STUDY GUIDE FOR ACSM PERSONAL TRAINING EXAM
CREATED BY: SIERRA OLSEN
# Testimonials from Current Personal Trainers

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<td>• What to do and not to do in the field of personal training.</td>
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<td>• How to get started with building a clientele.</td>
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Exam Preparation Testimonials

When should I start preparing for my exam?
- "Start preparing about 2 months in advance. I saw what I was comfortable with and what I wasn’t, I was then able to divide up my time based upon where I was at." -Gabby Record
"Give yourself at least 6 months to study and prepare before you take the exam. 2-3 months prior to the exam you should be dedicated a couple hours a week to strict studying." -Cole Mercer

How many hours did you study prior?
- "About 100 hours, I spent a couple weeks before the exam studying much more in-depth." -Gabby Record

What studying tools did you value most?
- "I really like taking the practice tests where I could really see what areas of the text book I needed to focus on the most." -Gabby Record
"Practice test apps were probably the most helpful, and general textbook reading time." -James Scott

What is the number one thing I should to prepare for my exam?
- "Definitely take practice exams! It gives you familiarity with exam format and questions. It will help you to feel much more confident when you go in to take the exam" -Gabby Record
"Buy the book and have a hard copy. It allows you to write and annotate as you study." -Cole Mercer
Field Experience Testimonials

How has your experience been as a personal trainer?

- "I really like it! It has been an adjustment with working in such a hands-on environment, the exam is just a small portion of being a personal trainer." - Gabby Record

"It has taught me patience more than anything. It has overall been a good experience being able to help people. Seeing their emotions when they see themselves improving is the most inherently rewarding." - James Scott

If you could change one thing about beginning your personal training experience, what would it be and why?

- "I didn’t have a distinct personal training experience due to starting out as an online personal trainer first. So that’s what I probably would have done is more in person training experience." - Cole Mercer

"I wish I knew what I do now when I started. I am extremely glad for the mistakes and failures I had when I first started because it taught me how to take an approach to clients that suites their needs and goals." - James Scott

What is the hardest component about personal training?

- "I would say the scheduling. One-hour increments are such a small amount of time, you have to make sure you coordinate well." - Gabby Record

"For me the hardest thing is balancing time schedules as well as consoling/increasing motivation when they don’t reach their goal when they thought they would." - James Scott

What is the number one thing NOT TO DO as a personal trainer?

- "Don’t be flaky or rude, meet everyone where they are at in their journey. Accept them for who and where they are, not where you want them to be." - Gabby Record

"Don’t impose your fitness goals on your participants. Not everyone wants to heavy weight lift or 60 minutes of cardio." - Cole Mercer

What is the number one thing TO DO as a personal trainer?

"Definitely make sure you are inclusive. You are there for that person no matter their age, weight, gender, where or when. Make sure you are there to serve them, not be better than them, but rather to help them be better and reach their goals." - Cole Mercer

"Never put them in a position to get hurt. There are always safer ways to go through an exercise and you never want to risk injuring your client" - James Scott
**Step by Step How to Register**

- **Step 1:** Go to ACSM.org and choose “certifications”, “get certified” and then “personal trainer”

- **Step 2:** You will then be directed to the indicated page in the left photo. Click the sidebar “Get Certified”. Scroll down and choose “learn more” under the personal trainer tab.
**Step 3:** Scroll down and double check that all criteria to take the exam are met.

**Step 4:** Select “Register Today!!”.

**Step 5:** On right side of webpage, either select “Sign in” or “Create account”.

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** Become an ACSM-CPT™ in Three Simple Steps**

- **You Meet the qualifications?**
  - Age or Older
  - Diploma or the Equivalent
  - Certification Important

- **Prepare to take the Exam**
  You can create your own preparation plan, or let us guide you through the process! Whichever option you choose, ACSM has the tools to support you.
  Just scroll down!

- **Register for the Exam**
  The ACSM Certification exam can be taken in-person at a Pearson VUE testing center or online from the comfort of your home, office, or workspace. As an ACSM member, get a discount on all ACSM Certification exams.

Ready to schedule your exam? Register Today!
Step 6: Choose a testing option that best suits your needs whether online, or in person at a testing location.

Step 7: Sign up for exam by choosing a date and time. The website will indicate whether that date and time is available.

