

ErgoAnalysis™ MVC measurement protocol



- Maximum Voluntary Contraction (MVC) values are set to relate the physical load of the work to the maximum muscle-specific force of the participant
- These MVC-tests can be conducted in actual work environments

Getting ready

Equipment:

- Length adjustable (2-3m) unstretchable strap
- Rubber handle or small towel to grip between the strap and hand
- Jamar grip strength dynamometer

Isometric tests:

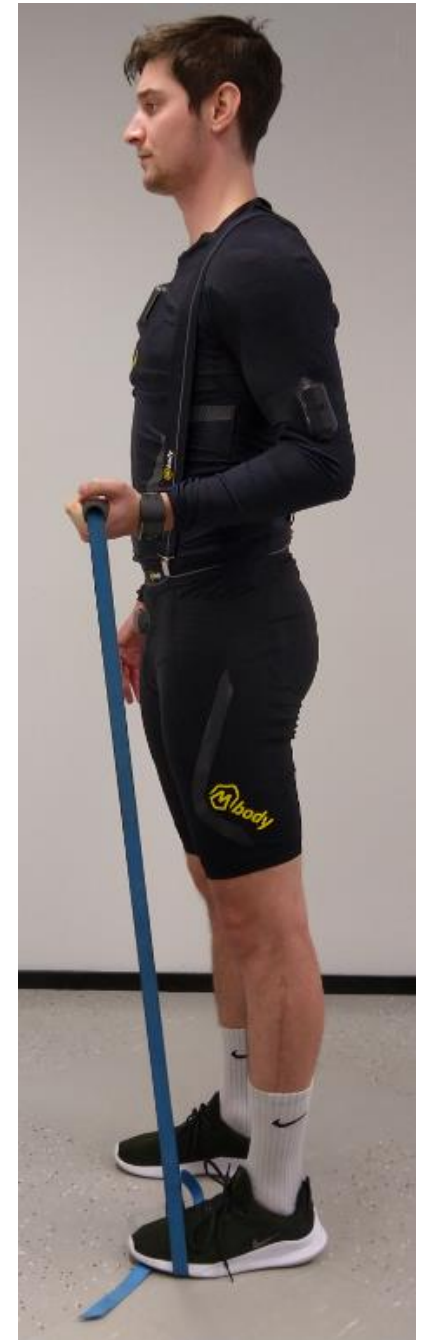
- Elbow flexion (biceps & forearm)
- Shoulder elevation
- Shoulder abduction
- Knee extension
- Hip extension
- Repeated squats
- Hand grip strength

For every test:

- 1 warm-up trial on appr. 50% effort level from the maximum
- 2 actual MVC trials per movement, isometric maximum contraction duration 5-8 seconds
- 1 minute rest in between the two trials

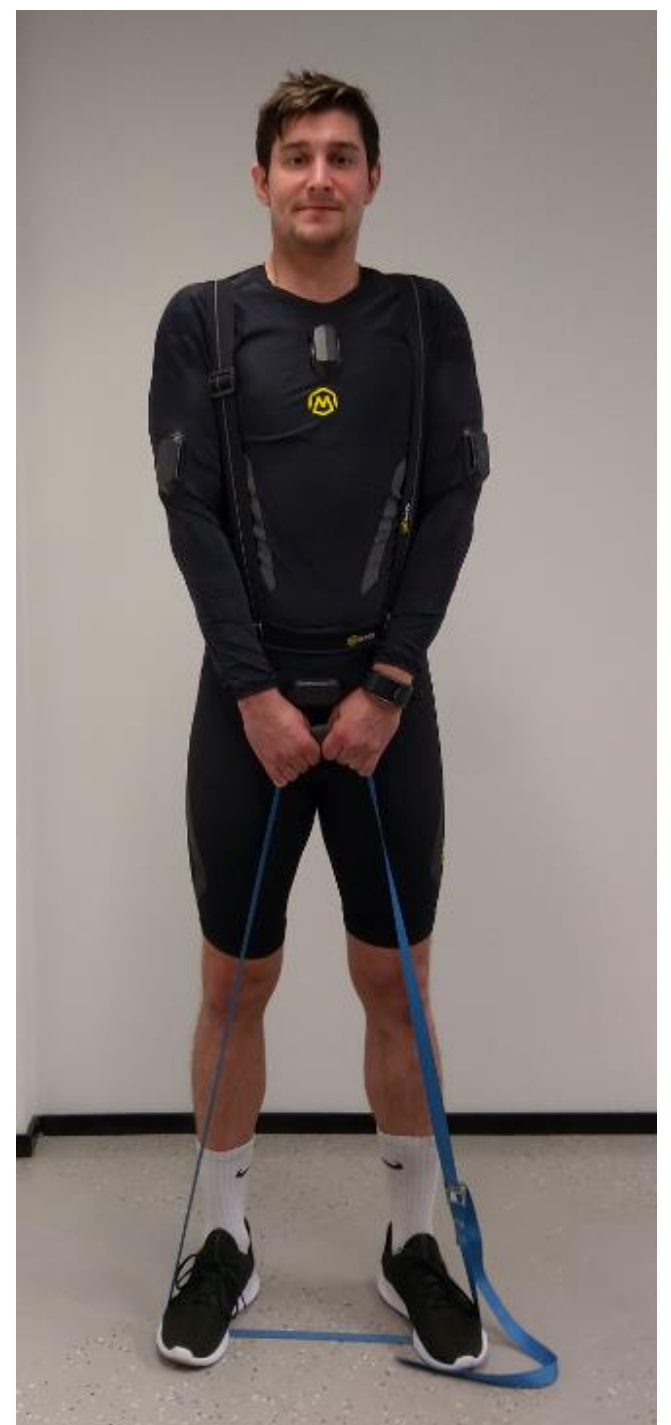
Biceps & elbow tests for right and left arm

