



THE LEGAL ASPECTS

Resistance Training and Litigation

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The current escalation of litigation within the fitness industry is an indication of a serious problem regarding client expectations versus service delivery. The crux of the problem is the fact that, in general, the industry is more sales oriented than service oriented. This is reflected in the lack of professional training and qualifications on the part of facility management personnel as well as the average fitness instructor and personal trainer (1).

In the past, most litigations leading to costly judgments have been due to cardiac arrests wherein there has been insufficient screening, lack of programming, poor supervision, and the failure to have an effective and timely emergency response, which, all too often, has led to the deaths of facility members. Today, however, there has been an upsurge in the number of personal injury lawsuits against health facilities, fitness instructors, and personal trainers regarding inappropriate resistance exercise training and supervision. Even with the obvious deterrent of prospectively executed waivers and releases, the public seem more willing to take their grievances to court.

Drawing on this author's experience as an expert witness in numerous personal injury lawsuits within the fitness industry, this column will address concerns related to inappropriate resistance training and supervision. Because some cases to be discussed are ongoing, the plaintiffs and defendants will not be referenced. Resistance training concerns will be discussed regarding training with body weight, free-weight, and fixed-weight exercises.

BODY WEIGHT EXERCISES

Body weight exercises have become very popular in all types of fitness centers and recreation facilities. Although often fun, challenging, and of physical benefit to participants, when conducted incorrectly, too intensely, and/or with faulty equipment, the risk of injury increases significantly.

For example, the lunge is a complex exercise requiring strength, balance, and coordination. Too frequently, novices are instructed to complete this movement through its full range without previously having the opportunity to practice it with stabilization techniques and limited ranges. Often, the novice is even instructed to attempt the exercise with dumbbells in hand without having mastered the movement with body weight alone.

Most errors associated with this exercise are due to stride length (overstriding) and torso movement (6). During the forward

execution phase, there is a tendency for the beginner to lean forward, rather than maintaining an erect torso. During the backward execution phase, one should push off with the front foot without using any upper torso momentum. However, during this recovery phase or return to the starting position, it is common for the untrained to use upper torso momentum and to throw oneself backward with a force that can lead to a loss of balance and falling.

In one case, this exercise was performed on a linoleum-tiled floor without spotting by the personal trainer. The individual, while attempting to recover to the starting position, threw herself backward, lost her balance, fell to the floor with an outstretched arm, and so severely broke her wrist that even after surgery, had difficulty in accomplishing basic hygienic duties (14). If the plaintiff had performed the exercise on a surface with more secure footing and had mastered the return movement with progressive sliding or "stutter stepping" to the starting position, she most likely would have been able to complete the exercise safely (6). The personal trainer was negligent in not progressively preparing her for the lunge exercise, allowing her to perform the exercise on a tile floor, and failing to spot her.

In another lunge injury, the plaintiff was a member of an aerobic dance class conducted for obese individuals who, by virtue of their being overweight, were risky candidates for deep lunges. The lunge was not introduced separately and progressively but rather suddenly presented as just another step during the class. The instructor, who lacked any formal education and credible certification, had the class members perform a forward-skipping



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movement and then rapidly turn to the diagonal and execute a full lunge. As a result of her excessive weight and consequent momentum, the plaintiff was unable to control the depth of the lunge, and her knee went well beyond her foot at which point she felt it give way and collapse. Multiple surgeries were unable to restore normal knee stability and strength, and she remains permanently disabled (21).

A young middle-school child was the victim of an unnecessary lunge accident because of a physical education (PE) instructor treating his PE class like an athletic team. The injured child, who was extremely overweight for his age, was required to do a series of deep lunges as part of a group-exercise class that consisted of approximately 30 students. Although the child complained of difficulty and knee discomfort with this exercise, his PE teacher shamed him into continuing the activity until the child collapsed and had to be assisted off the field. The injury resulted in multiple knee dislocations through time that eventually required reconstructive surgery. Sadly, the PE teacher was degreed in Exercise Science and possessed a credible certification. Although he was certified and qualified, he was not justified in his actions (2).

It should be noted that too often, individuals do unnecessary walking lunges that increase the chances of injury. One can do lunges in place and receive similar muscular benefits while decreasing the potential for falling. The risk of falling during walking lunges is further increased when such an activity is preceded by exercises such as squats, leg presses, and leg extensions that preexhaust those muscles needed for balance and coordination. In one case, a serious wrist injury was incurred as a result of a fall while performing walking lunges after the previously listed exercises (25).

