



CPR helped save the life of an 8-year-old girl who suffered a cardiac arrest while playing at her school.

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Don't despair in face of failure, Kim tells grads

By Tracie White

Rather than focusing on his many scientific successes, Peter Kim, PhD, a biochemist known for his innovative work in developing and shepherding drugs to market, chose instead to tell the School of Medicine's graduating class of 2016 about one of his key failures.

"The greatest scientific failure in my career was when I had to stop a clinical trial of a vaccine for HIV/AIDS. And it came just as we thought we were on the threshold of success," said Kim, the Virginia and D.K. Ludwig Professor of Biochemistry, addressing the graduates and their families and friends seated under a giant white tent on Alumni Green on June 11. "When we ended the clinical trial, the hopes of literally millions of people around the world were dashed."

The key is not to despair in the face of failure, said Kim, the keynote speaker at the diploma ceremony.

"As you know, science is, at its core, the pursuit of truth. ... That is what science is all about: discovering the truth and following it wherever it leads," he said.

Lilies, roses, babies, cameras

The ceremony began with the sounds of the Golden Gate Brass Ensemble playing as the robed graduates marched up on stage, led by Lloyd Minor, MD, dean of the School of Medicine. In the audience, mothers held lilies and roses for the graduates; dads held babies; everyone, it seemed, held a camera. It was a sunny afternoon filled with selfies and videos and group shots, a day of tears and celebration, and a day to pause and reflect on the years of hard work and the road ahead.

Following words of congratulations and encouragement from the two student speakers, Lauren Popov, who was receiving a PhD in microbiology and immunology, and Muthu Alagappan, who was receiving a medical degree, Minor introduced Kim. The dean encouraged graduates, each of whom he said faced "remarkable futures," to "always remain true to yourself and your values."

Kim, who earned a PhD in biochemistry at Stanford in 1985, joined the faculty of the School of Medicine in 2014 as a professor of biochemistry. He is member of ChEM-H, an interdisciplinary effort focused on the

chemistry of human health.

'Up a blind alley'

Previously, Kim was president of Merck Research Laboratories, where he helped launch a vaccine targeting the human papilloma virus, the causative agent of cervical cancer, among many other products. He returned to Stanford to relaunch a career as a research scientist, he said. His research at Stanford includes efforts to create an HIV vaccine.

In 2003, as the newly installed head of Merck Research Labs, Kim believed that Merck scientists were close to finding a vaccine for HIV/AIDS. "This would not have been the ultimate HIV vaccine, but it would have been an enormous step forward," he said. "And much of the scientific community, as well as the HIV/AIDS advocacy community, shared our optimism — and our hope."

Under his leadership, Merck partnered with the National In-

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NORBERT VON DER GROEBEN



Dina Wang-Kraus walks across the stage with Amber, a 7-year-old psychiatric assistance animal, at the medical school diploma ceremony.

Male, female brain activity differs during cooperative task, study finds

By Sarah C.P. Williams

Studies have long shown that when faced with a problem that must be solved by cooperating with others, males and females approach the task differently. Now, researchers at the School of Medicine have discovered how those differences are reflected in brain activity.

When the researchers asked people to cooperate with a partner and then tracked the brain activity of both partici-

pants, they found that males and females had different patterns of brain activity.

The new findings, published online June 8 in *Scientific Reports*, could offer some clues into how cooperative behavior may have evolved differently between males and females, and could eventually help researchers develop new ways to enhance cooperative behavior.

"It's not that either males or females are better at cooperating or can't cooperate with each other," said the study's senior author, Allan Reiss, MD, professor of psychiatry and behavioral sciences and of radiology. "Rather, there's just a difference in how they're cooperating."

Women vs. men

Cooperation — between family members, friends, coworkers and even governments around the world — is viewed as a cornerstone of human society. But not everyone cooperates equally, as anyone who's worked on a group project knows. And one factor shaping a person's approach to cooperation: sex. Previous behavioral studies have found that women

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Researchers: Ramping up treatment of worm disease would be cost-effective

By Ruthann Richter

Millions of people in the developing world could be spared from lifelong disability — or possible death — from parasitic worm disease under a vastly expanded treatment program that is cost-effective, according to a new analysis led by School of Medicine researchers.

The modeling analysis suggests that current World Health Organization guidelines may need to be revised to more effectively combat parasitic worm disease, which afflicts some 1.5 million people across the globe. It points the way to a sweeping new program in which more than 1 billion doses of two low-cost drugs — often donated — could be dispensed in sub-Saharan Africa to largely knock out these infections.

Using prevalence and cost-effectiveness models, the researchers found it would be economically worthwhile to make these drugs available to schoolchildren every year in communities where as few as 5 percent are infected with schistosomiasis, as opposed to the 50 percent threshold now recommended by

DAVID WILLIAMS / ILLINOIS STATE UNIVERSITY



Schistosoma worms are among the parasitic worms that cause diseases in millions of people in the developing world each year.

WHO. It would also be feasible to expand treatment to adults and preschool-aged children, who often aren't included in WHO guidelines, and to combine treatment in areas heavily afflicted by the two most common types of worm infections, which are caused by schistosomes and the soil-transmitted helminths, said Nathan Lo, a Stanford MD-PhD student and lead author of the study.

"If we incorporate this new evidence, See WORM, page 4



STEVE FISCH

Allan Reiss co-authored a study on brain activity in men and women engaging in a cooperative task.

Study finds support across ethnicities for physician-assisted death

By Tracie White

Physician-assisted death was supported by a majority of California and Hawaii residents, regardless of their ethnicity, who responded to an online survey, according to a study by researchers at the School of Medicine.

The study also found that older people were more likely than younger people to believe it is OK to allow physicians to prescribe life-ending drugs to terminally ill patients who request them, and that the most religious or spiritual people were the least supportive of this idea. But even among those who declared that religion or spirituality was very important to them, a majority still supported the practice.

The study was published online June 9 in the *Journal of Palliative Medicine* to coincide with the date that California's End of Life Option Act took effect. The act was signed into law Oct. 9, 2015. Physician-assisted death is illegal in Hawaii.

"It is remarkable that in both states, even participants who were deeply spiritual (52 percent) were still in support of physician-assisted death," said the study. "Both genders and all racial/ethnic groups in both states were equally in support of PAD."

'Surprisingly positive'

"The response was surprisingly positive across all ethnic groups," said VJ Periyakoil, MD, clinical associate professor of medicine, who is the lead and senior author of the study. Those taking the survey marked their ethnicities as African American, Latino, white, Native Hawaiian/Pacific Islander or Asian.

"I was surprised that people who were deeply spiritual were still positive overall," she added.

To conduct the study, researchers developed an online survey that asked participants to respond, true or false, to whether they believed it is acceptable to allow a physician to prescribe medication, at the request of a terminally-ill patient, in order to end that person's life.

"We wanted a broad question that didn't specify what kind of medication, that didn't say oral pills or self-administered, none of that," Periyakoil said. Participants were also asked: "How important is your faith/religion/spirituality to you? (Unimportant, somewhat important, important and very important.)"

Participants responded to the online survey, which was housed and stored on a secure Stanford server. Data was collected from July through October 2015.

