Cardinal athlete dives back in, thanks to Stanford surgeon

Thoracic outlet syndrome would make Taylor Sishc's left arm feel numb and weak. He underwent surgery at Stanford to treat the condition.

By Sara Wykes

Taylor Sishc is honest about the mystery condition that turned his left arm so numb and weak he could not even pick up a shoe. “I struggled,” he said. “I’m not a cryer, but I broke down multiple times. It just seemed like it would never end.”

Sishc, an All-American high school diver recruited to Stanford University’s elite team, had received prompt attention from the team’s trainers and sports medicine doctors, but until he was referred to Stanford Hospital & Clinics’ vascular surgeon Jason Lee, MD, he didn’t really know what was going on with his arm.

Lee, an associate professor of surgery at the medical school, had his suspicions about what the problem was: Sishc might have thoracic outlet syndrome, a condition often seen in athletes but also found in people who use their arms in a repetitive motion, which can lead to the compression of nerves or blood vessels, or both, in the thoracic outlet — an area bounded by the base of the neck and the first rib.

Diagnosis of thoracic outlet syndrome, also known as TOS, is not straightforward. “There’s no one blood test or radiographic test or physical exam finding that gives you that ‘aha’ moment,” Lee said. “It’s a combination of positive and negative tests.”

Sishc had been a gymnast since childhood and a serious competitive diver since he was 13. By the time he reached Stanford, he had been lifting his arms over his head in a similar motion for years — exactly the kind of long-term overuse that creates thoracic outlet syndrome. Sishc’s TOS, Lee determined, was caused by compressed nerves. The growing numbness and weakness in his arm threatened a premature end to his college diving career.

“The tricky part about TOS, Lee said, is not just making the diagnosis. Trainers, therapists and surgeons have worked on TOS treatment for decades with results that were not always consistent. In a 2010 paper published in the Journal of Vascular Surgery, Lee and his colleagues presented a review of nine years of Stanford TOS patients that showed that a specific kind of surgery gave you that ‘aha’ moment. “It’s a combination of positive and negative tests.”

Scientists reveal how beta-amyloid may cause Alzheimer’s disease

By Bruce Goldman

Scientists at the School of Medicine have shown how a protein fragment known as beta-amyloid, strongly implicated in Alzheimer’s disease, begins destroying synapses before it clumps into plaques that lead to nerve cell death.

Key features of Alzheimer’s, which affects about 5 million Americans, are wholesale loss of synapses — contact points via which nerve cells relay signals to one another — and a parallel deterioration in brain function, notably in the ability to remember.

“Our discovery suggests that Alzheimer’s disease starts to manifest long before plaque formation becomes evident,” said Carla Shatz, PhD, professor of neurobiology and of biology and senior author of the study, published Sept. 20 in Science.

Investigators at Harvard University also contributed to the study. The research, conducted in mice and in human brain tissue, may offer new light.

In social interactions, ‘love hormone’ may play wider role than previously thought

By Bruce Goldman

Researchers at the School of Medicine have shown that oxytocin — often referred to as “the love hormone” because of its importance in the formation and maintenance of strong mother-child and sexual attachments — is involved in a broader range of social interactions than previously understood.

The discovery may have implications for neurological disorders such as autism, as well as for scientific conceptions of our evolutionary heritage.

Scientists estimate that the advent of social living preceded the emergence of pair living by 35 million years. By the time humans developed complex brains, oxytocin was already playing an important role in their decision-making skills, under the eye of Dr. Sicko.

A new video game helps surgical trainees improve their decision-making skills.
The learning and physical disabilities that affect people with Down syndrome may be due at least in part to excessive stem cell regulation throughout the body, according to researchers at the School of Medicine.

The defects in stem cell growth and self-renewal observed by the researchers can be alleviated by reducing the expression of one gene on chromosome 21, they found.

The finding marks the first time Down syndrome has been linked to stem cells, and addresses some long-standing mysteries about the disorder. Although the genetic change called Usp16, is unlikely to be the only contributor to the disease, the finding raises the possibility of an easy therapy based on reducing its expression.

“THERE appear to be defects in the stem cells in all of the tissues that we tested, including the brain,” said Michael Clarke, MD, the Karel H. and Avie N. Beekhuis Professor in Cancer Biology. The researchers have published their studies in both mouse and human cells. “We believe Usp16 overexpression is a major contributor to the neurological defects seen in Down syndrome,” Clarke said.

