Money may influence whether trauma patients are transferred

By Ranjini Raghunath

Emergency rooms at non-trauma centers are less likely to transfer severely injured patients to trauma centers if they have health insurance, according to a new study by researchers at the School of Medicine.

The counterintuitive finding suggests that such patients are more at risk of receiving sub-optimal care than trauma patients without insurance.

Rejuvenated stem cells enable muscle recovery in elderly mice

By Krista Conger

Researchers at the School of Medicine have pinpointed why normal aging is accompanied by a diminished ability to regain strength and mobility after muscle injury: Over time, stem cells within muscle tissues dedicated to repairing damage become less able to generate new muscle fibers and struggle to self-renew.

“In the past, it’s been thought that muscle stem cells themselves don’t change with age, and that any loss of function is primarily due to external factors in the cells’ environment,” said Helen Blau, PhD, the Donald and Delia B. Baxter Foundation Professor. “However, when we isolated stem cells from older mice, we found that they exhibit profound changes with age. In fact, two-thirds of the cells are dysfunctional when compared to those from younger mice, and the defect persists even when transplanted into young muscles.”

Blau and her colleagues also identified for the first time a process by which the older muscle stem cell populations can be rejuvenated to function like younger cells. “Our findings identify a defect inherent to old muscle stem cells,” she said.

“Most exciting is that we also discovered a way to overcome the defect. As a result, we have a new therapeutic target that could one day be used to help elderly human patients repair muscle damage,” Blau, a professor of microbiology and immunology and director of Stanford’s Baxter Laboratory for Stem Cell Biology, is the senior author of a paper describing the research, which was published online Feb. 16 in Nature Medicine. Postdoctoral scholar Benjamin Cosgrove, PhD, and former postdoctoral scholar Penney Gilbert, PhD, now an assistant professor at the University of Toronto, are the lead authors.

The researchers found that many muscle stem cells isolated from mice that were 2 years old, equivalent to about 80 years of human life, exhibited elevated levels of activity in a biological cascade called the p38 MAP kinase pathway. This pathway impedes the proliferation of the stem cells and encourages them to instead become non-muscle progenitor cells.

Volunteer cuddlers at hospital provide comfort to infants — and their parents

By Erin Digitale

During 16 years of volunteering to cuddle babies in the intensive-care nurseries at Lucile Packard Children’s Hospital Stanford, husband-and-wife psychologists Pat Rice and Claire Fitzgerald have developed a few trade secrets for calming fussing infants.


The hospital’s baby cuddlers provide extra pairs of loving arms for sick infants, reducing the strain of long hospitalizations on both the infants and their families.

“On the pediatrics unit, there’s one playing a tuba in here?” — which once prompted a person across the room to ask, “Is someone playing a tuba in here?”

Baby cuddlers Pat Rice (seated) and Claire Fitzgerald open their arms to hospitalized infants.
By Molly Sharlach

Physicians often prescribe drugs for unapproved indications, but current methods of tracking these off-label uses are limited in scope. Now, a study by researchers at the Stanford University School of Medicine describes a way to extract and sort valuable information about off-label uses from electronic medical records. The study’s authors hope their findings will help to jump-start research into off-label uses that are promising, low-risk and low-cost, as well as flag potentially risky uses for further review.

Drugs prescribed for unapproved conditions, dosages or age groups account for 21 percent of all U.S. prescriptions, according to a 2006 investigation published in the Archives of Internal Medicine. But only 27 percent of such uses are supported by robust science.

These statistics are not as alarming as they seem at first glance. The lengthy, costly drug-approval process makes a certain amount of off-label drug use inevitable. Off-label prescriptions are legal in most cases and can be an important source of innovation to accelerate new uses for drugs.

Nigam Shah, MBBS, PhD, assistant professor of medicine and senior author of the new study, believes better tracking and investigation of off-label use can help patients, physicians and regulators, but should also appeal to drug companies, who will benefit from new approval of their products. “Just as detection of these experiments may ultimately lead to clinical trials and new approvals,” Shah said, “we want to get into good and bad buckets.”

The "good bucket" of high-cost, high-risk uses should raise red flags that prompt re-evaluation by physicians and regulators.

Off-label uses are limited in scope.

For indications in cross-species disease transmission in western Uganda — Laura Bloomfield, PhD; Bio-X summer intern William Chen; and former research assistant Srinivasan Iyer. The study was funded by a grant from the National Institutes of Health to the National Center for Biomedical Ontology and the Smith Stanford Graduate Fellowship. The authors also gratefully acknowledge additional funding from the Medi-Span databases from Wolters Kluwer Health and the Stanford’s Department of Translational Research and Clinical and Translational Research and Integrated Data Environments. The authors were granted complimentary access to the National Center for Biomedical Ontology and the Smith Stanford Graduate Fellowships.

The investigators and projects received a final list of 403 off-label drug uses. For further study, the researchers took into account the cost of each drug and its risk of causing adverse reactions. They used these two parameters to rank each use and determine whether they are good, bad or buckets.

