

# **Heart Rate Training**

**CORRESPONDENCE EDUCATION PROGRAM # 121.**

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## Heart Rate Training Course Objectives

**After completing the Heart Rate Training course, the participant will:**

1. Understand how to maximize heart rate for optimal performance
2. Learn how to customize your heart rate target zone
3. Understand how to maximize the use of a heart rate monitor
4. Understand how to develop sport specific heart rates
5. Understand how to use heart rate training to increase aerobic endurance
6. Understand how to use heart rate training to increase anaerobic endurance
7. Understand how to use heart rate training to increase speed and power
8. Learn to use heart rate training to design effective training programs
9. Learn to use heart rate training to design effective walking programs
10. Learn to use heart rate training to design effective jogging and running programs
11. Learn to use heart rate training to design effective cycling, swimming and triathlon programs
12. Understand how to use heart rate training to design effective rowing and skiing programs
13. Understand how to use heart rate training to maximize performance in other team sports



## Heart Rate Training Course Examination

For each of the following questions, circle the letter of the answer that best answers the question.

1. All of the following are components of fitness according to the book *Heart Rate Training* EXCEPT:
  - A. Endurance
  - B. Body composition
  - C. Economy
  - D. Speed
  
2. Phase III generally uses heart rate zones of:
  - A. 85-95% MHR
  - B. 95-100% MHR
  - C. 75-85% MHR
  - D. 60-75% MHR
  
3. The best application for using heart rate training are for activities such as:
  - A. Rugby
  - B. Lacrosse
  - C. 10k run
  - D. Boxing
  
4. When heart rate does not increase, but VO<sub>2</sub> does increase during a workout, the relationship between the two is considered to be:
  - A. Nonlinear
  - B. Linear
  - C. Aerobic
  - D. Phase II
  
5. If a runner is at a Vo<sub>2</sub> max of 8.0 L/min, how many calories are they burning per minute?
  - A. 20
  - B. 40
  - C. 64
  - D. 80

6. Which statement is false?
  - A. Heart size can affect the accuracy of max heart rate calculations using HR formulas
  - B. It takes practice to perform well and get a true max on a stress test
  - C. Heart rate responses vary depending on the mode of activity
  - D. The best way to find your max heart rate is to get a treadmill stress test from your physician.
7. When using the Borg Rating of Perceived Exertion scale, a percent effort of 85% is:
  - A. A rating of 15
  - B. Economy phase
  - C. Hard
  - D. Very hard
8. Which of the following will not affect heart rate at rest or during exercise?
  - A. State of recovery
  - B. Gender
  - C. Temperature
  - D. Stride length
9. When the heart rate rises due to temperature and not due to an increase in effort, this is referred to as:
  - A. Heat stroke
  - B. Fibrillation
  - C. Cardiovascular drift
  - D. Cardiac crimp
10. Which of the following is the better indicator that the athlete is overtraining?
  - A. Increased resting heart rate
  - B. Cardiac crimp
  - C. Increased exercise heart rate
  - D. Atrial fibrillation
11. Adaptation changes that you would want to see include all of the following EXCEPT:
  - A. Decrease resting heart rate
  - B. Increase in anaerobic threshold heart rate
  - C. Stabilized heart rate at fixed loads
  - D. Improvements in respiratory function
12. Which heart rate will the athlete need to monitor continually?
  - A. Aerobic threshold
  - B. Recovery
  - C. Maximal
  - D. Anaerobic threshold
13. How close to the transmitter should the elastic strap of the heart rate monitor be stretched for proper fit?
  - A. 6 inches
  - B. 15 inches
  - C. 3 inches
  - D. 6 cm

