

Say NO to Sitting: Save Healthcare Costs and Prevent Co morbidities in our Clients!

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March 2022



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Learning Objectives

1

Discuss how medical complications in general affect overall healthcare costs

2

Identify the (5) most common medical complexities and co-morbidities that occur in mobility device and CRT users

3

Describe a functional activity that promotes medical well being and can prevent complications caused by prolonged sitting



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Similar risks are seen in a full-time wheelchair user who spends on average 10.6 hours/day seated.

(Sonnenblum 2016).

Let's talk about sitting...

For the able-bodied population, those who spend **>8 hours/day** sitting are at higher risk for:

- Cardiovascular disease
- Type 2 diabetes
- Certain cancers
- Depression
- Mortality

(Lakerveld 2017, Biswel 2015).

Comorbidities

*By definition: “Any distinct **additional entity** that **has existed** or **may occur** during the clinical course for a patient”*

Asthma
Osteoarthritis
Spasticity
Contractures
Hip problems
Depression
Edema
(Kypho)scoliosis
Neuropathic pain
Musculoskeletal pain

Pressure injuries
Problematic spasticity
Autonomic dysreflexia
Hypertension
Neurogenic heterotopic ossification
Pneumonia
UTI
Urinary incontinence
Fecal incontinence
Constipation

Healthcare Costs

HOSPITALIZATION

2018 were \$1.9 trillion

2020 yearly cost was close to \$1.32 trillion

EMERGENCY VISITS

\$8.3 billion dollars in healthcare costs.



Healthcare Costs



UTI (Urinary Tract Infection)

*Hospital stay
average/per day
\$15,000 in 2017*



PAIN

*Treated with medications
up to
\$560–635 billion a year.*



PRESSURE INJURY

*Estimate of
\$6.8 billion a year*

Urinary Tract

Individuals with a Spinal Cord Injury (SCI)

Increased risk of kidney stones
due to poor urine flow in the first
3-6 months post injury



(Chen et al., 2000).

Urinary Tract Infections

Our aging population

People are living longer – due to benefits of medical and technological advances

SCI: 85% of typical lifespan

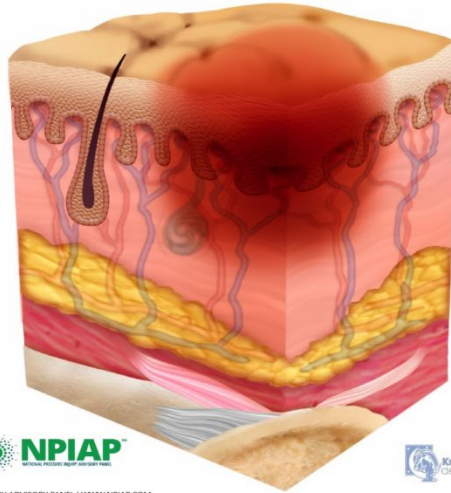
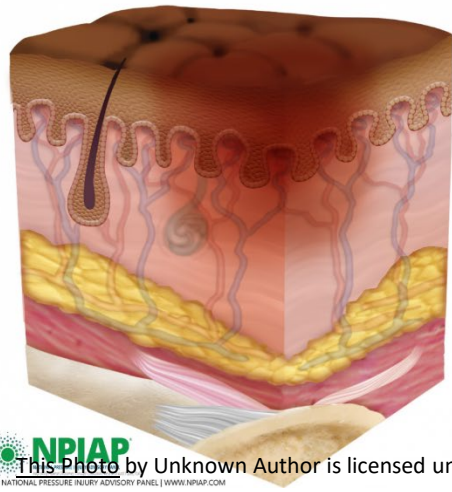
Similar for MS , other neurological conditions (Molton & Yorkston, 2017)

But...as mobility decreases

Increased risk of kidney stones and urinary concerns (incontinence)

(Domingos & Serras, 2011).





Pressure Injury

22.6% of patients with pressure injury are re-hospitalized due to their wounds

(NPIAP, 2020).

Average of 60,000 patients die yearly.

Pain

Usually treated with medication at a cost of **\$560–635 BILLION/year**

(Schirmer et al. 2020).

10.7% of U.S. adults age 20 and over, used one or more prescription pain medications (opioid or nonopioid)

5.7% of U.S. adults used one or more prescription opioids.

(www.cdc.gov/nchs/products/databriefs/db369.htm)



Retrospective Review

DISABILITY AND REHABILITATION: ASSISTIVE TECHNOLOGY
<https://doi.org/10.1080/17483107.2021.1969453>



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RESEARCH ARTICLE



Comorbidities and medical complexities of mobility device users: a retrospective study

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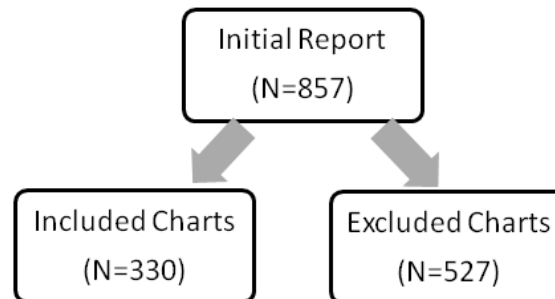
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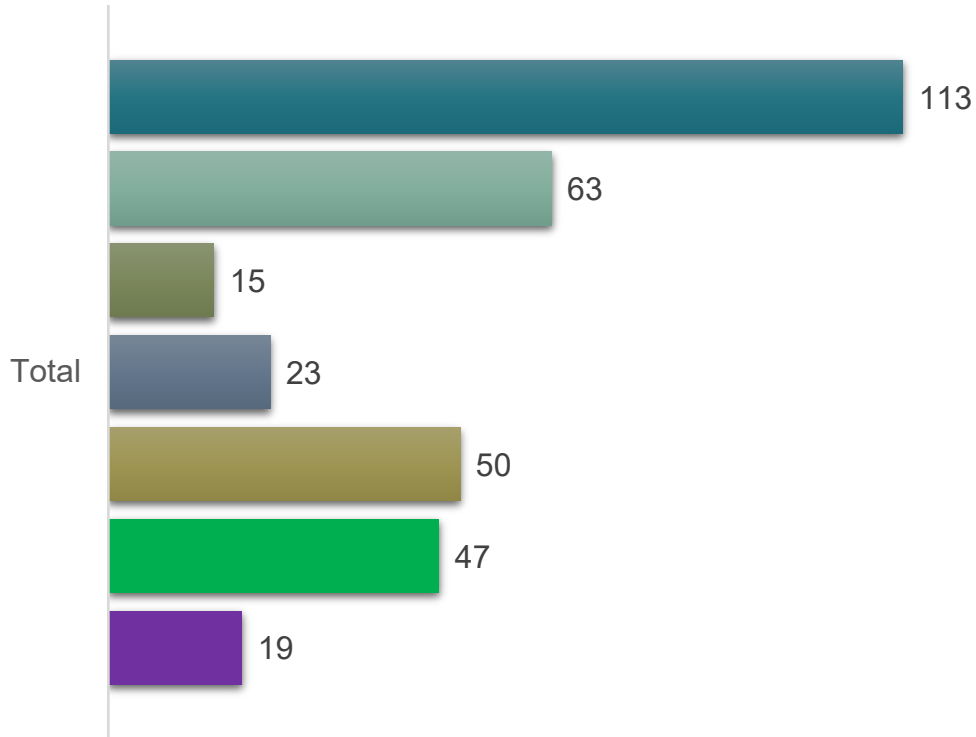
Study design

