IMAGINE

Innovations in Care
It's not uncommon when meeting a new person, to ask what they do, what's their occupation. The answers are often very interesting, but even more interesting might be to ask "why." Why do we do what we do? What is our purpose? What drives us?

At Dartmouth-Hitchcock, our “why” is clear. We are here to improve the lives of the people and communities we serve, for generations to come. Delivering health and health care, educating future physicians and performing research is what we do. But it’s the why that is most important. Our physicians and staff are passionate about serving our patients and families, and it shows in the work we do every day.

In the following pages, you’ll get a glimpse of some of that work. These stories illustrate how we are creating a sustainable health system with a core focus on patients and families first. Our goals as a leading academic health system are to improve the health of our population, to provide value — only the highest quality care that well informed patients want and need, at a reasonable price — and to do so transparently, in payment models that reward quality and value, not the number of patients we see or procedures we do.

Thank you for your trust and your support. We’re privileged to serve you.

Dr. James N. Weinstein
CEO and President
in this issue

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Bonnie Mercier suffered from episodes of pain down the side of her right leg. Initially diagnosed as sciatica — a common type of pain affecting the sciatic nerve, which extends from the lower back down through each leg — the condition got worse over time.
“It got to the point in the spring of 2012 where I couldn’t walk more than a few yards without stopping because the pain was so excruciating,” she recalls. “It almost ruined the Disney cruise that my husband and I took our granddaughter on for her 16th birthday. It took me forever to walk around the ship. They had to keep waiting up for me, and we had to sit down and take little rests.”

Even after many other treatment options failed — including acupuncture, chiropractic care, massage therapy, physical therapy and pain injections — Mercier resisted having an operation. “My mother had back surgery years ago and it pretty much paralyzed her, so I was very leery about it,” she says. “Finally, I couldn’t take it anymore. I said to my doctor, ‘Send me to someone who can help me.’”

That someone was William Abdu, MD, at Dartmouth-Hitchcock’s Spine Center. Mercier had a procedure called a “laminectomy and fusion” with Abdu in December of 2012. “I had a disc out of place that was pressing on the spinal nerves,” she says. “Basically, he removed the material that was pinching the nerves. Then he used some rods and screws and a bone graft from my hip to put my disc back in place and make it stable again. As soon as I woke up from the procedure, I had immediate relief. The pain was gone.”

Mercier is back to the active lifestyle that she enjoys. “I walk every day and I’m able to do everything I want without limitations,” she says.

“My husband and I love Dr. Abdu,” adds Mercier. “He was compassionate and very thorough. He spent a lot of time with us, explaining all the ins and outs of the procedure and the recovery process. That made such a difference. I couldn’t be more pleased with how things turned out. I feel 10 years younger.”
Ronalo “Ron” Pelchat loves to play with his four grandchildren. So as 5-year-old Lilianna (Lili) pedaled her tricycle around the driveway of his Lancaster, NH, home on a June afternoon, Pelchat raced after her.

Even though the 57-year-old ran two Boston marathons and climbed Mount Washington several times, he did not race Lili on foot. Instead, Pelchat chased her in a motorized wheelchair that he operates with a head array, a halo-like device connected to his wheelchair that he controls by moving his head. The ravages of amyotrophic lateral sclerosis (ALS, known as Lou Gehrig’s disease) have left him with muscle function only in his face, neck and shoulders, and confine the now-retired high school social studies teacher to a wheelchair or hospital bed.

Additionally, the tracheostomy he underwent in December 2013 has meant full-time ventilation and a feeding tube. It’s also robbed him of his voice. A DynaVox Vmax+ speech-generating device is Pelchat’s primary way of communic-
Pelchat races down the driveway with his granddaughter Lili.

Anita Pelchat, his wife of 30 years, calls the tracheostomy a “life-saving choice” since her husband was losing his ability to breathe on his own and would have died without the procedure. But the tracheostomy tube has made more difficult the long drive to Dartmouth-Hitchcock Medical Center (DHMC) for appointments with Pelchat’s neurologist, Jeffrey Cohen, MD.

“We need to travel with someone who monitors the trach now,” Anita explained. “And the roads are bumpy, especially in the winter, so it jostles him all over the place. It’s a couple of hours driving there, a couple of hours at the appointment, a couple of hours to drive home and then right to bed. And toileting and eating are not easy on the road. It’s an exhausting day.”

PELCHAT HAS BEEN Dr. Jeffery Cohen’s patient since his ALS diagnosis in August 2009, but had not seen him since July 2013 due to the challenging drive, however, in May and July of 2014, he had appointments with Cohen via a telemedicine consult, connecting Cohen at DHMC in Lebanon, NH, to Pelchat at Weeks Medical Center in Lancaster, NH, less than a mile from his home. The Dartmouth-Hitchcock Center for Telehealth had equipped Weeks with telemedicine carts in February 2014, thanks to a three-year rural health care grant provided by the United States Department of Agriculture.

These carts enable D-H rheumatologists, dermatologists and psychiatrists to conduct real-time video consults with Weeks Medical Center’s patients. Now the Neurology department at Dartmouth-Hitchcock utilizes them for Pelchat and for a TeleStroke program that launches at Weeks this fall.

“With the difficulty of long-distance travel, telehealth consults made perfect sense both physically and financially,” Pelchat said. “For people in rural areas,
or those with severe travel difficulties, it’s an efficient and advantageous way to gain and maintain access to specialized care."

“These telemedicine appointments have been really helpful,” Cohen said. “It’s great to be able to interact with Ron. This is not an acute medical situation. It’s more of a support situation as we help him through this stage of the disease. But it’s very helpful to see him, talk to him, and answer any questions that he and Anita have.”

Anita Pelchat is thrilled that telemedicine gives her husband access to Cohen again, minus the challenging drive. “The whole telemedicine piece allows us to have a complete ALS clinic team without having to travel more than a quarter mile. The pulmonologist goes to Weeks and everyone else — the speech pathologist, the occupational therapist, the physical therapist — they all come to our house. So the only piece we were missing was Dr. Cohen.”

