Could Lifestyle Changes Slow Alzheimer’s Effects?
Twenty-five years ago, USC developed a new degree program that to many seemed unthinkable – the doctor of physical therapy. Today, it is hard to believe that the idea engendered such resistance and skepticism.

In this issue (page 3) we announce a new pathway to the DPT that might again appear inconceivable — a hybrid program that will combine significant online learning with live face-to-face sessions and on-campus intensives for hands-on training.

The contractual arrangements for this new hybrid program, which we are calling DPT@USC, have only just been finalized. This did not give us time for extensive coverage of this new program in this issue of inMotion, but we do intend to provide comprehensive coverage in future issues.

Nevertheless, let me make a few points about this new pathway to the DPT.

Why are we doing this? First and foremost, we strive to maintain our leadership in the physical therapy educational community. We at USC and at the other top PT programs need to expand our reach to meet the surging demand for doctors of physical therapy. In the past five years, 34 new programs have started, so we are growing new programs at the rate of seven a year — the vast majority in colleges that you have never heard of. This rapid proliferation of programs is a looming disaster for the profession. We need to respond responsibly and with a clear vision of the profession’s future. While increased access to DPT education is certainly necessary, we strongly believe that it is better for this to occur by expanding programs of proven quality than to start new programs. Too often new programs are too small to provide the breadth of physical therapy expertise that is needed to educate 21st century physical therapists. USC Physical Therapy needs to continue to be a leading force in the PT educational community. That is the responsibility that comes with being No. 1.

DPT@USC will also allow us to provide access to a USC DPT education to a wider audience of potential students, especially to those who may be unable to move their families or household to Los Angeles. Online education is growing steadily. As of 2014, 29 percent of undergraduates were taking at least one class online; nearly half of those were taking their entire program online. Among graduate students, over a quarter are earning their degrees exclusively online. Clearly, online undergraduate and graduate education is the future, and we must lead the way in adapting these approaches for physical therapy education. Most important, we now have the technology and expertise to ensure that online education is not merely the poor country cousin of on-campus education. Indeed, over the past decade, we have been adopting online technologies and methods for our on-campus program, with excellent results.

Finally, we have been working on this program for almost a year and a half, including intensive discussions among faculty and with our new corporate partner, 2U, Inc. At the beginning of this lengthy deliberation by the faculty, we made a commitment to ourselves. We decided that we would not undertake any new program, or any changes to our existing DPT program, that would in any way reduce the quality of the education and the excellence of our graduates.

As we begin this new chapter in the history of USC Physical Therapy, we make that same promise to our students, to our alumni, to our patients, present and future, and to all those who look to USC PT for leadership and inspiration.

Here at USC, we consider it our job to imagine the future of health care and to translate the vision into our educational programs. This new program represents our best attempt to create the future in physical therapy — to transform DPT education. We do not undertake this new direction lightly. We have considered, discussed and debated the various possibilities for well over a year. We are genuinely excited about being the first program to create a top-quality DPT program that takes advantage of the newest online technologies. We believe that this new program will enable us to continue our leadership in physical therapy education. We believe that we must earn the right to be called the No. 1 program, and we earn that right by imagining and creating the future.

Fight on!

James Gordon
Associate Dean and Chair,
USC Division of Biokinesiology & Physical Therapy
COVER STORY

BREAKING THE MOLD

14-19

BY MICHELLE McCARTHY

Could lifestyle changes be the key to slowing Alzheimer’s symptoms? A new collaboration between USC physical therapy and the USC Stevens Neuroimaging and Informatics Institute aims to find out how cognitive and physical activity might affect the brain health of people at risk for the progressive disease.

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BY HOPE HAMASHIGE
Jab, jab, hook. Could boxing help knock out symptoms related to Parkinson’s disease? Find out how one physical therapy practice is getting patients with neurological conditions to step into the ring to strengthen their minds and bodies.

EARNING THEIR STRIPES
24-25

BY JAMIE WETHERBE MA ’04
USC physical therapy students gain valuable experience serving some of our country’s bravest men and women through unique fieldwork experiences with the armed forces. Meet three students who just completed their 16-week extended clerkships on military bases across the country.

CONTRIBUTORS

KATHARINE GAMMON
Katharine Gammon is a freelance science writer based in Santa Monica, Calif., and writes for a wide range of magazines covering technology, medicine and child development. When not chasing her young sons around or interviewing scientists, she can be found on a horse or a sailboat. Gammon traveled into the immersive world of virtual reality to write “Virtual Reality Rehab,” exploring the ways in which Assistant Professor Sook-Lei Liew is using VR to help survivors of stroke regain movement in their arms and hands.

BRYAN KANG MA ’18
Growing up in Redondo Beach, Calif., Bryan Kang feels privileged to have soaked up the Southern California sun his whole life. Kang attended UCLA for his undergraduate degree and is now enrolled in the master’s program at the USC Chan Division of Occupational Science and Occupational Therapy. During his free time, Kang loves to play guitar, take pictures in the woods and spend time with his dog, Sandy. For this issue, Kang interviewed the Prehab Guys, which you can find on page 5.

DAVE MURRAY
Dave Murray is a Toronto-based illustrator and creative. When not creating images for a growing list of clients (including Scientific American, the Wall Street Journal and the Washington Post) Dave can be found cycling, playing hockey, walking his dog, Sophie, and cheering for the Montreal Canadiens. In this issue, Murray conceived and illustrated the title page for “Earning their Stripes,” chronicling the lives of USC physical therapy students completing their clerkships on U.S. military bases, on page 24.
USC physical therapy to launch blended online-on campus DPT program

BY JOHN HOBBS MA ’14

The division has partnered with education technology company 2U, Inc. to launch its top-ranked doctor of physical therapy (DPT) program into cyberspace.

The blended online-on campus program, called DPT@USC, is scheduled to accept its first students in Fall 2018, pending approval by USC and the appropriate accrediting boards.

It will not replace the existing on campus DPT program. It will only extend the program to promising students across the nation who are unable to relocate to Southern California.

It’s the latest move for a program that has long been at the vanguard of physical therapy education. In 1978, USC launched the nation’s first PhD in physical therapy program, and in 1995, the first accredited DPT program — both of which pushed the profession further toward the evidence-based science it is today.

“USC has a long history of pioneering and shaping the profession through groundbreaking leadership in research, education and clinical practice,” said Associate Dean James Gordon.

“We are excited to partner with 2U to launch an online doctor of physical therapy program that will be both innovative — by leveraging the best elements of online and experiential learning — and accessible, by reaching more students nationwide to meet the growing demand for highly qualified physical therapists.”

It has been Gordon’s longtime vision to advance physical therapy education by quantum leaps through the use of technology and innovative educational practices.

