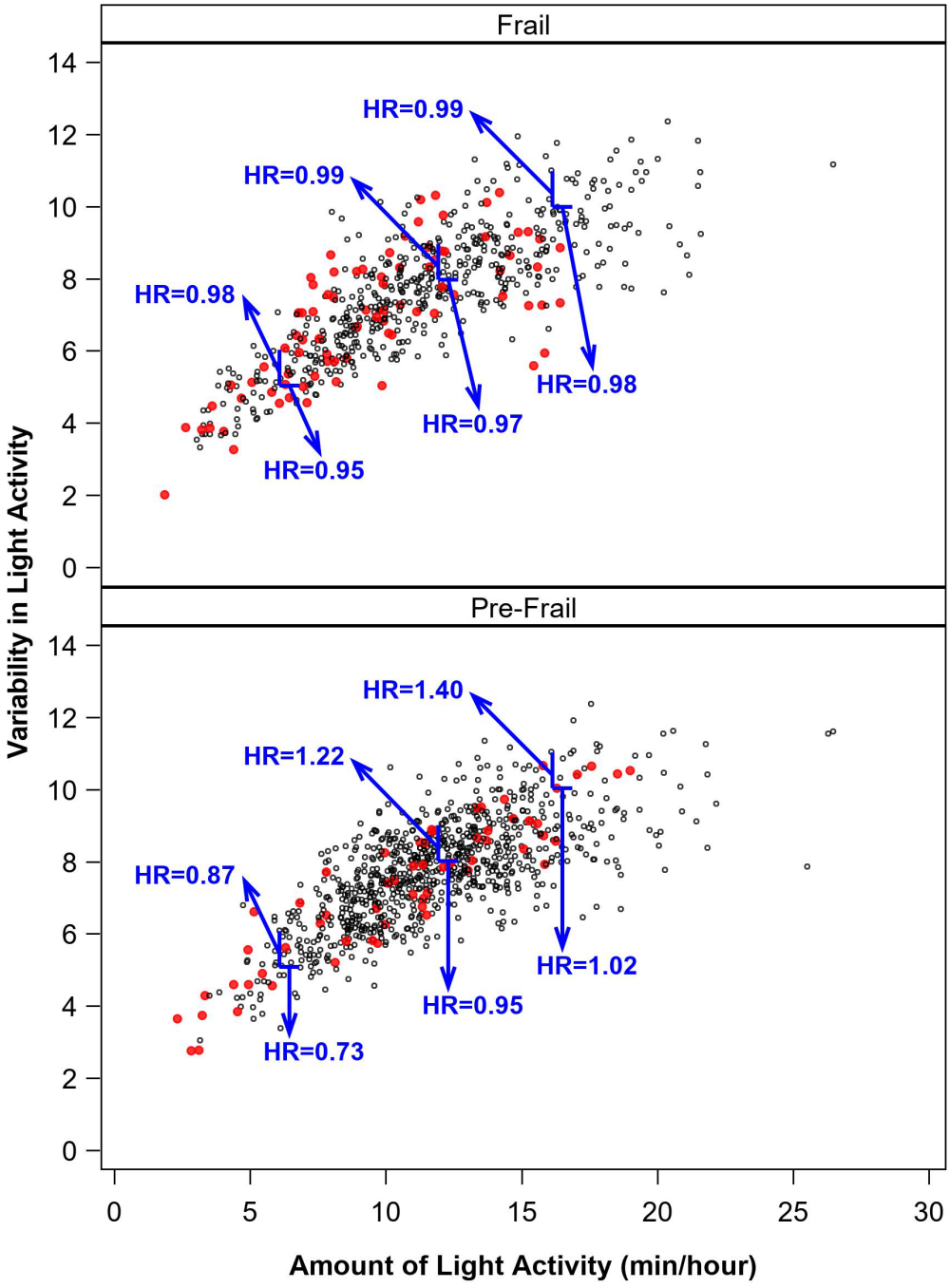
Supplemental Table 1: Development of Cox Proportional Hazards models using an accelerometer cut point of 1040 to define moderate-to-vigorous physical activity (MVPA). Each column represents a step in the development of the model for light physical activity (LPA) or MVPA, culminating in the final full model, which retained all significant predictors identified in the model building steps, plus covariates. Note: HR = hazard ratio; SPPB = short physical performance battery; BP = blood pressure, CVD = cardiovascular disease.

