



# PEAK PERFORMANCE

## SPECIAL REPORT

### DYNAMIC POWER WORKOUT

## Mobility Training: These pre-workout exercises can give a valuable boost to competitive performance

What you do just before your workout begins can have a big impact on what you are able to do during your workout. Many athletes prepare for a training session by carrying out some routine stretching exercises, but it's important to remember that stretching helps to improve your static (non-moving) flexibility and may not do such a good job at preparing your body to move quickly and efficiently. That's why I recommend that you focus on 'dynamic mobility exercises' before every workout.

Dynamic mobility exercises during your pre-workout warm-up period prepare your body completely for the vigorous movements that make up the main part of your workout. Most sports involve forceful, strenuous activity, and mobility exercises and drills stimulate your nervous system, muscles, tendons, and joints in a very dynamic manner. Static stretching exercises, in which you're not moving around at all but are simply elongating a particular muscle or group of muscles, do have a place in your training programme, but their value and proper usage are often misunderstood.

It's probably best to place your static stretches at the end of your workout as part of the cool-down, not at the beginning of a training session. Static exercises help bring your body back toward a state of rest and recovery and allow you to focus on relaxing and lengthening the muscles that you have put under stress during your workout. Placing static stretches at the beginning of a training session, on the other hand, tends to interrupt the natural flow of an optimal warm-up and fails to prepare you fully for the dynamic movements that will follow.

What follows is a detailed description of a group of dynamic mobility exercises designed to

warm you up, stretch you out, and keep you moving as you make the transition from resting to high-energy activity. In addition, I have provided two sample mobility training units that you can utilize during your pre-workout warm-ups.

#### Joint rotations

From a standing position with your arms hanging loosely at your sides, flex, extend, and rotate each of the following joints (perform six to 10 rotations at each group of joints before moving on to the next group): (1) Fingers, (2) Wrists, (3) Elbows, (4) Shoulders, (5) Neck, (6) Trunk and Shoulder Blades, (7) Hips, (8) Knees, (9) Ankles, and (10) Feet and Toes.

Progress through this sequence of rotations at a low intensity and slow speed, and make yourself aware of the motions that occur at each joint. Tune your mind into your body, and prepare yourself mentally for engaging in physical activity (picture yourself moving smoothly and powerfully). Complete the series of joint rotations from fingers to toes in no more than three to four minutes.

#### Continuous warm-up activity

After you've finished your joint rotations, move continuously at a slow, easy pace for five to seven minutes to warm up. Jogging and cycling are the most traditional exercises used for warming up, but you need not limit yourself to these two activities. As an alternative, you may alternate slow jogging with jogging backward, skipping, galloping, side-shuffling, cross-over stepping (also known as carioka or grapevine movement), skipping backward, walking while swinging your arms in circles forward or backward, and/or jogging with easy 'bum kicks' (alternately bringing heels to the buttocks while jogging). Each of these variations may be done in segments of 30-50 metres, interspersed with brief periods of normal jogging in between segments.

If you like to use seated stationary cycling during your warm-up, it may be alternated with cycling from a standing position on the pedals, backward pedaling, and standing-backward-pedaling. Other types of warm-up activities include stair stepping, treadmill walking or jogging, ski-machine usage, climbing on a climbing machine, slide-boarding, and rowing. All warm-up activities should begin at a slow pace

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and gradually increase in intensity. You should feel a sense of warmth and relaxation in your muscles – and perspire lightly by the end of your five- to seven-minute warm-up period.

### **Dynamic mobility exercises**

After you've finished your joint rotations and brief warm-up, perform the movements described below as smoothly as possible, and progress gradually from small to large ranges of motion over the course of the repetitions. Begin the exercises by keeping all swings and bends at a slow and safe speed of movement. As your mobility increases, gradually increase the speed to make them more dynamic. Please remember to stay within your own normal range of motion, but work to increase your amplitude (range of motion) and speed of movement in small increments from week to week. Don't find your limit (in speed or amplitude) by going past it and injuring yourself. Mobility training is for injury prevention and performance improvement – not injury promotion.

Please perform the following exercises, in order, from a standing position, remembering to carry out all movements in a smooth, continuous manner, without stopping or jerking:

## **I. UPPER BODY MOBILITY**

### **A. ARM SWINGS (Two movements)**

1. *Overhead/Down and Back* – Swing both arms continuously to an overhead position and then forward, down, and backwards. Repeat for six to 10 repetitions.

2. *Side/Front Crossover* – Swing both arms out to your sides and then cross them in front of your chest. Repeat for six to 10 repetitions.

