

# essential skills

BY BEN E. BENJAMIN AND JEFFREY P. HAGGQUIST

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# ACTIVE ISOLATED STRETCHING AND STRENGTHENING

## Injury Rehabilitation, Part 2

In Part 1 of this article (May/June 2010, page 88), we talked about the various roles that Active Isolated Stretching and Strengthening (AIS) can play in rehabilitating an injury. We introduced the five steps of the rehabilitation process and gave a detailed explanation of the first three: addressing the pain, restoring the full range of motion, and neuromuscular reeducation.

In Part 2, we conclude by discussing steps four and five—rebuilding strength and restoring full function—and various ways in which we can personalize this process so our clients heal as effectively and efficiently as possible.

### Using AIS to Rebuild Strength

Developing and maintaining strong muscles is important for everyone, but particularly crucial for those suffering from atrophy due to neuromuscular disease or trauma. As we've used AIS with clients, we've been surprised at how effective it can be in reversing such declines.

For instance, with a client of Ben's who has Parkinson's disease, there appears to be a direct correlation between the strength she builds and the lessening of her tremors and pain. Over the course of a few months, she has reported great improvements in her ability to write, walk without dragging her foot, and sleep through the night. She says that whenever she begins to feel pain in her arm, she does the arm strength protocol and the pain goes away within five minutes.

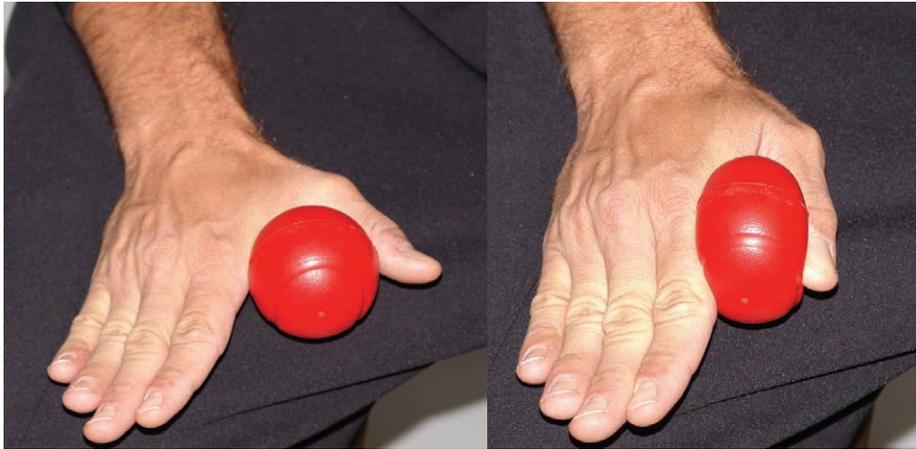
While AIS is a gentle modality and builds strength in small increments, the end results can be quite dramatic. One of the AIS practitioners mentioned in Part 1, Roger McNear, worked with a young man who had suffered a brain trauma in a head-on motorcycle collision. His left arm and both hands lacked mobility and were in a continual contraction, and a year of treatment had failed to restore functioning to his legs; he was told by his doctors that he would probably never walk again.

Roger used AIS to help develop strength throughout this client's body. In the first two or three months, he used only manual resistance. Then, as the client grew stronger, Roger had him use resistance bands and weights. Through the course of the treatment, the contractions in the client's hands and arm were resolved to a point where he could grasp and move. Moreover, after three additional months of regular sessions (one to two hours, three times a week), he was able to walk with crutches. After six months, he could walk either with a cane or unaided.

### 4. REBUILDING STRENGTH

While restoring mobility and flexibility is an important step forward, we must be careful not to stop there. Increasing the range of motion without developing strength in that range makes a client more susceptible to injuries and joint dysfunction. Only by actively building strength can balance and resilience be achieved.

