

DANU Asymmetry & Metrics

Protocol:

Timed Up and Go (TUG) Test

- Distance of 3 meters.
- Can assess baseline mobility, speed, dynamic balance, and symmetry.
- DANU measures Spatiotemporal parameters, Footstrike mechanics, and Centre of Pressure.

2-minute walk

- Assess endurance and functional capacity during walking, when continuously walking for 2 minutes on a flat surface.
- Can assess baseline mobility, speed, dynamic balance, total distance, and symmetry.
- DANU measures Spatiotemporal parameters, Footstrike mechanics, and Centre of Pressure.

Single Leg Stance Test

- Assess balance and stability, injured Vs. Non-injured leg.
- 30 seconds on each leg.
- DANU measures area of Ellipse, width & length of Ellipse, mediolateral range, anterior-posterior range, total displacement, and DANU stability index.

Double Leg Stance Test

- Assess balance and stability, injured Vs. Non-injured leg.
- 30 seconds in total.
- DANU measures area of Ellipse, width & length of Ellipse, mediolateral range, anterior-posterior range, total displacement, and DANU stability index.

Stair Walking Test

- Assess functional lower limb strength, mobility, and dynamic balance during common gait
- Aim for 8-10 steps, prohibited patients have the required number of steps.
- DANU measures spatiotemporal parameters, Footstrike mechanics, Centre of Pressure, and time to complete task.
- Can be both up and down the stairs, up to practitioner.

List of full metrics:

Gait:

- Spatiotemporal parameters:
 - Stride Time
 - Contact Time
 - Swing Time
 - Step Length
 - Stride Length
 - Gait Velocity
 - Step Time
 - Double Support Time
 - Cadence
 - Swing-Stance Ratio
 - Step by Step Asymmetry % for each metric
- Centre of Pressure (CoP) Parameters:
 - Video visualisation with CoP trajectory
 - Accumulation of Initial contacts, final contacts, and CoP trajectories for each step.
 - CoP Velocity

- Anterior-posterior range
- Mediolateral range
- Length of gait line
- Other parameters:
 - Total load – Accumulation of tibial accelerations throughout the session in all three axes.
 - Overall limb dominance – Determines how dominant a particular leg is (longer contact times implies more dominant action of that leg).
 - Duty Factor – this is a ratio between contact time and stride time.
 - Peak Tibial Acceleration

Balance Assessments:

- DANU stability index – A score we have developed based on the metrics collected, where a 10 is considered perfectly stable with almost no movement and a 0 indicating high instability and a lot of movement.
- Area of Ellipse
- Width of Ellipse.
- Length of Ellipse.
- Mediolateral range
- Anterior-posterior range
- Total Displacement.