The authors identified 3267 uses that are promising, low-risk and low-cost, as well as flag potentially risky uses. These uses are classified as off-label uses for their products. “Just as detection of negative results from these experiments may ultimately lead to clinical trials and new approvals,” Shah said, “we want to get into good and bad buckets.”

The “bad bucket” of high-cost, high-risk uses should raise red flags that prompt re-evaluation by physicians and regulators.

The researchers built a program to run 9.5 million simulations of the off-label uses and make a map of the National Center for Biomedical Ontology Annotationator, a tool funded by the NIH and designed to pick out names of drugs, names and medical conditions from any text. After filtering their results and checking them for scientific support in the medical literature, they generated a final list of 403 off-label drug uses.

To prioritize these uses for further study, the researchers took into account the cost of each drug and its risk of causing adverse reactions. They used these two parameters to rank each use and determine whether they are good, bad or buckets.

For indications in tuberculosis complex — Tobias Jung, MD, PhD, assistant professor of neurosurgery; George A. Winzer Professor in Cell Biology.

For repurposing an approved drug against dengue virus — Vijay Panj, PhD, professor of medicine; George A. Winzer Professor in Cell Biology.

For repurposing a biologic therapy for neurotrophin receptors — Dominik Naczynski, PhD, postdoctoral scholar in radiation physics; Cesare Chiaffarino, graduate student in medical physics; and Lei Xing, PhD, professor of radiation physics.

For an intracranial access device for minimally invasive evacuation of recurrent subdural hematomata — Stanley Hoang, MD, neurosurgery resident; Mark Blumenkranz, MD, professor of neurosurgery; and George A. Winzer Professor in Cell Biology.

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For repurposing approved drugs against dengue virus — Vijay Panj, PhD, professor of medicine; George A. Winzer Professor in Cell Biology.
Computerized checklist reduces type of hospital infection, new study finds

By Erin Digitale

A computerized safety checklist that automatically pulls information from patients' electronic medical records was associated with a dramatic decrease in the serious type of hospital-acquired infection, according to a study by researchers at the School of Medicine and Lucile Packard Children's Hospital Stanford.

The study, conducted in the hospital's pediatric intensive care unit, targeted bloodstream infections that begin in central lines — catheters inserted into major veins. The infections are a preventable cause of illness and death, and hospitals across the country are working to reduce their frequency.

The automated checklist, and a dashboard-style interface used to interact with it, made it fast and easy for caregivers to follow national guidelines for keeping patients' central lines infection-free. The new system combed through data in the electronic medical record and pushed alerts to physicians and nurses when a patient's central line was due for a check-up. The study, the rate of central line infections in the hospital's pediatric intensive care unit dropped from 2.6 to 0.7 per 1,000 days of central line use.

The findings were published online Feb. 23 in Pediatrics.

“Electronic medical records are data-rich and can be a ‘biofeedback loop,’” said Natalie Pageler, MD, the study’s lead author. Often, data in electronic medical records is cumbersome for busy-care teams, but this system, but the study showed a way to change that, said Pageler, who is a critical care medicine specialist at the hospital and an assistant professor of pediatrics. “Our new tool lets physicians focus on taking care of the patient while automating some of the background safety checks.”

Central lines are among many uses, such as administering long-term antibiotics or chemotherapy and providing access to the bloodstream in patients who need kidney dialysis or frequent blood draws. The Institute of Medicine has designated them a “patient safety crisis,” noting that 7 of 10 bloodstream infections that begin in central lines are preventable.

“Central lines are useful in many ways, such as administering long-term antibiotics or chemotherapy and providing access to the bloodstream in patients who need kidney dialysis or frequent blood draws. The Institute of Medicine has designated them a ‘patient safety crisis,’ noting that 7 of 10 bloodstream infections that begin in central lines are preventable.”

One of the key reasons why central line infections are difficult to prevent is that many are caused by “health care–related contamination,” such as when the dressing covering the line is changed. Just 48 minutes of contamination can increase the risk of bloodstream infection from a central line 100,000-fold, according to a study published by researchers at the University of California, San Francisco.

The researchers hope to expand the system to other uses, such as monitoring the recovery of children who have received organ transplants.

“The nice thing about this tool is that it’s integrated into the electronic medical record, which we use every single day,” Pageler said.

Addison Burnette, “This system works like a GPS-based road map that pulls relevant information to the forefront, and helps guide decisions about how to get safely to the destination.”

The study’s senior author and chief clinical patient-safety officer, Jaap Suermondt, PhD, of HP Labs, also collaborated on the research.

The work was funded by the Lucile Packard Foundation for Children’s Health, Stanford’s Child Health Research Institute Innovations in Patient Care Program, Stanford’s Clinical and Translational Science Award and an HP Sustainability and Social Innovation grant.

The Department of Pediatrics also supported the work.

Diagnostics and predictive medicine

Assessment and prediction of age-related macular degeneration progression through quantitative imaging biomarkers — Daniel Rubin, MD, assistant professor of ophthalmology and visual science; Mark Sauder, PhD, assistant professor of ophthalmology and visual science; and Akihito Inoue, MD, PhD, assistant professor of ophthalmology.