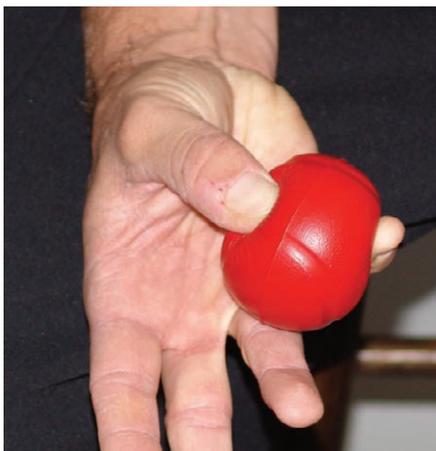
There are several principles to keep in mind when working to rebuild strength. First, you want to make sure that a person's strength extends beyond the demands of his or her normal activities. Most people are strong enough to meet the basic demands of daily life, but don't have reserves of strength. Therefore, in an unusually challenging situation (such as lifting a particularly heavy object or slipping



Thumb adduction.



Thumb hyperadduction.



Thumb opposition.



Finger adduction.

There are AIS exercises designed to strengthen almost every individual muscle in the body. There are dozens for the fingers and hand alone.

a particularly heavy object or slipping on ice and using their arms to catch themselves), they may easily get injured. This means that it's important both to develop each muscle more fully and to develop a wider range of muscle groups. AIS protocols incorporate the full spectrum of muscles in a particular area—including those responsible for rotating, bending, extending, and flexing—so you don't focus solely on the most frequently used structures.

Another source of risk is having uneven levels of strength in a given muscle. Generally, a muscle is much weaker and more vulnerable at the end of its range of motion. As a result, a sudden or strong exertion from a position of full stretch (e.g., getting up suddenly from a lunge or starting to use a pectoral weight machine from the most stretched position) can result in injury. AIS exercises limit this risk by working each muscle throughout its full range of motion, starting with very light weights.

Along the same lines, you want to be sure that the person has adequate strength in eccentric contraction, not just concentric contraction. In concentric contraction, the muscle shortens while it contracts, as when you lift a weight in a biceps curl. Slowly releasing from a biceps curl involves eccentric contraction, in which the muscle is simultaneously contracting and lengthening. As we mentioned in Part 1, some individuals experience difficulty with eccentric contraction following an injury. AIS places a strong emphasis on eccentric contraction, which actually builds strength 30–40 percent more efficiently than concentric contraction. In many cases, we use manual resistance (resisting the client's motion with our own strength, rather than a weight), which enables us to directly feel where the muscles are weaker and then adjust the exercise

## Using AIS to Restore Full Function

Rehabilitation treatment is always a personalized process, since the goals depend heavily on the individual's lifestyle and patterns of activity. One client we interviewed began receiving AIS work in the aftermath of a horseback riding accident in Costa Rica; the horse had lost its footing and actually landed on him, leaving him with a broken wrist and severely damaged knee (including a torn meniscus and tears in many surrounding ligaments and muscles). At the time he had a very active lifestyle—living on a farm and staying fit with running, biking, skiing, and working with a personal trainer. It became clear that he would need reconstructive surgery to regain full function in his knee, but the surgeon said he would not recommend it for someone his age (48 years old); he performed the procedure primarily on competitive athletes and other highly active younger people.

Intent on getting his joints back, this client persisted and went ahead with the surgery. "I'm 48, not 84," he said. He received intensive AIS stretching and strengthening work both before and afterward, three to four times per week. The results exceeded both his and his surgeon's expectations. His knee is now at 100 percent, and he has been able to resume all of his normal physical activity. (AIS work with his wrist also restored full flexibility and strength to that area.) Now, he tells us, aside from a scar on his knee, you would never know he had any problem with it at all. It's as good as it was before the accident—and maybe even a little bit more flexible.

