



ACSM Information On...

## EXTREME CONDITIONING PROGRAMS

A relatively new form of exercise referred to as extreme conditioning programs (ECPs) is currently marketed to a wide, active population. These are vigorous exercise workouts that are physically demanding.

### A Complete Physical Activity Program

A well-rounded physical activity program includes aerobic exercise and strength training exercise, but not necessarily in the same session. This blend helps maintain or improve cardiorespiratory and muscular fitness and overall health and function. Regular physical activity will provide more health benefits than sporadic, high intensity workouts, so choose exercises you are likely to enjoy and that you can incorporate into your schedule.

ACSM's physical activity recommendations for healthy adults, updated in 2011, recommend at least 30 minutes of moderate-intensity physical activity (working hard enough to break a sweat, but still able to carry on a conversation) five days per week, or 20 minutes of more vigorous activity three days per week. Combinations of moderate- and vigorous-intensity activity can be performed to meet this recommendation.

Examples of typical aerobic exercises are:

- Walking
- Running
- Stair climbing
- Cycling
- Rowing
- Cross country skiing
- Swimming

In addition, strength training should be performed a minimum of two days each week, with 8-12 repetitions of 8-10 different exercises that target all major muscle groups. This type of training can be accomplished using body weight, resistance bands, free weights, medicine balls or weight machines.

Extreme Conditioning Programs often consist of a variety of training methods such as resistance training with kettlebells and barbells, repeated body weight exercises, explosive movements, sprints and flexibility. This variety can prevent boredom and participants often feel motivated, challenged and excited. These ECPs boast claims of vastly improved fitness in rather short periods of time. Many of the ECPs provide the convenience of working out in settings other than a gym, such as parks and warehouses. This may be attractive for some exercise enthusiasts who are interested in exercise, but not interested in paying costly fitness facility fees.

ECPs are high repetition, vigorous training workouts that incorporate challenging exercises performed in sequence with short rest periods between sets. ECPs combine aspects of circuit training (going from station to station of exercise), resistance training, high-intensity interval training and body weight calisthenics. Many certified exercise professionals use these same training programs, although very safely and effectively, with clients on a daily basis.

### Potential ECP Benefits

Many ECPs integrate high intensity interval training, often referred to as HIIT, workouts. This system of training involves repeated bouts of high intensity efforts followed by recovery periods of varying lengths of time. HIIT programs have been shown to have several health benefits including:

- Improve cardiovascular health
- Improve insulin sensitivity (*i.e.*, the uptake and utilization of blood glucose)
- Lower blood pressure (when elevated)
- Improve the good HDL-cholesterol.

Another focus of ECPs is 'functional fitness.' Program designers of ECPs describe functional fitness as the ability to repeatedly perform whole-body or multi-joint movements under fatiguing conditions.

### Concerns About ECPs

Certain characteristics of ECPs appear to ignore many of the current standards for safe participation in exercise. For instance, the performance of very fast, timed repetitions with insufficient rests periods between sets contrasts with currently held scientific evidence to improve muscular strength. Controlled movements with adequate rest reduce the risk of injury. Unskilled participants who are not ready to perform a complex movement with weights are at risk for musculoskeletal injury. Insufficient rest between exercise sets and circuits may be a precursor to overtraining syndrome. Overtraining syndrome manifests itself with physiological and psychological signs and symptoms that impair performance and delay the normal recovery from exercise. Many ECP instructors encourage participants to push themselves to compete athletically with more experienced members in the ECP class. In this type of competitive setting, it becomes difficult for a novice exerciser to scale back

to the appropriate training intensity. There appears to be a wide range of variability in how these programs are being taught, as the owners of many ECP programs may not regularly employ certified exercise professionals to teach these classes (such as ACSM Certified Health Fitness Specialists and Personal Trainers). Finally, despite the growing popularity of these programs, very little research has been conducted and published on the specific health and fitness benefits, injury patterns and risk factors for injury.

### Who Should Not Participate?

Individuals with certain medical and health-related factors should avoid ECPs, including persons with:

- Traumatic brain injury (including concussion)
- A recent musculoskeletal injury (such as ankle sprain)
- A medical condition who has been advised by her/his health practitioner not to participate in vigorous exercise
- Current medication use which may impair balance

### Safety Considerations for the Participant

- Exercise equipment needs to be structurally sound and designated away from walking, running and exercise pathways in a fitness area.
- The equipment, facility, and the exercise environment should be inspected and maintained daily in order to prevent injury.
- Effective exercise programs should be introduced gradually with a planned, stepwise progression in exercise intensity and duration, particularly for beginning students with low fitness levels.
- Safe, effective exercise programs should be individualized, and based from appropriate fitness assessment by certified exercise professionals.
- Training sessions should ensure appropriate recovery between exercise sets.
- Avoid any exercise program that encourages participants to perform excessive amounts of repetitions or training movements that lead to exhaustive fatigue.
- ECP workouts should be separated with days of rest, relative rest (mild, low volume activity with low impact) or of different exercise modes (e.g., cycling, swimming, yoga).
- Personnel who are properly trained with appropriate certifications should supervise all training sessions and assist with spotting and monitor the safety of the participant.