Development of non-invasive, laser-based breath analysis to detect lung cancer — lambert d’Oliveira, assistant professor of medicine; J. Michael McShane, assistant professor of biostatistics and bioinformatics; and J. Craig Venter, PhD, JCVI founder, director and chief scientist.

Eating and cancer prevention — Althea Beck, assistant professor of medicine.

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Spectrum

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disciplinary Program in Environment and Resources.

• Social and environmental determinants of DNA methylation: A population-based study — David Rehkopf, PhD, assistant professor of medicine.

• Online cognitive-behavioral therapy for mild-to-moderate anxiety and depression in adolescents and young adults with chronic illness — Christy Sandberg, MD, professor of pediatrics.

• Health coaching in a population management program to reduce stroke and vascular risk — Waimai Tai, MD, clinical assistant professor of neurology and neurological sciences. From the Clinical Excellence Research Center: Lucy Kalanithi, MD, postdoctoral scholar; Karen Conway, graduate student; Annie Milet, MD, professor of medicine and center director.

• A comprehensive decision analysis framework supporting international chronic hepatitis-B control policy — J. Michael McShane, PhD, assistant professor of medicine.

• Health4U and environmental conservation: A shared journey — Ingrid Rodriguez, PhD, associate professor of pediatrics.

• Incorporating historical and intergenerational trauma to prevent diabetes in urban American Indians — Lisa Gonzales Rosas, PhD, assistant professor of medicine.

Community engagement

• Fighting food insecurity and hunger in East Palo Alto: Evaluation and dissemination of a collaborative public health intervention — Jennifer Scarmoni, graduate student; Kenneth Ong, PhD, assistant professor of medicine; and Jacobia Biocna, MPH, assistant professor of epidemiology.

• Health4U and environmental conservation: A shared journey — Ingrid Rodriguez, PhD, associate professor of pediatrics.

• Incorporating historical and intergenerational trauma to prevent diabetes in urban American Indians — Lisa Gonzales Rosas, PhD, assistant professor of medicine.

Sue S. Marcus Krupp

Krupp was a founder of the Palo Alto Medical Research Institute, where he served as director for 36 years. As a community physician and member of the clinical faculty, he taught medical students and residents at Stanford Hospital from 1946 through 1997.

He was a recipient of the medical school’s Albion Walter Hewlett Award and its J. E. Wallace Sterling/Maleshoe Award. The university also awarded Krupp the Gold Spike for his years of volunteer leadership service.

Krupp was preceded in death by his first wife, Muriel McClure; a son, David; and his brother, Robert. He is survived by his wife, Donna; sons Michael and Peter; daughter Sara Krupp Kinney; grandchildren Katy, Elizabeth and Whitney; and nieces and nephews.

Donations in Krupp’s memory can be sent to Stanford University Development Services, PO. Box 20466, Stanford, CA 94309-0466. Checks should be made out to Stanford University and note “The Krupp Memorial Fund” in the memo section.

Danish companyNovo Nordisk funds autonomy fellowship

The Institute for Immunity, Transplantation and Infection will receive $2.5-2.9 million over a five-year period from Novo Nordisk, a pharmaceutical company based in Bagsvaerd, Denmark, for the Novo Nordisk Senior Postdoctoral Research Fellowship in the Clinical Research Center and the National Institutes of Health’s National Institute of Allergy and Infectious Disease.

The Inspiring Change Leadership Award

Nominations are now being accepted for the School of Medicine Spirit Award and Inspiring Change Leadership Award.

The Spirit Award is given each year to two eligible staff members. Winners of the award will be selected based on outstanding dedication, initiative, motivation, positive attitude and customer service.

The Inspiring Change Leadership Award is given to one or two eligible staff members. Nominees should be outstanding performers who have served at least two years at the medical school and who have initiated or led change and innovation — e.g., implementing new processes, systems, organizational structures or operating paradigms that have yielded outstanding, long-lasting improvements in service, efficiency, value, effectiveness, outcome or satisfaction.

Each Institute, which will receive $3,000, will be recognized at the annual staff appreciation event. For more information or to make a nomination, go to med.stanford.edu/employee/recognition/awards.

The nomination deadline is March 3.
Neuroscience building designed to transform patient services

By Ruth Schechter

Diseases, injuries and disorders of the brain and nervous system, such as Alzheimer’s, Parkinson’s disease, brain tumors, multiple sclerosis and stroke, are some of the most devastating and difficult conditions to treat in all of medicine. The challenge is to provide integrated care that merges the expertise of neurologists — who specialize in diagnosis and treatment — with the skills of neurosurgeons and interventional radiologists, who perform therapeutic procedures.

Stanford Hospital & Clinics is breaking ground this month for a new building that will bring key programs and services into all these subspecialties under one roof. The $79 million, 92,000-square-foot neuroscience building is being constructed as part of the Stanford University Medical Center Renewal Project. Situated next to the Hoover Pavilion on Quarry Road, the new building will have four stories, above ground and one below ground. It’s new building will have four stories, above ground and one below ground. It’s

The neuroscience building will integrate neurology, neurosurgery and interventional neuroradiology outpatient services, along with specialized support services, in a single location, creating a superior one-stop destination experience for our patients,” said Alison Kerr, executive director of the neuroscience service line at Stanford Hospital & Clinics. “It’s a comprehensive model that is not available anywhere else in the country.”

