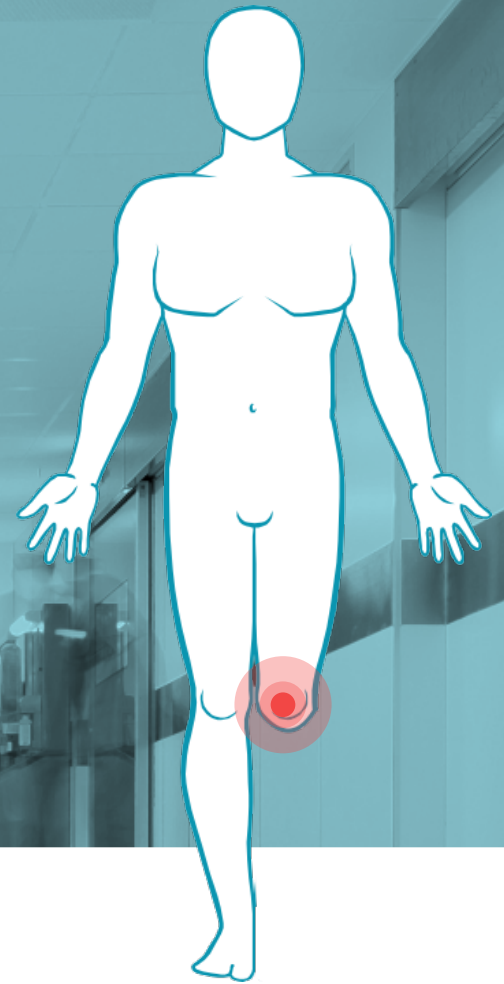


# Considerations for the Management of Amputees In Acute Care



**A Pre-Clinical Learning Module for DPT Students**

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UNC Chapel Hill Doctor of Physical Therapy Candidate 2017



# Hello!

**I am Terra Osmon**

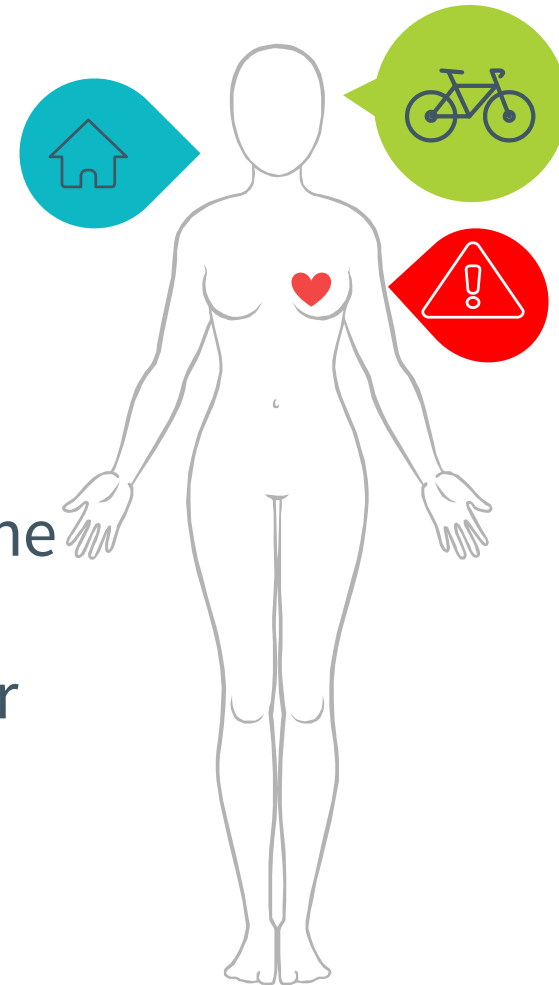
(← & this is my dog Mochi 😊)

I hope you find this presentation helpful as you begin to prepare for future clinical rotations!  
You can find me at  
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## STUDENT OBJECTIVES:

Students will ...

- ▶ Appreciate the potential barriers & social determinants of health for Amputees in the Acute Care Setting.
- ▶ Select Outcome Measures appropriate for Acute Setting & Amputee Patients.
- ▶ Understand the PT's role in Discharge Planning with respect to this population.