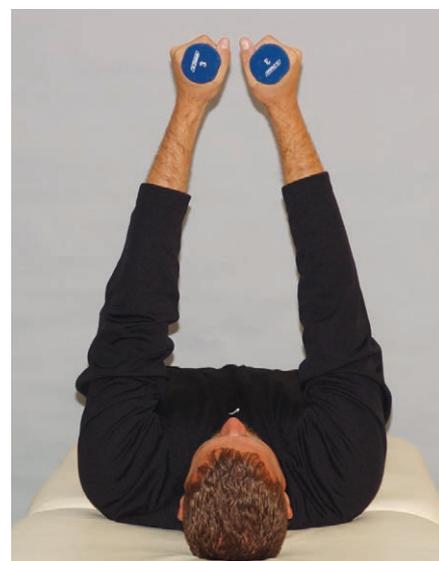


regimen accordingly. Because AIS is so specific, we can make targeted adjustments that isolate the precise areas that need the most work.

One final consideration is the need to combine strength with endurance. It's possible to be strong enough to lift a relatively large amount of weight, but lack the endurance to carry it for any length of time. In AIS, we simultaneously build endurance and strength by performing many repetitions of an exercise, very slowly, with a relatively low weight. The gentle, repetitive motion enhances metabolism within the soft tissues, improving nutrient delivery and the circulation of blood and lymph.

### 5. RESTORING FULL FUNCTION

All the work we do in the first four stages lays the groundwork to prepare clients for whatever training is necessary to resume their normal level of activity, which will be somewhat different for each individual. At this point, a lot of the progress may be made outside the treatment room, sometimes with the help of a physical therapist, personal trainer, or coach. For instance, in working with a runner, we'd get that person ready to go back to track practice. We can provide some guidance on how to proceed (e.g., starting slowly and building up gradually), and then it's the process of actually running and doing training drills that will ultimately restore full function. In



A muscle is generally much weaker at the end of its range of motion, in a full stretch. To limit the risk of injury, it is important to start with very light weights when building up strength from this position.

other cases, an individual may need help in preparing to return to a physically challenging job. Physical therapy clinics have special sections devoted to “work hardening,” using real or simulated work activities to mimic the demands of various types of jobs—from driving to custodial duties to heavy manual labor.

Back in the treatment room, we can play an important role in this stage of rehabilitation by tracking clients’ progress and helping to ensure that they don’t reinjure themselves by doing too much too quickly. As people resume more strenuous activities, they may develop new accommodation patterns (using stronger muscles to compensate for the ones that have just recently healed) or fall back into old, unconstructive ways of moving that contributed to their injury in the first place. If any setbacks do occur, we can facilitate healing and help prevent minor strains from developing into larger, chronic problems.

### A PERSONALIZED PROCESS

While the five guidelines we’ve discussed provide a good general outline of the rehabilitation process, the details will vary depending on each person’s individual needs. That process won’t necessarily be linear; you might find yourself circling back to earlier steps, particularly if the client incurs any new injuries or has other setbacks in the healing process. At times, it may also make sense to change the order of the steps. For instance, with a person who is hypermobile (excessively flexible), you typically want to introduce strengthening early on in the rehabilitation protocol. A hypermobile joint is less stable and more vulnerable to injury, so it’s important for the surrounding musculature to be strong.

The time needed for recovery will also vary from person to person, depending in part on the individual’s overall health and fitness. A client

whose body is relatively strong, flexible, and healthy (apart from the injury) will tend to heal much more quickly than someone who is in generally poor shape. Healing time is also highly dependent on the nature and severity of the injury and/or accompanying disease conditions. While some clients take months or years to regain functionality, others recover very quickly once they receive the appropriate treatment.



### What It Takes to Practice AIS

For those seeking to achieve full mastery, AIS is best learned in small increments, amounting to at least 8–12 days of study over a four- to eight-month period. The techniques are not overly strenuous or complex, but it takes some time for a person to develop a facility with this type of work—for instance, to become sensitive to the end feel of each movement; to be able to stretch just beyond a client’s level of comfort, without pushing too hard or creating strain; and to develop a sense of the timing and pacing that will be optimally beneficial for each individual. It’s also important to have a solid working knowledge of the anatomy and physiology of the body.