- Stand legs apart at shoulder line. Keep your body straight.
- Put the strap under your foot
- Set elbow to 90-degree angle, the upper arm downwards firmly attached to the body
- Squeeze hand and flex elbow upwards as hard as possible for 5-8 seconds
- NOTE! The shoulder should not elevate and the body should not bend during performance.



Trapezius test

- Stand legs apart at shoulder line
- Put the strap under your feet
- Adjust the length of the strap tight so that your arms are straight
- Pull shoulders up towards your ears as hard as possible for 5-8 seconds



Deltoideus test for right and left shoulder

- The strap is under the supervisor's foot
- Participant's shoulder is in 90-degree abduction
- Back is loose from the chair, knees in 90-degree angle
- Participant lifts the arm upwards (see arrow) as hard as possible for 5-8 seconds



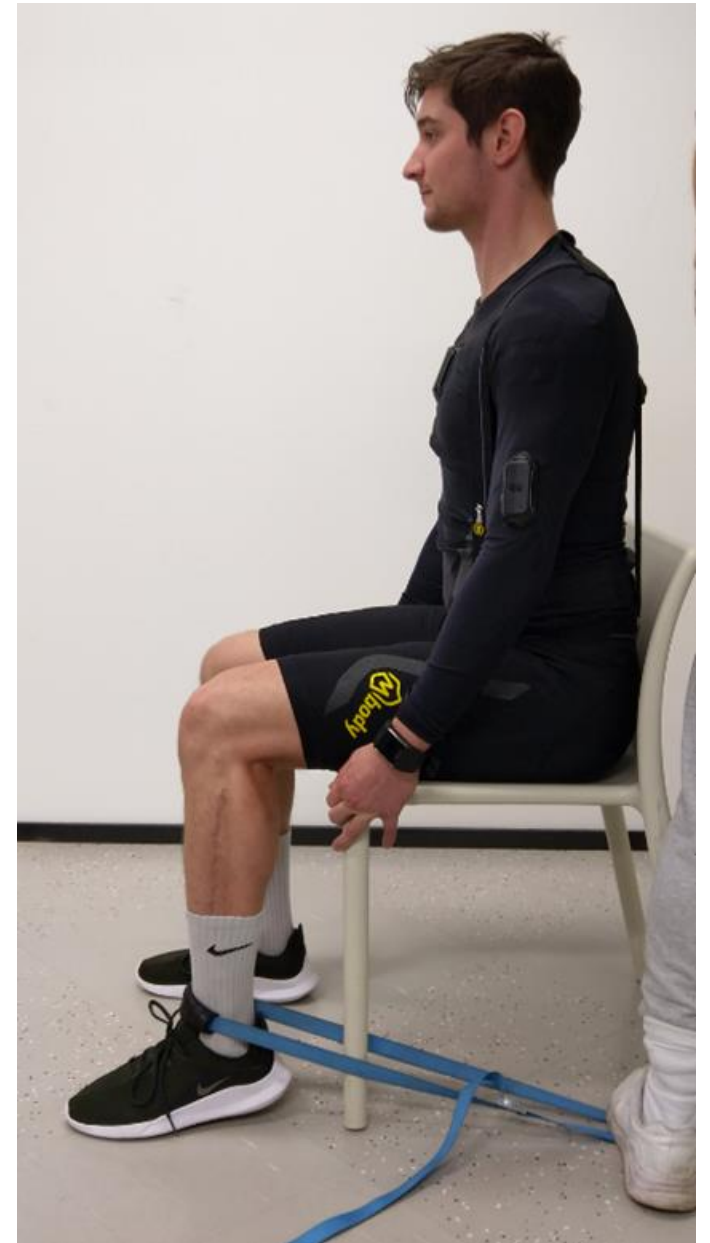
Hand grip strength

- Sit back straight
- Knees in 90-degree angle and feet on the floor
- Hold the forearm at a 90-degree angle, the upper arm downwards firmly attached to the body
- Squeeze the dynamometer as hard as possible for 5-8 seconds



