

# Identifying and managing pre-frailty in older adults with a new walking speed sensor (WSS)

**Joe McLoughlin**

**Director, Astraline and Innovation**

Johnnie Johnson Housing



# Delivery team



Centre for Assistive Technology and Connected Healthcare

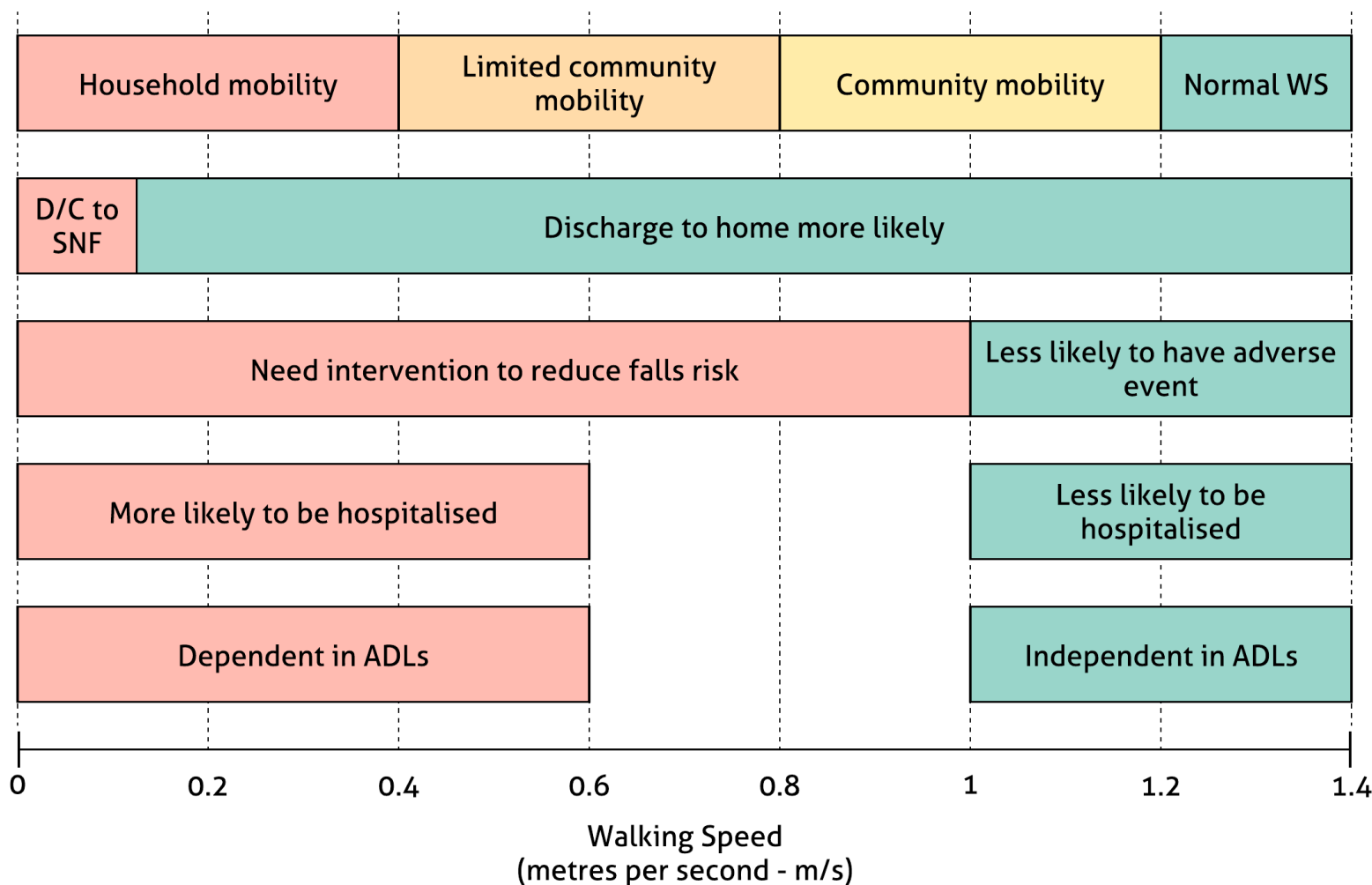


- 1. What is Service?**
- 2. Is it useful, usable or desirable?**
- 3. How do we achieve scale?**