“We are the architects of our profession’s future. Through our efforts today, we design and build the foundations and frameworks that will make it possible for a strong and vibrant and creative profession to emerge in the next decade, in the next 40 years, in the next century,” Gordon said during his 2014 Mary McMillan Lecture.

DPT@USC students will receive the same high-quality and academically rigorous training, with the same access to expert faculty members, as their on-campus counterparts. To graduate, online students must complete 33 courses, 50 weeks in full-time clinical internships and will be required to travel to USC for more than 65 days of hands-on clinical skills laboratories.

The online program will include collaborative, live classes as well as high-quality engaging coursework developed by USC faculty, utilizing 2U’s innovative learning platform.

“Here at USC, there is no more important task than educating the next generation of physical therapists,” Gordon said. “Online education is not merely about convenience. The online environment provides opportunities for learning that go beyond what is available in a traditional classroom.”

He adds, “With DPT@USC, we hope to combine the best that USC physical therapy has to offer with the best online platform to develop a program that will serve as a model for other academic institutions looking to launch their own online programs.”

2U partners with great colleges and universities to build what it believes is the world’s premier online education. At USC, it has developed partnerships with the USC Suzanne Dworak-Peck School of Social Work as well as the USC Rossier School of Education, both of which utilize the 2U platform for their online programs.
IN BRIEF

RESNIK NAMED CATHERINE WORTHINGHAM FELLOW

Associate Chair and Associate Professor of Clinical Physical Therapy Cheryl Resnik DPT ’97 has been named a Catherine Worthingham Fellow of the American Physical Therapy Association (APTA), continuing the division’s distinction of having the highest concentration of fellows, with nine faculty members adding the FAPTA credential behind their names. The fellowship is the highest honor bestowed by the APTA. It is meant to inspire all physical therapists to attain the same professional excellence and impact that its namesake Catherine Worthingham, a physical therapy visionary, did during her career. To be eligible, a physical therapist must have at least 15 years’ experience contributing to the profession through leadership, influence and achievements. Resnik was president of the California Physical Therapy Association (CPTA) from 2007 to 2010. She also served as vice president of two sections of the CPTA, chair of the APTA Ethics and Judicial Committee and currently serves on the National Interprofessional Education Consortium.

GODGES RECEIVES 2017 LUCY BLAIR SERVICE AWARD

Adjunct Associate Professor of Clinical Physical Therapy Joe Godges has won a 2017 Lucy Blair Service Award for his more than 35 years of service to the American Physical Therapy Association. The prestigious award honors physical therapists who have made exceptional contributions to the APTA through appointed or elected positions at the association and component levels. Since becoming a member in 1980, Godges has served in several leadership roles on the APTA’s Orthopaedic Section and the Committee on Clinical Residency and Fellowship Credentialing. The Lucy Blair Award has been bestowed upon APTA members with profound expertise since 1969. Past division honorees include Cheryl Resnik DPT ’97, William O’Grady MS ’77, Michael Pagliarulo MS ’74, Judith Deutsch MS ’86, John G. Wallace Jr. MS ’81 and Katherine Sullivan PhD ’98. Godges will officially receive the award at the 2017 NEXT Exposition and Conference, taking place June 21-24 in Boston.

USC physical therapy researchers to study use of electrical stimulation therapy for stroke survivors

BY JOHN HOBBS MA ’14

Could electricity help stroke survivors regain control of their legs and return to mobility? It’s a question that Assistant Professor James Finley and Professor Carolee Winstein MS ’84 hope to answer with a new study that could transform the way physical therapists help stroke survivors get back on their feet.

Finley and Winstein were recently awarded an Innovative Research Grant by the American Heart Association/American Stroke Association (AHA/ASA) to study the use of non-invasive electrical stimulation to improve stroke survivors’ walking ability.

The study, titled “TESLA-Stroke: Transcutaneous Electrical Stimulation for Locomotor Ability After Stroke,” builds upon a promising treatment modality called neuromodulation, which is a treatment during which electrical or magnetic stimulation is applied outside the body to treat problems ranging from spinal cord injury to urinary incontinence to depression.

TESLA-Stroke uses the treatment in a completely different way to treat stroke survivors, applying external non-invasive electrical stimulation directly to the spine, instead of the brain where it is most often used.

What we’re saying is, “Sure the brain is important, but we don’t want to ignore the role of the spinal cord, particularly as it pertains to walking,”’ Finley said.

If the proof-of-concept study is successful, it could offer physical therapists a promising new treatment to get survivors of stroke back on their feet.

According to the Centers for Disease Control, more than 795,000 people have a stroke in the United States each year — one every 40 seconds — with more than 600,000 surviving. Stroke is also the leading cause of serious long-term disability.

Crosstown Collaborators

The study pairs the division’s stroke rehabilitation expertise with spinal cord physiology expertise from the Edgerton Neuromuscular Research Laboratory. That lab, part of the University of California, Los Angeles, is led by Dr. V. Reggie Edgerton, who has been studying spinal cord physiology for more than 40 years.

Edgerton and his team have used electrical stimulation to treat patients with spinal cord injury. They have published a number of studies that demonstrate significant changes in lower extremity function as a result of spinal cord electrical stimulation, Finley said.

“We hope to use electrical stimulation the same way in stroke survivors to actually show some short-term improvements in walking function or even control of the legs,” he added.

The study will be conducted in two phases. First, researchers will focus on asymmetry, determining which segments of the spinal cord, when stimulated, impact which muscle activity patterns in each leg.

Secondly, the team hopes to find optimal stimulation locations and combinations to help improve lower extremity function.

“If we could, for some subset of stroke survivors, actually improve their walking function beyond what is currently possible with standard techniques, we could imagine this becoming an actual intervention,” Finley explained.

Finley joined the division in 2013. He is the director of the Locomotor Control Laboratory and has devoted himself to better understanding how locomotion is controlled and adapted in both healthy and injured neuromuscular systems. The junior faculty member has two active grants and three completed grants, totaling nearly $900,000.

Winstein has been a professor at the division since 1990. She runs the Motor Behavior and Neurorehabilitation Lab, which is focused on motor control and learning.
Michael Lau DPT ’17, Craig Lindell DPT ’17 and Arash Maghsoodi DPT ’17 are on a mission to redefine physical therapy. Looking to optimize the human movement system to reduce injury risk, the “Prehab Guys” have recorded nearly 400 short videos demonstrating strength-training exercises for the online masses. And with 124,000 Instagram and 37,000 Facebook followers — and a USC physical therapy education, to boot — these guys might just have what it takes to change the public’s perception of physical therapy.

