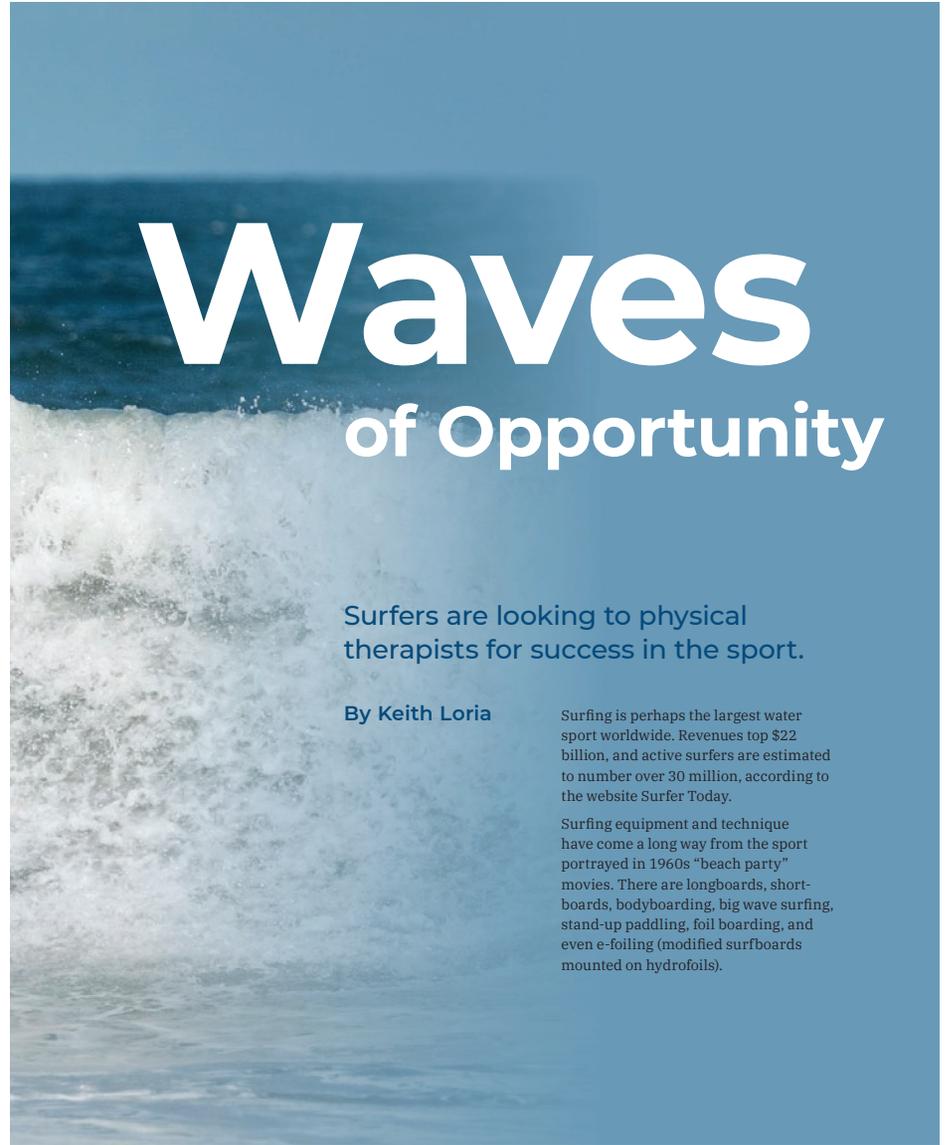




Professional surfer Caroline Marks. CREDIT: INTERNATIONAL SURFING ASSOCIATION



# Waves of Opportunity

Surfers are looking to physical therapists for success in the sport.

By Keith Loria

Surfing is perhaps the largest water sport worldwide. Revenues top \$22 billion, and active surfers are estimated to number over 30 million, according to the website Surfer Today.