Many AIS practitioners are massage therapists, doctors, physical therapists, exercise specialists, or personal trainers. Some physicians/osteopaths, chiropractors, and physical therapists learn AIS themselves and then go on to supervise others in their offices and clinics; they take responsibility for performing the initial assessments and prescribing the protocols that will be most useful. In general, more highly skilled professionals will be better able to customize AIS programs to suit people’s individual needs, particularly for those with serious diseases or injury conditions.

Whatever your background, it’s helpful to learn AIS in a clinical setting where you get exposure to clients with various challenging conditions. Many accomplished therapists have started out by working under Aaron Mattes’s supervision in his clinic in Sarasota, Florida. Others have worked for or apprenticed under other experienced AIS practitioners—for instance, in Jeffrey Haggquist’s clinic in Washington, D.C. Another option is attending the day-long clinics in Cambridge, Massachusetts, where therapists work under Ben Benjamin’s supervision.

In the interviews we conducted for this article, several practitioners reported that it was witnessing or experiencing one of those rapid recoveries that first got them excited about AIS. Paul John Elliott says he was inspired by observing Aaron Mattes (the creator of this system) as he worked with a woman who had severe scoliosis. When she first came in, her torso was rotated about 20 degrees and bent about

20 degrees to the left. Over the course of several days, she straightened out dramatically. (This practitioner now sees that same woman as a client; the bend in her spine has been reduced to roughly 4 degrees, and the rotation is virtually gone.) Another practitioner, Kathy Shadrick, was impressed by the healing of her own injury. Her carpal tunnel pain had become so intense that it was waking her up in the middle of the night, and she had begun to worry that she'd have to give up doing massage. She attended a five-day AIS workshop, and Mattes treated her at his clinic, between clients. By the end of the workshop, her pain was gone.

Of course, most musculoskeletal problems will not resolve quite so rapidly. It's important for clients to keep doing AIS work regularly until the healing is complete. However, once they have received instruction from a skilled therapist, they can often do much of this work on their own. This is particularly beneficial for individuals who cannot afford to come for frequent sessions. So long as they are compliant—consistently doing the stretches and strengthening exercises they've been taught—they can go a long way toward healing themselves. In our minds, the ability to empower clients in this way is one of the greatest assets of AIS. Other practitioners we spoke with feel the same way. In Shadrick's words: "It proves it's not about me as a therapist; it's about the work. It's AIS, not me. That keeps me humble." **m&b**

**6** *Ben E. Benjamin, PhD, holds a doctorate in education and sports medicine. He is founder of the Muscular Therapy Institute. Benjamin has been in private practice for more than 45 years and has taught communication skills as a trainer and coach for more than 25 years. He teaches extensively across the country on topics including orthopedic massage, Active Isolated Stretching and Strengthening, SAVI communications, and ethics, and is the author of Listen to Your Pain, Are You Tense? and Exercise Without Injury, and coauthor of The Ethics of Touch. He can be contacted at 4bz@mtti.com.*

**6** *Jeffrey P. Haggquist, DO, is an osteopath who specializes in physiatry, a branch of medicine focused on restoring optimal functioning and quality of life to people with physical impairments or disabilities. Haggquist completed his residency training in physical medicine and rehabilitation at Temple University Hospital in Philadelphia, his osteopathic internship at the University of Medicine and Dentistry of New Jersey, and his medical education at Kansas City University of Medicine and Biosciences. He teaches widely on flexibility and neuromuscular reeducation, and is a national specialist on Active Isolated Stretching. He has trained elite athletes and is the medical director of the Flexibility, Sports, and Rehabilitation Clinic in Washington, D.C. Prior to his medical training, he practiced as a neuromuscular massage therapist for more than two decades.*

Editor's note: *Massage & Bodywork* is dedicated to educating readers within the scope of practice for massage therapy. Essential Skills is based on author Ben E. Benjamin's years of experience and education. The column is meant to add to readers' knowledge, not to dictate their treatment protocols.

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