PHOTO BY NATE JENSEN

Continued on page 6 »
Your mission statement talks about “instilling new meaning into physical therapy.” What does that mean? There is a physical therapy identity crisis. Our ultimate goal is to re-brand the profession in the eyes of the public. Physical therapists are movement specialists, and it’s our belief that physical therapists should be leading the way in health and wellness. Why take a reactive approach to health? Let’s optimize the movement of the population — from the youth soccer player at risk for an ACL injury to the 80-year-old grandma at risk for hip fractures from falls — and take a preventative approach to health.

What are some ways an average person can work the concept of “prehab” into their activities? By following us! (laughs) But seriously, we produce daily evidence-based content with the purpose of informing people how to be proactive with their health and fitness. We provide free education to help the average person identify flaws with their movement system. More importantly, we offer the tools via exercises on how to train better, smarter and more efficiently.

How has USC’s DPT program helped equip the Prehab Guys going forward? The DPT program at USC has provided us with many tools and resources, but above all, it has taught us how to think critically and self-reflect. As a group, we are skeptical of what we learn, both in class and online, and we constantly critique each other’s work to put forth a better product. We are fortunate USC has instilled this way of thinking into us from the beginning.

What are some future goals for the Prehab Guys? We have plans to open a clinic, teach globally and revolutionize the way education is taught online.

Follow the @theprehabguys on Instagram.
Rx

Exercise

Obesity could be to blame for breast cancer recurrence, according to an Allure.com article, highlighting a study done by Christina Dieli-Conwright PhD ’09, associate professor of research at the division.

Knowing that an excess amount of fat creates a chronic state of inflammation in the body — which can stimulate breast cancer progression — Dieli-Conwright collected fat biopsies from 10 exercising breast cancer survivors versus 10 who didn’t exercise, looking for chemical signs of inflammation.

It turns out inflammation levels in the exercising group actually declined. “Our results showed, at the tissue level, that exercise produces anti-inflammatory effects in the body,” Dieli-Conwright tells Allure. “By reducing inflammation through exercise, we may be able to decrease the risk of breast cancer mortality in obese women.” Larger studies are needed to confirm her findings, Dieli-Conwright says. Read more about her study here.

No Mountain High Enough

In their everyday lives, they might need crutches or a wheelchair to get around. But for awhile, when they’re on the mountain, the individuals with disabilities participating in an Unrecables ski trip, get to experience true freedom as they rush down the snowy mountainside.

“It’s pretty incredible to see the look of accomplishment on their faces when they’ve been able to progress in their skiing ability or just going for a ride down the mountain,” says Michelle McCarthy DPT ’98.

The USC alumna is president of Unrecables (short for “Unlimited Recreational Ability”), which is the L.A. branch of Disabled Sports USA, a nonprofit organization that aims to improve the lives of people with disabilities by giving them opportunities to enjoy the great outdoors.

Every year, Unrecables takes up to seven ski trips to Mammoth, Calif., where participants with disabilities — including vision and hearing loss, stroke, brain injury, cerebral palsy and multiple sclerosis — carve up the snow, with assistance from adaptive devices. “Each individual needs something different,” McCarthy explains. “And they may need something different each trip. We have to recognize how we can best help them stay safe and have a really fun time on the mountain.”

Interested in volunteering with Unrecables? Visit unrecables.com to find out how.
For Dora Shaieb MPT ’88, life these past few years has been a walk in the park — a walk in 51 parks, in fact, as the outdoor adventurer and hiking enthusiast has crisscrossed the nation to complete her personal goal of visiting all 59 U.S. national parks.

“As you get closer to age 50, you start thinking of ‘bucket lists’ and all the things you want to do,” Shaieb says. “I knew how much I enjoyed the parks in the past, and knowing there were 59, which doesn’t seem like that many, I just thought ‘Why not visit them all?’”

Shaieb MPT ’88 began her outdoor odyssey in 2012, with just a handful of national parks already under her belt. In the past four years, she ramped up her park attendance, stealing away for an average of 10 parks per year — sometimes visiting several in just one trip. She once completed an epic roadtrip, renting a car in Tennessee and covering 3,500 miles (and 15 states) to visit five parks in the region.

While it might seem like work to some, trips to the park give Shaieb, who often travels alone, a break from the hassles of 21st century life.

“These visits are exactly what I want them to be, which is freedom and enjoying nature and what God has given us on this planet,” Shaieb says. “You don’t have to worry about a lot of the things we are doing to harm the world because it’s not happening there in the parks.”

Next up on her bucket list is to travel to all of the Pac-12’s football stadiums (she has two left) and visiting all seven continents (she’s already checked off her list Australia, Europe and North America).

★ Been there, done that!
★ I’m on my way!

Parks & Recreation
Getting a Leg Up on Injury

Division student holds cycling and running clinics to help fellow athletes avoid serious injury.

Longtime cyclist Randi Richardson DPT ’17 knew something had to be done when she would hear fellow cyclists complain about common aches and pains during group rides. “I started to notice this flexed posture that the athletes were in on the bike as well as while standing and sitting,” says Richardson, who used her USC physical therapy education to begin holding clinics in local bike shops to help area cyclists avoid injury. The 90-minute sessions begin with Richardson demonstrating typical cycling postures and how they might create tightness or fatigue in certain muscle groups. She then leads participants — an average of 15 to 18 people — through exercises showing postures to avoid as well as stretches to do to strengthen their muscles. “When Randi hosted her first clinic with me, I was just coming back from several weeks off the bike due to two herniated disks in my spine,” says Jennifer Landis, 30, a clinic attendee. “She spoke to my injury and explained — better than my doctor had — what was going on, what I could do to prevent it in the future and why the rehab I was doing was going to help me recover.”

In late 2016, Richardson also began holding running clinics, where she educates runners on typical running injuries, footwear and running pattern considerations as well as good strengthening and stretching exercises. “I see these people at least once a week,” says Richardson, who works out with many of the participants outside her clinics. “To watch them grow and utilize the tools they were given is very rewarding and further fuels my interest in getting this information out.”
Trojan Newsmaker

Live from Richmond, Va., WRIC News — Laura (Tampanello) Thoene DPT ’03 was featured on the local ABC affiliate for her work last summer with the FUNfitness program during the 2016 Special Olympics World Games. “This population tends to be underserved within the community, so this is an opportunity to screen them individually and see if there’s any needs for them,” says Thoene, Virginia’s FUNfitness clinical director, beginning around :56. Check out the video here.

Tied-Up Training

You might need to brush up on your tourniquet tying skills soon.

Blood-flow restriction training — or “tourniquet training” — has been gaining popularity recently in the sports world.

The technique, featured here by APTA’s Move Forward Radio, involves limiting blood flow to an injured limb, thereby depriving the muscles of oxygen, while the athlete performs a routine exercise. The lack of oxygen not only triggers increased lactic acid production but also keeps the acid in the muscle longer, promoting robust muscle growth without further damaging any injured joints.

