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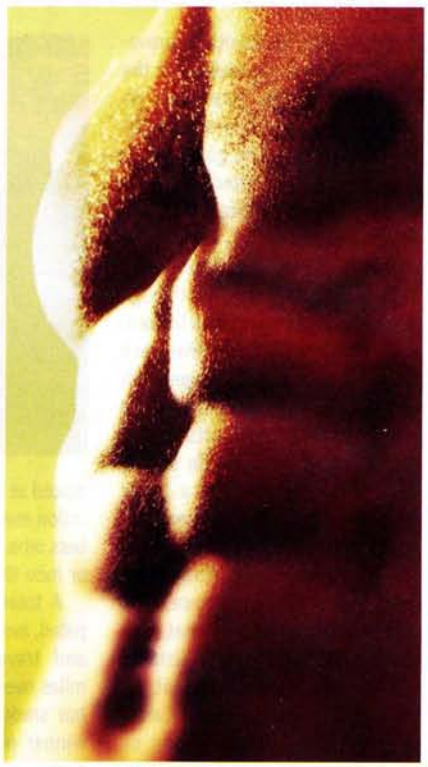
Is vibration training effective?



ONE OF the latest methods of training is whole-body vibration (WBV). The use of WBV is becoming increasingly popular among a wide range of populations, from athletes to older adults. WBV has two main elements. One is the vibration that comes from a device or platform. The other is the exercise/activity. WBV can be done using a single leg or both legs, static or dynamic contractions, or unloaded or loaded conditions (with additional weight).

It's touted as an effective way to prevent and treat osteoporosis and muscle atrophy, as well as improve "muscle performance," "athletic power" and "body balance." As with most methods of training, however, anecdotal reports are one thing, and scientific studies are another.

Most of the long-term studies (12 to 24 weeks) using one or more comparison groups found that WBV with resistance training isn't significantly better than resistance training alone in improving muscular strength, vertical jump, speed of movement and fat-free mass. The acute (immediate) effects from WBV — most notably increases in vertical jump and flexibility — have led some to view WBV as a potential warm-up procedure rather than a recommended training protocol.

When administered for up to 24 weeks at 26 to 45 Hertz, WBV appears to be safe, with very few side-effects reported in the scientific literature. Nevertheless, the effects of long-term exposure to vibration are unknown. **FM**

Is it possible to decrease the shear forces in the knee joint during the barbell squat by changing the stance?

Research has shown that moving the knees forward (toward the toes) while performing a barbell squat increases the knee shear (side-to-side) forces. To minimize these shear forces, then, the lower leg must be kept as close to perpendicular to the ground as possible.

In one study, 39 male powerlifters were filmed while competing in a national masters' championship. In powerlifting competition, the lifters perform three movements — the squat, bench press and deadlift — and are given three attempts at each. The highest successful attempt in the squat for each of the 39 lifters was analyzed (17 second attempts and 22 third attempts). Their stances were normalized and expressed as a percentage of each lifter's shoulder width. The 13 smallest widths were assigned to the narrow-stance group, the 13 middle widths were assigned to the medium-stance group and the 13 largest widths were assigned to the wide stance group.

The study found that the lifters who used a narrow stance had about 1.57 to 2.36 inches of greater knee movement toward their toes compared to lifters who used medium and wide stances. So it seems that using either a medium or wide stance will minimize the shear forces in the knee. FM

Does sodium bicarbonate help to improve performance?

Sodium bicarbonate (baking soda) has a wide range of applications, such as treating acid indigestion, whitening teeth and absorbing odors in refrigerators. But it's also been promoted as an agent that delays the onset of fatigue.

A great deal of research has shown that sodium bicarbonate improves performance. In one study, 16 female subjects (average age 19) were randomly assigned to two groups. One group received sodium bicarbonate and the other a placebo (sodium chloride). Both groups performed interval training on a stationary cycle three times per week for eight weeks. The only difference was that 90 and 30 minutes prior to a session, the subjects consumed either sodium bicarbonate or the placebo. The researchers found that the group that consumed sodium bicarbonate before each session had significantly greater improvements in lactate threshold and endurance than the group that consumed the placebo.

Likely side effects from sodium bicarbonate include gastrointestinal disturbances such as nausea, vomiting, diarrhea and flatulence. Sodium citrate is thought to have the same benefits as sodium bicarbonate without the side effects. But in one study, eight of nine subjects (elite athletes) who received sodium citrate experienced gastrointestinal distress. FM

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