Coordinated care

The building has been designed with the needs of neurological patients in mind. For example, a dark room will be easily accessible for migraine patients who require dim lighting and quiet to help relieve their symptoms. On-site infusion stations will allow people with multiple sclerosis, brain tumors or neuroendocrine disorders to see their doctors and receive treatment in one location. Exam rooms will be large enough to fit multidisciplinary care teams. Interior fixtures will be subdued, and all light fixtures will be dimmable to accommodate the acute light sensitivity of many patients.

The building’s layout and infrastructure are the result of months of planning based on the insights of the people who will be using the facility, including patients, physicians, nurses and other staff. “There was a lot of exchange between the users and the designers,” said Rachel DeGuzman, a senior project manager at Stanford Hospital & Clinics. “This collaboration helped us refine our selection of interior details and finishes that support the needs of the patients as well as the staff.”

The building will integrate the synergies of how we practice medicine and create a huge advantage for patients,” said Gary Steinberg, MD, PhD, professor and chair of neurology. “It will be a place dedicated to research, clinical care and improving quality of life.”

Researchers’ new test for cystic fibrosis may lead to more treatments

By Becky Bach

Treatments for cystic fibrosis may be faster to develop with the use of a new test created by Stanford researchers.

The test, which involves sampling sweat, shows that people need smaller amounts of a particular protein function than previously thought to avoid cystic fibrosis symptoms, according to Jeffrey Wine, PhD, a professor of psychology and of biology.

“I was amazed it worked as well as it did,” said Wine, who also is director of Stanford’s Cystic Fibrosis Research Laboratory and a member of the Child Health Research Institute at Stanford. Wine and his colleagues, including faculty in the School of Medicine, used the test to measure levels of protein function in patients taking a cystic fibrosis drug. Their findings were published in the journal PLOS ONE. Wine was the senior author of the study. The lead author was Jessica Char, a life science research assistant.

Cystic fibrosis is a recessive genetic disorder that disables a key protein — known as the cystic fibrosis transmembrane conductance regulator, or CFTR — that is responsible for transferring fluids and minerals in and out of cells. The effect on the 30,000 Americans diagnosed with the condition is debilitating. They suffer from chronic lung infections, male sterility and a host of other symptoms. In the past, carriers struggled to survive past infancy.

Doctors usually treat cystic fibrosis by tackling symptoms as they appear. Very few drugs target the underlying problem — that is, patients’ broken, damaged or missing CFTR.

CFTR defects vary greatly: The amount of CFTR function in the lungs could be zero, or it could have just a few flaws. Current tests, which measure the amount of CFTR in sweat, can precisely identify how much functioning CFTR is present.

The new test determines the ratio between the volumes of two types of sweat in each individual by using dyes to color sweat bubbles that form on the skin, revealing the individual’s level of functional CFTR.

Wine’s work showed that even healthy people have a small amount of CFTR in sweat, and doctors could use this result for drug development. They would need to restore less than 10 percent of CFTR functionality to improve symptoms, based on the researchers’ findings.

The researchers examined the CFTR function in eight subjects with cystic fibrosis. Six of the patients were taking ivacaftor, a drug currently available to treat some types of cystic fibrosis. (Ivacaftor boosted CFTR function as expected, and also increased CFTR function in a type of cystic fibrosis it is not currently designed to treat, Wine said.)

Next, Wine said, he plans to examine different types of CFTR in healthy individuals. He hopes eventually to determine the precise amount of CFTR needed to alleviate symptoms.

“The CF community is eagerly awaiting these CFTR-directed therapies,” Wine said. “We all work as hard as we can to speed drug delivery to patients.”

Other Stanford co-authors are former research associate Shin Hye In Cho, MD, PhD, II-Ho Park, MD, PhD, and Jin Hyoek Jeong, PhD, visiting scholar Eric Friber; clinical research coordinator Denis Dunn and Zoe Davies; Carlos Millan, MD, associate professor of pediatrics; Richard Moss, MD, professor emeritus of pediatrics; and Eunice T. Kim, professor of psychology.

The study was supported by a grant from Cystic Fibrosis Foundation Therapeutics.
Garbage strike gene variant increases heart-disease risk

By Tracie White

Think of it like a garbage strike. Due to a genetic defect, the body’s ability to dispose of its daily garbage — the tonnage of dead cells gets dammed up, and as a result the body’s garbage — in the form of old cells and debris — starts to build up within the walls of its blood vessels.

This is how Nicholas Leeper, MD, an assistant professor of vascular surgery and of cardiovascular medicine, describes the findings of a recent study of which he was a senior author.

The study was published Feb. 17 in the Journal of Clinical Investigation. Tom Quertermous, MD, professor of cardiovascular medicine, was the other senior author. Yoko Kojima, MD, PhD, senior research associate, was the lead author.

