

Section 4: Assessment

Chapter 11. Health, Wellness, and Fitness Assessments Summary

- The general purposes of conducting physiological assessments are to collect baseline data to help fitness professionals develop personalized exercise programs.
- The PAR-Q+ is considered an appropriate minimal screening tool for conducting a HRA.
- Fitness professionals should also gather additional information, through the use of a HHQ, that may prove useful in selecting fitness assessments, designing exercise programs, and monitoring progress.
- A HHQ includes information about a client's medical history (e.g., injuries, surgeries, medications, and chronic disease) and lifestyle habits (e.g., exercise, diet, sleep, stress, and occupation).
- Resting and exercising heart rate and blood pressure responses provide valuable information pertaining to health risks and training adaptations.
- There are many anatomical locations that can be used to measure a client's RHR. However, for accuracy, safety, and ease of administering, NASM recommends that fitness professionals measure a client's radial pulse.
- Blood pressure (BP) is defined as the outward pressure exerted by blood on the arterial walls. BP scores are important because higher scores indicate greater risks for developing cardiovascular disease, which can become life-threatening. A normal BP reading is less than 120/80 mm Hg.
- Anthropometry is the field of study of the measurement of living humans for purposes of understanding physical variation in size, weight, and proportion.
- Many different anthropometric measures exist, including body fat assessments, BMI, and circumference measurements. Anthropometric measurements provide useful information related to predicting a client's risk for mortality and morbidity.
- There are many methods for measuring a client's body fat percentage, including underwater weighing, skinfold measurements, and bioelectrical impedance analysis. While all methods are valid, for ease of use, bioelectrical impedance is arguably the most popular method used in fitness facilities.
- Cardiorespiratory assessments help the fitness professional identify safe and effective starting exercise intensities as well as appropriate modes of cardiorespiratory exercise for clients. Examples of cardiorespiratory assessments include $\dot{V} O_{2\max}$ testing, the YMCA 3-minute step test, the Rockport walk test, and the 1.5 mile run test.
- $\dot{V} O_{2\max}$ testing is considered the gold standard for identifying a client's level of cardiorespiratory fitness, but it requires specialized equipment and training to conduct.

In addition, it requires the client to exert maximal effort. Consequently, this test is not commonly used outside of exercise laboratories or medical facilities.

- The talk test is an informal cardiorespiratory assessment used to gauge the intensity of cardiorespiratory activity based on the client's ability to hold a conversation.
- The VT1 test is an incremental test performed on any device (e.g., treadmill, bike) that gradually progresses in intensity level and relies on the interpretation of how a person talks to determine a specific event at which the body's metabolism undergoes a significant change. A key point to this protocol is to remember that it is an aerobic test that aims to estimate the intensity where the body is using a balance of fuels (i.e., 50% fat, 50% carbohydrates).
- The VT2 talk test measures the intensity where the body can work at its highest sustainable steady-state intensity for more than a few minutes.

Important Concepts (not an exhaustive list)				
Contraindication	A specific situation where a medication, procedure, or exercise should be avoided because it may prove to be harmful to the individual.			
Physical Activity Readiness Questionnaire (PAR-Q+)	A detailed questionnaire designed to assess an individual's physical readiness to engage in structured exercise.			
Health history questionnaire (HHQ)	A questionnaire with lists of questions that pertain to health history and habits, such as exercise history, eating behaviors, and general lifestyle			
Manual heart rate measurement	For accuracy, safety, and ease of administration, NASM recommends that fitness professionals measure a client's radial pulse.			
Blood pressure ranges	<ul style="list-style-type: none"> • Normal (healthy): Less than 120/80 mm Hg • Elevated: Systolic between 120 and 129 and diastolic less than 80 mm Hg • Stage 1 hypertension: Systolic between 130 and 139 or diastolic between 80 and 89 mm Hg • Stage 2 hypertension: Systolic 140 or higher or diastolic 90 mm Hg or higher • Hypertensive crisis: Systolic greater than 180 and/or diastolic greater than 120 mm Hg 			
Body mass index (BMI)	The measurement of a person's weight relative to his or her height, which is used to estimate the risks of obesity. <ul style="list-style-type: none"> • Metric formula: $BMI = \text{weight (kg)} \div [\text{height (m)}]^2$ • Imperial formula: $BMI = 703 \times \text{weight (lb)} \div [\text{height (in.)}]^2$ 			
Bioelectrical impedance analysis (BIA)	A body composition assessment technique that estimates body fat percentage by measuring the resistance to the flow of electrical currents introduced into the body.			
BMI Classification	BMI	Disease Risk	Classification	
	<18.5	Increased	Underweight	
	18.5–24.9	Low	Healthy weight	
	25.0–29.9	Increased	Overweight	