A retrospective data review of **857** individual medical charts at a Level 1 Trauma Hospital and Clinic System

330 male and female (24 - 92 years old) mobility device users with a wide range of diagnoses

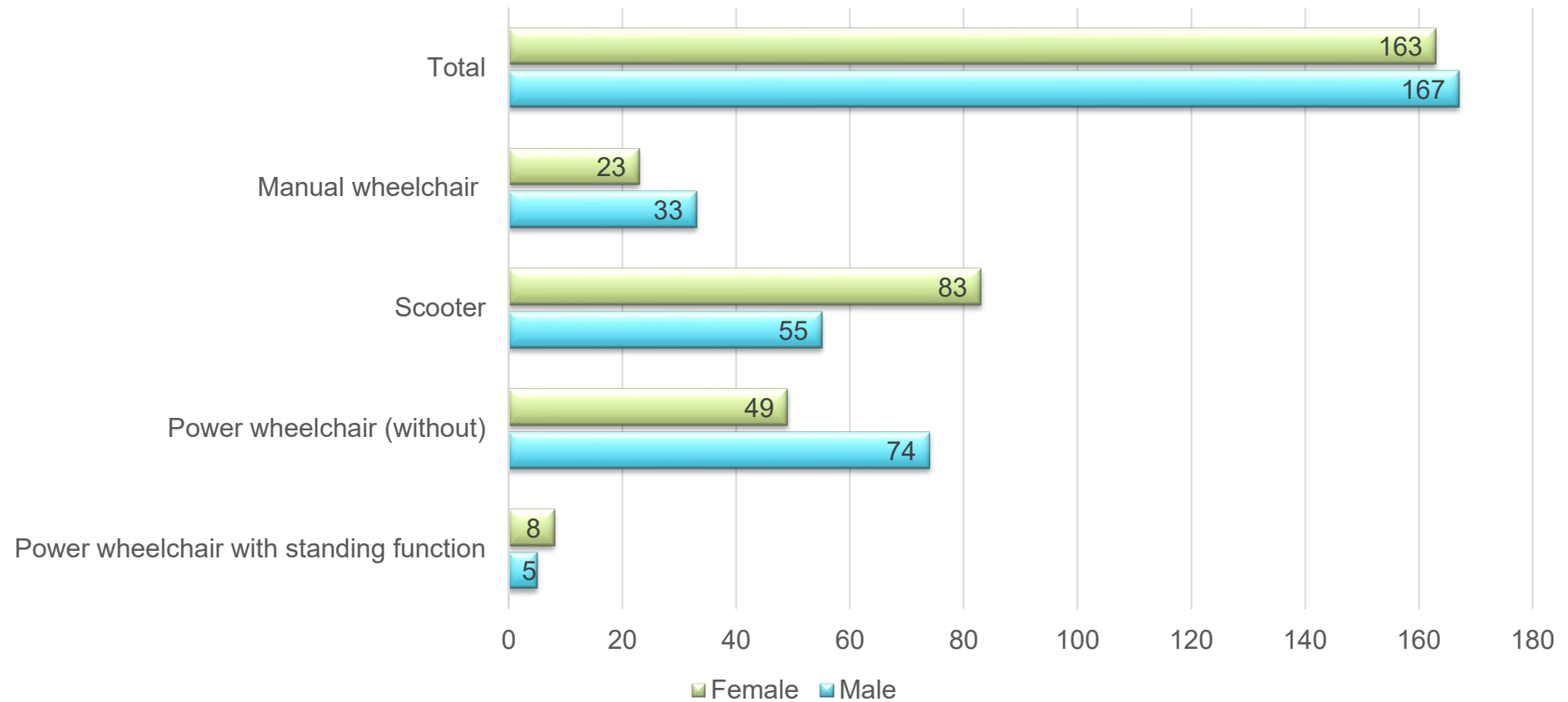


- Other: without diagnosis
- Other: with diagnosis
- CP, schizencephaly, spinocerebellar ataxia
- Muscle disease/CNS
- Spinal cord injury, spina bifida, polio
- CVA/Stroke/TBI
- Amputation



Diagnoses Included in the Study

Mobility devices



Comorbidities

*By definition: “Any distinct **additional entity** that **has existed** or **may occur** during the clinical course for a patient”*