Step 8: Be sure to read the requirements of the exam, for example showing up 30 minutes early and testing your technology prior to the exam.
Preparation for the ACSM exam is best achieved through studying the updated textbook that incorporates all required information for exam success.

The most current text can be found on Chegg and or Amazon for a reasonable price.

Older text will not have up-to-date protocol and so most recent version is highly suggested.
DIGITAL RESOURCES

Applications:
• Quizlet flashcards
• Fitness Pocket Prep
• ACSM CPT Pocket Preparation

Websites:
• ACSM webpage
• ACSM Health and Fitness Journal

Note: Additional resources are bonus exposure to exam material. Apps may not include all encompassing information needed for the exam.
ACSM HEALTH & FITNESS JOURNAL

- For current events in the fitness world, ACSM Health and Fitness Journal provides up to date information on protocol and exercise techniques.

- Many articles are provided for free, however a student membership can be purchased for $10 with a $20 renewal each year.
OTHER USEFUL RESOURCES

- Numerous other online and text resources provide ample studying tools. These resources include flashcards, practice questions/exams and practical application practice. These tools are useful additions to utilize while in preparation for taking the exam.
**SCOPE OF PRACTICE**

Personal trainers are NOT eligible to provide medical advice, diagnose injuries, or prescribe nutritional information to patrons.

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Personal trainers ARE eligible to assess and prescribe:

- Resting and exercise heart rate.
- Resting and exercise blood pressure.
- Height and weight.
- Body composition estimates.
- Calculation of body mass index.
- Circumference measurements of limbs, hips and waist.
- Measurements of flexibility
- Tests for muscular strength/endurance
- Tests for cardiorespiratory fitness
- Calculations for waist-to-hip ratio
ANATOMY: BODY POSITIONING & JOINT MOVEMENT

- **Anatomical positioning:**
  - Standing tall, feet together, palms facing forward with thumbs out to side.

- **Planes of motion (axis of rotation):**
  - Sagittal → Divides the body into left and right halves.
  - Coronal → Divides the body into front and half divisions.
  - Transverse → Divides the body into top and bottom divisions.
ANATOMICAL LOCATIONS AND POSITIONS

Term:
- Anterior
- Posterior
- Superficial surface.
- Deep skin.
- Proximal
- Distal point
- Superior
- Inferior
- Ipsilateral
- Contralateral
- Prone
- Supine
- Valgus deviates laterally.
- Varus deviates medially.

Definition:
The front side of the body.
The back side of the body.
Close to or on the bodies
Below the surface area of the skin.
Closer to any reference point
Farther from any reference
Toward the head (higher).
Away from the head (lower).
Same side.
Opposite side.
Face down.
Face up.
Distal segment of a joint
Distal segment of a joint
## JOINT MOVEMENTS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexion</td>
<td>Decrease of the joint angle (sagittal plane).</td>
</tr>
<tr>
<td>Extension</td>
<td>Increase of joint angle (sagittal plane).</td>
</tr>
<tr>
<td>Adduction</td>
<td>Movement toward the midline of the body (coronal plane).</td>
</tr>
<tr>
<td>Abduction</td>
<td>Movement away from the midline of the body (coronal plane).</td>
</tr>
<tr>
<td>Eversion</td>
<td>Abducting the ankle</td>
</tr>
<tr>
<td>Inversion</td>
<td>Adducting the ankle</td>
</tr>
<tr>
<td>Dorsiflexion</td>
<td>Flexing ankle toward body (sagittal plane)</td>
</tr>
<tr>
<td>Plantar flexion</td>
<td>Extending ankle away from body (sagittal plane)</td>
</tr>
</tbody>
</table>
## Joint Movements Cont.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal rotation</td>
<td>Rotate toward midline of body (transverse plane).</td>
</tr>
<tr>
<td>External rotation</td>
<td>Rotate away from midline of body (transverse plane).</td>
</tr>
<tr>
<td>Lateral flexion (L/R)</td>
<td>Movement away from the midline of the body (frontal plane).</td>
</tr>
<tr>
<td>Elevation</td>
<td>Scapula moving superiorly (coronal plane).</td>
</tr>
<tr>
<td>Depression</td>
<td>Scapula moving inferiorly (coronal plane).</td>
</tr>
<tr>
<td>Retraction</td>
<td>Scapula moving towards the spine (coronal plane).</td>
</tr>
<tr>
<td>Protraction</td>
<td>Scapula moving away from the spine (coronal plane).</td>
</tr>
<tr>
<td>Downward rotation (coronal plane)</td>
<td>Downward and medial movement of inferior angle of scapula</td>
</tr>
<tr>
<td>Upward rotation</td>
<td>Upward and lateral movement of scapula (frontal plane)</td>
</tr>
</tbody>
</table>
- Open chain movements → When the distal segment moves within space.
  - Example: Bicep curl or leg extensions
- Closed chain movements → When the distal segment is fixated in place.
  - Example: Pushups or wall sits
5 components to joint stability:

