Chapter 11: Muscle Fitness: Basic Principles and Strength

Lesson 11.1: Muscle Fitness Basics

Self-Assessment 11: Determining Your Modified 1RM and Grip Strength
Lesson 11.1: Muscle Fitness Basics

Lesson Objectives:
• Explain the difference between strength and muscular endurance.
• Describe some of the health benefits of muscle fitness.
• Describe the various types of muscles and muscle fibers.
• Describe some of the methods of progressive resistance exercise used to improve muscle fitness.
Lesson 11.1: Muscle Fitness Basics

Question

What is meant by the term *muscular endurance*?
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Answer

Muscular endurance means:
- Muscles can work for long periods before becoming fatigued.
- This happens because the energy systems of your muscle cells are improved.
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Question

What is the main way to improve muscular endurance?
Lesson 11.1: Muscle Fitness Basics

Answer

The main way to improve muscular endurance is
• by resistance training.
• doing resistance training in a specific way (high reps, low weights).
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Question

What is meant by the term *muscular strength*?
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Answer

Muscular strength is the amount of force a muscle can produce (usually assessed using low reps).
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Question

What is meant by the term *hypertrophy*?
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Answer

Muscular hypertrophy
• is an increase in size of the muscle fibers.
• happens as a result of resistance training involving heavy weights and low repetitions.
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Question

Can you explain the terms *reps* and *sets* used in designing a PRE program?
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Answer

• Reps – the number of lifts in a set.
• Sets – one set is a group of repetitions (e.g., lifting 2 sets of 15 repetitions).
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Question

Name the three types of muscles your body has.
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Answer

Your body has three types of muscles:
• Smooth
• Cardiac
• Skeletal
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Question

What are smooth muscles and cardiac muscles?
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Answer

- Smooth muscles make up the walls of internal organs, such as the stomach and blood vessels.
- Your heart is made of cardiac muscle.
- Both smooth and cardiac muscles are classified as involuntary muscles because you cannot consciously control their movements.
Lesson 11.1: Muscle Fitness Basics

Question

What are the different types of fibers in skeletal muscle called?
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Answer

- The different types of skeletal muscle fibers are classified as fast-twitch, slow-twitch, and intermediate.
- Slow-twitch fibers
  - contract at a slow rate.
  - generate less force than fast-twitch fibers.
  - can resist fatigue.
Lesson 11.1: Muscle Fitness Basics

Answer (continued)

• Fast-twitch fibers
  – contract fast.
  – generate more force when they contract.
  – are important for strength activities.
• Intermediate fibers have characteristics of both slow- and fast-twitch fibers.
  – These fibers contract fast and have good endurance.
Lesson 11.1: Muscle Fitness Basics

Question

What is an isotonic contraction?
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Answer

A muscle contracts and changes length (gets shorter or longer).
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Question

What are concentric and eccentric isotonic contractions?
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Answer

- Eccentric contraction—the muscle lengthens under tension.
- Example: lowering a dumbbell slowly eccentrically contracts the biceps.
Lesson 11.1: Muscle Fitness Basics

Answer (continued)

• Concentric contraction—the muscle shortens under tension (natural movement).
• Example: curling a dumbbell concentrically contracts the biceps.
Lesson 11.1: Muscle Fitness Basics

Question

What is an isometric contraction?
Lesson 11.1: Muscle Fitness Basics

Answer

Isometric movements involve no lengthening or shortening of the muscle.
Lesson 11.1: Muscle Fitness Basics

Question

What factors influence the strength of a muscle?
Answer

The strength of a muscle depends on several factors:

• how well trained a person is,
• the speed of the movement being performed,
• the angle of the joint during a specific lift,
• age,
• sex, and
• heredity (the types of muscle fibers you have).
Lesson 11.1: Muscle Fitness Basics

Question

What types of equipment are available to do progressive resistance exercises?
Lesson 11.1: Muscle Fitness Basics

Answer

The types of equipment available:
• Resistance machines (isotonic)
• Free weights (isotonic)
• Inexpensive equipment for isometric exercises, such as a wall, a towel, or a rope
Self-Assessment 11: Determining Your Modified 1RM and Grip Strength

Question

What is meant by the phrase *estimating your 1RM*?
Self-Assessment 11: Determining Your Modified 1RM and Grip Strength

Answer

- 1RM means one repetition maximum. It represents the maximum amount of weight a group of muscles can lift at one time.
- Because beginners should begin gradually, not begin with heavy lifting, a modified method has been developed that allows you to determine your 1RM without overexerting.
Self-Assessment 11: Determining Your Modified 1RM and Grip Strength

Answer (continued)

- You can estimate your 1RM for any muscle group, but the arms and legs are often used for self-assessments.
Self-Assessment 11: Determining Your Modified 1RM and Grip Strength

Question

How is the seated arm press performed?
Answer

Seated Arm Press

- Sit on the stool with the handles even with your shoulders. Grasp the handles with palms facing away from you. Tighten your abdominal muscles.
Self-Assessment 11: Determining Your Modified 1RM and Grip Strength

Answer (continued)

• Push upward on the handles, extending your arms until the elbows are straight.
• Caution: Do not arch your back. Do not lock your elbows.
• Lower to the starting position.
Self-Assessment 11: Determining Your Modified 1RM and Grip Strength

Question

How is the leg press performed?
Self-Assessment 11: Determining Your Modified 1RM and Grip Strength

Answer

Leg Press:

• Adjust the seat distance for leg length comfort. The closer the seat, the greater the range for working and the greater the intensity. Sit with your feet resting on the pedal.
Self-Assessment 11: Determining Your Modified 1RM and Grip Strength

Answer (continued)

• Push the pedal until your legs are straight.
• Caution: Do not lock your knees.
• Slowly return to your starting position.
Self-Assessment 11: Determining Your Modified 1RM and Grip Strength

• See your textbook and follow the guidelines that will enable you to estimate your 1RM.
Self-Assessment 11: Determining Your Modified 1RM and Grip Strength

Question

How do you perform the grip strength test?
Self-Assessment 11: Determining Your Modified 1RM and Grip Strength

Answer

• If possible adjust the dynamometer to fit your hand size. Many dynamometers allow you to make the grip bigger or smaller by turning the grip handle.
Self-Assessment 11: Determining Your Modified 1RM and Grip Strength

Answer (continued)

• Squeeze as hard as possible. You may not touch your body with your arm or hand, but you may bend or extend the elbow.

• Record the best of two scores for each hand.

• See your textbook to determine your rating.