

SDC3-Table 1. Power Calculations Using Paired Two-Sample t-Tests from Existing RCTs Examining the Cardiometabolic Disease Biomarker Responses After versus Before Acute and Chronic Aerobic Exercise Compared to After versus Before Control to Detect a Significant Difference between Aerobic Exercise versus Control (acute $k=5$; chronic $k=13$).

Study Characteristics ^a	Intervention Features: <u>F</u> requency, <u>I</u> ntensity, and <u>T</u> ime	Mean Change (\pm SD) in Cardiometabolic Disease Biomarker and the Estimated Sample Size Required to Detect Significant Exercise-Induced Changes ^b						
		SBP	DBP	TRIG	GLUCOSE	INSULIN	LDL-C	HDL-C
Acute – RCTs^{c, d}								
Magkos, 2010 (20) (12 hr post-AE vs. Con)								
<i>N</i> = 27 M/W 29.0 \pm 5.2 yr 24.7 \pm 4.2 kg·m ⁻² 39.0 \pm 10.4 ml·kg ⁻¹ ·min ⁻¹	I: 60.0% \pm 5.2% VO ₂ peak (HR=134 \pm 2.0 bpm) T: ~30 min T: cycle				-0.2 \pm 0.3 mmol/l <i>N</i> = 18	-3.0 \pm 8.7 pmol/l <i>N</i> = 68		
GRIP, 2016 (2) (60 min post-AE vs. Con)								
<i>N</i> = 27 (23M/4W) 37% WH, 56% AA, 7% other 40.6 \pm 10.4 yr 30.7 \pm 3.6 kg·m ⁻² 27.4 \pm 5.7 ml·kg ⁻¹ ·min ⁻¹	LAB I: 60% VO ₂ peak T: 30 min T: cycle ABP – Awake ABP – Sleep ABP – 19-hr	-2.2 \pm 6.3 mmHg <i>N</i> = 63	-1.0 \pm 5.3 mmHg <i>N</i> = 223					
		-5.5 \pm 9.2 mmHg <i>N</i> = 24	-3.6 \pm 6.9 mmHg <i>N</i> = 31					
		0.4 \pm 9.7 mmHg† <i>N</i> = –	0.1 \pm 6.5 mmHg† <i>N</i> = –					
		-2.7 \pm 7.9 mmHg <i>N</i> = 70	-1.8 \pm 5.5 mmHg <i>N</i> = 76					
APEX, 2004;2010 (13, 21) (9 hr post-AE vs Con)								
<i>N</i> = 46 M 100% WH 44.3 \pm 8.5 yr 30.7 \pm 5.9 kg·m ⁻²	Low I: 40% VO ₂ peak T: 30 min T: cycle Mod I: 60% VO ₂ peak T: 30 min T: cycle Vig I: 100% VO ₂ peak T: GXT to exhaustion T: cycle	-2.8 \pm 12.3 mmHg <i>N</i> = 155	-1.5 \pm 8.08 mmHg <i>N</i> = 230					
		-5.4 \pm 12.8 mmHg <i>N</i> = 47	-2.1 \pm 8.1 mmHg <i>N</i> = 119					
		-11.7 \pm 14.4 mmHg <i>N</i> = 14	-4.9 \pm 10.1 mmHg <i>N</i> = 36					
<i>N</i> Needed for Each Cardiometabolic Biomarker ‡		55 (14–155)	98 (31–230)		18	68		
<i>ES</i> for Each Cardiometabolic Biomarker ‡		-0.39 (-0.23, -0.81)	-0.29 (-0.19, -0.52)		-0.67	-0.34		
Chronic – RCTs								
AbouAssi, 2015 (1)								
<i>N</i> = 27 (13M/14W) 89% WH, 11% AA 51.4 \pm 10.0 yr 30.5 \pm 3.0 kg·m ⁻² 27.1 \pm 5.6 ml·kg ⁻¹ ·min ⁻¹	~32 wk (supervised) F: 3.2 \pm 0.5 d/wk I: 60-85% VO ₂ peak T: 38 min/d (121 \pm 20 min/wk) T: treadmill, elliptical, cycle Adherence=91.9				-2.0 \pm 9.9 mg/dl <i>N</i> = 195	-2.0 \pm 3.0 μ U/ml <i>N</i> = 20		