# 52,195

Annual # of Medicare Beneficiaries with LE Amputations

# 23.2%

Amputees Readmitted within 30 Days of Procedure

# \$14,358 / person

Avg Cost of Readmission with Amputation Complication

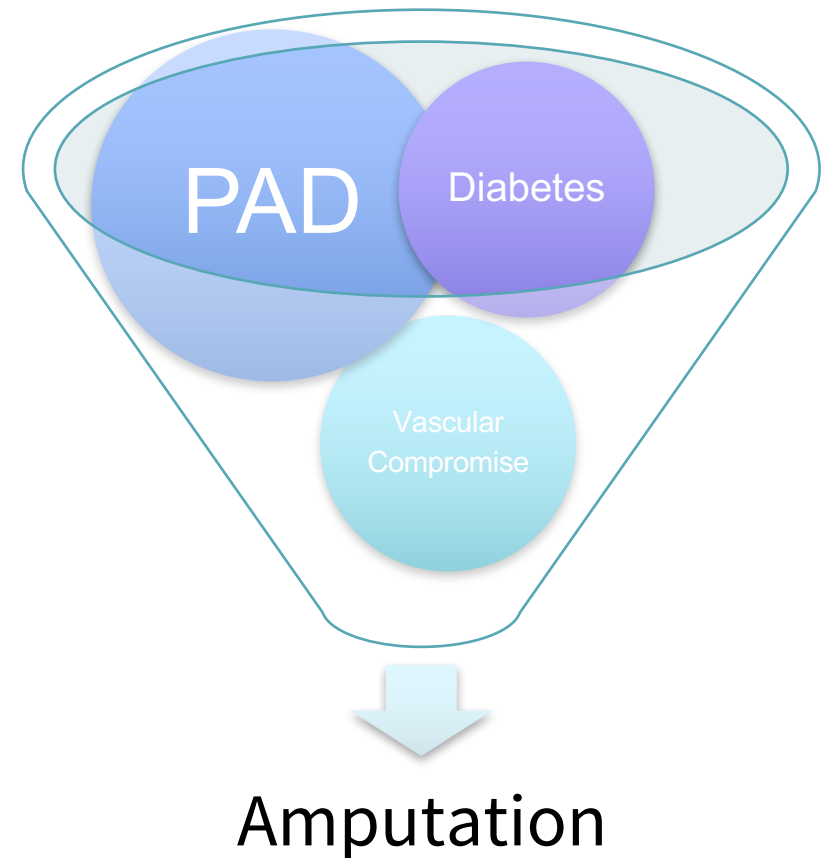
# POTENTIAL MEDICARE SAVINGS ANNUALLY (Lawson et al. 2013)



\$80.9\*  
MIL/YEAR

## MAJOR CAUSE(S) OF VASCULAR AMPUTATION

- ▶ Peripheral artery disease is the most common cause of LE amputation. (Dillingham et al. 2002; Ziegler-Graham et al. 2008)
- ▶ Diabetics are 10x more likely to get amputation than general public. (Pemayun et al. 2015)