- Ligaments allowing normal movement and inhibiting excessive movements.
- Muscles and tendons providing stability.
- Fascia assisting with maintenance of stability.
- Atmospheric pressure externally creating greater force than internal pressure, supporting joints (suction).
- Bony structure of a joint provides stability itself.
# Types of Joints

<table>
<thead>
<tr>
<th>Synovial Joints</th>
<th>Location</th>
<th>Cartilaginous Joint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ball &amp; Socket</td>
<td>Glenohumeral &amp; Hip</td>
<td>Intervertebral</td>
</tr>
<tr>
<td>Hinge</td>
<td>Elbow &amp; ankle (talocrural)</td>
<td></td>
</tr>
<tr>
<td>Pivot</td>
<td>Radioulnar (proximal)</td>
<td></td>
</tr>
<tr>
<td>Ellipsoidal</td>
<td>Wrist</td>
<td></td>
</tr>
<tr>
<td>Gliding</td>
<td>Ankle (subtalar)</td>
<td></td>
</tr>
<tr>
<td>Bicondylar</td>
<td>Knee</td>
<td></td>
</tr>
</tbody>
</table>
Term:

- Normal alignment: Think hip, knee and ankle ratio. Women have a large hip to knee ratio than men.
- Genu Varis: "knock knee syndrome"
- Genu Valgum: "bow legged syndrome"
BONES OF THE PELVIS
BONES OF THE LOWER EXTREMITIES
MUSCLES OF THE SHOULDER, FOREARM, AND HAND FLEXORS
HIP COMPLEX AND LOWER EXTREMITIES

MUSCLES OF THE HIP COMPLEX

[Diagram of hip muscles and related anatomy]
<table>
<thead>
<tr>
<th>Muscle type:</th>
<th>Definition &amp; Example:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fusiform</td>
<td>Run parallel and spindle shaped. ex. Biceps brachii</td>
</tr>
<tr>
<td>Strap</td>
<td>Parallel fibers (long &amp; strap like) ex. Sartorius</td>
</tr>
<tr>
<td>Pennate</td>
<td>Fibers run obliquely.</td>
</tr>
<tr>
<td>Unipennate</td>
<td>Fibers are only on one side of tendon. ex. Flexor pollicis L.</td>
</tr>
<tr>
<td>Bipennate</td>
<td>Fibers run on both sides of the tendon. ex. Rectus femoris</td>
</tr>
<tr>
<td>Multipennate</td>
<td>Two or more fibers meet to merge into one muscle. ex. Pectoralis major</td>
</tr>
</tbody>
</table>
Law of inertia (1st law):

An abject at rest stays at rest and an object in motion stays in motion with the same speed and in the same
direction unless acted on by another force.

Law of acceleration (2nd law):

The linear acceleration of an object is produced by the force placed directly proportional to that force is
inversely proportional to the objects mass. (F=mass X Acc.)

Law of reaction (3rd law):

For every force, there is a reaction force equal in magnitude and opposite in direction.
To find what modality of training produces the most volume, the equation for work can be used.

- Work = F x d
  - F = linear force, D = linear displacement
  - For angular work, replace linear with angular = (M(angular moment) x theta (angular displacement))

- Total mechanical work = (F x D) x R x S
  - F= force, D= displacement, R= repetitions, S= sets
  - Example: 3 sets, 12 reps, 100lbs, 3ft (100 x 3) x 12 x 3 = Total work 10,800 lbs x ft
Once the equation for work is completed, power can then be equated.

