Is Yoga Enough to Keep You Fit?

Three yogis were sent to the lab to test the theory that yoga is all you need for optimal fitness.
By Alisa Bauman

When it came to the fitness benefits yoga can or can't provide, yoga teacher John Schumacher had heard it all. A student of B. K. S. Iyengar for 20 years and founder of the Unity Woods studios in the Washington, D.C. area, Schumacher was convinced yoga provides a complete fitness regime. But many people, even some of his own students, disagreed. Yoga might be good for flexibility or relaxation, they'd say, but to be truly fit, you had to combine it with an activity like running or weight lifting.

Schumacher just didn't buy it.

He knew three decades of yoga practice—and only yoga practice—had kept him fit. He didn't need to power walk. He didn't need to lift weights. His fitness formula consisted of daily asanas (poses) and pranayama (breathwork). That's all he needed.

Four years ago at age 52, Schumacher decided to prove his point. He signed up for physiological testing at a lab in Gaithersburg, Maryland. As he expected, Schumacher tested near the top of his age group for a variety of fitness tests, including maximum heart and exercise recovery rates. His doctor told him that he was in excellent physical condition and estimated that Schumacher had less than a one percent chance of suffering a cardiac event. "I've always maintained that yoga provides more than adequate cardiovascular benefits," says Schumacher. "Now I have the evidence that regular yoga practice at a certain level of intensity will provide you with what you need."

Evidence of yoga's ability to bolster fitness, however, goes well beyond Schumacher's personal experience. Yoga Journal's testing of three yogis also yielded impressive results. Even physiologists who don't do yoga now agree that the practice provides benefits well beyond flexibility and relaxation. Recent research—though preliminary—shows that yoga may also improve strength, aerobic capacity, and lung function. If you practice yoga, you already knew that. But if, like Schumacher, you've been told by friends, family, doctors, or even other yoga students that you need to add some power walking for your heart or strength training for your muscles, here's evidence that yoga is all you need for a fit mind and body.

What Is Fitness?

Before you can prove yoga keeps you fit, you must first define what "fitness" actually means. This isn't a simple task. Ask eight different physiologists, and you'll hear eight different definitions, says Dave Costill, Ph.D., one of the first U. S. researchers to rigorously test the health and fitness benefits of exercise.

Now professor emeritus of exercise science at Ball State University in Muncie, Indiana, Costill defines fitness simply as the ability to live your life without feeling fatigued. "For normal daily living you don't need the strength of a football player or the endurance of a marathon runner, but you've got to be able to perform your normal activities and still have a reserve," says Costill. The American College of Sports Medicine (ACSM),

the largest exercise science association in the world, defines fitness as both related to your ability to maintain physical activity and related to your health (for example, people who become more fit reduce their risk for heart disease). According to ACSM, four types of fitness help to bolster health:

Cardiorespiratory fitness.
This refers to the fitness of your heart, lungs, and blood vessels. The better your cardiorespiratory fitness, the better your stamina, the lower your risk for a host of diseases like heart disease, diabetes, and cancer.

Your ability to move without feeling winded or fatigued is measured by your VO2max (maximal oxygen uptake), a technical term that indicates how efficiently oxygen enters your lungs, moves into your bloodstream, and is used by your muscles. The more fit you become, the more efficiently your body transports and uses oxygen, improving your overall VO2max.

To test VO2max, physiologists ask you to cycle or walk or run on a treadmill with a tube-like mask over your mouth. The mask gathers the carbon dioxide and oxygen you exhale, and the ratio between the two gasses helps to indicate how efficiently your muscles use oxygen.

There are other tests that measure additional aspects of cardiorespiratory fitness, including a lung function test, in which you take a deep breath and then blow into a tube to measure your lung capacity, and heart rate tests, taken both at rest and during exercise. Since equally fit people can vary as much as 20 percent in heart rate,this measure best indicates your own progress: If you become more fit, your heart rate generally drops.