Clarke is the senior author of the research, which was published Sept. 11 in Nature. Excellence Scholar Maddalena Adorno, PhD, is the lead author.

Conceptually, this study suggests that drug-based strategies to slow the rate of stem cell use could have profound effects on cognitive function in people with Down syndrome,” said co-author Craig Garner, PhD, who is co-director of Stanford’s Center for Research and Treatment of Down Syndrome and a professor of psychiatry and behavioral sciences.

Down syndrome, which is caused by an extra copy of chromosome 21, affects about 400,000 people in the United States, including people in every age group. It involves both physical and cognitive problems. While many of the physical issues, such as vision and hearing difficulties, can now be treated, no treatments exist for poor cognitive function.

The new study’s findings suggest an answer to one long-standing mystery about the condition, including why people with Down syndrome appear to age faster and exhibit early Alzheimer’s disease.

“This study is the first to provide a possible explanation for these tendencies,” said Garber. The fact that people with Down syndrome have three copies of chromosome 21 and the Usp16 gene accelerates the rate at which stem cells are used during early development, which likely exhausts stem cell pools and impairs tissue regeneration in adults with Down syndrome. As a result, their brains age faster and are susceptible to early onset neurodegenerative disorders.

The researchers didn’t confine their studies to laboratory mice. They also investigated the effect of Usp16 overexpression in human cells. Adorno and colleagues in the laboratory of co-author Samuel Cheshier, MD, assistant professor of neurology, found that the presence of excess Usp16 caused skin cells from unaffected people to grow more slowly. Furthermore, neural progenitor cells (those self-renewing cellular factories responsible for the development and maintenance of many of the cell types in the brain) were less able to form balls of cells called neurospheres — a laboratory test that reflects the number and robustness of nerve stem cells in a culture. Conversely, reducing Usp16 expression in skin and nerve-progenitor cells from people with Down syndrome allowed the cells, which usually proliferate slowly, to assume normal growth patterns.

“THERE is a classical idea in the molecular pathways involved in the self-renewal of these cells. Understanding how normal stem cells regenerate themselves could help explain why they are unusually resistant to chemotherapy or radiation therapy — often resulting in cancer and premature aging — and how organ damage from disease, and understanding how cancer stem cells maintain themselves could help explain why they are unusually resistant to chemotherapy or radiation therapy — often resulting in cancer and premature aging,” said Clarke.

The researchers are now considering strategies to slow the rate of stem cell use and thereby slow the rate of stem cell use and thereby slow the rate of cell division. Blocking Usp16 expression would allow nerve stem cells in a dish to grow more normally than were cells from the Ts1Cje mice. Reducing the expression of Usp16 in the cells from the Ts65Dn mice to more normal levels largely corrected these functional defects.

“We demonstrated that central nervous system stem cells in Down syndrome mice were defective in their ability to self-renew — the process by which stem cells regenerate themselves upon cell division. Blocking Usp16 expression in these cells restored this ability,” said Cheshier. “We hope in the future that correcting this Usp16 defect can lead to therapeutics that will ameliorate the central nervous system defects seen in patients with Down syndrome.”

Finally, the researchers created a new, Ts65Dn-derived mouse strain in which one of the three copies of Usp16 was mutated. This normalized the level of expression of that gene, without affecting the overexpression of the other 131 triplicated genes in these mice. Nerve progenitor cells from these mice grew more slowly and were equal as normal cells to form neurons. The researchers are now continuing their studies of these mice.

“We are really interested in learning how other genes in this chromosomal region may be affecting stem cell renewal,” said Clarke. “We also want to understand how much we’re able to rescue the neuronal defect by normalizing the expression of Usp16 in this mouse model. How does this compare to what is happening in humans? We’re sure it plays some significant role.”

Other Stanford researchers involved in the work were postdoctoral scholars Sha- hoon Sikandar, PhD, Anjera Kuo, PhD, and Marco Quarta, PhD; senior research scientist Siddhartha Mitra, MD; postdoctoral students Benedetta di Robilant and Youssef Ouadah; California Institute for Regenerative Medicine intern Veronica Haro-Acosta; life sciences technician Jac- queline Rodrigues; lab manager Dalong Qian; and professor of cardiothoracic surgery and pediatrics Vidyallya Reddy, MD.