Appropriate professional training and proper adaptation of body weight movements based on each client's current fitness level and health status are essential. In another preventable injury case, an unqualified trainer took an unfit client on her first session and had her perform step-ups on an 18-inch bench designed for sitting. As a result of this step-up exercise with knee lifts at the top and an extended floor tap at the bottom, the plaintiff proceeded to rupture her Achilles tendon.

The chin-up has long been a favorite body weight exercise to strengthen the latissimus dorsi and the biceps. If the bar is beyond the normal reach of an individual, he or she may need to mount a stable platform to grab the bar safely. Sometimes, individuals may jump a few inches to reach and grab a bar that is well within their reach and capability. Whenever jumping is required, it should be done from a nonslip floor that also is uncluttered. In another ongoing case, a chin-up bar was placed at an extreme height and well-above-normal jumping reach; therefore, the trainer placed a Reebok (Canton, MA) step with risers on each end and instructed the client to jump from the step and grab the bar. Although the client was uncomfortable with this request, she was assured by the trainer that he was positioned to spot her. When jumping from this unstable platform, she lost her balance as the step moved, fell forward beyond the reach of

the trainer, and literally punched a hole through the drywall with her head, leading to a serious cerebral injury with chronic pain.

Another case related to an unstable surface led to a serious injury of a plaintiff who was in her 60s and severely deconditioned. On her second session with her personal trainer, who possessed an accredited certification, she was instructed to perform squats on an inverted BOSU® (Ashland, OH) ball. As with the previous case, the trainer assured her that she would be spotted safely. However, when she lost her balance, the trainer was unable to prevent her fall that led to a serious back injury. The injury required surgery, spinal stabilization, and months of physical therapy, which although helpful, still left her with a permanent disability. It should be noted that the BOSU® Ball has a specific warning written on the flat side that states "standing on platform not recommended" (19).

FREE-WEIGHT EXERCISES

A commonly performed exercise is the deadlift, which, although effective for the well trained and conditioned, can be unsafe for the novice. In a case involving litigation against a personal trainer, who also was a nationally competitive bodybuilder, the plaintiff experienced an extreme back injury that has left her debilitated for life. The trainer had his client stand on the end of a flat bench, such as used for a dumbbell fly exercise, and then allow the barbell to descend to the extent that the bar went below the end of the bench. To reach this extreme descent, the client had to round her back. This exercise, coupled with full squats that also led to a rounded back, caused a number of herniations and consequent nerve root impingements. After four spinal surgeries with fixation (fusion), the plaintiff remained in such chronic pain that she had a morphine pump implanted (25). Interestingly, the TV show *Inside Edition* sent an investigative reporter to interview the plaintiff regarding her injury and her trainer, and on September 20, 2012, the show aired an exposé on unqualified personal trainers (10).

Many free-weight exercises are performed on benches and seats, which may be subject to collapse if not maintained properly. In one case, a well-trained individual and figure competitor was performing seated bicep curls when her seat collapsed. The bench height was adjustable by means of a pull-pin mechanism that had been partially bent in addition to having a fatigued spring. The bench, which was 15 years old, had no record of ever being inspected nor had the pull pin ever been replaced. Because of the pin having been bent and the spring having metal fatigue, the pin was not inserted fully as the plaintiff began her exercise. Evidently, the swinging action of the weights created a jarring effect on the defectively engaged locking mechanism that contributed to the pin's release and the seat's collapse. The extended fall and sudden stop led to extreme compressive forces on the spinal column and multiple disc herniations requiring two lumbar surgeries and causing a severe and permanent disability (13).

The problem of defective pins as well as missing and inappropriate pins has been the cause of many accidents. Because of a missing pin, an ongoing case was filed, wherein the plaintiff was seriously injured and required surgery because a piece of

equipment in a condominium facility was not maintained. When the individual positioned himself in the equipment and began to exercise, a supporting structure gave way, and he fell to the ground in a compromising position that led to his injury. How often have we witnessed that the original pins for securing a weight stack have disappeared only to be replaced by an inferior bolt from a local hardware store. Then, upon individuals slamming the weight stack (bottoming out), the bolt is ejected, and the individual forcefully exerts himself only to find that there is no resistance, a situation that can lead to a serious injury.