A recent article in the New York Post highlighted the blood-flow restriction training provided by physical-therapist-to-the-sports-stars Drew Morcos DPT ’07, who used the technique on New York Knicks player Carmelo Anthony after knee and shoulder injuries nearly sidelined him. Read more about it here.
5 Things To Know About

Carly Ow-Wing

The grass doesn't grow under Carly Ow-Wing's feet. Whether mentoring, running the L.A. Marathon or cooking a delicious meal, she prefers an active lifestyle with both creative and physical outlets to keep her busy. It's part of why she chose a career in physical therapy. “I'm not the type of person who likes to sit behind a computer,” she says. “I like to be interacting with people and moving, staying active throughout my day.” Now as a physical therapist at Keck Hospital of USC and an instructor of clinical physical therapy at the division, Ow-Wing’s time is divided between caring for patients with neurological impairments and helping students ensure their clinical affiliations are met to receive their DPT degrees. Here are five more things to know about Ow-Wing:

1. THE SOUTHERN CALIFORNIA NATIVE HAD AN ITCH TO CHECK OUT THE EAST COAST. Carly Ow-Wing was born and raised in Newport Beach, Calif., but decided she needed a change when it came time to apply for college. “I wanted to get out and see what life was like on the East Coast,” she says. Ow-Wing attended Wake Forest University in Winston-Salem, N.C., for undergrad. After earning her bachelor’s degree, she moved to New York City where she attended Columbia University for her DPT degree.

2. SHE IS A CERTIFIED PILATES INSTRUCTOR. “I have always been interested in science and medicine, and I've always held roles as a teacher during my academic and extracurricular activities,” she says. In college, she taught Pilates and cycling classes while also mentoring and tutoring other students. She even taught Pilates while working on her DPT degree. She credits her interest in physical fitness and science for paving her way in physical therapy.

3. HER MOST MEMORABLE PATIENT CARE STORY WENT BEYOND PT TREATMENTS. Ow-Wing worked with a patient with a spinal cord injury who became quadriplegic after a gang attack. Ow-Wing stepped in to provide compassionate care and friendship to the patient who had no family in the area. She often brought him his favorite Starbucks drinks and took him around the hospital to see some of his previous nurses. “It made him really happy,” she says. “I think his case is a perfect example of how being a PT and working on functional mobility also translates over to the patient’s experience after a traumatic and life changing event.”

4. SHE IS LOOKING FORWARD TO ESTABLISHING HERSELF AS A PT AT THE KECK HOSPITAL OF USC. “The patient population is very acutely ill, and the medicine at Keck is really advanced, so everyday I feel like I'm learning something new,” she says. During the next five years, she hopes to get her neurologic specialist certification and to become even more involved with academics and students as much as possible.

5. SHE'S MADE A CREATIVE HOBBY INTO A BUSINESS. Ow-Wing recently turned her calligraphy hobby into a business called Calligraphy by Carly. She provides her services mostly to brides and others who are having parties. “Its a nice creative outlet that I need and don’t always get from [physical therapy],” she says. “I'm also currently working on my own wedding invitations, which is of course really fun!”

PHOTO BY NATE JENSEN

BY YASMINE PEZESHKPOUR MCM ’16
Parkinson’s disease nearly knocked Robert Yoshida off his feet. But with physical therapy — and weekly boxing classes — Yoshida has found the footing to hold off the mental and physical decline brought on by the neurological disease.
Yoshida’s case, he was also unable to control the direction he was walking and could not stop unless he ran into something or fell.

As a result, he began to experience regular falls, which made it impossible for him to continue his job as a financial analyst. Only 50 at the time, Yoshida’s quality of life took a major hit. “I would lean forward and run, and I could not control it,” he says. “I didn’t leave the house much because of it.”

In an effort to improve the festination, Yoshida sought help from a physical therapist. At first, not much changed — in part, he says, because his first therapist had not worked with patients with Parkinson’s and didn’t have the tools to help his festination.

After failing to improve, a neurologist at Keck Medicine of USC suggested he try again with **re-active physical therapy & wellness**, a clinic run by Erin Caudill, a division faculty member who specializes in working with patients with neurological conditions.

When Yoshida first met Caudill, adjunct instructor of clinical physical therapy, his festination was so severe that it was putting him in danger. “He was walking so fast, he was almost running and he was falling a lot, which can lead to serious injuries,” Caudill says.

She notes that physical therapy can be extremely beneficial for patients with a broad range of neurological disorders, including stroke and traumatic brain injuries. But the specialty is still relatively young, and not all neurologists are aware that their patients would be better served by working with a physical therapist who specializes in patients with neurological disorders, Caudill explains.

**Physical therapy can help**

The physical therapy performed at re-active is all grounded in the growing body of scientific research on physical activity for neurological patients. By incorporating the latest findings on neurological disorders and exercise, the re-active team has developed therapies that are very effective for patients like Yoshida, who struggle with a range of symptoms from their condition.

With respect to patients with Parkinson’s, in particular, Caudill notes that much of the groundbreaking research is being done by Keck neurologists and has changed the way they treat Parkinson’s patients.

They now know, for example, that Parkinson’s patients should do vigorous, high-intensity workouts, and that their program needs to involve both aerobic and skill-based exercise for maximum benefit.

By maximum benefit, Caudill doesn’t just mean they should only experience improvements in muscle control, balance, posture and their overall endurance. They now know that Parkinson’s patients — if given the right type of physical therapy — will not only experience changes in their bodies and muscles but also in their brains.

“This is a way to promote better blow flow to the brain, which promotes better use of dopamine,” Caudill says, adding that many patients reduce their medication if they stay with physical therapy. “With the right program, people can get better and not worse, and Parkinson’s patients can make improvements even years after the onset of their disease.”

**Stepping into the ring**

Yoshida’s treatment at re-active involves at least two sessions a week. One is a high-intensity exercise class aimed at helping participants improve the most common challenges for patients with Parkinson’s disease — balance, posture and endurance. The other is a one-on-one boxing class taught by Jacki Nash DPT ’16.

Nash says that there is little research on boxing and whether it benefits Parkinson’s patients, but she believed that many of the types of movements that are taught in a boxing class are those that are known to help address Parkinson’s symptoms.

“There is a lot of rotating, which helps with rigidity, which can be a big challenge for people with Parkinson’s,” she says.

Boxing also forces participants to do two skills at once. They have to follow precise stepping patterns, while practicing specific types of hits, like jabs and hooks, with their arms at the same time. Those types of moves require intense focus for many individuals with Parkinson’s who not only struggle with balance and strength but also in reacting to commands to move certain ways.

