

Weight Training PE 101
Article Review Assignment

1. In what journal was the article published? When was it published?
The article was published in *Medicine & Science in Sports & Exercise* in June, 1998.
2. The combination of which 3 factors provides the overload stimulus?
The combination of frequency, intensity, and duration of chronic exercise provide the overload stimulus.
3. What does HRR stand for?
HRR stands for maximum heart rate reserve.
4. What are the recommended frequency, duration, and intensity for CV fitness and body composition?
The recommended frequency for CV fitness and body composition is three to five days per week. This should be done for a duration of 20-60 minutes of continuous or intermittent aerobic activity, depending on the intensity of the activity. The intensity should be around 55/65%-90% of maximum heart rate, or 40/50%-85% of maximum heart rate reserve.
5. What is the basic recommendation for resistance training?
The article recommends one set of 8-10 exercises (with 8-12 repetitions per exercise) that condition the major muscle groups. This should be performed 2-3 times per week.
6. What is the minimum frequency of flexibility training to acquire flexibility benefits?
In order to acquire flexibility benefits through flexibility training, one should perform exercises that stretch the major muscle groups a minimum of 2-3 days per week.
7. What is the abbreviation used for maximal oxygen uptake?
The abbreviation for maximal oxygen uptake is $\dot{V}O_2R$
8. When was the original position statement first published? When was it revised?
The original position statement was published in 1978. It was revised in 1990.
9. Is there a difference between the quality and quantity of exercise needed to attain fitness benefits vs. health related benefits
The quality and quantity of exercise needed to attain health-related benefits may differ from what is recommended for fitness benefits. Lower levels of physical

activity than recommended may by the article may reduce the risk for certain chronic degenerative diseases and improve metabolic fitness and yet may not be of sufficient quantity or quality to improve VO₂ max.

10. What is the problem for researchers studying subjects with different initial fitness levels?

Interpretation and comparison of results are dependent on the initial levels of fitness. The lower the initial VO₂ max, the larger the percentage of improvement found.

11. What is the lactate threshold? At what % VO₂ max does it occur for most **untrained individuals**?

The lactate threshold is the highest maximum oxygen uptake that can be maintained without a sustained rise in blood lactate. For most untrained individuals, the lactate threshold occurs between 40% and 60% of VO₂ max.

12. Higher intensity exercise is associated with _____ adherence to training compared to lower intensity exercise.

Higher intensity exercise is associated with lower adherence to training compared to lower intensity exercise.

13. Refer to Table 1

a. “Light” intensity endurance-type exercise corresponds to what % max heart rate?

According to Table 1, “light” intensity endurance-type exercise corresponds to a 35-54% maximum heart rate.

b. “Hard” intensity resistance-type exercise corresponds to what % max voluntary contraction?

According to Table 1, “hard” intensity resistance-type exercise corresponds to a 70-84% maximum voluntary contraction.

14. In what year was Table 1 first published?

Table 1 was first published in 1996.

15. What % of US adults participate in physical activities with sufficient intensity and regularity to meet minimum ACSM recommendations for improvement of maintenance of fitness? Who reported this finding?

According to the US Department of Health and Human Services, only about 15% of adults participate in physical activities with sufficient intensity and regularity to meet minimum ACSM recommendations for the improvement and maintenance of fitness.

16. What is the amount of improvement in VO₂ max that occurs with training more than 5 days per week?

The amount of improvement in VO_2 max that occurs with training more than five days per week is minimal to none. The magnitude of change is smaller and tends to plateau when frequency of training is increased above three days per week. However, the incidence of injury increases disproportionately.

17. Why is cross training recommended?

Cross training that emphasizes the use of various large muscle groups is beneficial to achieving a more well-rounded training effect.

18. Who has a greater risk of lower extremity injury when beginning an exercise program – women or men? What possible reasons are given for this?

When beginning an exercise program, women have more orthopedic injuries of the lower extremities than men. The lack of muscle mass in the lower limbs and greater Q angle for women make them more injury prone.

19. Resistance training has significant value for increasing what?

Resistance training has significant value for increasing muscular strength and endurance, FFM, and physical function.

20. After 25-30 years of age VO_2 max generally declines how much per decade in sedentary adults?

After 25-30 years of age, sedentary adults generally experience a 9-15% decline in VO_2 max per decade.

