ACE Personal Trainer Manual, 4th edition

Chapter 6: Building Rapport and the Initial Investigation Stage

Learning Objectives

- This session, which is based on Chapter 6 of the *ACE Personal Trainer Manual (*4th ed.), covers the earliest stages of the client–trainer relationship.
- After completing this session, you will have a better understanding of:
  - Facilitating change and motivational interviewing
  - How to perform a health-risk appraisal and utilize common forms
  - How various health conditions and medications affect the body's response to exercise
  - How to choose and schedule assessments so that the process is appropriate for each client
  - How to accurately measure a client's heart rate and blood pressure

Introduction

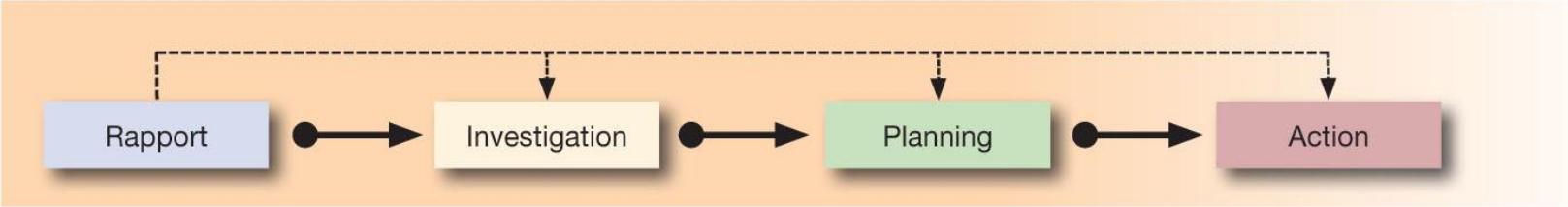
- The first impression a personal trainer makes is the most critical.
- This first impression may be made in person, over the phone, or even through an email.
- It is imperative to make a strong, convincing, and positive first impression.
- After a good first impression, building rapport is essential to developing a solid client–trainer relationship.

Attributes of a Successful Relationship

- Rapport implies a relationship of mutual trust, harmony, or emotional affinity.
- Three attributes are essential to successful relationships:
  - Empathy
  - Warmth
  - Genuineness

Stages of a Successful Client–Trainer Relationship

- Rapport
- Investigation
- Planning
- Action



Initial Communication With Clients

- The first objective when meeting a prospective client is to build a foundation for a personal relationship.
- Gathering information on the client's goals and objectives is secondary.
- Taking time to get to know the client and discover his or her individual characteristics is important.

Individualizing Communication With Clients

- A trainer must be attentive to personality styles.
- A trainer should avoid treating each client in the same manner.
- The four basic personality styles:
  - Director
  - Deliberator
  - Collaborator
  - Expressor
- Trainers should also be attentive to general communication skills and factors.

General Communication Skills and Factors

- Environment
- Attending behaviors
  - Distance and orientation (body positioning)
  - Posture and position
  - Mirroring and gestures
  - Eye contact
  - Facial expressions
- Voice quality (tonality and articulation)

Listening

- Listening effectively is the primary nonverbal communication skill.
- Effective listening implies listening to both the content and emotions behind the speaker's words.
- Listening occurs at different levels:
  - Indifferent listening
  - Selective listening
  - Passive listening
  - Active listening

Empathy

- Trainers must be attentive and empathetic, regardless of personal opinion.
  - Separate meaningful content from superfluous information.
  - Be aware of how the client's emotional patterns change based on the nature of the content being discussed.
  - Be conscious of how cultural and ethnic differences affect communication.
- Trainers must distinguish between verbal messages that reflect the apparent (cognitive) and the underlying (affective) content of the communication (predominantly non-verbal).

Interviewing Techniques

- It is important to use a variety of interviewing techniques to clearly understand the content of a client's message.
  - Minimal encouragers
  - Paraphrasing
  - Probing
  - Reflecting
  - Clarifying
  - Informing
  - Confronting
  - Questioning
  - Deflecting

Communication Styles

- Trainers should select a communication style that matches the client's needs and personality style, as well as the situation.
  - Preaching style
  - Educating style
  - Counseling style
  - Directing style

Facilitating Change

- Adopting healthy behavior is a complex process, and several theories have been developed to explain factors affecting lifestyle change.
- One model is the transtheoretical model of behavioral change (TTM).
  - Personal trainers should determine each client's or prospective client's readiness to change behavior and stage of behavioral change.
  - This "Readiness to Change" Questionnaire is easy for trainers to administer during the client interview.
  - The more "yes" responses, the more likely the person is to commit to changing key behaviors.

	YES	NO
Are you looking to change a specific behavior?	❑	❑
Are you willing to make this behavioral change a top priority?	❑	❑
Have you tried to change this behavior before?	❑	❑
Do you believe there are inherent risks/dangers associated with not making this behavioral change?	❑	❑
Are you committed to making this change, even though it may prove challenging?	❑	❑
Do you have support for making this change from friends, family, and loved ones?	❑	❑
Besides health reasons, do you have other reasons for wanting to change this behavior?	❑	❑
Are you prepared to be patient with yourself if you encounter obstacles, barriers, and/or setbacks?	❑	❑

Motivational Interviewing

- Motivational interviewing helps the client feel in control.
  - A client-centered, directive method for enhancing intrinsic motivation by exploring and resolving ambivalence
    - It involves careful listening and strategic questioning.
    - It is an interviewing technique to help get clients “off the fence” about exercise or behavior change.
  - Helps the client learn more about the reasons for change, and then participate in the behavioral change process
  - Information gathered through motivational interviewing is important when providing the clients with the motivation needed to achieve personal goals.