Pressure injuries

Problematic spasticity

Autonomic dysreflexia

Hypertension

Neurogenic heterotopic

Ossification

Pneumonia

UTI

Urinary incontinence

Fecal incontinence

Constipation

Asthma

Osteoarthritis

Spasticity

Hip problems

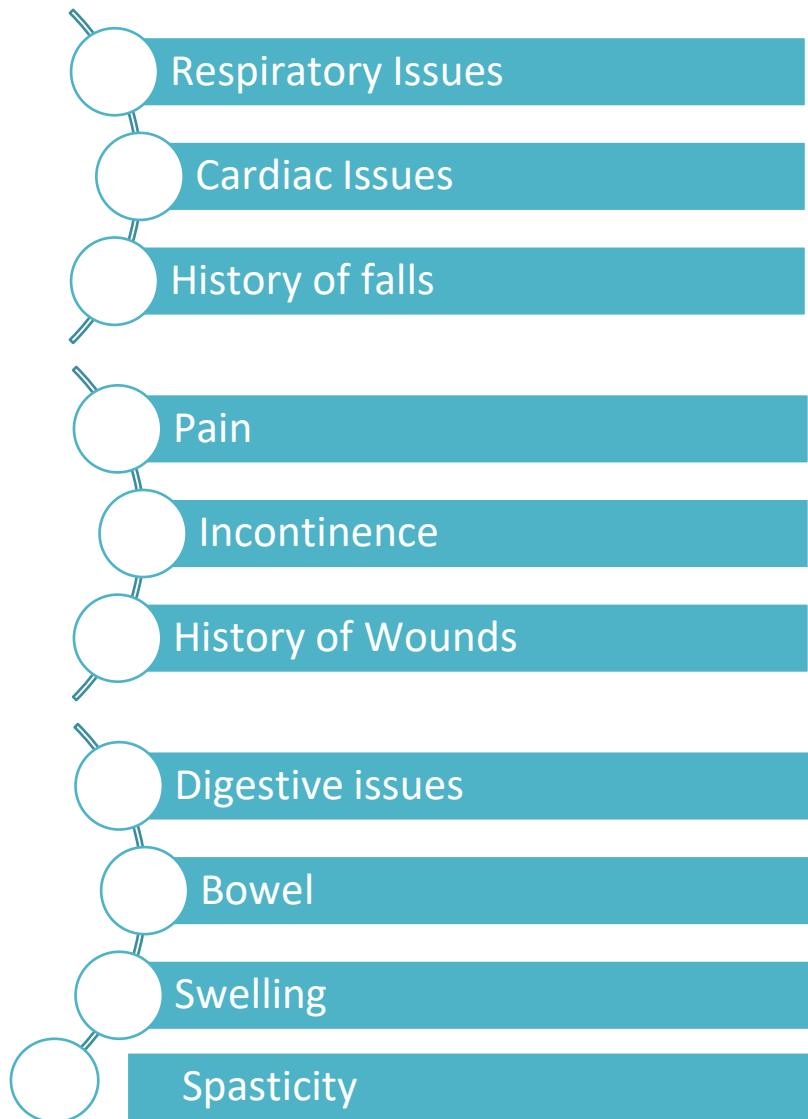
Depression

Edema

(Kypho)scoliosis

Neuropathic pain

Musculoskeletal pain



Our focus:
*what we
looked for*

10 separate
comorbidities



In addition:

*Number of
occurrences of*

ED/UC visits

Hospitalizations

UTIs for each patient

1 year prior to and 1 year post Mobility
Evaluation

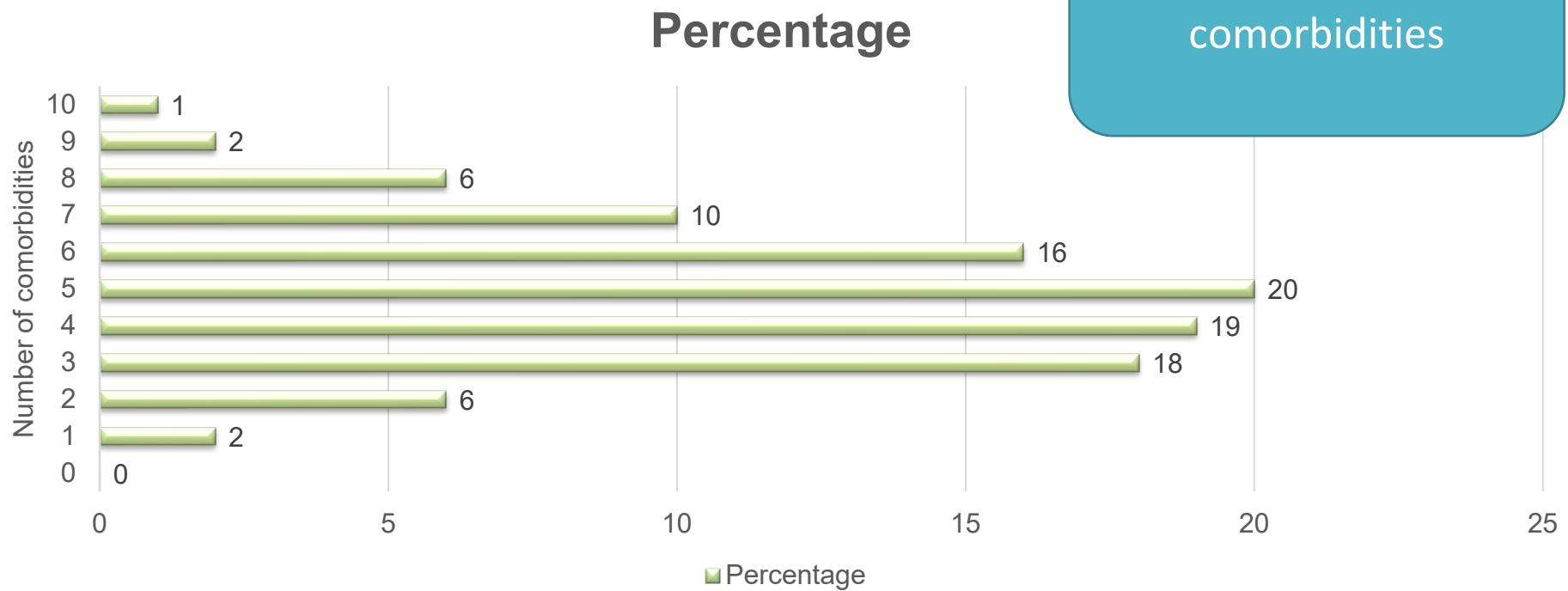
Retrospective Results

	<u>Mobility device</u>				
	Manual wheelchair	Scooter	Power wheelchair (without standing)	Power wheelchair (with standing)	<i>All users</i>
n	56	138	123	13	330
Age, mean (SD)	54 (16)	60 (10)	57 (13)	53 (16)	58 (13)
Gender, %female (n)	41% (23)	60% (83)	40% (49)	62% (8)	49% (163)
Diagnosis*					
Amputation, %(n)	5% (3)	3% (4)	10% (12)	0 (0)	6% (19)
CVA/stroke/TBI, %(n)	18% (10)	9% (12)	20% (25)	0 (0)	14% (47)
SCI, spina bifida, polio, %(n)	27% (15)	2% (3)	18% (22)	77% (10)	15% (50)
Muscle disease/CNS, %(n)	14% (8)	4% (5)	7% (9)	8% (1)	7% (23)
CP or similar diagnosis, %(n)	9% (5)	1% (1)	7% (8)	8% (1)	5% (15)
Other, %(n)	27% (15)	82% (113)	38% (47)	8% (1)	53% (176)
Sitting time					
>8 hours per day	80% (45)	55% (76)	92% (113)	83% (11)	71% (234)

Study Population

Comorbidities

	<u>Mobility device</u>				<i>All users</i>
	<i>Manual wheelchair</i>	<i>Scooter</i>	<i>Power wheelchair (without standing)</i>	<i>Power wheelchair (with standing)</i>	
<i>n</i>	56	138	123	13	330
<u>Comorbidities</u>					
<i>Pain, %(n)</i>	79% (44)	98% (135)	89% (110)	85% (11)	91% (300)
<i>Cardiac issues, %(n)</i>	55% (31)	77% (106)	70% (86)	46% (6)	69% (228)
<i>History falls, %(n)</i>	47% (26)	77% (106)	55% (68)	31% (4)	62% (205)
<i>Respiratory issues, %(n)</i>	30% (17)	57% (79)	46% (57)	54% (7)	49% (162)
<i>Incontinence, %(n)</i>	50% (28)	30% (41)	52% (64)	85% (11)	44% (145)



