Review – Week 4 - Programming for Muscular Fitness

THIS MATERIAL IS A SUPPLEMENTAL TOOL. IT IS NOT INTENDED TO REPLACE INFORMATION PROVIDED IN YOUR TEXT AND/OR STUDENT HAND-BOOKS.
Reading - Chapter 9, 13, 22

Case Histories:
- Devise a training program for their subjects. It should include recommendations for CRF, nutrition, flexibility and resistance training.

Case #1: Your 38-year-old female client, whom you have been training for fitness for the past year, tells you she wants to do a triathlon six months from now.

Case #2: Your best friend is concerned about her 60-year-old father, who recently was released from rehab after a heart attack, and is afraid to exercise on his own. She wants to hire you to help him get in shape.

Case #3: An acquaintance has a 15-year-old teenage son who weighs nearly 300 pounds. He has hired you to help his son lose weight, and to get him in shape to try out for football next season.

Case #4: A 53-year-old woman who is 40 pounds overweight just sent her last child off to college, and is ready for some “me” time. She wants you to help her with a fitness makeover.

Case #5: A 22-year-old friend of yours just joined the Marine Corp, and will be heading off to boot camp two months from now. He is worried that he won’t have the physical stamina to make it in the corps. He needs your help.

Understanding Volitional Fatigue
When we do resistance training sets, our goal is to work the muscles to volitional fatigue, the point at which you cannot do another “clean” repetition without compromising good form. For average individuals, you want to reach volitional fatigue within the eight to 12 repetition range, as outlined by the ACSM guidelines. As your client grows stronger, they will eventually be able to execute more than 12 repetitions. At that point, increase the weight load by five to 10 percent, and reduce the number of repetitions. Remember safety is first and foremost! Start with low weights!

MACHINES
Selecting Appropriate Weight Loads
- How will you know how much weight to use with a client on a particular exercise? You have already learned how to test for 1RM, and how to estimate 1RM based on eight to 12 repetitions. When training a new client, begin with a weight that is lighter than you think they can lift. Focus on teaching good form and technique with regard to speed, range of motion and breathing. Gradually increase the weight by five to 10 percent, until you arrive at a weight that produces volitional fatigue within the eight to 12 repetition range. Special note: Remember to use your assessment information for your client’s safety and success!!
- Practice finding appropriate weight loads on various equipment based on the premise of volitional fatigue within an eight to 12 repetition framework. Remember to use the baseline as determined by the assessments!
Body Alignment and Range of Motion
When positioning the body for a particular exercise, think of your body as a finely tuned piece of machinery. In order to move smoothly through their normal range of motion, your joints should be aligned with the axis of rotation of the moving levers of a weight machine. When using free weights, position the body so that the joints align with one another. Maintain neutral spinal alignment, and contract your core muscles to support your trunk. Avoid hyper-extension of joints.

- Using a leg press and a seated chest press, demonstrate correct body alignment and range of motion.
- Review cuing techniques and joint alignment. For example, on the leg press, “knees hip-width, no deeper than 90 degrees, don’t lock the knees at the top, neck relaxed, spine straight.”
- On the chest press, “grip aligned with pecs, elbows at shoulder height, arms parallel to the floor, take your elbows no deeper than the shoulder.”
- Remember to cue for breathing.

Execution, Breathing, Speed and Control
- Correct breathing technique while using machines: generally, inhale on the eccentric phase and exhale on the concentric.
- Exhale through the mouth and inhale through the nose.
- The most important thing is that there is some form of rhythmic breathing taking place during exercise.
- Speed of execution. Generally, two seconds on the concentric phase and four on the eccentric phase.
- Control of the weights, avoiding the use of momentum or gravity to generate movement.

Common execution errors for machines:
- Poor equipment set-up.
- Too much/too little weight.
- Poor spine and neck alignment.
- Improper joint alignment.
- Too fast.

FREE WEIGHTS
Free Weight Safety and Etiquette:
- Demonstrate and discuss the following issues:
- Racking dumbbells and stripping and racking plates after use.
- Cleaning benches and equipment after use.
- Returning balls and tubing to their place after use.
- Allowing other gym members to use equipment between sets.
Body Alignment, Speed, ROM, Breathing
- Review body alignment basics when standing, sitting or lying down.
- Seated and standing spinal alignment: chest lifted, shoulders back and down, hips and shoulders aligned.
- Standing: wide base of support with feet under hips, abs tucked in, knees slightly bent.
- Lying on floor or bench: feet flat, neutral spine, neck relaxed, head resting on bench.
- Quadruped: back flat hips and shoulders square, hips aligned over knees aligned over ankles, wide base.
- Alignment for squats, lunges, deadlifts: knees under hips and over ankles, erect spine, lifted chest, deadlift bar close to your body.