Testing the feasibility of measuring walking speed frequently and unobtrusively in the home using technology that is:

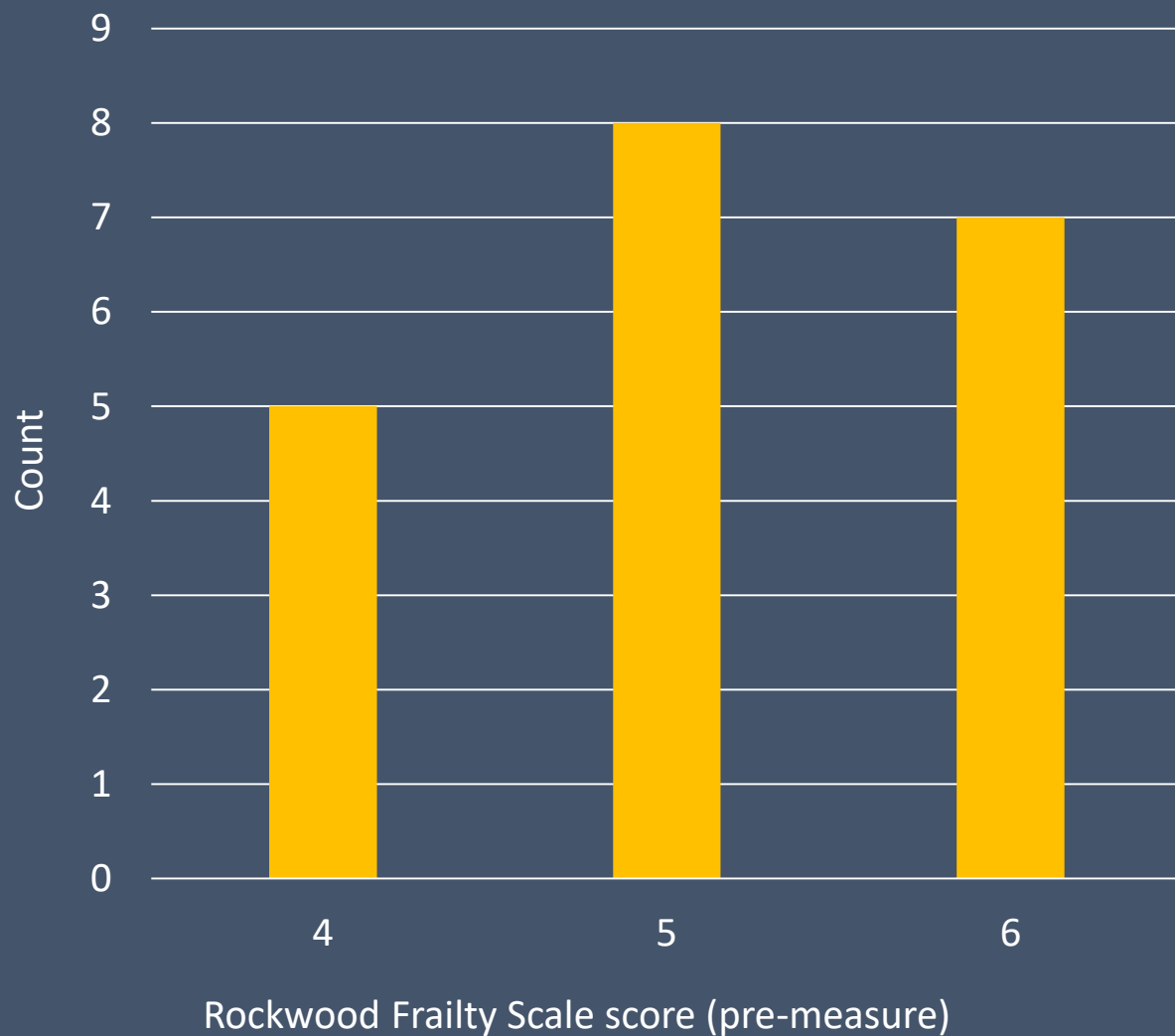
- easy to install
- reliable
- low cost
- acceptable to older people

# Linking walking speed and independence



Adapted from Fritz, S. & Lusardi, M. (2009). White Paper: Walking speed: the sixth vital sign. *Journal of Geriatric Physical Therapy*, 32(2), 2-5

# Recruitment



**4 Vulnerable** – While not dependent on others for daily help, often symptoms limit activities. A common complaint is being “slowed up”, and/or being tired during the day.



