Supplemental Digital Content 3. Associations of the two physical activity metrics* with markers of bone health with no imputing of zeros during night-time non-wear (wave 9, N = 220).

	Model 1		Model 2		Model 3		Result
	Coefficient	95% CI	Coefficient	95% CI	Coefficient	95% CI	
Hip aBMD							
Average acceleration (m*g*)	**0.007**	**0.003, 0.011**	**0.007**	**0.003, 0.012**	0.005	-0.001, 0.011	
[a]Intensity gradient	**0.141**	**0.063, 0.218**	**0.143**	**0.064, 0.223**	**0.098**	**0.001, 0.196**	Independent effect of intensity
Average acceleration X intensity gradient					-0.003	-0.022, 0.017	
Total Body BMC (minus head)							
Average acceleration (m*g*)	**14.092**	**4.431, 23.753**	**16.156**	**8.485, 23.827**	**11.161**	**1.468, 20.854**	Independent effect of volume
[a]Intensity gradient	**295.305**	**112.576, 478.035**	**289.136**	**144.335, 433.937**	**183.270**	**8.797, 357.742**	Independent effect of intensity
Average acceleration X intensity gradient					0.145	-29.977, 30.268	
[b]Spine aBMD							
Males (N = 96)							
Average acceleration (m*g*)	**0.007**	**0.002, 0.012**	**0.007**	**0.002, 0.012**	0.005	-0.000, 0.011	
[a]Intensity gradient	**0.120**	**0.015, 0.226**	**0.122**	**0.010, 0.235**	0.077	-0.044, 0.199	
Average acceleration X intensity gradient					0.009	-0.017, 0.035	
Females (n = 124)							
Average acceleration (m*g*)	0.002	-0.003, 0.007	0.003	-0.003, 0.008	0.002	-0.004, 0.008	
[a]Intensity gradient	0.054	-0.042, 0.151	0.070	-0.042, 0.182	0.062	-0.057, 0.181	
Average acceleration X intensity gradient					-0.015	-0.039, 0.010	
Hip femoral neck cross-sectional area							
Average acceleration (m*g*)	**0.025**	**0.009, 0.042**	**0.027**	**0.012, 0.042**	0.018	-0.002, 0.037	
[a]Intensity gradient	**0.488**	**0.175, 0.802**	**0.488**	**0.192, 0.784**	0.303	0.065, 0.672	
Average acceleration X intensity gradient					0.019	-0.044, 0.082	
Hip femoral neck section modulus							
Average acceleration (m*g*)	**0.015**	**0.004, 0.026**	**0.017**	**0.008, 0.027**	**0.012**	**0.001, 0.024**	Independent effect of volume
[a]Intensity gradient	**0.263**	**0.054, 0.471**	**0.243**	**0.051, 0.434**	0.099	-0.131, 0.328	
Average acceleration X intensity gradient					0.028	-0.007, 0.063	

*Activity metrics (average of waves 6-9): Intensity gradient and average acceleration (across wear-time)

[a]Intensity gradient: Gradient of the regression line from log-log plot of intensity (x) and minutes accumulated (y).

[b]Analyses run separately by sex due to a significant sex X activity interaction term. For the sex-specific analyses only, consistently non-significant co-variates (height and age) were dropped.
Model 1 adjusted for sex and mass only. Model 2 adjusted for sex, age, height, mass, years from PHV (all from wave 9), the proportion of the 24h cycle the monitor was worn and mean age for physical activity measures. Model 3 further adjusted for alternate activity metric and the product term (average acceleration X intensity gradient) entered to investigate interactive effects
95% CI = 95% confidence interval
Scores were centered before entry into the analysis. Physical activity interaction terms were calculated from the centered scores.
Significant associations are denoted in bold.