Common Execution Errors:
- Squats: leaning forward from hips, rounding the spine, bending the knees before engaging the hips, shifting body weight to the forefoot, knee over toe,
- Lunges: leaning forward from hips, rounding the spine, shifting body weight to the forefoot, knee over toe.
- Deadlifts: rounding the spine, knees locked out, stance too narrow or too wide, bar too far from the body.
- Barbell biceps curl: stance too narrow or too wide, grip too wide, elbows hyperextended, shoulders rounded, generating momentum with gluteals, hamstrings and low back, poor control in eccentric phase.
- Dumbbell kickbacks: rounded spine, dropped head, narrow base of support, misalignment of hips and shoulders, generating momentum from posterior deltoid, poor control in eccentric phase.

TUBING

BODY WEIGHT

Alternative Resistance Modes: In addition to traditional dumbbells, barbells and plates, many alternative modes of resistance and other equipment are available to add variety to your workouts, and to challenge your clients in new ways. Some options are: (2 of these 6 will be required for your exam!)

1. Stability Balls
2. Medicine Balls
3. Elastic Resistance (bands and tubes)
4. Kettle Bells
5. BOSU and other balance devices
6. TRX systems

New and unusual equipment is constantly being developed. Be sure to incorporate some of these great options into your workouts!
Program Design

There is no right or wrong way to train, but there are some basic guidelines to follow:

1. Train larger muscle groups before smaller.
2. Do explosive power moves early in your session.
3. Do multiple-joint compound exercises before doing single-joint exercises for muscles in the same muscle group. For example, do squats before leg extensions or leg curls. Do chest presses before biceps curls or triceps extensions. **As with all exercises, makes sure the exercise is demonstrated, discussed, and time is allowed for questions and answers.**
4. If time is limited, as is often the case when training clients, arrange your exercises in a “push-pull” sequence, so that muscles on one side of the joint are resting while the opposing muscles work.
5. Take time to stretch the muscles worked after each exercise.

Programming for Health, Fitness and Performance: Different individuals have different goals when it comes to physical activity. Some just want to improve their health. Some want a higher level of fitness. And some want to compete or perform at an athletic level. You can apply the FITT principle to program for frequency, intensity, time and type of exercise for any client.

<table>
<thead>
<tr>
<th>Health</th>
<th>VS.</th>
<th>Fitness</th>
<th>VS.</th>
<th>Performance</th>
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</thead>
<tbody>
<tr>
<td>Lower risk of health problems</td>
<td>1. 40-59% HRR</td>
<td>Cardiovascular fitness</td>
<td>1. 60-80% HRR</td>
<td>Running performance</td>
</tr>
<tr>
<td>2. 5-7 days · wk⁻¹</td>
<td></td>
<td>2. 3-5 days · wk⁻¹</td>
<td></td>
<td>1. &gt;80% HRR</td>
</tr>
<tr>
<td>3. Accumulate ≥150 min · wk⁻¹</td>
<td></td>
<td>3. 20-60 min · session⁻¹</td>
<td></td>
<td>2. 7+ times · wk⁻¹</td>
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</table>

|               |       |               |       |               |
| 30 min most days |       | About 3 mi     |       | About 50-90 mi · wk⁻¹ |
| 3 times · wk⁻¹  |       | 3 times · wk⁻¹ |

**Monitoring Exercise Intensity:** It is important to monitor intensity of exercise if you want to get a training effect. The following chart compares intensity and energy expenditure at varying speeds of walking, jogging and running.
Calculating Energy Needs

Refer to the student workbook and pages 248-249 in text.

Refer to Figure 12.2 (student workbook and page 248 in text).

What is Resting Metabolic Rate (RMR) means? (RMR is the total cost of energy necessary for the body to function at rest.)

What “thermic effect of food” means? (Thermic effect is the energy required to digest and metabolize food.)

Discussion: “How might increasing exercise intensity alter the percentage of energy needed for basal metabolism?”

