VALD

HUMANTRAK

MOVEMENT ANALYSIS SYSTEM

Test Guide

Understanding common testing applications with HumanTrak.

Contents

1 Introduction 2

1.1 What does HumanTrak Measure? 2

1.2 Why use HumanTrak? 2

2 Test Types 5

2.1 Summary 5

2.2 Stability / Balance Tests 6

2.2.1 Standing Posture 6

2.2.2 Single Leg Stand 7

2.2.3 Semi Tandem Stand 8

2.2.4 Tandem Stand 9

2.3 Cervical Spine Range of Motion Tests 10

2.3.1 Cervical Lateral Flexion 10

2.3.2 Cervical Flexion / Extension 11

2.4 Upper Body Range of Motion Tests 12

2.4.1 Shoulder Abduction / Adduction 12

2.4.2 Shoulder Flexion / Extension 13

2.4.3 Shoulder Internal / External Rotation 14

2.5 Lower Body Range of Motion Tests 15

2.5.1 Seated Hip Internal / External Rotation 15

2.6 Lower Body Dynamic Tests 16

2.6.1 Single Leg Squat 16

2.6.2 Squat 17

2.6.3 Sit to Stand 18

2.6.4 Stand to Sit 19

2.6.5 Overhead Squat 20

2.6.6 Drop Jump 21

2.6.7 30 Second Sit to Stand 22

2.6.8 5 Repetition Sit to Stand 23

2.6.9 Lunge 24

2.6.10 Countermovement Jump 25

2.7 Understanding HumanTrak Metrics 26

3 Troubleshooting 27

3.1 Incorrect result metrics 27

3.2 Movement tracking 27

1 Introduction

This document aims to provide practitioners with an understanding of common testing applications with HumanTrak.

This document assumes the reader has a basic knowledge of how to use HumanTrak, including setting up the hardware and software, managing profiles, running tests and accessing results. To get up to speed on these processes, refer to the VALD Support Site.

1.1 What does HumanTrak Measure?

HumanTrak measures human movement, enabling the assessment of movement quality, range of motion, balance and stability.

How does HumanTrak measure human movement?

HumanTrak uses motion capture to measure human movement.

Motion capture is the process of recording movement of objects or people, and it has many applications in sport, entertainment, military, medical sciences, and research.

For instance, sports video game developers use motion capture data acquired from real-life athletes to recreate actual movements in the game.

Similarly, the motion capture data collected by the HumanTrak system is used to create a dynamic 3D model of an individual's body.

Why does HumanTrak use motion capture?

A reliable and accurate motion capture system like HumanTrak allows the capture of more data in a faster and more accurate manner than video-based or subjective assessment methods.

For practitioners this may be the difference between capturing or missing a key piece of data.

Motion capture systems allow practitioners to work more effectively and efficiently, collecting more information reliably in a shorter period of time.

1.2 Why use HumanTrak?

The HumanTrak system can be used to assess an individual's movement quality, range of motion, balance and stability using 3D motion capture technology.

What are the benefits of using HumanTrak?

HumanTrak enables practitioners to collect objective data to strengthen clinical reasoning and engage individuals to take ownership of their rehabilitation journey.

The following HumanTrak features are used to collect, display and report test and training data:

