

The Benefits of Cross-Training

By Paul Krause, MD

The goal of most athletes is to become stronger, improve performance, and avoid injuries. It is difficult to achieve all of these goals by training in one sport alone; “cross-training” can add the missing link. As a new approach to an athlete’s workout routine, cross-training can increase power, add flexibility, build stability, and increase motivation.

We’ve learned over recent years that exercise can both treat and prevent injury and illness. Overdosing on one type of exercise, however, is unhealthy and can result in overtraining injuries, metabolic imbalance, and mental fatigue. In contrast, participating in a variety of exercise activities allows the body to recover from one beneficial stress, while being exposed to another. The symbiotic relationship between these different activities optimizes the training effect on an athlete’s physiology.

Adding cross-training to a workout routine can lead to endless training possibilities. For example, instead of going for a 45-minute run or a 2-hour bike ride, you can do 15 minutes of each and then add some weight training, rowing, or yoga. My experience comes from triathlon training, which by the nature of combining three sports (swim, bike, and run) is cross-training. But even with this diversity of sports, I still need to sometimes “shake it up” a bit. I’ve found that adding weight training or yoga and varying the biking and running by going off-road has challenged and strengthened both my mind and body.

It is the variation of stresses to the athlete’s muscles while cross-training that tricks both the muscles and brain into believing the body needs to be prepared for all of these sports in the future. These variations trigger new neuro-muscular adaptations or, in other words, new pathways from the brain to the muscles. These pathways allow the muscles to respond to stress, adapt, and strengthen, thereby facilitating more efficient muscle firing patterns and improved overall balance. As a result, the athlete’s body can grow and



Paul and Bella cross-training with a game of “fetch” while backcountry snowshoeing up Mount Judah, overlooking Donner Lake, California.

strengthen in ways that improve overall health and optimize performance in their favorite sport.

As I’m sure the *AMAA Journal* reader knows, a major benefit of cross-training is that it can help the athlete prevent overuse injuries. By varying workouts, the athlete alters the types of stress to the joints, which provides time for the weaknesses to adapt or for injuries to recover. It also allows the muscles and connective tissues used in the primary sport to rest and recuperate. For example, runners tend to have strong hamstrings and calves, while bikers have strong quadriceps muscles. These imbalances can put the athlete at risk for injury. By strengthening opposing muscles through complementary activities, the joints are more stable and the antagonist muscles are less likely to fatigue with intense or prolonged loading of the primary muscle groups. Biomechanical weaknesses, like over-pronation in runners, adductor-dominance in cyclists, or pectoral-dominance in swimmers can also be solved. The result is more power translated to a balanced stride, pedal stroke, or swim technique.

The best motivator for most athletes is performance enhancement. Consider the following example of how this performance enhancement works: watch a fatigued runner in the final miles of a marathon. What do they look like? They are hunched over with their neck jutting forward, pelvis posteriorly rotated, and their legs barely lifting from the ground to initiate each stride. As the hip flexors, abdominal stabilizers, and back muscles fail, the runner’s ability to finish strong is impaired. The lack of trunk stabilization allows the center of mass to deviate from a balanced position, requiring more energy from the legs to stabilize the body. With cross-training, this same runner could gain core stability, maintain balance and posture, and waste less energy—translating into more power with less energy expenditure and more effective forward motion.

With better efficiency, more strength and power, and greater training volume, cross-training can boost the athlete’s fitness and speed. Athletes also need to learn to recover well after an event. Cross-training is a dynamic way to let their body heal after a race or long training session. While many athletes struggle with fitting recovery and rest into their training plan, top competitors make these methods a priority. They know that recovery can be done “actively” to more efficiently move metabolic waste out of their system, before giving their tired and even damaged tissues a rest. As an example, running-backs in the NFL can be seen spinning on a stationary bike on the sidelines of the field to recover and return stronger for their next offensive drive. This technique does not need to be limited to professional athletes; amateurs can reap the same benefit from recovery workouts.

Both rest and recovery are important in clearing metabolites and rebuilding muscle fibers, but they are not the same thing. Light recovery workouts regenerate increased blood flow to vital tissues and prepare the body for the healing

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ing. . . Now I might have some pains and aches, but I never have to go through that [initial phase] again.” That knowledge can itself be a very motivating thing: Why put your body back through that phase once past it?