“We’ve created our own clinic team,” her husband added. “It sounds daunting but it can be done, especially with the help of your local home health care agency. For us, Dr. Cohen completed the link.” Pelchat paused, grinned and then resumed selecting letters. “Can we call Dr. Cohen the missing link? Ha, ha, ha!”

CLEARLY, PELCHAT HAS not lost his sense of humor despite this difficult disease. “He has a good outlook on things,” Anita confirmed. As Pelchat posted on his Facebook page in early August, the average life expectancy for those diagnosed with ALS is two to five years. “I’m five plus and still going,” he wrote. “That makes me a Lou Gehrig — one of the lucky ones!”

Pelchat at home with his wife, Anita, and granddaughter, Lilianna

Pelchat at home with his wife, Anita, and granddaughter, Lilianna

Pelchat conducts a telemedicine appointment with Dr. Cohen close to home.

Pelchat still enjoys teaching and recently conducted tracheostomy tube training at a local nursing home where their daughter Leah Milligan is a nurse. He also instructed a speech pathology graduate student on the DynaVox’s many features. Pelchat said he would not have undergone a tracheostomy if not for this device and the numerous communication abilities it affords him. Besides giving him a voice, the DynaVox lets him use the Internet, access his computer to write a weekly column for the Coos County Democrat, and maintain his website (http://rpelch57.wix.com/alsdisease), where he shares advice on living with ALS.

It troubles him that many DynaVox users, who don’t have supplemental health care coverage like he does, can’t afford to access the Internet on the device because of Medicare cutbacks. “Medicare will no longer cover the computer aspect,” he said. “But Internet access is so important for independence. It’s wrong to take it away.”

Pelchat perseveres in the face of this deadly disease thanks to the love and support of family and friends. “Being close to grandkids, friends and family allows for me to feel some sense of normalcy and maintain some pride in
who I am when this disease strips the human dignity and normalcy away."

He refers to Anita as his "caregiver extraordinaire," and daughter Leah and son Nate, an IT specialist at Weeks, also provide assistance. And when the Pelchats needed a van modified for wheelchairs, this tight-knit North Country community helped raise $16,000.

"We lived a respectful life, so in a sense, we earned it," said Pelchat, who taught at Groveton High School and Lancaster Elementary School for 26 years, worked as a lifeguard at the local recreation center, and was a youth sports coach and referee. "But it's still amazing."

Ever the teacher, Pelchat was eager to help others by sharing his story. "It's very important that people don't feel helpless. You can live with ALS. It's not easy, but you can do it."

"Powerful Device - Instant Messages"

Google Glass is known as wearable technology, but neurosurgery resident Brandon Root, MD, describes it more simply: "It's a computer on your face." Neurosurgeon Robert Singer, MD, performed the first Google Glass surgery at Dartmouth-Hitchcock Medical Center in June as part of a pilot study that Neurosurgery is conducting. Singer is excited about the device's clinical and educational applications. Glass allows quick access to data without breaking sterility, gives students and consultants a surgeon's perspective, and enables the live-streaming and archiving of operations. He notes that third-party software is required for Health Insurance Portability and Accountability Act (HIPPA) compliance. "But they're pretty powerful devices and might be a very nice solution not only in the hospital, but also remotely for telemedicine with the Dartmouth-Hitchcock Center for Telehealth."
What are your thoughts about where Dartmouth-Hitchcock (D-H) is in its efforts to create a sustainable health system. How are you feeling about the future?

**Dr. Weinstein:** We have a clear sense of where we want to go, we’re making great progress and, most of all, we have really great teams across D-H, pulling together in a united purpose: to create a sustainable health system that will improve the lives of the people and communities we serve for generations to come.

We have done a tremendous amount of work over the last few years. D-H was an early adopter and is now nationally recognized as a leader in accountable care and risk-based payment models. We have excelled in quality measures (especially for our low readmission rates) and are helping to lead change in the delivery of health care (especially through the High Value Healthcare Collaborative — see page 27 for more information). As hospitals in our region have considered their futures, they have sought out D-H to help them imagine their futures as part of a broader health system that is focused on delivering value.

Based on Medicare data compiled by the health care intelligence company Sg2. D-H consistently ranks at or near the top when benchmarked against the leading hospitals in the country on key performance criteria related to effective disease management, care delivery and management of post-acute care. For example, D-H ranked first when compared with Boston’s leading academic medical centers and second only to Mayo Clinic among top national academic health systems featured in *US News and World Report’s* Top 20 hospitals.

There’s certainly a lot of change taking place in health care now. Does that worry you?

**Weinstein:** The prospect of change can be overwhelming, especially when the future is filled with uncertainties, however, when you are confident of your strategic direction, that same change can be exhilarating because you know you are working together toward a shared vision of something that is better than what exists today.
Dr. James N. Weinstein, CEO and president, consults with one of his patients.

To provide the necessary context, it’s important to understand where we are headed as an organization. D-H continues to pursue a model of increasing integration and is moving toward a payment environment that will be substantially capitated (where reimbursement is based on caring for a set population of patients, not for the number of procedures) within the next decade. That means changes in how we operate. By the end of June 2017, we need to have the capability to deliver excellent, patient- and family-centered care under any payment model. The transition will have its challenges, but I’m excited about moving out of the fee-for-service world, which is a major driver of overuse, overtreatment and high health care costs.

There has been a lot of focus nationally on health charges and how they vary. There was a recent story about one California hospital charging $10 for a blood test and another charging $10,000 for the same test. Why is health care pricing such a black box?

Weinstein: Health care shouldn’t be a black box. I often say it should be like a cereal box. You can look at a cereal box and quickly see the cost, the quality of the ingredients, the nutritional value and, from the calorie and cholesterol count, what the risk or benefit might be. We should be able to do the same thing with health care. Patients should be able to know, going in, what the costs are likely to be, what the quality will be and how they are likely to do after the procedure or treatment.

I’m proud that we at D-H post our prices and give patients an online calculator that allows them to estimate what their out-of-pocket costs will be. More
important though, is that, since 2003, we have posted online our clinical and patient satisfaction results so patients and families can make fully informed decisions about treatments. This is the kind of transparency we need across the health care profession.

