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# Comprehensive Examination on Mobility Functions for Chronic Stroke Patients: A Case Series

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## Disabilities of Stroke

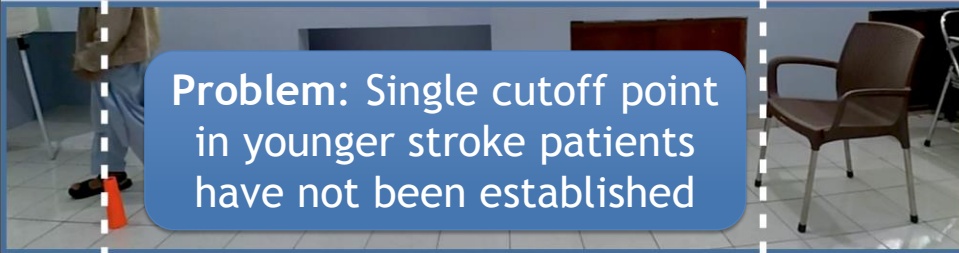


Zorowitz RD, Baerga E, Cuccurullo SJ. Stroke. In: Cuccurullo SJ, editor. Physical medicine and rehabilitation board review. 3rd ed. New York (NY): Demos medical Publishing; 2015. p. 1-52.  
 Pollock A, Baer G, Campbell P, Pl C, Forster A, Morris J, et al. Physical rehabilitation approaches for the recovery of function and mobility following stroke. Cochrane Database Syst Rev. 2014;Apr 22(4).  
 Winstein CJ, Stein J, Arena R, Bates B, Cherner LR, Cramer SC, et al. Guidelines for Adult Stroke Rehabilitation and Recovery: A Guideline for Healthcare Professionals from the American Heart Association/American Stroke Association. Vol. 47, Stroke. 2016. p.98-169.

## Methods: Mobility Assessment

### Timed Up and Go (TUG) Test

3 meter distance



Problem: Single cutoff point in younger stroke patients have not been established

Turning

Gait 1 & 2

Stand & Sit

$\geq 13.5s$

$\geq 65$  yrs

↑ Fall

Risk

Barry E, Galvin R, Keogh C, Horgan F, Fahey T. Is the Timed Up and Go test a useful predictor of risk of falls in community dwelling older adults: A systematic review and meta-analysis. BMC Geriatr [Internet]. 2014;14(1):1-14. Available from: BMC Geriatrics  
Podsiadlo D, Richardson S. The Timed Up and Go: A test of basic functional mobility for frail elderly persons. J Am Ger Soc. 1991;142:8.

Expande

## Sample Characteristics

	S1	S2	S3	HC1	HC2	HC3	HC4	HC5	p-value
Age	50	54	41	43	42	53	54	45	1.000
Height	180	161	166	168.5	168.5	169	162	170	0.786
Weight	78	61	63	74	76.5	65.5	69	96	0.393
TUG	19.86	16.03	18.31	11.26	8.94	9.72	10.23	8.36	<b>0.036</b>
Hemi- paretic	Right	Right	Right						
Brunn- strom	4	5	4						
Times	2x	1x	1x						
Since	7 mo	43 mo	7 mo						

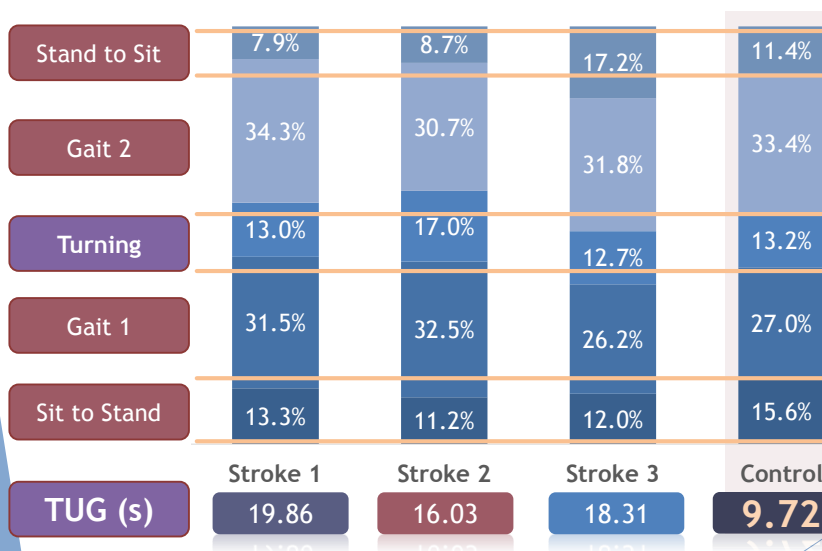
**\*\*Notes:**

S - Stroke Subjects

HC - Healthy Controls

Statistical test - Mann Whitney b/w 2 groups

## Results: Expanded Timed Up and Go



## Turning Analysis

S1 Right Hemiparesis	S2 Right Hemiparesis	S3 Right Hemiparesis
Brunnstrom 4	Brunnstrom 5	Brunnstrom 4
Right Turn Direction	Left Turn Direction	Right Turn Direction
Right First Stance	Right First Stance	Right First Stance
Spin Turn Strategy	Step Turn Strategy	Spin Turn Strategy
4 Steps	4 Steps	4 Steps
Turn Time: 2753 ms	Turn Time: 2786 ms	Time: 2085 ms

## Discussion - Observable Aspects

### Expanded Timed Up and Go

- Positional Change
- Gait Pattern
- Turning Execution
- Visuospatial Perception
- Dynamic Balance

### Comprehensive Stroke ICF Core Set

#### Body Function

- b140 Attention Functions
- b144 Memory Functions
- b260 Proprioceptive Functions
- b270 Sensory Functions Related to Temperature and Other Stimuli
- b710 Mobility of Joint Functions
- b715 Stability of Joint Functions
- b730 Muscle Power Functions
- b735 Muscle Tone Functions
- b740 Muscle Endurance Functions
- b760 Control of Voluntary Movement Functions
- b770 Gait Pattern Functions

#### Body Structure

- s110 Brain
- s720 Shoulder Region
- s730 Upper Extremity
- s750 Lower Extremity

#### Activity & Participation

- d410 Changing Basic Body Position
- d415 Maintaining a Body Position
- d450 Walking

## Conclusion

A simple modification would transform TUG into a powerful tool to assess mobility over time

### Patient

Acknowledge progress towards functional recovery

Improves confidence as they observe changes in their gait patterns

### PMR

Specific strengthening program for Paretic Limb or Healthy Limb

Target specific muscle group such as hip abductors

Recordings could use any kind of camera as time is the outcome rather than angles

Further study is required to have a single time cutoff for stroke patients



*“Do not simply add **years** to their **life**,  
but strive to add **life** onto their  
remaining **years**”*

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