Among the 1,095 responses from California and 819 from Hawaii, the majority — both in California (72.5 percent) and Hawaii (76.5 percent) — were supportive of PAD.

"Older participants were more supportive of PAD compared with their younger counterparts in both states," the study said. "Persons who reported that spiri-

tuality was less important to them were more likely to support PAD in both states."

For those who said religion/faith/spirituality was very important to them, about 52 percent were in favor of PAD, the study found.

"The act of deliberately hastening death is not supported by most religions. ... Thus it is not surprising that in our study participants who reported faith to be most important to them were least in support of PAD," the study said.

Need for cultural sensitivity

Periyakoil, an expert on end-of-life care and director of the Stanford Palliative Care Education and Training Program, stressed that it's important for physicians in California to prepare for the new law. In addition to training in end-of-life conversations and being aware of cultural differences, physicians need to be honest with their patients, Periyakoil said.

"Just be upfront," she said. "Tell patients, 'Listen, this is a very hard topic for all of us.'"

In particular, primary care physicians will inevitably be faced with questions from patients, she said.

"It takes a tremendous amount of courage on the patient's part to ask these questions," Periyakoil said. "How the doctor responds initially to the patient's question is very important and will set the tone for the rest of the interaction about this sensitive issue."

The study provides evidence that patients of various ethnicities and religious backgrounds will be seeking information from their physicians on the issue, many of them at what may be the most vulnerable time in their lives, she said.

"We stress that requests from diverse patients have to be approached with great cultural sensitivity," the researchers wrote in the study.

The study asserted that because of the number of complex provisions in the law — such as the requirement that medication must be self-administered by a mentally competent patient — it will actually affect only a tiny fraction of seriously ill patients.

This has been borne out in Oregon, which in 1997 became the first state to pass an assisted-suicide law.

"Only a small sliver of the population will be eligible for the End-of-Life Option Act, and of those eligible, only a portion are likely to utilize this option, and no one ethically opposed would likely do so," the study said. "For example, of the 34,160 Oregonians who died

in 2014, only 155 received a lethal prescription and 105 utilized it."

Although long-debated in California, the issue of physician-assisted death gained momentum after Britany Maynard, a 29-year-old Californian who was terminally ill, decided to move to Oregon in 2014 to end her life rather than suffer the pain and debilitation caused by brain cancer.

"As California is a highly populous majority-minority state, we are soon going to learn how diverse racial and ethnic groups respond to legalizing physician-

NORBERT VON DER GROEBEN



VJ Periyakoil led a study that found a majority of California and Hawaii residents who responded to a survey supported physician-assisted death, regardless of their ethnicity.

assisted death," Periyakoil said. "In order to alleviate suffering for all seriously ill patients, it is extremely important that we also provide excellent palliative care early in the illness process."

Periyakoil's teaching module on physician-assisted death, which is posted on the medical school's website, is designed to be used as a discussion aid for both patients and physicians. It is available at <https://palliative.stanford.edu/physician-assisted-death>.

The other Stanford co-authors of the paper are Helena Kraemer, PhD, professor emerita of biostatistics in psychiatry, and analyst Eric Neri.

Periyakoil's work is supported by the Veterans Administration Palo Alto Health Care System and the National Institute on Minority Health and Health Disparities.

Stanford's Department of Medicine also supported the work. ISM

Stanford Medicine X conference to focus on how to realize moonshot ideas

By Tracie White

On the heels of co-hosting a precision medicine workshop at the White House earlier this month, organizers of Stanford Medicine X, an annual conference for health-care innovation, have announced the agenda for the upcoming fall conference.

This year's conference is being dubbed Medicine X Week because the offerings have expanded and will take place over seven days, Sept. 12-18, instead of three days. Most events will take place at the

Li Ka Shing Center for Learning and Knowledge on the School of Medicine campus.

Medicine X Week will focus on how to realize moonshot ideas for improving health care.

"We're taking the moonshot thinking and the inspirational talks that Med X is known for and tying it to how to implement these ideas out in the world," said Lawrence Chu, MD, associate professor of anesthesiology, perioperative and pain medicine at Stanford and executive director of the conference. "The whole

idea is that change is something each of us can be responsible for and create."

'Everyone Included'

Geared toward researchers, patients, providers, designers, technologists and policy leaders, Medicine X aims to provide a framework for health-care innovation, implementation and transformation based on principles of mutual respect and inclusivity, Chu said. This framework, known as "Everyone Included," a trademark of Stanford Medicine X, was co-developed with a diverse group of health-care stakeholders over the past six years at Medicine X.

"What we have learned over the years is that what people value most from this conference is its inclusivity," Chu said. "We bring together researchers, patients and policy leaders to work on problems that matter in health care, to look at emerging technologies from a patient-focused viewpoint, and to create new ideas to solve problems."

"Three days is just not enough to do all this," he added. "We've expanded to a week to create more opportunities for collaborations, for co-creations and participatory design."

Keynote speakers will be Susannah Fox, chief technology officer for the U.S. Department of Health and Human Ser-

vices, who will discuss building a nation of innovators; Lindred Green, PhD, assistant professor of organizational behavior at Stanford, who will talk about flattening the hierarchy in health-care systems; Jonathan Bush, CEO and president of Athenahealth, who will discuss bringing the "network effect" to health care; and LaVerne Council, chief information officer at the U.S. Department of Veterans Affairs, who will discuss technological innovation at the VA.

The following events will take place during Medicine X Week:

- MedX Makers Community Event: a free event open to the public that brings community members to join Medicine X in the movement to revolutionize health care.

- Health Care Safety Design Challenge: a daylong event that focuses on the question, "How should we respond when medicine hurts instead of heals?" This will bring together a diverse group of stakeholders, including those who have experienced medical error, to work on developing solutions by redesigning the system.

- IDEO Design Challenge: a daylong dive into design thinking for health care to be held in partnership with IDEO, a global design firm that takes a human-centered,

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Researchers identify possible drug target for common skin disease

HRIANA / SHUTTERSTOCK.COM

By Krista Conger

Psoriasis is one of the most common human skin diseases. People with severe cases sometimes resort to immunosuppressive treatment to quell the skin scaling, itching and joint arthritis that are hallmarks of the disorder. But long-term administration of the medication can leave them vulnerable to infection and other unwanted side effects.

Now, researchers at the School of Medicine have identified a new molecular target for potential therapies. A small protein in the skin called Rac1, which is involved in wound repair, appears to link well-known environmental triggers of the disease with a genetic predisposition to the condition. It also sheds light on the interplay between the skin and the immune system that is responsible for disease flare-ups.

"Normally there's a quiet, ongoing conversation between the epidermis and our immune system as they work together to fight disease such as infections," said Peter Marinkovich, MD, associate professor of dermatology. "In psoriasis, this has escalated into an uncontrollable shouting match that results in abnormal cellular proliferation, scaling and inflammation with no real effective therapies other than long-term immunosuppression. Targeting a protein in the skin, rather than quieting the immune system, could be a potential game changer for many patients and clinicians."

A paper describing the research was published online June 13 in the *Journal of Clinical Investigation*. Marinkovich is the senior author, and postdoctoral scholar Marten Winge, MD, PhD, is the lead author.