The research was funded by the Californ- ia Institute for Regenerative Medi- cine, the National Institutes of Health, the Fondatazione Umberto Veronesi, the Department of Defense, the Down Syn- drome Research and Treatment Foun- dation, the Fidelity Foundation and a Stanford Graduate Fellowship.

The Department of Medicine also supported the work.

Cognitive deficits in Down syndrome linked to stem cells

By Krista Conger

The Child Health Research Institute at Stanford has awarded a total of $2.7 million to six researchers through its faculty scholar program. The awards support junior and mid-level faculty who have university-tenured or medical-center line appointments in clinical departments, and whose research involves the health of expectant mothers, embryos, fetuses, infants, children and adolescents.

Following is a list of the recipients and the titles of their research projects:

• MANISH BUTTE, MD, PhD, assistant professor of pediatrics: “Mechani- cal Forces in T-Cell Function.”
• MANPREET SINGH, MD, assistant professor of psychiatry and behav- ioral sciences: “Risk and Resilience in Youth at Familial Risk for Mood Disorders.”
• BRICK WARD, MD, assistant professor of surgery: “Developing an Effective Cell-Based Approach for Bone Regeneration in Children Through Epigenetic Manipulation.”
• MARIUS WERNING, MD, PhD, assistant professor of pathology: “Direct Lineage Reprogramming to Study and Treat Congenital Brain Diseases.”
• SEAN WU, MD, PhD, assistant professor of medicine: “Cardiac Pro- genitor Cells in Development and Disease.”
• FAN YANG, PhD, assistant professor of orthopaedic surgery and of bio- engineering: “Engineering a Brain in a Dish: 3D In Vitro Models for Studying Pediatric Brain Tumor Using Biomimetic Hydrogels.”

For more information about the institute’s faculty scholar program, visit http://med.stanford.edu/rmg/funding/chi_fac_scholar.html.
Girls’ concussion symptoms may differ from boys’, physicians say

At soccer practice last July, 13-year-old Ava James bent down to kick a ball near a goalpost when another player’s shin hit her head. The impact propelled her head into the metal post. Dizzy and a little nauseous, Ava sat down. Fifteen minutes later, feeling better, she resumed practice.

Afterward, her head began hurting again. When the pain persisted through the next few days of school, Ava told her mother, Alexandra. Ava’s pediatrician referred her to Paul Fisher, MD, at Lucile Packard Children’s Hospital.

As soccer, lacrosse, basketball and other popular “incidental contact” sports have grown in popularity among girls, so has the concussion rate, rising about 21 percent for these young athletes each year over a recent 11-year stretch, according to a study in The American Journal of Sports Medicine.

With these trends in mind, writer Louis Bergeron discussed the topic with Fisher, chief of pediatric neurology at Lucile Packard Children’s and professor of neurosurgery at the School of Medicine, and pediatric neurosurgeon Gerald Grant, MD, associate professor of neurosurgery at the School of Medicine, Grant, a U.S. Air Force veteran, treated soldiers with blast concussive injuries in Iraq.

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Q: What are the symptoms of a concussion?

FISHER: A concussion is a head injury that causes temporary impairment of normal brain function, such as loss of awareness or alertness. Girls and boys tend to report different symptoms of concussion and may also describe the same symptoms differently. Boys often report symptoms that are fairly severe — confusion, bad headaches, nausea, or pain sensitivity. But girls may report milder symptoms, such as drowsiness, malaise or noise sensitivity. But boys don’t mean a girl’s concussion is any less severe.
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A big problem here is that when a girl reports milder symptoms to a male coach — and a lot of coaches in girls’ sports — their concussion could be missed if the coach isn’t alert to the differences in how boys and girls report symptoms.

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Q: Are girls more vulnerable to concussions than boys?

GRANT: We don’t know enough to say, but there is a lot of interest and a lot of research into whether gender plays a role in the vulnerability to head injury. The Department of Defense has become particularly interested in this issue lately because of the increasing numbers of female combat soldiers.
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Fisher saw Ava two weeks after her concussion. She had played soccer in a week and a half, but had taken a few days off school. After a thorough evaluation, Fisher concluded she had already rested and recovered enough and that she could — and should — resume her normal activities.