D-H is an academic health system with a three-part mission of patient care, research and teaching. What role do research and education play in today’s health care environment?

Weinstein: Research and education are vitally important. With our partners at the Geisel School of Medicine and the undergraduate and graduate schools of Dartmouth College, we are performing clinical and population-based research that is transforming care, unlocking keys to disease that allow us to develop new treatments, and increasing our understanding of the U.S. health care system and population health. Just in our cancer center alone, we have 355 clinical trials in progress!

We are training the doctors of tomorrow and engaging in new collaborations to educate nurses, technicians, and other health care workers who are so critical to our ability to provide high-quality, compassionate care.

And of course, we are one of only 60 academic medical centers in the country to receive a Clinical and Translational Science Award (CTSA). Our SYNERGY program is a major engine of research here at Dartmouth and I’m excited that population health is a core part of the CTSA.

Tell us about the term “Culture of Caring.” Where did that come from and what does it mean to you?

Weinstein: You know, I get hundreds of emails from patients, families, and colleagues, telling me about incidents of kindness, thoughtfulness, skill and tenderness — not just with our patients, but with each other and visitors to our sites. I was talking to my wife, Mimi, about this one evening and she said, “What you’re talking about isn’t a series of individual acts, but a culture. Dartmouth-Hitchcock has a culture of caring.” That’s where that phrase came from, and I truly believe it describes who and what we are.

That’s probably a good note to end on. Is there anything else you want to say?

Weinstein: Yes. Remember, it’s not the “What” or the “How,” it’s the “Why.” A lot of the things we’ve discussed today are about how we’re going to operate in the future and what’s going to be different. They’re important questions, but unless we understand the “Why” — Why we’re doing what we’re doing, they’re just disconnected pieces. For the tens of thousands of people who walk through our doors everyday — 15,000 a day at DHMC alone — we need to know why we are here.

So why are we here? To create a sustainable health system, to improve the lives of the people and communities we serve, for generations to come.

If we focus on that and have that as the guiding force for all the decisions we make, the what and the how will fall into place.

I talk a lot about the word, “Imagine.” Martin Luther King talked about a dream. He didn’t say “I have a Plan”; he said “I Have a Dream.” It’s what we imagine, what we dream, what we work toward, that’s important. How we get there is just a matter of transportation to reach our goal, to benefit our patients and their families at some of their most vulnerable times.

Creating a sustainable health system in, a culture of caring, to improve the lives of the people and communities we serve, for generations to come. That’s D-H, that’s us, together with our patients and their families, creating our future together.

“Dr. James N. Weinstein
UNLOCKING A COMMON PARASITE’S CANCER-ATTACKING SECRETS

Toxoplasma gondii (T. gondii) is a single-celled parasite that lives in the intestines of warm-blooded animals, including humans. While most people feel no effects from the parasite, it can cause flu-like symptoms in some. Interestingly, researchers have found that the way the human immune system responds to and attacks T. gondii closely resembles how the immune system attacks a cancerous tumor.

In their Geisel School of Medicine laboratory, David Bzik, PhD, professor of Microbiology and Immunology, and Barbara Fox, a senior research associate of Microbiology and Immunology, created “cps,” an immunotherapeutic vaccine. Even in a person with a weakened immune system, such as a cancer patient, cps stimulates vaccine responses.

Research in mouse models shows that the cps vaccine is extremely aggressive in combating melanoma and ovarian cancer, resulting in high rates of cancer survival.

SIMPLIFYING BREAST CANCER SURGERY

A new combination of magnetic resonance imaging (MRI) and optical scanning, developed by doctors and researchers at Dartmouth-Hitchcock Norris Cotton Cancer Center and engineers from Dartmouth College’s Thayer School of Engineering, locates small breast cancer tumors with great accuracy. The new method, which is a pre-surgery procedure, gives a surgeon a 3-D image of a tumor. It simplifies surgery in patients where the tumors are too small to be felt.

It’s the first time that optical scanning and MRI have been combined to localize breast cancer, according to Richard Barth Jr., MD, section chief for General Surgery at Dartmouth-Hitchcock. The new method locates breast tumors during a pre-operative MRI and maps the tumor with an optical scan to identify the tumor’s size, shape and location. The scan and MRI together create an interactive 3-D image that the surgeon sees on a computer screen.
How does a health care organization as widely located as Dartmouth-Hitchcock (D-H) — with a main campus and subsidiary clinics in Lebanon, NH, five Community Group Practices in New Hampshire and Vermont and clinics scattered across both states — make sure that its medical practices are both consistent across the system and state of the art?

Through the Dartmouth-Hitchcock Knowledge Map. This new initiative, launched this past summer, supports clinical teams in delivering the latest research- and evidence-based care options. It will facilitate best-practice, evidence-based approaches to care and assure a consistent experience for patients and their families across D-H.

“D-H Knowledge Map is a resource that will support teams across the care spectrum, from wellness and prevention to acute illness management,” says Nancy Morden, MD, MPH, medical director of the new program.

Approximately 15 million people, including Ralph Thomas of Sunderland, VT, suffer from gastroesophageal reflux disease (GERD), experiencing acid reflux's symptoms on a chronic, often daily, basis.

Dartmouth-Hitchcock’s Ted Trus, MD, is the first surgeon in northern New England to install a LINX, a new device recently approved by the Food and Drug Administration that employs a small, flexible band of earth magnet beads, implanted around the esophagus just above the stomach, to keep the esophageal sphincter closed and prevent stomach acid from leaking back into the esophagus, the cause of GERD.

Thomas was the first of Trus’ patients to receive a LINX. He says that one of the things he likes best about the LINX is that, unlike more complicated surgical procedures to fix GERD, there are no dietary restrictions. “I was actually able to have a cheeseburger on my way home, which was awesome,” he says.