Quadriceps test for right and left foot

- Sit straight, back apart from the chair, knees in 90-degree angle
- Strap is around the ankle
- Participant is extending the leg as hard as possible for 5-8 seconds



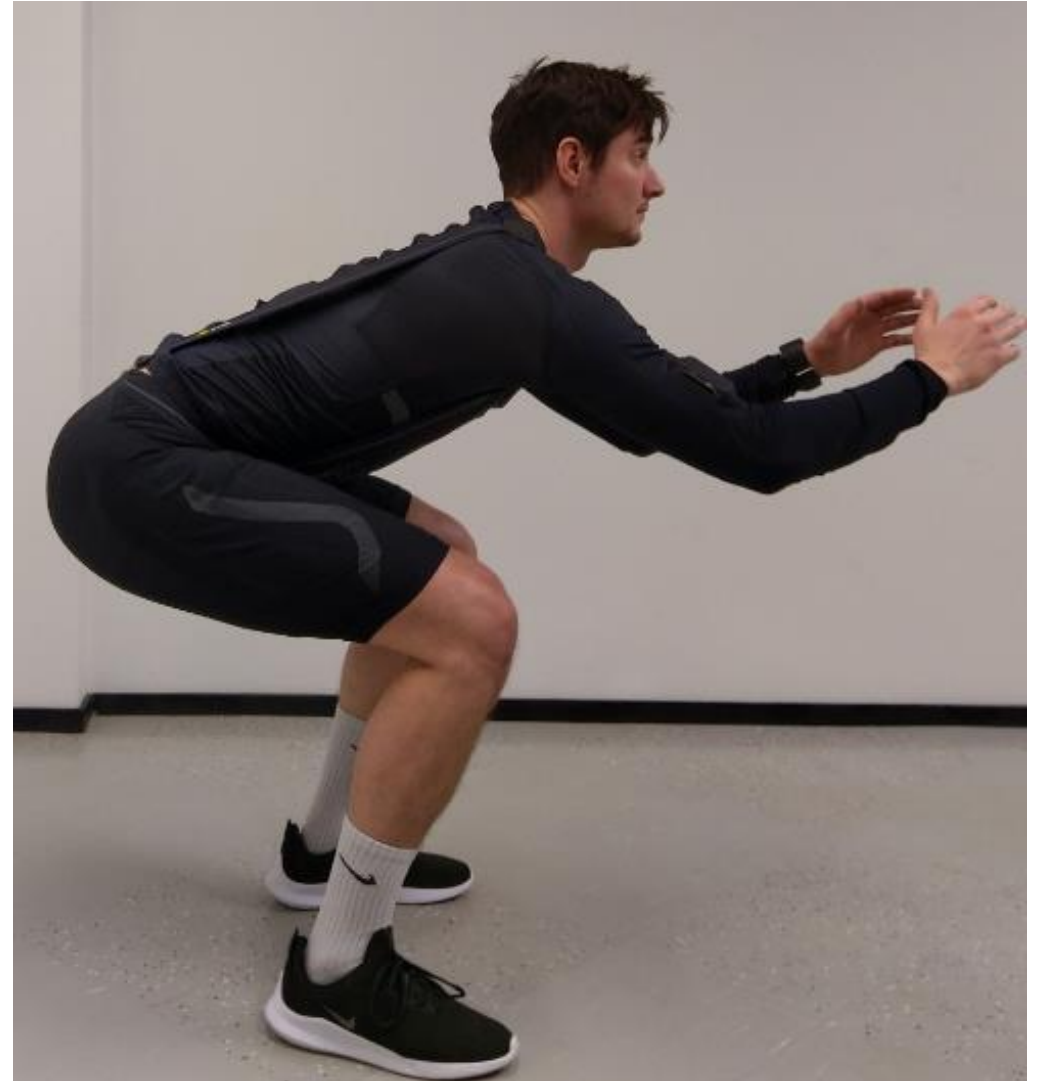
Hamstring and gluteus test for right and left foot

- Participant is leaning towards the wall (see picture)
- Bring the heel as far back as possible, keeping the leg straight, as the supervisor is resisting the movement
- Hold for 5-8 seconds



Squat test

- Participant performs 10 squats at his/her own pace
- Knees will flex to max 90-degree angle
- Heels will stay on floor



Shoulder and trunk movement offset calibration



- Hand movement offset calibration: Participant raises both hands sideways to 90-degree angle
- Trunk movement offset calibration: While participants both arms are lifted sideways to 90-degree angle, supervisor holds the front MCell in upright position with his/her fingers
- Hold this position stable for 15 seconds
- NOTE: It is recommended to perform this set of movement offset calibration also in the end of whole measurement test session with the video on. The purpose is to synchronize video with the other data. Particularly in long measurements (e.g. 1,5 hours), the difference between video and other data timing may be 4-10 seconds.