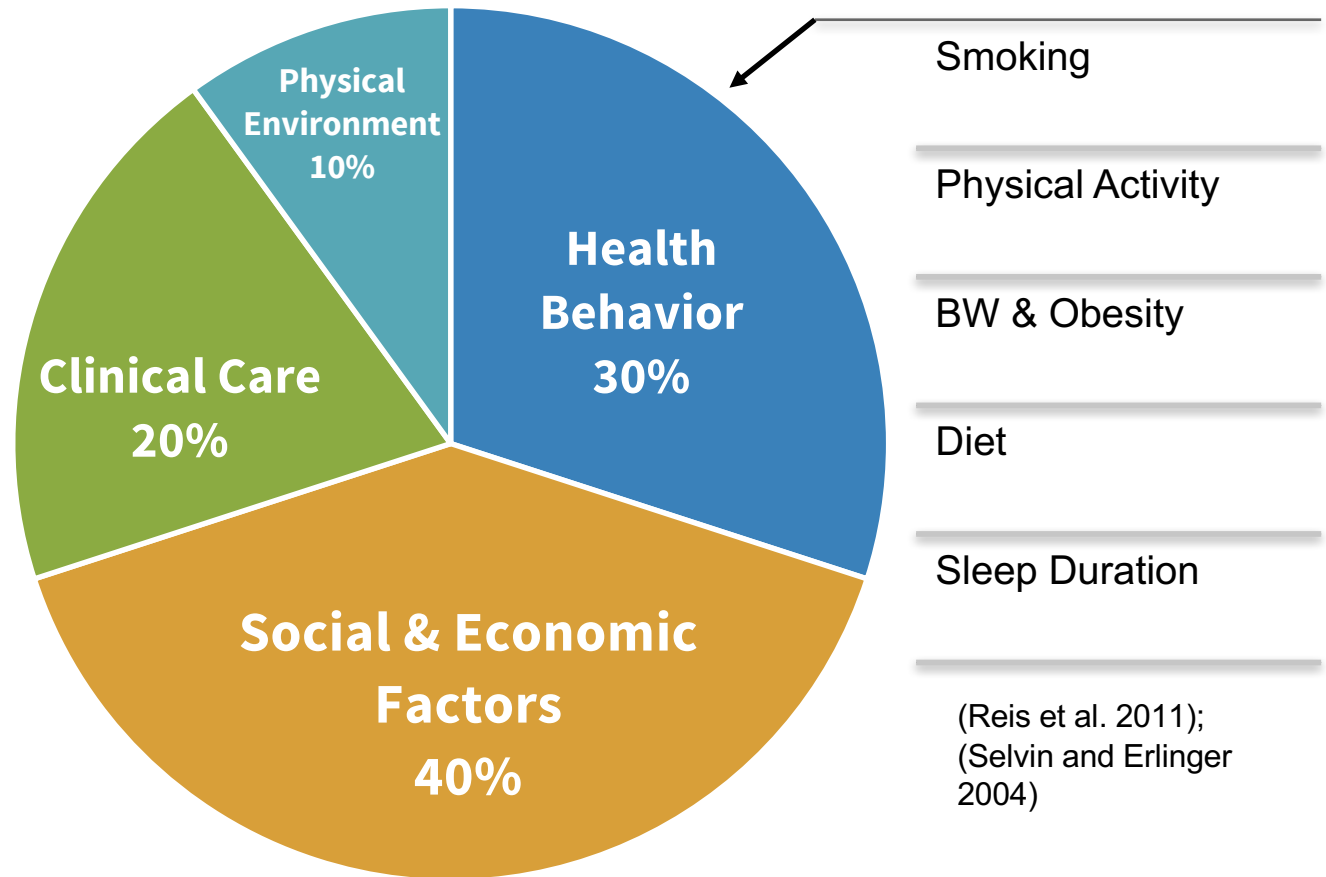


# 30%

of factors determining health outcomes are Behaviors.

Behavior impacts:  
1) pre-morbid disease &  
2) Complications post-amputation!

## Determinants On Health



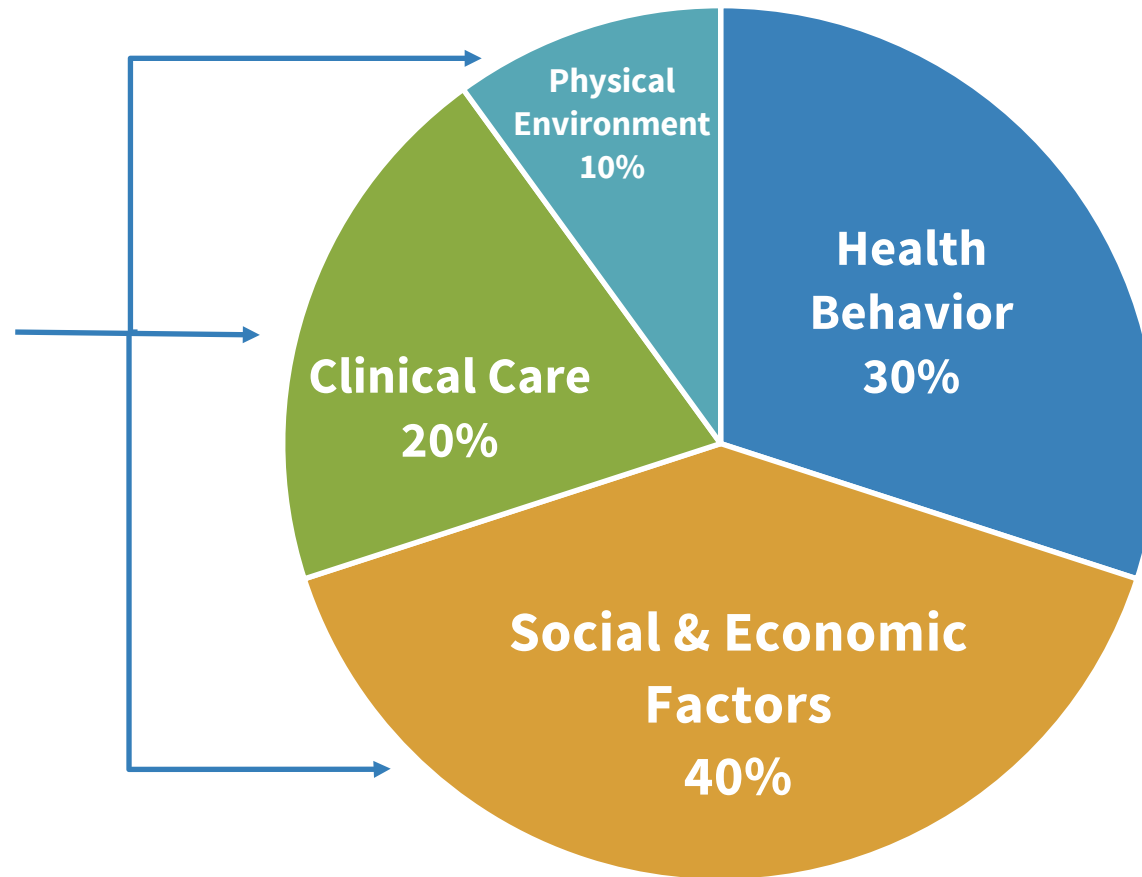
Adapted from <http://www.countyhealthrankings.org/>