Comorbidity Percentage

100%



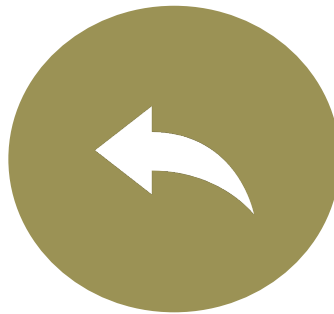
PAIN



Hospitalizations & ED/UC Visits



HOSPITALIZATIONS
ONE YEAR
RANGE OF 0-17 visits

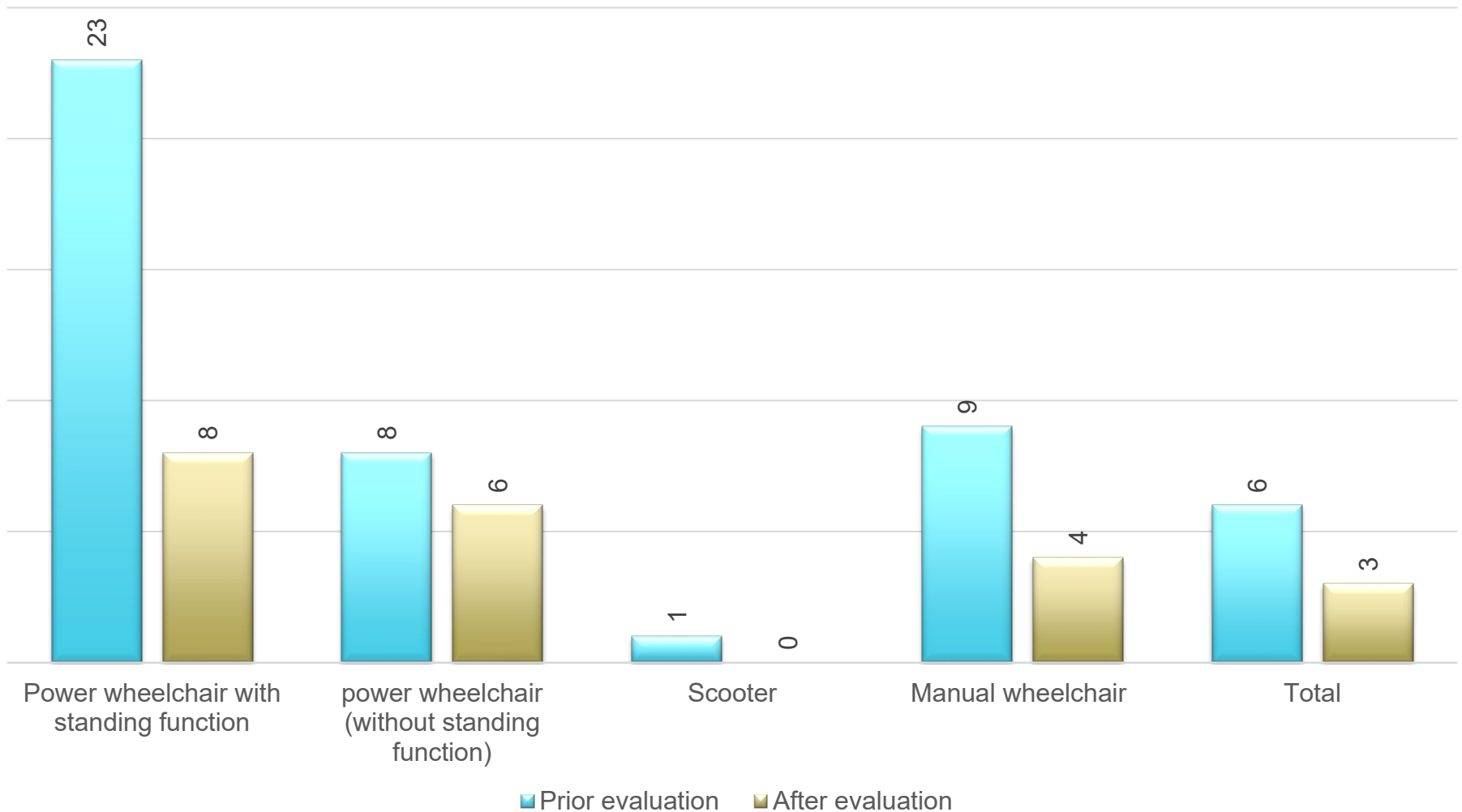


ED/UC VISITS
ONE YEAR
RANGE of 0 -22 visits



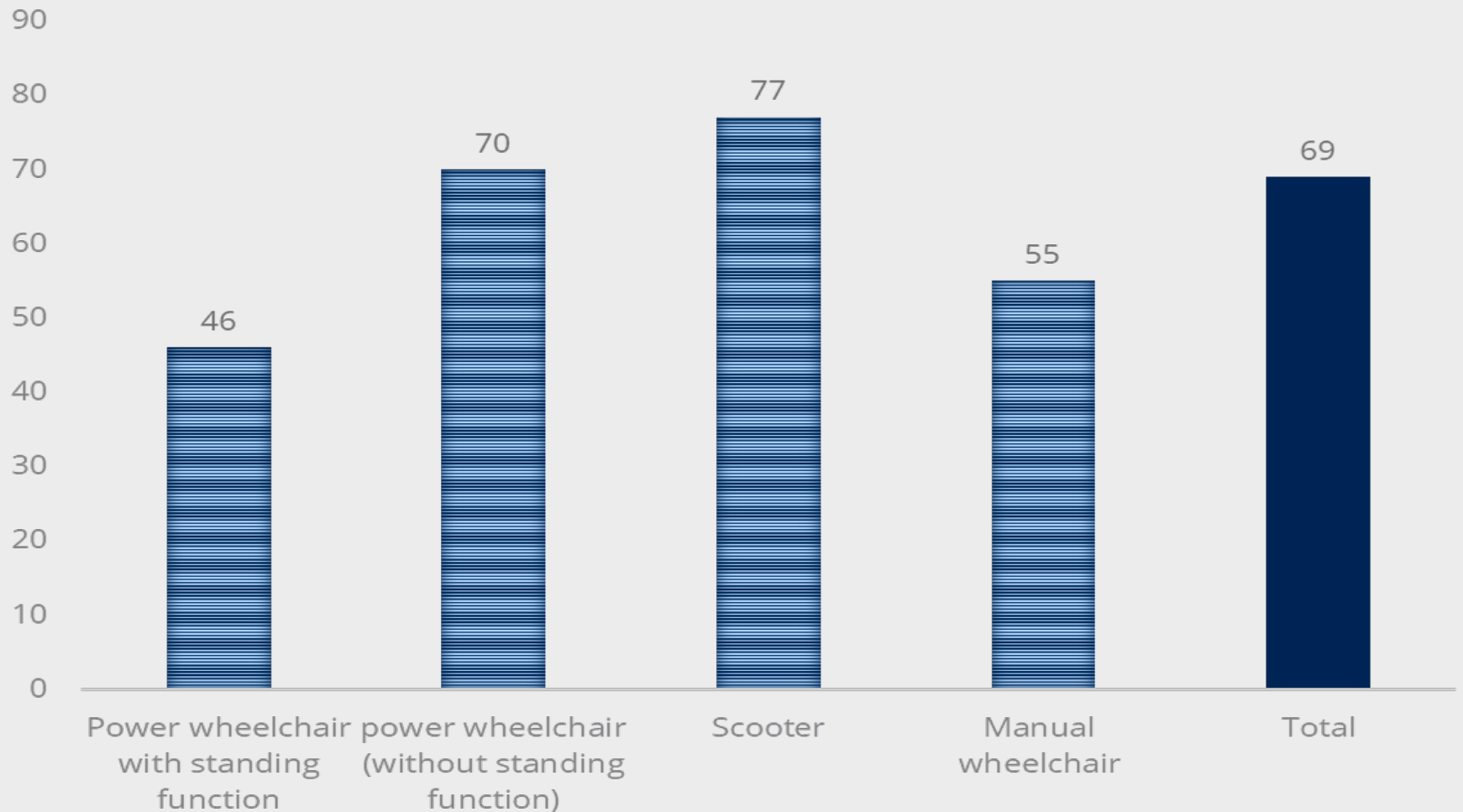
No clinical relevance was
noted comparing the year
before and the year after
device evaluation