The equation for work incorporates (t) or time. (P=W/t or P = F x d / t with work broken down as shown in the previous slide.

- Linear power = W/t
- Angular power = angular work/ time
PHASES OF A NORMAL WALKING GAIT

Stance phase
- First double support
- Single limb stance
- Second double support

Swing phase
<table>
<thead>
<tr>
<th>Type:</th>
<th>Definition:</th>
<th>Biomechanical response:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antalgic gait</td>
<td>A self-protective result of injury</td>
<td>Stance phase is unequal</td>
</tr>
<tr>
<td>Arthogenic gait</td>
<td>Results from stiffness or deformity</td>
<td>Unequal step length</td>
</tr>
<tr>
<td>Equinus gait</td>
<td>Inadequate dorsiflexion range</td>
<td>Weight bearing on lateral edge of foot.</td>
</tr>
<tr>
<td>Short leg gait</td>
<td>Leg length difference</td>
<td>Exaggerated flexion of the knee and hip of unaffected limb.</td>
</tr>
<tr>
<td>unaffected limb</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CARDIAC FUNCTIONS

Heart rate
• # of beats per minute (BPM)
• Average HR 60-80 BPM at rest

Blood pressure:
• Filling phase and contraction phase of the heart
• Systolic (contraction phase)
• Diastolic (filling phase)
• Average 120/80 at rest mm/Hg
• Hypertension 140/90 mm/Hg

Stroke volume
• The blood ejected from the heart in a single contraction

Cardiac output
• The volume of blood pumped by the heart in one minute (L)
Heart rate

• # of beats per minute (BPM)
• Average HR 60-80 BPM at rest

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Stroke volume

• The blood ejected from the heart in a single contraction

Cardiac output

• The volume of blood pumped by the heart in one minute (L)
CARDIAC FUNCTIONS IN RESPONSE TO CARDIOVASCULAR EXERCISE

Heart rate
- Increases gradually as exercise intensity increases
- Max HR calculation (220-age)

Blood pressure
- Increases linearly with exercise intensity
- Typically, maximal level of systolic BP is 190-220 mmHg, diastolic should not exceed 115 mmHg

Stroke volume
- Increases with intensity until reaching highest possible (40-50%)

Cardiac output
- Increases linearly with exercise intensity
- Rise of HR and SV increases CO

Blood flow
- At rest 15-20% of CO is distributed to the muscles
- With exercise, 85-90% of blood flow is directed to the muscles (4-5x increase)
Control by autonomic nervous system.

Diaphragm, ribs, and intercostal muscles control inspiration and expiration through contraction and relaxation.

Pulmonary ventilation is the total volume of air exchanged within 1 minute.

Tidal Volume is the total volume of air within one inhale and one exhale.
AEROBIC AND ANAEROBIC METABOLISM

These systems are how the body creates, and uses energy for the muscles to use during exercise or physical activity.

They rely on the respiratory and cardiovascular systems for delivery of oxygen and nutrients to the body's cells, as well as removing waste products.
Energy Systems & Exercise: The Basics

0 sec  4 sec  10 sec  1.5 min  3 min +

- **ATP**
  - Strength – Power: power lift, shot put, golf swing

- **ATP-PC (phosphagen)**
  - Sustained Power: sprints, fast breaks, football

- **Lactic Acid/Aerobic Glycolysis**
  - Anaerobic Power – Endurance: 200-400 m dash, 100 m swim

- **Aerobic System**
  - Aerobic Endurance: Beyond 800 m run

- Immediate/short-term non-oxidative systems
- Aerobic-oxidative system
# Anaerobic Energy System

## Anaerobic Glycolysis
- Breakdown of glycogen or glucose without the use of oxygen to create energy (ATP)
- Lactate is a biproduct of glycolysis and can be recycled for ATP production
- Lactate does NOT cause soreness

## Creatine Phosphate (CP)
- Assists with phosphorylation of ADP to ATP

## Adenosine Triphosphate (ATP)
- Energy agent that provides energy to the cells
AERobic Energy Systems

Requires oxygen for energy production
Electron transport chain and the Krebs cycle assist with oxidative phosphorylation for energy production.