Surfing equipment and technique have come a long way from the sport portrayed in 1960s “beach party” movies. There are longboards, shortboards, bodyboarding, big wave surfing, stand-up paddling, foil boarding, and even e-foiling (modified surfboards mounted on hydrofoils).



“I’ve been hurt more times than I can count. At one point, I’d had a thousand stitches and not had an operation. Our sport involves a lot of wounds. I’ve had an array of injuries — punctures, broken shoulders, broken ribs, scrapes. You name it and I’ve had some version of it.”

LAIRD HAMILTON, BIG-WAVE SURFER

U.S. surfer Laird Hamilton rides a wave at Teahupoo in Tahiti on May 14, 2013.

CREDIT: GREGORY BOISSY/  
AFP VIA GETTY IMAGES

With that many surfers in a dangerous and evolving sport, injuries are common. Laird Hamilton, a legendary big-wave surfer, told APTA’s Move Forward Radio podcast, “I’ve been hurt more times than I can count. At one point, I’d had a thousand stitches and not had an operation. Our sport involves a lot of wounds. I’ve had an array of injuries — punctures, broken shoulders, broken ribs, scrapes. You name it and I’ve had some version of it.”

Mark Kozuki, PT, DPT, a board-certified clinical specialist in orthopaedic physical therapy, is the team physical therapist for Hurley International, which makes and sells surfing and swimming apparel and equipment. Kozuki also covers events for the World Surf League and has been treating surfers for more than 15 years.

“Once I started my own clinic in Costa Mesa, California, surfers started coming in and I began to gain a deeper understanding of the injuries

that were sustained in professional surfing and by surfers in general,” he says. “At a certain point, one of the more elite professional surfers I was working with asked his sponsor to have me travel with him. So I started traveling with him and working with a group of surfers, taking care of them around the world.”

Surfer Today in its March 2018 article “How Many Surfers Are There in the World?” cited research by the International Surfing Association that estimated that there are about 13.5 million surfers in the Americas (including 2.7 million in the United States), 6.5 million in Oceania, 6 million in Asia, 4.5 million in Europe, and 4.5 million in Africa.

Among those millions of surfers, the most common body location for aches and pains, Kozuki notes, is in the lower back.

“My observation is that it has to do with the positioning of paddling. You arch your back for a

sustained period, and then you twist,” Kozuki says. “When you surf, you place your feet on the board in the same way each time. So if your left foot is always forward, you tend to twist to the left more often. That, combined with the positioning, can cause problems.”

Another common injury occurs when one foot slips off the surfboard and the other stays on, causing an issue with the hip or knee. “Depending on the orientation of the body, you can strain an ACL, groin, or hamstring,” Kozuki says.

Professional surfers have a greater likelihood of ankle injuries today than a decade ago, he notes, because they are doing more “airs” — going high into the air, spinning, and landing back on the water. “That leads to more compression of the ankle and subjects it to a lot of torque and pressure, which can cause injury,” Kozuki says.

His protocol for working on an ankle injury starts with releasing tension through that area of the body and strengthening and reactivating muscle around the area. For surfers specifically, Kozuki incorporates a lot of balance exercises, more so — he says — than with other sports’ rehab processes.

“Sometimes, we start integrating surfing on a longer, more stable board,” he says. “We sequentially load up the ankle and progress their surfing as it’s tolerated.”

Keyvyn Dean, PT, MSPT, medical director of USA Surfing, regularly works with some of the top surfers in the world, many who represent the United States at the Olympic Games. Over the years, he’s become an expert on what it takes to return an injured surfer back to performing on the water. Dean is a board-certified clinical specialist in orthopaedic physical therapy.

“If someone takes to the air, that leads to ankle and hip injuries; shoulder injuries tend to be due to falls, as the back is tumbling pretty heavily.”

KEVYN DEAN

He recently was involved in a study looking at surfing-related injuries dating back to 2003, charting why they were occurring and the mechanisms of the injuries.

