

Miles to Go Before I Sleep

Dr. Claudio Stampi teaches endurance sailors how to perform better on minimal sleep. The secret, he says, is learning how to power-nap.

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JOE HARRIS KNEW he was in trouble, even though he was winning the Transat 2004, a masochistic 2,800-mile solo-sailing race from Plymouth, England, to Boston, Massachusetts. Harris, a 45-year-old Boston-based commercial real estate investor, was making his debut in the big leagues of solo sailing and was elated to be in the lead. But beneath the adrenaline, he was exhausted. For almost 24 hours, he had stayed on the deck of Wells Fargo-American Pioneer, his 50-foot sloop, driving it hard through big winds and steep waves—"on the hairy edge," as he would put it later.

Claudio Stampi Since the Transat's start, a week earlier, Harris had been subsisting on three to four hours of sleep a day, snatched mostly in 20-minute naps. But when he found himself in perfect sprinting conditions, with his first real chance to tear into the 100-mile gap between Wells Fargo and then-leader Kip Stone, on Artforms, his competitive instincts took over and he stopped sleeping altogether. Hour after hour, Harris ground out the miles. When the morning roll call came in, he had nosed in front.

Now he was faced with protecting a slim lead just as his brain and body were screaming for sleep. Harris fought to keep the boat moving as light winds settled over his stretch of the sea, but his coordination deteriorated into five-martini territory, and he started to pass out on his feet, crashing repeatedly to the deck. Finally, he surrendered and slept for two and a half hours while Wells Fargo went nowhere. When he awoke, the position report delivered the cruel news: Stone was back in the lead.

"I knew I had shot my bolt," Harris said. "I pushed myself past my limits."

MANAGING SLEEP deprivation is a critical skill in the solo-sailing racing game, and Harris—who finished second to Stone after another week of difficult conditions—knew he was risking a meltdown with his mad dash for the lead. Four months before the Transat, he had been to see Dr. Claudio Stampi, the 51-year-old sole proprietor of the Newton, Massachusetts-based Chronobiology Research Institute, which he founded in 1997 and which is dedicated to the highly refined art of achieving maximum performance on minimal sleep. Stampi, whom sailors often refer to as Dr. Sleep, is the go-to guru when you want to race sailboats alone across the ocean on ridiculously small amounts of shut-eye.

Stampi had become interested in chronobiology—the study of biological rhythms—as a young student at Italy's University of Bologna, from which he received a medical degree in 1977, a Ph.D. in biomedical engineering in 1983, and a degree in neurology the following year. He has been obsessed with the trade-off between sleep and human performance ever since, publishing more than 100 research papers on the topic and, in 1992, a book, called *Why We Nap*. Over the years, Stampi has attracted a diverse clientele, from NASA astronauts and long-haul truckers to jet-lagged CEOs. But his specialty is helping sleep-deprived solo sailors.

"Solo sailing is one of the best models of 24/7 activity, and brains and muscles are required," Stampi said one day at his home, from which he runs the institute. "If you sleep too much, you don't win. If you don't sleep enough, you break."

Stampi has been hanging around docks for the past 20 years, placing custom-designed sleep-tracking wrist monitors (which record movement over time) on more than 100 solo sailors. His untraditional research raised questions from scientific sticklers, but according to James Maas, a professor of psychology at Cornell University and a leading specialist in sleep deprivation and performance, Stampi's open-ocean work has been very useful. "People often wonder how these guys, or someone like Charles Lindbergh, do what they do," Maas says. "So any evidence we can get as to how people will react under extreme conditions on very little sleep adds tremendously to our understanding."

The extensive data Stampi obtained from the monitors led him to an interesting conclusion: Sleep-deprived humans are better off snoozing like most animals—in brief, precisely timed naps.

"For those sailors who are seriously competing, Stampi is a necessity," says Brad Van Liew, a 37-year-old Californian who began working with Stampi in 1998 and went on to become America's most accomplished solo racer and the winner in his class of the 2002-2003 Around Alone, a 28,000-mile global solo race. "You have to sleep efficiently, or it's like having a bad set of sails or a boat bottom that isn't prepared properly."

Stampi also helped 28-year-old British sailing superstar Ellen MacArthur to become the first woman to win the Transat, in 2000, and she went on to knock off a singlehanded global circumnavigation, on February 7 of this year, in 71 days and 14 hours, smashing the former record by 32 hours.

"The more time you can be awake and alert, the faster the boat is going to be sailing," says British sailor Mike Golding, one of the world's best soloists and winner of the 60-foot monohull class in the Transat 2004. "By working with Claudio, I've been able to cut my average amount of sleep from 5.5 hours to 4.5."