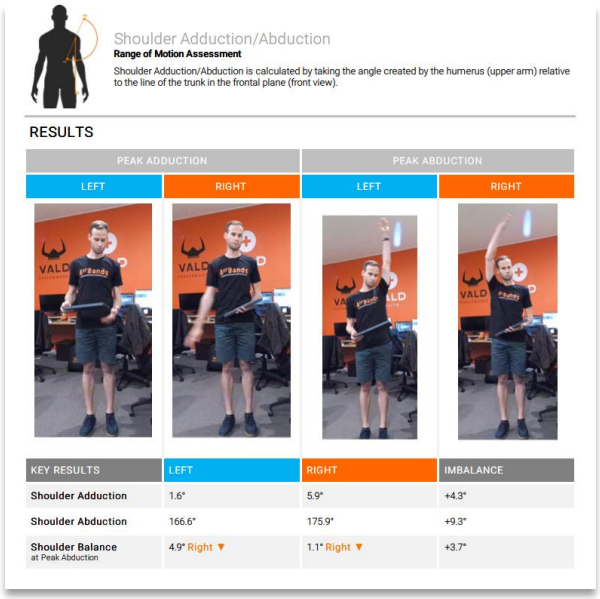
Functional assessments

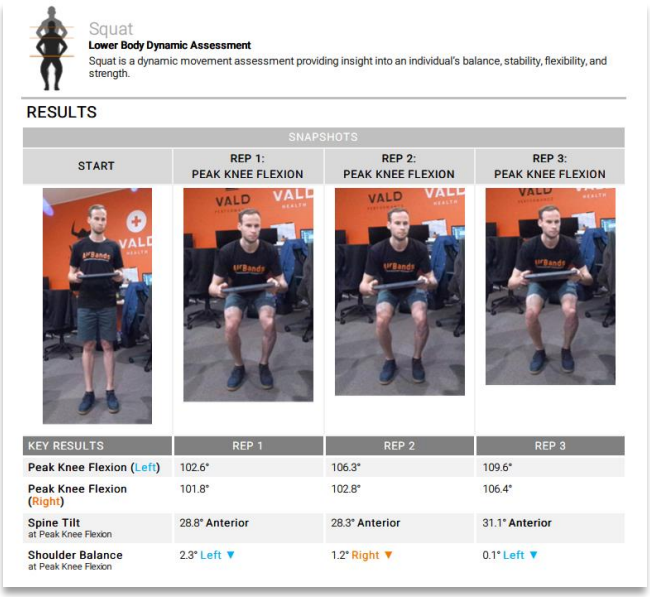
HumanTrak features a wide variety of movement assessments, including:

- Stability and balance;
- Cervical spine range of motion;
- Upper body range of motion;
- Lower body range of motion; and
- Dynamic movements.

Each assessment provides in-depth metrics and insights into compensatory movement that goes beyond what can be seen with the naked eye.

As HumanTrak measures these details, the practitioner can focus on coaching and assisting the individual through the assessment tests.





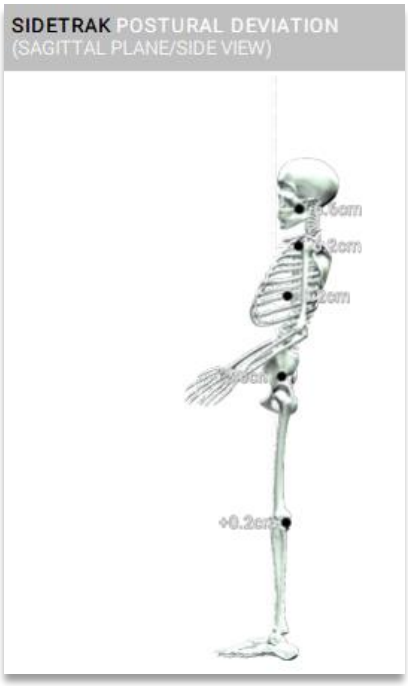
SwayTrak

SwayTrak reports Centre of Mass (COM) movement during balance tests in an easy to interpret graphic that provides a birds-eye view of COM and knee movement.

The overall sway is quantified by analysing the movement of the full body, which can be used for baseline testing and tracking changes in balance over time.

SideTrak

SideTrak provides a side view which is displayed using a 3D skeleton that updates in real-time. This view provides a quick reference to better understand the individual's posture while they are in a neutral position or completing stability and balance tests.



AutoTrainer

HumanTrak also includes an AutoTrainer feature that enables practitioners to implement interactive and engaging exercise plans for their clients.

The AutoTrainer feature includes default exercise programs and the ability for practitioners to create tailored training programs, complete with reps, sets and rest periods.

Once a program is assigned to an individual, the AutoTrainer can be used to independently guide the individual through each exercise in the program, without the need for intervention from the practitioner.

2 Test Types

This section aims to explain each HumanTrak test type so that users can better understand HumanTrak test results.