**5 Mildly Frail** – These people often have more evident slowing, and need help in high order IADLs (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.



**6 Moderately Frail** – People need help with all outside activities and with keeping house. Inside, they often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing.

# Method



	Installation	Week 1	Month 1	Month 2	Month 3
Rockwood Frailty Scale	✓		✓	✓	✓
Self-report health rating			✓	✓	✓
Self-report health symptoms			✓	✓	✓
Data check		✓	✓	✓	
Participant interviews					✓

# Measuring walking speed



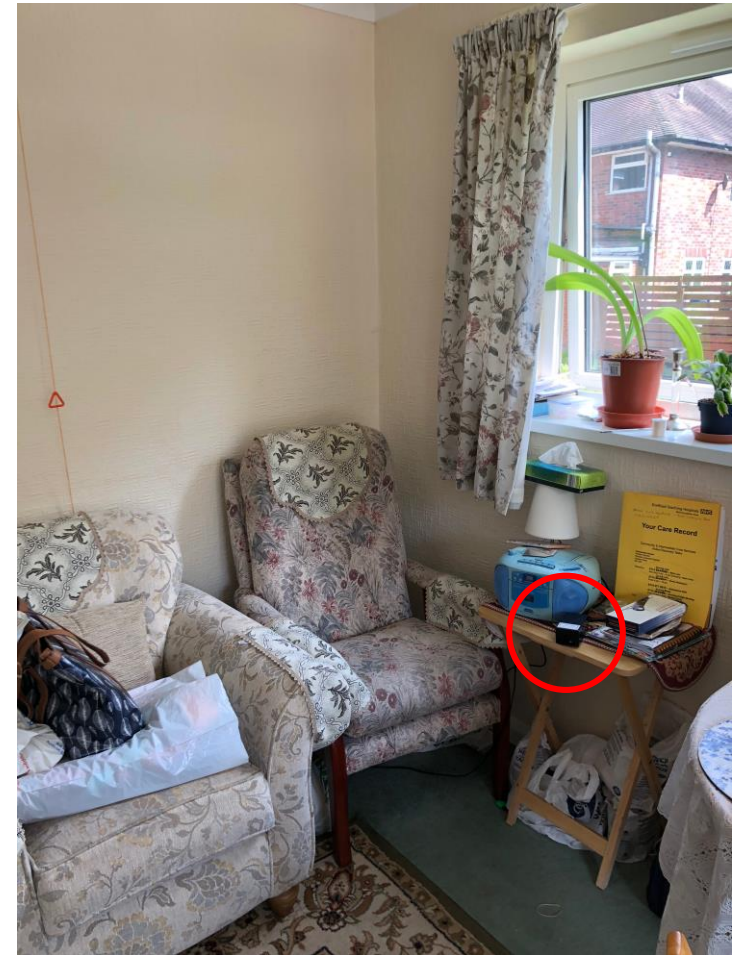
Screenshot from 'Gait Speed Test', Paul Potter PT, <https://www.youtube.com/watch?v=JtiTxfGFOY>



