

Physical Therapy Management of a Patient with a Transtibial Amputation Using an Over-Ground Body Weight Support System: A Case Report

E Kelly, BS, DPT Student

University of New England, Portland, Maine

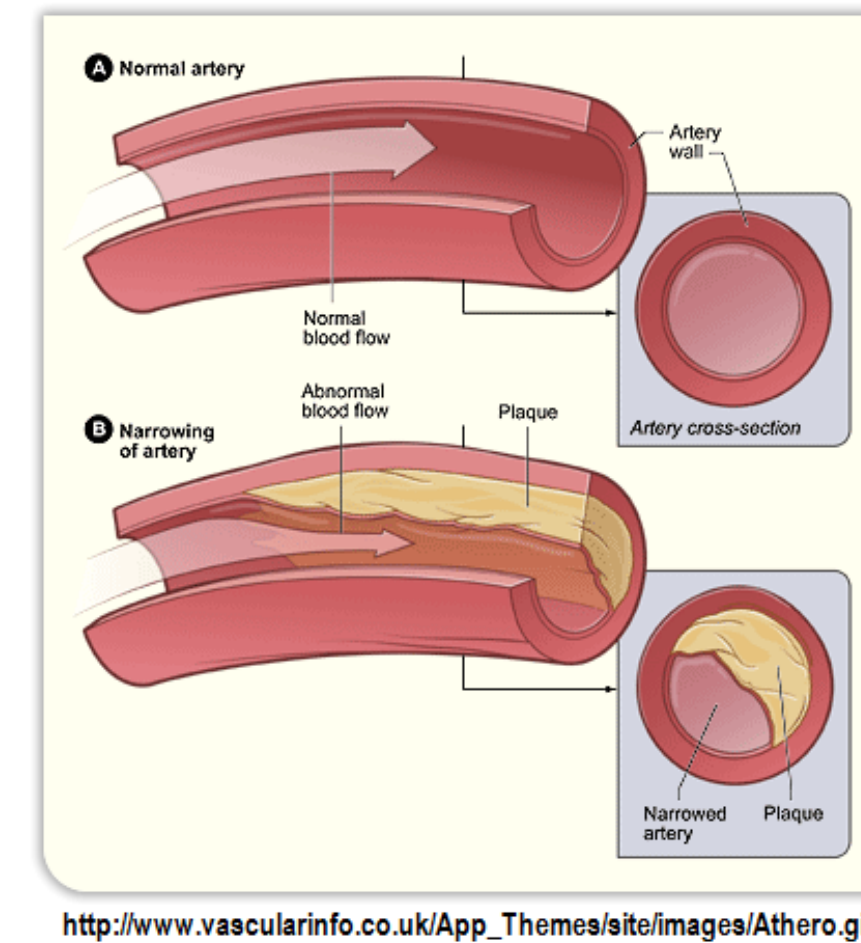


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Background

Peripheral Arterial Disease (PAD)

- Narrowing of the vessels secondary to atherosclerotic plaque buildup
- Results in ischemia to extremities which can lead to:
 - Intermittent claudication
 - Decreased distal pulses
 - Impaired healing



Lower Extremity Amputation

- 54% of amputations in the USA are due to PAD, either alone or in conjunction with diabetes (Kalapatapu V. et al)
- Transtibial and transfemoral most common
- Best outcomes with multidisciplinary approach

Body Weight Support (BWS) Systems

- Commonly used in patients after stroke or incomplete spinal cord injury
- Methods: treadmill or over-ground
 - Over-ground allows for assistive device training and varying terrains
- Parameters: high-intensity, high-repetition, task-specific
- Lack of research investigating BWS systems after lower extremity amputations

Purpose

The purpose of this case report was to provide a framework for the physical therapy management, including the use of a body weight support system, for a patient with a transtibial amputation in a skilled rehab setting.