“Acid reflux, magnetic beads and an ‘awesome’ cheeseburger”

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AN INCLUSIVE APPROACH FOR CHILDREN WITH AUTISM

Dartmouth-Hitchcock's Neurodevelopmental Child Psychiatry Clinic (NDPC), was established to create a comprehensive plan for children suffering from autism spectrum disorder (ASD). “You will not find centers anywhere else in the U.S. where such experts are working together from such diverse disciplines,” says Stephen Mott, MD, director of the Child Development Program at the Children's Hospital at Dartmouth. The multidisciplinary clinic brings together specialists from cognitive neurology, psychiatry and neuropsychology.

NDPC's inclusive approach is especially helpful with children who may be suffering from co-occurring disorders or conditions. “We really see the clinic as one point of care with multiple perspectives, all focused on one child. That is what allows us to do a comprehensive evaluation,” comments Mott.

Families travel to NDPC from all over New Hampshire, Vermont, southern Maine and northern Massachusetts for the clinic’s unique approach and the quality of its services, which includes working with families to receive care within their home community.

INNOVATION IN TRAUMA LEADS TO TOP RANKING FOR D-H

Dartmouth-Hitchcock Medical Center (DHMC) operates one of approximately 180 Level One and Level Two trauma centers across the U.S. The Trauma Quality Improvement Program (TQIP) has, for the third time in three years, ranked DHMC’s Trauma and Acute Care Surgery program as one of the best in the nation.

“When you consider that the severity of illness in trauma patients has increased, it makes our results all the more impressive,” says Richard Freeman, MD, chair of the Department of Surgery. “It truly is excellent teamwork across nearly all of the medical center’s domains — from the advanced response teams to the emergency department, to the operating room and blood bank, to lab services, the intensive care unit (ICU) and many other care units and supportive services — that has allowed us to achieve these population-based results that are highly illustrative of how Dartmouth-Hitchcock delivers value by providing high quality care at lower costs.”
AT THE CHILDREN’S HOSPITAL
at Dartmouth-Hitchcock (CHaD),
moms are now the first line of treatment for babies born with neonatal abstinence syndrome (NAS). NAS occurs when a baby is born dependent on an opioid or narcotic drug a woman was taking while pregnant. A recent transition in care at CHaD has made it possible for moms and babies at risk for NAS to room together, creating an environment conducive to the best possible outcomes for mom and baby.

“We advocate parental presence,” says pediatrician Bonny Whalen, MD, medical director of the Newborn Nursery at CHaD. “Now moms can be with their newborns 24/7, and do what we often call ‘mother-care.’” This level of care begins with a mother and child being together in a calming environment. The fundamental components of the non-pharmacological treatment, explains Whalen, includes “skin-to-skin contact, cue-based feeding, and continued presence in a soothing atmosphere: lights dimmed, low tones and limited people.”

Evidence-based research has shown that this holistic first line treatment results in NAS babies requiring less medication and less time in the hospital.
**Preparing for Baby**

**The First Step** to the best possible experience for new moms and their babies was staff training, says Whalen: “We looked at issues regarding the transition of care from the ICN to the Pediatric Unit, and found that the concerns staff had regarding babies with NAS — respiratory difficulty, apnea, or acute issues when starting morphine — weren’t prevalent. Across all of the units, we did a lot of education with staff and physicians. We also worked on scoring and assessment so they were more consistent and reflective of a baby’s condition.”

Scoring, Whalen explains, is noting a baby’s indicators of withdrawal, such as tremors, high-pitched crying or loose stools. In reviewing the way staff were performing the baby’s assessment, she says processes were also improved.

**Then and Now**

“Prior to this transition, if a newborn was experiencing withdrawal symptoms, we would monitor the baby for at least four days in the Birthing Pavilion,” explains Johanna Beliveau, MBA, RN, administrative director for patient care in Maternal Child Health and Psychiatry. “This allowed mom and baby to stay close.” If symptoms had to be managed with medication, however, the baby would be transferred to the Intensive Care Nursery (ICN), which, while appropriate for acute levels of care, was not favorable for one-on-one quiet time between a mother and baby.

“A baby might be in the ICN anywhere from one to two weeks,” says Beliveau. During that time, as there is no place for a mom to sleep in the ICN, she would go home. Once a baby was stable on medication and weaning, he or she was transferred to the Pediatric Unit where moms could once again room-in with their child. “But,” says Beliveau, “if the baby’s symptoms escalated, historically, they required transition back to the ICN. So we were in a situation where there were often multiple transfers for one family.”

Now, Beliveau explains, “we have the ability to transfer moms directly from the Birthing Pavilion to the Pediatric Unit, and they can stay there regardless of the medication or dosing.” Additionally, the transition opens access in the ICN for the most critical babies.

“We made our care and assessments of babies more baby-focused, trying to limit over-stimulation. Now we ask that moms do skin-to-skin contact with their baby prior to and during scoring, and to call the nurse for assessment after feeding. This way the baby will be calmer, and won’t be scored for excessive sucking due to hunger.”

Johanna Beliveau, MBA, RN, center, talks with colleagues.
A BROADER MISSION

Whalen, (pictured right) a member of the New Hampshire Governor’s Commission Prenatal Task Force, believes that, with the epidemic levels of opioid abuse and dependence across the region, an even larger community effort is required.

“The goal is to be able to care for these women in their own communities, keeping moms and babies together. But, the funding is not currently available for implementation of an intensive inpatient and outpatient residential treatment program to expand on the success of our River Mill Addiction Treatment Program model. We’d be able to provide help to so many more women in need. The current need far exceeds the available resources in New Hampshire and the region.”

ANOTHER LEVEL OF SUPPORT

for these mothers and babies is the volunteer program. “We recruited and trained a group of volunteers to work specifically with this population. The 24/7 responsibility can be tiring for new parents, so it’s reassuring to know their baby has someone holding them and providing a nurturing environment in their absence,” says Johanna Beliveau, MBA, RN.

The transition is rolling out in two phases. Phase one began in July, focused on women who give birth at CHaD. “At the end of August, we began planning for phase two, focusing on referrals from outside organizations,” says Beliveau.