Variable	LPA Model 1	Series of MVPA Models (Backward Elimination of Higher Order Interactions)				Full Model
		MVPA Model 1	MVPA Model 2	MVPA Model 3	MVPA Model 4	
Age at Randomization	β=0.03; *p*=0.14;HR=1.03	β=0.02; *p*=0.21;HR=1.02	β=0.02; *p*=0.21;HR=1.02	β=0.02; *p*=0.20;HR=1.02	β=0.02; *p*=0.18;HR=1.02	β=0.02; *p*=0.40;HR=1.02
Body Mass Index	β=0.03; *p*=0.03;HR=1.03	β=0.03; *p*=0.06;HR=1.03	β=0.03; *p*=0.06;HR=1.03	β=0.03; *p*=0.06;HR=1.03	β=0.03; *p*=0.06;HR=1.03	β=0.03; *p*=0.07;HR=1.03
Race (Non-Hispanic White)	β=-0.01; *p*=0.97;HR=0.99	β=0.05; *p*=0.81;HR=1.05	β=0.05; *p*=0.80;HR=1.06	β=0.05; *p*=0.82;HR=1.05	β=0.04; *p*=0.83;HR=1.05	β=-0.00; *p*=0.99;HR=1.00
SPPB ≤ 7	β=-6.67; *p*=0.01	β=0.60; *p*=0.08	β=0.69; *p*=0.02	β=0.79; *p*<.01	β=0.89; *p*<.01	β=-6.38; *p*<.01
History of Hypertension	β=-0.20; *p*=0.33;HR=0.82	β=-0.23; *p*=0.26;HR=0.80	β=-0.23; *p*=0.26;HR=0.80	β=-0.22; *p*=0.28;HR=0.80	β=-0.22; *p*=0.28;HR=0.80	β=-0.28; *p*=0.18;HR=0.76
History of CVD Disease	β=0.63; *p*<.01;HR=1.88	β=0.59; *p*<.01;HR=1.80	β=0.59; *p*<.01;HR=1.80	β=0.58; *p*<.01;HR=1.79	β=0.58; *p*<.01;HR=1.79	β=0.58; *p*<.01;HR=1.79
History of Lung Disease	β=-0.32; *p*=0.24;HR=0.73	β=-0.39; *p*=0.16;HR=0.68	β=-0.39; *p*=0.15;HR=0.68	β=-0.39; *p*=0.15;HR=0.67	β=-0.38; *p*=0.16;HR=0.68	β=-0.32; *p*=0.24;HR=0.73
History of Arthritis	β=0.05; *p*=0.81;HR=1.06	β=0.00; *p*=0.99;HR=1.00	β=-0.00; *p*=1.00;HR=1.00	β=0.00; *p*=0.99;HR=1.00	β=0.02; *p*=0.92;HR=1.02	β=0.10; *p*=0.68;HR=1.10
Log LPA Amount	β=-4.05; *p*<.01					β=-3.96; *p*<.01
LPA Variability	β=-1.04; *p*<.01					β=-1.03; *p*<.01
Log LPA Amount * LPA Variability	β=0.44; *p*<.01					β=0.44; *p*<.01
SPPB * Log LPA Amount	β=3.27; *p*<.01					β=3.38; *p*<.01
SPPB * LPA Variability	β=1.08; *p*=0.01					β=0.83; *p*=0.06
SPPB * Log LPA Amount * LPA Variability	β=-0.47; *p*<.01					β=-0.38; *p*=0.02
MVPA Amount		β=-0.02; *p*=0.94	β=0.02; *p*=0.95	β=0.23; *p*=0.36	β=0.11; *p*=0.62	β=0.18; *p*=0.46
MVPA Variability		β=-0.34; *p*=0.02	β=-0.33; *p*=0.02	β=-0.29; *p*=0.04	β=-0.22; *p*=0.06;HR=0.81	β=-0.21; *p*=0.06;HR=0.81
MVPA Amount * MVPA Variability		β=0.05; *p*=0.26	β=0.04; *p*=0.32			
SPPB * MVPA Amount		β=-0.78; *p*=0.24	β=-0.99; *p*=0.06	β=-1.05; *p*=0.05	β=-0.61; *p*=0.02	β=-0.58; *p*=0.04
SPPB * MVPA Variability		β=0.29; *p*=0.26	β=0.25; *p*=0.29	β=0.23; *p*=0.33		
SPPB * MVPA Amount * MVPA Variability		β=-0.05; *p*=0.64				

Supplemental Table 2: Development of Cox Proportional Hazards models using an accelerometer cut point of 760 to define moderate-to-vigorous physical activity (MVPA). Each column represents a step in the development of the model for light physical activity (LPA) or MVPA, culminating in the final full model, which retained all significant predictors identified in the model building steps, plus covariates. Note: HR = hazard ratio; SPPB = short physical performance battery; BP = blood pressure, CVD = cardiovascular disease.

