

University of Manitoba, Physical Plant Caretaking Services, Caretaking Physical Fitness Assessment

The purpose of the Caretaking Physical Fitness Assessment is to test general levels of fitness based on general fitness standards. General physical fitness tests are used as an entry-level standard to determine whether someone is qualified to perform essential tasks for the job. Therefore, the Caretaking Physical Fitness Assessment will resemble and test the physical challenges required to perform the job.

The components of the assessment were designed to simulate actual caretaking tasks and the ability to perform the job, such as, picking up and moving garbage bins; cleaning; vacuuming; and sweeping. The assessment is designed to encourage applicants to work at the submaximal level of their physical ability. This assessment and variations of it have been used for other occupations with similar job performance requirements.

PART 1: General Fitness Assessment includes 4 components (cardio respiratory fitness, grip strength, hamstring/lower back flexibility, back extension endurance) that are adopted from the CPATH (Canadian Physical Activity Training for Health) protocols established by CSEP (Canadian Society of Exercise Physiology). These components are important for general health and are related to injury prevention. Applicants are scored relative to their age and gender using norms and percentiles based on Canadians 15—69 years of age.

PART 2: Practical Job Related Portion includes 6 components (weight transfer, weight to high shelf, floor to waist lift, shoulder health, push, pull) that assess practical abilities to handle weight safely and effectively; assess positional tolerance; and joint health. These tests are scored based on ability to complete the test as well as the technique demonstrated, for example, using proper lifting technique.

Initial Screening

Before the test administrator can proceed with the assessment, applicants resting heart rate and blood pressure are taken as a safety precaution. This is to ensure that the heart rate is not equal to or above 100 beats per minute and the blood pressure is not equal to or above 144/94 mmHg. If an applicant is equal to or above these national standards, he/she will be asked to see a physician in order to get medical clearance to proceed with the test. Weight, height and body mass index are taken for consultation purposes.

HEART RATE < 100 beats/min

The heart is a muscle like any other muscle in the body; to become stronger it must be exercised regularly. Resting heart rate reflects this strength. A stronger heart is able to pump more blood with each beat; therefore, fewer beats are required to get an adequate amount of blood (and oxygen) to the body. The lowering resting heart rate can result in significant saving of the heartbeats per day and over a lifetime this will undoubtedly result in a great deal less "wear and tear" on this most vital organ. Improved efficiency of the heart is perhaps the most plausible explanation for a reduced incidence of circulatory disease in the active individual.

BLOOD PRESSURE <144/94 mmHg

Blood pressure is the pressure the blood exerts against the walls of the arteries. The walls of the arteries are elastic and muscular and they stretch and relax in response to the increases and decreases in blood pressure.

Each time the heart contracts, blood flow and blood pressure in the arteries increase. The pressure, when the heart contracts, is referred to as systolic (top number). When the heart relaxes, blood flow and blood pressure in the arteries decrease. This pressure during relaxation is diastolic (bottom number). The more difficult it is for the blood to flow through the arteries, the higher the blood pressure.

BODY COMPOSITION (Weight and Height)

Body Mass Index (BMI) is the relationship between a person's height and weight. A high BMI score may be the result of excessive fat or from a high degree of muscularity. If an applicant has a low percentage of body fat and high BMI score it is due to his muscularity.

PART 1: General Fitness Assessment

(Adopted from CPATH—Canadian Physical Activity Training for Health)

SINGLE-STAGE EBELING TREADMILL WALKING TEST

Test Description:

The combination of the heart rate, workload, weight, gender and age are used to predict the maximal oxygen consumption (VO_2 max). The greater the exercise intensity and the lower the heart rate, the greater the VO_2 max. VO_2 max is recorded in liters per minute (l/min^1) as the absolute amount and relative to client's own body weight expressed in milliliters per kilogram of body weight per minute ($ml/kg^1/min^1$). The latter units are more commonly used so individuals of different sizes can be more fairly compared to each other.