### **B. NECK MOBILITY (Three movements)**

1. *Flexion/Extension* – Tuck your chin into your chest, and then lift your chin upward as far as possible. Repeat for six to 10 reps.

2. *Lateral Flexion* – Lower your left ear toward your left shoulder and then your right ear to your right shoulder. Six to 10 reps.

3. *Rotation* – Turn your chin laterally toward your left shoulder and then rotate it toward your right shoulder for six to 10 reps.

### **C. TRUNK AND SHOULDER-GIRDLE MOVEMENTS (Three movements)**

1. *Flexion/Extension* – Slump (protract) shoulders, tuck your chin toward your chest, and drop your chest forward slightly. Then, pull your shoulders back (retraction), raise your chin up, and lift your chest while arching your back slightly. Six to 10 reps.

2. *Lateral Flexion* – With your arms at your sides, bend sideways at the waist to your left, and then bend sideways to the right. Repeat for six to 10 repetitions on each side.

3. *Rotation* – With hands in front of your chest and elbows out to the sides, twist at your waist to the left, and then back to the right. Six to 10 reps.

## **II. LOWER BODY MOBILITY**

### **A. Hip Circles and Twists (Two Movement)**

1. *Circles* – With your hands on your hips and feet spread apart wider than your shoulder, make circles with your hips in a clockwise direction for 10 to 12 repetitions. Then repeat the circles in a counterclockwise direction for 10 to 12 repetitions.

2. *Twists* – Extend your arms out to your sides, and twist your torso and hips to the left, shifting your weight on to the left foot. Then twist your torso to the right while shifting your weight to the right foot. 10 to 12 reps on each side.

### **B. Leg Swings (Two Movements)**

1. *Flexion/Extension* – With your weight on your left leg and your right hand on a support for balance, swing your right leg forward and backward for 10 to 12 repetitions. Repeat with the left leg for 10 to 12 reps.

### **2. Cross-Body Flexion/Abduction**

Leaning slightly forward with your hands on a wall and your weight on your left leg, swing your right leg to the left in front of your body, pointing your toes upward as your foot reaches its farthest point of motion. Then swing the right leg back to the right as far as comfortably possible, again pointing your toes up as your foot reaches its final point of movement. Repeat this overall motion 10 to 12 times before performing 10 to 12 reps with the left leg.

### **C. Ankle Bounce (Two Movements)**

1. *Double-Leg Bounce* – Leaning forward with your hands on the wall and your weight on your toes, raise and lower both heels rapidly (bounce). Each time, lift your heels one to two inches from the ground while maintaining ground contact with the balls of your feet. 12-16 reps.

2. *Single-Leg Bounce* – Leaning forward with your hands on a wall and all your weight on your left foot, raise the right knee forward while pushing the left heel towards the ground. Then lower the right foot to the floor while raising the left heel one to two inches. Repeat in a rapid, bouncy fashion for 12 to 16 repetitions before carrying out 12-16 reps with the opposite side.

### Sample routines

The following routines are excellent for warming you up and enhancing your mobility before your main workout begins. Unit A is particularly appropriate before an intense training session but may be used by any athlete who desires improved mobility. Training Unit B is a shorter version of Unit A and may be used to maintain previously developed levels of mobility. Best results will be realized by performing one of the units on a daily basis.

### MOBILITY TRAINING UNIT A (Developmental unit; 20-30 minutes in duration)

1. *Joint Rotations* (3-4 minutes)
2. *Warm-Up Activity* (5-7 minutes of walking, jogging, skipping, etc.)
3. *Upper Body Mobility* (2-3 minutes)
  - a. Arm Swings (2 movements, 10 reps each way)
  - b. Neck Movements (3 movements, 10 reps each way)
  - c. Trunk and Shoulder-Girdle Movements (3 movements, 10 reps for each)
4. *Fast Jogging* (2 minutes: 2-3 x 50-60 metres, with 20- metre walk recoveries)
5. *Lower Body Mobility* (34 minutes)
  - a. Hip Cycles and Twists (2 movements, 12 reps each way)
  - b. Leg Swings (2 movements, 12 reps each way)
  - c. Ankle Bounces (2 movements, 16 reps each way)
6. *Fast Striding* (2-3 minutes): 2 X 50-60 metres, with 50- metre walk recovery
7. *Acceleration Runs* (2-3 minutes): 2 X 40-50 metres, increasing speed throughout, with a 50- metre walk recovery.