# 60%

of Factors determining a person's health are Non-Health Behavior Related.

These areas will be our focus....

## Determinants On Health



Adapted from <http://www.countyhealthrankings.org/>



# 1. Social Determinants of Health (Braveman et al. 2011)

To better understand the various barriers that are typical for amputees and the impact this may have on health outcomes.

## SOCIAL DETERMINANTS OF HEALTH

“Health is socially determined by the conditions in which we are born, grow & age, & in which we live & work” (Marmot et al. 2008; Braveman et al. 2011)



## SOCIAL DETERMINANTS OF HEALTH

### Social Determinants (Marmot et al. 2008; Braveman et al. 2011)

<b>Economic Stability</b>	Employment, income, medical bills, financial support
<b>Neighborhood and Physical Environment</b>	Housing, transportation, safety parks, playground, walkability
<b>Education</b>	Literacy, Language, Early childhood education, Vocational training, higher education
<b>Food</b>	Hunger and Access to healthy options
<b>Community and Social Context</b>	Social Integration, Support Systems, Community engagement, Discrimination
<b>Health Care System</b>	Health Coverage, provider availability, provider linguistic and cultural competency, quality of care.

## ECONOMIC STABILITY:

Employment, income, medical bills, financial support

### Barriers specific to the amputee:

- ▶ There is a correlation between low income regions, diabetes & prevalence of amputations.(Stevens et al. 2014)
- ▶ 2 year cost of amputation is >90,000 (MacKenzie et al. 2007)

## NEIGHBORHOOD AND PHYSICAL ENVIRONMENT: Housing, transportation, safety, etc

### Barriers specific to the amputee:

- ▶ Housing barriers in multiple level homes, navigating stairs and curbs, etc
- ▶ Lack of transportation if unable to drive and/or living in rural areas without accessible public transport.

## EDUCATION:

Literacy, Language, Early childhood education,  
Vocational training, higher education

### Educational Barriers Impacting Readmission:

- ▶ Lack of Health literacy leads to high readmissions due to medications. (Forster et al. 2003)
- ▶ Misunderstanding on proper diabetic management results in medical complications. (Schillinger et al. 2002)



## FOOD: Hunger and Access to healthy options

### Barriers to food access:

- ▶ Low level adherence to diet due to cost of healthy alternatives being one of the biggest barriers to eating healthier foods.(Littman et al. 2015)(Pham et al. 1996)

## COMMUNITY AND SOCIAL CONTEXT:

Social Integration, Support Systems, Community engagement, Discrimination

- ▶ Social & Racial barriers common to Amputees:
- ▶ Reduced social networks are due to living alone as well as social withdrawal following amputation. (Rodríguez-Artalejo et al. 2006)
- ▶ With respect to racial disparity, African Americans are 4x more likely to have amputations than white americans.(Feinglass et al. 2008)