Muscular fitness.
This refers both to muscle strength (how heavy an object you can lift) and muscle endurance (how long you can lift it). Without exercise, all of us lose muscle mass as we age, which can eventually result in weakness and loss of balance and coordination. Because muscle is such active tissue, it also plays an important role in regulating your metabolism, with every pound of muscle burning about 35 to 50 calories a day.

In a lab, researchers test your muscle strength and endurance on specialized equipment that looks like an exercise machine at a gym but contains sensors that read how much force your muscles generate as they contract.

Flexibility.
As most people age, their muscles shorten and their tendons, the tissue that connects muscles to bones, become stiffer. This reduces the range of motion, preventing optimum movement of your knees, shoulders, elbows, spine, and other joints. Loss of flexibility may also be associated with an increased risk of pain and injury. Tight hamstrings, for example, pull down on your pelvis, putting pressure on your lower back. In general, tight muscles increase the likelihood you'll suddenly move past your safe range of motion and damage ligaments, tendons, and the muscles themselves.

Body composition.
Your body composition refers to the percentage of your body made up of fat instead of muscles, bones, organs, and other nonfat tissues. Though the use of body composition as a fitness and health indicator has come under fire in recent years by those who argue that it's possible to be both fat and fit, the ACSM and many physiologists continue to assert that too much fat and too little muscle raises your risk for disease and makes movement less efficient.

Physiologists can measure body composition in several ways. The simplest method uses a pair of calipers to pinch the skin and underlying fat at various spots on the body. This method works best for athletes and others

with little visible body fat. For those with more body fat, a more accurate method is hydrostatic weighing—being weighed while submerged in water and comparing the result to your out-of-water weight. Because fat floats, the greater the difference between your submerged and dry weights, the higher your body fat percentage.

Experts have long recommended that we do at least three different types of activity to achieve optimum cardiorespiratory and muscular fitness, flexibility, and body composition. For example, the ACSM recommends building cardiorespiratory fitness by exercising at an intensity that raises your heart rate to at least 55 percent of your maximum heart rate (the highest rate you can maintain during all-out effort, generally estimated as 220 minus your age); muscular fitness by targeting each major muscle group with eight to 12 repetitions of weight-bearing exercise; and flexibility by stretching.

No one argues against yoga's ability to satisfy the flexibility requirement. But until recently, few scientists had considered whether yoga could improve other aspects of fitness. Now that's starting to change.

Putting Yoga to the Test

In one of the first studies done in the United States that examines the relationship between yoga and fitness, researchers at the University of California at Davis recently tested the muscular strength and endurance, flexibility, cardiorespiratory fitness, body composition, and lung function of 10 college students before and after eight weeks of yoga training. Each week, the students attended four sessions that included 10 minutes of pranayama, 15 minutes of warm-up exercises, 50 minutes of asanas, and 10 minutes of meditation.

After eight weeks, the students' muscular strength had increased by as much as 31 percent, muscular endurance by 57 percent, flexibility by as much as 188 percent, and VO2max by 7 percent—a very respectable increase, given the brevity of the experiment. Study coauthor Ezra A. Amsterdam, M.D., suspects that VO2max might have increased more had the study lasted longer than eight weeks. In fact, the ACSM recommends that exercise research last a minimum of 15 to 20 weeks, because it usually takes that long to see VO2max improvements.

"It was very surprising that we saw these changes in VO2max in such a short time," says Amsterdam, professor of internal medicine (cardiology) and director of the coronary care unit at the U. C. Davis Medical Center in Sacramento. He is now considering a longer, larger study to authenticate these results.

A related study done at Ball State University offers further evidence for yoga's fitness benefits. This research looked at how 15 weeks of twice-weekly yoga classes affected the lung capacity of 287 college students. All of the students involved, including athletes, asthmatics, and smokers, significantly improved lung capacity by the end of the semester.