A BROADER MISSION

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HAVING A CHILD IN THE HOSPITAL can be exhausting — mentally, physically and emotionally. At the Children’s Hospital at Dartmouth-Hitchcock (CHaD), caregivers understand this. Nurses, physicians, child-life specialists and others who care for patients on CHaD’s 23-bed inpatient unit are committed to providing the best team-based, patient- and family-centered care. But that can be challenging, given that the physical layout and design of the unit hasn’t changed significantly since it first opened two decades ago.

“The CHaD inpatient unit is currently a physically demanding environment for nurses,” says Buffy Meliment, RN, BSN, unit nurse manager. “Our nurses, and most importantly, our patients and their families staying on the unit deserve a physical environment that supports the highest standards of care.”

For now, Whalen and others continue to spread the word, sharing best practices through education and the transition of care at CHaD. “The primary reason and value of this transition is that this is the best possible care situation for these babies and their families, giving them the environment to be successful in this situation, helping them manage symptoms and leave the hospital sooner to get home to where they really want to be.”

The work CHaD has accomplished in the field of neonatology is now being modeled in other hospitals. Working with partners like Northern New England Perinatal Quality Improvement Networks, and the international Vermont-Oxford Network, Whalen says, “we’re able to help with resources and idea sharing for best practices. We’ve had requests from hospitals throughout the region and country for our parent education booklet, and several model our guidelines. We also continue to do outreach for pregnant women.”

“With this redesign, we will have a physical space that works with us to provide the best care to our young patients and their families,” says Meliment.

FOR MORE INFORMATION ABOUT SUPPORTING THE CHaD INPATIENT PROJECT, contact Carol Olwert in the Office of Development at 603.653.0723 or email her at Carol.Olwert@Hitchcock.org.
INNOVATION in health care is often associated with advances in specialty services such as surgery and the breakthroughs in technology that help make them possible. But as the nation’s health care system continues to move away from an episode-driven, fee-for-service approach and toward a coordinated, preventive model of care delivery, exciting innovations are also taking place in the arena of primary care.

In his new role as Primary Care Service Line Leader for Dartmouth-Hitchcock (D-H), Don Caruso, MD, MPH, who also serves as Medical Director of Dartmouth-Hitchcock Keene/Cheshire Medical Center, talks about how D-H is leading some of these changes across its region.
How is Primary Care different at D-H?

For the first time, D-H is establishing a system-wide service line for primary care, meaning that we’ll be focused on standardizing the way care is provided across all of our sites. Moving toward a more unified approach, where we’re using the same evidence-based care processes, supported by the same systems and tools, will help us to improve health and lower the cost of care.

How is this system-wide approach enhancing primary care services at D-H?

It’s allowing us to build upon the medical home foundation we’ve established and add a population health approach to care — which involves not just caring for patients who walk through the door, but embracing responsibility for the health of our region’s entire population.

Using financial data from payers (insurance companies) and patient data from our electronic medical records, we’re able to identify patients by particular health risks and to design care that more closely matches their needs. For example, in the past if a patient was diagnosed with diabetes, we would provide all of the resources available, whether they needed them or not, in an effort to improve their outcomes. Now we’re able to identify patients by high risk, medium risk and low risk. High-risk patients get the most intensive levels of care, including a designated care coordinator who monitors them closely, trying to keep them out of the hospital and as healthy as possible.

Since medium-risk patients typically manage their blood sugars pretty well and don’t need to see the physician on a regular basis, we’ve created a collaborative care nurse position to provide the education and support they need, so they don’t end up in the high-risk group. For the low-risk, healthy individuals, we employ patient data coordinators with great interpersonal skills to manage our patient registries and reach out to provide health screening reminders and wellness information as appropriate.

One recent system-wide innovation involves mental health. Can you describe what that entails?

We know that mental illness impacts a patient’s ability to manage their illness or disease, so we’ve integrated behavior health across the primary care system at D-H. Our sites now have a psychologist or psychiatrist, depending upon the community’s needs, who can see patients and also consult with physicians and care teams on appropriate interventions. In addition, we’ve recently integrated into the practices a behavioral health coordinator, who can reach out to patients and help them manage their medications, make sure they’re getting to their counselors and help them with any social issues that need rectifying, such as transportation. A recent study we’ve been involved in, looking at outcomes based on this model of care, clearly shows that it makes a difference for patients.

Are there some efforts that you would like to see modeled across the D-H system?

One example in the Keene community involved hypertension, a major driver of heart disease in Cheshire County. Before we put a care coordinator model in place, which included strong engagement from the community, Cheshire Medical Center was at the national norm of 18 to 19 percent for readmissions for people over age 65. We now run consistently at 8 to 9 percent.

Another area we’ve really been working hard on is chronic obstructive pulmonary disease (COPD), a major reason why respiratory illness has historically been a leading cause of admission at Cheshire. Taking the population health approach, we provided flu and pneumonia vaccines to the at-risk patients in the community, and also a “COPD Rescue Pack,” for the highest-risk patients, to help them begin treatment earlier at home if they ran into trouble.

How do the strengths of D-H’s health system support your efforts?

The fact that we are part of a leading academic health system that is dedicated to research and education, as well as clinical care, helps us stay on the cutting edge of technology and medical knowledge. Having a strong focus on improving population health and access to the right kinds of resources directly supports our efforts to find innovative ways to provide the highest level of primary care at lower costs.

The emphasis should be on providing evidence-based care and doing the right thing by the patient.
THE LETTER that Julie Haubrich, a high school guidance counselor from Loudon, New Hampshire, received from Puerto Rico, when she adopted Walker as a young rescue dog back in 2004, had described the Golden Retriever to a tee. “It said that even as a puppy he was mellow, had a very sweet disposition and got along with all of the other dogs,” recalls Julie.

Those traits have made Walker a community favorite and unofficial mascot at the ball fields in Loudon, where Julie’s 8-year-old son Noah plays baseball and soccer in the town’s recreation leagues. “Walker’s favorite thing is to go down to the ball field on a sunny day, with the wind blowing and all of the people around,” says Noah. “He doesn’t ask for attention, but he gets an awful lot of it.”