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Q: What can be done to reduce the incidence of concussions?

FISHER: Probably the most effective way to reduce the number of sports-related concussions is to enforce the rules of whatever game is being played.
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That’s particularly important in girls’ sports, because when the level of play and the rules are the same, girls get more concussions than boys. Why? No one knows.

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Q: What can be done to reduce the effects of a concussion?

FISHER: Spot it early. Everyone should know the symptoms of concussion. Having coaches and parents keeping an eye out for symptoms isn’t enough — players and their families also need to watch out for each other.
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A lot of times athletes are reluctant to report concussion symptoms — theirs or another player’s — because they’re afraid of being thought of as wimpy or hurting the team. But they should understand that the sooner they acknowledge a concussion, the less playing time they will lose.

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A kid who gets a concussion has to sit out sports for a while. It’s paramount to keep them from getting a second concussion before the first one has healed.
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Deadly Nipah virus looms as pandemic threat, scientist says

By Rob Jordan

It usually starts with a fever and headache, maybe some cough and a disoriented feeling. Before long, inflammation of the veins, arteries and brain sets in, a seizure takes hold and you lose consciousness. Seven out of 10 cases end in death. Of those who survive, one-third have permanent, crippling neurological disorders.

That’s the fate of people unlucky enough to be infected with the Nipah virus in Bangladesh, where outbreaks occur in most years. But people outside Southeast Asia have reason to be concerned too, according to Stephen Luby, MD, professor of medicine and director of research at Stanford’s Center for Innovation in Global Health.

“The global community must do a better job of estimating and managing the risk, Luby said. That will require stepped-up study of how the virus is transmitted, closer observation of infected people and consideration of vaccinations for at-risk communities.”

Rich countries need to help improve poor countries’ health care systems — specifically, making sure health-care workers have access to protection such as gloves and hand washing — to help prevent spread, Luby said. In densely populated Bangladesh, health-care providers who treat Nipah patients typically lack gloves and masks, while patient attendants often lack soap and water for hand washing.

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In our globally connected world, humanity could face its most devastating pandemic.
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Among Nipah’s worrisome traits: Many strains are capable of limited person-to-person transmission, and it is a ribonucleic-acid virus, which has the highest known rate of mutation among biological agents. If a more efficient human-adapted strain developed, it could spread rapidly in highly populous South Asia before spilling into other regions.

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A new, Web-based game could go a long way toward plugging what James Lau, MD, calls a gaping hole in surgical education. The game, SICKO, is designed to help students and surgical trainees practice making choices about surgery without involving actual patients. Lau, a clinical associate professor of surgery at the Stanford University School of Medicine, and his colleagues are already working with medical schools outside the United States to translate SICKO into other languages.

Lau won a grant this year from the Kadry Foundation to help surgery trainees, too.

SICKO, an acronym for Surgical Improvement of Clinical Knowledge Ops, is a Web-based game designed to replicate surgeons' real-world experience, so players must cope with the care of multiple patients.

SICKO, like Septris, is designed to replicate clinicians' real-world experience, so players must cope with the care of multiple patients. Every decision a player makes is instantly commented upon by the graphic character called Dr. Sicko, who smiles or frowns and then awards or reduces points for each decision. The game includes scenarios considered classic in acute surgical disease, among them appendicitis or cholecystitis.

Today, there are no assessments of these nontraditional skills until the oral exams surgeons take as part of their board certification tests, several years beyond their first responsibilities for patient care. "We do mock exams," Lau said, "but we’ve no way to discern different knowledge levels of surgical trainees to see if they'll be able to intuit what we would want in surgery. Once we get more and more people to play SICKO, we’ll have more and more data about that." Septris, released last year, was designed by Stanford clinicians and technologists. It has been played more than 21,000 times worldwide and Stanford medical students rated their knowledge significantly enhanced by its content. SICKO has more bells and whistles than Septris; its platform can handle several levels of acuity and complexity; raw imaging, such as X-ray and MRI images; and analytic tracking of player actions. SICKO, like Septris, is designed to replicate surgeons' real-world experience, so players must cope with the care of multiple patients.