Standards and guidelines provided by associations like the American College of Sports Medicine and the National Strength and Conditioning Association specifically state that facility operators should have a preventive maintenance program for all equipment that includes documentation of inspections and any repair work (3,11). Texts used by universities providing degree programs in Exercise Science and courses dealing with the management of fitness facilities will almost always have chapters devoted to the maintenance of equipment as well as documentation of inspections and repairs (7).

Bench presses and squats are two of the most commonly performed free-weight exercises. They also are frequently conducted improperly, resulting in serious injuries. Too often, we witness poor spotting technique coupled with a lifter executing the bench press with an open grip, a recipe for disaster from a falling barbell. In addition, the open grip requires a hyperextended wrist that can lead to problems. To see some of the horrific bench press accidents, the reader can Google YouTube “Bench Press, Funnies, Fails and Blunders.” Sadly, one also may Google “400 LB Powerlifter Accident in Russia,” a video depicting a failed bench press improperly spotted that led to the lifter’s chest being crushed, the tearing of his diaphragm, and the breaking of his ribs, an accident that reportedly caused his death shortly thereafter at a nearby trauma center.

Unfortunately, it is rare to see the barbell bench press exercise being spotted correctly. To assume a proper stance, the spotter should have a good shoulder-width spread of the feet on the frontal (coronal) plane and a staggered spread of the feet on the sagittal (anterior/posterior) plane. While maintaining a straight back and also descending and ascending with the bar, the spotter should use an alternate grip that provides a more secure hold on the bar if he or she has to intervene and take the weight from the lifter.

When spotting a seated overhead dumbbell press, incline dumbbell press, or even a dumbbell fly exercise, the spotter should not spot the elbows as is so often seen, even on the cover of a textbook for an accredited personal trainer certification and, unfortunately, even on some American College of Sports Medicine publications. The spotter should spot the dumbbells by the wrists, for he or she cannot prevent these weights from falling in the lifter’s face if his/her hands are on the elbows (8).

When spotting the squat exercise, the spotter would be behind the lifter with again a shoulder-width spread of the feet and a staggered stance. If the lifter’s weight is not too heavy, the spotter may spot the weight directly with his or her hands just short of

touching the bar. However, with heavier weights, the spotter is better advised to place the forearms under the lifter’s armpits in order that he/she could “jack” the lifter into an upright position should the lifter begin to “round out.”

Ideally, squats should be done within a power rack where safety bars can be set at appropriate heights to provide a range limitation as well as to provide a safety factor should the lifter be unable to ascend from the bottom position. Yet, how often do we witness lifters stepping outside the rack and not affording themselves this protection? Within the rack, a weight may be so heavy that two spotters are required to be positioned at each end of the bar. As with the bench press, the reader can Google YouTube squat accidents and view unnecessary and scary incidents.

In an ongoing case, a personal trainer instructed his 14-year-old female client to attempt a one-rep max squat with 200 lbs. Without being in a power rack and unable to handle 200 lbs with his hands by the bar, the trainer could not prevent the weight from injuring his client because she failed to maintain a straight back and lost complete control of the exercise. An obvious concern is why would a trainer have a young girl do a one-rep max when she is capable of developing good strength without the heightened stress of a maximal lift? Where is the benefit considering the risk? Knowing that the young girl was still going through a growth spurt, could there be a concern for stressing epiphyseal cartilage?

In light of stressing epiphyseal cartilage (growth plates), another case involved a 12-year-old boy who experienced a “slipped capital femoral epiphysis” as a result of martial arts training and the kicking of a heavy bag. His personal trainer, who had no formal education in exercise or a credible certification, had the young man, whose femoral growth plates had not ossified, execute high kicks on a heavy bag with an inappropriate technique. Consequently, the head of the femur became misaligned with the neck thereby requiring surgery and pinning that left this young man with one leg shorter than the other (19).

FIXED-WEIGHT EXERCISES

Lat pulldown accidents are one of the most common fixed-weight accidents resulting in litigation. In one case, the plaintiff was working with her personal trainer on a lat pulldown machine. The bar was attached to the cable’s thimble by means of an “S” hook rather than the designated gated snap hook. Unfortunately, the use of an “S” hook on a lat pulldown device is witnessed frequently in facilities because it is easier and faster to change out or replace another bar onto this open-ended hook rather than a pigtail or gated snap hook. However, when the client’s grip slipped, and her trainer failed to catch the bar, the bar flew up until the weight stack bottomed out. At this point, the 14-lb bar with its upward momentum came off the open end of the “S” hook and fell on the client’s forehead, wherein she suffered a severe laceration and required 35 stitches (24). The manufacturer’s maintenance and inspection manual specifically stated “never use S-hooks” (12).