The Health-risk Appraisal

- Exercise and physical activity are associated with some inherent risks.
- The purposes of the pre-participation screening include:
  - Identifying the presence or absence of known disease
  - Identifying individuals with medical contraindications who should be excluded from exercise or physical activity
  - Detecting at-risk individuals who should first undergo medical evaluation and clinical exercise testing before initiating an exercise program
  - Identifying those individuals with medical conditions who should participate in medically supervised programs
  - Identifying pre-existing conditions and/or injuries that make certain exercises or movements contraindicated
- Self-directed versus supervised exercise

Pre-participation Screening

- A pre-participation screening must be performed on all new participants.
- The screening should be valid, simple, cost- and time-efficient, and appropriate for the target population.
- Additionally, there should be a written policy on referral procedures for at-risk individuals.
- Individuals participating in self-guided activity should at least complete a general health-risk appraisal.

Physical Activity Readiness Questionnaire (PAR-Q)

- Experts recognize the PAR-Q as a minimal, yet safe, pre-exercise screening measure for low-to-moderate, but not vigorous, exercise training.
- If someone is identified by the PAR-Q as having multiple health risks, a more detailed health risk-appraisal should be used.

Risk Stratification

- The purpose for performing a risk stratification prior to engaging in a physical-activity program is to determine:
  - The presence or absence of known cardiovascular, pulmonary, and/or metabolic disease
  - The presence or absence of cardiovascular risk factors
  - The presence or absence of signs or symptoms suggestive of cardiovascular, pulmonary, and/or metabolic disease
- Specific risk factor categories are used to score client risk for stratification.
- Client risk is stratified (categorized) as low, moderate, or high.
- Recommendations for physical activity/exercise, medical examinations or exercise testing, and medically supervised exercise are based on the number of associated risks.
- This process involves three basic steps that should be followed chronologically.
- The worksheet presented on the following slide presents clinically relevant coronary CAD health risks that are scored for risk stratification.

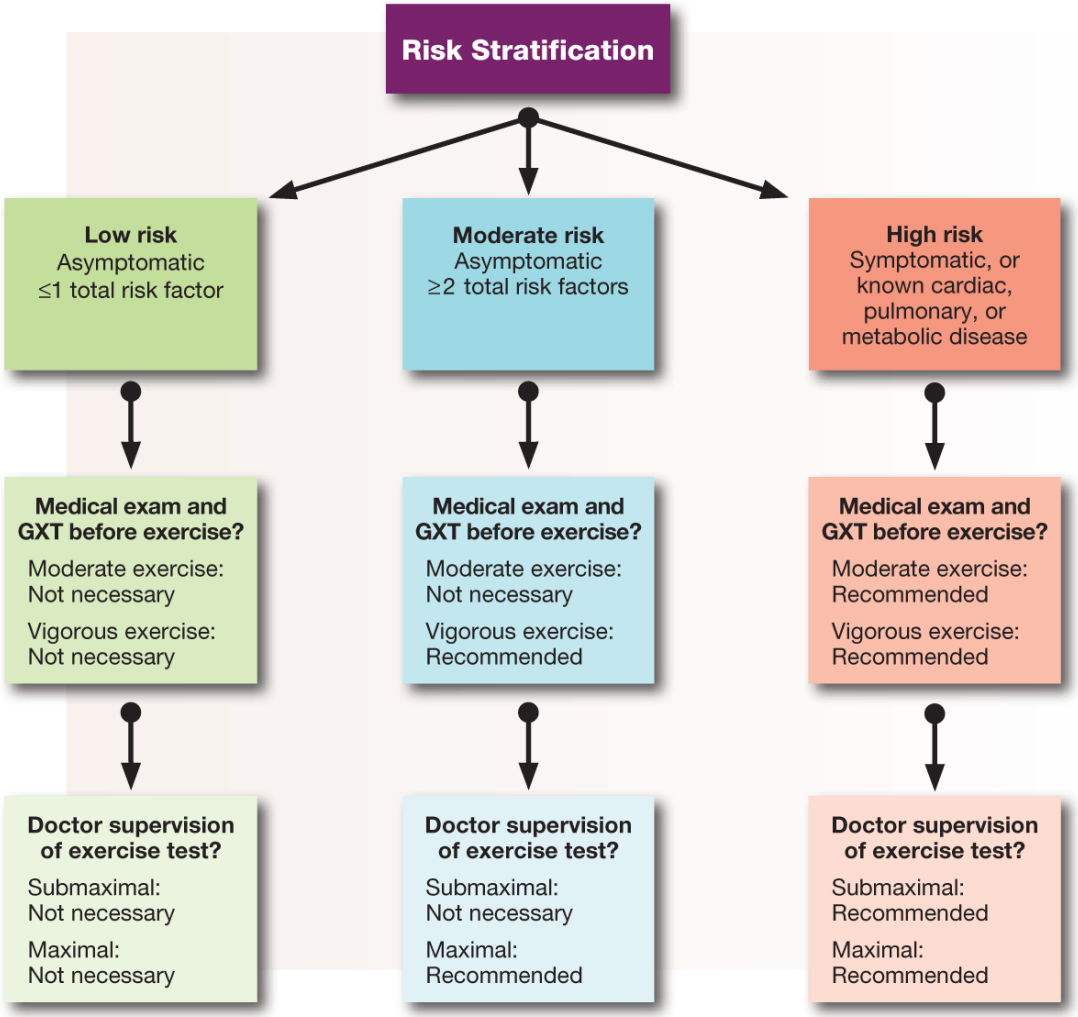
CVD Risk Factor Thresholds

Positive Risk Factors	Defining Criteria	Points
Age	Men ≥45 yrs, women ≥55 yrs	+1
Family History	Myocardial infarction, coronary revascularization, or sudden death in of parent or other first degree relative if male less than <55 yrs or female <65 yrs	+1
Cigarette Smoking	Current smoker or those who quit within the past 6 months; OR exposure to environmental tobacco smoke (second-hand smoke)	+1
Hypertension	SBP ≥140 mmHg or DBP ≥90 mmHg confirmed by measurements on at least two separate occasions, OR on antihypertensive medication	+1
Dyslipidemia	LDL >130 mg/dL OR HDL <40 mg/dL, OR on lipid-lowering medication. If total serum cholesterol is all that is available , use >200 mg/dL	+1
Prediabetes	Fasting blood glucose ≥100 mg/dL but <126 mg/dL confirmed on at least two separate occasions	+1
Obesity	BMI >30, or waist girth >102 cm (40 in) for men and >88 cm (35 in) for women	+1
Sedentary Lifestyle	Persons not participating in a regular exercise program accumulating 30 minutes or more of moderate physical activity on most days of the week	+1
Negative Risk Factors	**Defining Criteria**	**Points**
High Serum HDL	>60 mg/dL	-1
	Total	

Determining CVD Risk Factors

- Each positive risk factor category equals one point.
- There is also a negative risk factor for a high level of high-density lipoprotein (HDL).
- If a client meets the defining criteria for a risk category, he or she is awarded that positive or negative point.
- An individual's CAD risk during exercise and/or physical activity is determined by:
  - Total number of risk factors
  - The presence or absence of signs or symptoms
- The trainer should sum the risk factors and use this score to stratify the client's risk, as illustrated on the following slide.