This past spring, however, Walker seemed a little more subdued than usual. “That’s when I noticed there was something red and swollen in the back of his mouth,” says Julie, thinking it was perhaps an abscessed tooth. A visit with her veterinarian revealed much worse — oral melanoma. “We were shocked; even with treatment options like surgery, Walker’s life expectancy was only about five months.”

THE NEW FRONTIER IN CANCER RESEARCH
PROMISING DISCOVERIES SAVES LIVES — INCLUDING MAN’S BEST FRIEND
Julie heard about an experimental treatment at Dartmouth-Hitchcock (D-H). Since the new treatment was being developed and tested both in mice implanted with human breast tumors and in dogs with naturally occurring tumors that were identical to Walker’s tumor — Julie was able to enroll him in the treatment program.

The treatment, known as magnetic nanoparticle hyperthermia, involves injecting many microscopic iron oxide nanoparticles into a tumor. These non-toxic particles can be engineered to bind specifically to cancer cells. Once they enter the tumor, they’re exposed to a magnetic field, which produces enough heat to kill the cancer cells. Because the nanoparticles can be directed to the tumor cells, it’s possible to be very specific with the treatment. This is the goal of all cancer treatments — to destroy the tumor cells without harming the surrounding normal tissue.

**AN EXCELLENT MODEL OF STUDY**

“Although there are some minor differences, dogs and humans have the same types and incidence of cancer,” explains study director P. Jack Hoopes, DVM, PhD, a researcher at D-H’s Norris Cotton Cancer Center (NCCC) and a professor of Surgery and Radiation Oncology at the Geisel School of Medicine and at the Thayer School of Engineering. He has spent his career researching new cancer therapy techniques.

Above, a CT scan of Walker’s head. Below, tumor cells readily take up magnetic nanoparticles (black objects). When a tumor containing nanoparticles is exposed to an alternating magnetic field, the nanoparticles will heat and kill the tumor cells.
“Luckily, many of the tumor types we study in mice and dogs have a similar human cancer counterpart and they respond the same way to treatment,” he says. “The dog study is very gratifying, not only because the treatments can be easily and effectively transferred to human patients, but because we can help the dogs, too,” says Hoopes.

Nanoparticle therapy offers a number of positive and unique cancer treatment opportunities. “So far, we have largely pursued the direct injection of nanoparticles into tumors,” Hoopes explains. “Over the next few years, we’ll concentrate on the systemic delivery of targeted nanoparticles, with the hope that they will seek out and find tumor cells in the body. We’ll also work to develop accurate imaging techniques for nanoparticles, find ways to deliver higher doses of nanoparticles to tumors, and more effectively combine nanoparticle treatment with conventional therapies.”

DARTMOUTH’S CENTER OF CANCER NANOTECHNOLOGY EXCELLENCE

Hoopes’ studies are part of a broader effort undertaken by the Dartmouth Center of Cancer Nanotechnology Excellence (DCCNE), a collaborative research initiative that combines the expertise and resources of scientists, engineers and clinicians from Geisel, the Thayer School of Engineering at Dartmouth and NCCC.

Since it received a $12.8-million grant from the National Cancer Institute, with the charge of applying nanotech-
nology to provide new and more effective ways to diagnose and treat cancer, the DCCNE (one of nine such centers in the country) has been making steady progress.

"Unlike with chemotherapy, which can stop working or be too toxic for the body to tolerate, nanoparticle therapy can be repeated as many times as necessary," says Ian Baker, PhD, a material scientist who serves as both director of the DCCNE and Thayer's Sherman Fairchild professor of Engineering. "We have found that nanoparticle therapy can be very effective when combined with chemotherapy, radiation and surgery."

Baker adds: "I think what distinguishes our work here at Dartmouth is that we're more focused on therapeutics than diagnostics, and our grant is wholly focused on using magnetic nanoparticle hyperthermia."

Hoopes’ nanoparticle treatments, especially when combined with radiation treatments, have shown such positive outcomes—in either curing the cancers or significantly extending the dogs’ lifespans—that he and his clinical and basic science colleagues are currently seeking FDA approval for the first U.S.-based human clinical trials. The initial trial will focus on breast cancer and will include a diverse cohort of D-H physicians, including Drs. Kari Rosenkranz, Peter Kaufman, Thomas Sroka and Lionel Lewis.

A HOPEFUL PROGNOSIS

Meanwhile, Walker’s treatments—he is the twelfth and latest participant in Hoopes’ dog study—are showing promising results. “His tumor is no longer visible,” says Julie. “He seems to be bouncing back beautifully. It’s nice to see him acting so happy and healthy.”

“The other day, Walker was scratching the rug and then he gave a little bark and ran into our family room,” says Noah. “He kept begging us to pet him. It reminded me of how he used to act when he was a puppy,” says Lisa.

“You know, initially I had concerns about subjecting my dog, who is like a member of our family, to experimental treatments,” Julie says. “But it’s just been a great experience. Dr. Hoopes and his whole team have been so conscientious and caring, it feels like we’re going to our own veterinarian. We’re very grateful for all they’ve done for Walker. But I know there is a bigger purpose to this. I’ve had friends and family members who have had cancer. Knowing that this may ultimately help people like them makes it all the more meaningful.”
EPSIS, a serious and potentially life-threatening complication of an infection, is a notoriously difficult condition to detect and treat. Patients with sepsis often exhibit symptoms — such as a fever, confusion and elevated pulse — that can easily be attributed to other illnesses like the flu or food poisoning.

Sepsis can progress very quickly, setting off a body-wide inflammatory response that can lead to shock, organ failure and death. A one-hour delay in providing antibiotics to a patient in severe sepsis, for example, raises mortality by almost 8 percent. And while many providers know how to treat sepsis, few have been able to establish a consistent, evidence-based care process for achieving improved outcomes. It’s no surprise then, that sepsis is the leading cause of hospital deaths in the U.S., affecting about 750,000 patients per year and costing an estimated $17 billion annually to treat.