Bell, 2010 (N=128) (5)								
<i>N</i> = 40 M/W 100% WH 25-65 yr 31 \pm 6 kg·m ⁻² 24.9 \pm 5.4 ml·kg ⁻¹ ·min ⁻¹	~24 wk (supervised) F: 3-4 d/wk I: 55-70% VO ₂ peak T: ~20-43 min/d T: cycle, treadmill Adherence=77%	-1.0 \pm 17.0 mmHg <i>N</i> = 2,261	-2.0 \pm 13.5 mmHg <i>N</i> = 360	-0.07 \pm 2.0 mM <i>N</i> = 6,408	-0.2 \pm 0.9 mM <i>N</i> = 240		-0.1 \pm 1.4 mM <i>N</i> = 786	-0.04 \pm 3.0† mM <i>N</i> = –

Study Characteristics ^a	Intervention Features: Frequency, Intensity, and Time	Mean Change (±SD) in Cardiometabolic Disease Biomarker and the Estimated Sample Size Required to Detect Significant Exercise-Induced Changes ^b						
		SBP	DBP	TRIG	GLUCOSE	INSULIN	LDL-C	HDL-C
Frank, 2005 (N=173) (14)								
N = 87 W 100% WH 60.7±6.7 yr 30.4±4.1 kg·m ⁻² 20.0±3.5 ml·kg ⁻¹ ·min ⁻¹	~52 wk (supervised) F: ≥5 d/wk I: 60-75% HR _{max} T: ≥45 min/d T: cycle, treadmill Adherence=87%			-4.0±83.4 mg/dL N = 3,413	1.1±124.0† mg/dL N = —	-0.7±12.5 μU/mL N = 2,504		
STRIDE, 2007; 2011 (N=303) (3, 19, 24)								
N = 215 (119M/96W) 82% WH, 15% AA, 17% other 51.0±7.7 yr 29.9±2.9 kg·m ⁻² 28.2±6.0 ml·kg ⁻¹ ·min ⁻¹	~24-48 wk (supervised) F: 3-4 d/wk I: ~60-75% VO ₂ peak T: ~45 min/d (~150 min/wk) T: treadmill, elliptical, cycle Adherence=88%			-0.2±0.6 mmol/l N = 58		-11.6±29.1 pmol/l N = 52		0.04±0.2 mmol/l N = 128
HERITAGE Family Study, 2012 (N=723) (8)								
N = 473 (227M/246W) 100% WH 35.8±14.5 yr 25.8±4.9 kg·m ⁻² 33.2±8.9 ml·kg ⁻¹ ·min ⁻¹	WH 20 wk (supervised) F: 3 d/wk I: 55-75% VO ₂ max T: 30-50 min/d (~30 min/d) T: cycle Adherence=100% (60 AE sessions)	0.2±6.2 mmHg† N = —		-0.02±0.4 mmol/l N = 3,462		-5.2±24.9 pmol/l N = 182		0.04±0.1 mmol/l N = 73
N = 250 (100M/150W) 100% AA 33.6±11.5 yr 27.8±5.8 kg·m ⁻² 27.3±7.3 ml·kg ⁻¹ ·min ⁻¹	AA	-1.2±7.8 mmHg N = 334		-0.03±0.4 mmol/l N = 1,467		-10.8±44.6 pmol/l N = 136		0.03±0.1 mmol/l N = 150
DREW Study, 2007 (N=326 W) (10)								
N = 143 W 61% WH, 34% AA, 7% HL/other 57.7±6.6 yr 31.6±3.8 kg·m ⁻² 15.5±2.9 ml·kg ⁻¹ ·min ⁻¹	4 kcal/kg/wk ~24 wk (supervised) F: 2.6 d/wk I: ~50% VO ₂ max T: 30 min/d (72±12 min/wk) T: cycle, treadmill Adherence=94.6%	-1.6±15.1 mmHg N = 700		-0.08±0.5 mmol/l N = 273		-2.0±31.1 pmol/l N = 1,856		-0.01±0.2 mmol/l† N = —