Normally, the body is extremely efficient at taking out the garbage. Two hundred billion cells die every day in our bodies, and they’re cleared out within a matter of seconds. But when this process breaks down and garbage, in the form of necrotic debris, starts building up in the walls of blood vessels, it’s not a good thing.

Leeper and his colleagues set out to discover why genetic variation at the chromosome 9p21 location has been repeatedly identified as the most important commonly inherited DNA sequence for a set of conditions of cardiovascular diseases, including stroke, heart attacks and aneurysms.

Conducting studies in mice with atherosclerosis, the researchers showed that loss of a candidate gene at this locus leads to impaired "effectorcytosis" — from the Latin for "take to the grave" — the process by which dead or necrotic cells are removed. Mice with this genetic variation showed an increase in buildup of these dead cells, further advancing their atherosclerosis, as opposed to those that did not have the genetic variation.

In other words, a commonly inherited genetic variant, which is found in 20 percent of the population, contributes to the development of coronary artery disease (also known as coronary athero-sclerosis) by stimulating the accumulation of necrotic debris within the evolving plaque.

If you were born with genetic variation at the 9p21 loci, your risk of heart disease is elevated, though we haven’t understood why. The research gets at that hidden risk. You can be a nonsmoker, be thin, have low cholesterol and still get a heart attack if you were born with this variant. This work may help explain that inherited risk up front, allowing us to develop a new therapy to prevent the inheritable component of cardiovascular disease.

Other Stanford co-authors were Randi Kundra, PhD, senior research associate; postdoctoral scholars Clint Miller, PhD, Uwe Raaz, MD, and Frederick Dewey, MD, PhD.

The study was funded by the National Institutes of Health, the American Heart Association and吉利德 Pharmaceuticals.
Trauma

continued from page 1

But the patient’s insurance status also influences that decision, according to the study, which was published online Feb. 19 in the Journal of the American College of Surgeons. Stanford researchers analyzed more than 4,500 trauma cases reported at 636 hospitals in a 2009 Nationwide Emergency Department Sample put together by the U.S. Department of Health and Human Services.

They found that insured patients initially taken to a non-trauma center had a 11 to 14 percent higher rate of admission there than uninsured patients. “Insured patients may, ironically, get worse outcomes because they are taken care of at a center where there’s a lower volume of resources for critically injured patients,” said M. Kir Delgado, MD, the lead author and a founding Stanford associate professor of medicine. Delgado is now an emergency care research scholar at the University of Pennsylvania.

“Being in the trenches most often strive to do what’s best for patients,” Delgado said. “But these findings are concerning and suggest that non-trauma centers are considering admitting some patients with life-threatening injuries based on whether or not they can be paid, when research has shown these patients fare better if transferred to a trauma center.”

Traumatic injuries — such as gunshot wounds or injuries from car accidents — are the most common causes of death in the United States among people younger than 44.

Timely access to a specialized trauma center can save lives. The risk of a severely injured patient dying at a level-1 trauma center, which has the highest level of trauma care, is 25 percent lower than at a non-trauma center, a 2006 New England Journal of Medicine study found.

Designated trauma centers are equipped with trained specialists and resources ready to handle critical injuries. Level-1 trauma centers have a full array of in-house surgeons, nurses working round-the-clock, specialists such as neurosurgeons and orthopedic trauma surgeons on call, designated operating rooms and medical equipment such as a 4/7 blood bank operation, apart from educational and preventive outreach programs.

The current study is one of the first population-level analyses to reveal what happens to severely injured patients seen at non-trauma centers, said Nancy Wang, MD, senior author of the study and associate professor of emergency medicine at Stanford.

“Finding disparities in the quality of trauma care based on insurance is very disturbing,” said Wang. “It is important for researchers to identify and call attention to these disparities in access to care and outcomes so that all people can receive the appropriate, high-quality care regardless of their insurance status.”

Wang — who is also associate director of pediatric emergency medicine at Stanford and colleagues previously found disparities in access to trauma care for children and the elderly in the state of California, with insurance status being one of the influencing factors.

It is important that the community understands this trend so that it can be changed,” she said.

The current study also found that, in addition to insured patients, older patients and those brought to urban teaching hospitals and high-volume emergency rooms had lower chances of being transferred to a trauma center.

Emergency-room encounters should be more closely monitored, the authors suggest, to ensure that patients get the right kind of care regardless of their ability to pay. Splitting costs between hospitals and trauma centers is another solution; it may help hospitals cover any financial loss that they expect from sending patients away.

“Study after study has shown that the more patients that a trauma team takes care of, the more experience they get — and their outcomes are going to be better,” Delgado said.

Each state has different rules for designating a hospital as a trauma-care facility. Designated hospitals are reviewed by the American College of Surgeons to verify that they have all the resources listed in the association’s trauma-care guidelines.

The trauma-care guidelines also spell out the steps emergency physicians should follow to decide whether an injured patient needs to be transferred. But emergency physicians often fail to follow these steps. In some cases, a trauma hospital may be understaffed or have limited resources. In others, it may have to decide whether conditions would better do at a trauma center, and some of it has to do with practice patterns — what the hospital is used to taking care of on its own,” Delgado said.

