Supplemental data

Table S1: Conditional differences in blood pressure or heart rate recovery compared to robust category (% baseline)

SBP	Model 1		Model 2	
	Prefrail	Frail	Prefrail	Frail
10	0.39 [-0.41,1.20]	0.29 [-2.58,3.17]	0.44 [-0.40,1.28]	1.07 [-1.97,4.10]
20	-0.59 [-1.39,0.21]	-3.83 [-6.69,-0.97]**	-0.44 [-1.28,0.40]	-1.65 [-4.67,1.38]
30	-0.59 [-1.38,0.21]	-4.08 [-6.92,-1.23]**	-0.37 [-1.20,0.46]	-1.93 [-4.94,1.07]
40	-0.44 [-1.19,0.32]	-3.62 [-6.30,-0.94]**	-0.27 [-1.06,0.52]	-1.67 [-4.49,1.16]
50	-0.28 [-1.00,0.44]	-3.16 [-5.71,-0.61]*	-0.17 [-0.92,0.59]	-1.40 [-4.09,1.29]
60	-0.13 [-0.83,0.57]	-2.70 [-5.17,-0.23]*	-0.07 [-0.80,0.67]	-1.13 [-3.73,1.48]
70	0.02 [-0.67,0.71]	-2.24 [-4.69,0.21]	0.04 [-0.69,0.76]	-0.86 [-3.44,1.72]
80	0.17 [-0.53,0.87]	-1.78 [-4.25,0.69]	0.14 [-0.60,0.87]	-0.59 [-3.20,2.02]
90	0.32 [-0.40,1.04]	-1.32 [-3.87,1.23]	0.24 [-0.52,0.99]	-0.32 [-3.01,2.37]
100	0.48 [-0.28,1.23]	-0.86 [-3.54,1.82]	0.34 [-0.45,1.13]	-0.05 [-2.88,2.77]
110	0.63 [-0.17,1.42]	-0.40 [-3.25,2.44]	0.44 [-0.39,1.27]	0.22 [-2.79,3.22]
DBP				
10	0.80 [-0.01,1.61]	2.77 [0.10,5.44]*	0.55 [-0.31,1.40]	2.59 [-0.27,5.45]
20	-1.00 [-1.80,-0.20]*	-2.49 [-5.13,0.15]	-0.84 [-1.69,0.00]	-0.84 [-3.68,1.99]
30	-1.18 [-1.97,-0.39]**	-3.66 [-6.23,-1.09]**	-0.77 [-1.61,0.06]	-1.61 [-4.36,1.15]
40	-1.03 [-1.78,-0.28]**	-3.41 [-5.84,-0.98]**	-0.68 [-1.47,0.11]	-1.52 [-4.11,1.08]
50	-0.88 [-1.60,-0.16]*	-3.16 [-5.47,-0.84]**	-0.58 [-1.34,0.18]	-1.43 [-3.90,1.05]
60	-0.73 [-1.43,-0.03]*	-2.90 [-5.15,-0.65]*	-0.48 [-1.22,0.25]	-1.34 [-3.74,1.06]
70	-0.58 [-1.27,0.11]	-2.65 [-4.88,-0.42]*	-0.38 [-1.11,0.35]	-1.25 [-3.62,1.13]
80	-0.43 [-1.13,0.27]	-2.40 [-4.64,-0.15]*	-0.29 [-1.02,0.45]	-1.16 [-3.56,1.25]
90	-0.28 [-1.00,0.43]	-2.14 [-4.46,0.17]	-0.19 [-0.94,0.57]	-1.06 [-3.54,1.41]
100	-0.13 [-0.88,0.61]	-1.89 [-4.32,0.54]	-0.09 [-0.88,0.70]	-0.97 [-3.57,1.62]
110	0.01 [-0.77,0.80]	-1.64 [-4.21,0.93]	0.01 [-0.82,0.84]	-0.88 [-3.64,1.87]
HR				
10	-1.26 [-1.93,-0.59]***	-2.02 [-4.20,0.16]	-0.51 [-1.22,0.19]	0.70 [-1.64,3.03]
20	0.49 [-0.17,1.15]	2.90 [0.74,5.06]**	0.70 [0.01,1.40]*	3.10 [0.79,5.42]**
30	0.46 [-0.19,1.10]	1.80 [-0.32,3.92]	0.77 [0.10,1.45]*	1.98 [-0.29,4.25]
40	0.39 [-0.22,1.01]	1.56 [-0.45,3.57]	0.74 [0.10,1.39]*	1.80 [-0.35,3.96]
50	0.33 [-0.26,0.92]	1.32 [-0.61,3.25]	0.71 [0.10,1.33]*	1.63 [-0.43,3.69]
60	0.26 [-0.31,0.84]	1.08 [-0.79,2.96]	0.68 [0.08,1.28]*	1.45 [-0.55,3.46]
70	0.20 [-0.37,0.77]	0.85 [-1.02,2.71]	0.65 [0.06,1.25]*	1.28 [-0.70,3.26]
80	0.13 [-0.44,0.71]	0.61 [-1.27,2.48]	0.62 [0.02,1.22]*	1.10 [-0.90,3.11]
90	0.07 [-0.52,0.66]	0.37 [-1.56,2.30]	0.59 [-0.03,1.21]	0.93 [-1.13,2.99]
100	0.00 [-0.61,0.62]	0.13 [-1.88,2.14]	0.56 [-0.08,1.20]	0.76 [-1.40,2.91]
110	-0.06 [-0.71,0.59]	-0.11 [-2.23,2.01]	0.53 [-0.15,1.21]	0.58 [-1.69,2.85]

