Pilates and athletes have had a long and intertwined history. The New York dance community embraced the exercise method developed by Joseph Pilates as an important conditioning tool in the late 1920s. What those professional dancers discovered more than 80 years ago, and the NFL, NBA, MLB, and more are realizing now, is that Pilates is one of the best forms of conditioning for a top-tier athlete. However, it isn't just a critical component of an athlete’s training program; it’s one of the best forms of rehabilitation for an injured athlete.

VERSATILITY IS KEY
One of the main reasons the Pilates method continues to flourish as an effective form of rehabilitation is its versatility. The exercises incorporate flexibility, strength, core stability (use of deep abdominals, pelvic floor muscles, and deep spinal stabilizers) into the therapy process, along with awareness of the body in space during movement. These elements can be addressed individually in the beginning of the rehab process and, as the person progresses, can be layered to simulate more functional activities.

These whole-body principles also allow therapists to not only treat an injured area, but to find the source of the injury.

In addition, the wide range of progression and the ability to modify the exercises from very basic to very challenging make it ideal for treating a variety of populations—from those suffering orthopedic injuries like a joint injury, to those with neurological disorders like multiple sclerosis, to an elite athlete recovering from a hamstring or knee injury.

Kris Bosch, DPT, ATC, PMA-CPT, and Dane Burke, PT, ATC, PMA-CPT, along with their partner Gerry Morigerato, BS, BA, PMA-CPT, are co-founders of Northstar Pilates Solutions, a Pilates-based rehabilitation center in Buffalo, NY. Both Bosch and Burke have worked extensively with athletes and believe that Pilates is a phenomenal form of rehabilitation for both the general population and elite athletes.

However, for clinicians looking to implement Pilates into their practice, both therapists believe that it is important to distinguish between Pilates for rehab and Pilates for general fitness.

PILATES FOR REHAB VERSUS PILATES THE EXERCISE
"The difference lies primarily with the application of the specific exercise," Burke says. "In Pilates, fundamental principles apply to movement. Those principles don't change whether the exercise is used for rehab or fitness. What changes is how the principles are applied to the individual."

As an example, he points to axial elongation—the lengthening of the long axis of the spine or extremity. Within general fitness, the goal of axial elongation is to facilitate more efficient movement. Within rehabilitation, axial elongation not only facilitates more efficient movement, but helps minimize destructive forces that might otherwise pass through the site of a lesion.

HOW IS PILATES USED TO TREAT AN ATHLETE?
"As a generalization, it is the same approach with any client: you are trying to find the mechanism and other contributing factors that are causing an injury, and then address those injuries through the exercises," Bosch says. "What's different with an athlete is that we have to keep in mind what the athlete's particular sport is and what kind of movements they will need to resume at a high level. We have to push them farther within their rehabilitation course than we would push an average person."
Northstar uses Pilates as an assessment, treatment, and performance-enhancement tool. Bosch and Burke use the exercises in the repertoire to evaluate where an athlete has a weakness or imbalance. Athletes tend to have larger muscular imbalances than the general population because they repeat the same movement over and over within their sport. This increased repetition, usually performed with large amounts of force, creates an environment where tissues in the body can begin to break down. In addition, most athletic activities are unilateral and greatly favor one side of the body, which also contributes to muscle imbalances.

"Pilates treats this imbalance by putting the athlete in a more assistive environment, which allows them to focus on correcting the imbalance," Burke says. "Once the athlete understands how to correct the issue and maintain that correction, then we use the exercises to challenge them in different orientations of gravity and with different levels of resistance and assistance."

HOW IS PILATES EQUIPMENT USED IN THERAPY?
Northstar has a full studio of Pilates equipment, such as the Reformer, the Cadillac (Trapeze Table), and the Pilates Chair (see sidebar on page 27 for definitions), according to Burke. "We use these pieces along with small apparatus like magic circles, foam rollers, and rotating disks," Burke says, "because they allow us to challenge an athlete in environments similar to those in which they compete, and also in some that are completely different. This variety ensures their ability to maintain the corrections achieved by doing Pilates, and exceeds both the expected and unexpected demands of their sport."