The implications are startling. But researchers are only now able to investigate these trends because population-wide emergency department data from non-trauma centers have only recently become available.

Delgado also acknowledged that with this database, there’s no way to confirm if insured patients are receiving worse outcomes because they are being kept back.

“Something is happening to people that we’re trying to figure out next,” he said.

Another question that Delgado plans to explore is how much patients know about their options.

“We’re doing research right now to figure out what role patients and their families’ preferences play in the transfer decision,” he said. “People who have insurance may not realize that they could do better if they are transferred.”

The study was supported by the National Institutes of Health.

The other Stanford authors of the study are medical student Michael Yolell; assistant professor of surgery Kristan Staudenmayer, MD; David Spain, MD; professors of surgery and the Carol and Neil Specker Professor; and Tina Hernandez-Boussard, PhD, assistant professor of surgery. The Department of Surgery also supported the work.

Ranjini Raghunath is a writing intern for the Office of Communication & Public Affairs.

Writer, physician Abraham Verghese to speak at school commencement

Writer and physician Abraham Verghese, MD, a leader in advocating the importance of the patient-physician relationship in an era of increasingly sophisticated medical technology, will be the commencement speaker for the School of Medicine Class of 2014. The ceremony is scheduled for 11 a.m. to 1 p.m. June 14 on the Alumni Green in front of the Li Ka Shing Center for Learning and Knowledge.

Verghese is vice chair for the theory and practice of medicine in the Department of Medicine and the Linda R. Meier and Joan E. Lan Provostial Professor.

He is the author of the bestselling novel Cutting for Stone. His first book, My Own Country, a memoir about AIDS in rural Tennessee, was a finalist for the National Book Critics Circle Award.

He has published extensively in the medical literature, and his writings have appeared in: The New Yorker and The Atlantic, among other publications. His emphasis on empathy and the potential of the patient’s focus of his talks both nationally and internationally.

In a quote on his website, Verghese said that “the best way to understand a hospitalized patient is not by staring at a computer screen, but going to see that patient. For it is at the bedside that I can figure out what’s important to the patient and how the data you have accumulated makes sense.”

Writer and physician Abraham Verghese will be the speaker at the 2014 School of Medicine commencement.

Cuddlers

focused on their patients’ essential medical needs, which sometimes limits their time to attend to more personal needs, said Stevenson, who is also the Harold K. Faber Professor of Pediatrics at the School of Medicine.

“The cuddlers are volunteers who address the personal needs of another small human being, holding and talking to them when their parents can’t be present,” he said. “The cuddlers become a part of the health-care team.”

Many years ago, Fitzgerald was in the shoes of the worried parents whose baby she now comforts. When her son was 14 months old, he was hospitalized with a suspected brain tumor at what was then Stanford Children’s Hospital. Fortunately, the tiny girl was too small to be held, but as she grew and gained strength, Fitzgerald and Rice cuddled her and cheered for her development, rejoicing when she went home.

Eight years later, they were at a soccer match for one of their grandchildren when the coach invited them to meet his daughter.

“I thought it was nice that he was introducing us to the team,” Fitzgerald said. “And then this beautiful little girl came up and said, ‘May I hug you? My mommy says you held me when I was just a little baby.’” It was the same girl, grown into a healthy child who loves to play soccer and ride horses.

Fitzgerald and Rice are grateful that cuddling allows them to make a difference in the world.

“When you hold these little babies and see their heart rate get back to normal, you know you’re doing something important,” Fitzgerald said.

“It’s become a major focus of our lives,” Rice added. “It’s an opportunity to extend something we both treasure — to help create an environment that’s conducive to the growth and healing of these babies.”

Some of its tentatives are, and I think it helps them to see me,” he said.

Fitzgerald recently received the President’s Call to Service Award, honoring her for more than 4,000 volunteer hours at the hospital. She now trains new cuddler volunteers.

Among the couple’s favorite patients was an infant born 14 weeks early. At first, the tiny girl was too small to be held, but as she grew and gained strength, Fitzgerald and Rice cuddled her and cheered for her development, rejoicing when she went home.

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A year after a major heart attack, followed by cardiac surgery, Bruce Simon found himself back in the hospital with continued heart problems. This time, his doctors in his hometown of Billings, Mont., began to talk about a heart transplant. Simon wasn’t arguing. His congestive heart failure was so extreme that he had to sleep propped up while using an oxygen mask, and he couldn’t walk more than a few feet without becoming short of breath.

Yet four years later, Simon is a picture of health. He has shed his oxygen mask, and his heart transplant was a success. He’s on fewer medications. He’s back to spending long days rowing down the Smith River to his favorite fly-fishing spot, and he can walk two miles on a treadmill at 3.5 miles per hour. It wasn’t high-tech medicine that drove his recovery: It was simply avoiding excess salt.

"A lot of people with heart failure come to a cardiologist’s office and expect to get medications,” said Simon’s doctor, Dipanjan Banerjee, MD, clinical assistant professor of cardiovascular medicine and medical director of Stanford Hospital’s Mechanical Circulatory Support Program. “Probably the most important thing we do in our clinic is focus on lifestyle and dietary changes. The cornerstone of our therapy for our congestive heart failure patients is sodium restriction.”