Parameters are estimated from mixed effects models with linear splines. Model 1: Age and sex, Model 2: Age, sex, BMI, smoking, depressive symptoms, self-reported CVD conditions, medication use *P<0.05, **P<0.01, ***P<0.001

Table S2: Model parameters for blood pressure and heart rate recovery following active standing (mmHg of heart rate)

		Frailty*Time (rate of recovery)		
	Intercept (10s difference)	10-20s	20-30s	30-110s
Systolic BP (mmHg)				
Model 1				
Prefrail	0.34 [-1.30,1.98]	-1.27 [-1.78,-0.75]***	-0.04 [-0.55,0.47]	0.20 [0.07,0.33]**
Frail	1.27 [-4.66,7.21]	-5.99 [-7.89,-4.09]***	-0.47 [-2.37,1.43]	0.67 [0.13,1.21]*
Model 2				
Prefrail	0.13 [-1.59,1.85]	-1.20 [-1.74,-0.66]***	0.08 [-0.46,0.62]	0.13 [-0.01,0.27]
Frail	0.89 [-5.39,7.17]	-4.47 [-6.49,-2.44]***	-0.46 [-2.49,1.57]	0.43 [-0.14,1.01]
Diastolic BP (mmHg)				
Model 1				
Prefrail	0.10 [-0.74,0.94]	-1.30 [-1.60,-0.99]***	-0.25 [-0.55,0.05]	0.10 [0.04,0.16]**
Frail	1.01 [-1.76,3.78]	-3.87 [-4.99,-2.75]***	-0.93 [-2.03,0.18]	0.20 [-0.03,0.43]
Model 2				
Prefrail	-0.08 [-0.95,0.80]	-1.01 [-1.33,-0.69]***	-0.04 [-0.36,0.28]	0.07 [0.00,0.13]*
Frail	0.32 [-2.59,3.23]	-2.80 [-4.00,-1.60]***	-0.61 [-1.80,0.58]	0.10 [-0.15,0.35]
Heart rate				
Model 1				
Prefrail	0.92 [0.18,1.67]*	1.03 [0.78,1.29]***	-0.04 [-0.29,0.21]	-0.04 [-0.09,0.01]
Frail	2.09 [-0.32,4.50]	2.99 [2.22,3.76]***	-0.78 [-1.55,-0.01]*	-0.14 [-0.30,0.02]
Model 2				
Prefrail	0.98 [0.22,1.74]*	0.71 [0.44,0.98]***	0.04 [-0.23,0.30]	-0.02 [-0.07,0.03]
Frail	1.42 [-1.05,3.90]	1.45 [0.61,2.29]***	-0.73 [-1.56,0.10]	-0.11 [-0.29,0.07]

Parameters are estimated from mixed effects models with linear splines. Interaction coefficients represent the difference in time slopes or rate of recovery in blood pressure or heart rate at each stage of the active stand. Model 1: Age and sex, Model 2: Age, sex, BMI, smoking, depressive symptoms, self-reported CVD conditions, medication use *P<0.05, **P<0.01, ***P<0.001