Peter Marinkovich

Itchy, scaly patches of skin

About one of every 50 people in the world has psoriasis, which is a genetic disease characterized by itchy, scaly patches of thickened skin across the body. Many also experience pain and associated arthritis in nearby joints. It can occur at any age, and the severity of the condition can wax and wane throughout a person's life.

Psoriasis flare-ups can be triggered when skin is damaged and the epidermal cells become hypersensitive to growth signals. That's why many people struggle with the condition on their elbows, knees and other areas of the body that tend to get roughed up. But, strangely, the disease can also be activated in susceptible people by the bacteria that cause strep throat.

The exact mechanisms by which these events trig-

ger the disease are unknown, and most therapies focus on quieting the immune system's side of the noisy conversation.

Studying environmental triggers

Winge and Marinkovich tried to find other options for patients by eavesdropping on the skin's role in the disease process. That meant considering environmental triggers, which led them to a small molecule, called Rac1, known to play a role in both wound repair and in strep infection.

"Both of these processes activate a small protein called Rac1," said Marinkovich. "So we wondered if Rac1 was somehow involved in triggering psoriasis in susceptible people."

When activated, Rac1 is believed to promote the proliferation of cells in the epidermis, as well as send signals to activate the immune system. Under normal conditions, this is a necessary response to heal after an injury. But over-proliferation and over-inflammation could have detrimental effects. Interestingly, some genetic mutations that have been linked to psoriasis affect molecules that are involved in many of the same signaling pathways as Rac1.

The researchers consistently found that Rac1 was highly activated in biopsies of psoriatic skin from 20 people with the condition. When they artificially activated Rac1 in the skin of laboratory mice, the animals exhibited similar symptoms as human patients.

"They had scaling of the skin and arthritis in their joints that precisely mimics what we've seen in the clinic," Marinkovich said. The effect was abolished, however, in mice engineered to lack immune cells called T cells — further confirming the immune system's role in the disorder.

Blocking protein's activity

Finally, blocking the activity of Rac1 in patches of psoriatic human skin that had been transplanted onto the backs of mice reversed the skin hyperplasia and reduced the recruitment of immune molecules known as cytokines to the transplanted patch.

"Psoriasis is one of the most prevalent skin diseases in the world," said Marinkovich. "But it's been difficult to study due to the complex interplay between genetic and environmental influences. Now we've learned that targeting Rac1 activation in the skin, rather than the immune system's role in the disease, may be a way to



Psoriasis, a genetic disease characterized by scaly patches of thickened skin, affects about 1 in every 50 people in the world.

treat the disease without needing to suppress the immune system."

Marinkovich and his colleagues plan to continue their study of what causes Rac1 activation in the epidermis.

"The study is the first to find a molecule linking genetic susceptibility to the disease with the environmental causes known to trigger it," Marinkovich said. "We'd like to understand all the steps between these gene defects and Rac1 activation. Then we can try to identify drugs that can down-regulate the cause of abnormal Rac1 activation in psoriasis. The availability of a cream or other topical application could completely change the way we treat psoriasis in the clinic."

Other Stanford co-authors of the study are former visiting scientists Bungo Ohyama, MD, PhD, Wei Li, MD, and Teruhiko Makino MD, PhD; former research assistant Clara Dey; former graduate student Lisa Boxer, PhD; postdoctoral scholar Nazanin Ehsani-Chimeh, MD; former medical students Allison Truong, MD, and Diane Wu, MD; former postdoctoral scholars Daniela Starcevic, PhD, and Elizabeth Waterman, PhD; research assistant Ngon Nguyen; and professor of dermatology Paul Khavari MD, PhD.

The study was supported by the U.S. Department of Veterans Affairs, the National Institute of Arthritis and Musculoskeletal and Skin Diseases, the National Psoriasis Foundation, the European Union's Seventh Framework Program, the Swedish Society of Medicine and the Fernstrom Foundation.

Stanford's Department of Dermatology also supported the work. ISM

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design-based approach to help organizations innovate. This will take place Sept. 15 at IDEO's headquarters in Palo Alto.

- Health Care Innovation Summit: a one-day event on Sept. 15 to explore how to address health-care costs.

- Behavior design workshop: an event led by behavior design expert Kyra Bobinet, MD, to explore neuroscience solutions to health-care problems.

In addition, Medicine X will feature

presentations and panels on a range of topics, including a takeoff of the reality television show *Shark Tank*. The Medicine X version will have five finalists who will pitch ideas for improving cancer care in front of a live panel of judges, including, Robert Herjavec, one of the stars of *Shark Tank*.

Special sessions will address the opioid crisis, policing patient privacy and the future of President Obama's Precision Medicine Initiative.

For more information about the conditions and registration details, visit <http://medicinex.stanford.edu>. ISM



COURTESY OF STANFORD MEDICINE X

Larry Chu speaks at the 2015 Stanford Medicine X conference. This year's conference will be Sept. 12-18.

Lisa Freeman to serve as senior adviser for clinical affairs

Elizabeth (Lisa) Freeman has been appointed the School of Medicine's senior adviser for clinical affairs. She will begin June 27.

Freeman was previously the director and CEO of the U.S. Department of Veterans Affairs Palo Alto Health Care System, where she was responsible for administrative and clinical programs, including planning for facilities.

Reporting to Norman Rizk, MD, senior associate dean of clinical affairs, Freeman will oversee projects that enhance Stanford Medicine's focus on precision health and that improve quality, safety and efficiency.

"Lisa Freeman was welcomed into the position because of her deep experience in performance improvement, promotion of cost efficiency and attention to what really matters to patients," Rizk said. "We hope to profit from her long and distinguished career to make Stanford Medicine safer, better and more efficient. Her devotion to patients over many years makes her the perfect fit."

Freeman said she is looking for-

ward to joining Stanford after working closely with School of Medicine leaders through her work at the VA.

"I am very excited about the opportunity to focus on specific areas of improvement and innovation in both patient care and patient experience and to partner with the world-class Stanford staff in doing so," Freeman said. "My hope is to use my experience and expertise to further their efforts."

Freeman earned a bachelor's degree from the University of Notre Dame in civil engineering and a master's degree in business administration from Louisiana Tech University.

She has held several leadership and administrative positions within the Department of Veterans Affairs, including interim network director for the VA Southwest Healthcare Network in Phoenix; director of operations at the VA Sierra Pacific Network in San Francisco; and project manager and senior resident engineer for the VA Office of Construction in Washington, D.C. ISM



Lisa Freeman

Mohs surgery for melanoma in situ offered at Stanford Health Care

NORBERT VON DER GROEBEN

By Sara Wykes

Edyth Ledbetter had had enough common skin cancers removed from her face to recognize that the dark, fast-spreading spot on the side of her nose was something different.

She was right. Three months ago, Ledbetter became one of the estimated 76,000 people in the United States diagnosed with melanoma in 2016. Melanoma is the most lethal of all skin cancers, and its incidence is rising steadily while its mortality rate remains stubbornly stable. Even when melanoma is in situ — an early stage during which the cancer has not yet grown beyond the outer layer of skin — removing it is often a multistage process that takes a few days as patients and doctors wait for tissue analysis. Without the finesse of a layer-by-layer surgery called Mohs, which is used universally for other forms of skin cancer, removal of early-stage melanoma can produce large wounds and disfiguring scars.