In another lat pulldown accident, the plaintiff suffered a severe cervical injury. Because of a lack of maintenance and

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inspections, the threaded cable attachment, which screwed into the selector shaft and the weight stack's first plate, became worn and loosened through time. When the plaintiff applied force to the pulldown bar, the cable attachment parted from the selector shaft and its plates thereby permitting no resistance to the full downward force applied to the bar. The bar struck the plaintiff on the top of his head causing not only a severe laceration to the scalp but also herniations to three cervical discs. The injury required multiple surgical fixations or vertebral fusions that led to extreme limitations in his neck's range of motion along with chronic pain (20).

A competitive female bodybuilder was working out with a lat pulldown machine when she was severely injured. With this particular piece of equipment, the top plate on the weight stack was only 10 lbs; therefore, the instructional manual specified that any bars used on this equipment should not exceed a 10-lb limit. However, heavier bars were made available, and such a heavier bar was on the machine as the plaintiff readied to reset the weight. As the plaintiff leaned over and pulled the pin from the weight stack, the top plate could not counteract the weight of a 14-lb bar that landed on her, knocked her unconscious, and broke her jaw requiring major reconstructive surgery (15).

In addition to lat pulldown machines, leg press equipment is frequently involved in unnecessary accidents. In one case, the plaintiff was injured while trying to use a leg press machine that was in disrepair. Unfortunately, there was no signage indicating "out of order"; therefore, the plaintiff tried to figure out why the machine was not working properly. The selector shaft with its one plate had been elevated and misaligned with its end diagonally resting against the lower weights. When the plaintiff grasped the end of the selector shaft and realigned it with the weight stack tunnel or center hole, the shaft with its plate dropped suddenly into the hole and her hand was crushed between two plates requiring major surgery (22). Ideally, facilities should contract service providers for inspections and maintenance of equipment; however, if this is not feasible, then facilities should designate qualified staff personnel to conduct these functions and document that they have done so (9).

A plaintiff was provided one-time and cursory instruction on how to use an incline leg press machine to which she had never been exposed previously. Her trainer had no formal exercise science education and had just completed a two-day certification program. Besides not being told to avoid locking out knees, limiting range of motion to 90 degrees between thigh and leg, establishing a hip-width foot placement, and maintaining buttocks on the seat, she was not instructed to ensure that her knees tracked over her feet (5). Without any monitoring of her capability to handle a given weight beyond that of the platform, her trainer arbitrarily advised her to complete three sets with a specific amount of weight on her next solo visit to the facility. She struggled to complete the three sets with knees that collapsed inwardly from the excessive weight and experienced pain throughout the exercise. The trainer's prior admonition of "no pain, no gain" was her incentive to complete the three sets. The plaintiff

experienced severe damage to the medial meniscus that required three surgeries and left her with a permanent disability (16).

Using the services of a personal trainer, a gentleman who was elderly and obese was instructed to use an incline leg press that had a built-in range limiter. The range limiter was a pin that could be inserted at different levels on the frame, thereby preventing the platform from descending so low that the individual's buttocks would be lifted off the seat and endanger the lower back. The trainer failed to demonstrate the exercise to the plaintiff, a process that would have allowed the client to visualize what had been explained and to appreciate the key aspects of the exercise including highlighting safety concerns (4). After the plaintiff positioned himself in the machine, the trainer removed the safety pin and then proceeded to turn his back on his client as he accepted a cell phone call. The plaintiff was unable to handle the weight, and, therefore, the platform descended to a point that literally crushed him, causing a severe back injury that required surgery (23).

CONCLUSIONS

The number one precedence of any fitness facility must be the health and safety of its membership, and that priority is reflected in the availability of safely designed, well-constructed, and properly maintained equipment. However, equally important is the qualification of fitness instructors and personal trainers who can ensure that members are provided with appropriate and timely instruction on equipment use as well as attentive supervision to ensure that directives are understood and carried out accordingly. Whether working with equipment or body weight exercises, instructors and trainers must understand those activities that compromise the structural integrity of the human body and what constitutes safe, progressive exercise programming. However, accidents and injuries are foreseeable, and therefore, instructors and trainers must not only be certified in cardiopulmonary resuscitation/automated external defibrillators but also certified in first aid.

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