Stratifying a Client's Risk



Signs and/or Symptoms of Disease

- Signs or symptoms are also included in risk stratification, but must only be interpreted by a qualified licensed professional.
  - Pain (tightness) or discomfort (or other angina equivalent) in the chest, neck, jaw, arms, or other areas that may result from ischemia
  - Dyspnea
  - Orthopnea or paroxysmal nocturnal dyspnea
  - Ankle edema
  - Palpitations or tachycardia
  - Intermittent claudication
  - Known heart murmur
  - Unusual fatigue or difficulty breathing with usual activities
  - Dizziness or syncope
- Clients reporting any of these signs/symptoms should be referred for medical evaluation.

Evaluation Forms: Informed Consent

- Informed consent, or “assumption of risk,” form
  - The exerciser is acknowledging having been specifically informed about the risks associated with activity.
  - Also used prior to assessments and provides evidence of disclosure of the purposes, procedures, risks, and benefits associated with the assessments
- Limitations
  - Not a liability waiver, and therefore does not provide legal immunity
  - Intended to communicate the dangers of the exercise program or test procedures
  - The trainer should also verbally review the content to promote understanding

Evaluation Forms: Agreement/Liability Release Waiver

- Used to release a personal trainer from liability for injuries resulting from a supervised exercise program
- Represents a client's voluntary abandonment of the right to file suit
- Limitation
  - Does not necessarily protect the personal trainer from being sued for negligence

Evaluation Forms: Health-history Questionnaire

- This form collects more detailed medical and health information beyond the CAD risk-factor screen, including:
  - Past and present exercise and physical-activity information
  - Medications and supplements
  - Recent or current illnesses or injuries, including chronic or acute pain
  - Surgery and injury history
  - Family medical history
  - Lifestyle information

Evaluation Forms: Exercise History & Attitude Questionnaire

- Provides a detailed background of the client's previous exercise history
- Includes behavioral and adherence experience
- This information is important when developing goals and designing programs.

Evaluation Forms: Medical Release Form

- Provides the client's medical information, and explains physical-activity limitations and/or guidelines as outlined by his or her physician
- Deviation from these guidelines must be approved by the personal physician.

Evaluation Forms: Testing Forms

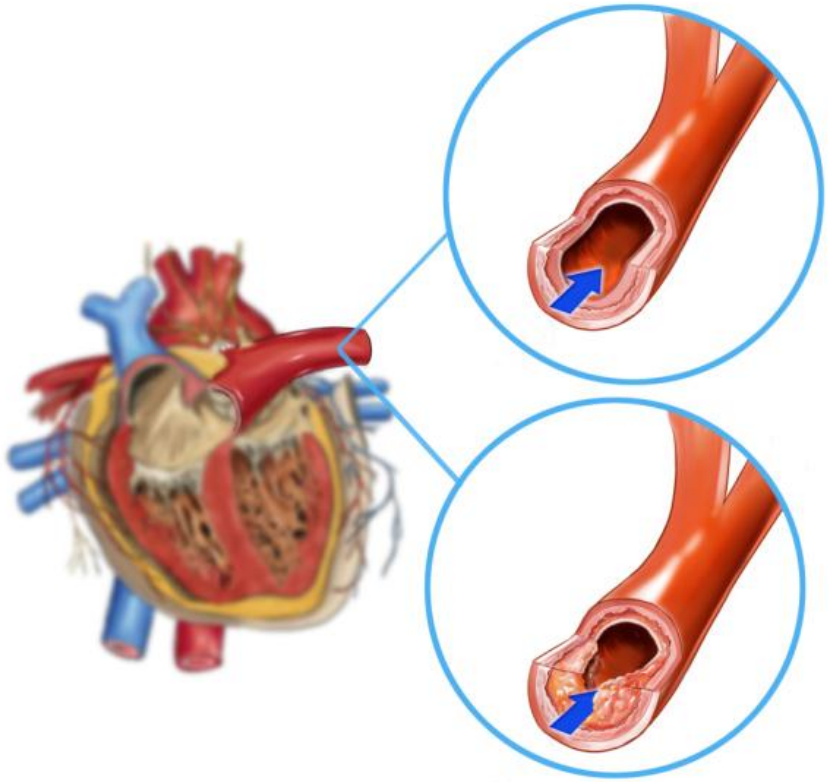
- Used for recording testing and measurement data during the fitness assessment
- Testing instructions and normative tables are used to determine client rankings for each fitness test.
- Can be assembled in a notebook or be accessible via a computer, PDA, or website.

Inherent Risks Related to Physical Activity

- Overall absolute risk in the general population is low, especially when weighed against the health benefits of regular exercise.
- Injuries related to physical activity usually come from aggravating an existing condition or precipitating a new condition.
- The primary systems of the body that experience stress during physical activity are:
  - Cardiovascular
  - Respiratory
  - Musculoskeletal
- A complete health history helps to ensure that each client gets the most benefit from an exercise program with the lowest degree of risk.

Cardiovascular Conditions

- Atherosclerosis is a process in which fatty deposits of cholesterol and calcium accumulate on the walls of the arteries.
- When this process affects the arteries that supply the heart, it is called (CAD).
- If the vessels that supply this blood to the heart are narrowed from atherosclerosis the blood supply is limited.



