

PAR-Q

Physical Activity Readiness Questionnaire



what may you see in client who perform a lot of overheard work such as construction or painting

possible shoulder soreness which can result in tightness of the latissimus dorsi and weakness in the rotator cuff



what may you see in a client that wears heels

tightness in gastrocnemius and soleus, causing postural imbalances such as overpronation at the foot and ankle complex



What do you need to be aware of with a client that has had past ankle sprains

Ankle sprains have been shown to decrease the neural control of the gluteus medius and maximus. This can lead to poor control of the lower extremities



What do you need to be aware of with a client that has had knee injuries involving ligaments

knee injury can cause a decrease in neural control to muscles that stabilize the patella and lead to further injury. Knee injury's that are not a result of contact are often result of ankle or hip dysfunctions



what is the average resting heart rate for a male and female

male 70 bpm

female 75 bpm



The heart rate training zones

Zone 1 - build aerobic base and aids in recovery

65-75 % of max heart rate

Zone 2 - Increase endurance and trains the anaerobic threshold

80-85% of max heart rate

Zone 3 - Builds high end work capacity

86-90% of max heart rate



systolic reading

"top #"

reflects the pressure produced by the heart as it pumps blood to the body

normal systolic ranges from 120mm hg to 130 mmHg



diastolic

"lower number"

signifies the minimum pressure with the arteries through a full cardiac cycle
ranges from 80-85 mm hg

methods of body fat measurement

Skin fold caliper

bioelectrical impedance

underwater weighing

Durnin Womersley formula

Measure four areas with skin fold calipers

1. biceps
2. triceps
3. subscapular
4. Iliac creast

all should be taken from the right side of body.

Add the totals of the fours sites (in millimeter) and consult the durnin wormersley chart

Circumference Measurements

designed to asses change in girth

1. neck, at adams apple
2. chest, across nipple line
3. waist, narrowist point
4. Hips, widest point
5. thighs, measure 10 in above patella
6. calves, max circumference
7. biceps, at maximal circumference

BMI

Body mass index

divide body weight (inn kilograms)
by height (in meters squared)

health related proble in crease when BMI is above 25

mild: 25-30

moderate: 30-35

Severe: >35

Cardiorespiratory assessments

3 minute step test

rockport walk test



Three minute step test
designed to estimate cardiovascular starting point
Step 1: Determine max heart rate (220-age)

Step 2:
-perform a 3 minute step test by having a client do 24 steps per minute on an 18in step.
-have client rest for 1 min
-measure pulse for 30 sec
record as recovery pulse

Determine fitness level with formula:

$$\frac{\text{Duration of exercise (sec)} \times 100}{\text{recovery pulse} \times 5.6}$$

Step 3: located final # in category
28-38- poor
39-48- fair
49-59- average
60-70- good
71-100 very good

Step 4: Determine the appropriate starting point

Poor: zone 1
Fair: zone 2
Average: zone 2
good: zone 2
very good: zone 3
=cardio vascular efficiency



Rockport walk test
Step one: determine max heart rate(220-age), and corresponding zones
Step two: record weight
- have client walk as fast as he or she can control on a treadmill
-record time
-record heart rate immediately after the walk
use formula:
 $132.853 - (.0769 \times \text{weight}) - (.3877 \times \text{age}) + (6.315 \times 1(\text{men}) \text{ or } \times 0(\text{women})) - (3.2649 \times \text{time}) - (0.1565 \times \text{heart rate}) = \text{Vo}_2 \text{ score}$

Step 3-locate score in the charts
step 4- Determine appropriate starting point

Poor: zone 1

Fair: zone 2

Average: zone 2

good: zone 2

very good: zone 3



posture

the alignment and function of all component of the kinetic chain at any given moment



Structural efficiency

The alignment of the musculoskeletal system that allows our center of gravity to be maintained over our base of support



functional efficiency

The ability of the neuromuscular system to monitor and manipulate movement during functional tasks using the least amount of energy, creating the least amount of stress on the kinetic chain



Postural equilibrium

maintaining a state of balance in the alignment of the kinetic chain



Neuromuscular efficiency

The ability of the nervous system to communicate effectively with the muscular system



Functional Strength

The ability of the neuromuscular system to contract eccentrically, isometrically, and concentrically, in all three planes of motion



postural distortion patterns

Predictable occurrences of muscle imbalances caused by altered movement patterns



Overhead Squat Assessment

designed to assess dynamic flexibility on both sides of body as well as integrated total body strength.

