Periodization Training for Sports

CORRESPONDENCE EDUCATION PROGRAM # 2011-089

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Periodization Training For Sports
Course Objectives

After completing the Periodization Training for Sports course, the participant will:

1. Understand the physiological concepts in designing sports specific strength programs

2. Understand the abilities that are needed for achieving goals for sports discussed in the book including power, strength, and endurance.

3. Understand the role that strength training plays regardless of athletic level.

4. Apply the concept of designing a periodization plan geared towards specific sports and athletic ability.

5. Understand the concepts of physiological energy production and how to train these energy systems specifically towards one's sport

6. Educate themselves and clients on questionable training techniques and their true application in sport training.

7. Develop various strength training programs in a specific and appropriate sequence to assist an athlete in reaching the highest individual levels of power and muscular endurance.

8. Incorporate the use of load, force application, repetitions, loading patterns in each phase of a periodization program to facilitate adaptations for reaching peak performance.

Periodization Training For Sports
Course Examination

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

1. Which program is not organized according to a competition schedule?
   A. Power training
   B. Olympic weightlifting
   C. High Intensity training
   D. Periodization

2. Which type of program uses explosive exercises throughout the sports training cycle?
   A. HIT
   B. Periodization
   C. Olympic weightlifting
   D. Power Training

3. Which of the following is true regarding the basic concept of periodization?
   A. To model the strength training and increase rate of power in a yearly plan
   B. To develop the rate of improvement from year to year
   C. To focus on quick gains in strength
   D. To focus on the improvement of the primary movers in any sport or activity

4. All of the following are most important for successful athletic performance EXCEPT:
   A. Speed
   B. Strength
   C. Agility
   D. Endurance

5. When agility and flexibility are combined, it is called:
   A. Power
   B. Biomotor abilities
   C. Mobility
   D. Speed-endurance

6. When should speed training be performed?
   A. After endurance training
   B. Before strength training
   C. After strength training
   D. Peak of the sports season

7. Movements in a sport of activity that constantly change such as in a gymnastic routine are called:
   A. Biomotor
   B. Cyclic
   C. Transitional
   D. Acyclic

8. The ability to provide force against resistance for 2-5 minutes is:
   A. Common in cyclic sports or activities
   B. Considered to be M-E Long activities
   C. Considered to be M-E Short activities
   D. Common in acyclic sports or activities

9. The ability to generate force immediately following a landing phase is called:
   A. Strength-Speed
   B. Take off power
   C. Reactive power
   D. Speed-Endurance

10. What happens to the body when velocity increases in the water?
   A. It speeds up
   B. It slows down
   C. It floats better
   D. It keeps speed steady

11. A sport that requires a strength training program focusing on M-E Medium, acceleration power, and starting power is:
   A. Gymnastics
   B. Ice hockey
   C. Middle distance speed skating
   D. 1000 meter kayaking race

12. What percentage of our body weight is made up of the skeletal system?
   A. 20
   B. 30
   C. 40
   D. 50

13. Which statement is TRUE concerning muscle structure?
   A. Motor units are not as affected by load during strength training as a sarcomere is.
   B. Actin is the thick filament in a sarcomere
   C. Actin filaments increase in thickness via maximum strength loads
   D. Myosin filaments increase in thickness via maximum strength loads

14. Which statement is TRUE concerning fast and slow twitch muscle fibers?
   A. Strength training can change a slow twitch fiber to a fast twitch fiber
   B. Fast twitch muscles fibers have a sub-category called IIA and IIB
   C. Slow twitch fibers fatigue faster
   D. Type I fibers do not require oxygen in order to function

15. The “size principle” states that:
   A. Motor units and muscle fibers recruit from smallest to largest
   B. Recruitment of fibers begins with fast twitch fibers first
   C. Motor units and muscle fibers recruit from largest to smallest
   D. Strength training can change the ratio of fast twitch to slow twitch muscle fibers in a particular muscle

16. All of the following are types of contractions that occur in the stretch-shortening cycle EXCEPT:
    A. Eccentric
    B. Isokinetic
    C. Isometric
    D. Concentric

17. Which structure best responds to the rapidity of a muscle stretch?
    A. Golgi tendon organs
    B. Actin
    C. Muscle spindles
    D. Myosin

18. Power must have two components, force and:
    A. Maximum endurance
    B. Speed
    C. Limited time
    D. Maximum strength

19. Which of the following is directly affected by the athlete's body weight?
    A. Absolute strength
    B. Muscular endurance
    C. Relative strength
    D. Power

20. How many phases are there in a periodization strength program?
    A. Four
    B. Six
    C. Five
    D. Seven

21. Which phase of periodization focuses on the increase in muscle cross-sectional area and storage capacity of energy within the muscle?
    A. Hypertrophy
    B. Transition
    C. Anatomical adaptation
    D. Competition

22. The appropriate intensity during the conversion phase when lifting the weight as quickly as possible should be:
    A. 55-75%
    B. 65-85%
    C. Close to 100%
    D. 80-95%