# Good examples of placement



# Sensor installation

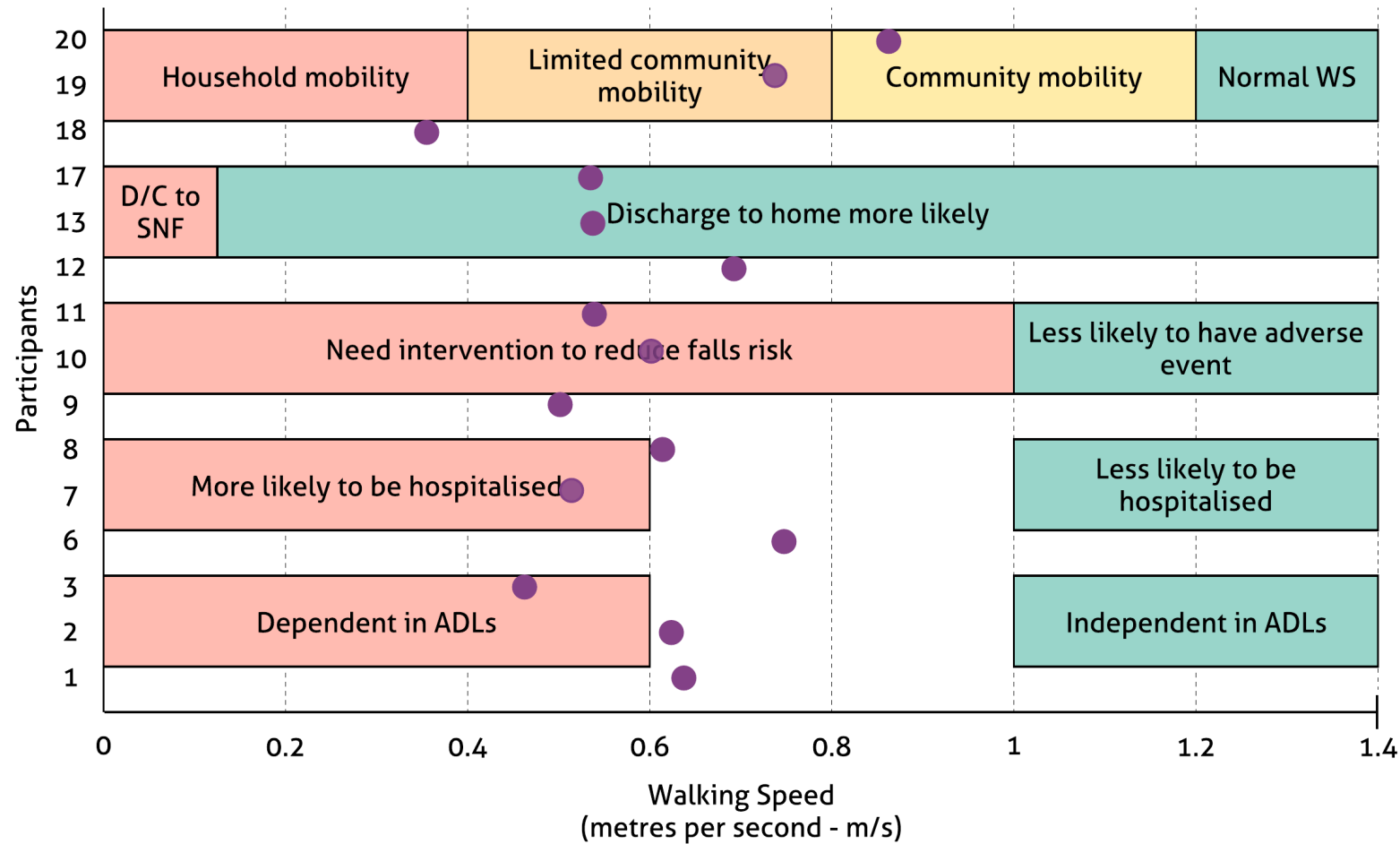


# Results

Participant	Total No. Measurements	Median WS (m/s)
1	277	.622
2	1509	.616
3	433	.473
4	9	.465
<del>5</del>	<del>13</del>	<del>.895</del>
6	3623	.753
7	1413	.524
8	329	.617
9	324	.502
10	3439	.603

Participant ID	Total No. Measurements	Median WS (m/s)
11	2085	.537
12	1005	.698
13	837	.533
14	13	.654
<del>15</del>	<del>97</del>	<del>.289</del>
16	2	.364
17	134	.529.5
18	1347	.365
19	1640	.723.5
20	1386	.866

# Linking walking speed and independence



Adapted from Fritz, S. & Lusardi, M. (2009). White Paper: Walking speed: the sixth vital sign. *Journal of Geriatric Physical Therapy*, 32(2), 2-5

## Summarised data from participant interviews:

- Positive responses to the concept of measuring walking speed, receiving feedback on speed and to the design/appearance of the sensor
- Mixed response on awareness of the sensor in the home
- Negative response to the idea of long-term walking speed measurement
- Positive responses to the notion of health data being shared with others; family most common, also supported living staff and clinicians

# Feasibility study

“...it's small, you don't know it's there so you're just walking and **you leave it there to do its job.**”