14. If you strap on the heart rate monitor and do not see a reading on the receiver, you should:
- A. Wet your shirt
  - B. Moisten the electrodes
  - C. Tighten the strap
  - D. Wear the strap over a dry t-shirt
15. Which of the following is not a reason that can cause irregular numbers on the heart rate monitor?
- A. Static cling
  - B. Dry shirts
  - C. Slippage
  - D. Interference from cross feeds
16. Which of the following is not possible to reveal with the new technology of heart rate monitors?
- A. Fatigue
  - B. Illness
  - C. Heart disease
  - D. Overtraining
17. Which sport is about 50/50 using both anaerobic and aerobic energy systems?
- A. Ice hockey
  - B. Rowing
  - C. 100m running
  - D. Soccer
18. Which situation is the heart rate monitor best utilized?
- A. Anaerobic threshold
  - B. Maximal heart rate
  - C. Recovery measurements
  - D. Aerobic heart rate range
19. Which statement is false concerning the anaerobic glycolysis system?
- A. It is also referred to as the lactic acid system
  - B. It lasts less than 10 seconds
  - C. It relies on carbohydrates
  - D. It can provide energy fairly rapidly
20. Why is correlating heart rate to training in shorter anaerobic sessions more difficult?
- A. It takes the heart rate longer to respond in shorter anaerobic sessions
  - B. It takes fat longer to metabolize at this rate
  - C. The lactic acid build up affects intensity
  - D. Oxygen load will offset heart rates
21. Which system is used for all-out exercise lasting 15 seconds or less?
- A. Lactic acid system
  - B. ATP-PC system
  - C. Carbo-loading system
  - D. Anaerobic glycolysis system
22. Recovery in exercise is always:
- A. Aerobic
  - B. Anaerobic
  - C. Glycolysis
  - D. Only fat burning

23. Which system is heart rate monitoring limited in judging intensity?
- A. 5000 m run
  - B. 800 m run
  - C. 1500 meter run
  - D. 100 m run
24. Fast twitch muscles fibers prefer what fuel source?
- A. Carbohydrates
  - B. Fats
  - C. Protein
  - D. Glucose
25. At what heart rate is it generally considered that the athlete is ready for a repeat interval
- A. 65%
  - B. 70%
  - C. 75%
  - D. 50%
26. When focusing on increasing aerobic endurance, what is considered to be the proper target heart rate range?
- A. 75-80% MHR
  - B. 60-85% MHR
  - C. 60-75% MHR
  - D. 50-85% MHR
27. When someone can talk for a very long time while exercising without the slightest challenge to your breathing, this is called the:
- A. Talk test
  - B. RPE test
  - C. Faulkner test
  - D. Cardio test
28. Which of the following statements is true concerning adaptations of a well-trained endurance athlete?
- A. Stroke volume increases
  - B. AVO<sub>2</sub> decreases
  - C. MHR increases
  - D. Blood volume decreases
29. Which of the following is not a normal adaptation that occurs as endurance is developed?
- A. Ligaments get stronger
  - B. Capillaries increase in number
  - C. Less lactic acid is produced
  - D. More carbohydrate is burned
30. At what percentage of MHR does 50% of energy come from carbohydrates?
- A. 60-65%
  - B. 70-75%
  - C. 65-70%
  - D. 75-80%

31. What is an ideal way to introduce small elements of faster movements into your endurance workout?
- A. LSD training
  - B. Fartlek training
  - C. Phase I training
  - D. Stroke volume increases
32. In order to avoid overuse injuries, how much should an athlete increase the volume of work each week?
- A. 25-30%
  - B. 20-25%
  - C. 15-20%
  - D. 10-15%
33. When performing fartlek training, how do you determine where in your 60-75% HR range you should be training?
- A. The type of mode you choose
  - B. The frequency of your training
  - C. Your general level of fitness
  - D. The distance you will be running for your training
34. When performing the base-building training pattern, how many days per week should be easy days?
- A. 2
  - B. 3
  - C. 4
  - D. 1
35. For weeks 3 and 4 of the base-building program, how long should you repeat the weekly pattern?
- A. Until you can do the fartlek training for 3-5 minutes 30 times
  - B. Until you can do the fartlek training for 30 minutes
  - C. For 3-4 weeks
  - D. Until you feel ready
36. When transitioning into enhancing endurance, what heart rate zone is the goal?
- A. HICE zone
  - B. A zone where the athlete is not breathing hard
  - C. 65-75% MHR in interval training
  - D. 75-80% MHR in steady state
37. When building your endurance baseline, how long does it take to develop new blood vessels?
- A. 12-16 weeks
  - B. 2-3 weeks
  - C. 6-10 weeks
  - D. 6 months
38. The heart rate zone for stamina training in phase II is:
- A. 80-85%
  - B. 85-90%
  - C. 70-75%
  - D. 75-80%