So when Joe Harris decided to join the somnambulistic solo-racing fraternity, he made a point of immersing himself in the teachings of Dr. Sleep, who helped Harris learn to nap according to his body's needs. I decided to do the same, albeit for different reasons. I'm an amateur sailor and a new father battling the awesome sleep-sapping powers of the human infant, so I visited Stampi hoping to crack the code on how to perform better with fewer hours in the sack.

STAMPI IS SLENDER and has an easygoing international charm; he was born to Italian parents in São Paulo, Brazil, where his love of sailing began at age three. Striking photos from his many adventures at sea, which include two round-the-world races, are all over his house, as are vestiges of the boats he has loved—including sections of a broken mast and a cabin door that he uses as his work table.

After a childhood spent messing around on boats, he moved to Italy as a teenager and went on to receive his medical degree. "I had conflicting desires in life," Stampi says, "but as soon as I encountered chronobiology, I knew I could find a way to merge the sacred—medicine—and the profane, sailing."

That meant entering the first round-the-world sailboat event he could find—the 1975 Clipper Race, from the United Kingdom to Australia and then on around Cape Horn and back to the start—to do some onboard research. Stampi monitored the sleep patterns, body temperatures, and cognitive performance of his six crewmates every two hours. He turned the resulting data into his dissertation.

The benefits of frequent naps made sense to the sailor in Stampi, who understood the demands of a boat. But he had no scientific proof that, in situations of sleep deprivation, polyphasic sleep—the term for frequent napping—was more efficient than monophasic (getting sleep all in one chunk).

So in 1990 he turned from the docks to the Cambridge, Massachusetts-based Institute of Circadian Physiology's research

labs, rounding up some willing test subjects and dividing them into three groups. Each group would sleep only three hours in 24. One group would take all three hours at once. A second would sleep an hour and a half at night and then take three naps during the day. And the last group—the true polyphasics—would accumulate all their sleep in half-hour naps every four hours.

Stampi began by testing the performance of his subjects when they were getting a full eight hours of normal sleep, administering a short cognitive test that was easy to repeat. Then he had them shift to their three-hour routines. After more than a month, the monophasic group showed a 30 percent loss in cognitive performance. The group that divided its sleep between nighttime and short naps showed a 25 percent drop. But the polyphasic group, which slept exclusively in short naps, showed only a 12 percent drop.

Stampi was not surprised by the numbers. As he explained to me, there are two types of sleep: REM sleep, which is important for memory and learning, and non-REM sleep, which restores energy and releases hormones for growth and development. Non-REM sleep occurs in four stages: Stage one is a light slumber; stage two marks the onset of real sleep, where the heart rate and breathing slow; and stages three and four provide the deep (or slow-brainwave) sleep that is most highly restorative.

Generally speaking, sleepers cycle through these stages about every 90 minutes, with a pit stop for REM sleep between each cycle. Interestingly, the body seems to want its slow-wave fix first, and racks up most of the slow-wave quota in the first three hours. If you slash eight hours of sleep to four and your body has to triage, you retain 95 percent of the slow-wave sleep while ditching large chunks of REM and stage-two sleep. "That suggests that slow-wave sleep is the most critical," Stampi says. "Sleep charges your battery more at the beginning of the sleep cycle than at the end, so if you take more naps you are recharging more efficiently, because you take that first big charge frequently."

Ripping up normal patterns to sleep almost exclusively in short naps sounds extreme, but as Stampi points out, approximately 85 percent of mammals are polyphasic sleepers. In fact, he says, until about 10,000 years ago—before humans developed the tools and skills that allowed them to stop worrying constantly about becoming some hungry predator's next meal—humans probably were too. Infants are polyphasic sleepers, and even today there are remote hunter-gatherer tribes in Malaysia that sleep four to six hours a night and nap frequently during the day. Perhaps the most famous polyphasic sleeper was Leonardo da Vinci, who supposedly slept only 15 minutes every four hours, for a total of 1.5 hours of shut-eye every 24. "That would help explain his prodigious output," Stampi says. "But I suspect he only used that mode when he was rushing to dissect fast-rotting cadavers."

IF YOU EVER NEEDED proof of what sleeplessness can do to a sailor, look no further than the first slide Stampi likes to show clients. In the picture, a blood-red twin-masted racing boat is stranded on its side in the surfline of a remote southwest Australia beach. The boat belonged to exhausted French soloist Jean Luc Van Den Heede, who in a 1994 round-the-world race put his head down for a five-minute nap and woke up when he felt the keel grind ashore. (He refloated the boat and got back in the race.)

Stampi's point is that not only do you have to nap; you have to nap wisely—meaning you have to tailor nap times and lengths to your body's specific needs. To help his clients, Stampi had to develop answers to an all-important question: When, how often, and how long should polyphasic sleepers nap for maximum sleep efficiency?