Uses fat predominantly, but also protein and carbohydrates for ATP production.
Exercises that allow for increases in muscular strength and or endurance

Increases in strength are results of increasing the load over time ("overload" principle)

Exercise load is dependent on individuals' level of fitness at any given time

Hypertrophy (increased muscle mass) is the bodies adaptation to this training type
CARDIOVASCULAR EXERCISE TRAINING

Assists with decreasing incidence of lifetime diseases such as heart disease or hypertension

Important for the health in those diagnosed with coronary artery disease (CAD)

Elicits changes in the bodies aerobic capacity (VO2)

Long term cardiovascular exercise decreases the demands of the heart, lowering BP and HR

With training, less lactic acid is produced during submaximal workloads
NUTRITION

- 6 categories of nutrients
  1. Carbohydrates
  2. Fats
  3. Minerals
  4. Proteins
  5. Vitamins
  6. Water

One nutrient does not take precedence over another. The key to nutrition is a balanced diet.
Exercise increases the rate at which energy is burned, measured in cal or kcal.

Nutrients that provide the body energy are carbohydrates, fats, and proteins and are highly important in a balanced diet.

These nutrients also assist the body to maintain temperature, muscular contraction, nerve function, and cell function.
Water mixed with a 6-8% carbohydrate solution is best for performance with those who are in endurance sports.

Electrolytes are important for proper hydration, carbohydrate within sports drinks also provide energy to the muscles.
DIETARY RECOMMENDATIONS FOR EXERCISE/ COMPETITIONS

▪ **Before**
  ▪ 3-4 hours before competition, diet should focus primarily on carbohydrates and plenty of fluids
  ▪ Consume only familiar foods to avoid upset stomach
  ▪ Avoiding high fiber foods
  ▪ Drinking 5-7 mL per kilogram of body weight

▪ **During**
  ▪ Carbohydrates are important to intake during competition, longer duration and higher intensity exercise, carb intake should be smaller
  ▪ Helps to refuel the body as well as nourish the nervous system

▪ **After**
  ▪ Consume 1-1.2 (200-400kcal) grams of carbs per kilogram during 4-6 hours post exercise is most beneficial
  ▪ Individuals should drink at least 20 oz of fluid per lb of body weight within 2 hours post exercise
It is common for individuals to relapse to sedentary habits following a regimented exercise routine by a professional.

It is VERY important to bring awareness to how to overcome old habits and supplement with new and healthier routines.

Setting goals is a great way to direct behavior, start with small goals, such as being able to do a squat with good form, and then work toward larger and more longitudinal goals such as being able to run a mile.

Intrinsic goals will help the individual to feel heard, motivated, and realistic for them.
SMART GOALS

- (S) Specific
- (M) Measurable
- (A) Attainable
- (R) Realistic
- (T) Time frame specific

Be sure to incorporate SMART goals for both short term and long term durations
Short term: < 6 weeks
Long term: < 3 months

Keep activities variable and exciting for the client, move them outdoors, do activities they are interested in, keep it new and fresh so that they can build a positive connection with exercise
CLIENT AND TRAINER PROFESSIONALISM

▪ Courtesy call 24-48 hours prior to meeting
▪ Be on time, or even better early for all trainings or meetings
▪ Be 100% on your game and prepared for training
▪ Respond to all texts, emails and phone calls in a timely manner
▪ Show that you are organized and have reputable sources
▪ Answer clients questions scientifically and as thoroughly as possible
▪ Speak respectfully to the clients and of others
▪ Dress professionally and appropriately
Be sure to gather clearance for exercise if necessary, with medical conditions

Fill out a PAR-Q form that provides necessary information for clearance

Fill out an informed consent form, so there is clear communication between client and professional on benefits and risks

Personal trainer-client agreement form is used for clarification on no-show appointments and or other essential business expectations

KNOW the medical conditions associated that require extra clearance (ex. Acute myocardial infarction within 2 days, pericarditis, ongoing or unstable angina)
Personal Training Contract

I, the undersigned, understand and agree to the following terms and conditions:

1. Fees

   Payment of fees ______ for _____ personal training sessions will be due prior to the beginning of sessions unless payment options are arranged.

2. Scheduling

   Sessions are to be made by appointment only. Appointments can be made in person or by phone but only with the assigned trainer.

3. Cancellations

   Cancellations must be made at least 1 hour prior to the training session. Early morning training sessions must be canceled the evening prior to the session.