Lau and his colleagues are already considering what other surgical specialties can be practiced with the help of mobile, Web-based games. The medical school's Educational Technology group also is working with medical schools outside the United States to translate SICKO into other languages.

To learn more about SICKO and play it, visit http://cme.stanford.edu/sicko.
 Nicely put, Mr. Newby. The communications manager for Spectrum, the Stanford Center for Clinical and Translational Education and Research.

Leslie Williams

Taylor Sisck had been a gymnast since childhood and a serious competitive diver since he was 13. By the time he reached Stanford, he had been lifting his arms over his head in a similar motion for years.

Feliciana Jimenez documents hazards in her neighborhood using a computer tablet.

JASON LEE

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

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of oxytocin in autistic patients, but also suggest possible new treatments for neuropsychiatric conditions in which social activity is impaired.

"People with autism-spectrum disorders may not experience the normal reward the rest of us all get from being with friends," said Robert Malenka, MD, PhD, professor of medicine, identified a series of interconnected brain regions responsible for our sensation of pleasure in response to a variety of activities such as finding or eating food when we’re hungry, sleeping when we’re tired, having sex or acquiring a mate, or, in a pathological twist, taking addictive drugs. The reward system has evolved to reinforce behaviors that promote survival, he said.

Malenka, and lead author Gül Dölen, MD, PhD, a postdoctoral scholar in his group with over 10 years of autism-research expertise, teamed up to untangle the complicated neurophysiological underpinnings of oxytocin’s role in social interactions. They focused on biochemical events taking place in a brain region called the nucleus accumbens, known for its centrality in reward.

In the 1970s, biologists learned that in prairie voles, which mate for life, the nucleus accumbens is replete with oxytocin and is critical for mating. "We thought that activating the binding of oxytocin to these receptors impaired prairie voles’ monogamous behavior. In many other species that are not monogamous by nature, such as mountain voles and common mice, the nucleus accumbens appeared to lack those receptors," Malenka said. This observation spawns a dogma that pair bonding is a special type of social behavior tied to the presence of oxytocin receptors in the nucleus accumbens. But what’s driving the more common group behaviors that all mammals engage in—cooperation, altruism or just playing around — remained mysterious, since these oxytocin receptors were supposedly absent in the nucleus accumbens of most social animals," said Dölen.

The discovery shows that mice do indeed have oxytocin receptors at a key location in the nucleus accumbens and, importantly, that blocking oxytocin’s activity there significantly diminishes these animals’ appetites for socializing. Dölen, Malenka and their Stanford colleagues also identified, for the first time, the nerve tract that secretes oxytocin in the region, and they pinpointed the effects of oxytocin release on other nerve cell types.

"It’s very simple," Malenka said. "You like to hang out in places where you had fun, and avoid places where you didn’t. We give the mice a ‘house’ made of two rooms, a door between them. They can walk through at any time. But first, we let them spend 24 hours in one room with their littermates, followed by 24 hours in the other room all by themselves. Then, the third day we put the two rooms together to make the house, give them complete freedom to go back and forth through the door and log the amount of time they spend in each room.

Mice normally prefer to spend time in the room that reminds them of the good times they enjoyed in the company of other mice. In our preference tests, we observed that when oxytocin activity in their nucleus accumbens was blocked. Interestingly, only social activity appeared to be affected. There was no difference, for example, in the mice’s general propensity to move around. And when the researchers trained the mice to prefer one room over another by giving them cocaine (which mice love) only when they went into one room, blocking oxytocin activity didn’t stop the mice from picking the cocaine den.

In an extensive series of elegant, highly technical experiments, Dölen, Malenka and their teammates located the oxytocin receptors in the murine nucleus accumbens. The receptors lie near on nucleus accumbens nerve cells that signal for the release of other reward-system nodes but, instead, at the tips of nerve cells forming a tract from a brain region called the dorsal Raphe, which projects to the nucleus accumbens. The dorsal Raphe secretes another important substance, serotonin, triggering changes in nucleus accumbens function that are potentially important in addiction and other reward mechanisms.

"As addicted as we are to dopamine, we can’t get enough serotonin," said Zvetko Popov, MD, PhD, another assistant professor in the Department of Psychiatry and Behavioral Sciences, who also has studied the dorsal Raphe projections to the nucleus accumbens, in turn liberating serotonin in this key node of the brain’s reward circuitry. The serotonin causes changes in the activity of yet other nerve tracts terminating at the nucleus accumbens, ultimately resulting in altered nucleus accumbens activity — and a happy feeling.