While the most common injuries overall were lacerations, the most injuries, from a physical therapy point of view, affected ankles, knees, shoulders, hips, and lower back.

“If someone takes to the air, that leads to ankle and hip injuries; shoulder injuries tend to be due to falls, as the back is tumbling pretty heavily,” Dean says.

What he found in the study is that surfers often bring their knees in as they are compressing down.

If someone doesn't have sufficient range of motion at their ankle, they can get their knees over their toes, setting the knee up for an MCL strain or an ACL injury when they land compressed,” Dean says. “With a lack of ankle mobility and lack of hip stability, you get knee injuries.”

Shane Carpenter, PT, DPT, started Surfers Edge Physical Therapy in San Diego in 2013 to work with the growing population of surfers in that area.

She works mostly with recreational surfers and sees a lot of back injuries, with ankles and shoulders the next most problematic.

She says she sees a lot of knee injuries as well. “When you're an aggressive surfer, launching yourself off a lift or doing airs and aggressive cutbacks (a turn cutting back toward the breaking part of the wave), and you land, you're putting a good amount of torque on the medial collateral ligament of the back of the knee.”

One result of this knee injury is not being able to quickly execute a pop-up — essentially a fast pushup allowing surfers to get their feet on the board. That, in turn can mean the surfer enters the wave late, causing a series of other issues.

Carpenter teaches rolling patterns, works on assisted hip flexion, recommends substantial work on planks, and has patients use double yoga blocks to practice their pop-ups.

### Paddle Problems

Hawaii is one of the epicenters of surfing. Scott Layne, PT, DPT, with Surf and Shore PT in Waipahu, Hawaii, focuses on the surfing niche and sees surfers in his private clinic every day.

“The daily surfers are my bread and butter, and who I see the most, but I do work with a lot of professional surfers as well,” Layne says. “Injury-wise for the daily enthusiast, I see a lot of shoulder issues, particularly overuse injuries.”

That's because when there's a good swell for a week or two, many of these surfing lovers will ride the waves every day for two or three hours and “overuse everything,” Layne says. With pro surfers, injuries more often are a strain or trauma from trying to do a barrel (surf in the curl or hollow



Caroline Marks surfs in the Rip Curl Rottneest Search on May 20, 2021, in Rottneest Island, Western Australia.

CREDIT: MATT DUNBAR/WORLD SURF LEAGUE VIA GETTY IMAGES

part of a wave when it is breaking) or something in the air.

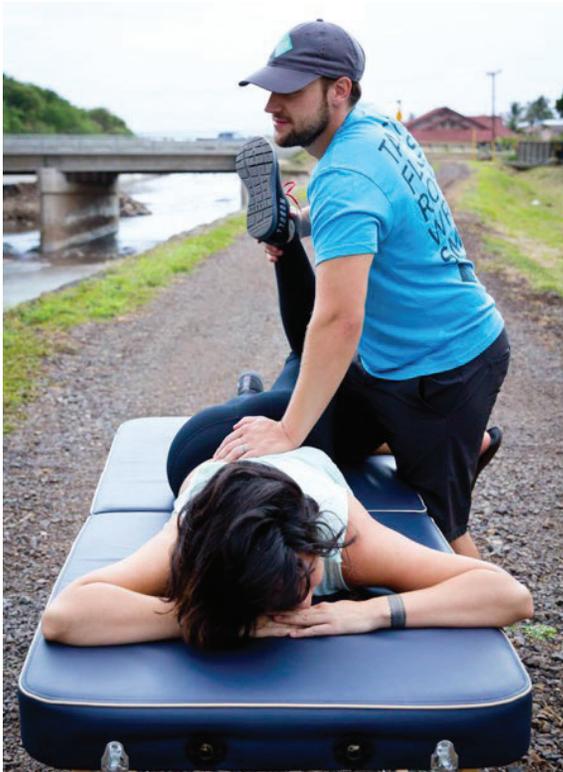
With shoulder injuries, the biggest thing Layne looks for is thoracic mobility.