Case Description

Patient History

- 66 year old male presented to skilled nursing facility one month following left transtibial amputation due to gangrene
- Co-morbidities: PAD, diabetes mellitus, CHF, COPD, HTN, kidney disease, metastatic lung and liver cancer
- Premorbid status: employed as town manager, community ambulator limited to 100-150 feet; utilized walking stick on uneven terrain

Systems Review

- Impaired musculoskeletal system (decreased strength)
- Impaired neuromuscular system (decreased balance and ability to ambulate)

Examination

Tests and Measures		
Measure	Initial	Discharge
30 Second Chair Stand Test	1 x/30s	15 x/30s
10 Meter Walk Test	0.25 m/s	0.73 m/s
MMT		
Left hip flexion	4+/5	4+/5
Left knee flexion	4+/5	5/5
Left knee extension	5/5	5/5
Bed mobility		
Rolling	Modified Independent	Independent
Supine < > sit	Supervision	Independent
Transfers		
Sit < > stand	Minimal Assist (Min A)	Independent
Wheelchair < > bed	Minimal Assist	Independent
Ambulation		
Level of Assist	Contact Guard/Min A	Supervision
Distance	12' x 1 with walker	125' x 2 with walker

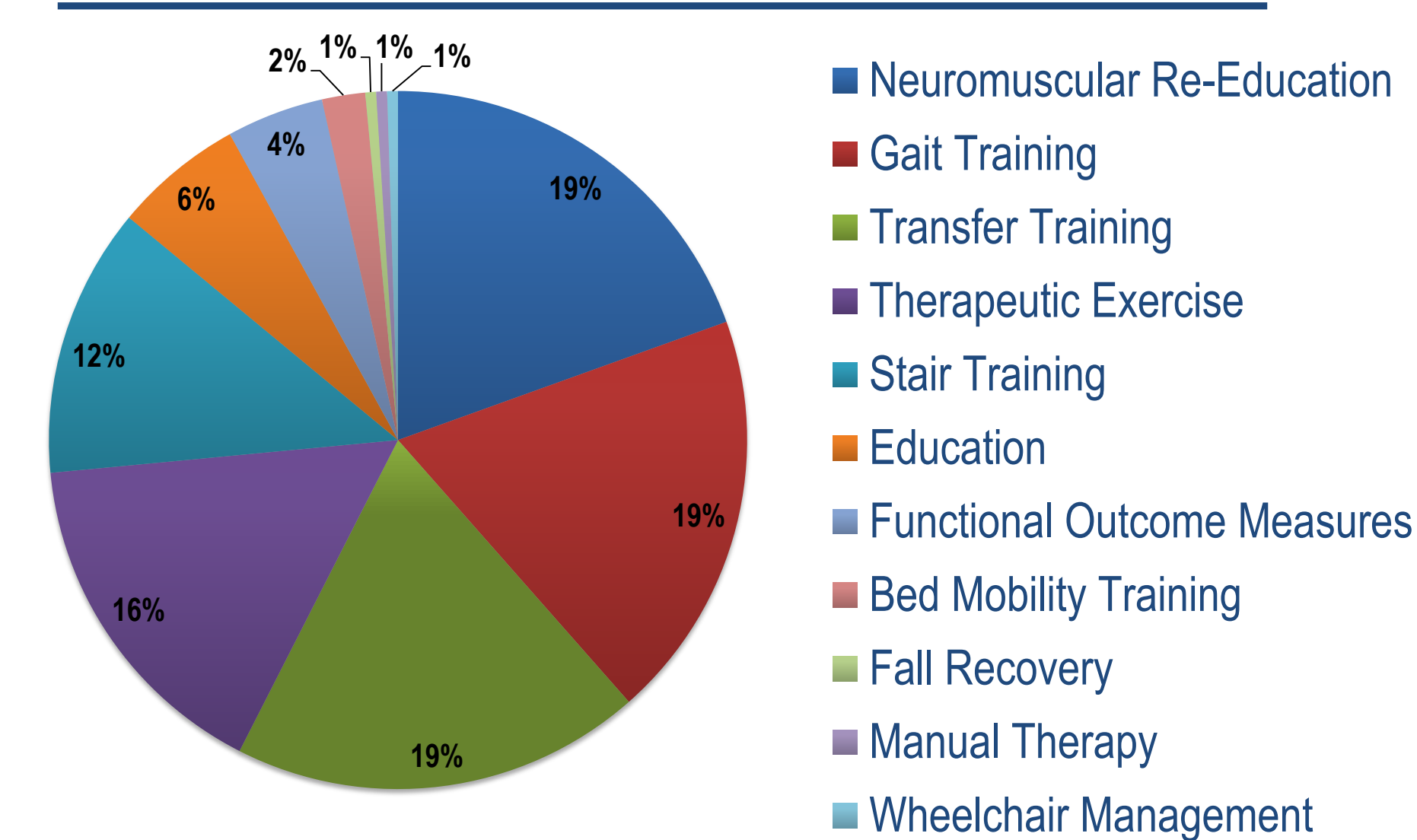
PT Diagnosis

Practice Pattern 4J

Impaired motor function, muscle performance, range of motion, gait, locomotion, and balance associated with amputation

Interventions

Time Dedicated to Interventions



Transfer Training



Therapeutic Exercise

- Seated bilateral leg exercises:
- Right: marching, knee extension and flexion, dorsiflexion, plantar flexion
 - Left: marching, knee extension and flexion