23. What is the best way to replenish glycogen stores after a high intensity workout?
    A. Eat high protein
    B. Eat complex carbs
    C. Eat simple carbs
    D. Perform long endurance training the next day

24. Which of the following is appropriate to do during Intensity Zone 1 training?
    A. Short recovery intervals between reps
    B. Long recovery intervals between reps
    C. Longer technical drills
    D. Increase endurance

25. When training for Intensity Zone 2, it is best to:
    A. Incorporate repetitions that last longer than 120 seconds
    B. Increase rest intervals between reps lasting 2-3 minutes
    C. Perform shorter drills that are completed within 20-45 seconds
    D. Use Zone 2 training daily during preseason training

26. What is the ideal recommendation for incorporating Intensity Zone 3 training?
    A. 5 minute periods at 90 % intensity
    B. 2-3 minute periods at 70-75% intensity
    C. 12 reps at 70% intensity
    D. 3-5 minute periods at 80-85% intensity

27. Intensity Zone 4 is often combined with which other Zone to help improve lactic acid tolerance?
    A. 2
    B. 3
    C. 5
    D. 6

28. Mean velocity per race utilizes the combination of which two zones for training?
    A. 1, 2, and 5
    B. 3, 4, and 5
    C. 2 and 4
    D. 1 and 2

29. As the competition approaches, what type of training should be the focus?
    A. Recovery
    B. Nonspecific training
    C. Zone 1
    D. Sports specific drills

30. Which of the following is NOT a misconception when strength training for endurance sports?
    A. Long distance running develops endurance for football
    B. Long distance runners do not need to develop strength
    C. Running uphill does not develop leg strength and power
    D. Games and competitions are the best time to develop speed training

31. Which of the following does NOT contribute to the development of sports specific speed?
    A. Use sports specific speed according to the position played by an athlete
    B. Use periodization for strength
    C. Use long rest intervals between reps
    D. Use the same type of equipment always in order to build a tolerance

32. What is the best way to determine whether to increase distance during a repetition for an athlete?
    A. Ask the athlete
    B. Observe quality of form
    C. Check the length of time it takes to complete the task
    D. Check the athlete's times and compare to the previous week's.

33. What anatomical structure must be elastic when performing ballistic movements to prevent injury?
    A. Ligaments
    B. Tendons
    C. Muscle spindles
    D. Golgi tendons

34. Why is the best position for working the abdominals lying supine with the calves resting on a chair?
    A. With the calves on the chair, it prevents contraction of the gluteus maximus
    B. With the hips bent, it lessens the activation of the Iliopsoas muscle
    C. It prevents us from flexing the spine too much
    D. It places less stress on the neck

35. The most powerful hip flexor in the body is:
    A. Biceps femoris
    B. Sartorius
    C. Rectus femoris
    D. Iliopsoas

36. When the back muscles and the abdominal muscles contract together to help our core stabilize, this is called:
    A. Spiking
    B. Isokinetic
    C. Irradiation
    D. Dynamic movements

37. When should proprioception training take place during periodization?
    A. Throughout the training process
    B. Transition phase
    C. Competition phase
    D. Preparatory phase

38. What popular type of training has been shown to <u>decrease</u> development and techniques in running?
    A. Strength training
    B. Periodization
    C. Overspeed training
    D. Plyometrics

39. Which method of increasing strength has been found to be beneficial in bodybuilders but impractical for athletes?
    A. Step-type approach
    B. Overload principle
    C. Brief maximum contractions
    D. Submaximal contractions to exhaustion

40. The frequency of increasing training load during the step-type approach is best determined by all of the following EXCEPT:
    A. Athlete's needs
    B. Athlete's rate of adaptation
    C. Equipment available
    D. Schedule of competitions

41. Once fatigue is achieved during a microcyle, the next phase is:
    A. Improvement
    B. Physiological rebound
    C. Adaptation
    D. Recovery

42. During a microcyle of periodization, the fourth step is:
    A. Loading phase
    B. The new lowest step for the next macrocycle
    C. Adaptation phase
    D. Improvement phase

43. Why is reverse step loading not as accepted in sports?
    A. Because it has a high risk of injury
    B. Because it has not been researched enough
    C. Because it does not follow progressive adaptation needed in sports
    D. Because it is still a new concept

44. When is variety in a workout particularly helpful?
    A. Prior to the competitive phase
    B. After the competitive phase
    C. During the transition phase
    D. During the recovery phase

45. What joint has the highest incidence of injury with female athletes?
    A. Elbow
    B. Shoulder
    C. Knee
    D. Hip

46. When specificity is not used properly, what movers of the body are neglected the most?
    A. Primary movers and antagonists
    B. Stabilizers and synergist
    C. Antagonist and stabilizers
    D. Primary movers and synergist

47. The generally and multilateral strength training program may last how long?
    A. 2-4 macrocycles
    B. 2-4 weeks
    C. 2-4 months
    D. 2-4 years

48. When does the high-performance phase of training end?
    A. When competition season begins
    B. When the athlete stops competing
    C. During the preseason
    D. After the preparatory phase

