Comparison of Cut Points for Predicting Physical Activity Intensity in Older Adults

Ameera Chakravarthy, PhD, CRNP, Barbara Resnick, PhD, CRNP, FAAN, FAANP, Elizabeth Galik, PhD, CRNP, FAAN, FAANP, FGSA , Kelly Doran, PhD, RN, FAAN, Cynthia Renn, PhD, Eric Lehr, MD, PhD, FRCSC, Kasey Knopp, GA

Background

- Physical activity among older adults is objectively measured by accelerometry (counts per minutes)
- There is no consensus on cut-points demarcating different levels of physical activity (Table 1)
- Lack of cut-point consensus makes comparing activity levels across different studies difficult
- Most used cut-points: Freedson (developed for adults) and Landry cut-points (developed for older adults)

Level Of Physical Activity	Range
Sedentary activity	50 to 500 counts/min
Moderate to vigorous physical activity	574 to 3,250 counts/min

Table 1. Physical Activity Ranges found in literature

Objective

- Measure physical activity using the MotionWatch 8 in older adults
- Explore which method of cut-points was more likely to be appropriate for older adults
- Hypothesis: controlling for age, gender, race, cognition, comorbidities, Landry cut points would be associated with function when compared to Freedson cut points

Figure 1. Nursing Assessment of Participant

Methods

- Secondary data analysis using MotionWatch 8 data from Function Focused Care for Acute Care using the Evidence Integration Triangle (FFC-AC-EIT)
- Inclusion criteria: hospitalized adults > 65 yrs., evidence of dementia, > 2 on AD8 Dementia Screening Interview, score ≤ 20 on the Saint Louis University Mental Status
- Exclusion criteria: Hospice; unit admission > 48 hours, no legal authorized representative, surgery admission, had a major acute psychiatric disorder or significant neurological condition that altered their cognitive ability other than dementia
- MotionWatch8 accelerometer measuring 24 hr. count data
- Compared with Freedson and Landry cut-points
- Impact on outcomes with hierarchical multiple regression
- and multivariate analysis of variance

Figure 2. Camntech MotionWatch 8

Results

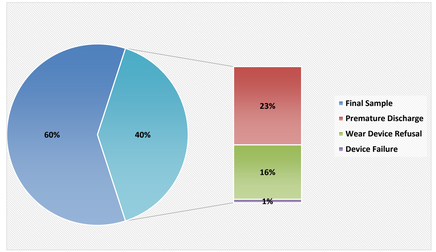

Figure 3. Sample Breakdown

- 11% of the variance in function was explained by all the variables in the model. The covariates entered in step 1 were associated with function with an adjusted R^2 change of .11, [F (5, 158) = 5.09, p<.001]
- Landry sedentary cut point was associated with function, a significant R^2 change of .14 [F (1, 157) = 5.40, p<.001], and an additional 3% of the variance in function was explained by the Landry sedentary cut point

Sample *N*=177		
Variable	Mean	SD
Age (years)	82.89	8.11
Function (Barthel index)	51.97	29.07
Cognition	7.27	5.94
MotionWatch 8: minutes in sedentary activity (Landry)	20.44	3.39
MotionWatch 8: minutes in light activity (Landry)	.75	1.29
MotionWatch 8: minutes in moderate/vigorous activity (Landry)	.13	.39
MotionWatch 8: minutes in sedentary activity (Freedson)	22.63	4.43
MotionWatch 8: minutes in moderate activity (Freedson)	.00	.00
MotionWatch 8: minutes in vigorous activity (Freedson)	.00	.00
Comorbidities	2.17	1.46
	N	%
Gender		
Male	66	37%
Female	111	63%
Race		
Black	54	30%
White	123	70%

Table 2. Sample Description

Conclusions

- A low amount and intensity of physical activity using Freedson or Landy cut points and less than guideline recommendation of at least 150 minutes a week
- The Landry cut point for sedentary activity was associated with function (10-item Barthel Index)
- None of the Freedson cut points were associated with function
- Freedson cut points do not provide an equivalent cut point for sedentary activity
- The model explained a small amount of the variance in function and other factors may have an impact on function such as motivation, fear of falling, facility and caregiver factors should be considered for future research
- Future research to use lower levels of activity to evaluate physical activity among older adults with higher severity of illness admitted to intensive care units and/or those receiving vasoactive treatment

Financial Disclosure

- Financial support from the Gerontological Advance Practice Nurses Association Foundation, Inc. (GAPNAF)
- Research Grant University of Maryland School of Nursing Biology and Behavior Across Lifespan (BBAL) DRIF Award
- R01 AG065338 (Resnick/Boltz) NIH/NIA
  Testing the Efficacy of FFC-AC-EIT in Patients with Alzheimer's Disease and Related Dementias

Contact Info.