Neuromuscular Re-Education



Gait Training

Over-ground body weight support system

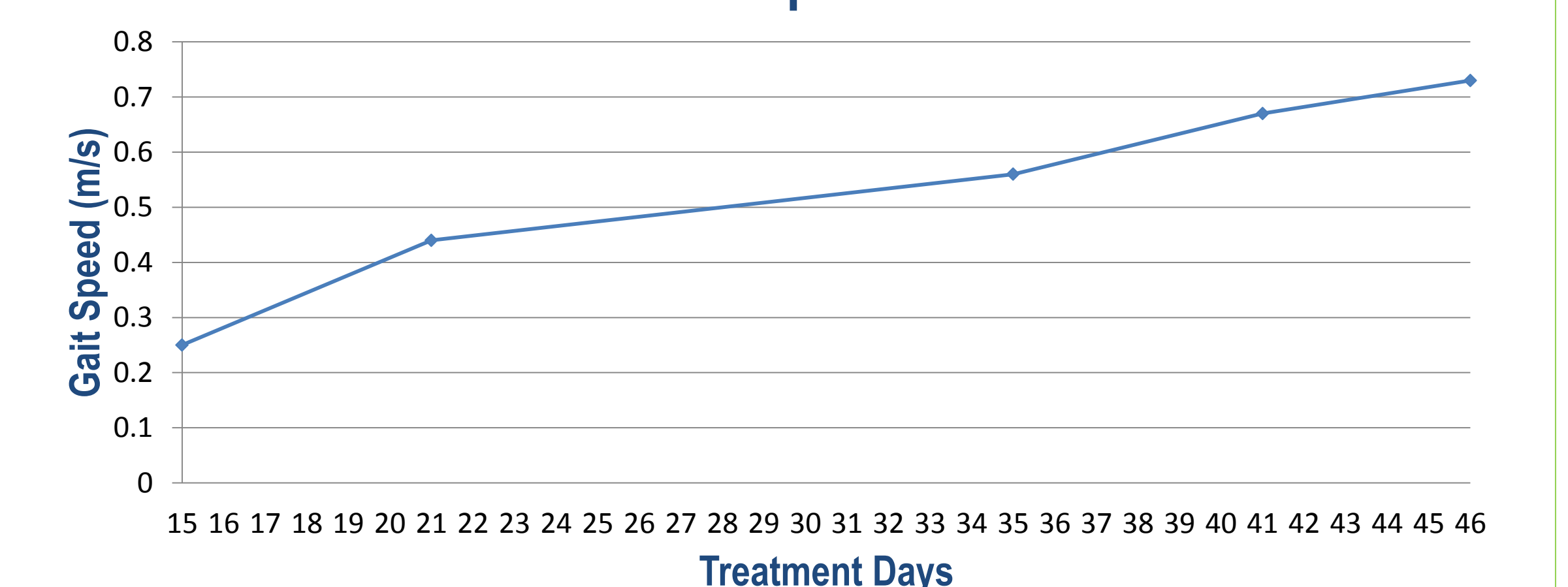


- Focus: ambulation distance and obstacle negotiation

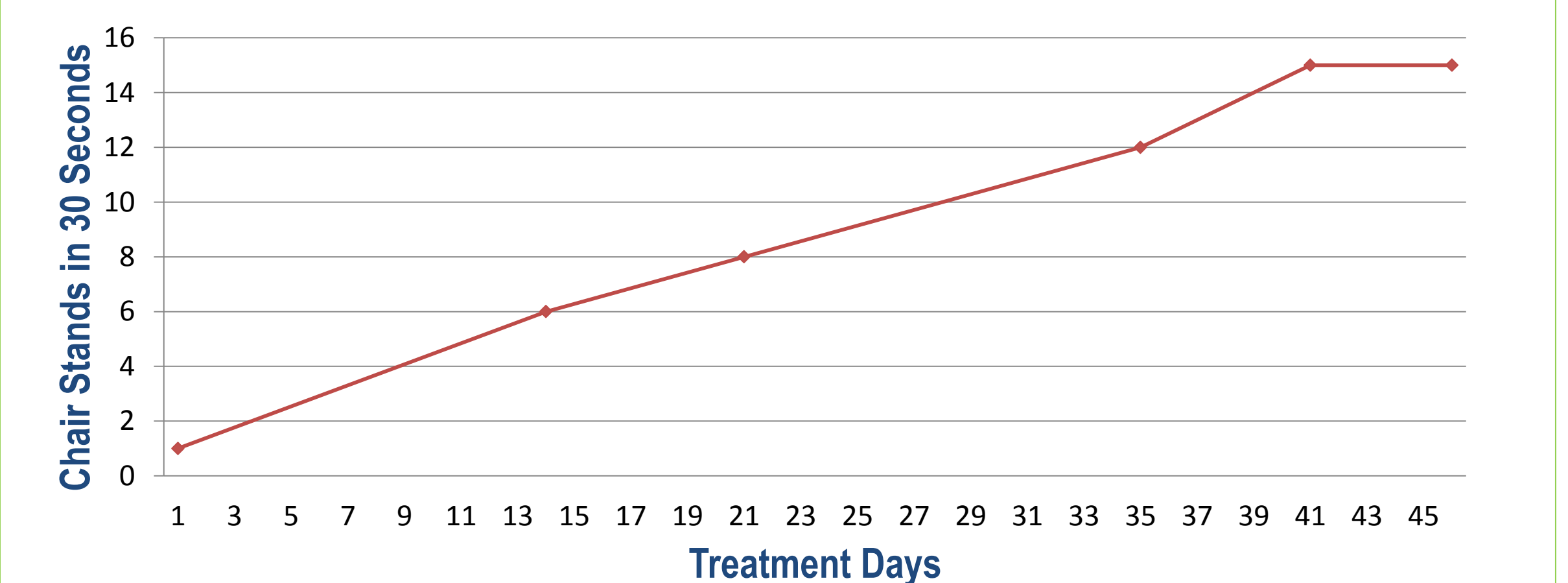
Outcomes

Following treatment for 9 weeks the patient demonstrated decreases in level of assistance for transfers and balance activities, increased ambulation distance, increased gait speed and increased score on his 30 second chair stand test

Gait Speed



30 Second Chair Stand



Discussion

- Functional outcome measures indicated decreased fall risk and increased functional mobility.
- Use of over-ground BWS systems may be a safe and effective method for gait training in patients with lower extremity amputations.
- Future studies should be performed to determine the benefits and limitations of gait training using an over-ground BWS systems in individuals with lower extremity amputation.

Acknowledgements

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References

Kalapatapau V. Lower extremity amputations. UpToDate. https://www.uptodate.com.une.idm.oclc.org/contents/lower-extremity-amputation?source=search_result&search=lower+extremity+amputation&selectedTitle=1-39#H614727678. Updated January 28, 2014. Accessed September 5, 2014.