Date ____________________________  Client Name ____________________________

Amount Paid ____________  Amount Due ____________

_________________________  __________________________
Trainer Signature  Client Signature
Components of an exercise session:

- **Warmup** - Atleast 5-10 minutes of low to moderate intensity cardiorespiratory or muscular endurance work (dynamic movements)
- **Conditioning** - 20-60 minutes of aerobic, muscular strength or endurance and or sporting activities
- **Cooldown** - Atleast 5-10 minutes of low to moderate intensity cardiorespiratory and or muscular endurance activities
- **Flexibility** - Atleast 10 minutes of stretching (static)
Follow the FITT-VP principle for programming

- (F) Frequency- 3-5 days per week
- (I) Intensity- Can use RPE scale, or HR
- (T) Time- Moderate intensity 30 min/day or 150 min/week
- (T) Type- Based upon program type (aerobic: swimming, running and anaerobic: resistance training)
- (V) Volume- Sets x reps x weight
- (P) Progression- How will the program progress over time (ex. Increasing weight or time)
RESISTANCE TRAINING

- **Specificity of training**: It is important to target muscles while training, adaptation will only occur within a muscle if it is trained. It is important to target ALL muscle groups.

- **Specific adaptations to imposed demands (SAID)**: Adaptations that occur will happen due to the exercise demands that are placed on the individual. For example, if higher volume is trained, the muscles will be able to lift more weight (muscular strength).

- **Progressive overload**: The body over time adapts to stimulus, and to progress a higher load must be placed on the body.

- **Variation in training**: Programs should be variable, and change with time.

- **Periodization**: Periodization allows for the body to be able to recover as well as great training.

- **Prioritization of training**: Training goals are important to identify what the focus of training needs to be. Such as sports season training, where it flows with the season.
<table>
<thead>
<tr>
<th>Cycle duration</th>
<th>Type of strength</th>
<th>Series x RM</th>
<th>Recovery</th>
<th>Cycle duration</th>
<th>Type of strength</th>
<th>Series x RM</th>
<th>Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday</td>
<td>Resistance</td>
<td>2 x 12RM – 15RM</td>
<td>1 min</td>
<td>Weeks 1 – 4</td>
<td>Resistance</td>
<td>2 x 12RM – 15RM</td>
<td>1 min</td>
</tr>
<tr>
<td>Friday</td>
<td>Hypertrophy</td>
<td>3 x 8RM – 10RM</td>
<td>2 min</td>
<td>Weeks 5 – 8</td>
<td>Hypertrophy</td>
<td>3 x 8RM – 10RM</td>
<td>2 min</td>
</tr>
<tr>
<td>Tuesday</td>
<td>Maximum strength</td>
<td>4 x 3RM – 5RM</td>
<td>3 min</td>
<td>Weeks 9 – 12</td>
<td>Maximal strength</td>
<td>4 x 3RM – 5RM</td>
<td>3 min</td>
</tr>
</tbody>
</table>

**Periodization Example**

**Linear versus Non-linear**
Variable Resistance

- Equipment that allows for variable resistance through a ROM
- Requires the muscle to contract maximally through a full ROM and so increases strength gains
- Usually have pullies, cables and or lever arms

Types of strength curves

- Ascending: Squat
- Descending: upright row
- Bell-shaped: Elbow flexion
MACHINES VERSUS FREE-WEIGHT EXERCISE

Machines
- Great for rehabilitation, beginners, and for maximal stability movements
- Use a fixed ROM
- Isolate muscle groups
- Allow greater independence with workouts

Free Weights
- Allow for a free ROM and so great for athletes who need to train within a full ROM
- Assist and stabilize muscles
- Increase musculoskeletal loading, which decreases chances for osteoporosis and improves balance
RESISTANCE TRAINING PROGRAM

Sequencing of exercises:

1. Large muscle groups exercised first, and then small
2. Multi-joint exercises before single joint
3. Alternate between push and pull movements for full body sessions
4. Alternate upper and lower body exercises during entire session
5. Explosive and plyometric exercises first, then basic strength and single joint exercises
6. Prioritize weak areas before strong
7. Begin with the most intense movements and regress to least intense when performing several exercises for the same muscle group
ACSM RECOMMENDATIONS FOR MUSCULAR STRENGTH