Yoshida was one of the first re-active participants to sign up for boxing and says he struggled initially, both with performing the moves and with developing the strength to hit hard. “Now, I feel like I am moving fluidly when I box,” Yoshida says. Nash adds that he has become a “powerhouse hitter.”

Since starting physical therapy at re-active three years ago, Yoshida says he has been able to reduce his medication and has even seen improvements in many of his symptoms.

“I am standing better, and my balance and strength is better,” Yoshida says, noting that he still festinates, but can now control the direction he walks and rarely falls anymore.

“My progress is a testament to the quality of the staff and the program,” he says. “I plan on coming here for as long as I can.”
BREAKING THE MOLD

USC physical therapy partners with Keck School of Medicine of USC for an exciting new study examining the impact of cognitive and physical activity on brain health in patients at risk for Alzheimer’s.

BY MICHELLE McCARTHY
Research participants placed in the physical activity intervention group will do moderate aerobic walking 150 minutes each week to determine its impact on their brain health.
It can start slowly and with slight changes.

You misplace your keys. You walk into a room and can’t remember why you went there. While these common lapses can be chalked up to busy schedules or simply getting older, in time, the behavior can morph into forgetting conversations altogether or not being able to recall names of people you know. These are symptoms many patients diagnosed with Alzheimer’s disease cite as the first signs something is off.

Early on, they know they’re changing,” says Judy Pa, assistant professor at the USC Stevens Neuroimaging and Informatics Institute and the neurology department — both in the Keck School of Medicine of USC. “They used to be outgoing and go to dinner parties, and now they have anxiety and don’t want to go out because they’re embarrassed. ‘What if I don’t remember Sue’s husband’s name this time?’ Or they start to tell the same stories over and over again, and their child or spouse will say, ‘Oh, you actually told me that already.’”

ALZHEIMER’S TREATMENTS DON’T WORK

While there are a few medications approved by the FDA for the treatment of mild to moderate dementia, there is currently no effective treatment for Alzheimer’s, a slow and progressive brain disease that affects 5.5 million Americans. Pa says the problem is these medications do not treat the disease itself; they only treat the symptoms.

“Unfortunately, they don’t really work,” she explains. “Patients will take them and say, ‘I am starting to feel better’ for maybe a few months, and then the effects wear off. A lot of studies suggest that even if the medication makes you feel better for a few months, the patient will still have the same amount of decline as those who never took it. Neurologists will prescribe them because they feel it’s worth a shot. But at the end of the day, it’s not a disease-modifying treatment.”

This lack of pharmacological options for those suffering with the disease is what inspired Pa to develop the research project, LEARNit (Lifestyle Enriching Activities for Research in Neuroscience Intervention Trial), which will look into whether two modifiable lifestyle factors — physical and cognitive activity — can have an impact on brain health in people who have not been diagnosed with Alzheimer’s but are at risk for the disease.

“What we’re looking for is a noninvasive way to help older adults keep their brains healthy,” says LEARNit Project Manager Lisette Isenberg, who holds a Ph.D. in cognitive neuroscience. “The goal is to see whether a relatively easy intervention, as opposed to going on a drug, is going to make a big difference in how their brain is able to function as they age.”

COULD LIFESTYLE ADJUSTMENTS MAKE A DIFFERENCE?

Pa says there is evidence that if you improve conditions such as high blood pressure, diabetes, high cholesterol, depression and lack of cognitive stimulation, it can potentially reduce your risk for Alzheimer’s disease.

“There are different studies that have examined these modifiable lifestyle factors but not enough clinical trials to actually prove it,” Pa says. “They were observational and aggregated data that already existed, whereas in a trial, you can randomize people and have more control over any potential baseline differences between your groups.” LEARNit is one of the first studies to take an in-depth look at the effects of cognitive and physical activity from a brain-imaging perspective.

According to Pa, there is not enough public awareness of the impact modifiable lifestyle factors can have on the brain. “That’s why we focus so much brain imaging and blood draws,” she says. “So we have empirical evidence that physical or cognitive activity has specific brain effects that we can measure and then take that back out to the public and say, ‘This is what it’s doing to your brain.’”

LEARNit received a five-year, $2.9-million grant from the National Institute on Aging, an arm of the National Institutes of Health, and plans to enroll 100 participants between the ages of 60 and 80 in one of two at-home interventions. They are looking for individuals who are sedentary, willing to undergo brain imaging, competent in English, mobile and interested in contributing to the science of brain aging.

FORGETTING CONVERSATIONS

Jeff Leonard, 66, learned about the trial during a presentation Pa gave at his church. Though not officially diagnosed with Alzheimer’s, Leonard has noticed in the past few years that it can take longer to recall specific words he’s looking for. “My wife thinks I forget some of the conversations we have,” he says.

But his decision to sign up for LEARNit came more from a desire to be of service. “When I was in college getting my MBA, I had to do research, and I remember it was tough to find people who would participate,” he says. “I thought this was something I could do, and it would be helpful.”

To determine a baseline assessment, participants undergo a battery of cognitive and physical tests over two days at USC’s Health Science Campus that includes neuroimaging via MRI and PET scanning.

LOOKING AT THE IMPACT OF PHYSICAL ACTIVITY

Those randomly placed in the physical activity intervention will be doing moderate aerobic walking 150 minutes a week. “It should be fast and get their heart rate up,” says Erin Fitzgerald DPT ’13, a physical therapist and the trial’s interventionist. She will be walking with the participants once a week for the first month, every other week for the second, and then once a month thereafter. Fitzgerald will teach them how to increase the intensity of the activity if their heart rate isn’t reaching the optimal level. “They can do that by picking paths that are longer and have hills,” she says.
Research participants in the cognitive activity intervention group will spend 150 minutes a week reading about modifiable lifestyle factors important for aging and Alzheimer's disease to determine its impact on their brain health.
She’ll be talking to them about monitoring their heart rate, staying motivated, picking a time of day that works, walking with music or a partner, wearing comfortable walking shoes and appropriate clothing, finding safe locations and finding places to walk if it’s raining.

“Alzheimer’s disease is in part caused by the death of cells in a specific portion of the brain,” Isenberg says. “Exercise can help generate new cell growth in that area.”

“Exercise has a lot of very positive brain effects,” Pa adds. “One is neurogenesis. For a long time, we thought we were born with all the neurons we would ever have in our life. That’s why we said we really need to take care of them. But we now know there’s an event that happens called neurogenesis in which there is a birth of new neurons.”