49. When a baseball player is able to maneuver himself under the ball while watching out for the outfield wall so as not to run into it, this is using his:
    A. Proprioception
    B. Dynamic structure
    C. Spatial orientation
    D. Visual orientation

50. What two training variables must be manipulated in order to have a successful training program?
    A. Volume and intensity
    B. Frequency and intensity
    C. Duration and sets
    D. Repetitions and sets

51. Which of the following is NOT considered a subset of volume and intensity?
    A. Sets
    B. Rest
    C. Frequency
    D. Repetitions

52. When does training volume become most important for an athlete?
    A. The anatomical adaptation phase
    B. The physiological adaptation phase
    C. The transition phase
    D. While approaching high performance training

53. All of the following are factors that affect training volume EXCEPT:
    A. Athlete's age
    B. Specifics of the sport
    C. The need for strength for that sport
    D. Athlete's biological makeup

54. Which of the following sports requires a maximum strength volume/year of 1000?
    A. Wrestling
    B. Rugby
    C. Gymnastics
    D. Triathlon

55. Which statement is true concerning training intensity?
    A. The greater number of reps performed, the lower the volume of work
    B. Supermaximum loads are a combination of concentric and eccentric contractions
    C. A supermaximum load should have at least 2 spotters
    D. Heavy maximum load is an intensity minimum of 90%

56. The only true way to increase intensity is to:
    A. Increase the length of the eccentric phase
    B. Increase the sets
    C. Increase the load
    D. Decrease the length of the concentric phase

57. Which of the following statements concerning the phase of training is false?
    A. As the number of exercises decrease, the number of sets should increase
    B. During the competitive season, decrease the number of exercises
    C. An increase in the number of exercises means the athlete is training for the specifics of the sport
    D. Avoid using the influences of bodybuilding recommendations for strength training for sports.

58. Which of the following statements is true regarding the order of exercises?
    A. Exercises should alternate between upper body and lower body
    B. Train small muscles groups first, then larger muscle groups
    C. Utilize the pre-exhaustion method
    D. Focus on single joint exercises throughout the training process

59. All of the following are proper protocol when developing a power program EXCEPT:
    A. Utilize 85-100% of 1 RM
    B. Utilize 50-80% of 1RM
    C. Reps should be between 5-10
    D. Utilize dynamic exercises

60. During the anatomical phase, which of the following recommendations is correct?
    A. Spend more time on the eccentric phase
    B. Spend more time on the concentric phase
    C. Pause 2 seconds before a further concentric lift
    D. Use quick explosive movements

61. The duration of the rest interval is dependent on all of the following EXCEPT:
    A. Body weight
    B. Load
    C. Speed of performance
    D. Gender

62. In sports that require athletes to tolerate lactic acid levels all of the following should be considered EXCEPT:
    A. Short rest periods of 3 minutes or less lowered the firing of motor neurons during maximal lifting exercises
    B. 1 minute rest intervals are not sufficient to restore muscle energy for high muscular tension exercises
    C. When an athlete works to exhaustion, 4 minute rest intervals in not long enough to remove lactic acid from working muscles
    D. It takes at least 24 hours to completely restore ATP-CP levels

63. In order for glycogen stores to return to normal after a workout or competition, the athlete should:
    A. Eat more complex carbohydrates
    B. Eat more protein
    C. Drink more sports drinks
    D. Rehydrate

64. How long does it take for phosphagen to be completely restored after a workout or competition?
    A. 30 seconds
    B. 24 hours
    C. 3-5 minutes
    D. 48 hours

65. Which statement is false concerning pyramid loading patterns?
    A. While load increases, reps decrease
    B. Most if not all motor units are activated
    C. The goal is to increase loading patterns to over 15% to optimize strength gains
    D. It is one of the most popular loading pattern programs

66. Which pyramid program is the best for optimal maximal strength gains?
    A. Double pyramid
    B. Flat pyramid
    C. Skewed pyramid
    D. Single pyramid

67. How often should athletes lift at 100% of the 1RM?
    A. Never
    B. Once every 2 weeks
    C. Once every 4 weeks
    D. Once every 6 months

68. What does the notation $\frac{100}{12}{}_{6}$ mean?

A. The load is 100 lbs, the reps are 6, and 12 sets are performed
B. The load is 100lbs, the reps are 12, and 6 sets are performed
C. The load is 100% of 1 RM, the reps are 6, and 12 sets are performed
D. The load is 100% of 1RM, the reps are 12, and 6 sets are performed

69. In order to set up and appropriate exercise prescription, all of the following should be considered EXCEPT:
A. Once the exercises are selected, the athlete should perform a low number of sets in order to adapt.
B. Exercises should be selected based on the primary movers performed vs. primary movers in the sports skill
C. Analyze the direction and limb position of the sports skill
D. Pick exercises that are similar to the angle of the sport skill performed

70. Which of the following is NOT a view of researchers and international-class coaches?
A. Multi-joint exercises need to mimic the pattern and motion of the sport activity
B. Training methods utilizing strength and agility will increase fast twitch fiber recruitment
C. To increase the speed of a contraction will increase the power of the contraction
D. Olympic lifting and bodybuilding exercise are a waste of time for athletes