“If surfers don't have thoracic extension rotation, often while they are paddling out, they start to have poor shoulder positions. That sets them up for overuse injuries,” he says. “The biggest challenge is trying to normalize motion everywhere else so they can get to that optimal positioning,” he says.

This is especially true for amateurs who don't have a regular strength or mobility program and frequently work at desks all day — so they already may have posture problems.



Kevyn Dean, PT, MSPT, medical director of USA Surfing, works with professional surfer Caroline Marks.



Scott Layne, PT, DPT, works with a client.

Layne's treatment plan includes extensive soft tissue work and making sure there's mobility. "It's important that the body mechanics are there so they don't set themselves up for injuries," he says. "Surfing in Hawaii is really great, and you'll see everyone from 12-year-olds to 60- and 70-year-olds out there. I want to help them make sure their bodies stay in shape and last so they can continue to do what they love every day."

### The View From Hawaii

Gregg Pacilio, PT, a physical therapist in Kauai, Hawaii, was part of a national championship surf team in high school, and the sport has remained a huge part of his life travels.

The Pacific Ocean in Hawaii produces big waves year-round. That means surfers face long, hard paddle-outs, strong currents, a constant crew of elite athletes out-positioning each other, and even jet ski-assisted tow-ins.

With Kauai having a lot of surfers — both professionals and hobbyists — they make up a great deal of Pacilio's clients, so he has extensive experience with surf-related issues both personally and as a PT.

"I have worked with elite professionals itching to get back to world-class competition, actual world champions such as those in in-tandem surfing. Most of my surfer patients, though, are

average people being seen for any number of garden-variety musculoskeletal issues," he says.

Because surfing can be a lifelong sport, chronic conditions are common. Similar to those named by Kozuki, Dean, Carpenter, and Layne, Pacilio's list includes neck, back, and shoulder conditions including rotator cuff degeneration, impingement syndrome, cervical radiculopathy, and lumbar spine dysfunction accumulate.

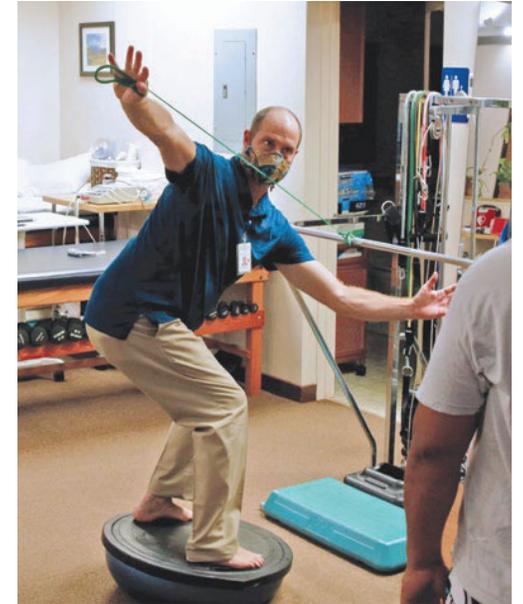
Pacilio explains that because surfing is 90% paddling and people only ride waves for seconds at a time, this leads to other issues with which a PT can help.

"All this prone endurance paddling, with bursts of maximal exertion paddling to get to the good part of the wave for takeoff, results in rapid reversal from spinal extension to flexion, and managing critical bottom turns, all before you actually get to the surfing part," he says.

Following the pop-up, once on the board, surfers can be injured as high-pressure turns compress their knees. Unpredictable turbulence caused by the spray thrown up during a turning maneuver also can cause a knee to slip or buckle as the surfer lands back on the board.

"Acute surf injuries vary just as every wave is unique," Pacilio says. Shoulder dislocations, labral tears, and knee injuries are common, but he also

Pacilio demonstrates a balancing and stabilizing exercise performed on a bosu. It replicates task-specific surfing moves such as a backside bottom turn or a frontside cutback.