**LOOKING AT THE IMPACT OF COGNITIVE ACTIVITY**

Participants randomly placed in the cognitive activity group will spend 150 minutes a week reading about specific modifiable lifestyle factors that are important for aging and Alzheimer’s disease. There are 15 topics that include smoking cessation, healthy eating, sleeping habits and financial planning, and participants can choose the two per month that appeal to them most. “Each month, I’ll meet with them and give them the packets,” Fitzgerald says. “We’ll talk about the topic introduction, and then there are questions at the end of each segment. We’ll go through the review questions from the topics they read about the month prior and make sure they don’t have any questions, or I’ll give them resources about where to learn more.”

Isenberg stresses the importance of staying cognitively active as you age: “The more engaged you stay, it helps your cognitive function, so you want people to be engaged both socially and cognitively. We know it’s kind of a ‘use it or lose it’ scenario. After somebody retires, the demands that are placed on their brains just aren’t as great, so they’re not continuously challenging themselves. You can start to see a decline in performance.”

After six months, participants will return to the Health Sciences Campus for another two-day visit, during which they will undergo the same cognitive assessments, physical function testing, brain imaging and a blood draw, which will be compared to their baseline test.

“We give them an intervention we think should improve their brain, and then we measure it afterward because it shows us what the intervention did to the brain,” Pa explains. “Did it make the brain healthier? Did it improve the communication between different brain areas? Did it change the level of the protein binding from the PET scans? So it allows us to look at change. That’s really important for a clinical trial — to say whether it was effective or not.”

**“MAYBE THEY’LL GET A NOBEL PRIZE”**

Isenberg says the ultimate goal for LEARNit is to figure out a way to delay the onset of Alzheimer’s disease by five or 10 years. “Because then we could potentially find a cure, or patients could live a long and happy life without ever having to develop dementia,” she says. “They can die of natural causes if we can delay it long enough. We are trying to preserve their quality of life.”

Pa continues, “If we can understand what combination of therapies has to occur so someone can maintain their cognitive status at the age of 60 or 65 or have it decline at a really slow rate until they’re 85, that would be ideal.”

As for Leonard, he’s expecting big things to emerge from the trial. And while he doesn’t yet know if he will land in the cognitive or physical activity intervention, he is looking forward to helping the greater cause.

“I want to be a good patient,” he says. “I want them to get good results and, who knows, maybe I’ll be part of helping them find something that will help a lot of people with Alzheimer’s. I don’t know … maybe they’ll get a Nobel Prize for something they discover.”

To participate or learn more about the study, call the LEARNit study line at (323) 442-0141 or email LEARNstudy@ini.usc.edu.
VIRTUAL REALITY REHAB

BY
KATHARINE GAMMON
Assistant Professor Sook-Lei Liew MA '08, PhD '12 is exploring new brain-computer interfaces that connect stroke survivors to the worlds of tech and medicine.
For people recovering from a stroke, even the simplest motions can become a struggle. To lift a hand, for example, requires a signal from the brain that travels all the way down an arm to the hand. That’s a lot of moving parts — and when something is damaged, it makes regaining those skills an arduous and slow process.

That could all change, though, with the help of some innovation and advances in virtual reality.

It was almost by chance that USC researcher Sook-Lei Liew, started thinking about virtual reality. She was a neuroscientist, and so was her husband. When she became a USC faculty member in 2015, her husband got a job in the Mixed Reality Lab at the Institute for Creative Technologies — and, between the two, a brain trust was born between VR and stroke rehab.

For Liew, the light bulbs really started to flash when she attended the Neurotech conference — a big, industry-academic partnership, featuring the latest in tech advances. Liew had already been working on stroke rehab for awhile and worked on brain-feedback interfaces, devices that essentially allow patients to see what is going on inside their brains to encourage them to build circuitry.

At the Neurotech conference, something clicked. “There was a lot of tech, but not a lot of science behind it,” says Liew, who has joint appointments with the USC Division of Biokinesiology and Physical Therapy, the USC Chan Division of Occupational Science and Occupational Therapy and the Department of Neurology and the Mark and Mary Stevens Neuroimaging and Informatics Institute at the Keck School of Medicine of USC.

Liew started to dig into VR research and found some fascinating studies about bodies inside a VR system. One study showed that if you give someone an avatar with long arms in the virtual world, they interact with the real world as if they had long arms. The effect even lasts for 10 or 15 minutes after a person removes the VR headset.

And another study showed if you give someone a child-like body in VR, that person starts to have more child-like features in the real world.

That made Liew wonder something that would change her work forever: “If you give someone a healthy body in VR, will that help them recover their health?”

She launched a project in January 2016, submitting a grant proposal to the American Heart Association and receiving $150,000 to explore the possibility of a VR brain-computer interface to treat stroke survivors. She and her partners (initially her husband but then other researchers) wanted to create something that was low-cost and portable. Her lab, the Neural Plasticity and Neurorehabilitation Laboratory, was home base for the work.

Most brain-computer interfaces used functional magnetic resonance imaging (fMRI), a huge and expensive technology that measures brain activity by detecting changes associated with blood flow. “The problem is that it’s really hard to get somewhere if you have a severe stroke,” Liew says. “Typically you can’t drive, and your mobility is impaired.” That made it all the more vital to get the device to people, rather than have people come to the tool.

The team built a prototype, using a laptop computer, an off-the-shelf VR rig, a $9 swim cap and an open-source brain-computer interface electroencephalogram (EEG) system. Liew used her mother’s sewing machine to connect the electrodes to the cap. The whole system costs less than $5,000. It’s called REINVENT: Rehabilitation Environment using the Integration of Neuromuscular-based Virtual Enhancements for Neural Training.

This is how it works: The system uses virtual reality as well as brain and muscle sensors to show arm and hand movement in the virtual world when the patient has used the correct brain and muscle signals even if the patient cannot move his or her arm or hand in the real world. Over time, they can train the damaged circuits to work again.

So far, the system has only been tested on healthy older adults, but, in the next six months, it will be tested on people recovering from a stroke.

Ryan Spicer, a programmer analyst on the project, pointed out that older adults are generally a population that isn’t thought of as VR adopters — but some of them were very interested. The initial results showed that the healthy older adults were happy to use VR. Spicer says that, in the future, the activities and art could be tailored to each person’s interests.

The team demonstrated the project at the...
In the study, stroke survivors will practice activating the brain regions necessary for arm and hand motion in the virtual world until they are able to do it in the real world.

South by Southwest festival this year, and the experience was mind-bending for Liew. “Our booth was across the hall from NASA, and they had a Mars habitat. Whereas we had a system that was sewn together with my mom’s sewing machine,” she says, with a laugh.

Still, she says they received great feedback during the conference. Out of 38 VR demonstrations, REINVENT won a special prize: Special Jury Recognition for Innovative Use of Virtual Reality Technology in the Field of Health.