21. What is the decrement in muscle strength between ages 20-75 years? When does most of this loss occur?

Between the ages of 20-75 years, there is a decrement in muscle strength of approximately 30% in both men and women. Most of this loss in strength occurs after the age of 50 years and after menopause.

22. Why is VO_2 max generally lower in women? Is there a gender difference in the magnitude of improvement in VO_2 max achieved through endurance training?

VO_2 max is generally lower in women due to lower cardiac output. However, there is no gender differences in the magnitude of improvement in VO_2 max with endurance training.

23. Is there a reduction in cardiorespiratory fitness after 2 weeks of detraining? How long does it take to return to pretraining fitness levels?

After two weeks of detraining, there is a significant reduction in cardiorespiratory fitness. It takes 10 weeks to 8 months to return to pretraining levels.

24. Summarize (2-3 lines) the findings of Hickson et al. (p.10). What are the implications of this for busy times of the year, e.g. finals, holidays?

In a series of experiments where frequency, duration, or intensity of training were manipulated, Hickson et al. discovered that missing exercise sessions periodically or reducing training frequency or duration for up to fifteen weeks will not adversely affect VO_2 max or muscular strength and endurance as long as training intensity is maintained. This means that if exercise sessions are missed during busy holidays or during finals, it won't greatly affect muscular strength and endurance, and thus one could maintain the same vigor of exercise upon one's next exercise session.

25. Which is the easiest way to induce a marked energy deficit – caloric restriction or exercise?

Caloric restriction is the easiest way to induce a marked energy deficit.

26. Which have been the most successful studies in terms of weight loss?

Caloric restrictions have been the most successful in terms of weight loss when compared with exercise.

27. What training regimens are recommended if the primary purpose of the training program is weight loss?

The best regimen for weight loss is a combining diet and exercise.

28. What is the progressive overload principle?

The progressive overload principle states that muscular strength and endurance are developed by increasing more than normal the resistance to movement or to movement or frequency and duration of activity.

29. What is the best way to develop muscle strength?

Muscular strength is best developed by using heavier weights with few repetitions.

30. What is the best way to develop muscle endurance?

Muscular endurance is best developed by using lighter weights with a greater number of repetitions.

31. What does RM stand for? What does this mean?

RM stands for "repetition maximum." It refers to the maximum number of times a load can be lifted (using good form and technique) before fatigue.

32. What risks are associated with heavy resistance exercise?

The risks associated with heavy resistance exercise include a dramatic acute increase in both systolic and diastolic blood pressure.

33. What are the recommended guidelines for resistance training for the average healthy adult?

A minimum of 8-10 exercises involving the major muscle groups should be performed 2-3 days per week. Also, a minimum of 1 set of 8-12 RM should be completed by most participants.

34. What are the recommended guidelines for resistance training for the serious weight lifter?

For more serious weight lifters, a regimen of heavier weights (6-12 RM) of 1-3 sets using periodization techniques usually provides greater benefits.

35. What two benefits of flexibility exercise are mentioned?

Two benefits of flexibility exercise include improvements in joint ROM and function and enhancement of muscular performance.

36. Aging often results in substantial loss of _____ and _____. Who said this?

Aging often results in substantial loss of tendon flexibility and limits in motion. This was stated by D.M. Raab, J.C. Agre, M. McAdam, and E.L. Smith in their article "Light resistance and stretching exercise in elderly women: effect upon flexibility."

37. What are the three main types of stretching exercises? Describe them.

The three main types of stretching exercises are static, proprioceptive neuromuscular facilitation (PNF), and ballistic. Static stretching slowly stretch the tendon, hold them in the stretched state for a period of time, and then return to the resting length. The PNF technique consists of alternating isometric muscle contraction and passive stretching through a series of motions. Ballistic stretching involves repetitive bouncing motions wherein the tendon is rapidly stretched and relaxed.

38. Which stretching technique is considered to be the best?

The PNF technique is considered to be the most effective in increasing flexibility.

39. What is the ideal duration of a stretch to achieve increased flexibility?

Studies have shown that holding a stretch for 10-30 seconds at the point of mild discomfort enhances flexibility without significantly greater benefit from longer durations.

40. What is the recommended number of repetitions per muscle group for maximum benefit from stretching exercise?

Although few studies have examined the optimal number of repetitions required to obtain maximal benefit from stretching exercises, a study performed by Taylor et al. found the greatest increase in ROM occurred in the first four repetitions without significant gains in subsequent stretches.