In these prone shots, clinic employee Ilan Enriquez is simulating a surfer. Gregg Pacilio, PT, is replicating paddling with left resisted flexion while he cues Ilan to increase thoracic extension chin tuck, and retract right scapula.

has seen a pubic symphysis separation from the surfer sliding one foot off the board before the other, a rectus femoris quadriceps muscle laceration from a board fin, and an injury from “a board’s nose that impaled one surfer unluckily near her ‘okole’ [buttocks].”

Since knee problems are a common issue among surfers, Pacilio details what his treatment involves, sharing that it’s similar to any knee recovery from any sport — progressing range of motion, strength, gait, steps, and squats to regain pain-free flexibility and stability.

“Once they’re regaining agility, we include single-plane plyometrics, then progress into rotational and unilateral weight shifting and bursting drills,” he says, citing balance boards, skateboards with tennis ball tires, BOSU balls, and similar equipment as useful for training. He also believes PTs who understand the surf jargon and culture, and who know local beaches and other locations for outdoor exercise, can better serve their surfing patients and clients.

### Hip to Surfing

Hawaii may be one of the most well-known surfing spots, but the sport can be found on coasts all over the United States. When Ginger Garner, PT, DPT, ATC, started her career in North Carolina more than 20 years ago, she had no idea she’d end up working with surfers. The job was in an underserved area called The Crystal Coast, at the southern tip of the Outer Banks and a surf haven for many.

“The Crystal Coast has gorgeous beaches, and it wasn’t long before surfers started showing up in my office,” she says. “Eventually, I ended up picking up surfing in a very amateur way myself, which helped me appreciate surfing from a physical therapy perspective even more.”

Over her years of treating surfers, Garner has seen a lot of injuries and notes that surfing injuries aren’t unlike other orthopedic injuries — there are shoulder, wrist, back, knee, and hip issues, such as tendinitis, sprains and strains, rotator cuff tears, labral tears of the hip and shoulder, and knee injuries.

For the hip in particular, in the study in which Dean was involved, 78% of hip injuries were hip impingement.

“Because my focus in orthopedics is pelvic health, I ended up seeing surfers with hip impingement and labral tear injuries,” she says. “Treating those injuries require looking closely at how the individual is recruiting and integrating the core with upper and lower body. Ultimately, the hip is a powerful connecting point for healthy load transfer.”

She explains that beyond accidents, the most typical injuries in surfing can be traced to poor motor patterning and muscular balance in the hip, and a lack of sustainable recruitment in the trunk, spine, and pelvis.

“I can identify common faulty patterns with rehabilitation ultrasound imaging and confirm them on physical examination, such as abdominal muscle recruitment, which rigidly holds or braces the abdominals and decreases force attenuation through the lower kinematic chain,” Garner says. “Rigid transversus abdominis recruitment is going to decrease performance and increase risk for lower quarter injury.”

Another common factor leading to injury is reliance on the superficial rectus abdominis — the quintessential “six-pack beach muscle” — or the major and minor psoas muscles and related hip flexors, to generate stability for upright balance and maneuvering on or off the board.

“Hip labral injury and femoroacetabular impingement can lead to back pain, pelvic pain, sacroiliac joint pain, sexual dysfunction, and knee pain, for starters,” Garner says. “If a surfer is experiencing typical ‘C sign’ pain — groin pain that is described by grabbing their hip in a way that makes a ‘C’ shape with their hand — then I want to screen for hip labral injury or impingement.” There is no one-size-fits-all treatment protocol for hip labral injury and femoroacetabular impingement; treatment time from the onset of pain is typically 2.5 years, Garner says.

For a surfer, or any athlete, that lost time can be a career killer or a recipe for chronic pain and early joint degeneration in the hip. “I want to minimize the time it takes for someone to get proper physical



Ginger Garner, PT, DPT, heads out to the surf in Costa Rica.

therapy care,” Garner says. She tries to differentially diagnose a surfer who comes in with back, pelvic, groin, knee, sacroiliac joint, or abdominal pain. These things could be secondary to, or masking, the real issue in the hip, she explains.