Results: UTIs



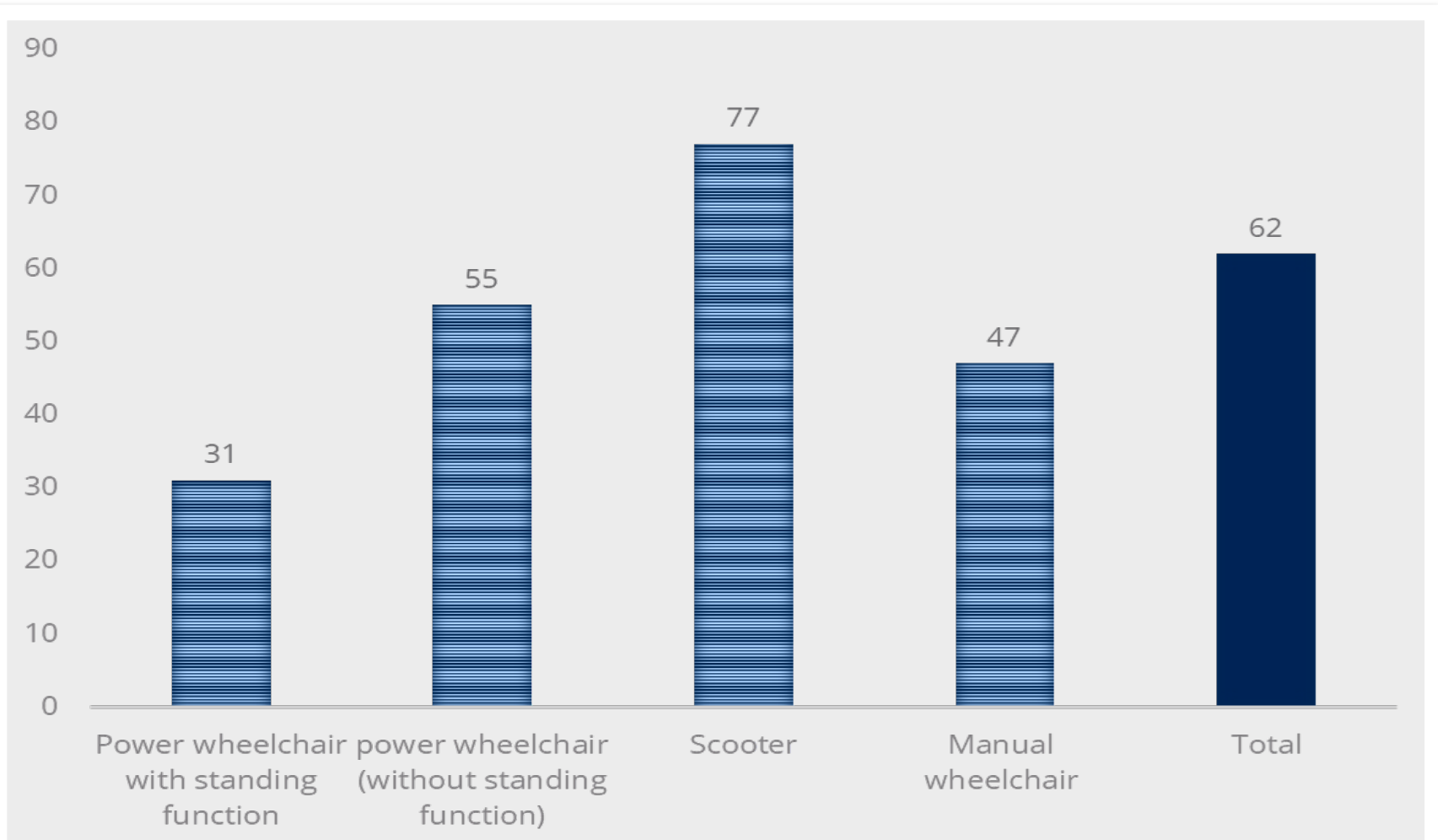
What about those with iS-PWCs?

(Cardiac)



What about those with iS-PWCs?