N = 89 W 61% WH, 33% AA, 6% HL/other 57.3±6.6 yr 32.1±3.1 kg·m ⁻² 14.9±2.4 ml·kg ⁻¹ ·min ⁻¹	8 kcal/kg/wk F: 2.8 d/wk I: ~50% VO ₂ max T: 50 min/d (136 min/wk) T: cycle, treadmill Adherence=89.0%	-3.1±11.8 mmHg N = 116		-0.02±0.5 mmol/l N = 4,906		-7.9±27.6 pmol/l N = 96		-0.01±0.2 mmol/l† N = —
N = 94 W 73% WH, 25% AA, 2% HL/other 56.6±6.6 yr 31.1±3.6 kg·m ⁻² 16.0±2.9	12 kcal/kg/wk F: 3.1 d/wk I: ~50% VO ₂ max T: 60 min/d (192 min/wk) T: cycle, treadmill Adherence=93.3%			0.03±0.6 mmol/l† N = —		-1.9±29.5 pmol/l N = 1,802		-0.04±0.2 mmol/l† N = —

Study Characteristics ^a	Intervention Features: Frequency, Intensity, and Time	Mean Change (±SD) in Cardiometabolic Disease Biomarker and the Estimated Sample Size Required to Detect Significant Exercise-Induced Changes ^b						
		SBP	DBP	TRIG	GLUCOSE	INSULIN	LDL-C	HDL-C
ml·kg ⁻¹ ·min ⁻¹								
INFLAME, 2008 (11)								
N = 70 (14M/56W) 70% WH, 19% AA, 11% HL/other 51.2±10.0 yr 31.1±4.3 kg·m ⁻² 19.1±5.6 ml·kg ⁻¹ ·min ⁻¹	~16 wk (supervised) F: 3-5 d/wk I: 60-80% VO ₂ max (75.3% HRmax) T: ~40-60 min/d (204 min/wk) T: cycle, treadmill Adherence=91%	-4.3±13.8 mmHg N = 83				-5.6±31.3 pmol/l N = 250		-0.05±0.1 mmol/l† N = —
ALPHA, 2010; 2011 (N=320) (15, 16)								
N=160 W 100% WH 61.2±5.4 yr 29.1±4.5 kg·m ⁻² 27.1±6.2 ml·kg ⁻¹ ·min ⁻¹	~52 wk (supervised, ≥3 d/wk) F: ≥5 d/wk I: 70-80% HRR T: ≥45 min/d T: cycle, treadmill Adherence=NR				0±1.4 mmol/l† N = —	-0.8±5.5 pmol/l N = 373		
JYVASKYLA, 2011 (18)								
N = 43 (22M/21W) 100% WH 53.0±8.0 yr 25.3±2.7 kg·m ⁻² 29.1±6.3 ml·kg ⁻¹ ·min ⁻¹	21 wk (supervised) F: 2 d/wk I: Above/ below anaerobic threshold T: ~45-60 min/d T: cycle Adherence=99%	-3.7±10.9 mmHg N = 71		-0.1±0.5 mmol/l N = 192		-3.2±14.0 pmol/l N = 153		0.01±0.2 mmol/l N = 3,462
MARYLAND, 2002 (29)								
N = 160 M/W 100% WH 58.0±5.8 yr 28.3±4.6 kg·m ⁻² 25.3±4.6 ml·kg ⁻¹ ·min ⁻¹	~24 wk (supervised) F: 3 d/wk I: 70% HRR T: 40 min/d (~120 min/wk) T: multiple ^e Adherence=NR	1.0±13.0 mmHg† N = —		-0.2±0.7 mmol/l N = 100		-11.0±21.0 pmol/l N = 31		0.08±0.2 mmol/l N = 57
N Needed for Each Cardiometabolic Biomarker ‡		225 (71–2,261)	360	1467 (58–6,408)	218 (195-240)	168 (20–2,504)	786	128 (57–3,462)
ES for Each Cardiometabolic Biomarker ‡		-0.21 (-0.06, -0.34)	-0.15	-0.08 (-0.04, -0.38)	-0.19 (-0.18, -0.20)	-0.22 (-0.06, -0.67)	-0.1	0.30 (0.05, 0.40)
Summary of the Overall Response to Acute and Chronic AE ‡		Acute	N = 66 ES = -0.35	(14 – 230) (-0.19, -0.81)	Chronic	N = 250 ES = -0.18	(20 – 6,408) (-0.04, -0.67)	