Test Justification:

Aerobic fitness is the combined efficiency of lungs, heart, bloodstream, and local muscles in getting oxygen and fuel to these muscles and using it to perform work. For this reason, cardiovascular endurance or aerobic fitness is the most important component of physical fitness. The higher the VO_2 max is the greater the functional (aerobic) capacity. With a larger aerobic capacity, daily activities require less effort and leave a bigger reserve for pursuing recreational activities and dealing with emergencies should they arise.

Test Procedure:

For this protocol, walking speed is individualized depending on the client's age, gender and fitness level. Walking pace is established during a 4-minute warm-up at 0% grade. Then the applicant continues the walking pace for an additional 4 minutes at 5% grade, followed by a 2 minute cool down. This is a submaximal assessment, meaning that the client will only reach 70-85% of their maximum heart rate during this assessment.

GRIP STRENGTH

Test Description:

Muscular strength is the ability of a muscle or muscle group to exert maximal force (contraction) in one all-out effort (e.g. opening a tight jar).

Test Justification:

Muscular strength and endurance are closely interrelated. They are best thought of as being on a continuum with strength at one end and muscular endurance at the opposite end. All activities lie along the continuum and therefore involve some combination of muscular endurance and muscular strength.

In order to increase muscular strength and endurance, the muscles must be overloaded. This overload can come from body weight, the use of weights or some other type of resistance.

Test Procedure:

Grip Strength is a measure of forearm strength and may be related to total body strength. Using grip dynamometer an applicant squeezes dynamometer exerting maximum force. Both hands are measured alternately giving two trials per hand. Highest score of each hand are added together.

HAMSTRING/LOWER BACK FLEXIBILITY**Test Description:**

The range of motion at each joint is a measure of the flexibility or suppleness of that joint. Movement at a joint site is limited by bone structure, elasticity of connective tissue and muscle tissue and ligament support. Therefore, flexibility varies from joint to joint.

Test Justification:

This test assesses lower back and hamstring flexibility.

Test Procedure:

Sit and reach (trunk flexion) measures the flexibility of the lower back, hips and hamstrings (back of thighs). Sitting in front of a flexometer with the knees fully extended, the applicant leans forward from the hips and reaches the hands as far past the feet as possible.

BACK EXTENSION**Test Description:**

Muscular endurance is the ability of a muscle or muscle group to exert a submaximal force over a long period of time (e.g. carrying a bag of groceries for five blocks).

Test Justification:

Muscular strength and endurance are closely interrelated. They are best thought of as being on a continuum with strength at one end and muscular endurance at the opposite end. All activities lie along the continuum and therefore involve some combination of muscular endurance and muscular strength.

In order to increase muscular strength and endurance, the muscles must be overloaded. This overload can come from body weight, the use of weights or some other type of resistance.

Test Procedure:

Back extension is measured using the portable step and a timer. The applicant lies face down on at the top of the steps with the iliac crest (pelvic region) positioned at the edge of the step, while keeping the hips, shoulders and head aligned (keeping a straight back while contracting abdominal muscles). The applicant's lower body will be secured to the steps using supportive straps. The applicant raises the upper half of their torso and crosses their arms on the chest, maintaining the horizontal position for as long as possible without dropping or rotating the torso for a maximum of 180 seconds. If the applicant's torso drops or rotates they will be given one warning and then the next time the test will be stopped.

PART 2: Practical Job Related Portion

WEIGHT TRANSFER**Test description:**

A 25 pound crate is placed on the seat of a chair. The applicant picks the crate up to waist height and walks to a marker placed 15 feet away. The applicant then walks backwards with the crate to the original start position. This is repeated 3 times in total and then the applicant sets the crate back on

the chair. Procedure is repeated with a 40 pound and a 50 pound crate.

Test Justification:

Test the applicant's ability to handle and move weight safely and effectively.

Test Procedure:

The applicant must demonstrate control using proper technique while lifting, moving, setting weight down. Tripping or dropping the weight would denote a fail, and they would be scored on the highest stage successfully completed. No time limit.