NORBERT VON DER GROEBEN



Ledbetter had the surgical wound on her nose patched with a skin flap from her forehead.

This spring, just in time for Ledbetter's surgery, Stanford Health Care became the first academic medical center in the western United States to begin using the Mohs technique for melanoma in situ. This outpatient surgery procedure is less expensive than the traditional surgical approach, creates a smaller wound and reduces the cancer's rate of recurrence. A melanoma in situ can be removed, and reconstructive surgery completed, in one day.

Preparing tissue samples

Using Mohs to treat melanoma in situ was not possible until researchers figured out how to prepare tissue samples of the cancer. Unlike more common forms of skin cancer, such as basal cell or squamous cell carcinoma, melanoma's cells are difficult to visualize with the standard dyes used to prepare slides for analysis. About 15 years ago, researchers finally developed an immunohistochemistry stain for melanoma, tuned to the cancer's particular biomarkers. That discovery made melanoma visible, but initially it was only used for formalin slides, which take about 12 hours to prepare, not the quicker, frozen-section slides used in Mohs surgery.

Doctors wanted to do with melanoma what they could do with other skin cancers: remove a tissue sample that could be stained, frozen and slide-ready in less than an hour. It wasn't a technical hurdle, but an evidentiary one. Clinicians were hesitant to use the new stain in the quick-processing preparation until studies showed it was as accurate as the previous formalin-slide-based, multiday analysis.

That evidence was published last year in the *Journal of the American Academy of*



Edyth Ledbetter attends a follow-up appointment with dermatologic surgeon Tyler Hollmig, who removed melanoma in situ from her nose using a technique called Mohs surgery.

Dermatology. "That study added to the growing body of evidence that shows the incredible usefulness of this immunohistochemical marker in frozen-section analysis in Mohs for in situ melanoma," said surgeon Tyler Hollmig, MD, clinical assistant professor of dermatology at the School of Medicine. "We are incredibly excited about those results and about Stanford Health Care's ability to now offer this new technique to our patients."

Proceeding carefully

Hollmig and his Stanford Medicine colleagues have proceeded carefully because the new processing and analysis are technically difficult. "We wanted to do things the right way," he said. Stanford Health Care's dermatopathology service became a crucial partner for the

advanced training needed for the new procedure.

The procedure is based on a technique developed by Wisconsin surgeon Frederic Mohs in the 1930s. Mohs surgery begins with the removal, like a plug, of the most visible center of the cancer. Then, the surgeon will remove tissue around the center, in layers about 3 millimeters thick. That tissue is sliced into micron-thin pieces, stained, frozen and examined within minutes. The incremental removal of tissue means that no more will be removed than is necessary. When the cancer is near the eyelid, for instance, the precision of Mohs keeps wounds and scars, or reconstructive surgery, to a minimum.

Hollmig said he and fellow dermatologic surgeon **See MOHS, page 5**

Worm

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we can start to consider elimination of this as a public health problem," Lo said. "Substantial populations are not receiving treatment under current guidelines that could benefit under a cost-effective program."

A prevalent ailment

Based on the analysis, it would make economic sense to increase treatment for schistosomiasis by six times the current estimated needs and twice current estimates for soil-transmitted helminth infections in sub-Saharan Africa, said Jason Andrews, MD, assistant professor of medicine and the senior author of the study.

"These worms cause an array of health effects from anemia, malnutrition and growth stunting to infertility, cancer of the urinary tract and liver cirrhosis," Andrews said. "Mass drug administration of the scale we've proposed could prevent many of these problems. Our analysis indicates that this would not only be effective but also a cost-effective investment when compared alongside other health interventions."

The study was published online June 7 in *The Lancet Infectious Diseases*.

Parasitic worm diseases are among the most prevalent ailments in the developing world, with documented transmission in 78 countries, according to WHO. About 150,000 people die of complications every year from these parasitic infections.

The two major categories of parasitic worms are the *Schistosoma* worms and the soil-transmitted helminths. The *Schistosoma* parasites reproduce in freshwater snails and can penetrate the skin of people who swim in contaminated lakes or rivers or who walk in muddy fields. The helminth worms, such as roundworm, whipworm and hookworm, are mainly found in soil. These worms may produce small eggs in the body that can be transmitted to others through ingestion of human feces in soil or water supplies.

Low-cost treatments

Both diseases are easily treated with low-cost drugs that have relatively few side effects, Lo said. Schistosomiasis is typically treated with praziquantel, which

costs about 21 cents a pill and can reduce egg production by 98 percent, he said. The helminths can be readily treated with albendazole, which costs about 3 cents a pill and can reduce the number of worm eggs by as much as 95 percent.

In the past 15 years, there has been a significant reduction in the global prevalence of these infections and greater access to medication, with 15 to 45 percent of those who need it getting treatment, according to WHO. Yet these diseases remain a persistent problem in many parts of the world, including Africa, South America and South Asia.

In February, WHO issued a press release urging further expansion of treatment where the disease is most endemic, with a goal of reaching 75 percent coverage in preschool- and school-age children by 2020. However, the WHO guidelines were written a decade ago and have not been updated to reach this goal.

"The guidelines were based on the best judgment of experts at the time, but I think there's fairly broad agreement that it's time to revisit these in view of new data, analyses and priorities," Andrews said.

He and his colleagues decided to take a systematic look at how best to control these infections, using a variety of models to examine prevalence and transmission patterns across Africa, as well as a cost-effectiveness model to determine what made the most economic sense.

They found that it would be most cost-effective to treat *Schistosoma* worm infections annually when prevalence among children was as low as 5 percent — well below WHO's current threshold of 50 percent prevalence. In the case of helminth infections, they found it would be economically worthwhile to treat school-age children when prevalence was 20 percent — the same level currently recommended by WHO.

Their analysis also shows that it would be feasible to include preschool-age children and adults in the treatment program, as both age groups may experience the disabling symptoms of parasitic infection but have not been traditionally included in these treatment programs. Moreover, adults can easily reinfect children through fecal contamination in the household environ-

ment, Lo said.

Finally, the researchers found that it would save money to treat the two diseases at the same time, rather than as separate programs because most of the cost is involved in delivering the treatment, not in the pills themselves.

"It makes sense to work together to treat multiple diseases when they are in a single setting," Lo said. "If you have health-care workers who go into a village to do one treatment, they will have to go back to the village for a different treatment, and the second visit costs just as much."

If these proposed recommendations for sub-Saharan Africa were followed, it would require a sixfold increase in treatment for *Schistosoma* infections — from about 120 million to more than 750 million doses annually — and a doubling of the number of doses for helminth infections from 335 million to nearly 660 million a year, the researchers estimate.

Question of affordability

The scientists did not calculate the cost of the total proposed program, and it's unclear whether current funders would be willing to increase their support. These programs are currently funded by the U.S. Agency for International Development, local ministries of health and various nonprofits, as well as pharmaceutical companies that donate the drugs.

In scaling up treatment, it would also be important to be mindful of the potential for drug resistance, although the proposed guidelines meet the best practices for avoiding the emergence of resistance, Lo said. He said resistance with these drugs has been documented in animals, though not in human populations.