Despite these challenges, Dartmouth-Hitchcock (D-H) is quickly becoming a model for implementing rapid improvements in sepsis care. “We’ve basically been able to replicate in six months what other organizations have done over several years,” says Andreas Taenzer, MD, MS, who is helping to lead a major initiative at D-H to improve care and outcomes for patients with sepsis.

TARGETING SEPSIS
TEAMWORK DRIVES EXCEPTIONAL CARE
Learning from the Best

How has D-H done it? By adopting best practices from national leaders in sepsis care, utilizing the expertise of its performance improvement group, and drawing on exceptional teamwork across its organization, says Taenzer.

“We’ve been able to accelerate our improvement process — in areas like the time it takes to administer antibiotics, the average length of stay and the mortality rate for sepsis patients admitted via the Emergency Department,” he says.

Through Taenzer’s work as a clinical liaison to the High Value Health Collaborative’s (see sidebar) efforts to improve sepsis outcomes nationally, D-H gained access to patient data and best practice information from leaders such as Intermountain Health in Salt Lake City, Utah, and North Shore Long Island Jewish Health System in New York, that have demonstrated excellence in sepsis management.

Research shows that patient outcomes can be dramatically improved if the clinical team recognizes sepsis early and gets a blood sample for lactate level (to measure the amount of lactic acid in the body), sends blood cultures, gives antibiotics and provides adequate fluids — all within three hours of symptom recognition (what is known as the sepsis 3-hour bundle).

Emergency Department and ICU Leading the Way

Since most septic patients are cared for in the Emergency Department (ED) and Intensive Care Unit (ICU) environments, those areas have been targeted initially. First to launch (in April) and show improvement results has been the ED. The ICU, which kicked off its sepsis work later in the spring, is making good progress with implementing the interventions tailored to its patient population.

Guiding the ED and the ICU through these implementations had been the responsibility of Sam Shields, MBA, a performance improvement expert with D-H’s Value Institute (a division within D-H that leads quality improvement work throughout the organization), who serves as the project leader.

A high-level team quickly evaluated processes, made recommendations and helped unit staff test those recommendations, and then the unit staff implemented improvements in care and efficiency.

Key to this process during the ED’s implementation, was the recognition that the unit needed engagement from front-line staff — those caring for patients at the bedside.

“The ED set up a core nursing group who took ownership of the project and has worked closely with residents, physicians and other team members,” says Shields. “As a result, we were able to aggressively drive the changes and implement solutions within 90 days — a very difficult thing to achieve in care settings like these.”

In addition, having good data allowed the ED to pinpoint problem areas and track its progress, says Patricia Lanter, MD, an emergency medicine specialist and project sponsor. “We’ve also gotten great engagement from key areas like the pharmacy, our systems support group and the lab,” she says.
Speeding Recognition, Care

The ED's process included adopting an early recognition tool based on the set of symptoms that identifies a potentially septic patient, what the group called “super SIRS” (systemic inflammatory response syndrome) criteria. “We started utilizing a float nurse to help care teams react more quickly and initiate appropriate sepsis care,” says Jennifer Norris, RN, a unit supervisor in the ED helping to lead the project. “In doing so, we’re now able to prevent some patients from progressing to severe sepsis, and our approach is also helping expedite our care in patients who don’t have sepsis, but are very sick.”

“I think the project has also enhanced communications between care team members in the ED, especially the nurses and physicians,” says Amy Curley, a clinical nurse specialist in the ED.

The ED’s focus now is on what it needs to do to sustain the high level of engagement and performance it has achieved. They meet weekly with ICU staff to share lessons learned and improve patient hand-offs, as the ICU works to implement the same changes and process improvements for its patients. Next, D-H will focus on improving the detection and treatment of sepsis across its general care units.

“The fourth and final component will be to roll the effort out to all of the hospitals and care centers in the community,” says Taenzer. “In order to impact the outcomes of all patients across the state, we need to work with other providers to intervene earlier. We’re not there yet, and it’s going to take a lot of work to sustain this effort, but we’ve come an astonishingly long way in a very brief period of time.”
“IT’S A SHINING example of how the High Value Healthcare Collaborative (HVHC) is leading change and improvement in health care, through collaboration, transparency, and a commitment to higher quality and better outcomes, at lower cost,” says Dr. James N. Weinstein, CEO and president of Dartmouth-Hitchcock and one of five founding partners of HVHC.

Formed in 2010 by D-H, Denver Health, Intermountain Health, Mayo Clinic and The Dartmouth Institute for Health Policy & Clinical Practice (TDI) — with the triple aim of improving care, improving health and reducing costs — HVHC has grown to encompass 19 health care delivery systems that serve more than 70 million people across the United States.

In addition to sepsis, HVHC is addressing five health conditions and treatments that have high cost and wide variation nationally. The projects, targeting diabetes, congestive heart failure, hip and knee replacement and spine surgery, have been launched in more than 160 clinical sites across the U.S. and are funded in part by a $26 million Health Care Innovation Award from the Centers for Medicare and Medicaid Innovation. Additional high-variation, high-cost conditions that affect diverse populations will be added over time.

HVHC’s innovative approach holds some distinct advantages over traditional research methods. "We’ve centralized the Institutional Review Board (IRB) process — a federally mandated committee that oversees research projects involving human participants — with Dartmouth serving as the IRB of record for HVHC studies across all members. The projects are being led by physicians and other providers, and all of the members are sending data to TDI, which serves as the facilitator and data convener for the Collaborative," says Jon Lurie, MD, MS, HVHC Program Lead for D-H. "Having 19 systems testing interventions for the same conditions and treatments on a national scale allows us to quickly generate and share new knowledge. Rather than evaluating interventions locally and comparing results, HVHC collects and analyzes data pooled from all HVHC health systems.

Identifying and accelerating widespread adoption of best-practice care models — and innovative value-based payment models — are goals of HVHC. To this end, earlier this year the Executive Committee of HVHC formed its Payment Reform Group, which produced a white paper that is helping to frame discussions with payers such as Medicare.