2.1 Summary

The following tests can be conducted with HumanTrak and each test is categorised based on their primary measurement outcomes.

Category	Title
Stability / Balance	Standing Posture
	Single Leg Stand
	Semi Tandem Stand
	Tandem Stand
Cervical Spine Range of Motion	Cervical Lateral Flexion
	Cervical Flexion / Extension
Upper Body Range of Motion	Shoulder Abduction / Adduction
	Shoulder Flexion / Extension
	Shoulder Internal / External Rotation
Lower Body Range of Motion	Seated Hip Internal / External Rotation
Lower Body Dynamic	Single Leg Squat
	Squat
	Sit to Stand
	Stand to Sit
	Overhead Squat
	Drop Jump
	30 Second Sit to Stand
	5 Repetition Sit to Stand
	30 Second Sit to Stand
	5 Repetition Sit to Stand
	Lunge
	Countermovement Jump

2.2 Stability / Balance Tests

HumanTrak includes the following Stability / Balance tests:

- Standing Posture
- Single Leg Stand
- Semi Tandem Stand
- Tandem Stand

2.2.1 Standing Posture

Standing Posture is a baseline postural assessment that can provide insight into an individual's structural balance, alignment, and postural strategy.

To measure:

- Peak trunk lateral flexion and pelvic lateral tilt

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in the middle of the position circle • Feet shoulder width apart • Head up • Chest tall • Arms by side	• Keeping head up • Stand still for the required time • Relax

Common Protocol Errors

Individual moving from standing posture before finishing the test.

Results

On screen metrics:	PDF report metrics:
• Trunk Lateral Flexion • Pelvis Lateral Tilt • Trunk Flexion • Neck Lateral Flexion	• Snapshots of key moments • SwayTrak • Neck Lateral Flexion • Trunk Flexion • Pelvis Lateral Tilt

2.2.2 Single Leg Stand

Single Leg Stand is a postural assessment that can provide insight into an individual's structural balance, alignment, postural strategy and imbalance.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in the middle of position circle • Feet shoulder width apart • Head up • Chest tall • Hands on hips	• Shift weight to the designated leg • Lift other foot off the floor • Keeping chest tall • Stand still for the required time • Relax

Common Protocol Errors

Individual moving the non-test leg in front of the test leg thereby blocking the camera's view of the test leg. The non-test leg should be next to or behind the test leg.

Results

On screen metrics:	PDF report metrics:
• Trunk Lateral Flexion • Pelvis Lateral Tilt • Trunk Flexion • Knee Valgus/Varus	• Snapshots of key moments • SwayTrak • Neck Lateral Flexion • Trunk Flexion • Pelvis Lateral Tilt

2.2.3 Semi Tandem Stand

Semi Tandem Stand is a baseline postural assessment that can provide insight into an individual's structural balance with a limited base of support.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in the middle of the position circle • Semi-tandem stance with toes of one-foot touching middle of required foot • Head up • Chest tall • Arms by side	• Keeping head up • Stand still for the required time • Relax

Common Protocol Errors

Individual losing balance and the test not being restarted/recaptured.

Results

On screen metrics:	PDF report metrics:
• Body Anteroposterior Range • Body Mediolateral Range • Trunk Lateral Flexion • Pelvis Lateral Tilt	• Snapshots of key moments • Centre of Mass • Pelvis Lateral Tilt • Trunk Lateral Flexion

2.2.4 Tandem Stand

Tandem Stand is a baseline postural assessment that can provide insight into an individual's structural balance with a limited base of support.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in the middle of the position circle • Tandem stance with toes of one foot touching heel of required foot • Head up • Chest tall • Arms by side	• Keeping head up • Stand still for the required time • Relax

Common Protocol Errors

Individual losing balance and the test not being restarted/recaptured.