She designs programs that focus on four major factors: (1) optimal kinematics (joint form and force closure); (2) efficient motor patterning that is sport-specific for return to activity, which moves beyond just force closure; (3) response to imposed stressors — determining their stress management in general, their pain perception, their propriocep-

“I ended up picking up surfing in a very amateur way myself, which helped me appreciate surfing from a physical therapy perspective even more.”

GINGER GARNER



Gregg Pacilio not only works with surfers; he enjoys the sport himself.

tion and interoception, and any previous trauma or other psychological needs; and (4) tissue extensibility and sensorimotor integration.

When working with surfers on these issues, she relies on healthy load transfer through the core to create a supple, mobile, responsive trunk and pelvis that can fluidly navigate the waves.

Also on the East Coast, Joseph W. Rusinowski, PT, a physical therapist at Holy Cross Hospital in Fort Lauderdale, Florida, has worked with amateur

surfers throughout his career, as well as one young woman who was sponsored and won many events.

Regardless of one's level of ability, he notes, the injuries sustained usually involve the shoulder, knee, or spine.

"Paddling, kneeling, rapid stance, rotational forces with turns, and awkward dismounts are the main means of causation," he says. "Encounters with others, shallows, boards, and sea creatures would fill out the list."



**"Any approach that allows for balance, flexibility, strength, and coordination is paramount."**

**JOSEPH W. RUSINOWSKI**

In addition to his usual practice, Rusinowski worked for a year in a COVID-19 testing center at Holy Cross Health, checking people for the virus before they arrived at the emergency department.

retrain the movements any individual needs in life and in sport to prevent reinjury."

Garner notes that PTs do more than just provide rehab for injuries. They can be health coaches across a competitor's life span.

"We can provide strength and conditioning that is sport-specific to surfing, and we can provide the information they need to optimize lifestyle choices for health and well-being, which will keep them out in the surf longer," she says.

In conversations Kozuki has had with surfers, it's not as common for an injury to happen "right out of the gate" on the water. Often, he says, it's their last wave. They're trying to go a little beyond their capabilities.

"A term I've been using is to 'leave a little gas in the tank' so they don't overextend themselves," he says. "In surfing, often they're paddling around a lot and just want to get one more wave. If they paddle into a wave that's substantial, and their timing is off because of fatigue, they can wipe out. A lot of those injuries could have been prevented."

He also recommends warming up before hitting the water — particularly when surfing in colder water, where a body will stiffen up more easily. He suggests warming up the arms, legs, and core.

### Advice for All

For PTs who may see a surfer walk through their doors only once in a while, the insight from these physical therapists can help them with a sport they aren't familiar with. But it has a broader application than just to surfers.

"Everyone needs a strong core to get through life — to give birth, recover from birth, lift heavy objects, work on your home, play with your kids, do your job, and enjoy hobbies. And certainly everyone can benefit from improved pelvic health, because it is the foundation for our basic functioning and sexual health as human beings," Garner says. "This means all the foundational pieces of the puzzle I use to treat surfers carry over into the rest of my patient population." ■

**Keith Loria is a freelance writer.**

Rusinowski recalls a case of a female surfer who complained of knee pain that was diagnosed as patellofemoral pain syndrome. But teasing through why it occurred and identifying the contributing factors was the key.

"I used the usual protocol for treating the patella but had to modify some of what she did in the water and on the board," he says. "Yoga seems to be big with surfers. Naturally, any approach that allows for balance, flexibility, strength, and coordination is paramount."

### Preventive Steps

With so many ways to be injured, avid surfers must stay highly trained and flexible, surf often, and cross train.

Pacilio says that constant stretching, yoga, and strength training are essential, and PTs can help keep a surfer on the waves.

"Foundational training to recover from injuries is what physical therapy has to offer," he says. "A PT will ensure the quickest recovery and avoid wrong turns along the way. A good PT should be able to