		30.0–34.9	High	Obese	
		35.0–39.9	Very high	Obesity II	
		≥40.0	Extremely high	Obesity III	
Waist-to-hip ratio (WHR)	The relative score expressing the ratio of the waist circumference to the hip circumference, which correlates to the risk for developing cardiovascular disease. <ul style="list-style-type: none"> WHR = Waist Measurement ÷ Hip Measurement 				
WHR Classifications		Health Risk	Men	Women	
		Low	0.95 or lower	0.80 or lower	
		Moderate	0.96–1.0	0.81–0.85	
		High	1.0 or higher	0.86 or higher	
Jackson and Pollock Seven-Site Measurement	<ul style="list-style-type: none"> Men: Chest, mid-axillary, subscapular, triceps, abdomen, suprailiac, thigh Women: Chest, mid-axillary, subscapular, triceps, abdomen, suprailiac, thigh 				
Jackson and Pollock Three-Site Measurement	<ul style="list-style-type: none"> Men: Chest, abdomen, thigh Women: Triceps, suprailiac, thigh 				
Durnin–Womersley Four-Site Measurement**very important	<ul style="list-style-type: none"> Men & Women: Biceps, triceps, subscapular, and suprailiac 				

Chapter 12. Posture, Movement, and Performance Assessments

Summary

- Static posture is typically assessed in standing position and is used to identify the three postural distortions: pes planus distortion syndrome, upper crossed syndrome, and lower crossed syndrome.
- Pes planus distortion syndrome is characterized by flat feet, knee valgus, and internally rotated and adducted hips.
- Lower crossed syndrome is characterized by an anterior pelvic tilt and excessive lordosis of the lumbar spine.
- Upper crossed syndrome is characterized by a forward head and protracted shoulders.
- The OHSA is the first movement assessment performed for clients and serves as the basis for all other movement assessments. It evaluates dynamic posture, core stability, and neuromuscular control of the whole body during a squatting motion.
- During the OHSA, notate all movement impairments to identify potential muscle imbalances. From the anterior view, look for feet turning out or knees caving in. From the lateral view, look for low-back arching, excessive forward lean of the torso, or arms falling forward.
- The single-leg squat assessment should be used by clients who have performed well in the OHSA, or if the fitness professional is considering single-leg exercises in their

programming. This test is a good assessment of an individual's ability to balance, which is an important functional consideration for activities of daily living and exercise programming.

- Pushing and pulling assessments evaluate function of the upper extremity and concurrent core stability. They can be used as an intake assessment or an integrated part of the actual programming.
- When performing pushing or pulling assessments, look for the following movement impairments: low-back arching, shoulders elevating, or head jutting forward.
- Performance assessments can be used for clients looking to improve athletic performance, and measure maximal strength, power, muscular endurance, and speed and agility.
- The push-up test measures muscular endurance of the upper extremities during a pushing movement.
- The bench press and squat strength assessments measure maximal strength capabilities. These tests are advanced assessments for strength-specific goals and may not be suitable for clients with limited experience with resistance training.
- The vertical jump and long jump assessments measure lower-body power.
- The LEFT test is designed to test lateral speed and agility. LEFT is considered an advanced assessment for speed and performance-specific goals.
- The 40-yard dash assessment evaluates reaction capabilities, acceleration, and maximal sprinting speed.
- The pro shuttle (5-10-5) test assesses acceleration, deceleration, agility, and control. This test is most appropriate for clients with athletic goals seeking to assess agility and sprinting speed.
- All assessments need to be sequenced in a specific order to help guarantee accurate results. Nonfatiguing assessments, such as a preparticipation health screening and physiological and body composition assessments, should be conducted prior to posture, movement, cardio, and performance assessments.
- Fitness professionals should always use caution when implementing movement and performance assessments with their clients. Certain populations, such as overweight or obese, youths, older adults, and prenatal clients, may need to modify or avoid certain movement and performance assessments. Some assessments are not applicable because they do not relate to the client's goals. Other assessments may cause safety concerns.