Beginners
- Volume: 1-3 sets per exercise
- Intensity: 60-80% 1RM
- Rest period: 2-3 minutes between sets
- Frequency: 2-3 days/week

Advanced
- Volume: Multiple set programs with systemic variations in volume and intensity
- Intensity: Cycling loading 80%-100% 1RM: Progressing to heavy loads for 1-6 reps
- Rest period: 2-3 minutes
- Frequency: 4-6 days/week
ACSM RECOMMENDATIONS FOR MUSCULAR HYPERTROPHY

Beginners:
- Volume: 1-3 sets per exercise
- Intensity: 70%-85% 1RM
- Rest period: 1-2 minutes
- Frequency: 2-3 days/week

Advanced:
- Volume: 3-6 sets per exercise (periodized manner)
- Intensity: 70-100% 1RM
- Rest Period: 2-3 minutes for heavy load or 1-2 minutes for moderate load
- Frequency: 4-6 days/week
## ACSM Recommendation for Cardiorespiratory Fitness

**Frequency:** 5 days a week of moderate intensity exercise or 3 days of vigorous intensity

**Intensity:** Moderate and or vigorous intensity exercise for most adults (HR or RPE)

**Time:** 30-60 minutes/day of moderate intensity exercise (150min/week)

**Type:** Regular, and intentional exercise that uses large muscle groups and is continuous

**Volume:** Measured in METS or 500-1,000 METS

**Pattern:** One continuous session per day or multiple sessions (ex. 10-minute sessions)

**Progression:** Gradually progress exercise volume by adjusting duration, frequency, and or intensity
<table>
<thead>
<tr>
<th>RPE Scale</th>
<th>Rate of Perceived Exertion</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td><strong>Max Effort Activity</strong></td>
</tr>
<tr>
<td></td>
<td>Feels almost impossible to keep going. Completely out of breath, unable to talk. Cannot maintain for more than a very short time.</td>
</tr>
<tr>
<td>9</td>
<td><strong>Very Hard Activity</strong></td>
</tr>
<tr>
<td></td>
<td>Very difficult to maintain exercise intensity. Can barely breath and speak only a few words</td>
</tr>
<tr>
<td>7-8</td>
<td><strong>Vigorous Activity</strong></td>
</tr>
<tr>
<td></td>
<td>Borderline uncomfortable. Short of breath, can speak a sentence.</td>
</tr>
<tr>
<td>4-6</td>
<td><strong>Moderate Activity</strong></td>
</tr>
<tr>
<td></td>
<td>Breathing heavily, can hold short conversation. Still somewhat comfortable, but becoming noticeably more challenging.</td>
</tr>
<tr>
<td>2-3</td>
<td><strong>Light Activity</strong></td>
</tr>
<tr>
<td></td>
<td>Feels like you can maintain for hours. Easy to breathe and carry a conversation</td>
</tr>
<tr>
<td>1</td>
<td><strong>Very Light Activity</strong></td>
</tr>
<tr>
<td></td>
<td>Hardly any exertion, but more than sleeping, watching TV, etc</td>
</tr>
</tbody>
</table>
FLEXIBILITY

- Important for maintenance of full ROM ability
- Helps to identify muscular imbalances
- Assists with activities of daily living (ADL's) as well as resistance training ability
- Helps to prevent injury with exercise or ADL's
- Improves balance and postural instabilities
- Can be completed on own or with personal trainer, great for patron homework
STATIC VERSUS DYNAMIC STRETCHING

Dynamic stretching
- Moving a joint through a controlled ROM (flexion of muscle)
- These movements should begin small and gradually increase with time

Examples of dynamic stretches:
- Arm circles, hip open cars, leg swings

Static stretching
- Holding a joint at a fixed position for a total of 60 sections for each joint stretched
- Only holding until mild discomfort or tightness

Examples of static stretches:
- Figure 4 hip stretch, seated forward fold, cross-body tricep stretch
**Frequency**
- Stretching for at least 2-3 days/week
- Stretching exercises are most effective if performed daily (2-4 repetitions per muscle group)

**Intensity**
- Stretching to mild discomfort or tightness

**Time**
- Holding each individual stretch for 10-30 seconds

**Type**
- A general stretching routine is best to improve flexibility
- Be sure to incorporate all large muscle groups

**Volume**
- Each individual stretch should be held for a total of 60 seconds

**Progression**
- Flexibility exercises can reduce power and strength, so performing after exercise is important
Children and adolescents are considered within the ages of 6-17 years of age.