Table S3: Conditional differences in blood pressure or heart rate recovery compared to robust category in (mmHg or heart rate)

SBP

	Model 1		Model 2	
	Prefrail	Frail	Prefrail	Frail
10	0.34 [-1.30,1.98]	1.27 [-4.66,7.21]	0.13 [-1.59,1.85]	0.89 [-5.39,7.17]
20	-0.93 [-2.56,0.71]	-4.72 [-10.65,1.21]	-1.07 [-2.78,0.64]	-3.57 [-9.85,2.70]
30	-0.97 [-2.60,0.66]	-5.19 [-11.11,0.74]	-0.99 [-2.69,0.72]	-4.03 [-10.30,2.24]
40	-0.77 [-2.36,0.83]	-4.52 [-10.27,1.23]	-0.86 [-2.53,0.81]	-3.60 [-9.68,2.48]
50	-0.57 [-2.14,1.00]	-3.85 [-9.47,1.78]	-0.73 [-2.37,0.92]	-3.17 [-9.11,2.78]
60	-0.37 [-1.92,1.18]	-3.18 [-8.72,2.37]	-0.60 [-2.22,1.03]	-2.73 [-8.59,3.12]
70	-0.17 [-1.72,1.37]	-2.51 [-8.02,3.01]	-0.47 [-2.09,1.15]	-2.30 [-8.13,3.53]
80	0.03 [-1.53,1.58]	-1.84 [-7.38,3.71]	-0.34 [-1.96,1.29]	-1.87 [-7.73,3.99]
90	0.23 [-1.34,1.79]	-1.17 [-6.79,4.46]	-0.21 [-1.85,1.43]	-1.44 [-7.38,4.51]
100	0.42 [-1.17,2.02]	-0.50 [-6.25,5.25]	-0.08 [-1.75,1.59]	-1.00 [-7.08,5.08]
110	0.62 [-1.01,2.25]	0.17 [-5.75,6.10]	0.05 [-1.66,1.76]	-0.57 [-6.84,5.70]

DBP

	Model 1		Model 2	
	Prefrail	Frail	Prefrail	Frail
10	0.10 [-0.74,0.94]	1.01 [-1.76,3.78]	-0.08 [-0.95,0.80]	0.32 [-2.59,3.23]
20	-1.20 [-2.04,-0.37]**	-2.86 [-5.62,-0.10]*	-1.08 [-1.96,-0.21]*	-2.48 [-5.38,0.42]
30	-1.45 [-2.28,-0.62]***	-3.79 [-6.52,-1.06]**	-1.13 [-1.99,-0.27]*	-3.09 [-5.96,-0.22]*
40	-1.35 [-2.16,-0.54]**	-3.59 [-6.25,-0.93]**	-1.06 [-1.91,-0.22]*	-2.99 [-5.78,-0.20]*
50	-1.25 [-2.05,-0.45]**	-3.39 [-6.00,-0.78]*	-0.99 [-1.83,-0.16]*	-2.90 [-5.63,-0.16]*
60	-1.15 [-1.94,-0.36]**	-3.19 [-5.76,-0.61]*	-0.93 [-1.75,-0.10]*	-2.80 [-5.50,-0.10]*
70	-1.05 [-1.83,-0.26]**	-2.99 [-5.55,-0.42]*	-0.86 [-1.68,-0.04]*	-2.70 [-5.39,-0.01]*
80	-0.94 [-1.74,-0.15]*	-2.79 [-5.36,-0.21]*	-0.79 [-1.62,0.03]	-2.60 [-5.30,0.10]
90	-0.84 [-1.64,-0.05]*	-2.59 [-5.20,0.02]	-0.73 [-1.56,0.11]	-2.51 [-5.24,0.23]
100	-0.74 [-1.55,0.07]	-2.39 [-5.05,0.27]	-0.66 [-1.50,0.19]	-2.41 [-5.20,0.38]
110	-0.64 [-1.47,0.19]	-2.19 [-4.92,0.54]	-0.59 [-1.45,0.27]	-2.31 [-5.18,0.56]