### MOBILITY TRAINING UNIT B (Maintenance unit, just 10-15 minutes in duration)

1. *Joint Rotations* (2 minutes)
2. *Warm-Up Activity* (5 minutes of walking, jogging, skipping, etc.)
3. *Upper Body Mobility* (2 minutes)
  - a. Arm Swings (2 movements, 6 reps each way)
  - b. Neck Movements (3 movements, 6 reps of each)
  - c. Trunk and Shoulder Movements (3 movements, 6 reps for each)
4. *Lower Body Mobility* (3 minutes)
  - a. Hip Circles and Twists (2 movements, 10 reps)
  - b. Leg Swings (2 movements, 10 reps for each leg)
  - c. Ankle Bounces (2 movements, 12 reps)

### Key points about mobility training

Train – don't strain. At first, perform all movements slowly and within a comfortable range of motion. Over a period of several weeks, gradually increase the speed and range of the exercises to make them more dynamic. This will allow your muscular and nervous systems to slowly but progressively adapt to the movements. The final result will be significant, functional increases in your mobility.

Don't forget to warm up properly before performing the dynamic movements. A short bout of continuous, moving activity will raise your body temperature, increase blood flow to your muscles, activate your nervous system, and prepare you fully for your mobility exercises – and for a strenuous overall workout.

Save your static stretching activities for after your workout, during your cool-down period. Relaxed, passive stretching prepares your muscles for the quiescent period which follows your workout.

If you're wondering why you should attempt to expand the mobility of your neck and shoulder when the 'prime movers' during your workout are probably your legs, wonder no more. Remember that your whole body functions as a unit – a 'chain' of interrelated parts. For example, if your shoulders are stiff, you won't have a quick, fluid arm swing when you are running. If you don't have proper arm swing, your legs will slow down and your workout quality will drop.

Don't forget to carry out your mobility training before every workout. Mobility and flexibility training has a cumulative effect over an extended period of time. After about four weeks or so, you should notice appreciable gains in your mobility, flexibility and ability to move smoothly during your training sessions. Best of all, you'll also notice an appreciable improvement in your workouts – and your competitive efforts!

**Circuit training:** *These exercises are an excellent way to build strength and stamina simultaneously*

During the past few years, endurance athletes in a number of sports have added resistance exercises to their training programmes in an effort to boost their muscle power and decrease their risk of injury. Scientific studies have linked resistance training with a reduced rate of injury in athletes, probably because resistance work fortifies leg muscles and strengthens 'weak links' in athletes' bodies, including the often-injured hamstrings and shin muscles, as well as abdominal and low-back muscles. Resistance work can also improve tendon and ligament strength and increase bone density, effects which should help to lower injury rates. In addition, resistance workouts heighten body awareness,

upgrade coordination, reduce body-fat levels, and improve self esteem, all of which can contribute to improved performance during competition. For athletes, the general preparation period before the beginning of actual competitions is an ideal time to initiate a resistance training programme. A four- to eight-week period of sound resistance training helps to develop a nice foundation of suppleness (mobility), strength, and stamina (endurance), to which athletes can add speed and racing skill just before the competitive season begins. 'Circuit training' is an excellent way to simultaneously build strength and stamina. The circuit-training format utilises a group of strength exercises (usually six to 10 or more) that are completed sequentially (one exercise after another). Each exercise is performed for a specified number of repetitions or for a prescribed time period before moving on to the next exercise. The exercises within each circuit are separated by brief, timed rest intervals, and each circuit is separated by a longer rest period. The total number of circuits performed during a training session may vary from two to six depending on your training level (beginner, intermediate, or advanced), your period of training (preparation or competition), and your primary training objective (You may be developing total work capacity, boosting your power, or engaging in 'active rest,' for example.) I have designed this special circuit-training programme with the following objectives in mind: The circuit work will increase your general work capacity by improving your ability to tolerate increasing levels of muscular fatigue (stamina improvement).

Over time, the circuit training will have shorter and shorter rest intervals between exercises, thus maintaining elevated heart rates during the circuit workouts and helping you to upgrade your cardiorespiratory capacity (stamina improvement). Circuit efforts will enhance your overall body strength, including the strength and resiliency of muscles, tendons, and ligaments, the integrity of your joints, and the strength and density of your supporting bone structures (strength improvement). The circuits will improve your movement skill and body awareness, because you'll perform exercises that utilise body weight as the primary form of resistance (skill improvement).

The circuit programme will increase your lean muscle mass by a moderate amount and decrease your body-fat levels through high levels of energy expenditure (body composition improvement).