(History of Falls)



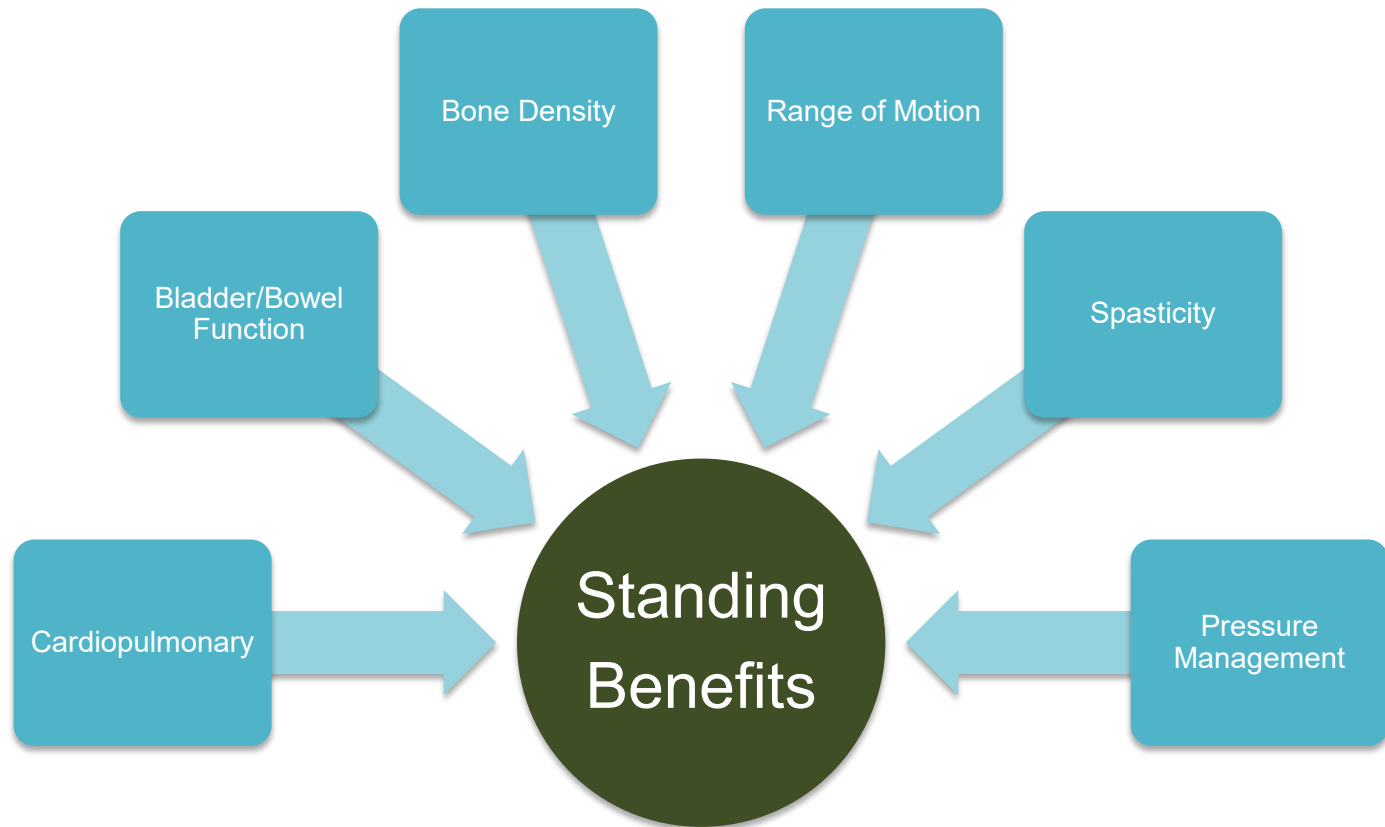


What can we
do?

Why
consider
standing
first?



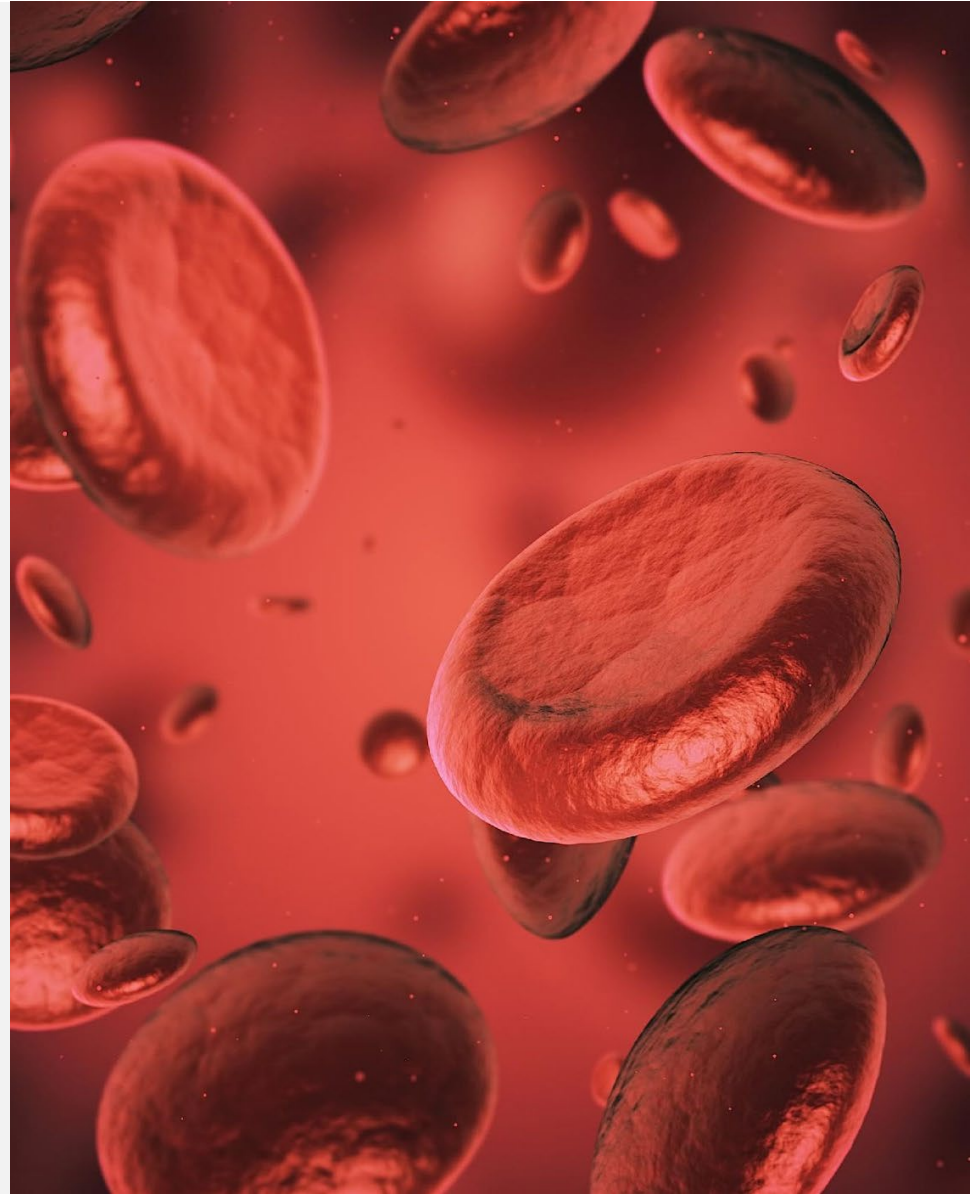
Standing Benefits



Cardiopulmonary

- Improved circulation
- Reduced edema
- Improved breathing when standing

(Eng, 2001; Dunn, 1998)