39. What body system is developed more in the AT training more so than any other phase?
- Respiratory system
  - Muscular system
  - Endocrine system
  - Digestive system
40. All of the following are names for the 80-85% heart rate zone EXCEPT:
- Ventilatory threshold
  - Lactate threshold
  - Anaerobic threshold
  - Glycolytic threshold
41. What is the primary objective of the stamina phase?
- To improve the respiratory system
  - To increase distance
  - To improve interval time
  - To tax the endocrine system
42. Which of the following is not considered a training technique for developing stamina?
- Heart rate fartlek
  - LSD
  - Tempo workouts
  - Interval training
43. When working in the stamina phase, when do you add or move up to a higher-intensity workout?
- When you can perform the sample workout without muscle soreness
  - When you have completed 2 cycles of the sample program
  - When you can perform the same workouts at the same intensity for 2-4 weeks
  - When your recovery shortens to 24 hours after the weekly workout
44. All of the following are physiological adaptations to economy training EXCEPT:
- Coordination improvements
  - Increase strength of intercostals muscles
  - Stimulation of the pituitary gland
  - A decrease in the size of capillary beds in the muscles
45. Improvements in biomechanics and body movements is known as:
- Economy
  - Efficiency
  - Endurance
  - Stamina
46. All of the following are guidelines of when an athlete is ready to move from phase II to phase III EXCEPT:
- A decrease in heart rate response to the same intensities of 10-15 bpm
  - Faster speeds at original heart rate zones
  - Confidence
  - Consistent 2-4 weeks of training in phase II
47. When training at high intensities, what needs to be the focus of the training?
- Intensity
  - Volume
  - Recovery
  - Frequency

48. What lays the foundation for higher intensity work as well as recovery from the high intensity work?
- A. Recovery
  - B. Tempo training
  - C. Endurance training
  - D. Fartlek training
49. Which statement is false concerning power and speed?
- A. Power can be both aerobic and anaerobic
  - B. Heart rate response is more immediate in power training
  - C. Power helps with speed, but speed does not help with power
  - D. Heart rate doesn't hit its highest until the end in speed work training
50. Which of the following is not a physiological adaptation to speed and power training?
- A. Greater mobility and flexibility
  - B. Improvement in mental toughness
  - C. Improved neural function
  - D. Improved ventilatory function
51. What is the best way to make sure you are adapting to your work effort and recovery when utilizing speed and power training?
- A. Make sure the heart rate is in the correct range
  - B. Use RPE to rate the intensity of the workout and recovery periods
  - C. Learn to gauge your pace
  - D. Use a stopwatch to time your recovery
52. When using speed training, a good way to monitor intensity is by:
- A. Check your heart rate monitor
  - B. Timing your splits
  - C. Note the total distance covered
  - D. RPE
53. What does HICE stand for:
- A. Heat, Ice, Compression, Elevation
  - B. High-intensity Cardiovascular Exercise
  - C. High-intensity Controlled Exercise
  - D. High-intensity, Continuous Exercise
54. What type of training is designed to mimic race conditions by utilizing faster tempo speeds?
- A. Phase II
  - B. Power training
  - C. HICE
  - D. Fartlek training
55. What is the downfall of HICE training?
- A. It does not work on speed
  - B. It does not work on power
  - C. It is complicated to incorporate into training
  - D. It has a high risk of injury

56. When performing Anaerobic Threshold training, what should the athlete use to measure intensity if they cannot measure heart effectively?
- A. Use the Talk Test
  - B. Use Karvonen
  - C. Use split times
  - D. Use RPE
57. When beginning a higher-intensity training regimen, how often should this training be incorporated into the workout?
- A. 1x/week for 1-2 weeks
  - B. 2x/week for 3-4 weeks
  - C. 1x/week for 3-4 weeks
  - D. 2x/week for 1-2 weeks
58. Which phase or program will take the most amount of time to develop?
- A. Anaerobic threshold
  - B. Speed
  - C. Power
  - D. Endurance base
59. Two considerations for specificity of training are:
- A. metabolic and muscle contraction
  - B. Tapering and recovery
  - C. Reversibility and tapering
  - D. Mode and duration
60. Which statement is correct concerning tapering?
- A. Volume increases while speed and intensity decrease
  - B. Volume decreases while speed and intensity increase
  - C. Intensity decreases, but speed increases
  - D. Speed decreases, but intensity increases
61. Which component of periodization focuses on speed work, hill work, and tempo runs?
- A. Mesocycles
  - B. Macrocycles
  - C. Microcycles
  - D. The first two macrocycles
62. How long should it take for resting heart rate to be back to normal after a workout?
- A. 6 hours
  - B. 12 hours
  - C. 24 hours
  - D. 2 hours
63. Which statement is false concerning classic overtraining?
- A. Exercise heart rates become more elevated than normal
  - B. Resting heart rate becomes more elevated than normal
  - C. Illnesses may increase
  - D. It can lead to several months of a layoff from exercise