### **The basic training circuit: recommendations.**

A full mobility-plus-circuit workout, including warm-up, mobility training, circuit work, and a

10-minute cool-down can be completed in about an hour or less. Is that too much time for the busy athlete? Definitely not! For one thing, you only need to complete the overall workout twice weekly during your base conditioning period. In addition, the payoffs from circuit training are great. Whether you're a cyclist, a racewalker, a runner, a rugby player, a swimmer, or a participant in racket sports, you'll improve your strength, mobility and stamina through circuit training. As a result, you will move much more powerfully as you take part in your sport. Bear in mind, though, that for best results the circuit training sessions should not be performed on consecutive days. If you are carrying out other intensive training on the same day as the circuit work, do the intensive work before the circuit training, since fatigue levels from the circuit might well interfere with training intended to develop speed, power, or event-specific endurance. Better yet, carry out circuit training on days during which other training is of low intensity. Don't do your circuit training on a rest day, however; rest really means rest!

Here is your sequential format for each circuit:

- Total-body exercise
- Upper-body exercise
- Lower-body exercise
- Core/trunk exercise
- Total-body exercise
- Upper-body exercise
- Lower-body exercise
- Core/trunk exercise

Notice that each part of the body is emphasised twice during each circuit.

### **The eight exercises in your circuit**

For each circuit, do the following exercises:

**1. Four-count squat thrusts:** Stand with your arms held at your sides, and then squat down, placing both hands in front of you on the floor. With arms straight and your weight resting on both hands, quickly extend both legs backward (hop backward), ending in a front-support position. Return legs forward (hop forward), ending in a low-squat position with hands on the floor.

Finally, jump into the air and return to a standing position. Repeat each of these four steps, in order, to a rhythmic 1-2-3-4 count, without pausing between counts or repetitions. How will this exercise benefit you? The high degree of amplitude (joint motion) at your hips and knees, combined with the resistance provided by your body weight, will develop strength and mobility in your knee and hip joints – important for high-speed movement. The front-support position develops stability and strength in the upper trunk, abdominal, and pelvic

regions, strength that is necessary to control torso movements during the running stride or when you strike a ball. The jump added to the exercise as you return to a standing position greatly increases your cardiac demand, hikes the power of your leg muscles, and increases the impact forces (upon landing) as well, fortifying the bones in your legs and feet. Use caution, though; perform the movements on a gym floor or grass, not on concrete.

**2. Push-ups:** Start in the front-support position with your hands and toes on the floor and trunk, hips, and legs extended. Bend your arms and lower your chest to the floor. Then push your body upward as you straighten your arms, returning to the front-support position. Repeat this action rhythmically and continuously without stopping for the allotted time. How does this benefit you? Push-ups are well known for increasing upper-body strength, but their value in developing abdominal and hip-flexor stability is often ignored. This improved stability helps to control hip, trunk, and shoulder movements as you move quickly and also promotes balance between the upper and lower body.

**3. Scissor step-ups:** Use a step or bench which is approximately mid-shin to knee height. Put your left foot on the step, with your right foot on the floor and your arms at your sides. Then push down with your left leg and drive your body upward rapidly, switching support (hopping) from left foot to right foot as your body reaches its maximal vertical height. With your right foot supporting your body, lower the left foot to the floor rapidly but under control. Repeat this action continuously, back and forth from foot to foot, without pausing at the top or bottom positions. How can this help you? The scissor step-up develops leg strength, power, and dynamic-balance control (coordination), without which you can't move quickly, whether it's from one end of the football pitch to the other, from the baseline to the net on a tennis court, or from the start to the finish of a 10k race. Cardiovascular benefits of this exercise can be increased by speeding up your stepping cadence or by increasing the height of the step. Step heightening also enhances leg-muscle power and improves mobility of the hip and knee joints.

**4. Abdominal sit-backs:** For this exercise, use a step, bench, or chair which does not have a vertical, support for your back. Sit with your legs bent and your arms extended in front of you, and then recline your trunk backward at the hips by about 45 degrees. That's your starting point for the exercise. To do the sit-backs, raise both arms simultaneously overhead while maintaining tight

abdominal muscles and a straight chest. Then simply return your arms to the extended position in front of you, without moving your trunk or legs. Repeat

this back-and-forth arm action in a smooth, continuous fashion without pausing at any point during the movement. How will this exercise benefit you? The increased abdominal stability gained from sit-backs carries over to improved posture and better core stability as you run. A strong pelvic girdle and trunk provide the anchor point for a strong pair of legs, allowing you to use your legs in a maximally powerful manner during quick sprints – or during sustained, vigorous running.