71. All of the following must have a spotter EXCEPT:
A. Bench press
B. Cleans
C. Military presses
D. Lunges

72. What determines back posture?
A. Hip rotation
B. Foot position
C. Head position
D. Stride length

73. Which statement is FALSE concerning strength training accessories?
A. Strength training shoes typically have a higher heel than athletic shoes
B. Weight belts should be worn at all times
C. Gloves are rarely used by athletes
D. Strength training shoes can compensate for lack of ankle flexibility

74. Prolonged activities especially those performed against gravity depend on all of the following EXCEPT:
A. Muscular endurance
B. Power
C. Agility
D. Power-endurance

75. A training program focusing on the anaerobic lactic system should have all of the following components EXCEPT:
A. Technical training taxing the aerobic system
B. Tactical training
C. Power-endurance training
D. Muscular endurance of short duration training

76. If the focus of a training program is hypertrophy, how much protein is recommended for your 180 lb. athlete?
    A. 178 g/day
    B. 139 g/day
    C. 245 g/day
    D. 300 g/day

77. Which of the following pre-game meal tips is false?
    A. Avoid alcohol consumption 24-36 hrs before a competition
    B. The pre-game meal should be at least 40% complex carbs
    C. Fast foods should be eliminated from meal plans
    D. If an athlete is hungry 1-3 hours before a completion, they should eat fruit

78. Which statement is false concerning proper hydration
    A. Drinking 150 mL of sports drink in 20 minute intervals can decrease glycogen storage
    B. Sports drinks are not generally appropriate if activity is less than 60 minutes
    C. Short bursts of activity type sports generally do not benefit from sports drinks
    D. Intermittent high-intensity sports do tend to benefit from sports drinks

79. Your 185 lb athlete lost 5.3 lbs after a workout. How much fluid should he drink in order to rehydrate appropriately?
    A. 7.5 liters
    B. 3.6 liters
    C. 6.0 liters
    D. 1.5 liters

80. Which training program consists of two taxing days of training followed by a lighter aerobic day?
    A. Speed and power dominant sports
    B. High-complexity sports
    C. Training for aerobic endurance-dominant sports
    D. Power dominant sports

81. Which types of macrocycles are most helpful during the preparatory phase of training?
    A. Step loading and developmental
    B. Double pyramid and shock
    C. Developmental and shock
    D. Step loading and double pyramid

82. What does the determination of how microcycles and macrocycles are integrated during the competitive phase?
    A. Biological makeup of the athlete
    B. Maturity of the athlete
    C. Competition schedule
    D. Experience of the athlete in the sport

83. What are the two basic components of periodization?
    A. Peak performance and strength
    B. Yearly plan and periodization of strength
    C. Short term athletic goals and peak performance
    D. Preparatory phase and competition phase

84. What should the coach's main objective be during the preparatory phase of periodization?
    A. Strive for perfection
    B. Develop physiological foundations
    C. Mentally prepare the athlete
    D. Avoid diversions and injuries to the plan

85. When a periodization plan is designed for a sport with only 1 competitive phase, it is called a:
    A. Single peak plan
    B. Transitional plan
    C. Competitive plan
    D. Pyramid plan

86. Once the transition phase is complete, the main objective is to:
    A. Decrease intensity in order to prepare for the next cycle
    B. Focus on set skills and drills
    C. Stop strength training in order to prepare for competition
    D. Design a program using most muscles in order to strengthen connective tissue

87. During the anatomical adaptation phase, all of the following should be included in the plan EXCEPT:
    A. Single plane type exercises
    B. Higher number of exercises
    C. Multi-lateral type program
    D. Moderate intensity

88. Which phase uses bodybuilding techniques such as supersets?
    A. Phase I
    B. Phase II
    C. Phase III
    D. Phase IV

89. During the competitive phase, how long can it take to begin to see detraining effects?
    A. 2 weeks
    B. 3 days
    C. 5-6 days
    D. 1 month

90. What is the longest the transitional phase should last for serious athletes?
    A. 4-6 days
    B. 4-6 weeks
    C. 1-2 microcycles
    D. 2-4 weeks

91. All of the following are changes that occur during detraining EXCEPT:
    A. Headaches
    B. Lack of appetite
    C. Decrease in testosterone
    D. Anabolism

92. Which one of the following statements is incorrect when discussing detraining?
    A. Fast twitch muscle fibers are the most affected by inactivity
    B. An inactive athlete can lose strength at the rate of 3-4% per day the first week
    C. Stopping training does not affect glycolitic enzyme activity
    D. Oxidative enzymes decline when training stops

93. Which activity includes incorporating 10 weeks of maintenance improving power during the periodization of strength phase?
    A. Throwing sports
    B. Sprinting
    C. Distance running
    D. Baseball

94. What phase should be the longest phase when training marathon runners?
    A. Competitive
    B. Preparatory
    C. Transition
    D. Maintenance