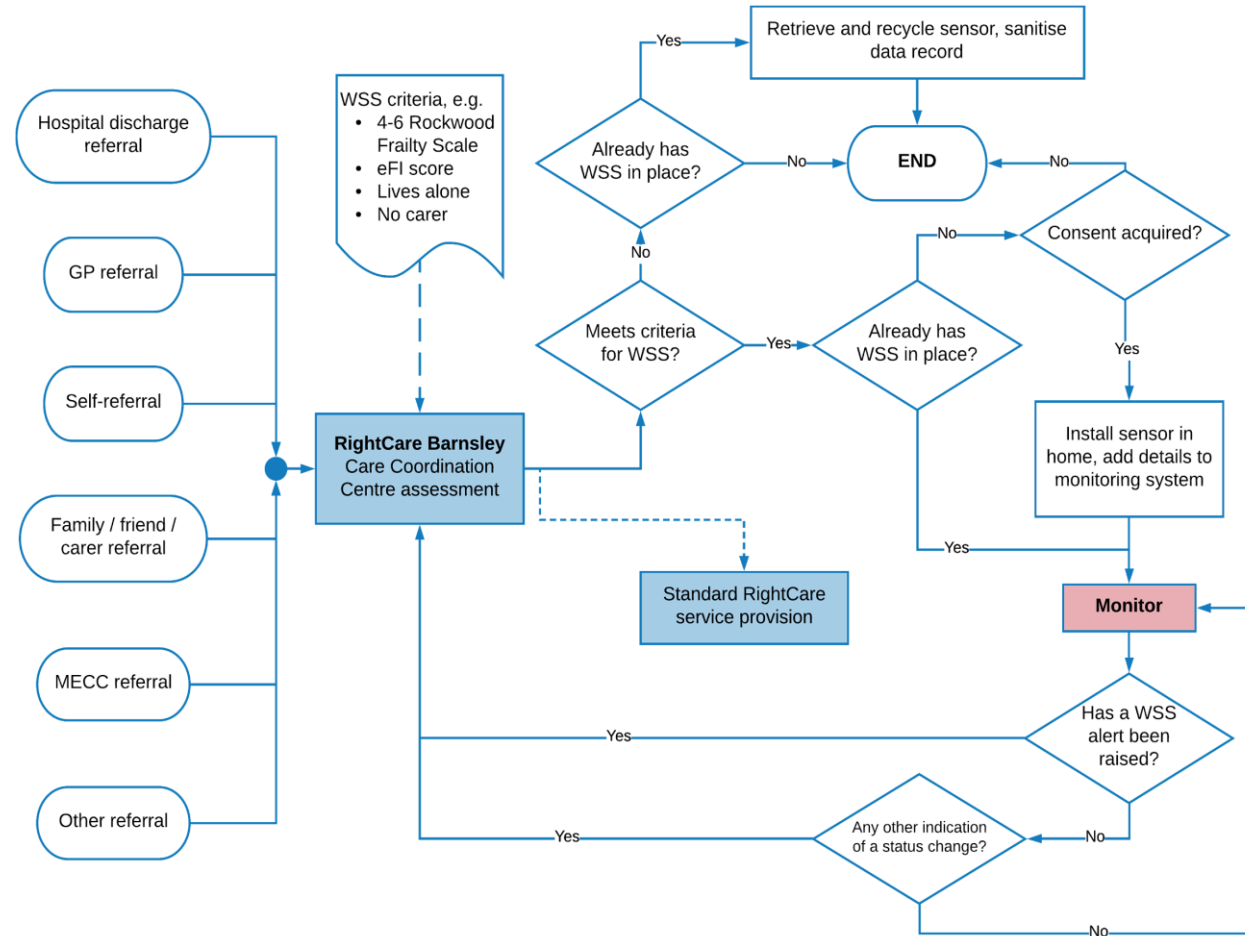
“It's just a box in the corner, **you don't really notice it.**”

“...I would think it wasn't very good [to find out your walking is getting slower], so **I must do something about it**, and perhaps go to my doctor or tell my nurse or my carer, ” and see what they would say...”



# Example integrated care pathway

## Barnsley RightCare Walking Speed System (WSS) pathway



# Value proposition



Greater quality of life  
for older adults, their  
family, and friends

Improved care provision  
through low cost integration  
into existing and new  
care models

Long-term financial savings  
for NHS and other  
care providers by shifting  
focus to prevention

Job and wealth creation  
in UK through  
market-defining  
innovation with global reach





# An unobtrusive sensor