Bladder Function

Neurological impairments whether disease or injury induced can contribute to bladder dysfunction

Benefits of Standing

- Improved bladder function
- Decreased urinary tract infections

(Sprigle, Maurer, & Sorenblum, 2009; Côté et al 2010)



Bowel Function

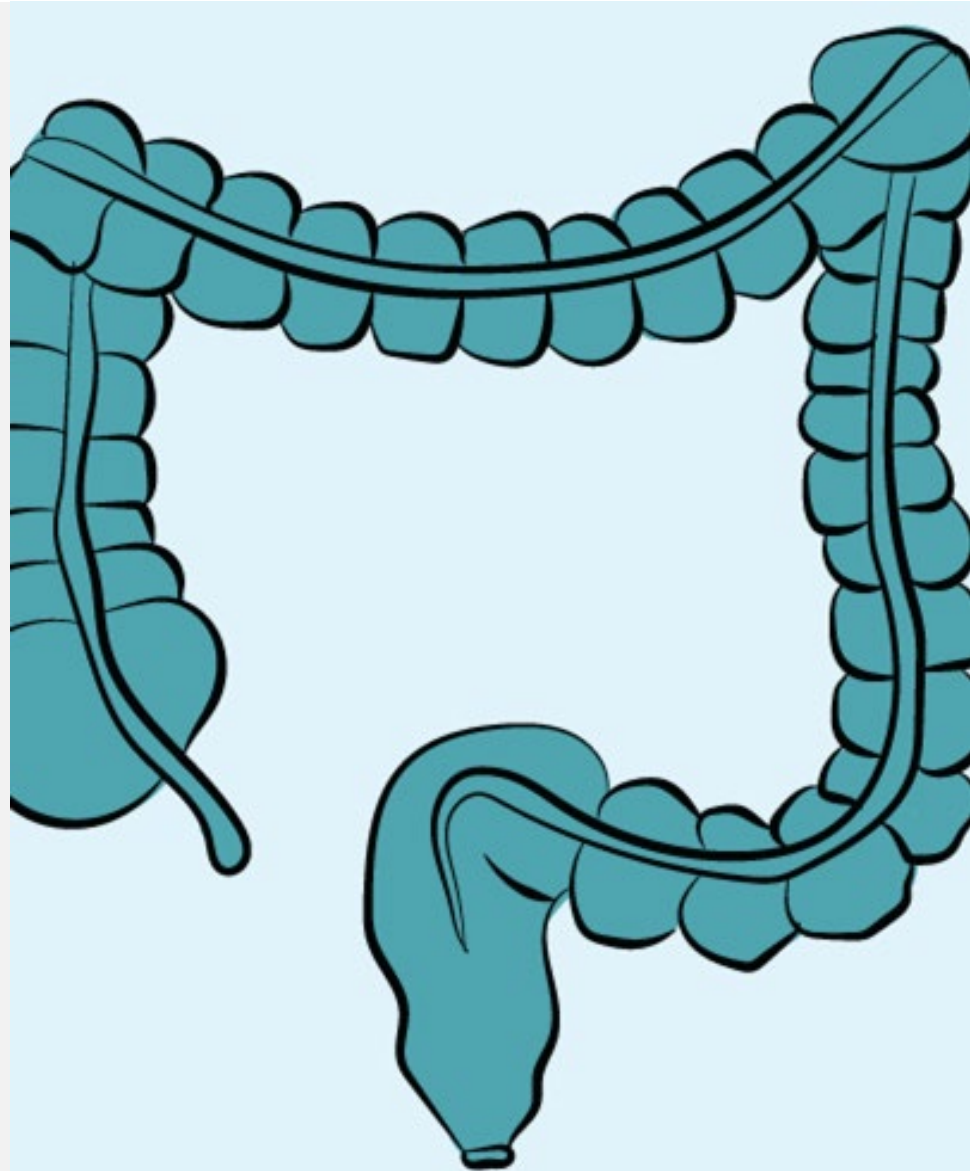
Benefits of Standing

- gravity assisted bowel movement
- improved bowel function

Standing in a dynamic fashion

- allows for the stretch of the colon
- stimulates bowel movement within the colon

(Hendrie, et al, 2017; Kwok, et al. 2015)