- Increased lean mass.
- Increased circulating growth hormone.
- Increased VO2

Using guidelines outlined on page 271 in the text, create a client profile and design a one-hour exercise session for that client.
1) **Explain the 7 acute program variables that affect the design of a strength training program (page XXX of text book)**

**Notes:**

- **Program Design Domain**
  - **Choice of exercise**
    - Structural, isolated-joint, multiple-joint, power, contraction type, equipment type
  - **Order of exercise**
    - Exercise sequences, large vs. small muscle groups, complex vs. simple, high skill vs. low skill
  - **Intensity**
    - Resistance used, power vs. high force, muscle recruitment level, repetition speed
  - **Number of sets**
    - Volume effects, total work
  - **Rest period lengths**
    - Amount of force produced, lactate responses, hormonal responses, power output level

2) **Identify the characteristics of several resistance training systems designed to enhance muscular fitness (page 208-209 of text book)**

**Notes:**
3) **Design an individual resistance training program for selected case study including suggestions for cardiovascular activity and flexibility exercises utilizing basic exercise programming guidelines. (workbook page 6-84)**

**Notes:**

4) **Review of:**
   a) Periodization
   b) Single-Set System
   c) Multiple Set
   d) Circuit Training
   e) Pre-exhaustion
   f) Assisted Training
   g) Plyometrics

5) **Review of guidelines for developing an exercise condition program:**
   a) Warm-up
   b) Strength training
   c) Cool-down - cardiovascular activity
   d) Flexibility/ROM enhancement – static stretches with special attention to specific target areas

**Programming Tip: Maximize time use by working one side of the joint while allowing opposing muscles on the other side to rest.**

<table>
<thead>
<tr>
<th>Opposing Muscle Groups</th>
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<tbody>
<tr>
<td>Pectorals Lats ↔ Rhomboids</td>
</tr>
<tr>
<td>Anterior and Medial Deltoid ↔ Posterior Deltoid</td>
</tr>
<tr>
<td>Triceps ↔ Biceps</td>
</tr>
<tr>
<td>Gluteus Maximus ↔ Hip Flexors</td>
</tr>
<tr>
<td>Abductors ↔ Adductors</td>
</tr>
<tr>
<td>Quadriceps ↔ Hamstrings</td>
</tr>
<tr>
<td>Gastrocnemius/Soleus ↔ Anterior Tibialis</td>
</tr>
<tr>
<td>Rectus Abdominis ↔ Erector Spinae</td>
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</table>
General Program Guidelines
These are general program guidelines to help determine where to start a client with their personalized fitness plan. It is not necessary to follow them exactly, but use as a starting point for developing their fitness prescription. The different programs illustrate that people need to train differently depending on their goals. Determine your client’s fitness level and goals—and customize their program from examples below.

<table>
<thead>
<tr>
<th>Weight Loss: Overweight</th>
<th>Cardio</th>
<th></th>
<th>Resistance</th>
<th></th>
<th>Flexibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 – 6 days after weights</td>
<td>30 – 45 minutes</td>
<td>10 - 12 whole body exercises</td>
<td>1 - 2 sets; 10 - 12 reps</td>
<td>General body</td>
<td></td>
</tr>
</tbody>
</table>

| Weight Loss: Endurance-Strength | 5 – 6 days after weights | 3 days | specific large muscle groups | 2 - 3 sets; 10 - 15 reps | General body |

| General Endurance | 3 - 5 days depends on goals | 20 - 45 minutes | 3 - 5 days endurance with strength | more reps and lighter weight | 3 - 4 sets; 8 - 10 reps | Areas of decreased mobility or muscles being trained |

| General Strength | 3 - 5 days depends on goals | 20 - 45 minutes | 3 - 5 days strength with endurance | many types of sets heavier: | 3 - 4 sets; 8 - 12 reps | Areas of decreased mobility or muscles being trained |
| Medium: | 3 - 4 sets; 10 - 15 reps |
| Light: | 3 - 4 sets; 15 - 20 reps |
| 4 - 6 days |

| Advanced Strength | 2 - 3 days opposite of lifting | 15 - 30 minutes | strength with endurance | general type of sets - strength heavy: | 3 - 6 sets; 8 - 12 reps | Areas of decreased mobility or muscles being trained |
| Negative Training |
| Pyramid Training |
| Occasional Endurance | 2 - 3 days warm up with 2 - 3 sets of 25 reps using minimal to no weight. Then, light weight | 2 - 3 sets; 10 - 15 reps |

| Arthritis | 3 - 5 days | 10 - 15 min. warm-up. | 20 - 30 min of cardio after weights for weight loss | focus on large muscle group and stabilization | All joints |
6) Demonstrate proper spotting techniques for bench press, chest fly and dumbbell chest press, barbell squat, pull-ups and dips

Setting your client up for the exercise entails aligning their joints and positioning their body for safe execution. Spotting means you are ready to assist them if their muscles fail, or if they lose control of the weights.