The other Stanford co-author of the paper is Eran Bendavid, MD, assistant professor of medicine. Researchers in Switzerland, Canada and the Ivory Coast also contributed to the study.

The research was funded by the Doris Duke Charitable Foundation, the Mount Sinai Hospital-University Health Network AMO Innovation Fund and the Stanford University Medical Scholars Program. **ISM**



Nathan Lo

Tale of Sofia Montoya's survival a testament to power of CPR

By Joan Semeria

"I did something amazing yesterday!" exclaimed Sofia Montoya. "I climbed to the top of the play structure all by myself!"

This would be a normal thing to do for most 8-year-olds, but it's not something Sofia's parents or her doctors at Lucile Packard Children's Hospital Stanford expected so soon after Sofia went into sudden cardiac arrest while playing with friends.

On April 18, while playing tag at her elementary school near Half Moon Bay, Sofia slumped to the ground and was unresponsive. Her friends ran for help. A school staff member, who found that Sofia had no pulse and wasn't breathing, performed CPR as a 911 dispatcher walked her through the steps. Hearing the call over the radio, a sheriff's deputy in the area quickly arrived and took over CPR until the Moss Beach Fire Department got to the school. Firefighters continued CPR and used a defibrillator twice to get Sofia's heart to start beating again.

It was quickly determined that Sofia needed to be treated at a trauma center, so she was transported by ambulance to the Half Moon Bay airport, where Stanford's Life Flight helicopter was waiting.

'White as a sheet'

"When I first saw her, she was lying on a backboard with a collar on. She was white as a sheet, not moving or breathing very well," said Shara Griffis, RN, the flight nurse who was on board with Sofia.

During the 10-minute flight to the hospital, Sofia again stopped breathing. Griffis inserted a breathing tube in her mouth. Griffis knew that Sofia's brain was in danger of not getting sufficient oxygen — a primary concern when someone has to be resuscitated.

At Packard Children's, Sofia went through a series of diagnostic tests to determine why she had gone into cardiac arrest. The hospital's Children's Heart Center team diagnosed Sofia with long QT syndrome, a disorder of the heart's electrical system that causes fast, chaotic heartbeats resulting in fainting spells, seizures or, in some cases, sudden death. Long QT syndrome can be caused by a genetic mutation and is often inherited. Sofia's family members have since all gone through genetic testing to see if they carry the same mutation.

Once Sofia was stabilized, pediatric cardiologist Scott Ceresnak, MD, surgically placed an implantable cardioverter defibrillator in Sofia's chest to help regulate her heartbeat. If the device detects an irregular heartbeat, it generates an electrical shock to restore a normal heart rate and rhythm.

After 11 days in the hospital, Sofia returned home.

She has resumed most of her normal activities and is expected to make a full recovery.

"The long-term outlook for Sofia is excellent," said Ceresnak, an assistant professor of pediatric cardiology at the School of Medicine. "With the combination of beta blocker medicines, which reduce cardiac events, and the ICD, we expect Sofia to live a long, healthy, fruitful life. And thanks to the tremendous CPR she received, she has made incredible neurological recovery."

Lifesaving CPR

While the ICD will keep Sofia's heart from malfunctioning, it's the CPR and early defibrillation that saved her life and improved her outcome.

"Sofia's story is a perfect example of all the pieces coming together," said Lynda Knight, MSN, RN, director of the REVIVE Initiative for Resuscitation Excellence at Stanford Children's Health. "This scenario is what we train for, starting with bystander CPR. Evidence shows that if a bystander performs CPR, the outcome will be better." She said paramedics take four to eight minutes on average to arrive at the scene, and that each minute someone in cardiac arrest goes without chest compressions reduces that person's chance of survival by 10 percent.

In 2013, Knight led an observational study that demonstrated the effectiveness of sending parents of children who had high-risk diagnoses home with a video-based, self-instructional CPR kit called CPR Anytime. Parents reported that they felt empowered by their knowledge of CPR, and most shared the kit with at least two other family members or friends. Since the program began, 10 children have received CPR from members of families that were given the kit. Nine of those children survived with favorable neurological outcomes. Now all infants and children born at or admitted to Packard Children's are sent home with the kit. To date, more than 6,500

families have received the free CPR kits, with an estimated impact of 19,000 community members becoming trained in CPR.

Understanding the difference between treating cardiopulmonary events in children and adults is especially critical for first responders. That's why Knight developed the Pediatric Advanced Workshop with Simulation program to train firefighters in pediatric CPR by using scenarios based on real cases of critically ill and injured children. The REVIVE American Heart Association Training Center, located at Packard Children's, also trains an additional 1,500 local health-care professionals annually in pediatric advanced life support.

Shawna Montoya, Sofia's mother, acknowledges that her daughter wouldn't be healthy and alive today if she had not received quality CPR.



Sofia Montoya was flown on the Life Flight helicopter to Lucile Packard Children's Hospital Stanford on April 18 after suffering a cardiac arrest on her school's playground in Half Moon Bay. Evan Toolajian (left) is the pilot who flew her, and Shara Griffis (right) is the flight nurse who cared for her.

"Although Sofia has some memory loss, she is making amazing strides every single day," said Montoya. "I'm so thankful for everyone who was part of her recovery and for the support of our community. My mission now is to promote CPR training because obviously it can save a life. My daughter is living proof of that." ISM

Video about terminally ill surgeon wins award

MARK HANLON

A video about a young Stanford neurosurgeon's imminent death from cancer earned the top award in a national competition.

The video, "A strange relativity," received a Gold Award in the long video category in the 2016 Circle of Excellence Awards program sponsored by the Council for the Advancement and Support of Education.

The video was an online companion to an essay by the late Paul Kalanithi, MD, published in the spring 2015 issue of *Stanford Medicine* magazine. In the essay and the video, Kalanithi described how his perception of time changed as a neurosurgeon-turned-patient facing a terminal diagnosis. The essay and video were published just a few weeks before he died of lung cancer.

The video was produced by Mark Hanlon, video director for the medical school's Office of Communication & Public Affairs.

The judges for the contest called the video "superb on a multitude of levels." They praised the video's use of a variety of elements — from an upbeat, clocklike beat on a guitar to the varying of film speed — to convey the notion of time. "We also love how the crew captured the small moments of Dr. Kalanithi with his family, especially when they captured the side of his



Paul Kalanithi holds his daughter in a screen shot from Mark Hanlon's video "A strange relativity," which won a Gold Award in the long video category in the 2016 Circle of Excellence Awards program sponsored by the Council for the Advancement and Support of Education.

happy and sad smile while he was playing with his infant daughter. It made several of us cry," the judges wrote. "It was a story and video that will leave an impression on us all for a lifetime — that is not something you can say very often."

CASE is a professional organization for those in the fields of communications, alumni relations and development at educational institutions. It includes more than 3,600 colleges and universities, as well as independent elementary and secondary schools in 77 countries. To recognize the best work in these fields, CASE sponsors its annual Circle of Excellence Awards. ISM

Mohs

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Sumaira Aasi, MD, a clinical professor of dermatology at Stanford, expect to use the procedure to treat the increasing number of people diagnosed with melanoma. The new technique is well-suited for patients whose melanoma is in areas where sparing tissue is most critical — the head, neck, hands, feet and genitalia. With speedy analysis of cancerous tissue now available, patients can have a tumor removed and any needed wound repair completed in one day.