"The athletes were the ones who were the most surprised, because they thought their athletic training in swimming or football or basketball had already boosted their lung capacity to the maximum," says study author Dee Ann Birkel, an emeritus professor at Ball State's School of Physical Education.

From the perspective of a Western scientist, the few additional studies that have looked at yoga and fitness all contain flaws in their research design—either too few subjects or inadequate control groups. One study, conducted in Secunderabad, India, compared a group of athletes taught pranayama to another group who were not. After two years, those who practiced pranayama showed a larger reduction of blood lactate (an indicator of fatigue) in response to exercise; in addition, they were more able than the control group to increase their exercise intensity as well as the efficiency of their oxygen consumption during exercise. Other smaller studies also done in India have found that yoga can increase exercise performance and raise anaerobic threshold. (Anaerobic threshold is the point at which your muscles cannot extract enough oxygen from your blood and therefore must switch from burning oxygen to burning sugar and creatine. Unlike oxygen, sugar and creatine are dirty fuel sources, creating lactic acid and other by-products that build up in the blood and make you hyperventilate, "feel the burn," and lose muscle coordination.)

Although the research on yoga is only starting to build, a convincingly large amount of research has been done on tai chi, an Eastern martial art that involves a series of slow, graceful movements. Many studies have found that tai chi helps to improve balance, cardiorespiratory and cardiovascular fitness, ability to concentrate, immunity, flexibility, strength, and endurance of the knee extensor muscles.

Dina Amsterdam, a yoga instructor in San Francisco and graduate student at Stanford University, is one of many researchers conducting a three-year study that compares the psychological and physiological benefits of tai chi as to those of traditional forms of Western exercise such as aerobics. (The daughter of Ezra Amsterdam, Dina Amsterdam was the inspiration behind her father's U. C. Davis study on yoga and fitness.)

"Though there haven't been a lot of studies done on yoga that are considered valid, there are numerous studies done on tai chi, with the current Stanford study the largest to date," she says. Because yoga shares many elements with tai chi but can also provide a more vigorous physical workout, Amsterdam expects future yoga studies to produce at least similarly encouraging results. But Amsterdam says she doesn't need additional research to prove to her that yoga builds fitness. "I haven't done anything but yoga and some hiking for 10 years," she says. "When I came to yoga, I was 25 pounds overweight and suffering from a compulsive eating disorder. Yoga completely brought me back to physical and emotional health."

Many yoga practitioners echo such thoughts. Jack England, an 81-year-old yoga and stretching instructor at the Club Med in Port Saint Lucie, Florida, says more than 30 years of yoga have kept him flexible, healthy, and strong. He's the same weight and height as he was in high school, and his stellar health continues to amaze his doctor. He delights audiences at Club Med by practicing Shoulderstand and other poses while balancing on a float board in a water ski show. "I'm an inspiration to people of all ages," he says. "I do things that 14-year-old girls can't do."

Stephanie Griffin, a 33-year-old director of business development for a pharmaceutical research company in San Francisco, discovered yoga after years of running marathons, spinning, and weight lifting. Before discovering yoga, she thought her intense exercise habits had turned her into a poster child for health and fitness. During the last four years, however, Griffin began doing more and more yoga and less and less running, weight lifting, and aerobicizing. As she dropped back on her hardcore fitness pursuits, she worried she might gain weight or lose her muscle tone or exercise capacity.

She didn't. "I have maintained my fitness and even enhanced it through yoga," says Griffin, who no longer has a gym membership. "And I like the way my body looks and feels now better than the way it did before."

Why Yoga Works

Exactly how does yoga build fitness? The answer you get depends on whom you ask. Robert Holly, Ph.D., a senior lecturer in the Department of Exercise Biology at U. C. Davis and one of the researchers on the U. C. Davis study, says that muscles respond to stretching by becoming larger and capable of extracting and using more oxygen more quickly. In other words, side benefits of flexibility include increased muscle strength and endurance.