1. Safely position your client for the exercise.
2. Hand your client the weights.
3. Spot, correct and cue your client during execution (alignment, speed, ROM, breathing).
4. Safely take the weights from your client and rack them.
5. Congratulate your client on a job well done.

Spotting a dumbbell bench press:

1. Hand your client the weights in a seated position, resting them on the thighs.
2. Get behind your client and ease him/her into the lying bench position, drawing the weights to the chest.
3. Help your client move the weights into preparatory position.
4. Spot during execution.
5. Draw weights back to the chest.
6. Assist your client to sitting position with a hand on the back, moving the weights to the thighs.
7. Retrieve the weights from your client and rack them.

**Bench Press**

Stand behind the bench with your hands above or underneath the bar but not touching it. Have one hand pronated and one supinated for better grip. Place one foot slightly in front of the other to create a greater base of support and balance. When the lifter (client) needs you, you can lean in and quickly grip the bar.

**Chest Fly**

Spot underneath the lifter’s elbows by kneeling on one knee behind and follow the movement with your hands.
Barbell Squat

Stand behind the lifter (client) and be prepared to assist at the hips or underneath the arms. Discuss with your lifter the most appropriate and comfortable place they would prefer you to spot prior to the exercise. Place one foot slightly in front of the other to create a greater base of support and balance and follow the lifter during the execution of the exercise.

Pull-ups and Dips

Stand behind the client and offer assistance by holding his/her feet and guiding them upward.

Exercise Set-Up and Spotting for Free Weights

- Safely position your client for the exercise.
- Hand your client the weights.
- Spot, correct and cue your client during execution (alignment, speed, ROM, breathing).
- Safely take the weights from your client and rack them.
- Congratulate your client on a job well done.

Note: when doing a dumbbell bench press:

- Hand your client the weights in a seated position, resting them on the thighs.
- Get behind your client and ease him/her into the lying bench position, drawing the weights to the chest.
- Help your client move the weights into preparatory position.
- Spot during execution.
- Draw weights back to the chest.
- Assist your client to sitting position with a hand on the back, moving the weights to the thighs.
- Retrieve the weights from your client and rack them.
HOMEWORK
1. Using the Case Studies from your workbook and develop an exercise condition program specific to their needs with special attention to weight training and cardiovascular activity.

2. Explain what each of the following mean in relationship to a client’s or athlete’s fitness and conditioning program

   1. **Maximum Muscle Endurance**
      a. Sequence
      b. Technique
      c. Set Number
      d. Weight Amount

   2. **Maximum Muscle Strength**
      a. Sequence
      b. Technique
      c. Set Number
      d. Weight Amount

   3. **Overcoming Strength Plateaus**
      a. Training Frequency
      b. Training Exercise
      c. Set/Repetition Change
      d. Resistance/Repetition
      e. Breakdown Training
      f. Assisted Training
      g. Negative Training
      h. Ten Second Training
Review – Week 4 - Programming for Muscular Fitness

Reading Assignments:
■ Chapter 13 and 14

Key Reminders:
■ REVIEW

■ Practice your stretches at home. Have the form down for all primary muscles (you never know what the tester will ask!)
■ Warm-up – why and how?

■ Are you demonstrating properly?
  Shoulder width apart, neutral position, 1,2/1,2,3,4; breathe out – exertion; breathe in - return
■ Do you know your assessments proper name? Do you know what muscle/body part the assessment is for?
■ Leg press – for the quadriceps, hamstring, and glutes; can be converted to calf raise.
■ What is the purpose of the assessment and what does it measure?

THESE MATERIALS WERE GATHERED BY THERESA HILL TO ASSIST STUDENTS WITH PRACTICAL STUDIES. THE INTENT WAS NOT TO SUPERSEDE TEXTBOOK OR WORKBOOK MATERIALS.