95. Which of the following is a difference between training an elite baseball team vs. an amateur team?
    A. The competitive season is shorter for the elite team than the amateur
    B. The maximum-strength period should last 3 weeks for the elite players and 6 weeks for the amateurs
    C. The transition phase starts at the same time for both elite and amateur teams
    D. The preparatory phase is longer for the amateur team than it is for the elite

96. How many months total do sprint swimmers train in the transition phase per year?
    A. 1 month
    B. 2 months
    C. 1.5 months
    D. 3 months

97. Which position in American football has a hypertrophy phase during the periodization for strength?
    A. Professional defensive backs
    B. College tailbacks
    C. Linemen
    D. Wide receivers

98. Which of the following is not a correct about yearly training plans for soccer players?
    A. Amateur players have more transitional phases than professional players
    B. Professional players preparatory phase is shorter than amateur players
    C. Amateur players start training later in the year than professional players
    D. Professional players have a longer maintenance phase than amateurs

99. How many weeks total should Alpine skiers train maximum strength during the year?
    A. 12 weeks
    B. 10 weeks
    C. 8 weeks
    D. 6 weeks

100. All of the following are limiting factors for martial arts training programs EXCEPT:
    A. Starting power
    B. Power endurance
    C. Muscular endurance of short duration
    D. Agility

101. All of the following are training objectives for figure skaters EXCEPT:
   A. Landing power
   B. Takeoff power
   C. Acceleration power
   D. Maximum strength

102. Training objectives for golfers include all of the following EXCEPT:
   A. Power
   B. Flexibility
   C. Aerobic endurance
   D. Maximum strength

103. Which of the following statements is false concerning loading patterns?
   A. They are not rigid in the planning
   B. They are standard for each sport
   C. They vary from sport to sport
   D. They can change depending on the training phase

104. The application of force in sports is typically:
   A. Very quick
   B. Very slow
   C. Not as important as strength
   D. The same as in body building

105. When can a high level of power be expected in training for an athlete?
   A. The end of the preparatory phase
   B. During the transitional phase
   C. The beginning of the competitive phase
   D. The end of the competitive phase

106. What method of training is considered to be the simplest way to use in the anatomical phase?
   A. Super sets
   B. Circuit training
   C. Pyramiding
   D. Body building

107. How long should the rest interval between stations be for circuit training?
   A. 1-3 minutes
   B. 60-90 seconds
   C. 30-60 seconds
   D. Long enough to get to the next station

108. Athletic differences are typically due to:
   A. Training
   B. Age which they started training
   C. Anthropometrics
   D. Type of coach they have

109. Who should or can safely work past the threshold of pain?
   A. No one because of the risk of injury
   B. Sprinters
   C. Distance athletes
   D. Advanced athletes

110. The total time a circuit training program should take for novice athlete is:
   A. 40-60 minutes
   B. 30-40 minutes
   C. To exhaustion
   D. 20-25 minutes

111. When should coaches test the athlete's 1RM when using circuit training to ensure proper loading?
   A. Every week
   B. Weeks 1, 4 and 6
   C. Once per month
   D. Once every 2 months

112. When circuit training, which athletes should NOT immediately transition to the maximal strength phase once the load reaches appropriate percentages of 1RM?
   A. Triathletes
   B. Figure skaters
   C. Marathoners
   D. American football linemen

113. How long should the anatomical adaptation program last for athletes who have 3-4 major peaks per year in the sport?
   A. 2 weeks
   B. 3 weeks
   C. 4 weeks
   D. 5 weeks

114. Which statement is true concerning adaptation of body structures?
   A. Muscle tissue can adapt to training within 1-2 months
   B. Ligaments take longer than tendons to adapt
   C. Tendons take 1 week to adapt to training
   D. Muscle tissue can adapt to training within 3-4 days

115. What is the typical load for body builders to develop hypertrophy?
   A. Close to 100% max
   B. 80-90%
   C. 70-80%
   D. 50-60%

116. What is the goal of athletics when it comes to training?
   A. Hypertrophy
   B. Symmetry
   C. Functionality
   D. Recovery

117. What is the focus of hypertrophy training for sports?
   A. Enlarge overall musculature
   B. Improve symmetry of all muscles
   C. Increase the size of specific primary movers
   D. Maximize muscular power

118. Training for sports specific hypertrophy requires:
   A. Heavy loads, moderate rest, high sets
   B. Moderate loads, little rest, and moderate sets
   C. Heavy loads, little rest, and high sets
   D. Moderate loads, moderate rest, and high sets

119. How often per week should hypertrophy training be performed for sports?
   A. 2-4
   B. 1-3
   C. only 1
   D. 1-2

120. Who should not perform slow speeds when training for hypertrophy?
   A. Marathoners
   B. Middle distance runners
   C. Sprinters
   D. Body builders

121. How long should the rest interval be for hypertrophy programs?
   A. 1-2 minutes
   B. 3-5 minutes
   C. 20-30 seconds
   D. 10-15 seconds

122. Which variation of hypertrophy for body building refers to sports specific hypertrophy?
   A. Hypertrophy II
   B. Hypertrophy IV
   C. Hypertrophy I
   D. Hypertrophy III