Angina

- Angina is a pressure or tightness in the chest, but can also be experienced in the arm, shoulder, or jaw.
  - Regular exercise can be an important part of the treatment and rehabilitation for CAD.
  - Anyone with a history of CAD or chest pain should have a physician's release.

Hypertension

- Hypertension, or high blood pressure, is more prevalent among the elderly and African Americans.
  - Higher levels of systolic blood pressure (SBP) or diastolic blood pressure (DBP) increase an individual's risk of developing a number of other conditions.
  - Blood pressure increases with exercise, especially in activities involving heavy resistance.
  - If a person's resting blood pressure is high, it may elevate to dangerous levels during exercise.

Respiratory Conditions

- The lungs extract oxygen from inhaled air and deliver it to the body's tissues via the cardiovascular system.
- A problem in the respiratory system will interfere with the body's ability to provide enough oxygen for aerobic exercise.
- Bronchitis, asthma, and chronic obstructive pulmonary disease (COPD) are common respiratory problems.
- Anyone with a respiratory system disorder should have a physician's clearance.

Musculoskeletal Conditions

- Most minor sprains and strains are easily managed, but a persistent problem or a more serious injury requires physician referral.
- Overuse injuries are the most common type of injury sustained by persons participating in physical activity.
- Any musculoskeletal disorder that a trainer is not qualified to deal with should be referred.

Post-rehabilitation Clients

- A client who has recently undergone orthopedic surgery may not be ready for a standard exercise program.
- Atrophy of the muscles surrounding an injury may begin after just two days of inactivity.
- Proper rehabilitation requires knowledge of the type of surgery and the indicated rehabilitation program.
- Beginning an exercise program before complete rehabilitation may lead to biomechanical imbalances that could predispose the client to other injuries.

Metabolic Conditions

- A client with a metabolic condition requires physician approval before initiating an exercise program.
- Diabetes
  - Exercise, both as a means to regulate blood glucose and to facilitate fat loss, is an important component of the lifestyle of an individual with diabetes.
  - Physician referral is especially important if a client is receiving insulin.
- Thyroid disorders
  - Hyperthyroid individuals have an increased level of metabolic hormones and a higher metabolic rate.
  - Hypothyroidism individuals have a reduced level of these hormones and require thyroid medication to regulate their metabolism to normal levels.
  - Because physical-activity status also influences the metabolism, trainers should know if a client suffers from thyroid disease.

Hernia

- An inguinal or abdominal hernia is a protrusion of the abdominal contents into the groin or through the abdominal wall, respectively.
  - Pain is usually present, but may not be in some cases.
  - During an activity involving increased abdominal pressure, the hernia may be further aggravated.
  - A hernia is a relative contraindication for weight lifting unless cleared by a physician.
  - Trainers should always educate clients on proper breathing and lifting techniques, especially when there is a history of a hernia.

Pregnancy

- Optimum fitness levels during pregnancy are beneficial to the health of both the mother and the fetus.
- This is not a good time to pursue maximum fitness goals.
- A client should have a physician's approval for exercise during pregnancy and until three months after delivery.

Illness or Infection

- A recent history of illness or infection may impair a client's ability to exercise.
- Moderate exercise may be acceptable during a mild illness such as a cold.
- A serious illness requires more of the body's energy reserves.
- To distinguish between a minor and a major illness, the trainer may need to consult with the client's physician.

Medications

- Drugs alter the biochemistry of the body and may affect a client's ability to perform or respond to exercise.
- Many prescription and over-the-counter medications or illicit drugs affect the heart's response to exercise.
  - Trainers should be familiar with the more common medications that affect heart rate during exercise for the safety of the client.
  - Alternate methods for monitoring exercise intensity should be used with clients taking any of these medications (e.g., RPE).
- The following two slides list many medication categories that may affect a person's response to exercise.

Effects of Medication on Heart-rate Response

Effects of Medication on Heart-rate (HR) Response				
Medications	**Resting HR**	**Exercising HR**	**Maximal Exercising HR**	**Comments**
Beta-adrenergic blocking agents	↓	↓	↓	Dose-related response
Diuretics	↔	↔	↔	
Other antihypertensives	↑, ↔, or ↓	↑, ↔, or ↓	Usually ↔	Many antihypertensive medications are used. Some may decrease, a few may increase, and others do not affect heart rates. Some exhibit dose-related response
Calcium channel blockers	↑, ↔, or ↓	↑, ↔, or ↓	Usually ↔	Variable and dose-related responses
Antihistamines	↔	↔	↔	
Cold medications:				
without sympathomimetic activity (SA)	↔	↔	↔	
with SA	↔ or ↑	↔ or ↑	↔	

Continued on next slide

Effects of Medication on Heart-rate Response

Medications	Resting HR	Exercising HR	Maximal Exercising HR	Comments
Tranquilizers	↔, or if anxiety reducing may ↓	↔	↔	
Antidepressants and some antipsychotic medications	↔ or ↑	↔	↔	
Alcohol	↔ or ↑	↔ or ↑	↔	Exercise prohibited while under the influence; effects of alcohol on coordination increase possibility of injuries
Diet Pills: with SA containing amphetamines without SA or amphetamine	↑ or ↔ ↑ ↔	↑ or ↔ ↑ ↔	↔ ↔ ↔	Discourage as a poor approach to weight loss; acceptable only with physician's written approval
Caffeine	↔ or ↑	↔ or ↑	↔	
Nicotine	↔ or ↑	↔ or ↑	↔	Discourage smoking; suggest lower target heart rate and exercise intensity for smokers

↑ = increase ↔ = no significant change ↓ = decrease

Note: Many medications are prescribed for conditions that do not require clearance. Do not forget other indicators of exercise intensity (e.g., client's appearance, ratings of perceived exertion).

Individual Responses to Drugs

- The drugs in each group of medications have a similar effect on most people, although individual responses may vary.
- A particular response is usually dose dependent.
- A trainer should consider the time when the medication was taken.
- Any client taking a prescription medication that could have an effect on exercise should have a physician's clearance for physical activity.