64. What are the prerequisites to begin the walking program design suggested in the *Heart Rate Training* book?
- A. 20 min. of walking 2x/week and 30 min. of walking 1x/week
  - B. The desire to start a walking program
  - C. 2 miles are covered during one 20-min. walk
  - D. The ability to do some light jogging
65. What qualifies as “fitness” walking for women?
- A. 1 mile in 14-17 min.
  - B. 1 mile in 13-16 min
  - C. 1 mile in less than 17 min
  - D. 1 mile in less than 13 min
66. What method is the better way to determine MHR for walkers?
- A. Balke Treadmill Test
  - B. Bruce Treadmill Test
  - C. Connolly-Benson Stress Test
  - D. YMCA Bike Test
67. When designing a walking program, which statement is correct concerning heart rates?
- A. The recovery HR is 75% MHR
  - B. The recovery HR is 50% MHR
  - C. The lower target HR is 75% MHR
  - D. The upper target HR is 75% MHR
68. Which statement is true concerning the level 1 walking program
- A. The intensity stays the same throughout the progressions
  - B. The frequency stays the same throughout the progressions
  - C. The time is consistent throughout the progressions
  - D. Frequency changes from 3 days per week in Progression A to 6 days/week in Progression C
69. In level 2, progression B, the long day recommends:
- A. 55 minutes of walking
  - B. Intensity of 60% MHR
  - C. Incline walking
  - D. 30 minutes of walking
70. If the walking program is followed as designed in the book, how long might it take to become a “fit” walker?
- A. After 6 weeks at level 2
  - B. After 2 weeks at level 2
  - C. After 4 weeks at level 2
  - D. After 12 weeks at level 2
71. What is the best way to improve compliance to an exercise program?
- A. Monitor the heart rate
  - B. Make the program easy
  - C. Make the activity convenient
  - D. Work on biomechanics

72. Which of the following is not a qualifier for starting at the level 1 jogging program?
- A. A base level of fitness
  - B. Jogging for 20 minutes 3-4 times per week
  - C. Ability to jog at least 30 minutes in one workout
  - D. Moderate risk factors
73. When an athlete experiences total fatigue and exhaustion from going for peak performance at 100% effort, this is known as:
- A. Hitting the wall
  - B. Over exertion
  - C. Overtraining
  - D. Pain barrier
74. If you are a recreational runner who wants to run a 5k road race, what level jogging program is appropriate?
- A. Level 4
  - B. Level 3
  - C. Level 1
  - D. Level 2
75. If a 56 year old male has a VO<sub>2</sub> of 35 ml/kg/min, what fitness category would he fall under?
- A. Fair
  - B. Average
  - C. Good
  - D. Poor
76. When determining your running training zone, what is the percentage MHR an athlete should train during economy runs?
- A. 95-100%
  - B. 85-95%
  - C. 75-85%
  - D. 65-70%
77. Which level program is appropriate for the runner wanting to just finish a marathon?
- A. Level 3
  - B. Level 4
  - C. Level 2
  - D. Level 1
78. What is the minimum number of weeks a runner needs to prepare for a full marathon?
- A. 16
  - B. 23
  - C. 18
  - D. 20
79. Which of the following is an objective of the 5K training program?
- A. To run the 2<sup>nd</sup> kilometer slower than the first, but faster than the last km
  - B. To run the last kilometer faster than the first two
  - C. To run the 1<sup>st</sup> kilometer faster than the last kilometer
  - D. To maintain a steady pace for all 3 kilometers