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Simon, who came to Stanford to be evaluated for a heart transplant, performed just a little too well on the test, and Banerjee wanted to watch him to try living with a simple rule that he often prescribes for his patients with heart failure: “Nothing out of a can, nothing out of a box, nothing out of a package and no processed foods” is how Simon remembers it.

“I thought they were nuts,” he said. “But I also recognized that I’d been sent to one of the finest medical facilities in the world, and I was under the case of some of the best doctors in the world, so I thought I should pay attention.”

“Medications are important,” Banerjee said, “but they can’t be used in isolation. For example, we’ve found that coronary artery disease isn’t just a passive accumulation of cholesterol in the blood vessels. Now we know that there’s active inflammation in these blood vessels, and if we don’t treat that inflammation, patients can have heart attacks and even strokes. We also know that age and diabetes have to modify their diet to reduce sugar, and over time, if they’re able to do that, some of those patients can come off their therapies for diabetes. We see patients with heart failure who can experience the same therapeutic benefits.”

Simon had a similar experience. Not only was he able to add exercise to his daily routine — which he did at the suggestion of Banerjee — but his low-sodium diet was so effective against his heart-failure symptoms that he noticed a difference within two weeks. Soon, he was sleeping without supplemental oxygen, just as he had before his heart failure. By the end of a month on the new diet, the pressures in his heart were normal. An echocardiogram showed that the right side of his heart, once enlarged, was back to normal size. “He was an unqualified success,” Banerjee said, “largely because of the work he did. That won’t be true for everyone, but we try to avoid invasive treatments and to first manage our patients’ health with lifestyle changes.”

Now 72, Simon has become a vigorous advocate for the low-sodium diet and delightfully accepts compliments about how good he looks. “People tell me I don’t look the same guy,” he said. “I feel great, and I can do just about anything I want. Eating carrots and celery is a whole lot better than having a heart transplant.”

Sara Wykes is a writer in the communications office at Stanford Hospital & Clinics.

MRI continued from page 1

Heike Daldrup-Link, MD, associate professor of radiology and a diagnostic radiologist at the hospital. “That is a big deal.”

The research team compared the modified MRI technique to standard PET-CT in 22 patients ages 8 to 53 who had either Ewing’s sarcoma or NCI. These cancers originate in the immune system and the bones, respectively. Both cancers can spread throughout tissues such as bone marrow, lymph nodes, liver and spleen. In the past, several hurdles prevented physicians from using whole-body MRIs to look for tumors. The scans took up to two hours. A whole-body PET-CT, however, takes only a few minutes. (It combines PET images taken by monitoring the metabolism of radioactive glucose with CT images, which are essentially a set of X-rays from different angles.)

More importantly, in many organs, MRI does not distinguish healthy from cancerous tissue. And existing contrast agents — chemicals injected into the body to make tumors visible — leave these areas too dark to be used in a lengthy, whole-body MRI.

To find tumors via MRI, the Stanford team used a new contrast agent consisting of iron nanoparticles. The nanoparticles of these iron nanoparticles are approved by the Food and Drug Administration to treat anemia, and the research team obtained FDA permission for the experimental use. The nanoparticles are retained in the body for many days. On MRIs, they cause blood vessels to appear brighter, providing anatomic landmarks. The nanoparticles also cause healthy bone marrow, lymph nodes, liver and spleen to appear darker, making tumors stand out.

The images generated from the experimental MRIs provided comparable information to the PET-CT scans that study subjects received as part of their cancer treatment. The PET-CT detected 174 total tumors in the 22 patients; the MRIs found 158 of 174 tumors. The two methods had similar levels of sensitivity, specificity and diagnostic accuracy.

“We were able to find a new way to integrate anatomical and physiological information to make it more efficient,” said Christopher Klenk, MD, a postdoctoral scholar and the paper’s lead author.

None of the patients experienced adverse side effects to the iron nanoparticles, though the FDA has previously noted a small risk of allergic reaction to the nanoparticles’ coating. (It’s rare for patients to have adverse reactions to contrast agents.)

Radiologists at several academic hospitals are searching for ways to reduce children’s radiation exposure. Daldrup-Link said, adding that she is sharing the new technique with colleagues around the country.

“Some type of whole-body MRI imaging test is available at many big children’s hospitals right now,” she said, adding that this form of imaging is not widely adopted, doctors are cautious about evidence that whole-body MRI does the job. “It’s slowly entering clinical practice, but clinicians are cautious and want to be convinced,” she added. The other barrier to widespread adoption is that of MRI-based test is lacking a billing code, a hurdle the researchers hope will soon be resolved. But there are no technological obstacles to use of the new technique.

“It’s really exciting that this will soon be clinically applicable,” Daldrup-Link said.

Future research will aim to validate the MRI-based method in larger, more diverse groups of cancer patients, as well as examine its possible use for monitor ing tumors over the course of cancer treatment. The MRI-based method also holds promise for scanning patients after their treatment is complete, when the ability to monitor them without radiation would be especially valuable.