Antihypertensives

- Hypertension is common in modern society, and there are many medications used for its treatment.
- Most antihypertensives primarily affect one of four different sites:
  - The heart
  - The peripheral blood vessels
  - The brain
  - The kidneys
- The site that the medication acts on helps to determine its effect on the individual as well as any potential side effects.
- The following slides present a brief overview of common antihypertensives.

Beta Blockers

- Beta-adrenergic blocking agents, or beta blockers, block beta-adrenergic receptors and limit sympathetic nervous system stimulation.
  - Block the effects of catecholamines and reduce resting, exercise, and maximal heart rates
  - This reduction in heart rate requires modifying the method used for determining exercise intensity.
  - Using ratings of perceived exertion, for example, would be appropriate for someone on beta blockers.

Calcium Channel Blockers

- Calcium channel blockers prevent calcium-dependent contraction of the smooth muscles in the arteries.
  - These agents also are used for angina and heart dysrhythmias.
  - There are several types of calcium channel blockers on the market.

Angiotensin-converting Enzyme (ACE) Inhibitors

- ACE inhibitors block an enzyme secreted by the kidneys.
  - This action prevents the formation of a potent hormone (angiotensin II) that constricts blood vessels.
- When this enzyme is blocked, the vessels dilate, and blood pressure decreases.
  - ACE inhibitors should not have an effect on heart rate.
  - These agents cause a decrease in blood pressure at rest and during exercise.

Angiotensin-II Receptor Antagonists

- Angiotensin-II receptor antagonists (or blockers) are a newer class of antihypertensive agents.
  - These drugs are selective for angiotensin II (type 1 receptor).
  - They are well tolerated, and do not adversely affect blood lipid profiles or cause “rebound hypertension.”
  - Clinical trials indicate that these agents are effective and safe in the treatment of hypertension.

Diuretics

- Diuretics increase the excretion of water and electrolytes through the kidneys.
  - They are usually prescribed for high blood pressure, or when a person is accumulating too much fluid.
  - They have no primary effect on the heart rate.
  - Since diuretics can decrease blood volume, they may predispose an exerciser to dehydration.
  - A client taking diuretics needs to maintain adequate fluid intake, especially in a warm, humid environment.
  - Extend the cool-down period to present venous blood pooling.

Bronchodilators

- Asthma medications, also known as bronchodilators, relax or open the air passages in the lungs, allowing better air exchange.
  - The primary action is to stimulate the sympathetic nervous system.
  - Bronchodilators increase exercise capacity in persons limited by bronchospasm.
  - They can also cause an increase in heart rate.

Cold Medications

- Decongestants
  - Act directly on the blood vessels to stimulate vasoconstriction
  - In the upper airways, this constriction reduces the volume of the swollen tissues and results in more air space.
  - Vasoconstriction in the peripheral vessels may raise blood pressure and increase heart rate.
- Antihistamines
  - Block histamine receptors
  - Do not have a direct effect on the heart rate or blood pressure
  - Produce a drying effect in the upper airways and may cause drowsiness
- Most cold medications are a combination of decongestants and antihistamines and may have combined effects.
- However, they are normally taken in low doses and have minimal effect on exercise.

Physiological Assessments

- Traditionally, personal trainers conduct baseline physiological assessments in the initial session to:
  - Identify areas of health/injury risk for potential referral
  - Collect baseline data
  - Educate a client about his or her present physical condition and health risks
  - Motivate a client by helping him or her establish realistic goals

De-motivational Aspects of Early Assessments

- Not all clients need or desire a complete fitness assessment from the start.
  - In fact, assessments may de-motivate some individuals, as they may feel uncomfortable due to several factors.
- Each client's needs and goals should be considered when evaluating the relevance and timing of assessments.
- Trainers must remember that a health-risk appraisal is an important step in the pre-participation screen, even when other fitness assessments are not conducted.

Typical Physiological Assessments

- The physiological assessments that merit consideration generally include:
  - Resting vital signs
  - Static posture and movement screens
  - Joint flexibility and muscle length
  - Balance and core function
  - Cardiorespiratory fitness
  - Body composition
  - Muscular endurance and strength
  - Skill-related parameters
- Assessments should be performed only after a trainer has identified a client's:
  - Personality style
  - Readiness to change behavior
  - Stage of behavioral change

Sequencing Assessments

- Physiological influences on an assessment must be considered when establishing the testing sequence and timeline for a client.
  - Resting BP and HR should be measured before any exertion.
  - Skinfold measures for body composition should be taken before activity.
  - Cardiovascular testing following resistance exercise may elevate HR responses and invalidate the results.
- Testing for muscular strength and endurance is not suggested for many novice clients due to the neurological adaptations that occur during the first one to four weeks of a resistance-training program.

Criteria for Exercise Test Termination

- Trainers must be aware of signs or symptoms that merit immediate test termination and referral.
  - Onset of angina pectoris or angina-like symptoms that center around the chest
  - Significant drop (>10 mmHg) in SBP despite an increase in exercise intensity
  - Excessive rise in blood pressure: SBP >250 mmHg or DBP >115 mmHg
  - Fatigue, shortness of breath, difficult or labored breathing, or wheezing (does not include heavy breathing due to intense exercise)
  - Signs of poor perfusion: lightheadedness, pallor (pale skin), cyanosis, nausea, or cold and clammy skin
  - Increased nervous system symptoms
  - Leg cramping or claudication
  - Physical or verbal manifestations of severe fatigue
- The test should also be terminated if the client requests to stop or the testing equipment fails.

Professionalism While Conducting Assessments

- Professionalism as a personal trainer includes management of the testing environment and gaining the proper experience.
- Trainers should integrate:
  - Distribution of instructions in advance of testing that clearly outline the client's responsibilities
  - Obtaining a signed informed consent from the client
  - Organization of all necessary documentation forms, data sheets, and assessment tables
  - Communication and demonstration skills, clearly explaining the tests, sequence, and instructions in a calm, confident manner
  - Calibration and working condition of all exercise equipment
  - Environmental control, ensuring room temperature is ideally between 68 and 72º F (20 to 22º C) with a relative humidity below 60%
  - A testing environment that is quiet and private to reduce test anxiety

Choosing the Right Assessments

- One of the primary factors to consider when choosing the appropriate assessments is the goals of each client.
- Personal trainers should answer the following relevant questions:
  - What are the needed performance-related skills and abilities to be successful in the client's chosen activity?
  - Which of these needed skills and abilities are currently lacking in this client?
  - What are the prevalent injuries and weaknesses associated with the activity in which the client wants to participate?
  - Which energy systems are required to be successful in this activity?
  - Which integrated movement patterns and planes of movement will need to be trained to be successful in this activity?