Position

1. stand shoulder width apart pointed straight ahead
2. have client raise his/her arms overhead, elbow fully extended

Movement

3. Instruct client to squat to roughly the height of a chair and return to the start position
4. have the client repeat the movement 5 times

Views

5. View feet, ankles, and knees from the front
6. View the lumbo pelvic-hip complex, shoulder, and cervical complex from the side

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If a client's feet turn out in an overhead squat assessment what are the probable overactive and under active muscles

Overactive:

Soleus

lat. gastrocnemius

biceps femoris (short head)

Underactive:

Med. Gastrocnemius

Med. Hamstring

Gracilis

Sartorius

popliteus

☐

If a client's knees move inward in an overhead squat assessment what are the probable overactive and under active muscles

Overactive

Adductor complex

Biceps femoris (short head)

TFL

Vastus Lateralis

Underactive:

Gluteus medius/maximus

Vastus medialis oblique

☐

If a client's LPHC has an excessive forward lean in an overhead squat assessment what are the probable overactive and under active muscles

Overactive:

Soleus

lat. gastrocnemius

hip flexor complex

abdominal complex

Underactive:

Anterior tibialis

Gluteus Maximus

Erector Spinae

☐

If a client's lower back arches in an overhead squat assessment what are the probable overactive and under active muscles

Overactive:

Hip flexor complex

erector spinae

Underactive:
Gluteus maximus
Hamstrings
Core stabilizers



If a clients arms fall forward in an overhead squat assessment what are the probable overactive and under active muscles

Overactive:
Lattissimus dorsi
teres major
Pectoralis major/ minor

Underactive:
mid/lower trapezius
rhomboids
rotator cuff



Single leg squat assessment

Position:

1. client to stand with hands on hip and eyes forward
- 2 feet should be pointed straight ahead and LPHC should be neutral

Movement:

3. Instruct client to raise one leg and place it parallel to the stance leg
4. have client squat to a comfortable level and return to start position
5. perform 5 reps on each side
- 6 view the knees from the front



If a clients knees move inward during a single leg squat assessment what are the likely overactive and underactive muscles

Overactive:
Adductor complex
bicep femoris (short head)
TFL
Vastus lateralis

Underactive:
Gluteus medius/maximus
Vastus medialis oblique VMO



Pushing assessment

Position:

1. Instruct client to stand with abdomen drawn inward, feet in split stance, and toes pointing forward

Movement:

2. instruct client to press handles forward and return slowly

If clients lower back arches during a push assessment what are the probably over and underactive muscles

Overactive:

Hip Flexors

Erector Spinae

Underactive:

Intrinsic core stabilizers

If clients elevates his/her shoulders during a push assessment what are the probably over and underactive muscles

overactive:

upper trapezius

sternocleidomastoid

levator scapulae

Underactive:

Mid and lower trapezius

If clients head protrudes forward during a push assessment what are the probably over and underactive muscles

overactive:

upper trapezius

sternocleidomastoid

levator scapulae

underactive:

Deep cervical flexors

Pulling assessment

1. Instruct client to stand with abdomen drawn inward, feet shoulder width apart, toes pointing forward

2. Instruct client to pull handles toward their body and return slowly

3. perform 20 reps

If clients head protrudes forward during a pull assessment what are the probably over and underactive muscles

overactive:

upper trapezius

sternocleidomastoid

levator scapulae

underactive:

Deep cervical flexors



If clients elevate his/her shoulders during a pull assessment what are the probably over and underactive muscles

overactive:

upper trapezius

sternocleidomastoid

levator scapulae

Underactive:

Mid and lower trapezius



If clients lower back arches during a pull assessment what are the probably over and underactive muscles

overactive:

hip flexors

erector spinae

underactive:

intrinsic core stabilizers



Performance assessments

Davies: assesses upper extremity stability

Shark Sill: assesses overall athletic ability

upper extremity strength:

advanced assessment that estimates one rep max, and upper extremity strength

lower extremity strength: advanced assessment that estimate one-rep max and lower extremity strength



Davies test

asses upper extremity agility and stabilization

1. place hand 36in apart
2. quickly move right hand to touch left
3. perform alternating touching on each side for 15 sec
4. repeat 3 time

reassess in future to measure improvement of number of touches



Shark Skill test

the observation is designed to asses lower extremity agility and neuromuscular control. It should be view as a progression from the single leg squat and as such, may not be suitable for all clients.

1. stand in center to grid

2. hop to boxes from upper left and around grid always returning to the center box
- 3 perform twice with each foot
- 4 record times, add .1 for the following faults
- non hop leg touches ground
- hand come off hips
- foot goes in wrong square
- foot does not return to center



Upper extremity strength assessment: bench press
designed to estimate the one rep max, for training intensity purposes. Advanced
assessment, for strength specific goals only

Position:

- on bench, feet pointed straight, back neutral
2. warm up with light resistance
 3. take 1min rest
 4. add 10-20 lbs (5-10%), perform 3-5 reps
 5. take 2 min rest
 6. repeat until failure at 3-5 rep
 7. use one rep max estimation chart to calculate one rep max



Lower extremity strength assessment:

squat

designed to estimate the one rep max, for training intensity purposes. Advanced
assessment, for strength specific goals only

Position:

- feet shoulder width apart, knees inline with toes
2. warm up with light resistance
 3. take 1min rest
 4. add 30-40 lbs (10-20%), perform 3-5 reps
 5. take 2 min rest
 6. repeat until failure at 3-5 rep
 7. use one rep max estimation chart to calculate one rep max
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Calculation for waist to hip ratio.

Waist / Hip



Used in the treatment of hypertension and congestive heart failure.

Vasodilators



What is the 3 minute step test used for?

To estimate cardiorespiratory health and determine which cardio zone to start the client on.

Measurement locations to calculate body fat percentages with skin-fold calipers.
The biceps, triceps, subscapular and iliac crest.

The blood pressure produced by the heart as it pumps blood to the body
Systolic Pressure

_____ information is gathered from a prospective client to give the health and fitness professional feedback regarding personal history such as occupation, lifestyle and medical background.

Subjective Information

The alignment of the musculoskeletal system that allows our center of gravity to be maintained over our base of support.

Structural Efficiency

This type of past injury could cause altered neural control of the rotator cuff muscles which could lead to instability of the shoulder joint during exercise.

Shoulder injuries.

What assessments would be used to determine posture health?

Posture and Movement Assessments:

-Overhead Squat Assessment

-One leg Squat Assessment

-Push Assessment

-Pull Assessment

The alignment and function of all components of the kinetic chain at any given moment.

Posture

Maintaining a state of balance in the alignment of the kinetic chain.

Postural Equilibrium

Predictable occurrences of muscle imbalances caused by altered movement patterns.

Postural Distortion Patterns

What is a PAR-Q?

Physical Activity Readiness Questionnaire.

What is gathered with General History?

Occupational and Lifestyle information

_____ Information is gathered to compare numbers with those measured weeks, months, or years later denoting improvements in the client and training effectiveness.

Objective

The ability of the nervous system to communicate effectively with the muscular system.

Neuromuscular Efficiency

This type of past injury can decrease the neural control too stabilizing muscles of the core, resulting in poor stabilization of the spine.

Low back injuries.

This type of past injury can cause a decrease in the neural control to the muscles that stabilize the patella and lead to further injury.

Knee injuries involving ligaments.

What is Heart Rate Zone Two?

Increases endurance and trains the anaerobic threshold. 80% - 85% of Max Heart Rate.

The ability of the neuromuscular system to contract eccentrically, isometrically, and concentrically in all three planes of motion.