Results

On screen metrics:	PDF report metrics:
• Body Anteroposterior Range • Body Mediolateral Range • Trunk Lateral Flexion • Pelvis Lateral Tilt	• Snapshots of key moments • Centre of Mass • Pelvis Lateral Tilt • Trunk Lateral Flexion

2.3 Cervical Spine Range of Motion Tests

HumanTrak cervical spine range of motion tests include:

- Cervical Lateral Flexion
- Cervical Flexion / Extension

2.3.1 Cervical Lateral Flexion

Cervical Lateral Flexion is a range of motion assessment that provides insight into the individual's neck flexibility.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in the middle of the position circle • Feet shoulder width apart • Head up • Chest tall • Arms by side	• Keeping rest of body still • Bend head to the side • Aim to touch ear to the shoulder • Repeat in opposite direction • Repeat for the required reps

Common Protocol Errors

Individual moving their head forward and backward as well as laterally.

Individual bending their torso left/right while laterally flexing their neck as a way to inflate their results.

Results

On screen metrics:	PDF report metrics:
• Neck Lateral Flexion • Trunk Lateral Flexion • Trunk Flexion	• Snapshots of key moments • Neck Lateral Flexion • Trunk Flexion • Trunk Lateral Flexion • Left/Right Imbalance

2.3.2 Cervical Flexion / Extension

Cervical Flexion/Extension is a range of motion assessment that provides insight into the individual's neck flexibility.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in the middle of the position circle • Feet shoulder width apart • Head up • Chest tall • Arms by side	• Keeping rest of body still • Tilt head forward • Aim to touch chin to the chest • Then tilt head backward • Aim to touch back of head to the back • Repeat for the required reps

Common Protocol Errors

Individual moving their head forward and backward as well as laterally.

Individual bending their torso forward/backward while flexing their neck as a way to inflate their results.

Results

On screen metrics:	PDF report metrics:
• Neck Flexion-Extension • Trunk Lateral Flexion • Neck Lateral Flexion • Trunk Flexion	• Snapshots of key moments • Neck Flexion-Extension • Trunk Flexion • Trunk Lateral FlexionX

2.4 Upper Body Range of Motion Tests

HumanTrak upper body range of motion tests include:

- Shoulder Abduction / Adduction
- Shoulder Flexion / Extension
- Shoulder Internal / External Rotation

2.4.1 Shoulder Abduction / Adduction

Shoulder Abduction/Adduction is a range of motion assessment that provides insight into the individual's shoulder flexibility and symmetry.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in the middle of the position circle • Feet shoulder width apart • Head up • Chest tall • Arms by side • Thumb pointed out	• Keeping arm straight • Raise arm up and out to side • Then back towards side of head • Then lower arm down, moving arm in front of the body • Repeat for the required reps

Common Protocol Errors

Thumb not pointing up when completing the movement - this improves ROM compared to thumb down.

Results

On screen metrics:	PDF report metrics:
• Shoulder Adduction-Abduction • Trunk Lateral Flexion • Trunk Flexion	• Snapshots of key moments • Shoulder Adduction-Abduction • Trunk Lateral Flexion • Left/Right Imbalance

2.4.2 Shoulder Flexion / Extension

Shoulder Flexion/Extension is a range of motion assessment that provides insight into the individual's shoulder flexibility and symmetry.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in the middle of the position circle • Feet shoulder width apart • Head up • Chest tall • Arms by side	• Keeping arm straight • Raise arm up and in front of the body • Then back towards side of head • Then lower arm down, moving arm past side of the body • Repeat for the required reps

Common Protocol Errors

The camera's view of the arm being blocked by the torso during extension.

Results

On screen metrics:	PDF report metrics:
• Shoulder Flexion-Extension • Trunk Lateral Flexion • Trunk Flexion	• Snapshots of key moments • Shoulder Flexion-Extension • Trunk Lateral Flexion • Left/Right Imbalance

2.4.3 Shoulder Internal / External Rotation

Shoulder Internal/External Rotation is a range of motion assessment that provides insight into the individual's shoulder flexibility and symmetry.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in the middle of the position circle • Feet shoulder width apart • Head up • Chest tall • Bend elbow 90 degrees and then raise arm out to side, to shoulder height	• Keeping arm at shoulder height • Rotate arm so hand moves toward ground • Rotate arm backwards so hand moves towards ceiling • Repeat for the required reps

Common Protocol Errors

The individual’s elbow not being flexed to 90°.