Note. Statistics are summarized as Mean ± Standard deviation (SD) or Median (Range). Gray shading=Data not available for power calculations. *SD calculated by assuming independence. † Blue shading=Cardiometabolic response was more favorable for Control vs. AE; N could not be calculated. ‡ N needed and ES are summarized as Median (Full Range=Minimum, Maximum). Abbr. AA=African American/Black. ABP=Ambulatory blood pressure. AE=Endurance (aerobic) exercise. AET=AE training. DBP=Diastolic blood pressure. CE=Continuous AE. CSE=Continuous sprint AE. ES=Effect size (ES=Mean change ÷ SD). HL=Hispanic/Latino. HDL-C=High-density lipoprotein cholesterol. GXT= graded pulmonary exercise test; start with a resistance of 30 watts and increased 30 watts every 2 minutes until exhaustion. HRmax=Maximal heart rate. HRR=Heart rate reserve. LAB=Laboratory. LDL-C=Low-density lipoprotein cholesterol. k=Number of study groups. KJ=Kilojoules. mM=millimolar. M=Men. Mod=Moderate intensity. N=Sample size. RCT=Randomized controlled trial. SBP=Systolic blood pressure. SIT=Sprint interval AE.

Study Characteristics ^a	Intervention Features: Frequency, Intensity, and Time	Mean Change (±SD) in Cardiometabolic Disease Biomarker and the Estimated Sample Size Required to Detect Significant Exercise-Induced Changes ^b						
		SBP	DBP	TRIG	GLUCOSE	INSULIN	LDL-C	HDL-C
<p>Trig=Triglycerides. Vig=Vigorous intensity. VO₂max=Maximal oxygen consumption. VO₂peak=Peak oxygen consumption. W=Women. WH=White/Caucasian. ^a ALPHA= Alberta Physical Activity and Breast Cancer Prevention Trial. GRIP=Graded Reductions In Pressure Study. HERITAGE=Health, Risk Factors, Exercise Training And Genetics. DREW=Dose Response to Exercise in Women. STRRIDE=Studies of a Targeted Risk Reduction Intervention through Defined Exercise. MARYLAND=University of Maryland Gene Exercise Research Study. INFLAME=Inflammation and Exercise Study. JYVASKYLA=University of Jyväskylä Study. ^b mean change values and units are presented as reported by study authors for each cardiometabolic biomarker outcome ^c Acute studies were supervised; only Intensity and Time are quantified (i.e., Frequency=1 d/wk). ^d Details regarding the cardiometabolic biomarker response to AE are provided in parentheses (i.e., timing of post-assessment, min or hr; mean change calculation). ^e Multiple modalities: stair-stepping machines, rowing ergometers, treadmills, stationary bicycles, and ski machines. References appear in SDC 7.</p>								