

TABLE S1: Demographics and aerobic capacity of young adult and middle-aged (older) men and women.

Parameter	Female		Male		<i>P</i>		
	Younger	Older	Younger	Older	Sex	Age	Sex × Age
Age (years)	23 (4)	52 (4)	24 (4)	52 (4)	0.60	< <b>0.01</b>	0.70
Height (cm)	165.9 (5.7)	163.5 (5.8)	179.0 (6.6)	178.4 (7.8)	< <b>0.01</b>	0.36	0.58
Body mass (kg)	65.9 (9.1)	64.0 (9.2)	81.0 (8.5)	83.2 (12.6)	< <b>0.01</b>	0.93	0.39
Body fat (%)	30 (4)	34 (5)	17 (5)	24 (4)	< <b>0.01</b>	< <b>0.01</b>	0.24
FFM (kg)	45.9 (5.8)	41.8 (5.0)	66.7 (6.6)	63.2 (8.9)	< <b>0.01</b>	<b>0.02</b>	0.87
<i>Upright peak power test</i>							
$W_{\text{peak}}$ (W)	191 (34)	146 (26)	297 (31)	254 (46)	< <b>0.01</b>	< <b>0.01</b>	0.85
$\dot{V}O_{2\text{peak}}$ (mL/min/kg)	36 (6)	29 (5)	44 (7)	36 (8)	< <b>0.01</b>	< <b>0.01</b>	0.97
Predicted $\dot{V}O_{2\text{max}}$ (mL/min/kg)	39 (3)	28 (3)	48 (2)	36 (4)	< <b>0.01</b>	< <b>0.01</b>	0.53
$HR_{\text{max}}$ (beats/min)	181 (8)	169 (11)	181 (5)	166 (9)	0.47	< <b>0.01</b>	0.47
Test duration (min)	8.45 (1.16)	8.11 (1.21)	8.64 (0.75)	8.83 (1.14)	<b>0.08</b>	0.77	0.30

Values are in mean (SD). FFM: fat-free mass.  $W_{\text{peak}}$ : Peak power output.  $\dot{V}O_{2\text{peak}}$ : Peak oxygen uptake. Predicted  $\dot{V}O_{2\text{max}}$ : Maximal oxygen uptake predicted using the FRIEND equation<sup>32</sup>.  $HR_{\text{max}}$ : Maximum heart rate. ANOVA effects with  $P < 0.1$  (White-adjusted for heteroscedasticity) are in **bold**.

TABLE S2: Demographics and aerobic capacity of middle-aged pre- and post-menopausal women.

Parameter	Middle-aged female		<i>P</i>
	Pre-menopausal	Post-menopausal	Menopause
Height (cm)	162.3 (6.8)	164.5 (4.8)	0.27
Body mass (kg)	65.3 (10.5)	63.0 (8.3)	0.49
Body fat (%)	32 (4)	36 (5)	<b>0.03</b>
FFM (kg)	43.8 (5.9)	40.1 (3.4)	<b>0.03</b>
<i>Upright peak power test</i>			
$W_{\text{peak}}$ (W)	150 (27)	142 (25)	0.40
$\dot{V}O_{2\text{peak}}$ (mL/min/kg)	29 (4)	29 (5)	0.74
Predicted $\dot{V}O_{2\text{max}}$ (mL/min/kg)	29 (3)	27 (3)	0.10
$HR_{\text{max}}$ (beats/min)	169 (10)	168 (11)	0.70
Test duration (min)	8.17 (1.11)	8.07 (1.32)	0.81

FFM: fat-free mass.  $W_{\text{peak}}$ : Peak power output.  $\dot{V}O_{2\text{peak}}$ : Peak oxygen uptake. Predicted  $\dot{V}O_{2\text{max}}$ : Maximal oxygen uptake predicted using the FRIEND equation<sup>32</sup>.  $HR_{\text{max}}$ : Maximum heart rate. T-tests with  $P < 0.1$  are in **bold**.

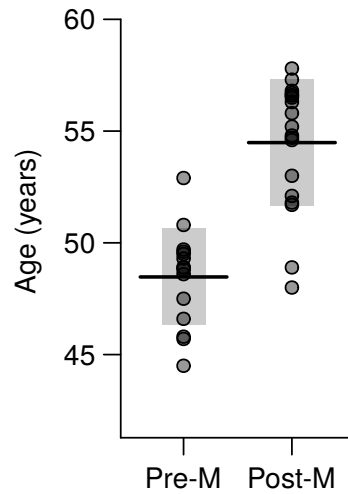


FIGURE S1: Age distribution of pre- (Pre-M) and post-menopausal (Post-M) women. — Mean and ■ standard deviation within each group.

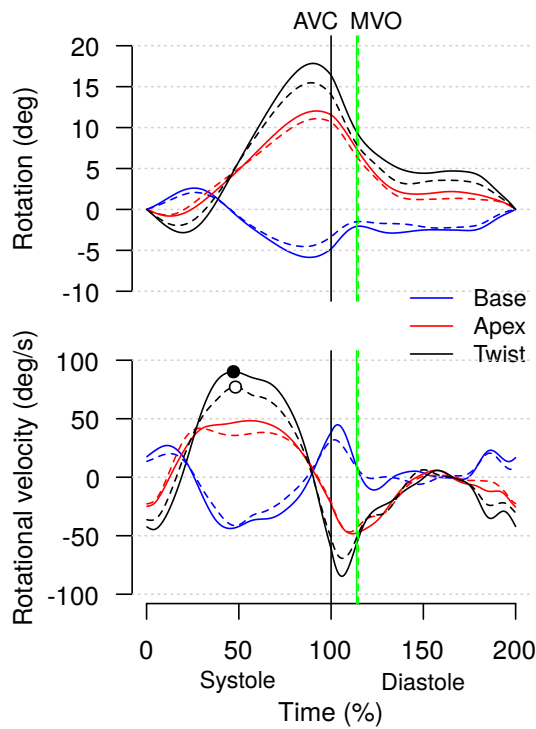


FIGURE S2: Interpolated rotation (top) and rotational velocity (bottom) curves at the base (blue) and apex (red), and the resultant twist/twisting velocity (black) across the cardiac cycle in middle-aged pre- (solid lines) and post-menopausal (dashed lines) women. Time at end-systole is defined as 100%, and end-diastole is 200%. Peak twisting velocity in ● pre-menopausal and ○ post-menopausal women. AVC: aortic valve closure (solid black vertical line). MVO: mitral valve opening (green vertical line).