HR

	Model 1		Model 2	
	Prefrail	Frail	Prefrail	Frail
10	0.92 [0.18,1.67]*	2.09 [-0.32,4.50]	0.98 [0.22,1.74]*	1.42 [-1.05,3.90]
20	1.96 [1.21,2.70]***	5.08 [2.68,7.48]***	1.69 [0.94,2.45]***	2.87 [0.40,5.34]*
30	1.92 [1.18,2.65]***	4.30 [1.91,6.69]***	1.73 [0.98,2.48]***	2.15 [-0.30,4.60]
40	1.88 [1.16,2.60]***	4.16 [1.81,6.51]***	1.71 [0.98,2.45]***	2.04 [-0.37,4.44]
50	1.84 [1.13,2.56]***	4.02 [1.70,6.34]***	1.70 [0.97,2.42]***	1.93 [-0.45,4.30]
60	1.81 [1.10,2.52]***	3.88 [1.58,6.18]***	1.68 [0.96,2.40]***	1.82 [-0.54,4.17]
70	1.77 [1.06,2.48]***	3.74 [1.44,6.03]**	1.66 [0.94,2.38]***	1.71 [-0.64,4.06]
80	1.73 [1.02,2.44]***	3.59 [1.29,5.89]**	1.65 [0.93,2.37]***	1.60 [-0.75,3.95]
90	1.70 [0.98,2.41]***	3.45 [1.13,5.77]**	1.63 [0.91,2.36]***	1.49 [-0.88,3.86]
100	1.66 [0.94,2.39]***	3.31 [0.96,5.66]**	1.62 [0.88,2.35]***	1.38 [-1.02,3.79]
110	1.63 [0.89,2.36]***	3.17 [0.78,5.56]**	1.60 [0.85,2.35]***	1.27 [-1.18,3.72]

Parameters are estimated from mixed effects models with linear splines. Model 1: Age and sex, Model 2: Age, sex, BMI, smoking, depressive symptoms, self-reported CVD conditions, medication use *P<0.05, **P<0.01, ***P<0.001