One of the most striking clues from Stampi's data was that sailors hardly ever slept between 6 and 8 p.m. Stampi theorized that the evening "forbidden zone," as he called it, was a vestige of the long-ago era when humans—who were more vulnerable at night—had to spend the early-evening hours wide awake, looking for or preparing a safe place to sleep. It generally made no sense, Stampi concluded, to try to snooze during these hours, because you would be fighting the natural human biorhythm.

At the same time, Stampi also noted sleep peaks that occurred midafternoon and in the wee hours of the morning. This

made scientific sense: Humans tend to be sleepiest (or feel "sleep pressure," as Stampi likes to say) then. Stampi thinks the midafternoon sleep bump is also a vestige of early human life, since the heat of the African sun made that a better time to sleep than hunt.

His research also showed that afternoon siestas were chock-full of slow-wave sleep, the type that appears to be most important for recharging the body. To Stampi it seemed obvious that sleep-deprived sailors should try to get at least some of their sleep quota then. The key to napping efficiently, Stampi says, is to get in phase and ride these waves of sleepiness and alertness, so no time is wasted merely trying to get to sleep. "My job is to find other hours of the day for each person where sleep is as efficient," he says, "and to try to find a range of sleeping gears, or nap lengths."

That means getting in touch with your inner sandman. All the monitoring Stampi has done over the years has supported the anecdotal notion that there are two types of people: morning people, or "larks," and evening people, or "owls." The distinction is important for anyone trying to adapt to sleep deprivation. Larks, Stampi discovered, are good at taking short naps but are not as efficient late at night, and prefer a more regular routine. Owls, on the other hand, appear to be excellent at coping with highly irregular schedules, but prefer longer naps. Mike Golding is an owl, and during the 1998 Around Alone, only 23 percent of his sleep time was devoted to naps of less than an hour. Ellen MacArthur, in contrast, is more of a lark and tends to spend 60 percent of her sleep time in naps shorter than an hour. Despite the different styles, both Golding and MacArthur sleep about the same amount while racing, between 4.5 and 5.5 hours on average in every 24—the minimum amount, Stampi believes, on which humans can get by.

COULD STAMPI'S STRATEGIES be put to use in other sports? Adventure racers, mountaineers staring down an emergency, and ultra-endurance cyclists experience the same brutal conflict between performance and the need to stay awake. Thirty-six-year-old American adventure racer Rebecca Rusch, whose Team Montrail won the grueling 2003 Raid Gauloises, says three hours of sleep a day for a weeklong race is common. As are hallucinations: She once conjured up a Vietnamese fruit stand in the middle of a New Zealand field and was so convinced of its existence that she asked her teammates if they had any money. Instead of wasting time trying to convince her it wasn't real, they just told her they were broke. "Oh, OK," she said, and kept going.

Anneke Heitmann, research director at Circadian Technologies, in Lexington, Massachusetts, once worked with Stampi on some of his sleep-deprivation experiments. She thinks a Stampian approach could benefit these extreme athletes. "A polyphasic regimen gives your body more chance to repair," she says.

How about the rest of us? Sleep researchers, including Stampi, agree that if you have the option of snoozing a solid seven or eight hours per night, then taking it is the best strategy for being a well-rested, efficient human being. But if you can't pull it off, a Stampian approach might help keep you upright with less than sufficient sleep.

Before I joined him in Newton, Stampi sent me a wrist sleep monitor. For two weeks I tried a variety of extreme sleep patterns. I started with the great Leonardo and tried to sleep just 15 minutes every four hours. After two days I was a walking ghoul, barely able to make a pot of coffee. I decided to go for an Ellen MacArthur solo-sailor pattern, with one to three hours of sleep in the middle of the night and enough 20- to 30-minute naps to get my sleep total up to about five hours in 24. This was a lot better, but, absent the threat of dying at sea, it got harder and harder to limit the overnight sleep to just three hours.

Ultimately I gravitated toward a five- or six-hour chunk of sleep at night, supplemented by a 25-minute nap in the sleepy part of the afternoon. Now I was getting somewhere, and when Stampi eventually downloaded all my sleep data from the wrist monitor, he wasn't surprised. He diagnosed me as a hybrid owl/lark, but with the owlsh preference for longer sleep periods.

"What's your schedule?" I asked him.

"Pretty much the same as yours," said Stampi, who slumbers six hours a night, with a 15-minute nap in the afternoon. "I never feel tired."

As for Joe Harris, it took the Transat for him to discover where exhaustion ends and a coma begins. "I'm so much more aware of my sleep patterns now," says Harris, who is working with Stampi to prepare for the 2006 5-Oceans Solo Race (formerly the Around Alone).

Winning races, or even just getting extra hours in a day, is not a bad trade-off for a little less shut-eye, so Dr. Sleep has an interesting bargain for a tired world. But don't call him after lunch. He'll be napping.

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