Important Concepts (not an exhaustive list)	
Pes planus distortion syndrome** very important	Static Positions Ankle joints—pes planus (collapsed arch) Knee joints—valgus and internally rotated Hip joints—adducted and internally rotated

	<p>Potential overactive muscles</p> <ul style="list-style-type: none"> • Gastrocnemius and soleus (calves) • Adductor complex (inner thighs) • Hip flexors (muscles near front of hips) <p>Potential underactive muscles</p> <ul style="list-style-type: none"> • Anterior and posterior tibialis (shin muscles) • Gluteus maximus and medius (butt muscles)
Lower crossed syndrome** very important	<p>Static Positions</p> <p>Hip joints—flexed Pelvis—anterior pelvic tilt Lumbar spine—excessive lordosis (extension)</p> <p>Potential overactive muscles</p> <ul style="list-style-type: none"> • Hip flexors • Lumbar extensors (low-back muscles) <p>Potential underactive muscles</p> <ul style="list-style-type: none"> • Gluteus maximus and medius • Hamstring complex • Abdominals
Upper crossed syndrome** very important	<p>Static Positions</p> <p>Thoracic spine—excessive kyphosis (hunchback, flexed posture) Shoulders—protracted (rounded forward) and internally rotated Head and neck—jutting forward</p> <p>Potential overactive muscles</p> <ul style="list-style-type: none"> • Pectoralis major and minor (chest muscles) • Levator scapula and sternocleidomastoid (neck muscles) • Upper trapezius <p>Potential underactive muscles</p> <ul style="list-style-type: none"> • Middle and lower trapezius, rhomboids (mid-back muscles) • Deep cervical flexors (muscle deep within the neck)
Overhead Squat Assessment	
Feet turn out** very important	<p>Overactive</p> <ul style="list-style-type: none"> • Gastrocnemius/soleus (calves) • Hamstrings complex <p>Underactive</p> <ul style="list-style-type: none"> • Anterior and posterior tibialis (shin muscles) • Gluteus maximus and medius
Knees cave in (knee valgus) ** very important	<p>Overactive</p> <ul style="list-style-type: none"> • Tensor fascia latae (TFL)(muscle near front of hip) • Adductor complex (inner thigh muscles) <p>Underactive</p> <ul style="list-style-type: none"> • Gluteus maximus and medius • Anterior and posterior tibialis

Low-back arches** very important	Overactive <ul style="list-style-type: none"> Hip flexors (rectus femoris, psoas, TFL) Lumbar extensors (low-back muscles) Latissimus dorsi (large back muscle) Underactive <ul style="list-style-type: none"> Gluteus maximus Hamstrings complex Abdominals
Excessive forward trunk lean** very important	Overactive <ul style="list-style-type: none"> Hip flexors Gastrocnemius/soleus Rectus abdominis and external obliques (superficial abdominal muscles) Underactive <ul style="list-style-type: none"> Gluteus maximus Hamstrings complex Lumbar extensors
Arms fall forward** very important	Overactive <ul style="list-style-type: none"> Latissimus dorsi Pectoralis major and minor (chest muscles) Teres major (posterior shoulder muscle) Underactive <ul style="list-style-type: none"> Middle and lower trapezius (mid-back muscle) Rhomboids (muscles near shoulder blades) Posterior deltoids (back of shoulder muscles) Portions of the rotator cuff (small muscles that stabilize the shoulder)
Single-leg Squat Assessment	
Knee caves in (knee valgus) ** very important	Overactive <ul style="list-style-type: none"> Tensor fascia latae (TFL) Adductor complex Underactive <ul style="list-style-type: none"> Gluteus maximus and medius Anterior and posterior tibialis
Pushing Assessment	
Low-back arches** very important	Overactive <ul style="list-style-type: none"> Hip flexors (rectus femoris, psoas, TFL) Lumbar extensors Underactive <ul style="list-style-type: none"> Gluteus maximus Hamstrings complex Abdominals
Scapular elevation** very important	Overactive <ul style="list-style-type: none"> Levator scapulae (posterior neck muscles) Upper trapezius Underactive <ul style="list-style-type: none"> Lower trapezius

Head juts forward** very important	Overactive <ul style="list-style-type: none"> Levator scapulae Sternocleidomastoid (anterior neck muscles) Underactive <ul style="list-style-type: none"> Deep cervical flexors (deep neck stabilizer muscles)
Pulling Assessment	
Low-back arches** very important	Overactive <ul style="list-style-type: none"> Hip flexors (rectus femoris, psoas, TFL) Lumbar extensors Underactive <ul style="list-style-type: none"> Gluteus maximus Hamstrings complex Abdominals
Scapular elevation** very important	Overactive <ul style="list-style-type: none"> Levator scapula Upper trapezius Underactive <ul style="list-style-type: none"> Lower trapezius
Head juts forward** very important	Overactive <ul style="list-style-type: none"> Levator scapulae Sternocleidomastoid Underactive <ul style="list-style-type: none"> Deep cervical flexors