

Are Your Legs A Liability?

How many people own the new bowling ball that jumps out of the bag and rolls down the lane on its own? The answer, zero. In fact, I have yet to see a ball just roll down the lane on its own. OK yeah, so what's my point. The point is a person can buy all the equipment in the world, but it won't do anyone a bit of good unless that person can physically propel it down the lane. Plain and simple. You can read all the ball reviews, purchase all the gimmicks, and even travel to every tourney in the country, but none of those will enhance your physical execution like what I'm about to give you.

ANYWAY, I have proposed for years there is a strong relationship between our functional mobility and bowling performance. That is a compelling statement which has been theoretically conceptualized and soon to be statistically supported. In the months to come you will begin to see some valid documentation of the effects of a bowling-specific exercise. Not to spoil our surprise though.

Closing a fabulous 1997 I am happy to say many of you have responded to Physically Speaking by either beginning or adapting your exercise program and inquiring about bowling injury information. We are pleased that you are using this information and encourage you let us at BTM know so we can share your enjoyment. On we go.

Some athletes call 'em tree trunks while others refer to them as the twigs or tooth picks. Either way, your legs support and transport nearly all of the body weight daily. Without them, functional mobility is difficult but possible. For bowling though, it is essential your lower body is conditioned to withstand the stress of our sport. So, ask yourself this question,

"Will a pair of strong and flexible or weak and stiff legs improve my bowling?"

By nature of sport, the legs generally sustain large amounts of stress, therefore classifying them as one of the most traumatized body parts. Many athletes, both competitive and recreational, experience career threatening injuries to the legs. In fact, recent studies have indicated nearly 50% of all athletic injuries occur at the knee joint. As for bowling, leg injuries, particularly to the knee, are the second most commonly occurring injury.

Anatomy

Your legs are a complex arrangement of bones and various tissues. Their greatest asset is a firm support system of muscles, tendons, ligaments, and cartilage. As one of the most complex and important joints of the body, the knee always receives a large amount of attention. The knee is the largest joint in the body and, because of poor bony alignment and a lack of padding (fat & muscle), is often prone to injury. Injury to the knee can occur while running, jumping, sliding, twisting, lunging, walking, and especially when bowling throughout the finish position. Therefore, understanding complete leg anatomy will enable us greater comprehension concerning successful overall leg training.

Four bones comprise the entire leg structure forming components of three joints (hip, knee, & ankle). The femur (a) is the large upper leg bone which extends from the hip joint to its attachment at the tibia (b) and the fibula (c). The femur is one of our largest and strongest bones understandably withstanding a large portion of the body weight. The patella (d), commonly known as the kneecap, is a sesmoid bone that floats freely within the tendon of the quadriceps muscle (e). The kneecap provides anterior protection to the knee and increases its leverage during extension.

The legs also consist of many muscles that would be way too boring to define and describe. Instead, choosing those bowling-specific and grouping them is pertinent to this discussion. The muscle group that extends the knee joint is the quadriceps (e). Its counterpart that flexes the knee joint is the hamstrings (f). Finally, the lower leg muscles, better known as the calf (g), calves, or cows using bodybuilding terminology extend the ankle joint.

The Training Protocol

Every training program no matter what the objective has three specific conditions essential for effectiveness. Each condition met in collaboration with the other will enable you to experience the physical & mental adaptations (benefits) you seek. I urge you to copy the three requirements onto a 3x5 note card and carry them with you whenever you train. Memorize and conform to them.

- **Acceptance** - Many bowlers and athletes alike have yet to fully accept the concept of physical training. As we transcend to a new plane in our sport, it is up to us, the bowler-athletes, to carry the torch leading the way. Your first step toward effective leg training is to fully accept the notion of physical fitness and sport specific training.

- **Commitment** - After years of managing various exercise facilities I have seen thousands of people initiate an exercise program with good intentions only to allow outside interferences or the lack of commitment derail their attention. Your second step to leg training is committing the appropriate time to a consistent pattern of regular sport specific training. Personally, I follow the American College of Sports Medicine recommendations of strength training 2 - 3 days a week.
- **Implementation** - So many people including bowlers try to rationalize that general activity or recreational sport is sufficient to meet their needs. That's just not the case. Exercise is goal oriented, specific, strenuous, and your only way to develop physical fitness. The third step to your successful leg training is performing the exercises as described.

A Leg Training Program - just what you need

There are two parts to your leg-training program including the warm-up phase of aerobic exercise and the strength training phase of resistance bearing exercise. The following routine is diagramed in distinct order not be deviated from unless medically, therapeutically, or otherwise advised. I suggest you follow ACSM's guidelines of only twice weekly allowing two or three days rest between each session. Rest and recuperation provide our body ample time to rejuvenate the fatigued energy stores and adapting the fatigued muscles.