"That are at least 14 different subtypes of serotonin receptor," said Dölen. "We identified one in particular as being important for social reward. Drugs that selectively act on this receptor aren’t clinically available yet, but our study may encourage researchers to start looking at drugs that target it for the treatment of social disorders such as autism, where social interactions are impaired.

Malenka and Dölen said they think their findings in mice are highly likely to generalize to humans because the brain’s reward circuitry has been so carefully conserved over the course of hundreds of millions of years of evolution. This extensive cross-species similarity, Malenka said, may also help explain why it is so difficult and time-consuming to reinforce behavior likely to boost an individual’s chance of survival and procreation.

"We think that the Simons Foundation Autism Research Initiative and the Walter and Idun Berry Foundation. Additional Stanford co-authors were graduate students Ayeh Darvishzadeh and former undergraduates Berry Foundation. Additional Stanford - at Harvard University. The Department of Psychiatry and Behavioral Sciences, supported by the Rockefeller Foundation. Nature Medicine. For this study, Malenka noted. But what’s driving the more common group behaviors that all mammals engage in—cooperation, altruism or just playing around — remained mysterious, since these oxytocin receptors were supposedly absent in the nucleus accumbens of most social animals,“ said Dölen.

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"What in the brain makes you enjoy hanging out with your buddies?"

"What in the brain makes you enjoy hanging out with your buddies?"

"What in the brain makes you enjoy hanging out with your buddies?"

"What in the brain makes you enjoy hanging out with your buddies?"

"What in the brain makes you enjoy hanging out with your buddies?"
Diabetes
continued from previous page

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Packard Children’s experts describe benefits of touch between babies, parents

By Julie Greicius

For babies, the nine months of pregnancy may feel like one long, loving embrace. It’s not surprising, then, that studies support the benefits of skin-to-skin contact for mothers and babies from the moment of birth, throughout infancy and beyond.

Experts at Lucile Packard Children’s Hospital recommend that expectant mothers incorporate immediate skin-to-skin contact with their babies as part of their birth plan.

“Even for babies born by cesarean section, skin-to-skin time right after delivery can be a wonderful, strong start for both mother and baby,” said obstetrician Susan Crowe, MD, director of outpatient pediatrics at Packard Children’s Hospital.

When the health of mom and baby allows, postponing the normal protocol of bathing, weighing and testing the baby can clear the way for shared skin-to-skin time.

“During this time, babies experience nine instinctive stages: birth cry, relaxation, awakening, activity, rest, 'crawling' (a shifting movement toward the breast), familiarization, sucking and sleep,” said Crowe, who is also a clinical assistant professor of obstetrics and gynecology at the School of Medicine. “For a mother who desires to breastfeed, supporting skin-to-skin time is one way we can help her reach that goal.”

Depending on each mother’s birth plan and medical needs, skin-to-skin time with baby offers benefits, whether the baby was born vaginally or by cesarean section. Whether it happens in the first hour or when mom is medically ready, and whether or not she is breastfeeding, skin-to-skin time in the first hour helps regulate babies’ temperature, heart rate, and breathing, and helps them cry less. It also increases mothers’ relaxation hormones.

A 2012 study published in the journal Neonatology showed that 95 percent of mothers who spent skin-to-skin time were breastfeeding exclusively 48 hours after delivery, and 90 percent were still breastfeeding exclusively as weeks later.

Babies and mothers with special medical needs also benefit from skin-to-skin time, when it becomes medically possible. In the meantime — and beyond that point as well — the mother’s partner can provide skin-to-skin time with baby, which can help keep baby warm and provide bonding time.

As babies grow, infant massage provides a natural next step to continue this bond and its benefits. “Infant massage is always about bonding, loving and respect,” said Maureen McCaffrey, a certified infant massage instructor at Packard Children’s. “We start by asking permission, and then listen for the baby’s cues to see if they’re engaging or disengaging. Babies communicate with us from the moment they’re born through body language, sound and behavior.”

In her classroom, McCaffrey sets up a nurturing environment that’s easy, safe and relaxing example to parents. “The environment is very important. Parents can begin to feel the benefits just by setting up a quiet, relaxing space where massage will take place,” she said.