Results

On screen metrics:	PDF report metrics:
• Shoulder Internal-External Rotation • Trunk Lateral Flexion • Trunk Flexion	• Snapshots of key moments • Shoulder Internal-External Rotation • Trunk Lateral Flexion • Left/Right Imbalance

2.5 Lower Body Range of Motion Tests

The HumanTrak lower body range of motion test is the:

- Seated Hip Internal / External Rotation

2.5.1 Seated Hip Internal / External Rotation

Hip Internal/External Rotation is a range of motion assessment that provides insight into the individual's hip flexibility and symmetry.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Sit towards front of a chair in the middle of the position circle • Head up • Chest tall	• Lift leg just off the ground • Keeping knee pointing forward • Rotate leg so foot moves away from other leg • Then rotate leg so foot moves towards other leg • Repeat for required reps

Common Protocol Errors

Confusion what is internal and external rotation.

Results

On screen metrics:	PDF report metrics:
• Hip Internal-External Rotation	• Snapshots of key moments • Hip Internal-External Rotation • Left/Right Imbalance

2.6 Lower Body Dynamic Tests

HumanTrak lower body dynamic tests include:

- Single Leg Squat
- Squat
- Sit to Stand
- Stand to Sit
- Overhead Squat
- Drop Jump
- 30 Second Sit to Stand
- 5 Repetition Sit to Stand
- Lunge
- Countermovement Jump

2.6.1 Single Leg Squat

Single Leg Squat is a dynamic movement assessment that provides insight into an individual's balance, stability, flexibility, and strength.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in the middle of the position circle • Feet shoulder width apart • Head up • Chest tall • Hands on hips	• Shift weight to designated leg • Lift other foot off floor • Keeping chest tall • Bend down into a squat • Keeping knee in line with toes • Then push through heel and stand up • Repeat for required reps

Common Protocol Errors

Foot pointing excessively out.

Individual rotating with respect to the camera during the movement.

Hands not on hips.

Results

On screen metrics:	PDF report metrics:
• Trunk Lateral Flexion	• Snapshots of key moments

• Knee Flexion • Pelvis Lateral Tilt • Hip Flexion-Extension • Hip Adduction-Abduction • Trunk Flexion	• Knee Flexion • Total Knee Distance • Knee Valgus/Varus • Trunk Lateral Flexion

2.6.2 Squat

Squat is a dynamic movement assessment providing insight into an individual's balance, stability, flexibility, and strength.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in the middle of the position circle • Feet shoulder width apart • Head up • Chest tall • Hands on hips	• Keeping chest tall • Bend down into a squat • Keeping knees in line with toes • Then push through heels and stand up • Repeat for required reps

Common Protocol Errors

Feet pointing excessively out.

Individual rotating with respect to the camera during the movement.

Hands not on hips.

Results

On screen metrics:	PDF report metrics:
• Trunk Lateral Flexion • Knee Flexion • Pelvis Lateral Tilt • Knee Anterior-Posterior Translation • Hip Flexion-Extension • Hip Adduction-Abduction	• Snapshots of key moments • Knee Flexion • Trunk Flexion • Trunk Lateral Flexion

2.6.3 Sit to Stand

Sit to Stand is a pathway assessment to the 30 Second Sit to Stand Test. This test provides information on functional leg power and strength.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Sit towards front of a chair in the middle of the position circle • Feet should width apart • Head up • Chest tall • Arms crossed on chest	• Keeping head up • Lean forward • Then push through heels to stand up

Common Protocol Errors

Individual rotating with respect to the camera during the movement.

Hands not on hips.