80. Which statement is true concerning a cycling program for a beginner?
- Training lasts 8 weeks
  - Training focuses on strength building
  - Training lasts 12 weeks
  - Work rate steadily increases
81. What is the advantage to indoor cycling over outdoor cycling?
- Outdoor provides a better environment for stabilizing heart rates
  - Outdoor gives greater control over intensity
  - Indoor gives greater control over intensity
  - Indoor cycling is more specific to racing conditions
82. Which statement is false when determining your cycling maximum heart rate?
- The hill climb is performed as fast as you can
  - The test is performed on a flat track that is 600-1000m long
  - The recovery is 2-3 miles
  - The better indicator of MHR is after the 3<sup>rd</sup> repeat
83. Triathlon sprint cycling focuses on:
- Duration
  - Intensity
  - Power
  - Endurance
84. Which of the following are characteristics of level 3 cycling training?
- More time focused on power and sprints
  - Less time in the easy to moderate work zone
  - Decrease in time on the bike
  - Increase in time on the bike
85. Which statement is false concerning swimming?
- It is a natural skill
  - It varies in level of exertion
  - Increased effort does not result in increase speed
  - Breathing is highly regulated
86. Which statement is true regarding heart rates in the pool?
- Heart is about 10 bpm lower in the water than on land for a very fit individual
  - MHR is higher in the water than on land for all individuals
  - A steady state will have a heart rate that is 25-40 bpm higher in the water than on land
  - Heart rates are the same in the water as on the land
87. What is the best way to classify swimming fitness?
- Base it on the distance you can swim at the beginning of your training
  - Base it on a 2-minute timed swim
  - Base it on a timed swim for distance
  - Base it on your heart rate for varying distances
88. What is the goal at the end of the week 6 for level 1 swimming training program?
- To stay within heart rate training zone 3 for an entire workout
  - To swim 1650 yards for time
  - To swim 1200 yards stopping 1 time
  - To swim 1650 yards without stopping

89. Which statement is false concerning training for triathlons?
- A. The cross training can increase the risk of injury
  - B. The cross training is challenging for the nutritional plan
  - C. There is more variables in the environment
  - D. Most triathletes are not strong in all three activities
90. How many miles are run in a sprint triathlon?
- A. 6.2 miles
  - B. 3.1 miles
  - C. 10K
  - D. ½ marathon
91. Which of the following is not the focus of the Level 2 program for triathlons?
- A. 1 extra session per week of running is recommended
  - B. It is for those weak in running
  - C. It is for ½ Ironman level triathlons
  - D. All the sessions should be completed even if a break is taken between them
92. What is the minimum time that should be taken to train for a ½ Ironman?
- A. 17 weeks
  - B. 12 weeks
  - C. 15 weeks
  - D. 20 weeks
93. What is the common distance for rowing?
- A. 200m
  - B. 2000m
  - C. 1000m
  - D. 1500m
94. Which statement is true concerning rowing and training?
- A. The common distance is not a progressive exertion
  - B. The warm up does not need to be as long as other sports
  - C. Determining MHR is not the same as it is for other sports
  - D. It is not possible to find the anaerobic threshold for rowing
95. When training at the level 1 programming, the rower should:
- A. Not worry about heart rates at A1-3 intervals
  - B. Decrease the intensity if the intervals are too hard
  - C. If the zone 1 workouts become boring, change them up
  - D. Stay above 85% MHR for the zone 2 stamina workout
96. Which athletes typically has the highest VO<sub>2</sub> than any other athlete?
- A. Triathletes
  - B. Distance swimmers
  - C. Marathon runners
  - D. Cross country skiers
97. When determining your cross country skiing heart rate training zone, you should:
- A. Perform a distance of 1500 m
  - B. Repeat the 600 m lap 4 times to find your indicator on you MHR
  - C. Use a hilly course
  - D. Use the heart rate at the end of the third trial be your indicator on your MHR

98. What is the goal for level 2 cross country skiing program?
- A. Build endurance
  - B. Increase MHR
  - C. Build up to 25K
  - D. Develop stamina
99. Which of these statements is FALSE?
- A. Weight lifting requires large static muscular contractions
  - B. Weight lifting causes large increases in blood pressure
  - C. Heart rates should be monitored while weight training
  - D. Respiratory frequency is reduced during weight training
100. Which statement is false concerning speed training for team sports?
- A. Recovery heart rate between intervals should be 60% MHR
  - B. Wind sprints should be run to exhaustion repeatedly
  - C. All out sprinting for 50 yards is ideal
  - D. Wind sprints should be performed at 85-90% MHR