The affair continues

The human form has evolved to run longer distances than nearly every other species, and this is a fitting observation for anyone who feels naturally drawn to it. Dyson is fond of a book called *Why We Run*, written by Bernd Heinrich, a naturalist in Vermont who himself held the 100-mile record for some time. And like many of us, Imme is clearly more fond of outdoor running than treadmill work-

outs, but dutifully puts in the time by breaking these workouts into segments.

Lately, though, traveling with Freeman has made training a bit more difficult. Imme has been sticking to shorter distances, but this did not stop her in March from stepping off a plane from Kazakhstan and running a 20K in Central Park. And this year she ran unofficially in Boston, accompanying a friend as he completed his 30th race there. Again, she surprised herself: “I thought, if this finish line was not the end and they said you had to do three miles more, I probably would.” For anyone who has completed Boston or really any marathon, this might well seem an astonishing statement. It appears that this human form, in particular, has certainly evolved to run.

Imme’s father was a physician in Germany, as were and are many of her family members. It’s fitting, then, that she would discover AMAA, and she is an avid attendee at many of the symposiums. But these days Imme’s passions remain her running and her grandkids. “The one thing that I truly want is to be able to run until I just die off. And I want to make sure that people know that my running shoes must be put into my coffin,” she says, “because that track up there on the clouds will be the softest I’ve ever run.” You might say Imme Dyson and running are a match made in heaven.

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and regeneration that follow with rest.

Core-strength has become an infomercial buzzword lately, but it’s not just for “Six-Pack Abs!” Core-strength allows for central stabilization of the body, which enables the maximum force to be ultimately generated by our extremities. For instance, the baseball pitcher’s throwing strength starts with his legs and moves through his abdomen and back, before even getting to his shoulder, arm, wrist, and fingers. The same is true for the push off of running, the pull of swimming, or even the golf swing. Why is it that we swing our arms when we sprint? It’s because they help us to balance and drive our legs. We need strong and stable core muscles in order to transmit power through our kinetic chain. Here again, cross-training in the form of yoga, pilates, or weight training can build core strength and stability, which leads to more power for the athlete.

Cross-training not only brings about positive changes in physical fitness and reduces the chance of injury, it can also provide the athlete with new motivation. It prevents boredom of the muscles, as well as the mind. It helps to keep workouts from getting stale, while sharpening reflexes. If variety is the “spice of life,” then cross-training is the “spice of exercise.”

When athletes cross-train, they tackle a more diverse and novel set of challenges. This allows them to be more complete athletes. Here is a list of sports that you may

be able to prescribe to patients/clients, or add to your own workout plan:

- Skate skiing: quadriceps strength and balance
- Classic skiing (aka “striding”): gluteus and triceps strength
- Snowshoeing: hip flexor and gluteus strength
- Inline skating: low back strength and balance
- Rowing: upper back and quadriceps strength
- Cycling: quadriceps and anterior tibialis strength
- Yoga: core strength and flexibility at low impact
- Pilates: core strength and power
- Elliptical trainer: legs and arm strength at low impact
- Circuit weights: functional strength, wherever it’s needed
- Rock climbing: upper body and core strength
- Swimming: shoulder and arm strength
- Deep water running: run strength with increased resistance and low impact

If the athlete has a big race coming up, the month before the event, he or she may need to do more sport-specific training near race pace and reduce the amount of cross-training. But in the months leading up to that event and certainly in the recovery week after it, cross-training could be the answer for future performance enhancement and injury prevention.

If your patient or client is a runner, suggest they try something new like a different gym workout or, perhaps, a triathlon. They may be amazed by how daily runs gets faster and easier—and will probably even have fun doing it!

Now that’s what cross-training is all about.

Dr. Krause is a family physician in Tahoe, California, where he works at the base of Squaw Valley and Northstar ski resorts. He has competed in over 50 triathlons from sprint to Ironman distance, as well as Nordic ski races, open water swims, and marathons. He is a Volunteer Clinical Faculty member at UC Davis School of Medicine and teaches both medical students and sports medicine fellows in training. He is a traveling physician for the US Nordic Ski Team and Hawaiian Ironman Triathlon World Championships. Dr. Krause spoke on the topic of triathloning and cross-training at the 38th Annual Sports Medicine Symposium at the Boston Marathon.

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