Focus of training should build a positive relationship with exercise, to do this the focus should be fun.

A variety of activities is important within age-appropriate ranges to maintain enjoyment.

Resistance exercises are appropriate for children if mature enough, coached effectively, and supervised during the exercise session.

60 minutes of activity per day is recommended and if not attained, should work toward that goal.
With age chronic health conditions and functional limitation arise and must be considered with exercise.

Heart rate declines steadily with increased age as do stroke volume and cardiac output, which leads to decreases in exercise capacity.

Older adults should be advised to avoid sedentary behaviours because exercise can increase cold tolerance, increase maximal oxygen consumption, bone mineral density and many more positive factors.

Aerobic training (cardiorespiratory fitness) can improve exercise efficiency more in the elderly population in comparison to young.

Consider that older adults have decreased balance, muscle mass, and mobility problems so machine work can provide the necessary safety for this population.
Using the PARmed-X examination can provide the necessary information for clearance to exercise (Get Clearance)

Fatigue, nausea, and vomiting as well as increases in weight distribution throughout pregnancy might limit or change availability to exercise

Pregnancy requires an increase of 300 kcal per day to fulfill needs of pregnancy nutrition

**DO NOT EXERCISE IF**: vaginal bleeding, amniotic fluid leakage, dizziness, chest pain, muscle weakness, headache, and calf pain or swelling

Walking, swimming, and cycling are viable modes of aerobic activity

Use the talk test or RPE (12-13 RPE) for intensity during pregnancy, not HR

30 minutes of exercise (20-30 intermittent bouts) to meet 150 min/week

Maintain a moderate intensity throughout
Exercise training improves
- Insulin sensitivity and blood glucose control
- Improves cardiorespiratory fitness
- Reduce blood pressure
- Improves flexibility and joint ROM
- Assists with the decrease of diabetic complications
- Improves muscular strength and endurance by increasing skeletal muscle mass
- Reduces body weight
Aerobic training

Frequency

- 3-7 days/week with no more than 2 consecutive days between sessions
- The more often exercise sessions there are, the more improvements will be seen in regard to insulin actions

Intensity

- 40-60% of VO2R
- Individual health status is the biggest indicator for intensity choice

Time

- 20-60 minutes to meet the recommended 150 minutes/week

Type

- Same recommendations for healthy adults
- Pick modalities that the individual most enjoys

Progression

- Increase duration and switch up exercise plan to avoid boredom and promote adaptation
SPECIAL POPULATIONS: DIABETES CONT.

**Resistance training**

Resistance training is vastly beneficial for this population to assist with mitigating symptoms of the disease and increase physiological function.

Helps to lower muscle wasting of skeletal muscle, improve glycemic control and insulin sensitivity.

Allows individuals to improve ADL's and maintain independence in everyday life.
CUSTOMER SERVICE AND LIABILITY

- Personal trainers are responsible for client safety
- It is the personal trainer’s responsibility to plan modifications, intensities, variations for all exercises and populations
- Each exercise plan should be thorough, incorporate short and long term goals as well as any prior injuries and or health concerns
- Proper charting is a "must have" not only for patrons, but also for ethical and liability reasons
- Keep track and share progressions with the patron so that training changes are known in all parties
- Provide professionalism in the face of a law-suit
LEGAL ISSUES AND RESPONSIBILITIES

- Make sure that proper certifications and qualifications are met before training
- Screen every customer with proper methods for medical history and clients health
- ONLY WORK WITHIN SCOPE OF PRACTICE
- Do NOT provide medical advice or dietary plans without the required certifications
- Be sure to have safe and effective equipment at all times, perform checks regularly
- Avoid sexual harassment claims by working in open environment and or explain all components of exercise routine with client, tell them how, where and when you are going to physically touch them to assist
- Create policies, procedures, and forms that meet industry standards to minimize risk of misinterpretation of events leading to lawsuit (ex. Informed consent)
- Always maintain client confidentiality and do not share personal information with others to maintain personal reputation and the clients
REFERENCES