Other Stanford authors of the paper were clinical fellow Rakhee Gawande, MD, visiting scholar Lefziz Uluh, MD, and postdoctoral scholars Aman Khurana, MD, and Desiqiang Qiu, PhD; Andrew Quo, MD, associate professor of radiology; Jessica Donig, research coordinator; Jarrett Rosenberg, PhD, a research scientist/biostatistician in radiology; Sandra Luna-Fineeman, MD, clinical associate professor of radiology; and Michael Mesolea, PhD, professor of radiology.

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Stanford’s Department of Radiology and Lucile Packard Children’s Hospital Stanford’s pediatric radiology program, also supported the work.
A family affair: maintaining normal, active lives with diabetes

By Diana Walsh

The Bergh household, with five children under age 11, is an unusually hectic place. Besides the usual schoolwork, baseball practice, gymnastics and piano lessons, there is an added complication: Two of the Bergh children have diabetes, and a third is likely to develop it in the next two years. Yet mom Tierra Bergh manages to maintain relative calm in her family’s San Jose home.

“I want my children to know that this disease is not going to define them. They are leading normal, healthy lives,” she said.

Both Maleki, 11, and Marae, 8, have type-1 diabetes. They each must inject themselves with insulin as many as eight times a day and pricking their fingers up to 15 times a day to monitor their blood sugar levels. In an effort to maintain their health, Tierra Bergh also tracks each gram of carbohydrate the two children eat. Every night, either she or her husband wakes at 3 a.m. to measure the kids’ blood sugar. If necessary, they adjust the levels by getting them to drink some juice or by giving them a shot if their sugar levels are really high. It all seems routine now, but when Maleki was diagnosed with diabetes at the age of 3, Bergh wasn’t sure she’d be able to manage her child’s disease.

Early support system

Maleki was practically in a diabetic coma when he arrived in the pediatric emergency room at Stanford Hospital & Clinics in May 2005. After Maleki spent several days in a hospital, the Berghs took him home with an assortment of insulin and syringes and a phone number that gave them 24-hour access to doctors at Lucile Packard Children’s Hospital Stanford. Although they had been trained with detailed instructions about how to care for Maleki, Bergh said they were terrified during their first few days back at home. What if they made a mistake? What if they couldn’t get his sugar levels right? The ability to call a doctor at any time of the day or night gave them both the time and the confidence to adjust to monitoring their son’s complex and life-threatening disease.

“They just keep saying, ‘It’s freaking out. I remember calling them and saying, ‘He’s refusing to drink his juice; what am I supposed to do?’” she said. “They just kept reassuring me that I was doing a good job, and they really gave me strength. This is a huge disease, and the doctors were a huge support system for us.”

Testing positive

Roughly 5 percent of families who have one child with diabetes will have a second child with the disease, but it’s unusual to have three, according to Bruce Buckingham, MD, professor of pediatric endocrinology at the School of Medicine. Buckingham, who treats the Bergh children at Lucile Packard Children’s Hospital Stanford, has interviewed everyone in the family for the disease by testing for antibodies that can generally predict when a child is going to develop diabetes. Four months after Maleki got his diagnosis, Marae tested positive for the antibodies. She did not get the disease this year or the next, but her dad said then Tierra Bergh knew what to do. After noticing that Marae was drinking and urinating excessively one weekend, she used her son’s glucose meter to test Marae’s glucose levels and immediately called Buckingham.

“I was devastated,” she recalled. “But Dr. Buckingham was very calm. He said, ‘You already know how to take care of a child with diabetes.’” He sent them to the closest emergency room. As they arrived, Buckingham was on the phone giving treatment instructions for Marae to the emergency room doctors. Tierra and Michael Bergh took Marae home with them that day and began their new routine, now managing type-1 diabetes for two children.

“It was emotionally and mentally draining to have two kids with diabetes,” said Tierra Bergh. They since have learned that another daughter, Jaeda, 5, has several of the antibodies, indicating that she is likely to get the disease in the next few years. Daughters Sienna, 9, and Averie, 2, are tested annually for the antibodies but so far have no signs of the condition.

Active participants

Through all of it, Buckingham and Stanford Medicine care teams encouraged the Berghs to make their kids’ lives as normal as possible, Tierra Bergh said.

Two years after his diagnosis, Maleki started playing baseball. He now plays shortstop and pitches for a traveling baseball team and was selected to the regional all-star team. Marae takes gymnastics with her older sister, and both have weekly piano lessons.

Buckingham said he’s always impressed by how calm and relaxed the Berghs seem when they come in for visits. “Some people find it overwhelming, but they seem to be incorporating it and living good, active lives,” he said. “The parents have a wonderful attitude, and it’s transferred to their kids.”

Buckingham said the Berghs’ willingness to have all of their children participate in multiple diabetes studies has been a tremendous help for research. Even with her family’s busy lives, Tierra Bergh said, she will always make time for the studies that may someday find a cure for her kids.

“We have completed about five studies, but it feels like 100 because I have all five of my kids participating,” she said. “I think participating because I want them to find a cure. That’s my main goal.”

Diana Walsh is a freelance writer.