Ledbetter, who lives in Lodi, said she appreciated that. Her melanoma had spread through half of one side of her nose. After removing the cancerous tissue, Hollmig built Ledbetter a new nose with a procedure called a paramedial forehead flap. The flap is a section of tissue about a half-inch deep and 5 inches long surgically separated away from the forehead. One edge remains attached to the forehead, just above the eyebrow; the rectangular remainder is turned down toward the nose to cover the area where cancer has been removed.

For three weeks, the flap grafts the nose wound. Then, the flap is separated completely from the forehead, and its top edge sewn to the top of the nose. Although the flap procedure is complicated, the one-day process enabled Ledbetter to arrive at the Outpatient Center in Redwood City at 8 a.m., Feb. 17, and head home at 4:45 p.m. Two months later, her healing was not considered complete, but she has boasted that her friends "can't tell I've had surgery."

"Hearing that from a patient is my best reward," Hollmig said. ISM

Graduation

continued from page 1

stitutes of Health to test the vaccine in 3,000 people, committing hundreds of millions of dollars to scale up production of the vaccine, ready to move into the final stage of testing if the results of the trial were encouraging, he said.

“Unfortunately, they were not,” he told the crowd. “Instead of making a breakthrough, we found ourselves up a blind alley. We had every reason to expect to succeed, but we had not. And this was a very public failure.”

PHOTOS BY NORBERT VON DER GROEBEN



Kim’s story was not, of course, just about failure. It was an inspirational tale of how failures in the world of science add to the greater body of scientific knowledge — and how his story of failure changed the course of his life, eventually leading him back to Stanford.

“On the day that we stopped the clinical trial, I wrote a letter to all Merck employees explaining the disappointing news,” he said. “I concluded by saying, ‘Although the answer is not what we desired, we had completed an incredibly important experiment.’ In as much as the results were deeply disappointing, we had succeeded in finding an approach that didn’t work. And that failure would lead researchers to search for other ways to succeed.”

“Now that I am back in academia, I am among those continuing the search. Why? Because today more than 36 million people are living with HIV/AIDS — that is one out of every 200 people on Earth. The quest for this vaccine simply must continue until it succeeds.”

‘Something you long look forward to’

“Expect to confront failure, but don’t let it defeat you,” Kim added. “Remember, as you leave this place, know that you carry with you the hopes of all those — yet unknown to you or them — in whose lives you will make a real difference. Carry this, not as a burden, but as an opportunity and a privilege.”

Families and friends of the graduates traveled from across the country, and around the world, to attend the

day’s ceremonies. The class of 2016 was awarded 49 master’s degrees, 87 medical degrees and 94 doctorates. Twenty-six of the graduates received MD-PhD degrees.

The mother of AbdulRasheed Alabi, one of those MD-PhD grads, beamed at him in his robes, recalling his brilliance in preschool. “We came all the way from Nigeria,” she said. “This is something you long look forward to.”

Graduate Roxana Daneshjou, who also earned an MD-PhD, took a moment before the ceremony to thank her

parents, who escaped persecution in Iran during the 1979 Iranian revolution by immigrating to the United States.

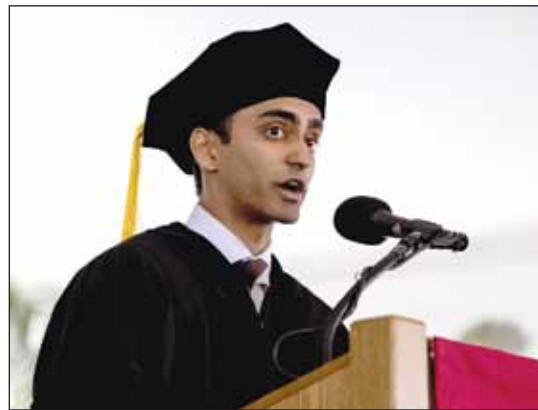
“My family sacrificed so much for me,” Daneshjou said. “My people, the Baha’i, are banned from attending higher education in Iran. My entire family came out from Texas to be here today. I’m the first doctor in the family.”

The words of the student speakers reflected the strong emotions of the day. They recounted the scholarship, hard work and perseverance that brought the graduates their diplomas, but also how their journey has left a lasting emotional mark.

“There’s that moment when you see something that no one has ever observed before, ... that precious nugget of knowledge, that moment when your discovery becomes part of a larger story of scientific progress,” said Popov, reflecting on the years of research that go into a PhD.

Alagappan, who received his MD, described a transformative moment that occurred for him during his clinical rotations: the joy of holding a 10-second-old baby girl.

“Literally all I did was hold a 6-pound infant for three minutes without dropping her, but I was physically and emotionally exhausted. I disposed of my gloves, wiped my eyes and thought to myself, ‘Everything was worth it.’” ISM



(Clockwise from top left) Neil Gesundheit hoods graduating MD-PhD student Roxana Daneshjou at the medical school’s diploma ceremony June 11. Biochemist Peter Kim delivers the keynote address at the ceremony. Muthu Alagappan, who earned a medical degree, was one of two graduating students who spoke at the event. Members of the medical school’s class of 2016 proceed to the ceremony, which was held on Alumni Green, next to the Li Ka Shing Center for Learning and Knowledge. Medical school Dean Lloyd Minor poses with Lauren Puryear, who earned a master’s degree, and her children Meara Hempey, 10, and Colin Hempey, 8.



Awards honor outstanding teaching, patient care

At the School of Medicine's diploma ceremony June 11, close to 30 faculty members, staff and residents, as well as a student, were honored for outstanding contributions to the Stanford Medicine community.

Awards in medicine

JOHN KUGLER, MD, clinical assistant professor of medicine; **MALATHY KUPPUSWAMY**, MD, clinical assistant professor of psychiatry and behavioral sciences; and **CLIFFORD WANG**, PhD, consulting assistant professor of chemical engineering, received the Arthur L. Bloomfield Award in Recognition of Excellence in the Teaching of Clinical Medicine.

JAMES LAU, MD, clinical associate professor of surgery, received the Franklin G. Ebaugh Jr. Award for Excellence in Advising Medical Students.

DORA HO, MD, PhD, clinical associate professor of medicine, received the Alwin C. Rambar-James BD Mark Award for Excellence in Patient Care, which recognizes a member of the medical faculty for compassion in working with patients and their families, excellence in providing medical treatment, and effectiveness and pleasantness in interactions with patient-care staff.

JOHN "EDDIE" ATWOOD, MD, clinical

professor of medicine, and **DAVID SVEC**, MD, clinical assistant professor of medicine, received the Lawrence H. Mathers Award for Exceptional Commitment to Teaching and Active Involvement in Medical Student Education.

ERIKA SCHILLINGER, MD, clinical professor of medicine, received the Award for Excellence in Promotion of the Learning Environment and Student Wellness.

MARTHA TRUJILLO, director of financial aid, received the Medical Education Staff Service Award.

