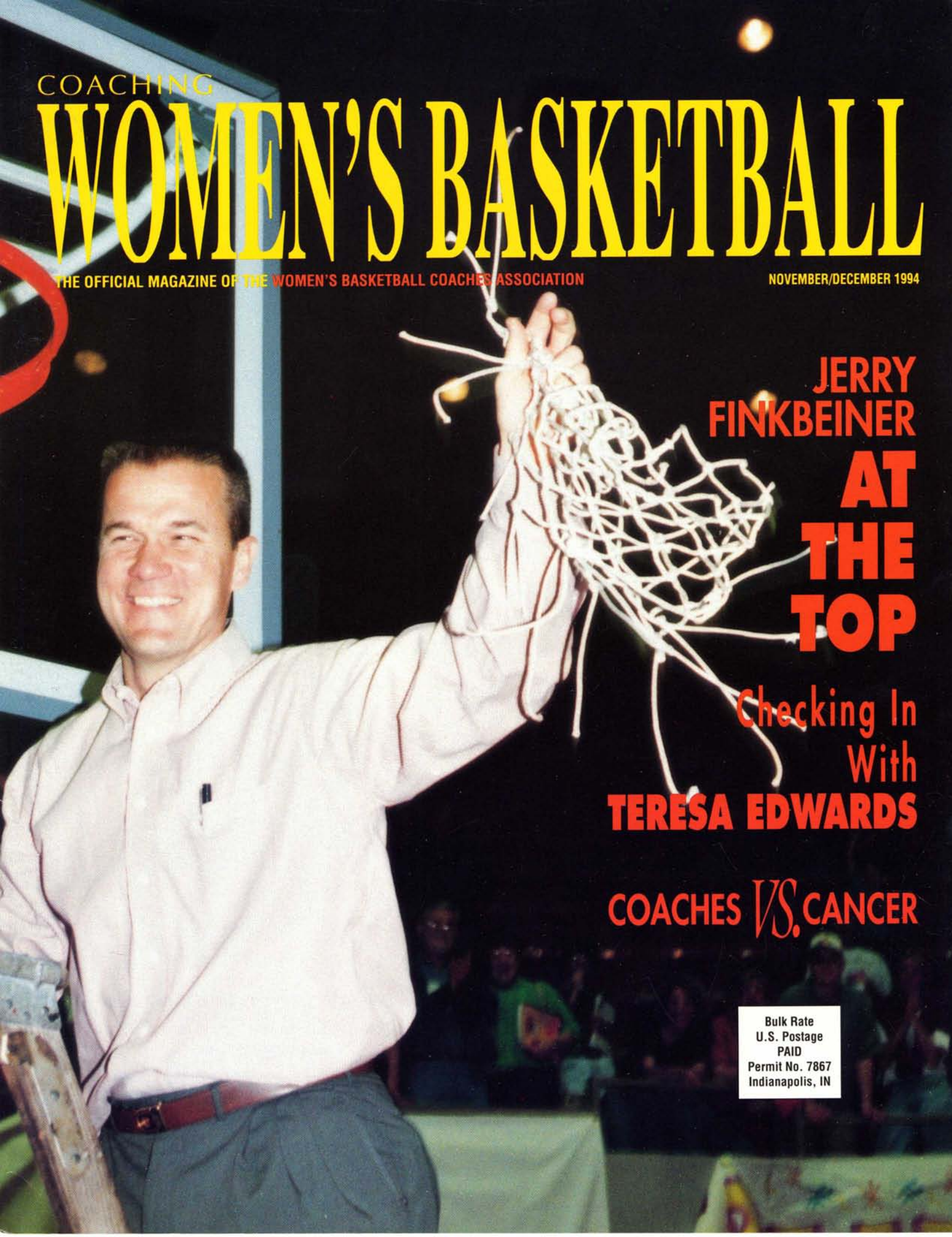

COACHING

WOMEN'S BASKETBALL

THE OFFICIAL MAGAZINE OF THE WOMEN'S BASKETBALL COACHES ASSOCIATION

NOVEMBER/DECEMBER 1994

JERRY FINKBEINER AT THE TOP

Checking In With TERESA EDWARDS

COACHES VS. CANCER

Bulk Rate
U.S. Postage
PAID
Permit No. 7867
Indianapolis, IN

STRENGTH TRAINING FOR THE LOWER BODY

by Matt Brzycki
Princeton University

Since the 1988-89 season, the data collected for the NCAA Injury Surveillance System indicates that the top two body parts injured in women's basketball during each of those five seasons were the ankle and the knee. Increasing the strength of the muscles, bones and connective tissue in the lower body will reduce the likelihood that an athlete will incur an injury while playing. That doesn't mean that she will never get hurt...sometimes injuries are a matter of being in the wrong spot at the wrong time. Strength training, however, will reduce her risk considerably.

Furthermore, the largest and strongest muscles in the body are located below the waist. These muscles permit a variety of functions on the basketball court, the most important of which are running and jumping. As such, the importance of requiring your athletes to strengthen their lower body cannot be overemphasized.