Functional Strength

The ability of the neuromuscular system to monitor and manipulate movement during functional tasks using the least amount of energy, creating the least amount of stress on the kinetic chain.

Functional Efficiency

Generally prescribed for hypertension, congestive heart failure, and peripheral edema

Diuretics

The minimum blood pressure within the arteries through a full cardiac cycle.

Diastolic Pressure

Calculation used to determine a client's maximum heart rate.

Client age - 220

What could past surgeries cause in a client?

Cause trauma and are similar to injury. Needs proper rehabilitation.

Generally prescribed for hypertension and angina.

Calcium-channel blockers

What is Heart Rate Zone Three?

Builds high-end work capacity. Max HR x .86 thru Max HR x .90

What is Heart Rate Zone One?

Builds aerobic base and aids in recovery. 65%-75% of max heart rate.

Generally prescribed to correct or prevent bronchial smooth muscle constriction in individuals with asthma and other pulmonary diseases.

Bronchodilators

This type of medication is used as antihypertensive. May be prescribed for arrhythmias.

Beta-blockers

Used in the treatment of various psychiatric and emotional disorders.

Antidepressants.

This type of past injury can result in a decrease of neural control to the gluteus medius and gluteus maximus muscles.

Ankle Sprains

Normal Range for diastolic pressure?

80 - 85 mm HG.

Normal range of systolic pressure?

120 - 130 mm HG

Places to take measurements for body circumference measurements.

-Neck: Across the Adams apple.

- Chest: Across the nipple line.

- Waist: Measure at the narrowest point of the waist, below the rib cage and just above the top of the hipbones. If there isn't an apparent narrowing of the waist, measure at the navel.

Hips: With feet together measure at the widest portion of the buttocks.

Calves: At the maximal circumference between the ankle and the knee measure the calf.

Biceps: At the maximal circumference, measure with the arm extended.

What could mental stress do to a client?

-Dysfunctional breathing patterns which could lead to postural distortion and kinetic dysfunction.

What could a past low back injury cause in a client?

-Decrease in neural control to stabilizing muscles of the core resulting in poor stabilization of the spine.



What tests are used to assess cardiorespiratory health?

- Three-Minute Step Test
- Rockport Walk Test



What information is gathered during Physiologic assessment?

- Resting Heart Rate
- Blood Pressure



What could wearing dress shoes do to a client?

- Puts the ankle complex in the plantarflexion position for extended periods of time. This can lead to tightness in the gastrocnemius and soleus causing postural imbalance.



What information is gathered regarding medical information?

- Past Injuries
- Past Surgeries
- Chronic Conditions
- Medications



What assessments can be used to assess dynamic posture and movement?

- Overhead Squat
- Single-Leg Squat
- Pushing
- Pulling



What is gathered regarding occupational information

- Occupation
- Extended periods of sitting
- Repetitive Movements
- Dress shoes
- Mental stress



What information is gathered regarding lifestyle?

- Hobbies
- Recreation



What could sitting for an extended period of time do to a client?

- Hips are flexed for a long period of time.
- Head and shoulders could fatigue under constant influence of gravity.
- These lead to postural imbalance.



Why is the body composition assessment so important?

- Give a "starting point" measurement.
- Used to motivate a client and gives them objective information to see results.

What could a past ankle sprain cause in a client?

- Decrease in the neural control to the gluteus medius and maximus muscles.

Poor Control of the lower extremities during activity which could lead to more injury.

What tests are used to assess basic performance?

- Davies Test

- Shark Skill Test

- Upper Extremity Strength; Bench Press

- Lower Extremity Strength: Squat.

What could repetitive occupational movements do to a client?

- Could create a pattern overload to muscles and joints which could lead to tissue trauma.

Example: Painter painting over his head all day could cause weakness in the rotator cuff.

What information is gathered for body composition?

- Body fat measurement

- Circumference Measurement

- Waist to hip ratio

- BMI (body mass index)

What could past shoulder injuries cause in a client?

- Altered neural control of the rotator cuff muscles.