“Most of the demonstrated uses for VR are gaming or entertainment right now,” Liew points out. “But the future has got to include VR for healthcare too.”

Are people in the future going to be controlling houses and cars with their brains? Liew thinks it’s unlikely. “If you can use your hands, your brain has lots of experience telling your hand to manipulate things,” she says. “The area where VR is the most useful is where they allow us to do things we can’t otherwise do.” That could include, for example, immersive worlds to distract people while they’re getting chemo in the hospital. “It’s a way to take your body out of a situation,” Liew says.

David Krum, a computer scientist on the team, agrees. “Everyone is excited about entertainment, but there are other uses for VR,” he says. “A lot of companies are more interested in monetizing games. Some of these other applications are a really important social good, but the economics of it are different.”

Liew sees VR as a true interdisciplinary venture: “It’s a blend of tech, industry, science and the clinic,” she says. “It really takes it to a whole new level.”
USC physical therapy students gain valuable experience with unique clerkships on military bases across the country.

BY JAMIE WETHERBE MA '04

ILLUSTRATION BY DAVE MURRAY/I2IART
ick Detrick DPT ’17 has long had a strong desire to serve. “My grandpa, uncle and cousin were in the military, and I’ve always been interested in it,” Detrick says. “With physical therapy, I can serve those who serve.”

Detrick was so committed to working with the military, he started a clerkship at the David Grant USAF Medical Center, the Air Force’s largest medical facility on the West Coast.

“I have a passion for driving prevention and increasing quality of care,” says Detrick, who was at the base in Fairfield, Calif., for nearly three months. “If we can do that for active-duty officers, we can prevent so many of the issues we see in our veterans.”

Detrick, along with two other USC students, just completed his extended 16-week clerkship to provide treatment to soldiers at military bases across the country.

A New Skillset

“I didn’t have any background in military or know much about it before going,” says Claudia Haeussler DPT ’17, whose clerkship took her to Womack Army Medical Center at Fort Bragg in North Carolina. “I’d heard from other clinicians — and I found this to be true — that in the military, you have a lot more autonomy.”

In the civilian world, physical therapists can’t prescribe medications or request imaging for injuries without a doctor’s consent. “I was able to order X-rays or MRIs,” Haeussler says. “You’re the first line of defense if anyone has a sprain or muscular/skeletal issue.”

Within the military model, physical therapists have a broader scope of practice than in the civilian world. “We’re more like primary care providers in the sense that I did most patient evaluations and re-evaluations,” Detrick says. “We could also prescribe some drugs, like muscle relaxants and higher-strength Tylenol and Ibuprofen.”

Chelsea Weedman DPT ’17 sought to expand her skill set by working with amputees. “I was seeking something that would help me grow,” Weedman says. “I knew this would be a challenge, and I felt this kind of opportunity as a student was really going to be beneficial.”

The hybrid internship program at the Naval Medical Center San Diego, where Weedman spent her clerkship, was designed so students have access to the extensive physical therapy and prosthetics services.

The program is a “unique opportunity for physical therapy students to gain experience with various aspects of rehabilitation for our military service members and veterans with extremity trauma and amputation,” says Shawn Farrokhi DPT ’03, PhD ’09, Weedman’s supervisor and senior scientist at the Extremity Trauma and Amputation Center of Excellence. “In addition, students participate in focused and clinically relevant research projects that will pave the way for innovation and improvements in future rehabilitation.”

Quality of Care

The students agree having access to unlimited resources and the military’s state-of-the-art technology vastly improves the kind of care they provided.

“We had a movement retraining clinic where we could attach motion-capture markers and have patients run on the treadmill to determine if they have a movement impairment,” Weedman says. “They can see on a screen if they’re doing well with a particular [physical therapy] strategy. We were treating them using real-time visual feedback and tailoring treatments as much as we could.”

Without insurance limitations, physical therapists can provide as many sessions as they see fit. “I could give really top care and throw everything I can at an injury to get patients back to work quickly,” Haeussler says. “That doesn’t always happen on the outside.”

Additionally, having different types of providers — occupational therapists, surgeons and mental health professionals — all under one roof creates more integrated care.

“Being able to collaborate with other providers offers a huge advantage,” Weedman says. “All of the services that patients need are so close together; you’re able to talk to their doctors, which is a new skill.”

Haeussler was encouraged to experience different forms of treatment outside of physical therapy. “With the hospital being right here, I was able to take excursions to see different procedures,” Haeussler says. “I saw an ACL [anterior cruciate ligament] reconstruction, and I was able to follow up with that patient. I saw that whole continuum of care.”

A Unique Patient Population

The majority of the patients students see are fit, active-duty men in their mid-20s, a unique population compared to the civilian world.

“Essentially, I treated high-level athletes — no one was overweight,” says Haeussler, who often saw shoulder injuries, along with ankle fractures or sprains that come with jumping out of planes. “Guys will come in and say they have pain on mile 10. They’re working out four-plus hours a day to prepare for deployment, and they’re all very motivated.”

When Haeussler recommended alternative forms of exercise, she’s assured patients follow her protocol.

“[Officers] are required to do training every morning, and I can put restrictions on their profiles,” she says. “I can say no push-ups or no more than 40 pounds on their backs, and their commanders see that. I can dictate activities based on patients’ injuries versus just hoping they follow a program.”

Many of Weedman’s patients had experienced traumatizing injuries from motorcycle accidents or intense falls while on Navy ships. “These patients had been through a lot more mentally and medically — concussions, traumatic brain injuries or possibly other trauma to their organs,” she says. “Learning to relate to people who’ve really gone through hardship, and discussing their care and what’s best for them has been a valuable lesson.”

Still, providing continuity of care can be a challenge in the military. “One of the hardest things about a rotation like this is all of the moving pieces,” Detrick says. “All of a sudden, you or your PT could get deployed. With the number of providers and technicians patients have seen, you can imagine having to detail your story each time, or providers being consistent with they way they cue exercises and deliver treatments. That makes it difficult, but that’s the nature of the military.”
1972

LINDA (KLINE) BALL ’72 wishes to thank USC for being a significant part of her rewarding 40 years as a PT, working with significantly disabled students, ages 0-21, in school districts. Linda served as department chair there for more than 20 years and loved serving with other PT and OT staff members. She has seen how USC’s program and campus have grown, continuing to develop first-class PTs and wishes to thank the teaching staff as well as Margaret Rood and Helen Hislop.

1978

PATTY (GARFIELD) DISEN MPT ’78 is rapidly approaching 40 years of practice as a physical therapist after receiving her training at USC. She started her first job at South Bay Hospital in Redondo Beach, Calif., in November 1977. After working in home health and acute care early on in her career, her passion shifted to pediatrics. Since 1993, she has worked as a physical therapist in the Lewisville Independent School District in Lewisville, Texas. Since 2003, she has been the lead therapist for a staff of 20-plus PTs and OTs.