Variable	LPA Model 1	Series of MVPA Models (Backward Elimination of Higher Order Interactions)				Full Model
		MVPA Model 1	MVPA Model 2	MVPA Model 3	MVPA Model 4	
Age at Randomization	β=0.02; *p*=0.20;HR=1.02	β=0.03; *p*=0.15;HR=1.03	β=0.02; *p*=0.17;HR=1.03	β=0.03; *p*=0.16;HR=1.03	β=0.03; *p*=0.15;HR=1.03	β=0.01; *p*=0.43;HR=1.01
Body Mass Index	β=0.03; *p*=0.03;HR=1.03	β=0.03; *p*=0.06;HR=1.03	β=0.03; *p*=0.06;HR=1.03	β=0.03; *p*=0.06;HR=1.03	β=0.03; *p*=0.07;HR=1.03	β=0.03; *p*=0.09;HR=1.03
Race (Non-Hispanic White)	β=-0.00; *p*=0.99;HR=1.00	β=0.05; *p*=0.80;HR=1.06	β=0.07; *p*=0.74;HR=1.07	β=0.07; *p*=0.74;HR=1.07	β=0.06; *p*=0.79;HR=1.06	β=0.00; *p*=0.99;HR=1.00
SPPB ≤ 7	β=-8.08; *p*<.01	β=0.33; *p*=0.43	β=0.68; *p*=0.04	β=0.79; *p*<.01	β=0.93; *p*<.01	β=-7.36; *p*<.01
History of Hypertension	β=-0.19; *p*=0.36;HR=0.83	β=-0.21; *p*=0.31;HR=0.81	β=-0.20; *p*=0.33;HR=0.82	β=-0.19; *p*=0.34;HR=0.83	β=-0.19; *p*=0.35;HR=0.83	β=-0.24; *p*=0.24;HR=0.79
History of CVD Disease	β=0.63; *p*<.01;HR=1.88	β=0.57; *p*<.01;HR=1.76	β=0.57; *p*<.01;HR=1.77	β=0.57; *p*<.01;HR=1.77	β=0.57; *p*<.01;HR=1.76	β=0.57; *p*<.01;HR=1.77
History of Lung Disease	β=-0.33; *p*=0.22;HR=0.72	β=-0.34; *p*=0.21;HR=0.71	β=-0.35; *p*=0.19;HR=0.70	β=-0.35; *p*=0.20;HR=0.71	β=-0.36; *p*=0.18;HR=0.70	β=-0.30; *p*=0.27;HR=0.74
History of Arthritis	β=0.05; *p*=0.83;HR=1.05	β=0.01; *p*=0.95;HR=1.01	β=0.00; *p*=0.99;HR=1.00	β=0.01; *p*=0.95;HR=1.01	β=0.02; *p*=0.94;HR=1.02	β=0.09; *p*=0.70;HR=1.09
Log LPA Amount	β=-4.69; *p*<.01					β=-4.53; *p*<.01
LPA Variability	β=-1.09; *p*<.01					β=-1.02; *p*<.01
Log LPA Amount * LPA Variability	β=0.52; *p*<.01					β=0.49; *p*<.01
SPPB * Log LPA Amount	β=4.12; *p*<.01					β=4.14; *p*<.01
SPPB * LPA Variability	β=1.40; *p*<.01					β=1.00; *p*=0.04
SPPB * Log LPA Amount * LPA Variability	β=-0.63; *p*<.01					β=-0.48; *p*<.01
MVPA Amount		β=-0.19; *p*=0.44	β=-0.07; *p*=0.76	β=-0.11; *p*=0.61	β=0.11; *p*=0.42	β=0.20; *p*=0.21
MVPA Variability		β=-0.37; *p*<.01	β=-0.33; *p*=0.01	β=-0.28; *p*<.01	β=-0.24; *p*=0.01;HR=0.79	β=-0.24; *p*=0.02;HR=0.79
MVPA Amount * MVPA Variability		β=0.06; *p*=0.04	β=0.04; *p*=0.12	β=0.04; *p*=0.14		
SPPB * MVPA Amount		β=0.03; *p*=0.94	β=-0.41; *p*=0.15	β=-0.26; *p*=0.08	β=-0.34; *p*=0.02	β=-0.36; *p*=0.04
SPPB * MVPA Variability		β=0.21; *p*=0.31	β=0.12; *p*=0.54			
SPPB * MVPA Amount * MVPA Variability		β=-0.09; *p*=0.19				

Supplemental Figure 1. Utilizing 760 as the cut point for MVPA, this figure illustrates the difference in risk for MMD that a 1-unit higher level of variability has at different amounts of LPA (vertical lines), and difference in risk associated with a 1-min/hr higher level of amount at different levels of variability in LPA (horizontal lines) among those with a short physical performance battery (SPPB) score ≤ 7 (bottom panel) and SPPB = 8-9, extracted from a model including all activity predictors. Note that we have illustrated variability hazard ratios at selected values of 6 vs. 5, 9 vs. 8, and 11 vs. 10, and amount hazard ratios at selected values of 7 vs. 6 min/hour, 13 vs. 12 min/hour, and 17 vs. 16 min/hour. Red dots represent activity measurement intervals followed by MMD events. HRs for LPA were obtained through back-transformation from model generated using log-transformed values of LPA.



Supplemental Figure 2. Stepwise Activity Recommendation Guide. Notes: Recommendations build from left to right, such that fostering basic physical function is necessary for building a greater volume of higher-intensity movement. Once higher intensity movement has been built into the day, and function is stable, a focus on lower-intensity movement is warranted, followed by a focus on distribution of lower-intensity movement. *It is vital to bear in mind that intensity is relevant, and as such, many basic activities of daily living (e.g., walking for transport) should be seen as higher-intensity for some individuals with very low levels of basic functioning.