Overview: High-intensity or extreme conditioning programs (ECPs) (e.g., CrossFit, P90X, etc.) have exploded in popularity. While there is great enthusiasm and anecdotal evidence supporting the use of such programs, there remains genuine concern regarding the effectiveness and safety of their ever-expanding use. Musculoskeletal injury from these demanding programs, particularly for novice participants, potential effectiveness and benefits, and research needs will be highlighted. The positive and negative characteristics of such programs and practical solutions to improve ECP prescription and implementation and reduce injury risk will be emphasized.

I. Which conditioning programs are considered “extreme” and why?

II. Why are these programs attractive and increasingly popular?
   a. Purported gains
   b. Functional Fitness
   c. Evident risks
      i. Are these risks any greater than traditional conditioning programs?

III. Positive aspects of extreme conditioning programs
   a. Variation
   b. Cardiovascular and metabolic demands and gains
   c. Functional fitness
      i. Total body
      ii. Multi-joint, multi-planes
      iii. Fatigue tolerance
   d. Challenging (psychological discipline), exciting, motivating and camaraderie/teamwork
   e. “Real-world readiness”

IV. Negative characteristics of extreme conditioning programs
   a. Repeated, maximal (near maximal) timed exercise repetitions
   b. Insufficient rest between intervals
   c. Highly technical or advanced multi-joint exercises
   d. Progressive initiation often lacking for novice participant (too much too soon)
   e. Contributing risk factors (not of the program itself, per se)
i. Insufficient recovery time between high-volume training sessions
ii. “Carry-over” residual effects
iii. Fatigue-related changes
iv. Competitive – “keeping up” with others
v. Overuse, overreaching and overtraining
vi. Not sufficiently integrated with other conditioning/training

V. Other concerns, contraindications and considerations
   a. Consider individual daily and performance demands
   b. Consider your long-term and realistic goals
   c. Consider health
   d. Consider conditions & safety
   e. Current or recent illness
   f. Other clinical conditions

VI. Program design
   a. Balanced & diverse: lower/upper body strength, power & endurance
   b. Mobility and agility
   c. Cardio-respiratory and recovery capacities
   d. Incremental and individually progressive
   e. Individual fitness and conditioning needs and limitation
   f. Minimize overload and fatigue
   g. Emphasize biomechanical control and technique
   h. Periodicity and rest/recovery
   i. Modification
   j. Education
   k. Certification

VII. Recommendations to improve implementation and reduce injury risk
   a. Stepwise progression (acclimation) to exercise intensity, duration and advanced exercises
   b. Individualized based on fitness, realistic goals and needs/demands
   c. Restrict participation based on health status
   d. Ensure suitable rest periods – between sets, days and cycles
   e. Proper nutrition; avoid stimulants
   f. Close monitoring
   g. Watch for trends

VIII. Summary