Physical Limitations of the Participant

- A trainer should choose tests that will provide valid results without causing undue stress on the client.
  - For example, if a client complains of chronic knee inflammation due to arthritis, a weightbearing walking test may prove to be painful.
  - The results will likely be compromised because the effort was limited by pain, not by cardiorespiratory endurance.

Testing Environment

- Environmental conditions can limit a client's performance on a cardiorespiratory endurance test.
- Privacy issues and distractions can also have a negative impact on testing outcomes.
- Trainers should be aware of the following considerations for testing:
  - Proper calibration and routine maintenance (documented) of all equipment
  - The ability of equipment to accommodate a range of exercise intensities and body sizes, as well as the client's specific needs
  - Adequately illuminated areas for testing
  - Proper emergency response protocol and access to emergency supplies
  - Appropriate temperature range between 68 and 72º F (20 to 22º C)
  - Avoid outdoor testing on excessively hot and humid days

Availability of Equipment

- Some personal trainers will have access to state-of-the-art computerized testing equipment.
- Others may be limited by what they can carry in their vehicles.
- In either case, choose the best test with whatever equipment is available.
- Laboratory testing requires an investment in precision equipment.
- However, there are a variety of valid and reliable field tests that can also be useful to the personal trainer.

Age of the Participant

- Aging can carry with it certain health risks.
  - In most cases, an older, de-conditioned client will not perform the same battery of tests as a younger client.
  - A thorough screening will ensure that important health risks are uncovered.

Tools to Get Started

- In some cases, a fitness facility provides access to a variety of fitness-assessment instruments and equipment.
- Other times, the trainer must have a portable system for providing fitness assessments.
- The following slide lists common assessment tools, as well as an approximate cost for each.
- ACE also provides valuable fitness calculators and assessment support materials on its website.
  - www.acefitness.org/calculators

Common Physiological Assessment Tools

Common Physiological Assessment Tools	
Assessment Tool	**Approximate Cost**
Blood pressure cuff	$10–35
Large blood pressure cuff (33.3 cm to 51 cm)	$15–45
Stethoscope	$6–25
Automatic blood pressure machine	$40–80
Heart-rate monitor	$60–120
Skinfold calipers (manual)	$20–400
Skinfold calipers (automated calculations using Jackson-Pollock method)	$470
Tape measure, retractable, non-elastic	$7
Crunch strap	$5
Metronome	$10–$35
Stopwatch	$7–$25
Portable first-aid kit	$10–$25
Pocket mask with gloves	$10–$20
Miscellaneous: calculator, floor mat, beach towel, masking tape	

Conducting Assessments: Heart Rate

- The pulse rate is measured where an artery's pulsation is close to the surface.
- Commonly palpated sites:
  - Radial artery
  - Carotid artery

- It is also possible to auscultate the actual beat of the heart using a stethoscope placed over the chest.
- If the trainer feels any irregularity in a client's pulse, it is recommended that the client contact his or her personal physician.

Resting and Exercise Heart Rates

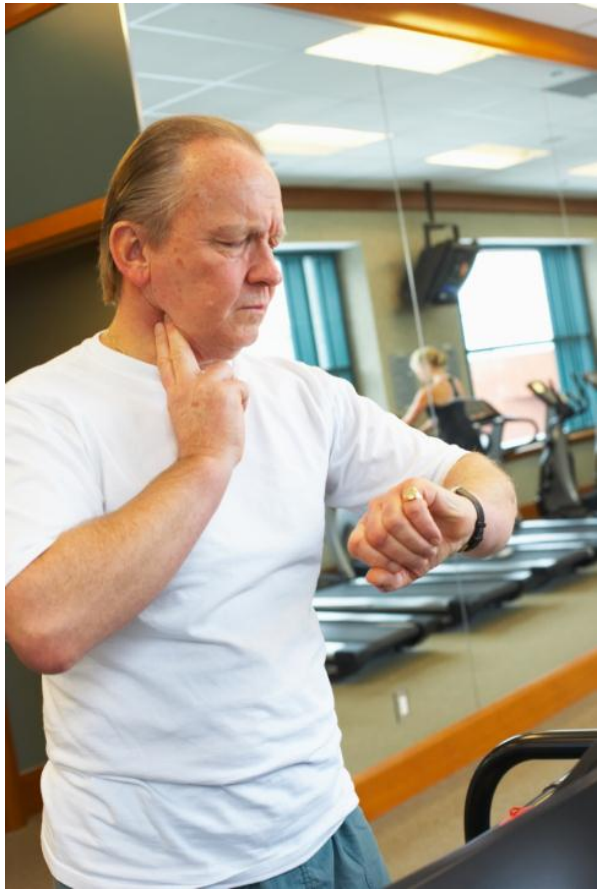
- Measurement of heart rate is a valid indicator of stress, both at rest and during exercise.
- Lower resting and submaximal heart rates may indicate higher fitness levels.
- Higher resting and submaximal heart rates are often indicative of poor physical fitness.
- A traditional classification system exists to categorize resting heart rate (RHR):
  - Sinus bradycardia HR (slow HR): RHR <60 bpm
  - Normal sinus rhythm: RHR = 60 to 100 bpm
  - Sinus tachycardia HR (fast HR): RHR >100 bpm
- Average RHR is approximately 70 to 72 bpm, averaging 60 to 70 bpm in males and 72 to 80 bpm in females.
- The higher values found in the female RHR is attributed in part to a few key physiological differences.