## HEALTHCARE SYSTEM:

Coverage, provider availability, provider linguistic & cultural competency, quality of care

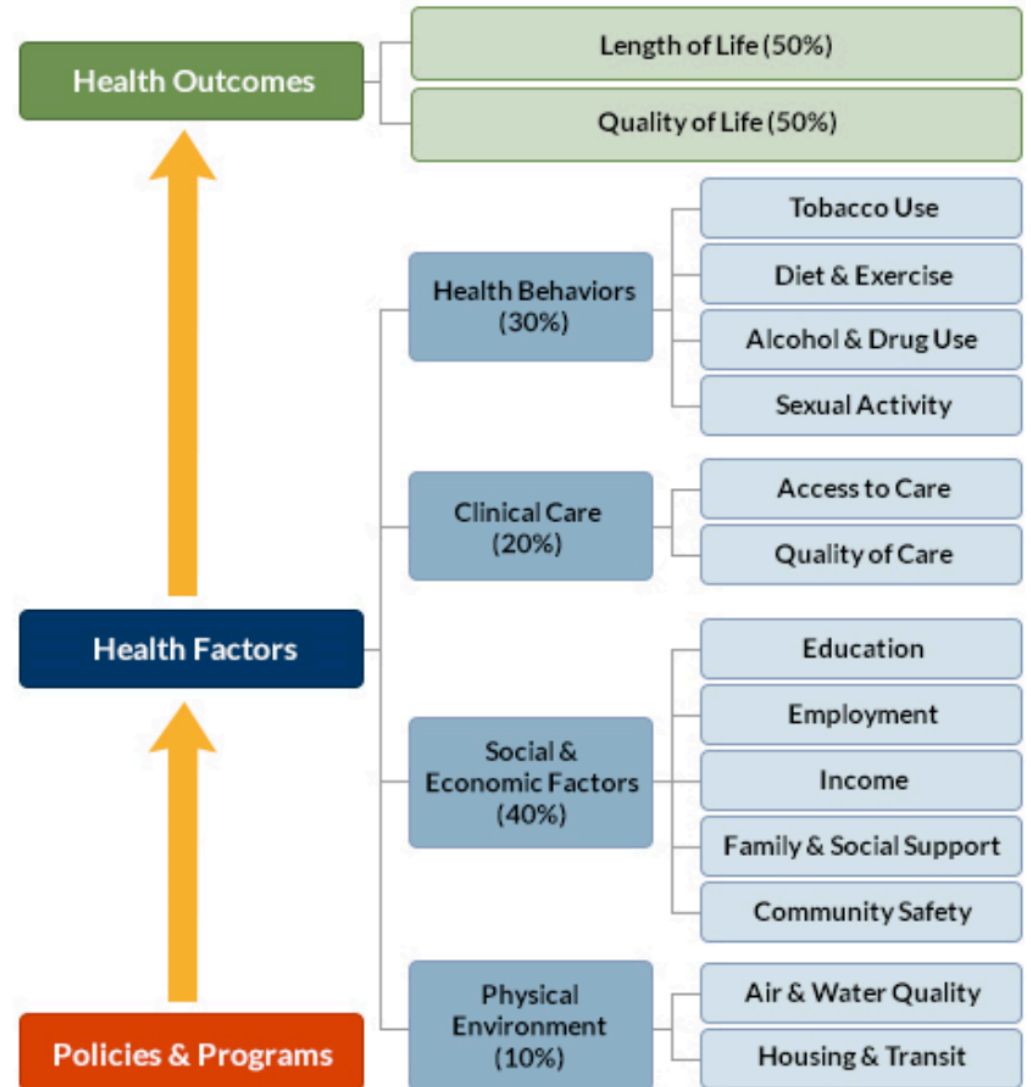
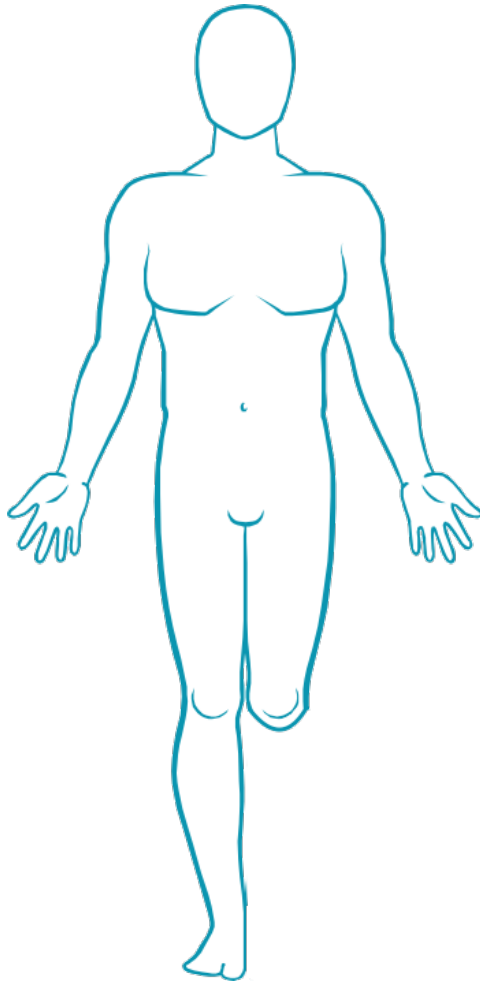
- ▶ Clinician and Systemic reasons for readmission:
- ▶ therapeutic error (Forster et al. 2003; Forster et al. 2004), insufficient follow-up (Jencks et al. 2009), premature discharge, inadequate post-discharge support and/or setting (Willis et al. 2016), & failed handoff (Kripalani et al. 2007)bullet
- ▶ Lack of Insurance coverage may leave patients to pay extreme costs (ie. especially prosthetic device).

