

american

# FITNESS

November/December 2013 \$4.50

**Earn Extra CEUs:  
Top Seven Injuries  
Below the Belt**

**Common  
Trainer Mistakes**

**Mind-Body  
Boot Camps**

**February APEX  
is Coming  
Full Brochure  
Inside!**

Moving Forward  
with **MaDonna**  
**GRIMES**

# AF Q & A

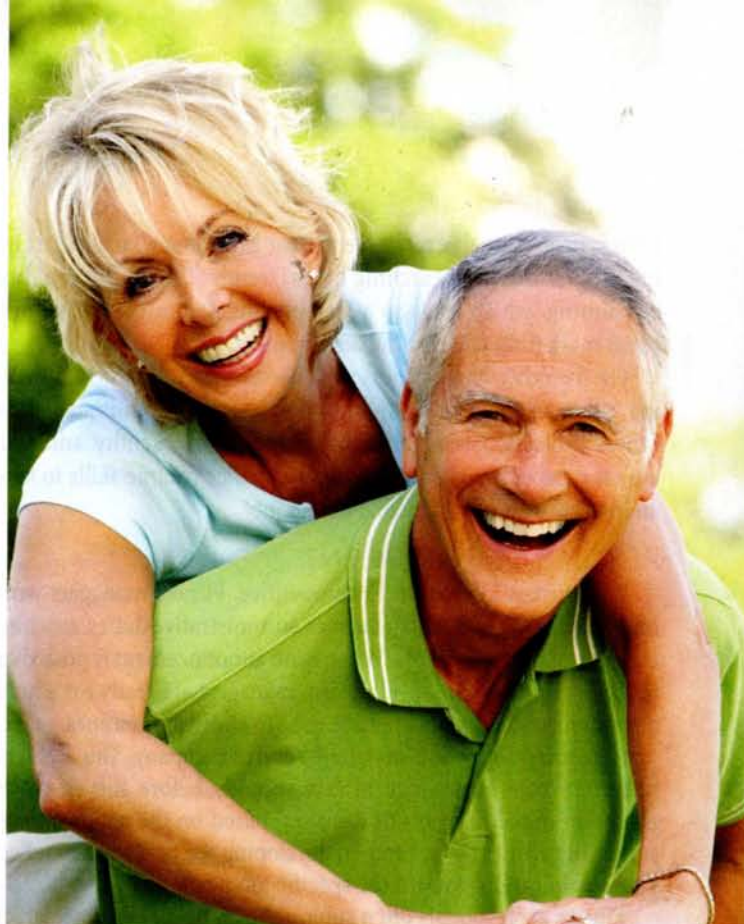
BY MATT BRZYCKI

## Is there a link between fitness and dementia in later life?

Many older adults are affected by dementia, a progressive loss of memory and thinking and reasoning processes. It seems plausible to think that being fit at younger ages makes dementia less likely at older ages, but what does the research say?

As part of the Cooper Center Longitudinal Study, researchers examined data on 19,458 middle-aged subjects (average age 49.8 at baseline) whose levels of cardiorespiratory fitness were assessed in conjunction with a preventive healthcare visit to the Cooper Institute in Dallas. The subjects were then followed for an average 25 years—beyond the time when they were 65 years of age—to see who developed dementia.

The researchers found that those who were most fit had a lower rate of all-cause dementia than those who were least fit. In other words, those who were most fit were less likely to develop dementia. So having a higher level of fitness earlier in life may lower the risk of dementia later in life.



## What workload is necessary for maximal activation of muscles?

Researchers in Brazil had 11 men perform the bench press on a Smith machine, determining their maximal isometric strength and maximal muscle activation of two agonist muscles (the pectoralis major and anterior deltoid) and one agonist muscle (the posterior deltoid). The subjects were then randomly assigned to do the bench press with four different levels of intensity: 60, 70, 80 and 90% of maximal voluntary contraction (MVC).

The study found that there were significant differences in muscle activation between 60 and 70% MVC and between 70 and 80% MVC. However, there was no significant difference between 80 and 90% MVC.

## Are any benefits derived from exercising during pregnancy?

Researchers randomly assigned 62 pregnant women (12 to 14 weeks gestation) who had been sedentary for a minimum of six months into two groups: One group remained sedentary and the other began a fitness program, doing aerobic training four times per week for 45 to 60 minutes per workout. The workouts consisted of step aerobics on the first day, walking as a group over hilly terrain on the second day, circuit training on the third day, and walking individually on the fourth day. This was done throughout the remainder of their pregnancy.

The study found that the women who were active significantly increased their aerobic fitness and muscular strength more than the women who were inactive. But the real surprise was that the women who were active had significantly fewer cesarean sections and recovered more quickly after delivery. There were no

So what are the implications of these findings for strength training? Well, this means that using a level of intensity that's beyond about 80% of MVC provides no greater benefit with respect to the activation of the agonist muscles or "prime movers." In other words, to obtain maximal involvement of the targeted muscles, there's no need to use a level of intensity beyond 80% of MVC.

One thing to remember, though, is that the data were obtained with isometric contractions, not dynamic contractions—namely, concentric and eccentric—that typically occur when lifting weights. Therefore, the percentage of MVC might not translate directly into a percentage of a one-repetition maximum. Nonetheless, this information is intriguing.

significant differences between the two groups in musculoskeletal pains during pregnancy, flexibility, length of pregnancy, overall length of labor, weight gain during pregnancy or weight retention postpartum.

**MATT BRZYCKI** is the Assistant Director of Campus Recreation, Fitness at Princeton University. He has more than 30 years of experience at the collegiate level and has authored, co-authored and edited 17 books.

## REFERENCES:

- DEFINA, L.F., ET AL. "THE ASSOCIATION BETWEEN MIDLIFE CARDIORESPIRATORY FITNESS LEVELS AND LATER-LIFE DEMENTIA: A COHORT STUDY." *ANNALS OF INTERNAL MEDICINE*, 158, NO. 3 (2013): 162-68.
- PINTO, R.S., ET AL. "RELATIONSHIP BETWEEN WORKLOAD AND NEUROMUSCULAR ACTIVITY IN THE BENCH PRESS EXERCISE." *MEDICINA SPORTIVA*, 17, NO. 1 (2013): 1-6.
- PRICE, B.B., AMINI, S.B. AND KAPPELER, K. "EXERCISE IN PREGNANCY: EFFECT ON FITNESS AND OBSTETRIC OUTCOMES-A RANDOMIZED TRIAL." *MEDICINE & SCIENCE IN SPORTS & EXERCISE*, 44, NO. 12 (2012): 2263-69.