

Outcomes Measures To Establish Evidence For Balance Retraining:

The Non-Ambulatory Patient

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Manual Muscle Testing

- Trunk Flexors
 - Rectus Abdominus
 - Int / Ext Obliques
- Trunk Extensors
 - Erector Spinae
- Trunk Rotators
 - R: R internal oblique & L external oblique
 - L: L internal oblique & R external oblique
- Pelvic elevation
 - Quadratus lumborum

Trunk Strength MMT

- Insert video...

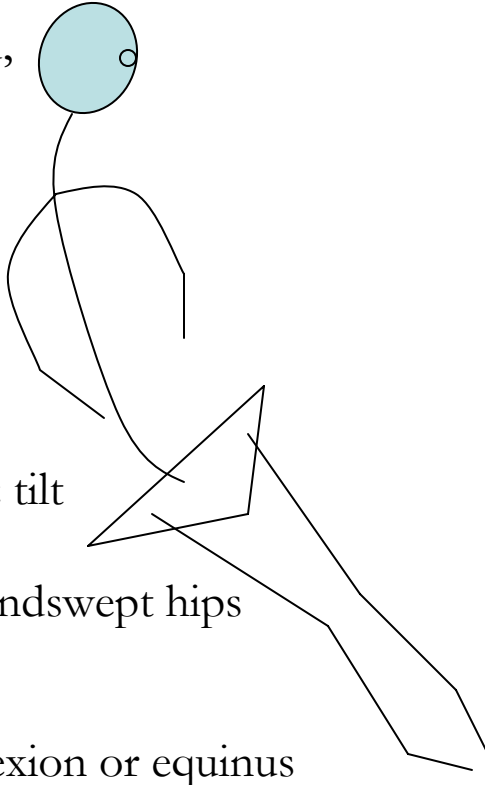
Seated Posture:

Extensor Synergy Spasticity

vs

Normalized Tone

Reversal of cervical
Lordosis;
Protracted head,
shoulders

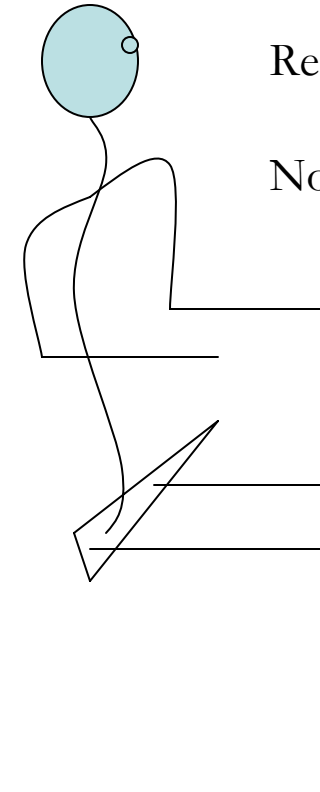


Reversal of
lumbar lordosis

Posterior Pelvic tilt

Adducted or windswept hips

Ankle plantarflexion or equinus



Retracted shoulders

Normal spinal curvature

Anterior Pelvic Tilt

Neutral hip
and ankle
position

Balance Measures: Non-ambulatory

- Sit To Stand Test
- Seated Multidirectional Reach Test
- Standing Functional Reach Test
- Seated Nudge / Push Test
- Berg (seated portion)
- Static sit unsupported
 - Reach to side
 - Reach across midline
 - Ability to don/doff a coat in seated position
- Ability to perform arm raises in sitting (Sitting Arm Raise Test). Document # reps in 15 seconds, unilateral or bilateral arm raises, and shoulder ROM.

Seated Chair Stand Test (Sit to Stand Test)

- Straight back chair without arms (17-18")
- Sit to Stand 10 times without arms
 - <20 seconds = nonfaller
 - >20 seconds = faller
- OR do 5 reps: <10 seconds is normal
 - <15 sec is normal for older adults
 - >15 seconds is the cutoff for identifying fall risk in older adults
- Norm for 60-89 year old: 13.4 sec +/- 2.2 sec

Sit to Stand Test

- Insert video..

Alternate Seated Chair Stand Test (Sit to Stand Test) – max # in 30 sec

Chair Stand Test (number of stands)							
AGE \ SEX	70-74	65-69	70-74	75-79	80-84	85-89	90-94
Normal Range for Men	14-19	12-18	12-17	11-17	10-15	8-14	7-12
Normal Range for Women	12-17	11-16	10-15	10-15	9-14	8-13	4-11

Normal range is the middle 50% of each age group.

Standing Functional Reach test

- 10 inches = unlikely to fall
- 6-10 inches = 2x more likely to fall
- 1-6 inches = 4x more likely to fall

Reference: Duncan PW, Weiner DK, Chandler J, Studenski S. Functional Reach: a new clinical measure of balance. J Gerontol 1990;45:M192-7.

Standing Functional Reach Test – Normative Values

Age (years)	Males (in)	Females (in)
20-40	16.73	14.64
41-69	14.98	13.81
70-87	13.16	10.47

Duncan 1990

<http://www.nursingceu.com/NCEU/courses/balancelr/>

Seated Multidirectional Reach Test

- Insert MDRT video here...

Seated Nudge / Push Test

- Difficult to reproduce consistently
- Poor interrater and intrarater reliability
- Gives therapist information to help develop exercise plan, but offers poor reproducibility
- In seated position, therapist challenges flexion, extension, side bending, and rotation.

Seated Nudge / Push Test

- Insert video here...

Berg Balance Test (seated portion)

- 14 criteria, only the first 5 criteria are typically relevant to non-ambulatory population
 - Sitting to Standing
 - Standing Unsupported (2 min)
 - Sitting unsupported (2 min)
 - Standing to Sitting
 - Transfers
- Ceiling effect, not very discriminating as an outcome measure for a non-ambulatory patient.