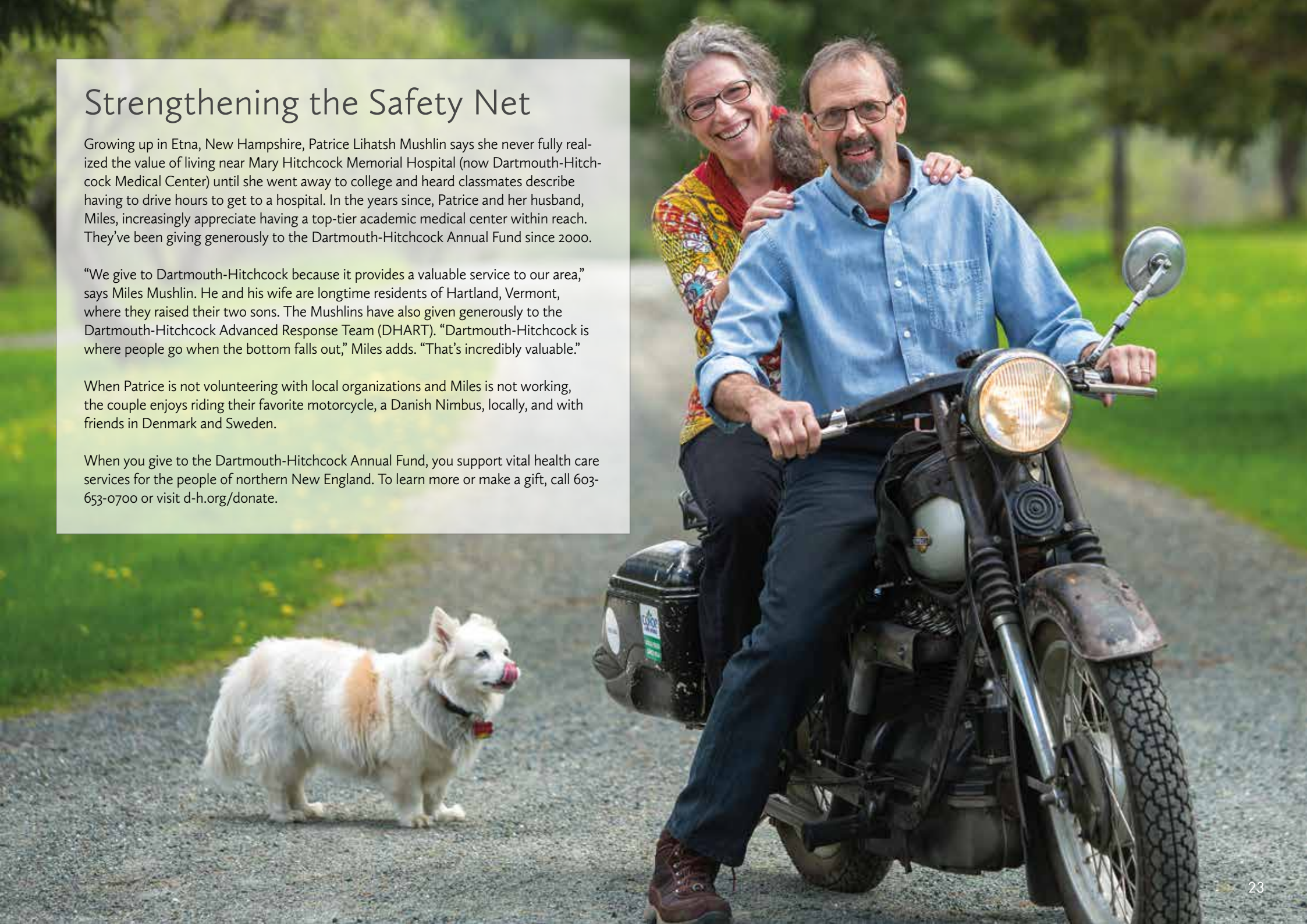
Strengthening the Safety Net

Growing up in Etna, New Hampshire, Patrice Lihatsh Mushlin says she never fully realized the value of living near Mary Hitchcock Memorial Hospital (now Dartmouth-Hitchcock Medical Center) until she went away to college and heard classmates describe having to drive hours to get to a hospital. In the years since, Patrice and her husband, Miles, increasingly appreciate having a top-tier academic medical center within reach. They've been giving generously to the Dartmouth-Hitchcock Annual Fund since 2000.