THE HIPS

The hip region is made up of three major muscle groups: the buttocks, the adductors and the iliopsoas.

Buttocks.

The buttocks are the largest and strongest muscles in the body and are composed of three main muscle groups: the gluteus maximus, the gluteus medius and the gluteus minimus. The primary functions of the "glutes" are hip extension (driving the leg backward) and hip abduction (spreading the legs apart). The buttocks are important muscles used in most basketball skills such as running down the court, crashing the boards, leaping to block a shot and performing a jump shot. In addition, the gluteus medius is used when shuffling the feet from side to side.

There are several exercises to choose from when training the buttocks. Perhaps the safest and most productive of all exercises that target the glutes is the leg press, which can be performed using a machine (either selectorized or plateloading). Along with gluteal involvement, this multi-joint movement also provides indirect work for the muscles of the upper legs. Another meaningful multi-joint exercise for the glutes is the lunge, which also influences the upper leg musculature. This exercise may be done with either a barbell or dumbbells. Finally, hip abduction is the movement that best isolates the muscles on the sides of the buttocks. Hip abduction can be performed on a selectorized machine or with manual resistance.

Adductors.

The adductor group is composed of five muscles that are located throughout the inner thigh. These inner thigh muscles are used during adduction of the hip (bringing the legs together). On the court, the adductors are used as stabilizers when maintaining a good defensive position and when shuffling the feet from side to side.

The best movement for isolating the adductors is hip adduction. This exercise can be done on a selectorized machine or with manual resistance.

Iliopsoas.

This is a collective term for the primary muscles of the front hip area — the iliacus and psoas. The main function of the iliopsoas is to flex the hip (bring the knee to the chest). The iliopsoas plays a prominent role in many skills like lifting the knees when running and raising the lead leg when laying the ball up into the basket. The iliacus and the psoas are sometimes considered with the muscles of the abdomen.

Hip flexion is the main exercise for training the iliopsoas. This movement can be done on a selectorized machine, with the body weight as resistance or with manual resistance.

THE UPPER LEGS

The two primary muscle groups in the upper legs are the hamstrings and quadriceps.

Hamstrings.

The "hams" are located on the backside of the upper leg and actually include three separate muscles: the semimembranosus, the semitendinosus and the biceps femoris. Together, these muscles are involved in flexing the lower leg around the knee joint (raising the heel toward the hip). The hams are used during virtually all running and jumping activities. Unfortunately, the muscle is very susceptible to pulls and tears. Strong hamstrings are necessary to balance the effects of the powerful quadricep muscles.

The primary movement used to exercise the hamstrings is the leg curl. Leg curls may be performed sitting, standing or laying prone using a machine (either selectorized or plateloading) or manual resistance.

Quadriceps.

The "quads" are the most important muscles on the front part of the upper leg. As the name suggests, the quadriceps are made up of four muscles: the vastus lateralis, the vastus intermedius, the vastus medialis and the rectus femoris. The main function of the quads is extending (or straightening) the lower leg at the knee joint. Like the hams, the quads are also involved in just about all running and jumping skills.

The quadriceps are used during the legs extension. Leg extensions can be done on a machine (either selectorized or plateloading) or with manual resistance.

THE LOWER LEGS

The calves and "dorsi flexors" are the two major muscle groups in the lower legs.

Calves.

Each calf is made up of two important muscles – the gastrocnemius (or "gastroc") and the soleus – which are located on the backside of the lower leg. The calves are involved when the foot is extended at the ankle (or when rising up on the toes). The calves play a major role in running and jumping activities.

The principal exercise used to train the calves is the calf raise. The calf raise is typically executed either sitting or standing using a machine (either selectorized or plateloading).

Dorsi Flexors.

The front part of the lower leg contains four muscles which are sometimes simply referred to as the dorsi flexors. The largest of these muscles is the tibialis anterior. The dorsi flexors are primarily used in flexing the foot toward the knee. It is critical to strengthen the dorsi flexors as a safeguard against shin splints.

Dorsi flexion is the best movement for exercising the dorsi flexors. This exercise can be performed on a machine (either selectorized or plateloading) or with manual resistance.

EXERCISE PRESCRIPTION

In general, 15–20 reps are the recommended goal for any hip exercise and 10–15 reps for leg exercises (upper and lower). The hip and leg exercises should be performed in the beginning of the strength workout while your athletes are still fresh – both physically and mentally. If done at the end of a routine, it isn't likely that your players will perform those exercises with any degree of enthusiasm. Finally, a comprehensive lower body sequence would be 1– 2 exercises for the hips followed by one exercise each for the hams, quads and lower leg (either calves or dorsi flexors).◆

Matt Brzycki is the Coordinator of Health Fitness, Strength and Conditioning Programs at Princeton University. Coach Brzycki has authored more than 120 articles on strength and fitness and a book, ***A Practical Approach to Strength Training****, which is in its second edition. He has also co-authored the book,* ***Conditioning for Basketball.***