ERIC KNUDSEN, PhD, the Edward C. and Amy H. Sewall Professor, Emeritus, and an emeritus professor of neurobiology, received the Outstanding Lecture/Presentation Award.

REKHA REDDY, MD, a physician at Mayview Community Health Center, received the Outstanding Community Clinic Preceptor-Preclinical Instruction Award.

SCOTT KLEIN, MD, a physician at East Valley Clinic, received the Outstanding Community Clinic Preceptor-Clinical Instruction Award.

CHARLES PROBER, MD, senior associate dean for medical education and professor of pediatrics and of microbiology and immunology, received the Henry J. Kaiser Family Foundation Award for Outstanding and In-

novative Contributions to Medical Education.

BEN BARRES, MD, PhD, professor of neurobiology, of developmental biology and of neurology and neurological sciences; **JOHN GOSLING**, MD, professor of surgery; and **DARREN SALMI**, MD, clinical assistant professor of surgery and of pathology, received the Henry J. Kaiser Family Foundation Award for Excellence in Preclinical Teaching.

JASON HOM, MD, clinical instructor of medicine; **POONAM HOSAMANI**, MD, clinical assistant professor of medicine; and **THOMAS ORMISTON**, MD, a physician at Woodland Healthcare, received the Henry J. Kaiser Family Foundation Award for Excellence in Clinical Teaching.

Medical residents **AMELIA CLARK**, MD, otolaryngology-head and neck surgery; **JOSEPH FORRESTER**, MD, surgery; **GEOFFREY KRAMPITZ**, MD, surgery; **CARMIN POWELL**, MD, pediatrics; and **BRINDHA SARAVANABAVANANDHAN**, MD, obstetrics and gynecology, received the Arnold P. Gold Foundation Award for Humanism and Excellence in Teaching. The award is given to residents based on their commitment to teaching and the compassionate treatment of students, colleagues and patients and their families.

Awards in biosciences

STEVEN BLOCK, PhD, the Stanford W. Ascherman, MD, Professor and professor of applied physics and of biology, received the Award for Excellence in Graduate Teaching. This award recognizes faculty whose teaching of graduate students is distinguished and especially valued by the medical school's biosciences community.

BEN BARRES, MD, PhD, professor of neurobiology, of developmental biology and of neurology and neurological sciences, received the Faculty Award for Excellence in Diversity and Inclusion. This award recognizes faculty who make distinguished contributions toward enhancing diversity, equity and inclusion in the biosciences.

MARTHA CYERT, PhD, professor of biology, and **AMATO GIACCIA**, PhD, the Jack, Lulu and Sam Willson Professor and a professor of radiation oncology, received the Faculty Award for Excellence in Mentoring and Service. This award recognizes faculty who make distinguished contributions toward enhancing the quality of training and the educational experience for biosciences graduate students.

CORDELIA ERICKSON-DAVIS, an MD-PhD student, received the Outstanding Teaching Assistant Award. **ISM**

Cooperation

continued from page 1

cooperate more when they're being watched by other women; that men tend to cooperate better in large groups; and that while a pair of men might cooperate better than a pair of women, in a mixed-sex pair the woman tends to be more cooperative.

Theories have circulated about why this is, but the brain science behind them has been scarce. "A vast majority of what we know comes from very sterile, single-person studies done in an MRI machine," said Joseph Baker, PhD, a postdoctoral scholar at Stanford and a lead author of the study. The other lead author is research associate Ning Liu, PhD.

Scanning pairs

To figure out how cooperation is reflected in the brains of men and women who are actively cooperating — rather than just thinking about cooperating while lying in a machine — the Stanford researchers turned to a technique called hyperscanning. Hyperscanning involves simultaneously recording the activity in two people's brains while they interact. And instead of using an MRI that requires participants to lie perfectly still and flat, the scientists used near-infrared spectroscopy, or NIRS, in which probes are attached to a person's head to record brain function, allowing them to sit upright and interact more naturally.

The 222 participants in the study were each assigned a partner. Pairs consisted of two males, two females or a male and a female. Then, while wearing the NIRS probes, each person sat in front a computer, across the table from their partner. Partners could see each other, but were instructed not to talk. Instead, they were asked to press a button when a circle on the computer screen changed color. The goal: to press the button simultaneously with their partner. After each try, the pair were told who had pressed the button sooner and how much sooner. They had 40 tries to get their timing as close as possible.

"We developed this test because it was simple, and you could easily record responses," said Reiss. "You have to start somewhere." It isn't modeled after any particular real-world cooperative task, he said.

Sex influences both behavior and brain

On average, male-male pairs performed better than female-female pairs at timing their button pushes

more closely, the researchers found. However, the brain activity in both male-male and female-female pairs was highly synchronized during the activity, meaning they had high levels of "inter-brain coherence."

"Within same-sex pairs, increased coherence was correlated with better performance on the cooperation task," Baker said. "However, the location of coherence differed between male-male and female-female pairs."

Surprisingly, though, male-female pairs did as well as male-male pairs at the cooperation task, even though they didn't show coherence. Since the brains of males and females showed different patterns of activity during the exercise, more research might shed light on how sex-related differences in the brain inform cooperation strategy — at least when it comes to this particular type of cooperation.

An exploratory study

"This study is pretty exploratory," Baker said. "This certainly isn't probing cooperation in all its manifestations." There could be other cooperative tasks, for instance, in which female-female pairs best males.

And the researchers noted they hadn't measured activity in all parts of the brain. "There are a lot of parts of the brain we didn't assess," Reiss said, pointing out that interbrain coherence may have been present in other regions of the brain that weren't examined during the task.

As they continue to study what in the brain underlies cooperation, the scientists' results could help explain how cooperation evolved in humans — and whether cooperation was selected for differently in males and females — as well as inform methods that use biofeedback to teach cooperation skills.

"There are people with disorders like autism who

The findings could help explain how cooperation evolved in humans.

CENTER FOR INTERDISCIPLINARY BRAIN SCIENCES RESEARCH



For the study, male-male, male-female and female-female partners sat across a table from each other in front computers. They were asked to press a button when a circle on the computer screen changed color. The goal was to press the button simultaneously with their partner.

have problems with social cognition," said Baker. "We're absolutely hoping to learn enough information so that we might be able to design more effective therapies for them."

Other Stanford authors are research associate Xu Cui, PhD; former postdoctoral scholar Pascal Vrticka, PhD; and Manish Saggat, PhD, and Hadi Hosseni, PhD, both instructors in psychiatry and behavioral sciences.

The study was funded by the Albert Yu and Mary Bechmann Foundation.

The Stanford's Department of Psychiatry and Behavioral Sciences also supported the work. **ISM**

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5 QUESTIONS

an occasional feature in which an expert answers five questions on a science or policy topic

Douglas Owens on colorectal cancer screening

United States, after lung cancer, yet many Americans are still loathe to be screened for the disease.

Guidelines released by the U.S. Preventive Services Task Force strongly recommend that adults ages 50 to 75 be screened for colon cancer, and suggest adults ages 76 to 85 make individual decisions about whether to be screened, depending on their overall health and prior screening history. The recommendation and several accompanying edito-

rials were published online June 15 in JAMA.

The recommendation from the independent body of national experts in prevention and evidence-based medicine also emphasized that colonoscopy is one of many screening options available.