## SOCIAL DETERMINANTS & 'AAAAQ' (WHO 2017)

In order for a patient to have a full 'right to health,' the **facilities, equipment, and services** must be: (WHO 2017)

- ▷ Available, Accessible, Acceptable, Appropriate
- ▷ Of Equal Quality

PTs can have a (+) impact on patient health by providing quality care & making discharge plans with consideration for an individual's health determinants and barriers.



(Source: <http://www.countyhealthrankings.org/>)

## 2. Selecting Outcome Measures

Considering the abilities and goals of the Amputee patient in Acute Care.

## OUTCOME MEASURES 'S IN THE ACUTE SETTING

Are required to...

- ▶ Justify discharge plans, equipment needs, etc
- ▶ Accurately portray Pt deficits/progression through POC

In the grand scheme, OM's may potentially impact...

- ▶ Hospital & departmental funding
- ▶ PT professional credibility & the value of our skilled services!

# ZERO.

# of high quality studies evidencing the most valid/reliable outcome measures for non limb-wearing lower limb amputees in the Acute setting.\*\*\*

## OUTCOME MEASURES FOR DISCUSSION

1. Balance & Falls Risk Measures: **Modified-Tinetti, 10 meter walk (gait speed)**
2. Mobility: **Timed Up and Go (TUG) or L-Test**
3. Cardiovascular Endurance: **2 MWT or 6 MWT** (*\*standard*)
4. Amputee-specific: **AMP no PRO** (*without prosthesis*)

## MODIFIED-TINETTI (AustPAR 2013)

- ▶ Assesses balance and gait
- ▶ Commonly used for fall screening tool as it indicates falls risk
- ▶ Scores of 19 or less indicate a moderate to high risk for falls



## 10 METER WALK (GAIT SPEED) (AustPAR 2013)

- ▶ 14 meter walk, measurement in middle 10m.
- ▶ Measures times and aspects of walking such as velocity, cadence, and step/stride length.

## TIMED UP AND GO (TUG) (AustPAR 2013; Stevens et al 2009)

- ▶ References for mean TUG times for transtibial and transfemoral amputees (19.3 +/- 15.1 sec) (Stevens et al 2009)
- ▶ Valid and reliable in amputee populations.
- ▶ Simple and fast, easy for entry level students to perform

## L-TEST

(AustPAR 2013; Deathe & Miller 2005)

- ▶ Expanded version of TUG developed due to TUG's ceiling effect
- ▶ change >3 seconds indicates real functional change
- ▶ report on mean times for amputees of different levels, cause of amputation, and aid usage.

## 2 MINUTE WALK TEST (2MWT) (AustPAR 2013; Stevens et al 2009)

- ▶ Highly correlated with 6MWT
- ▶ Performed at self-selected walking speed
- ▶ (Stevens et al 2009) provides mean and range data with respect to K Classification.