Results

On screen metrics:	PDF report metrics:
• Knee Flexion • Pelvis Lateral Tilt • Knee Total Distance	• Snapshots of key moments • Knee Flexion-Extension • Knee Displacement • Trunk Lateral Flexion • Knee-Ankle Separation Ratio • Hip Flexion-Extension • Trunk Flexion

2.6.4 Stand to Sit

Stand to Sit is an assessment on how well an individual can sit down without external support. This test provides information on lower limb stability, balance and strength.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in the middle of the position circle • Feet shoulder width apart • Head up • Chest tall • Arms crossed on chest	• Keeping head up • Bend hips and knees and sit down on chair

Common Protocol Errors

Individual rotating with respect to the camera during the movement.

Hands not on hips.

Results

On screen metrics:	PDF report metrics:
• Knee Flexion • Trunk Flexion • Trunk Lateral Flexion • Knee Total Distance	• Snapshots of key moments • Knee Flexion-Extension • Knee Displacement • Trunk Lateral Flexion • Knee-Ankle Separation Ratio • Hip Flexion-Extension • Trunk Flexion

2.6.5 Overhead Squat

Overhead squat is a dynamic movement assessment providing insight into an individual's balance, stability, flexibility, and strength.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in the middle of the position circle • Feet shoulder width apart • Head up • Chest tall • Holding object in hands - wider than shoulder width apart • Raise arms above head	• Keeping chest tall • Bend down into a squat • Keeping knees in line with toes • Then push through heels and stand up • Repeat for required reps

Common Protocol Errors

Feet pointing excessively out.

Individual rotating with respect to the camera during the movement.

Hands not on hips.

Results

On screen metrics:	PDF report metrics:
• Trunk Lateral Flexion • Knee Flexion • Pelvis Lateral Tilt • Trunk Flexion	• Snapshots of key moments • Knee Flexion • Trunk Flexion • Trunk Lateral Flexion

2.6.6 Drop Jump

Drop Jump is a dynamic assessment used to assess coordination, balance, joint stability, and power.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Stand in the middle of the position circle and landing zone • Then stand on top of box • Hands on hips	• Keeping chest tall • Step off box • Land softly on both feet • Then jump as high as possible • Then land softly and stand up

Common Protocol Errors

Users placing the box on the position circle instead of just behind the circle.

Individual landing and pausing prior to performing the jump.

Individual rotating with respect to the camera after jumping.

Results

On screen metrics:	PDF report metrics:
• Knee Flexion • Hip Flexion • Knee-Ankle Separation Ratio (Initial and at Peak Knee Flexion)	• Snapshots of key moments • Knee-Ankle Separation Ratio • Hip Flexion-Extension • Knee Flexion • Ankle Dorsiflexion

2.6.7 30 Second Sit to Stand

30 Second Sit to Stand is an assessment that provides information on function leg power and strength of participants.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in middle of position circle in front of chair • Feet shoulder width apart • Head up • Chest tall • Sit down on chair • Cross arms across chest	• Keeping head up • Stand up and sit down as many times as possible for 30 seconds • Relax

Common Protocol Errors

Individual rotating with respect to the camera during the movement.

Hands not on hips.

Results

On screen metrics:	PDF report metrics:
• Total Repetitions • Knee Flexion • Trunk Flexion • Knee Total Distance	• Snapshots of key moments • Total Repetitions • Knee Flexion-Extension • Knee Total Distance • Trunk Lateral Flexion • Knee-Ankle Separation Ratio • Hip Flexion-Extension • Trunk Flexion

2.6.8 5 Repetition Sit to Stand

5 Repetition Sit to Stand is an assessment that provides information on function leg power and strength of participants.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in middle of position circle in front of chair • Feet shoulder width apart • Head up • Chest tall • Sit down on chair • Cross arms across chest	• Keeping head up • Stand up and sit down 5 times as quickly as possible • Relax

Common Protocol Errors

Individual rotating with respect to the camera during the movement.

Hands not on hips.