Douglas K. Owens, the Henry J. Kaiser, Jr., Professor and director of the Stanford Center for Health Policy and Center for Primary Care and Outcomes Research, was a member of the task force when the guidelines were developed and co-authored the recommendation. He discussed the screening guidelines with writer Beth Duff-Brown.

1 What is the most significant finding of this final recommendation?

OWENS: The good news is that evidence convincingly shows screening for colorectal cancer works. The task force strongly recommends screening adults 50 to 75 for colorectal cancer, as it reduces the risk of dying from the disease. Unfortunately, one-third of people in that age group have never been screened, so we are missing an important opportunity to prevent deaths from colorectal cancer.

2 How should people decide which screening method is best for them?

OWENS: What really matters is that people get screened. There are several options that are effective, so we recommend that people discuss the options with their clinician. There are direct visualization tests, like colonoscopy, and stool-based tests, like fecal immunochemical testing. Each test has different strengths and limitations, and people may prefer one approach over another. For example, colonoscopy can be done every 10 years, but FIT testing should be done every year. But the real message is, choose an approach in consultation with your clinician and get screened.

3 The task force found that once adults reach age 76, the benefits of screening become smaller and the

potential for harm is greater. What should older Americans consider in deciding whether to be screened?

OWENS: We recommend individual decision making for patients ages 76 to 85. The benefits are smaller because a person's chance of dying of other causes goes up as they get older. The harms are still small but increase with age, primarily because the risks of the potential complications of colonoscopy (bleeding, perforation and infection) go up with age. Still, some people in this age group will benefit from screening.

People most likely to benefit are those who have not been screened before; people who are healthy enough to undergo treatment for colorectal cancer, should it be found; and people who do not have other diseases or conditions that limit their life expectancy substantially.

4 African-Americans have the highest incidence of colorectal cancer among all racial and ethnic subgroups. Should this group consider more frequent screenings?

OWENS: The task force recognizes the burden that colorectal cancer has on African-Americans, who are at higher risk of being diagnosed with and dying from

the disease than other racial/ethnic subgroups. We don't know why this is — more research is needed in this area. The task force did not find enough evidence to conclusively support that making a different recommendation specific to African-Americans would result in a greater net benefit for this population. So our recommendations are intended to apply to all racial/ethnic groups. More robust efforts are needed to ensure that at-risk populations actually receive the screening tests and the follow-up treatments or interventions they need, as people are dying unnecessarily from this disease.

5 What data did the Task Force use to come to its conclusions?

OWENS: We commissioned a comprehensive, systematic review of the available evidence on the benefits and harms of colorectal cancer screening. The task force also commissioned a modeling study from the Cancer Intervention and Surveillance Modeling Network to help it better understand different screening strategies, such as the optimal age to start or stop screening, and the length of time between screenings. The evidence is convincing that screening reduces the risk of dying from colorectal cancer. *ISM*



Douglas K. Owens

OF NOTE

reports on significant honors and awards for faculty, staff and students

SANJAY BASU, MD, PhD, assistant professor of medicine, received a Junior Investigator Recognition Award from the American College of Physicians at a May meeting in Washington, D.C. The award recognizes outstanding papers by residents or researchers who have completed their training within the past three years. Basu is being honored for "Medicare Chronic Care Management Payments and Financial Returns to Primary Care Practices: A Modeling Study," published Oct. 20, 2015, in the *Annals of Internal Medicine*.

BERNARD DANNENBERG, MD, the Davies Family Director of Pediatric Emergency Medicine and a clinical professor of emergency medicine, received the 2016 Martha Bushore-Fallis Advanced Pediatric Life Support Award from the American Academy of Pediatrics. The award recognizes an individual who has helped to further the goal of early recognition and stabilization of life-threatening children through the auspices of the Advanced Pediatric Life Support program.

RHIJU DAS, PhD, was promoted to associate professor of biochemistry, effective Jan. 1. His research focuses on the modeling and design of noncoding RNA and RNA-protein complexes through computer algorithms, rapid biochemical approaches and internet-scale collaboration.

WENDY FANTL, PhD, assistant professor of obstetrics and gynecology, received the Ellen Weaver Award from the Northern California Chapter of the Association for Women in Science at a May ceremony. The award recognizes women with distinguished scientific achievements who have excelled at helping other female scientists. Her research focuses on characterizing ovarian cancer at the single-cell level.

PAUL GEORGE, MD, PhD, was appointed assistant professor of neuro-



Sanjay Basu



Bernard Dannenberg



Rhiju Das



Wendy Fantl



Paul George



Gordon Li



Mary Lough



Uchechukwu Megwalu



Garry Nolan



Lawrence Steinman

ogy and neurological sciences, effective Jan. 1. He is a vascular neurologist and bioengineer whose research focuses on the application of biomaterials and stem cells for stroke recovery and on developing new techniques to improve stroke diagnosis.

GORDON LI, MD, was promoted to associate professor of neurosurgery, effective Jan. 1. His research focuses on developing treatments for brain tumors and improving techniques for brain tumor surgery.

MARY LOUGH, PhD, RN, received the Clinical Nurse Specialist of the Year Award from the National Association of Clinical Nurse Specialists. Lough is a clinical nurse specialist in critical care at Stanford Health Care and a clinical assistant professor of medicine at the School of Medicine. The award is presented each year to a nurse who demonstrates CNS competencies and exemplary practice in patient care, nursing and health-care delivery systems.

UCHECHUKWU MEGWALU, MD, was appointed assistant professor of otolaryngology-head and neck surgery, effective Jan. 1. He treats thyroid and parathy-

roid disorders, head and neck tumors, sinusitis and chronic ear disorders. His research focuses on outcomes and health services, particularly health literacy and health disparities.

GARRY NOLAN, PhD, the Rachford and Carlota A. Harris Professor and professor of microbiology and immunology, received a \$3.66 million grant to examine the chronic effects of Ebola infection from the U.S. Food and Drug Administration's Medical Countermeasures Initiative. The project, a partnership with several other institutions, will use immunopathology to study differences among Ebola survivors experiencing a variety of symptoms.

LAWRENCE STEINMAN, MD, the George A. Zimmermann Professor and professor of neurology and neurological sciences and of pediatrics, has been awarded the Anthony Cerami Award in Translational Medicine by the Feinstein Institute for Medical Research. The award honors researchers who have made discoveries that improved human health and who have advanced therapeutic treatments and understanding. Steinman was recognized for his research in neurology, particularly

on multiple sclerosis. Honorees receive \$20,000 and have the opportunity to discuss their research career in a monograph; Steinman's essay, "A Journey in Science: The Privilege of Exploring the Brain and the Immune System," was published June 2 on the website of the journal *Molecular Medicine*.

RANAK TRIVEDI, PhD, was appointed assistant professor of psychiatry and behavioral sciences, effective Jan. 1. She is also an investigator at the Center for Innovation to Implementation at the Veterans Affairs Palo Alto Health Care System. Her research and clinical focus is on improving the psychosocial well-being of chronically ill patients, with an emphasis on developing self-management programs that engage both patients and their family caregivers. She is also examining the treatment and assessment of mental illness in primary-care settings. *ISM*



Ranak Trivedi