**5. Squats to presses:** Use two dumbbells, each weighing approximately 10% of your body weight (e.g., if you weigh 150 pounds, each dumbbell should be 15 pounds). Individuals with less strength training experience may start with dumbbells which weigh 5% of body weight, while stronger athletes can use dumbbells checking in at 20% of body weight. You may need to experiment a bit, using a weight that makes the exercise challenging but achievable. If dumbbells are unavailable, a barbell of comparable total weight can be utilised. To do the exercise, stand upright with your feet spaced about hip- to shoulder-width apart and your hands supporting the dumbbells in front of your shoulders. Squat down until your thighs form an angle of 90 degrees with your shins (a half-squat), while maintaining a reasonably upright posture with your torso and while keeping your hands in front of your shoulders. Then rise quickly from the squat position while pressing (pushing) the dumbbells overhead simultaneously. Both arms and legs should reach full extension at the same time (You'll end up standing tall with legs straight and arms straight overhead). Then lower the dumbbells in a controlled fashion to the starting position. Repeat this three-count movement smoothly and continuously. How can this help you as an athlete? Squats to presses increase strength and power in your legs, hips, low back, abdominals, shoulders, and arms. Note that the whole-body involvement of the squat to press increases your cardiorespiratory requirements, compared to the more commonly used, isolated pressing exercises such as bench and shoulder presses.

**6. Body-weight rows:** For this one, you'll need a horizontal bar or beam which is sturdy enough to support your body weight. Set the bar at approximately the height of your navel (when you're standing straight up). To start the exercise, grip the bar with both hands at slightly wider than shoulder width, and hold your body in support

underneath the bar. Your heels should be on the floor, and your body should be straight and rigid from your shoulders to your ankles. Then, with your feet acting as a fulcrum, pull your chest up to the bar by bending your elbows and pulling them backwards. Return to the starting position by straightening your arms in a controlled manner, and repeat the overall action for the time period specified in the chart. How can this exercise help you? The body-weight row does for the back side of the body what the push-up does for the front side. Body-weight rows improve pulling strength of the upper-back, shoulder, and arm muscles, but they also serve to increase stabilising strength in the low back, gluteals, and hamstrings, all of which are critically important for quick movement whenever you participate in your sport. You'll achieve a balance between lower and upper body strength by performing this exercise.

**7. One-leg squats:** You'll need a bench or step six to eight inches in height. Stand with your left foot flat on the floor and your right foot behind you and elevated on the step. The distance between your feet should be approximately the length of your shin, and most of your weight should rest on the heel of your left foot. To do the exercise, bend your left knee and lower your body until the left knee makes an angle of 90 degrees between the thigh and lower leg.

Return to the starting position by straightening your left leg, while maintaining an upright posture with your trunk. Repeat this action with the left leg for the specified amount of time, and then switch to the right leg. How do one-leg squats help you? This exercise develops muscle strength in the quads, hamstrings, and gluteals, the muscles which provide much of your power while running. The actual motion of the one-leg squat closely resembles the 'frontside' mechanics of the hip and knee during the actual

running stride. By strengthening your hip and knee joints in a coordinated and integrated fashion, your leg strength and running power should improve tremendously. One-leg squats can also help you improve your vertical jumping ability.

**8. Low-back stabilisers:** For this exercise, you'll need a bench, padded table, or Roman-Chair' bench. Lie face down with your body extended and your hips at the edge of the supporting surface of the bench. Your arms should be extended straight down toward the floor in front of you. For added stability, it helps if your feet are wedged between the end of the bench and a wall. Smoothly raise both arms over your head simultaneously while maintaining your trunk in full extension (your body should be horizontal to the floor and held straight as an arrow), and then return both arms to the starting position. Repeat this action over and over again for the prescribed time period. How can this exercise possibly benefit you? Heightened low-back strength provides for proper posture while running and also provides excellent 'motion control' of the torso and hips throughout the running stride. As a result, you'll move more quickly – whether it's to return a serve on the tennis court or to reach the football in time to score a goal.

Remember that improvements in how your body functions can occur whenever you overload your body's systems. This circuit programme provides an overload of your cardiorespiratory system (especially the hard circuits), taxes your muscular system by forcing it to work against increased resistance, and forces the key joints involved in moving your body to go through a wider range of motion than they commonly encounter.

The result, I believe, will be better, more powerful performances.