"Each piece brings a different challenge for clients, and each can be used in different phases," Bosch says. "We try to blend things in comprehensively. The Reformer is a nice diagnostic tool; we can see how they are organizing their body or how their body is aligned. It is a good starting point to get them to engage with their core and start utilizing the Pilates principles of breath. After they have worked on the Reformer, then we can put them on the Pilates Chair for a more functional—and familiar—environment for standing and sitting exercises. And the Trapeze Table, depending on what part of the body is injured, can be used in conjunction with the other two."

REDUCING INJURY, INCREASING PERFORMANCE
Pilates is helpful in teaching athletes to integrate the moving parts of their bodies. "It maximizes the use of available range of motion throughout the joints associated with the injury, as well as joints not directly associated with the injury," Bosch states. "This allows the athlete's body to transmit and disperse the forces associated with an athletic activity more efficiently through the body, which in turn reduces the incidence of injury."

How can more efficient movement affect performance on the field?

"Reducing the chance of injury and increasing performance are two sides of the same coin," Burke explains. "The increase in muscle balance, ranges of motion, integration of body segments, and fluidity of movement preserves the tissues in the body while allowing them to generate maximal amounts of force in the most efficient way possible. That can't help but increase performance."

CASE STUDY
Here's an example of how Northstar Pilates Solutions used Pilates to treat a top-level athlete.

"Steve" is an 18-year-old male Division I football player who came to Northstar with complaints of left groin pain. He reported injuring his left groin 2 years prior, which was then diagnosed as a partial tear. He has since experienced multiple recurrent episodes of groin pain since the initial injury, the worst of which caused him to miss part of last season. Prior treatments included pain medication and physical therapy. Steve's overall health is good, and his past medical history is otherwise unremarkable. X-rays were taken 2 months prior to evaluation, which he states were negative.
Recently, Steve experienced increased left groin pain, which he attributed to weight training because he felt pain in his left groin while dead lifting. The pain was aggravated by running, and had intensified to the point where he could not run because of it. He was concerned because training camp for the university started in 5 weeks, and he needed to increase his training regimen.

Physical examination was performed, and he was found to have decreased AROM in hip rotation bilaterally for internal and external rotation. Strength was 5/5 throughout bilateral LEs, except for left adductors: 4/5. Neurological exam was negative. Palpation and soft-tissue assessment revealed an increased tone in the proximal 1/3 of left adductors; decreased Myofascial mobility at TFL/ITB; and junction of lateral quadriceps, hamstrings, and ITB. Special tests were negative (lumbar screen, hip scour, FABR, SI ligamentous stress tests). SLR was negative, 45° bilaterally.

Northstar designed a comprehensive Pilates program designed to improve core strength, increase LE flexibility, and correct muscle imbalances. The program utilized the concepts identified by Anderson & Spector (2000), and focused on beginning pain-free movement with nondestructive forces in a foreign environment, and then progressing to task-specific, functional weight-bearing exercise in a familiar environment. The program utilized the full complement of Pilates apparatus, and blended Pilates exercises with physical therapy techniques and applications to meet the client's goals. A brief example of the Pilates exercises utilized is listed in Table 1.

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Week 1</th>
<th>Week 4</th>
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</thead>
<tbody>
<tr>
<td>90/90—focus on hip mobilization; hip disassociation with core control</td>
<td>Long spring series</td>
<td></td>
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<tr>
<td>Supine long springs (PNF work)—stretching of hamstrings, TFL/ITB, adductors</td>
<td>LE neural mobilization using tower bar</td>
<td></td>
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<tr>
<td>Footwork</td>
<td>Feet in straps</td>
<td></td>
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<tr>
<td>Feet in straps</td>
<td>Standing hip stretch</td>
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<tr>
<td>Bridging</td>
<td>Elephant, inverted-V, long stretch</td>
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<tr>
<td>Side splits</td>
<td>Spring-assisted squats on foam roll</td>
<td></td>
</tr>
<tr>
<td>Standing hip stretch</td>
<td>Lunge to stand—forward and lateral</td>
<td></td>
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<tr>
<td>Footwork on jump board; with rotating disks, focus on hip rotation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Program examples.

Outcome: The client was seen for eight visits over a 4-week period. By the end of 4 weeks, all goals were met: he was pain-free, able to perform his weight training routine, and was able to run for distance as well as sprint during spring training.

Daniel Wilson is a contributing writer for Physical Therapy Products. For more information, contact PTPEditor@ascendmedia.com.

Normal Version