Warm-Up

It is best to begin any training routine with a minor warm-up period. For this protocol, 10-15 minutes of slow progressive activity will allow the legs to loosen and increase blood flow to their surrounding muscle tissues. Warm-up activity is designed to allow a bony joint to loosen by the internal lubrication of synovial fluids and increase blood flow to the muscles. Try walking, biking, rowing, stepping, jogging, or some minor activity that incorporates the hips and legs to become active. My favorite is the recumbent stationary bike. The warm-up, whichever activity you choose, should be performed in a slow and progressive manner. Those of you who like to train aerobically, the warm-up phase of this protocol can become your aerobic session. However, I stress not to exceed 30 minutes if you are aerobically training because it will fatigue the energy stored in the legs preventing effective leg strength training.

The Resistance Training Principle

Since the legs move in primarily two specific motions (flexion & extension), we will also train in an identical manner. On the other hand, if our sport required lots of lateral movement such as racquetball or tennis, we would train them similarly. One of the more common training mistakes by athletes is exercising the legs at the knee neglecting the hip and ankle joints. Therefore, to enhance the overall training protocol and its effectiveness, we will exercise incorporating the hip, knee, and ankle joints.

Four different exercises will be diagramed to effectively train the legs. They are the leg press, leg curl, leg extension, and calf raise. The training principle is *basic strength training* using resistance exercise as the foundation for promoting the desired physical adaptations. **Basic strength training purports one set of all out effort for 8-12 repetitions in slow motion fatiguing muscle tissue to a near fail state. The slow motion count, or movement speed, is a 4-second contraction count and a 4-second relaxation count (4 x 4). As you exert against the resistance or weight, count four seconds to complete the first half of the movement. Relax the resistance in accord with the same 4-second count completing the second half of the movement.** This is classified as one complete repetition.

By incorporating *basic strength training* there is no longer a need for multiple sets and repetitions and long periods in the gym. Upon the completion of one all-out-effort set, no further work is required of that exercise. Progress to the next one. That's all you need to do. One set of 8-12 repetitions using an intense resistance with a 4x4 count.

Initial Resistance

To ascertain the resistance required, experiment with each of the four exercises prior to start of the routine performing each with various resistance factors. Determine specifically the greatest resistance you can handle in slow motion for only 10 repetitions. This is your starting resistance until a pleasant change is required. As your training progresses over time you will notice the single set resistance becoming easier as your body adapts. Once this occurs, increase the resistance slightly using either a five or 10-pound increment. Stay with the new resistance factor until the next increase is required. Continue to push yourself to a point of increasing the resistance factor until leg strength is at desired levels. Remember, keep the increases minimal and motions slow. Finally, if you have trouble locating the exercise machines or need assistance with setting up on them, have your local fitness professional help or just give me a call.

Exercise # 1 - Leg Press

Use a leg press or variation machine designed by any of the fitness equipment manufacturers. Position yourself in the machine having a staff person adjust the seat setting to match your leg length. Set the resistance factor to your preset intensity level. Slowly press against the foot plate extending the apparatus for four seconds (h) and then relax for four seconds (i). Control the resistance at all times not throwing the weight or dropping it, instead treat it in a gentle manner.

Exercise # 2 - Leg Curl

Use a leg flexion (curl) machine designed by any of the fitness equipment manufacturers. Position yourself in the machine having a staff person adjust the machine to match your lower leg length. Set the resistance factor to your preset intensity level. Slowly pull against the apparatus curling the leg-bar for four seconds (j) and then relax for four seconds (k). Control the resistance at all times not throwing the weight or dropping it, instead treat it in a gentle manner.

Exercise # 3 - Leg Extensions

Use a leg extension machine designed by any of the fitness equipment manufacturers. Position yourself in the machine having a staff person adjust the seat height to match your leg length. Set the resistance factor to your preset intensity level. Slowly press against the leg-bar extending the apparatus for four seconds (l) and then relax for four seconds (m). Control the resistance at all times not throwing the weight or dropping it, instead treat it in a gentle manner.

Exercise # 4 - Calf Raise

Using a seated or standing (calf) raise machine designed by any of the fitness equipment manufacturers. Position yourself in the machine having a staff person adjust the seat height to match your lower leg length. Set the resistance factor to your preset intensity level. Slowly press down on the footpad and extend the apparatus or raise upward for four seconds (n) and then relax for four seconds (o). Control the resistance at all times not throwing the weight or dropping it, instead treat it in a gentle manner.

Preventing leg injuries, improving body balance, increasing flexibility and enhancing your strength are all probable results of a leg-training program. The preceding strength training protocol and information will enable you to take an active part in propelling your bowling performance and physical fitness. It is in your best interest, as dedicated bowlers, not only to learn but also practice the things that will develop your physical ability. Let us dedicate some time to developing ability implementing physical skills rather than depending on the quick fixes often pawned on us.

Always consult your medical provider before beginning this or any other exercise routine.