Lower-Limb Amputee (K0-K1)^	50 ± 30	4-96
Lower-Limb Amputee (K2)^	190 ± 111	16-480
Lower-Limb Amputee (K3)^	299 ± 102	48-475
Lower-Limb Amputee (K4)^	419 ± 86	264-624

## 6 MINUTE WALK TEST (6MWT)

(AustPAR 2013; Stevens et al 2009)

- ▶ Test of mobility & cardiorespiratory endurance
- ▶ Validity and reliability in LE amputees has been validated
- ▶ The standard that all other tests are compared to.
- ▶ 2MWT may be better for low level & those with respiratory issues.

## Amp No Pro

(AustPAR 2013; Gailey et al. 2002; Resnik and Borgia 2011)

- ▶ Patient specific as it assesses functional ambulation in LE amputees without a prosthetic, thus appropriate for those post-operative in acute care.
- ▶ (-) May underestimate individuals potential.
- ▶ (+) Valid, reliable, and strong correlation with 6-minute walk scores ( $r=0.69$ ,  $P.0001$ )

# 3. Discharge Planning

*“The entry-level acute care clinician must be able to make clinical decisions surrounding a **safe** discharge plan and **communicate** these decisions with all members of the interprofessional medical team – including the **patient** and **caregiver(s)** – in a manner that ensures the patient receives **optimal** care.”*

*(Greenwood, PT, DPT, MS, GCS et al. 2015)*

”



## ACUTE CARE CORE COMPETENCIES FOR ENTRY LEVEL DPT'S

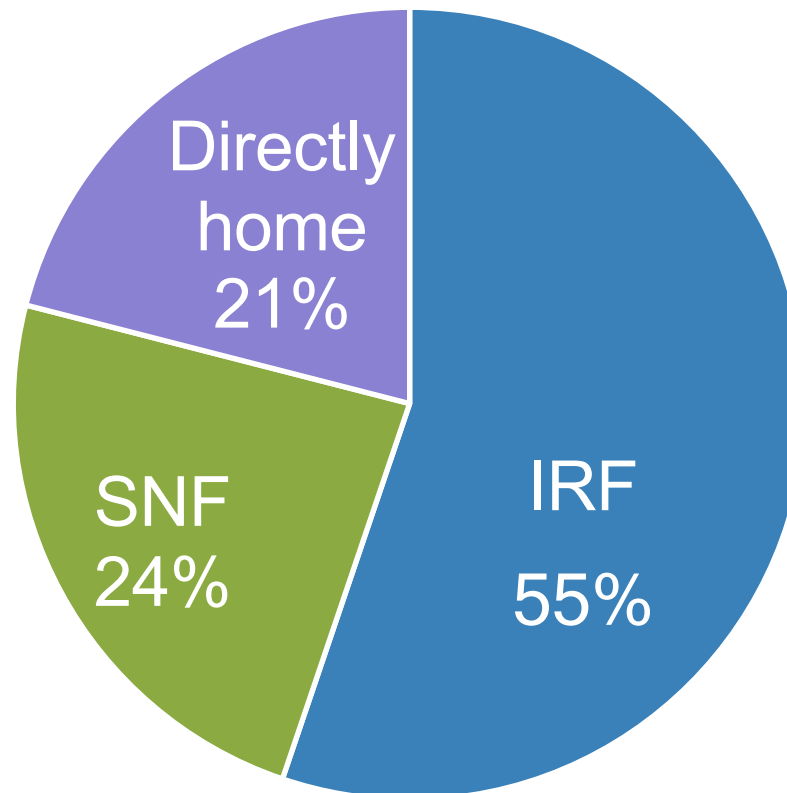
(Greenwood, PT, DPT, MS, GCS et al. 2015)

- ▶ Determine destination, level of support, & post-acute care needs.
- ▶ Critically assess patient safety (ie. cognition, function).
- ▶ Determine equipment needs that is reasonable & necessary (ie. available funding & patient's circumstances).
- ▶ Synthesize patient's life context, including: pre-hospitalization status; age; home suitability; caregiver support; transportation needs; risk factors for re-hospitalization; & economic resources.
- ▶ Assess expectations and desires of stakeholders (e.g., patient, family, caregiver, medical services, surgical services).
- ▶ Understand regulations (ie. healthcare systems & payers).