123. What is the biggest limitation for athletes to perform split routines?
   A. Energy
   B. Training
   C. Time
   D. Equipment

124. When utilizing the resisted repetition program, the partner should provide resistance for how long on the last 2-3 reps?
   A. 60 seconds
   B. 6-8 seconds
   C. 20-40 seconds
   D. Until the athlete fatigues

125. An athlete has just finished performing push ups and immediately begins to work traps and rhomboids. This is a _____ variation hypertrophy program.
   A. Split routine
   B. Resisted Reps
   C. Preexhaustion
   D. Superset

126. Heavy workouts to exhaustion should not be performed more than:
   A. 3 times/macrocycle
   B. 3 times/microcycle
   C. 3 times/ month
   D. 3 times/week

127. Once the hypertrophy phase is complete, the athlete can:
   A. End their season
   B. Progress to the transition phase
   C. Switch to the Hypertrophy II program
   D. Further develop hypertrophy in the maximum strength phase

128. The more important maximum strength is for a sport:
   A. The shorter the maximum strength phase
   B. The longer the maximum strength phase
   C. The longer the anatomical adaptation phase
   D. The shorter the anatomical adaptation phase

129. To increase the diameter of myosin filaments, the athlete must:
   A. Focus on volume and duration of the maximum strength phase
   B. Focus on synchronization of muscles by performing many reps of the same exercise
   C. Focus on the duration of the hypertrophy phase
   D. Focus on light weights, more repetitions

130. To improve muscle synchronization, the athlete must:
   A. Improving strength
   B. Improving explosive power
   C. Learning the movements of the activity or exercise
   D. Increasing the diameter of myosin filaments

131. Which type of muscle contraction requires the highest amount of tension?
   A. Concentric
   B. Eccentric
   C. Dynamic
   D. Isometric

132. All of the following are reasons why the maximum load method is the most effective way to develop sport specific strength EXCEPT:
   A. It is helps to increase power
   B. It results in maximal increases in hypertrophy
   C. It improves the coordination of muscles
   D. It has a high recruitment of fast twitch muscle fibers

133. In order for an athlete to recover faster from ATP deficiency, the ATP Deficiency Theory recommends:
   A. A load of 80-90%
   B. A short rest cycle
   C. A protein rich diet
   D. Creatine supplements

134. Alternate methods to increase maximum strength development include all of the following EXCEPT:
   A. Apply the progressive load principle
   B. Increase the ratio between concentric and eccentric contractions
   C. Alternate 3 weeks of transition phase with 3 weeks of adaptation for power sports
   D. Review and evaluate the rhythm or speed of the contraction

135. Maximum strength and explosive power are also known as:
   A. Eccentric training
   B. Maximal load training
   C. Nervous system training
   D. Periodization training

136. When loading, which approach is better for recovery and creates less fatigue?
   A. CNS adaption approach
   B. Sliding approach
   C. Horizontal approach
   D. Vertical approach

137. According to Hartmann and Tunnemann, how many repetitions should highly trained athlete perform when working at 80-90% maximum load?
   A. 70-110 reps
   B. 35-85 reps
   C. 20-40 reps
   D. 15-25 reps

138. How long should the rest interval be for the maximum load method?
   A. 1-2 minutes
   B. 2-4 minutes
   C. 3-6 minutes
   D. 6-10 minutes

139. How often should the maximal load method be incorporated to training during the athlete's competitive season?
   A. 1-2 max loads per month
   B. 1-2 max loads per week
   C. 3-4 max loads per week
   D. 1-2 max loads during the season

140. Which statement is false concerning isometric training programs?
   A. It most useful when used during the maximal strength phase
   B. It has little benefit for muscular endurance
   C. It strengthens throughout the entire range of motion of the activity
   D. Can be performed by lifting a weight heavier than the athlete's 1 RM

141. Which statement is incorrect concerning the isometric method?
   A. Fancy equipment is not needed
   B. A partner is needed
   C. The athlete can use this method even though injured
   D. It produces only a small increase in muscle hypertrophy

142. How long should the isometric contraction be held during this method of training?
   A. 4-6 seconds
   B. 20-30 seconds
   C. 6-12 seconds
   D. As long as possible

143. Which statement is false concerning the tetanus training method?
   A. The goal is to develop maximum strength in the muscle
   B. It's best used during the adaptation phase
   C. It requires a slow contraction speed
   D. Bouts of isometric contractions are interspersed

144. When designing a tetanus training program, the number of exercises should be:
   A. As many as possible for the isometric contractions
   B. Dependent on the number of sets and repetitions performed
   C. As few as possible for the isometric contractions
   D. Irrelevant

145. All techniques described in the tetanus training method increase all of the following EXCEPT:
   A. Explosive strength
   B. Reactivity
   C. Speed
   D. Agility

146. Which statement is true concerning the eccentric method of training?
   A. Improvements in strength gains are due to the hypertrophic response
   B. Two spotters are needed on the concentric phase
   C. Eccentric training creates higher tension in muscles than isometric, but less tension than isometric contractions
   D. Activity needs to be shorter for the concentric phase