Figure S1: Conditional mean blood pressure and heart rate responses across frailty categories (mmHg or heart rate)
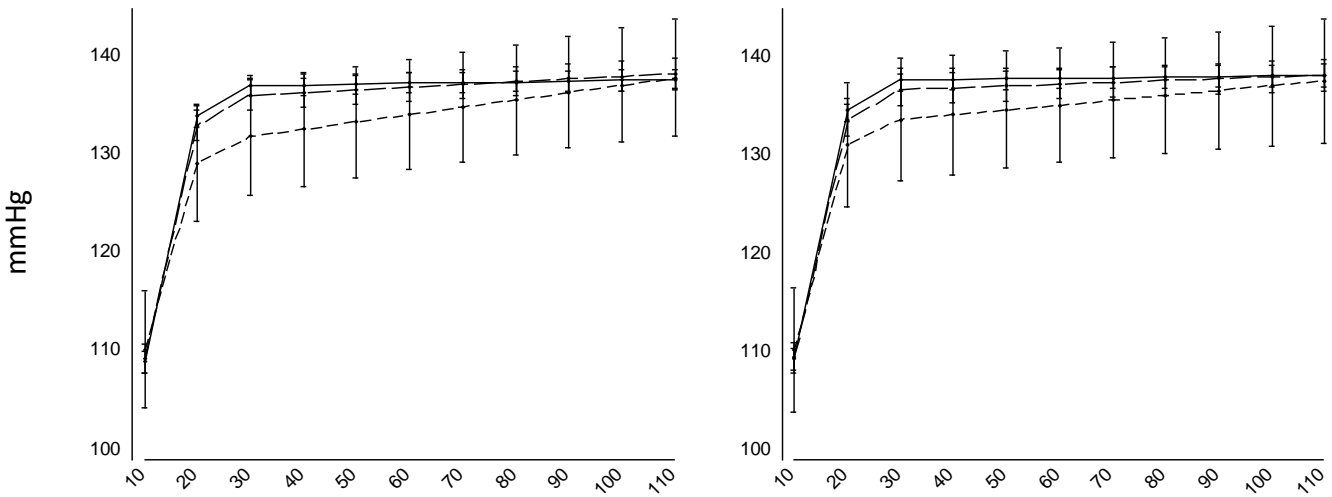
Data are conditional means and 95% confidence intervals estimated from mixed effects models. Model 1: Age and sex; Model 2: age, sex, BMI, smoking, antihypertensive and antidepressant medication use, depressive symptoms and CVD conditions.
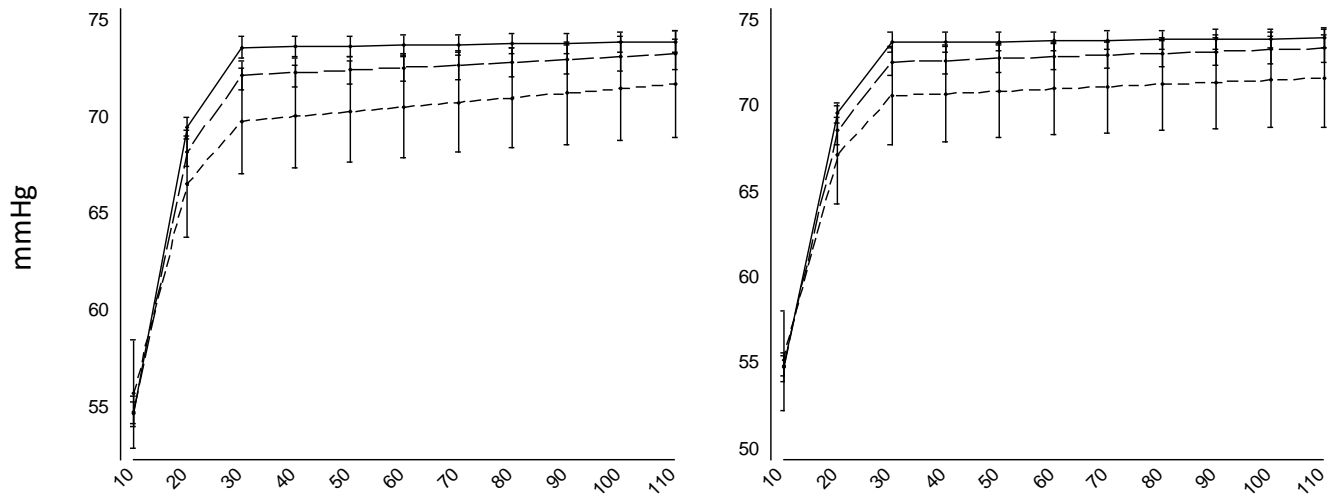
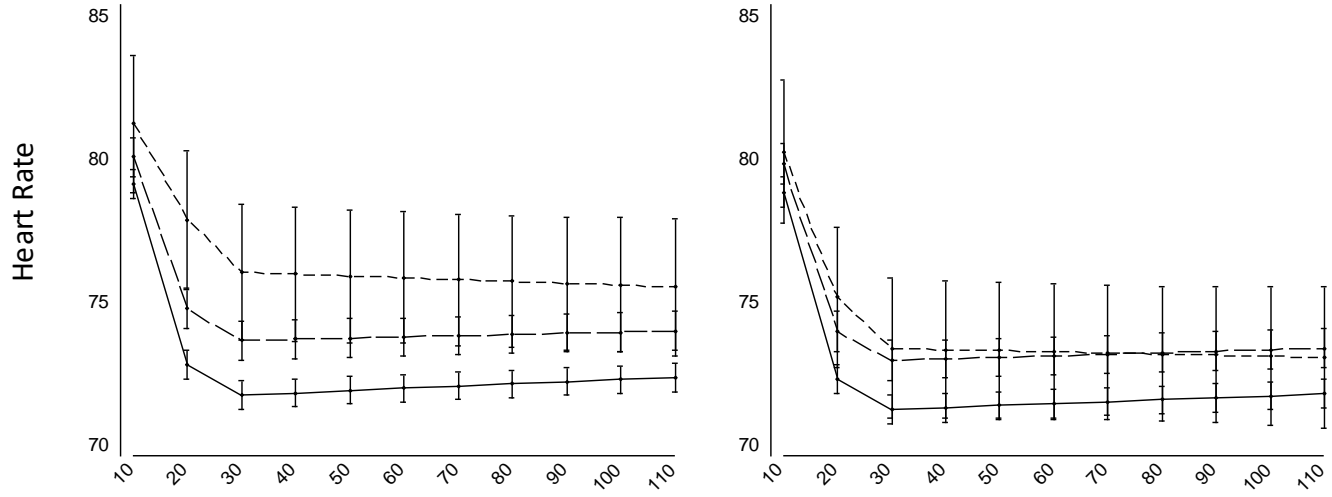———— Robust ————— Prefrail ------- Frail

Model 1

Model 2

Systolic blood pressure

Diastolic blood pressure

Heart Rate

Time since stand (s)