## TRENDS IN DISCHARGE DESTINATION AFTER DYSVASCULAR LOWER-LIMB AMPUTATION (Dillingham et al. 2011)

### Home unlikely:

- Older
- Unmarried
- PMH of nursing home residence
- + perioperative complications



### IRF Likely:

- Married
- higher cognitive functioning
- unilateral BKA
- Medicaid coverage

## I.D. PATIENTS IN NEED OF LIFE-LONG SUPPORT POST-D/C :

Significant factors associated with being unable to have independent living status following amputation:(Taylor et al. 2005)

- ▶ Age  $\geq 70$  years (HR 4.0, 95% CI 1.7-9.5)
- ▶ Age 60 to 69 (HR 2.7, 95% CI 1.1-6.5)
- ▶ Above-knee amputation (HR 1.8, 95% CI 1.2-2.8)
- ▶ Prior homebound status (HR 1.6, 95% CI 1.1-2.6)
- ▶ Dementia (HR 1.6, 95% CI 1.1-2.4)

## POST-D/C LOCATION IMPACTS ON FUNCTIONAL OUTCOMES

Amputees transferred to acute inpatient rehab have better 6 month functional outcomes compared to those discharged home or to a SNF. (Sauter et al. 2013)

Why don't  
all LE  
amputees  
qualify for  
Acute  
Inpatient  
Rehab?

Not Approved  
Approved

A pencil is shown horizontally in the lower right portion of the image. The background is a light blue gradient. The words "Not Approved" and "Approved" are written in a large, bold, sans-serif font, slanted upwards from left to right. The "Not Approved" text is positioned above the "Approved" text. The pencil is positioned below the "Approved" text.

## MEDICARE REQUIREMENTS FOR INPATIENT REHABILITATION SERVICES

(Medicare.gov 2017)

- ▷ IPR must be “medically necessary” & PT requires multidisciplinary therapy,
- ▷ must tolerate therapy at least 3 hours/day
- ▷ requires MD supervision 2-3 days/week.
- ▷ May remain in IPR as long as showing progress and satisfying the above.
  
- ▷ Cost with Medicare:
  - ▶ 0-60 days = 0\$\* ≥61 days=\$329/day

## MEDICARE REQUIREMENTS FOR SUBACUTE FACILITY (Medicare.gov 2017)

- ▶ Patients must have a "qualifying event" requiring 3 night hospital stay
- ▶ Must require skilled nursing or rehabilitation for at least 1 hour/day, 5 days/week.
- ▶ Medicare SNF benefits last 100 days without a new "qualifying event." (Medicare Interactive 2017)

## FACTORS THAT MAY AFFECT READMISSION

(Epstein et al. 2011)

Several factors that increase the likelihood of readmission may be **avoidable**. PTs have a role in prevention of readmission, including:

- ▶ Premature discharge
- ▶ Inadequate post-discharge support
- ▶ Nosocomial infections, pressure ulcers, and patient falls.



## PT PERSPECTIVES ON DISCHARGING PATIENTS FROM ACUTE CARE (Matmari et al. 2014)

From the Physical Therapist perspective:

- ▶ Mobility status is #1 indicator of Pt readiness to DC

Be prepared to expect...

- ▶ Informal Interdisciplinary Communication

Things to be cautious of:

- ▶ Pressure for early DC of patients
- ▶ Potential for ethical dilemmas
- ▶ *Give professional recommendation and stick to it!*

## PT DISCHARGE RECOMMENDATIONS PREVENT READMISSIONS (Smith et al. 2010)

- ▶ 83% of the time PT discharge recommendations are followed.
- ▶ When PT recommendations were not followed, patients were 2.9x more likely to be readmitted to the hospital.

Appreciate the importance of physical therapy professional recommendations. PTs are vital to the discharge process and patient outcomes.

## LET'S REVIEW SOME CONCEPTS

### **Health Determinants**

Include genetics/Behaviors, medical care, socioecological factors, and physical environment. This should be considered when implementing patient care and making recommendations.

### **Outcome Measures**

Currently no high quality evidence indicating best outcomes to use in Acute Care with respect to Amputee patients. Some measures have been suggested during this presentation, but using critical judgment with each patient is suggested.

### **Discharge Planning**

PT should consider health determinants and validate/support their decisions with outcome measures when making discharge recommendations. Ultimately our recommendations for discharge are an important part of the discharge process and have potential impact on patient outcomes.



# QUESTIONS?

You can email me  
[terra\\_osmon@med.unc.edu](mailto:terra_osmon@med.unc.edu)

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