"My own belief is that the small but significant increase in maximal oxygen capacity was due to an increase in muscle endurance, which allowed the subjects to exercise longer, extract more oxygen, and reach an increased maximal oxygen uptake," says Holly.

Then there's the pranayama theory. Birkel suspects that yoga poses help increase lung capacity by improving the flexibility of the rib area, shoulders, and back, allowing the lungs to expand more fully. Breathwork further boosts lung capacity—and possibly also VO2max—by conditioning the diaphragm and helping to more fully oxygenate the blood.

Birkel, Dina Amsterdam, and others are also quick to point out that Suryanamaskar (Sun Salutations) and other continuously linked poses increase the heart rate, making yoga aerobically challenging. And many yoga poses—particularly standing poses, balancing poses, and inversions—build quite a bit of strength because they require sustained isometric contractions of many large and small muscles. Of course, holding the poses longer increases this training effect.

Finally, yoga tunes you into your body and helps you to better coordinate your actions. "When you bring your breath, your awareness, and your physical body into harmony, you allow your body to work at its maximum fitness capacity," says Dina Amsterdam. "Yoga class is merely a laboratory for how to be in harmony with the body in every activity outside of yoga. This improved physical wellness and fluidity enhance not just the physical well-being but also permeate all levels of our being."

Are You Fit?

Given all this evidence, can you now confidently tell your nonyogi friends they're wrong when they insist that you should add other forms of exercise to your practice?

Maybe, maybe not. The answer depends largely on how much you dedicate yourself to yoga. Studies done on yoga have included more than an hour of practice two to four days a week. The yoga sessions included breathwork and meditation in addition to typical yoga poses. Finally, the asanas used in these studies included not just aerobically challenging sequences, like Sun Salutations, but also many strengthening poses, like Virabhadrasana (Warrior Pose), Vrksasana (Tree Pose), Trikonasana (Triangle Pose), Adho Mukha Svanasana (Downward-Facing Dog Pose), Navasana (Boat Pose), Sarvangasana (Shoulderstand), Setu Bandha Sarvangasana (Bridge Pose), and Plank.

So if you want to become and stay physically and mentally fit, make sure your yoga practice includes a balance of poses that build strength, stamina, and flexibility, along with breathwork and meditation to help develop body awareness. In particular, include a series of standing poses in your practice. As your practice expands, Schumacher suggests adding more challenging asanas such as balancing poses and inversions. "If you are just doing 15 minutes of gentle yoga stretches three to four times a week, you will also need to do some other form of exercise to stay fit," Schumacher readily admits. "I often tell my beginning students that they will need to do something in addition to yoga for a while until they can practice more vigorously."

Holly agrees. If you practice yoga for less than an hour twice a week, he suggests you either pair your practice with moderate intensity exercise like walking, or increase your yoga time or frequency. "But the best form of exercise is whatever you enjoy most and will continue to do on a regular, almost daily, basis," he says. "Should you do more than yoga if you don't enjoy other activities? No. Yoga has a lot of benefits, so do yoga regularly and enjoy it." Beyond fitness, yoga also offers many other gifts. It improves your health, reduces stress, improves sleep, and often acts like a powerful therapy to help heal relationships, improve your career, and boost your overall outlook on life.

All these positives are enough to keep former exercise junkie Stephanie Griffin hooked on yoga for life. Griffin had worried that, unlike her other fitness pursuits, yoga wouldn't give her the emotional satisfaction of aiming for and meeting goals. Soon, however, she realized that yoga offered her a path to constant improvement. "One day it hit me: I realized that my goal was to be practicing yoga well into my 90s," says Griffin. "For me, that is the new finish line. Practicing with that goal satisfies me more than any marathon."

Alisa Bauman stays fit through yoga, running, and fitness ball workouts. She lives and writes in Emmaus, Pennsylvania, where she is studying for yoga teacher certification under Mary Rosenberger at Accent on Yoga and Health.