147. All of the following are appropriate when designing an eccentric program EXCEPT:
   A. It can be combined with maximal load method
   B. Loads are generally 110-160% of 1RM
   C. It is appropriate for all athletes
   D. If an athlete reaches a plateau in their strength program, the coach should incorporate the eccentric program

148. How often should eccentric training be performed?
   A. 3x/week
   B. 2x/week
   C. 1x/week
   D. 1x/month

149. The Maxex training program combines:
   A. Maximum endurance and explosiveness
   B. Maximum power and explosiveness
   C. Maximum force and explosiveness
   D. Maximum eccentric contractions with jumping

150. All of the following sports benefit most from maxex training except:
   A. Kayaking
   B. Boxing
   C. Squash
   D. 10,000 meter run

151 When intramuscular coordination is more efficient, what occurs?
   A. Movements become more challenging
   B. Slow twitch muscle fibers become more dominant
   C. Movements become more precise
   D. Hypertrophy becomes more apparent

152. Which of the following is true concerning the conversion phase?
   A. Exercises should be performed statically
   B. More energy should be focused on power training
   C. Technical training should be avoided
   D. The number of exercises should be low

153. All of the following are correct about power EXCEPT:
   A. Power is the rate of producing force
   B. Power is measured in METs
   C. Power is the amount of work done in a certain time period
   D. Power is the rate at which muscles can produce work

154. Greatest improvements in power occur through:
   A. Higher speed
   B. Higher velocity
   C. Higher force
   D. Higher mass

155. Low velocity training with high resistance will:
   A. Decrease muscle synchronization
   B. Decrease the recruitment of motor units
   C. Improve the development of force
   D. Improve muscular strength

156. Agility is:
   A. The ability to decelerate using concentric contractions
   B. The ability to accelerate using eccentric contractions
   C. Muscular strength combined with flexibility
   D. The ability to decelerate using eccentric contractions

157. When is agility typically maximized during training?
   A. The beginning of the competitive phase
   B. The beginning of the conversion phase
   C. The end of the conversion phase
   D. The beginning of the adaptation phase

158. How many categories of plyometrics are in a sports specific periodization program?
   A. Two
   B. Three
   C. Four
   D. Five

159. Which statement is false concerning the isotonic method?
   A. If external strength exceeds internal resistance, the faster acceleration will be
   B. External resistance is the weight of the equipment
   C. If internal strength exceeds external resistance, the faster the acceleration will be
   D. Internal strength is the athlete's force exerted.

160. Which sport would need a load between 50-80% when designing the isotonic method?
   A. Javelin throwing
   B. Sprinting
   C. Martial arts
   D. Soccer

161. Which statement is appropriate to consider when designing for the isotonic method?
   A. The rest interval should be active performing light jogging movements
   B. Repetition should be non-stop especially for such athletes such as football linemen
   C. When the athlete is unable to continue the exercise in an explosive manner, he should stop, even if in the middle of a set.
   D. Exercises for power training do not always have to be sports specific

162. When should ballistic exercises be incorporated into the training?
   A. Before technical and tactical drills
   B. Immediately after warm up for speed/power sports
   C. After the athlete is exhausted from other training so as to challenge the CNS
   D. Never since ballistic exercises are high risk

163. Which statement is false concerning the ballistic method?
   A. The rest interval should be as short as necessary
   B. The weight of the implements used by the athlete is what dictates the training load
   C. The number of exercises should be as few as possible with as many sets as possible
   D. When speed declines, the athlete should stop

164. What are the most important parts of the power resisting method?
   A. A short isometric contraction and the following eccentric movement
   B. The speed of the movement and the control of the isometric contraction
   C. The weight lifting and the length of the isometric contraction
   D. A maximum isometric contraction and the following ballistic movement

165. Which statement is false concerning the plyometrics method?
   A. The greater the force generated, the more motor units that are recruited
   B. It is also known as the myostatic stretch reflex
   C. It is based on a voluntary contraction of fibers resulting from the rapid loading of these fibers
   D. The concentric contraction is followed by immediately by the eccentric contraction

166. Plyometric training results in all of the following EXCEPT:
   A. Greater stretch loads on the muscles
   B. A decrease in contact time with the ground or implement when fatigued
   C. Improvements in explosive force with slight thigh girth increases
   D. An increase in the firing rate of motor neurons

167. When introducing children to plyometrics, the coach should:
   A. Never use plyometrics with young athletes
   B. Young athletes can safely train utilizing demanding jumps early
   C. Avoid using plyometrics until the athlete is 16 years old
   D. Incorporate low impact activities for 2-3 years

168. Which statement is incorrect concerning training athletes using plyometrics?
   A. Hard surfaces should be used for highly trained athletes
   B. Ankle weights should not be used
   C. A soft surface is appropriate for all athletes
   D. A hard surface can enhance muscle reactivity

169. The “amortization phase” is:
   A. Best when it’s short
   B. Best when it’s long
   C. The point where the athlete lifts off the ground
   D. Is when the center of gravity is higher