Results

On screen metrics:	PDF report metrics:
• Knee Flexion • Trunk Flexion • Trunk Lateral Flexion • Knee Total Distance	• Snapshots of key moments • Knee Flexion-Extension • Knee Total Distance • Trunk Lateral Flexion • Knee-Ankle Separation Ratio • Hip Flexion-Extension • Trunk Flexion

2.6.9 Lunge

Lunge is a dynamic assessment that provides insight into an individual's strength, flexibility, and left/right symmetry.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in the middle of the position circle • Feet shoulder width apart • Head up • Chest tall • Hands on hips • Step out with one foot with weight through front heel and back toes	• Keeping chest straight • Lower knee down • Then push through heel and stand up • Repeat for required reps

Common Protocol Errors

Individual not keeping hips facing the camera when lunging

Results

On screen metrics:	PDF report metrics:
• Trunk Lateral Flexion • Trunk Flexion • Knee Flexion • Knee Valgus-Varus • Hip Flexion-Extension • Trunk Flexion	• Snapshots of key moments • Hip Flexion • Knee Flexion • Trunk Flexion • Trunk Lateral Tilt • Percent Asymmetry

2.6.10 Countermovement Jump

Countermovement Jump is a dynamic assessment that provides a measure of the individual's explosive lower-limb power.

Test Protocol

1. Starting position:	2. Instruction for the individual:
• Standing in the middle of the position circle • Feet shoulder width apart • Head up • Chest tall • Hands on hips	• Keeping chest tall • Quickly bend down into a squat • Then quickly push through heels and jump up • Then land softly • Repeat for the required reps

Common Protocol Errors

Individual rotating with respect to the camera during the movement.

Hands not on hips.

Results

On screen metrics:	PDF report metrics:
• Trunk Lateral Flexion • Knee Flexion • Knee Valgus-Varus • Trunk Flexion	• Snapshots of key moments • Jump Height • Trunk Flexion • Trunk Lateral Tilt • Hip Flexion • Knee Flexion • Knee Valgus/Varus • Percent Asymmetry

2.7 Understanding HumanTrak Metrics

The following metrics are explained on the VALD Support Site. Follow the links to learn more about each metric.

Ankle Lateral Shift	Knee Translation
Ankle Plantarflexion	Knee Valgus
Asymmetry	Neck Displacement
Body Tilt	Neck Flexion
Centre of Mass (COM)	Neck Lateral Flexion
Elbow Flexion	Pelvic Displacement
Head Displacement	Pelvic Lateral Tilt
Hip Abduction	Shoulder Abduction
Hip Flexion	Shoulder Flexion
Hip Internal Rotation	Shoulder Internal Rotation
Jump Height	Sternum Displacement
Knee Ankle Separation Ratio	Thoracic Rotation
Knee Deviation	Trunk Flexion
Knee Displacement	Trunk Lateral Flexion
Knee Flexion	

3 Troubleshooting

3.1 Incorrect result metrics

Is the individual facing the camera?

Many metrics reported in HumanTrak rely on projection to 2D anatomical planes (i.e., the sagittal, coronal, and transverse planes).

In HumanTrak the location of these planes is based on the orientation of the Azure Kinect camera. Therefore, it is critical the individual being tested directly faces the camera to ensure the camera's anatomical planes line up correctly with the individual's body.

Are the test protocols being followed?

Deviations from the test protocol can impact the results. Therefore, it is important to closely follow the HumanTrak test protocols.

Is the individual standing the correct distance from the camera?

Prior to beginning any HumanTrak test, the individual being tested must stand the appropriate distance from the camera. This distance differs which each test.

A centre of mass display on the testing screen indicates the correct location and where the individual is standing relative to the correct location.

3.2 Movement tracking

The Azure camera relies on a Time-of-Flight principle to measure depth and machine learning algorithm to determine body location. Therefore, the following factors may affect its accuracy:

- The camera being setup incorrectly
    - Check camera has been setup as instructed in the VALD Support Site.
- The individual is turned or oriented away from the camera during testing.
- The individual is standing far away from the camera
- The camera being cold
    - In colder environments the camera may require 30 minutes to warm up
- Environments or body shapes that are significantly different than the data used to train the Azure Kinect's body detection algorithm
- Movement speed that is faster than the Azure Kinect camera can detect
    - The individual may need to slow down their movements.
- The individual wearing glasses that obscures their face from the Azure Kinect camera
- Excessive ambient background light
- Low brightness in the capture area.