1. **STAGE 1:** The crate is weighted with 25 pounds is picked up from the chair, held at waist level. The applicant walks to a marker 15 feet away, both feet past the cutoff before walking backwards to the chair. The applicant walks back and forth an additional 2 times for a total of 3 walks. The weighted crate is set back down on the chair with control. 1 minute rest before Stage 2.
2. **STAGE 2:** The crate is weighted with 40 pounds and the above procedure is repeated. 1 minute rest before Stage 3.
3. **STAGE 3:** The crate is weighted with 50 pounds and the above procedure is repeated.

WEIGHT TO HIGH SHELF

Test Description

The applicant picks 25 pound box off the floor, carries it at waist level to a chest high shelf and sets the crate onto the shelf.

Test Justification

Tests the applicant's ability to safely carry and transfer weight to a mid-high level while demonstrating proper technique to reduce risk of injury.

Test Procedure

A weighted milk crate (25 pounds) is picked up off the ground and carried 15 feet to a table with enough stepping platforms placed onto it so that height is no lower than bottom of the applicant's sternum and no higher than the applicant's axillary crease. The applicant must place the crate safely onto the platform with control. Lifting and reaching technique will be analyzed to determine that safe form is demonstrated.

FLOOR TO WAIST LIFT

Test description

A 50 pound weighted crate is picked up from floor and raised to waist, then returned to floor.

Test Justification

Analyze subject's ability to safely lift a relatively heavy weight.

Test Procedure

The 50 pound weighted crate is picked up from floor using proper technique (i.e. neutral spine) then brought to waist level, held for a brief moment before being returned to the floor with proper technique and full control.

SHOULDER HEALTH

Test description

Subject reaches out to the side, directly in front, and overhead. This is repeated 6 times with each arm, without weight, and then repeated while holding 2.5 pounds.

Test Justification

Evaluates shoulder mobility and endurance.

Test Procedure

The applicant stands upright, shoulder flexed to 90 degrees with fist on chest (start position). The shoulder is then horizontally abducted and elbow extends so the arm ends up perpendicular to body, parallel to floor. Return to start position. Elbow is then extended so arm is directly in front of body, arm parallel to floor, and returned to start position. Shoulder is then horizontally abducted and abducted as high as possible (reaching overhead) and returned to start position.

This is repeated 6 times each arm, without weight, then repeated while holding 2.5 pounds

PUSH**Test description**

The applicant pushes the weight (35 pounds) on power training machine (PTM) to top of the range, holds it for 5 seconds, and then lowers the weight with control.

Test Justification

This evaluates the applicant's ability to safely control a weight similar to moving garbage bins, pushing brooms, or moving furniture.

Test Procedure

The applicant grasps the PTM handle with palms facing each other. With both feet back and core stabilized, the applicant applies pushing force to raise the weight to the top of carriage, keeping the arms bent with the elbows off the body and chest off the handle. The core should be fully activated and the chest kept low in a full forward leaning posture to avoid hyper extension or arching of the back while pushing. The weight is held at the top for 5 seconds, before being lowered with control. This is repeated an additional 2 times, for a total of 3 repetitions. The applicant is given a maximum 1 minute break between each repetition.

PULL**Test Description:**

Applicant pulls weight (50 pounds) on power training machine to top of range, holds for 5 seconds, then lowers weight with control. This is done for a total of 3 repetitions.

Test Justification:

Evaluate applicant's ability to safely control a weight similar to moving garbage bins or furniture.

Test Description:

The applicant grasps the PTM handle with palms facing each other. With both feet back and core stabilized, the applicant applies pulling force to raise the weight to the top of carriage, keeping the elbows slightly bent. The core should be fully activated and the chest up in a backward leaning posture. The weight is held at the top for 5 seconds, before being lowered with control. This is repeated an additional 2 times, for a total of 3 repetitions. The applicant is given a maximum 1 minute break between each repetition.