Key Notes About Heart Rate

- Any elevation in RHR >5 bpm over the client's normal RHR that remains over a period of days is good reason to taper training intensities
  - Certain drugs, medications, and supplements can directly affect RHR.
  - Body position affects RHR.
  - Digestion increases RHR.
  - Environmental factors can affect RHR.

Methods of Measuring Heart Rate

- Several methods are used to measure heart rate, both at rest and during exercise:
  - 12-lead electrocardiogram (ECG or EKG)
  - Telemetry (often two-lead)
  - Palpation
  - Auscultation with stethoscope
- Telemetry and palpation are the most common methods used in a fitness setting.



Measuring Exercise Heart Rate

- Measuring for 30 to 60 seconds is generally difficult.
  - Therefore, exercise heart rates are normally measured for shorter periods.
  - Generally a 10- to 15-second count is recommended.

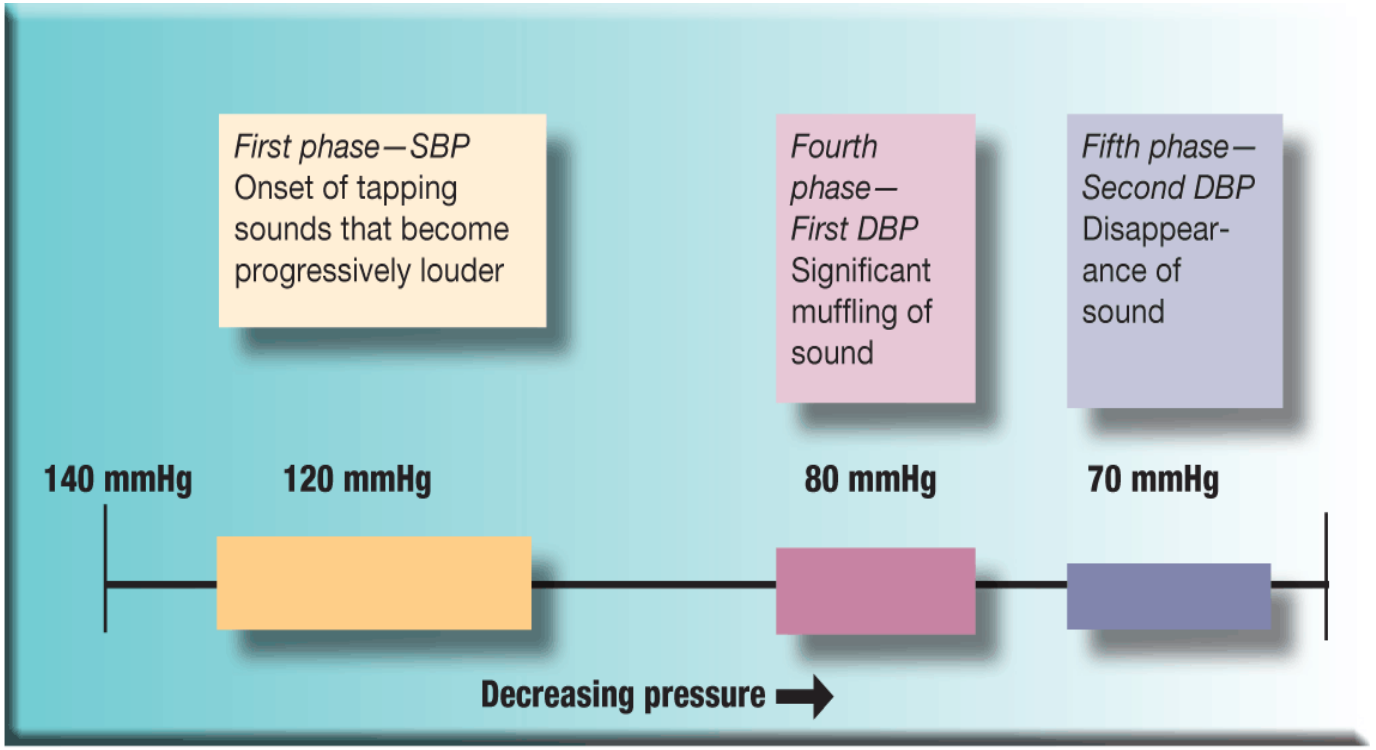
Blood Pressure

- Blood pressure is the outward force exerted by the blood on the vessel walls.
  - SBP represents the pressure created by the heart as it pumps blood into circulation via ventricular contraction.
  - DBP represents the pressure that is exerted on the artery walls as blood remains in the arteries during the filling phase of the cardiac cycle.
  - Blood pressure is measured within the arterial system.

Korotkoff Sounds

- Blood pressure is measured indirectly by listening to the Korotkoff sounds.
- These sounds are only present when some degree of wall deformation exists.
- Under pressure of a blood pressure cuff, vessel deformity facilitates hearing these sounds.
- When inflated to pressures greater than the highest pressure that exists within a cardiac cycle, the brachial artery collapses, preventing blood flow.
- As the air is slowly released from the bladder, blood begins to flow past the compressed area, creating turbulent flow and vibration along the vascular wall.
- First BP phase equals SBP.
- DBP is indicated by the fourth (significant muffling of sound) and fifth (disappearance of sound) phases, as illustrated on the following slide.

Korotkoff Sounds and Blood-pressure Phases



Note: SBP = Systolic blood pressure; DBP = Diastolic blood pressure

Blood Pressure Measurement Errors

- Common mistakes associated with measuring blood pressure include:
  - Cuff deflation that is too rapid
  - Inexperience of the test administrator or inability of the test administrator to read pressure correctly
  - Improper stethoscope placement and pressure
  - Improper cuff size
  - Inaccurate/uncalibrated sphygmomanometer
  - Auditory acuity of the test administrator or excessive background noise

Blood Pressure Classification

Classification of Blood Pressure for Adults Age 18 and Older*			
Category	**Systolic (mmHg)**		**Diastolic (mmHg)**
Normal**	<120	and	<80
Prehypertension	120–139	or	80–89
Hypertension***			
Stage 1	140–159	or	90–99
Stage 2	≥160	or	≥100

* Not taking antihypertensive drugs and not acutely ill. When systolic and diastolic blood pressures fall into different categories, the higher category should be selected to classify the individual's blood pressure status. For example, 140/82 mmHg should be classified as stage 1 hypertension, and 154/102 mmHg should be classified as stage 2 hypertension. In addition to classifying stages of hypertension on the basis of average blood pressure levels, clinicians should specify presence or absence of target organ disease and additional risk factors. This specificity is important for risk classification and treatment.