“As the shared data with HVHC members has shown opportunities to improve value, we’ve recognized that, unless payment for care is reformed, those improvements in value cannot be sustained," says Payment Reform Group Chair James Rohack, MD, a cardiologist from Scott & White Healthcare in Texas and past president of the American Medical Association. “Achieving a true high-value health care system requires alignment of the practitioner, hospital, patient and payer. Getting that alignment will require a thoughtful evolution that balances the needs of the individual patient with the needs of the population that individual is part of.”

THE RAPID GAINS made in Dartmouth-Hitchcock’s (D-H’s) recent efforts to improve sepsis identification and treatment (see main article) show what is possible when leading health systems agree to work together, pooling resources and sharing data on best practices that can then be adapted to patient populations at the local and regional levels.
The Dartmouth-Hitchcock Board of Trustees is a dedicated group of individuals who volunteer their time, energy and expertise to ensure that Dartmouth-Hitchcock is well positioned to create a sustainable health system and to achieve the healthiest population possible in our region and beyond.

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Dear Friends,

If I have but a single message to convey in these comments, let it be this: thank you. Thank you to all who have given to support the mission and, most importantly, the patients and families served by Dartmouth-Hitchcock and the Geisel School of Medicine at Dartmouth.

The generosity of more than 35,000 donors in FY 2014 provided $37 million, funds that can and will be used to benefit our patient care, research and education programs. These efforts, evidence of which can be found throughout this publication, have, of course, a common and profoundly important purpose: to improve the health and health care of the people and communities we serve.

On the following pages are listed but a fraction of those who have given during the period July 1, 2013 to June 30, 2014. Space allows us here to honor only donors of $1,000 or more and this we do most gratefully. But know that all contributions, of all sizes, are honored in our hearts and our very sincere gratitude extends to all who join us in supporting the work of Dartmouth-Hitchcock and the Geisel School of Medicine.

On behalf of my fellow trustees, thank you.

Prof. Robert A. Oden, Jr.
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The Reverend Preston Kelsey (left) and Virginia Kelsey (middle) admire the leadership of Dr. Mark Israel (right), who has led Dartmouth-Hitchcock’s Norris Cotton Cancer Center since 2001.

“The Preston T. and Virginia R. Kelsey Distinguished Chair in Cancer: Inspired by Collaboration”

“Collaboration is at the core of how we live and work at the Cancer Center, how we advance the cause of combating cancer every day,” says Mark Israel, MD, director of Dartmouth-Hitchcock Norris Cotton Cancer Center. Israel’s leadership and the culture of collaboration that he has fostered inspired the Reverend Preston Kelsey and Virginia Kelsey to make a $5 million gift to the Geisel School of Medicine to endow a distinguished chair for the Cancer Center. The newly established chair supports the director of the Cancer Center in advancing innovative research that translates into clinical and preventive cancer care. In June, Israel was named the inaugural holder of the chair.
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Dolan Family Foundation: Compassion in Every Step

Medicine is on one hand a science-based practice and on the other hand a deeply humanistic profession. Integrating these two sides with compassion as the central guiding philosophy is the goal of a new initiative at the Geisel School of Medicine. Funded by a generous grant from the Dolan Family Foundation, the effort aims to infuse compassion-centered medicine into all aspects of training for Geisel medical students and residents, as well as nurses, chaplains, social workers and other health trainees at Dartmouth–Hitchcock. “We would like our message of ‘compassion in every step’ to be resonant in the minds and speech of each one of our providers, as well as deeply integrated throughout our institutions,” said the late Pano Rodis, MD, who initiated the project with Joseph O’Donnell, MD, senior advising dean at the Geisel School.

Geisel medical students, like Shelsey Weinstein ’16, are learning the art of compassion-centered medical care with the help of patients like Dia Draper, a cancer survivor.
Patients diagnosed with brain aneurysms no longer have to travel long distances to access neurovascular expertise at Dartmouth-Hitchcock (D-H). Thanks to funding from the Missy Project — a foundation named for 12-year-old Marisa “Missy” Magel, who lost her life to an aneurysm — D-H now offers a neurovascular telemedicine program overseen by neurosurgeon Robert Singer, MD, and Sarah Pletcher, MD, director of D-H’s Center for Telehealth. During virtual aneurysm clinic visits, Singer talks to patients face-to-face using real-time video. “I’m looking at imaging, explaining pathology and then giving an opinion as to what the next step is,” he says.

The D-H program also includes urgent 24/7 tele-consultation to community hospital emergency departments. “I believe it’s going to save a lot of lives,” says Mary Magel, executive director of the Missy Project.
Asking the right questions can make all the difference when it comes to identifying risky behavior in young people. Grants from the New Hampshire Charitable Foundation, made possible by the Conrad N. Hilton Foundation, are helping D-H physicians and other caregivers throughout New Hampshire do just that. Based on screening tools developed and tested at Dartmouth-Hitchcock, the Screening, Brief Intervention and Referral to Treatment Program (SBIRT) is designed to significantly reduce substance abuse among youth, ages 12 to 22—a reduction that is desperately needed. New Hampshire has some of the highest rates of substance abuse among youth in the nation. Dartmouth-Hitchcock is working on the issue at the community level, too, through the Upper Valley Substance Misuse Prevention Network.
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Catherine Shubkin, MD, uses standard questions to screen a young patient for risky behavior.
Every year, grateful patients, community members and employees help keep Dartmouth-Hitchcock and the communities it serves strong by donating to the Dartmouth-Hitchcock Annual Fund (DHAF). Among this loyal group is Susan Cohen. “I believe in supporting organizations that take care of me and my community,” says Cohen, a retired English teacher and longtime resident of the Upper Valley. In FY2014, 3,180 donors contributed to DHAF, raising a total of $843,712. Their gifts are being put to work immediately, helping to create a sustainable health system to improve the lives of the people and communities served by Dartmouth-Hitchcock for generations to come.
Susan Cohen has been giving to the Dartmouth-Hitchcock Annual Fund for almost 20 years.
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Imagine a sustainable health system with one goal: to improve the lives of the people and communities we serve, for generations to come.
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.