1986

SALLY (HAGMAN) CHAN MPT ’86 recently had the privilege of traveling to Saudi Arabia as a medical consultant for the Adilstone Group where she attended the Arab Health Trade Show in Dubai, United Arab Emirates.

1993

ANDREA AVRUSKIN MPT ’93 is currently a member of the editorial board of the APTA. She also contributes to MoveForwardPT.com, which includes producing consumer guides for the symptoms and conditions page, as well as writing listicles. Moreover, she is a consultant on APTA media campaigns such as #AgeWell and #ChoosePT all the while acting as clinical director for Pima Medical Institute PTA Program.

1998

KYLE BALDWIN MPT ’98, DPT ’98 is proud to share that the Center for Physical Therapy in Long Beach, Calif., has built a great staff of USC physical therapists, including Nicole Orlando DPT ’14 and Stacy Pensinger DPT ’16. Fight on in the LBC!

1999

JEFF LAWRENCE DPT ’99 is currently serving on active duty with the United States Public Health Service Commissioned Corps. He was promoted to the rank of full Captain and was awarded the U.S. Public Health Service’s second highest award, the Meritorious Service Medal for Valor, by the U.S. Surgeon General.

2005

LINDSEY (FONG) TAYLOR DPT ’05 and her husband Steven welcomed their second child, Kenzie Lahn Taylor, on December 31, 2016.

2006

KIMIKO YAMADA DPT ’06 & VALERIE MUMPER DPT ’13 were invited to speak at the first Women in Medicine Conference, hosted by the USC Interhealth Council earlier this spring. June 2017 will also mark the third anniversary of the Adelante Community Exercise Class for cancer survivors. Check it out on Facebook.com/Adelanteexercise.

2007

SOLANGE (BORNA) COHN DPT ’07 has been married since January 2014. She and her husband have a 1-year-old girl and another on the way!

2009

CHRISTINA DIELI-CONWRIGHT PhD ’09 received the USC Excellence in Faculty Mentoring Award, which is awarded to only 20 faculty from a nomination pool of nearly 150 candidates. This is only the second time a faculty member from the division has received this award.

ANDREW FUNG DPT ’09 & REBECCA (SANDERS) FUNG DPT ’09 got married November 19, 2016 in Oakland, Calif.

JARED VAGY DPT ’09 who works as the course coordinator for PT621 and PT521, has been accepted into the United States Olympic Committee Sports Medicine Program.

2012

AMY EHRHART DPT ’12 & SHAWN SORENSON PhD ’12 met at USC and were married September 25, 2016 in Steamboat Springs, Colo. The ceremony was officiated by USC’s Dean of Religious Life Varun Soni. The wedding was attended by several Trojans!

2013

KATE HAVENS PhD ’13 had a son last year on the same day she was administering the final for her PT 554 Analytical Anatomy course. Within the first six months of his life, her son Onyx had participated in three division research studies: a one-week study with Dr. Beth Smith, a six-week study with Dr. Barbara Sargent and a two-day study with a PhD student in the division.

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I can say what inspires me in one quick list: Daniel Kirages ’94, DPT ’98, the second- and third-year physical therapy students I have worked with and the entire staff at USC PT Associates on Marengo Street.

All of them have come to feel like family over the four years I have spent in physical therapy, almost two days every week, gaining strength, courage and resilience.

I’m especially inspired by Dan, without whose encouragement, knowledge, dedication, kindness and incredible ability to tell a complaining whine (which he ignores) from a whine of real pain (which he responds to instantly) has pushed me further than I ever thought I could get.

While Dan is clearly in charge of my therapy, I consider him a friend. He’s Midwestern nice — even though he was born and grew up in L.A., makes me feel at ease and is almost always smiling. Nothing ruffles that man, not even the time when I tripped in the middle of the gym, swearing at the top of my lungs while PTs rushed from every corner to stop me from hitting the floor. When I was hauled back to my feet, Dan simply told me to try the exercise again and promised to catch me if I started to fall. My confidence in him has never wavered.

When I first was matched with Dan, it was because my neurosurgeon insisted I spend one year trying physical therapy as well as alternative therapies like meditation and acupuncture to make sure surgery was the only way I could stop the excruciating pain that radiated across my lower back and down my legs.

But nothing worked, and the pain was worse, so I headed to the operating room. The back operation was successful and was followed by a string of others, each six months apart: Two new knees, a new hip and a heart procedure to implant a “Watchman” in my left atrial appendage. I am now officially bionic, a TSA airport checker’s nightmare.

Eight weeks after every surgery, I was back at Marengo, working with Dan. The harder we worked, the more I realized I had to do. My glutes were a mess. I moved like a 100-year-old. My BMI was high (which I learned was the PT’s polite way of saying I was fat).

With every success, Dan raised the bar. I worked with each of the third-year students he mentored, grilling every one about what kind of physical therapy specialty they were interested in and what made them want to become physical therapists in the first place. The former answer ranged from orthopedics to neurology, from working with children to badly injured members of the military, from people with strokes to horrible physical injuries. Their desire to help people lead their best lives inspired me.

At the same time, I took the opportunity to work with second-year students in an eight-week program each fall and spring, led by Noriko Yamaguchi DPT ’08.

Often, on the last day, Noriko would ask me to give advice from the patient’s perspective. That was easy: “Remember, we the patients are as scared of you as you are of us. We don’t want to be in physical therapy. It hurts. It takes time. It underlines that we are not like normal people. Smile and make us feel comfortable and glad we are doing therapy. Learn about us as people and as patients. Prove that this work will help us. And, most importantly, make our time together as much fun as you can.”

The years have flown by since I first came to Marengo. At my lowest, I was pushing around a walker, which I hated because it prevented me from living the life I wanted. Now, at 72, I use a cane, and probably always will need its extra support. I’m OK with that. I have a good and active life. I drive again. I can take care of myself, though I still must improve my walking stamina and balance, strengthen my legs and glutes and increase cardio.

But I have come so far. I booked a trip to Africa for this summer, a lifelong dream. Last week, I practiced exercises with Dan and his latest mentee, Drew Blanchard DPT ’17, to help me get in and out of a safari Jeep. And we tried to see if I could get down on the floor so I could get into a dugout canoe in Botswana’s Okavango Delta. Not likely, I learned. Like all disabled people, I’ll have to find an alternative for some things. Still, who would have thought four years ago that such a trip would ever even be a possibility for me?

I owe Dan Kirages and the others at the Marengo clinic a debt of gratitude that I can never repay. Dan is giving me my life back, one exercise at a time. I’ve even learned to like it. What’s better than that!