### Other Health Risks

- **Exertional Rhabdomyolysis:** Some exercise participants may develop exertional rhabdomyolysis. In this condition, the muscle cell membranes begin to break down leading to spillage of some proteins (like myoglobin) into the blood. This leakage of cellular proteins into the blood may cause kidney damage and unsafe heart rhythms. Reports of ECPS resulting in exertional rhabdomyolysis include exercise situations where persons were exposed to doing hundreds of push-ups or squat jumps in a workout session, or perform explosive squats to exhaustion. A common factor with exertional rhabdomyolysis seems to be exertion beyond the point of fatigue. Only a doctor can diagnose an individual with exertional rhabdomyolysis. **What to look for:** The common symptoms include reddish brown (or cola-colored) urine, muscular pain, and weakness.
- **Musculoskeletal Injury:** Exercise should not be performed if there is pain in joints or soft tissues. If pain worsens during the exercise, the participant should stop. Exercise can be modified based on the individual to prevent development of pain. For example, older participants may be able to perform half squats instead of full squats to minimize joint or soft-tissue injury. Activities that induce pain should not be performed. **What to look for:** While muscle soreness is expected after unaccustomed aggressive exercise, pain greater than a three out of ten points (where 0= no pain, 10= worst possible pain) should not be present 24 hours after a session. Pain indicates that the session was excessive and the intensity and/or volume need to scale back or the exercise modified.

### Summary Thoughts: Put Balance in Your Exercise Program

Exercise enthusiasts can readily participate in high-intensity exercise, at the appropriate intensity level, when balanced with other popular training modes such as yoga, resistance exercise, body weight training and flexibility training. Suitable rest periods (*i.e.*, about two to three minutes) between sets of exercise are essential for effective muscle training. And, if participating in an ECP, regularly monitor signs for overtraining such as lingering muscle soreness, elevated heart rate upon awakening (about five or more beats higher than normal) on multiple mornings, and a decrease in exercise performance and motivation. Lastly, exercise enthusiasts are encouraged to seek out qualified fitness trainers who are trained to appropriately design, individualize, implement, and oversee an effective and progressive exercise program.

### Staying Active Pays Off!

Those who are physically active tend to live longer, healthier lives. Research shows that moderate physical activity—such as 30 minutes a day of brisk walking—significantly contributes to longevity. Even a person with risk factors like high blood pressure, diabetes or even a smoking habit can gain real benefits from incorporating regular physical activity into their daily life.

As many dieters have found, exercise can help you stay on a diet and lose weight. What's more – regular exercise can help lower blood pressure, control blood sugar, improve cholesterol levels and build stronger, denser bones.

### The First Step

Before you begin an exercise program, take a fitness test, or substantially increase your level of activity, make sure to answer the following questions. This physical activity readiness questionnaire (PAR-Q) will help determine if you're ready to begin an exercise routine or program.

- Has your doctor ever said that you have a heart condition or that you should participate in physical activity only as recommended by a doctor?
- Do you feel pain in your chest during physical activity?
- In the past month, have you had chest pain when you were not doing physical activity?
- Do you lose your balance from dizziness? Do you ever lose consciousness?
- Do you have a bone or joint problem that could be made worse by a change in your physical activity?
- Is your doctor currently prescribing drugs for your blood pressure or a heart condition?
- Do you know of any reason you should not participate in physical activity?

If you answered yes to one or more questions, if you are over 40 years of age and have recently been inactive, or if you are concerned about your health, consult a physician before taking a fitness test or substantially increasing your physical activity. If you answered no to each question, then it's likely that you can safely begin exercising.

### Prior to Exercise

Prior to beginning any exercise program, including the activities depicted in this brochure, individuals should seek medical evaluation and clearance to engage in activity. Not all exercise programs are suitable for everyone, and some programs may result in injury. Activities should be carried out at a pace that is comfortable for the user. Users should discontinue participation in any exercise activity that causes pain or discomfort. In such event, medical consultation should be immediately obtained.



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