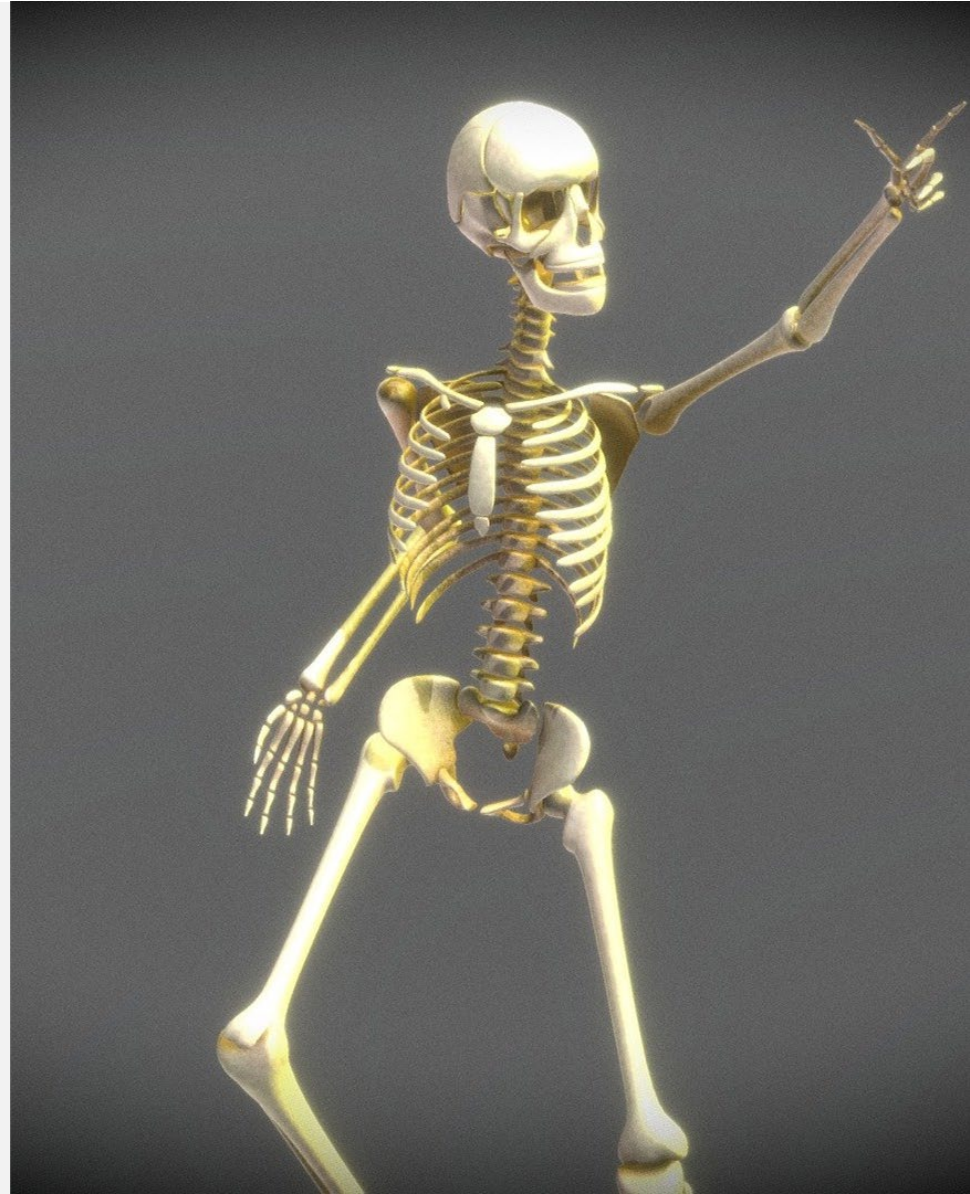


Bone Density

Benefit of Standing

- Standing has positive impact on lower limb density in children
- Standing early and longer results in best outcomes

(Craig et al 2016; Glickman et al, 2010; Paleg et al 2013)



Range of Motion (ROM)

Benefits of Standing

- Standing has shown benefits in range of motion and muscle length

Clinical Recommendations

- Stand in full hip extension to reduce flexor tightness
- To prevent the formation of contractures, start standing programs early
- Standing improved ROM in hips in clients as young as 14 months

(McDonald (1998); Stuberg (1992); Kunkel, et al; Macias (2005))



Spasticity

Benefits of Standing

- Standing resulted in decreased spasticity in both adults and children
- People with greater spasticity had greater effect from standing
- Effect was correlated with number of standing opportunities per day

John Hopkins Medicine; Craig et al 2016; Newman & Barker 2012; Paleg, Smith, Glickman (2013; Hendrie 2015; Tremblay et al 1990

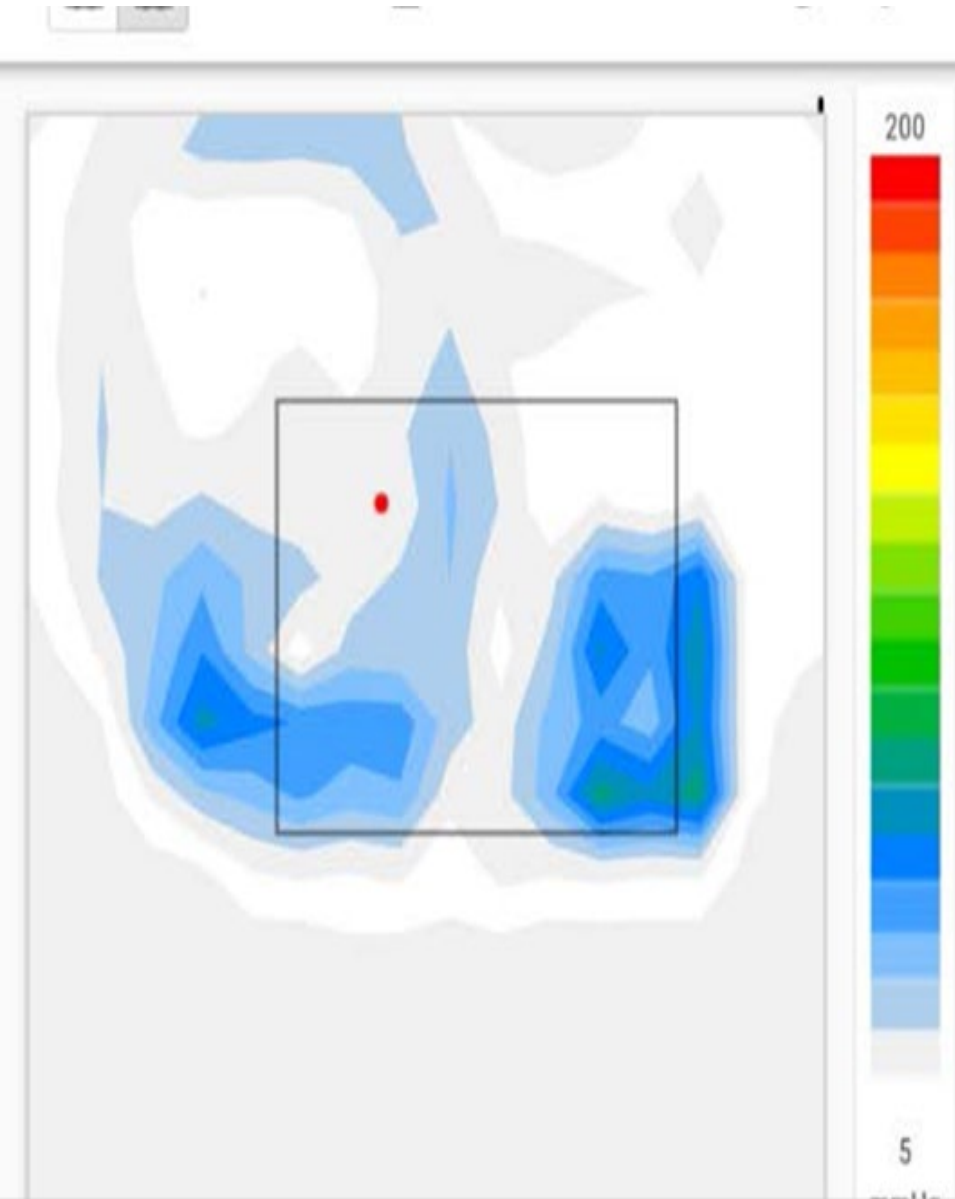


Pressure Redistribution

Benefits of Standing

- Substantial offloading of ischial tuberosities (ITs) when standing
- Skin surface temperatures are reduced when standing
- The only power seat function that reduces pressure load on both back and seat/cushion

(Sprigle, Maurer, & Sorenblum, 2009; Cotie et al 2010)



Functional Benefits

Higher levels of **independence**

Handwashing/reaching

Independence in toileting

Donning/doffing clothing

Decreased demand for care

Higher level of **involvement**
for the individual

(Kenyon et al 2021; Vorster et al 2019; Bayley, 2020)



LaBerge, N. B., Detterbeck, A., & Nooijen, C. F. (2021). Comorbidities and medical complexities of mobility device users: a retrospective study. *Disability and Rehabilitation: Assistive Technology*, 1-8.

Study Citation



Questions



Thank you!

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