"We give to Dartmouth-Hitchcock because it provides a valuable service to our area," says Miles Mushlin. He and his wife are longtime residents of Hartland, Vermont, where they raised their two sons. The Mushlins have also given generously to the Dartmouth-Hitchcock Advanced Response Team (DHART). "Dartmouth-Hitchcock is where people go when the bottom falls out," Miles adds. "That's incredibly valuable."

When Patrice is not volunteering with local organizations and Miles is not working, the couple enjoys riding their favorite motorcycle, a Danish Nimbus, locally, and with friends in Denmark and Sweden.

When you give to the Dartmouth-Hitchcock Annual Fund, you support vital health care services for the people of northern New England. To learn more or make a gift, call 603-653-0700 or visit d-h.org/donate.



Snapshots in Giving

The generosity of donors is vital to Dartmouth-Hitchcock's mission of advancing health through research, education, patient care and community partnerships. Thanks to all who help us sustain our mission.

SURGICAL INNOVATION TO REDUCE COSTS

As founder of a successful New Hampshire construction company, John Stabile knows firsthand the effect that rising health-care costs have on employers and their employees. So when he learned about Dartmouth-Hitchcock's efforts to use technology to keep people well and out of the hospital, and to reduce the cost of care, he wanted to support that approach. In 2016, the John P. Stabile Family Foundation made a gift in support of the Center for Surgical Innovation (CSI) at Dartmouth-Hitchcock Medical Center (DHMC). The 35-year-old nonprofit foundation focuses on education, medicine and philanthropic opportunities in New Hampshire.

Stabile recognized the potential for CSI—a state-of-the-art surgical research facility—to improve surgical procedures and, ultimately, reduce the cost of care. "It's clear they have a very dedicated team," says Stabile. And as a businessman, he understands that sometimes a big investment is needed to yield big returns in the future. In this case, the "big returns" will be more precise, safer and more innovative surgeries that help people leave the hospital sooner and resume their lives. For more on CSI, visit med.dartmouth-hitchcock.org/csi.

At left is the Center for Surgical Innovation, a pioneering research facility at DHMC.

HELPING PATIENTS STAY CONNECTED

Inspiration struck for Milly Schwartz in a moment of frustration. Schwartz, who lives in Brooklyn, New York, had been admitted to Dartmouth-Hitchcock Medical Center (DHMC), and she wanted to call her son, whom she had traveled to New Hampshire to see. But her cell phone battery was dead and she didn't have a charger. This was a problem that could be fixed, Schwartz realized—not just for her, but for other patients and families, too.

Weeks later, when Schwartz was well, she made a gift of $300 to the Office of Patient Experience for the purchase of cell phone charging kits. A variety of chargers are now available for patients and families to use in the Emergency Department, in the Intensive Care Unit, in the Birthing Pavilion, at the North Patient Towers Information Desk and at the Main Information Desk.

"It's almost as if we can see the relief on a patient's face when we inform them that we'd be happy to charge their phone," says Cyndi Jenks, a patient care representative. "It's priceless!"

"Staying connected with loved ones during an emergency situation and hospital stay is crucial to the healing process," says Geraldine Blain, who oversees the information desks at DHMC. "Sometimes the smallest services can make the largest impact on a patient and their family."

Imagine a health system that focuses on health, not just health care

Imagine a health system where care is based on value, not volume

Imagine a health system grounded in population-based strategy, not market share

Imagine a health system that rewards quality, not quantity of procedures

Imagine a health system where patients, when well informed, receive only the care they want and need

IMAGINE

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Imagine highlights Dartmouth-Hitchcock's leadership role in providing the best in patient care, translational research, medical education and community service. The stories featured in this publication exemplify our mission to create a sustainable health system to improve the lives of the people and communities we serve, for generations to come.

IN THIS issue