170. Low impact exercises for plyometrics includes all of the following EXCEPT:
   A. Jumps over a 15 inch bench
   B. Skipping
   C. Rope jumps
   D. Standing long jump

171. How long does it typically take for a young athlete using low impact exercises to appropriately develop the connective tissue to prepare the body for plyometrics?
A. 2-4 weeks
B. 2-4 years
C. 2-4 cycles
D. 2-4 months

172. To properly execute a power-endurance training program , the athlete should:
A. Perform all repetitions slow and controlled
B. Work at 50-80% of maximum strength
C. Perform explosive dynamic reps non-stop
D. Perform explosive dynamic reps with little rest in between

173. The shortest the power-endurance program should last is:
A. 8 weeks
B. 4 weeks
C. 6 weeks
D. 2 weeks

174. Maximum acceleration is generated by:
A. Pulling the body forward
B. Pushing the body forward
C. Pulling the body backward
D. Pushing the body backward

175. Using elastic bands for power training:
A. Is beneficial to increase power
B. Has a high rate of fast twitch muscle fiber involvement
C. Has a higher risk of injury
D. Is a great way to increase the strength of ligaments

176. Which statement is false concerning sports specific power training?
A. Reactive components of muscle are trainable through ballistic exercises
B. The depth of the crouch position before the take-off in a jump must be proportional to leg power
C. Developing maximal speed is a necessity for achieving high acceleration
D. The smaller the diameter of individual muscle fibers, the faster it contracts

177. When converting into muscular endurance, aerobic-dominant sports should do all of the following EXCEPT:
A. Incorporate training and exercises that focus on slow-twitch muscle fibers
B. Rely more on carbohydrates for ATP production
C. Alternate muscular endurance of long duration with short duration endurance exercises
D. Use training methods with several reps of 10-30 minutes non-stop

178. Which activity uses muscular endurance mixed with dynamic movements and isometric?
A. Sailing
B. Canoeing
C. Archery
D. Swimming

179. Which of the following statements is false concerning muscular endurance?
   A. It is also called “extensive interval training”
   B. Athletes should not do more than 100 reps
   C. The main objective is learning to cope with fatigue
   D. It uses a low load of about 30-50% of 1 RM

180. How long should the conversion phase be for muscular endurance when there are more muscles groups to be trained such as in wrestling?
   A. 8-10 weeks
   B. 8-10 months
   C. 2-4 weeks
   D. 6 months

181. All of the following are criteria coaches should incorporate when creating a medium muscular endurance program EXCEPT:
   A. The number of exercises does not have to be the same for every limb on the body
   B. Athletes should perform all of the exercises in the last phase
   C. The number of exercises should be even numbered
   D. New or inexperienced athletes should include 10 or more exercises in the circuit

182. What is the main difference in training during the competitive and transition phase from training during the maintenance phase?
   A. The training methodology incorporated into the competitive and transition phase
   B. The intensity of strength training compare to tactical and technical drills
   C. The higher number of exercises used to train primary movers during the competitive phase
   D. The volume of strength training compared to tactical and technical drills

183. If the competitive phase is longer than 5 months, how much time should be devoted to maintaining maximal strength in the competitive and transition phases?
   A. 15%
   B. 25%
   C. 35%
   D. 50%

184. All of the following are recommendations for a maintenance program for strength training for team sports with two games per week EXCEPT:
   A. 1-2 sets of 3 exercises
   B. A minimum of 20 minutes
   C. 70% of 1 RM
   D. Sessions should be short and sport specific

185. Which statement is false concerning tetanus training:
   A. Maximum tension is challenging to achieve in training settings
   B. It can be used immediately prior to competition
   C. It is a proven technique that has been around for decades
   D. It can be in the weeks following a competition

186. Issues coaches should consider when incorporating periodization into training include all of the following EXCEPT:
   A. Periodization of strength is not well known or applied in many sports
   B. Athletes in individual endurance sports must reach peak performance 2-3 times per year
   C. Athletes in individual sports have more days for specific training that those in team sports
   D. Sports that have numerous competitive phases per year need a longer preparatory phase

187. In order to taper an athlete appropriate which of the following should not be done?
   A. Tapering should last 4-5 weeks
   B. For power sports, the volume of training should be progressively reduced by 30-50%
   C. For team sports, lowering volume and intensity should be done only for major tournaments
   D. Peak performance is impossible without replenishing ATP stores

188. All of the following are ways to prevent muscle soreness EXCEPT:
   A. Use only concentric contractions in week 1
   B. Use 70% concentric and 30% eccentric contractions in week 1
   C. Ingest 1000 mg of vitamin C per day
   D. Gradually progress into the use of eccentric contractions

189. Which of the following is not a sign of overtraining?
   A. Decreased handgrip strength using a dynamometer
   B. Loss of appetite
   C. Increased resting heart rate over 2-3 days
   D. Acute muscle soreness

190. What percentage of your daily intake should be consumed in the evening meal?
   A. 35-50%
   B. 15-20%
   C. 30-35%
   D. 20-25%