McCaffrey teaches a variety of infant massage techniques tailored to the unique needs of babies and families and focuses on the shared benefits. Following is just a sampling of benefits that infant massage can provide:

- Enhance babies’ awareness of being loved, accepted and safe.
- Improve deep sleep patterns for babies.
- Improve digestion and elimination for babies.
- Reduce fussiness for babies and increase their comfort in their environment.
- Improve neurological function in babies.
- Increase weight gain for premature and full-term babies.
- Increase lactation production for mothers.

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When eighth-grader Jaden Turner isn’t absorbed in his schoolwork, he enjoys playing basketball with his buddies, listening to music and — like most teenagers — playing video games.

But over a period of roughly four months earlier this year, such normal activities were often unendurable for the young San Franciscan. He suffered from migraine headaches so severe that on many days exposure to anything more than dim light or a soft voice was agonizingly painful. His head was so hypersensitive to touch that a haircut was intolerable.

But thanks to an ongoing collaboration between California Pacific Medical Center and Lucile Packard Children’s Hospital, Jaden’s migraines are a thing of the past.

It started in January, when Jaden, then 12 years old, developed what seemed to be an ordinary headache. It passed, but soon he was afflicted with another headache. And another. And another. At times he would vomit when he was stricken.

As the headaches worsened, Jaden’s mother, Stacey Williams, took him to CPMC. The symptoms were awful: Once, Jaden’s school called Stacey because he had another headache, vomited and reported feeling tense and numbness in his right arm and down his leg.

“Whatever really worried me was that I didn’t really understand why my legs and arms would be shaking because of a headache,” Jaden said.

The diagnosis was migraines, but test and theophylline didn’t help. That’s when the family was referred to Packard Children’s neurologists at CPMC. Since early 2012, physicians at both Packard Children’s and CPMC have been working together to enhance access to specialized care for San Francisco and North Bay children.

Packard Children’s pediatric neurologist Sunny Jung, MD, who is also a clinical assistant professor of neurology at the School of Medicine. “For a mother who desires to breastfeed, supporting skin-to-skin time is one way we can help her reach that goal.”

“My children’s breast,” said Jung.

The hospital referred to Packard Children’s Pain Management Service, where anesthesiologist Meredith Brooks, MD, evaluated him.

Brooks, who is also a clinical assistant professor of anesthesiology at the School of Medicine, agreed that his symptoms were consistent with his parents’ description. “During this time, babies experience nine instinctive stages: birth cry, relaxation, awakening, activity, rest, ‘crawling’ (a shifting movement toward the breast), familiarization, sucking and sleep,” said Crowe, who is also a clinical assistant professor of obstetrics and gynecology at the School of Medicine. “For a mother who desires to breastfeed, supporting skin-to-skin time is one way we can help her reach that goal.”

Depending on each mother’s birth plan and medical needs, skin-to-skin time with baby offers benefits, whether the baby was born vaginally or by cesarean section, whether it happens in the first hour or when mom is medically ready, and whether or not she is breastfeeding, skin-to-skin time in the first hour helps regulate babies’ temperature, heart rate, and breathing, and helps them cry less. It also increases mothers’ relaxation hormones.

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As babies grow, infant massage provides a natural next step to continue this bond and its benefits. “Infant massage is always about bonding, loving and respect,” said Maureen McCaffrey, a certified infant massage instructor at Packard Children’s. “We start by asking permission, and then listen for the baby’s cues to see if they’re engaging or disengaging. Babies communicate with us from the moment they’re born through body language, sound and behavior.”

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Postdocs will share work Oct. 11 at annual event

The university community is invited to a half-day event Oct. 11 featuring select oral and poster presentations by Stanford postdoctoral scholars.

The third annual Stanford Postdoctoral Research Symposium is free and open to all Stanford affiliates. The planning committee should register at http://goo.gl/FGuKqw.

The event takes place at the Office of the Vice Provost for Graduate Education, the Office of Postdoctoral Affairs and the Office of the Dean of the School of Medicine.

Jaden Turner was plagued by debilitating migraines for months.

September 23, 2013            InSIde Stanford medIcIne

Julie Greicius is editorial director for the communications office at Packard Children’s Hospital.