** Normal blood pressure with respect to cardiovascular risk is below 20/80 mmHg. However, unusually low readings should be evaluated
for clinical significance.

***Based on the average of two or more readings taken at each of two or more visits after an initial screening.

Chobanian, A.V. et al. (2003). *JNC 7 Express: The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure.* NIH Publication No. 03-5233. Washington, D.C.: National Institutes of Health & National Heart, Lung, and Blood Institute.

Blood Pressure Measurement During Exercise

- Accurate blood pressure is very difficult to obtain during exercise due to excessive movement and noise.
- A sphygmomanometer with a stand and a hand-held gauge are better choices for measuring BP during exercise.
  - If SBP drops during exercise, it should immediately be remeasured prior to terminating the session to ensure accuracy.
  - If the client was anxious prior to the cardiorespiratory assessment, it is likely that the initial exercise SBP reading will drop.

Application of Blood Pressure Measurement Results

- For individuals 40 to 70 years old, each 20 mmHg increase in resting SBP or each 10 mmHg increase in resting DBP above normal doubles the risk of cardiovascular disease.
- If the trainer discovers an abnormal BP reading, it is prudent to recommend that the client visit his or her physician.
- Blood pressure can be reduced with medication or certain behavior modifications, including:
  - Exercise
  - Weight loss
  - Sodium restriction
  - Smoking cessation
  - Stress management
- For those with prehypertension, BP can realistically be reduced with lifestyle interventions.
- For those with clinical hypertension, physicians typically treat it with medication and lifestyle interventions.
- The personal trainer can provide guidance and motivation on appropriate lifestyle-modification practices.

Ratings of Perceived Exertion

- RPE is used to subjectively quantify feelings and sensations during physical activity.
- Two standardized RPE scales exist: the Borg 15-point scale (6-to-20 scale) and a modified 0-to-10 category ratio scale, which is a revision of the original Borg scale.
- On the original 6 to 20 Borg scale, each value corresponds to a heart rate. For example:
  - Borg score: 6 = corresponding heart rate of 60 bpm
  - Borg score: 12 = corresponding heart rate of 120 bpm
  - Borg score: 20 = corresponding heart rate of 200 bpm

Ratings of Perceived Exertion (RPE)

RPE	Category Ratio Scale
6	0 Nothing at all
7 Very, very light	0.5 Very, very weak
8	1 Very weak
9 Very light	2 Weak
10	3 Moderate
11 Fairly light	4 Somewhat strong
12	5 Strong
13 Somewhat hard	6
14	7 Very strong
15 Hard	8
16	9
17 Very hard	10 Very, very strong
18	* Maximal
19 Very, very hard	
20	

Source: Adapted, with permission, from American College of Sports Medicine (2010). *ACSM's Guidelines for Exercise Testing and Prescription* (8th ed.). Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins

Common Trends in RPE Measurement

- Men tend to underestimate exertion, while women tend to overestimate exertion.
- Initially, very sedentary individuals may find it difficult to use RPE charts.
  - De-conditioned individuals may perceive any level of exercise to be fairly hard.
- Conditioned individuals may under-rate their exercise intensity if they focus on the muscular tension requirement of the exercise rather than the cardiorespiratory effort.

Recommendations for Using RPE

- The 6-to-20 scale is difficult to use:
  - Use when HR equivalents are needed and the actual exercise HR is not a reliable indicator of exertion.
- The 0-to-10 scale should always be used to gauge intensity when the trainer does not need to measure HR equivalents via the RPE.

The Exercise-induced Feeling Inventory

- Overall exercise experience strongly influences exercise adherence.
  - Trainers should aim to leverage positive emotional experiences associated with exercise to promote long-term adherence.
  - The exercise-induced feeling inventory (EFI) quantifies a client's emotions and feelings following an exercise session.

Instructions: Please use the following scale to indicate the extent to which each word describes how you feel at this moment in time. Record your responses by checking the appropriate box next to each word.

0 = Do not feel
1 = Feel slightly
2 = Feel moderately
3 = Feel strongly
4 = Feel very strongly

	0	1	2	3	4
1. Refreshed	❑	❑	❑	❑	❑
2. Calm	❑	❑	❑	❑	❑
3. Fatigued	❑	❑	❑	❑	❑
4. Enthusiastic	❑	❑	❑	❑	❑
5. Relaxed	❑	❑	❑	❑	❑
6. Energetic	❑	❑	❑	❑	❑
7. Happy	❑	❑	❑	❑	❑
8. Tired	❑	❑	❑	❑	❑
9. Revived	❑	❑	❑	❑	❑
10. Peaceful	❑	❑	❑	❑	❑
11. Worn out	❑	❑	❑	❑	❑
12. Upbeat	❑	❑	❑	❑	❑

Administering the EFI

- The EFI should be administered during the initial interview, with the trainer asking the client to rate previous exercise experience.
  - This will establish a baseline from which to compare future assessments.
  - The EFI is then administered shortly after a client completes a workout to help trainers identify whether the recommended programming is a positive experience.
  - The trainer can determine the variables that promote or discourage a positive exercise experience.

Summary

- As a facilitator of change, a personal trainer creates conditions and uses techniques that will help bring about the desired outcomes for each client.
- It is important to conduct a thorough health assessment utilizing appropriate health-risk appraisals and risk stratifications.
- This session covered:
  - Facilitating change and motivational interviewing
  - The health-risk appraisal
  - Evaluation forms
  - Health conditions that affect physical activity
  - Medications
  - Sequencing assessments
  - Choosing the right assessments
  - Conducting essential cardiovascular assessments
  - Ratings of perceived exertion
  - The exercise-induced feeling inventory