

Supplementary Online Content

Christensen RH, Wedell-Neergaard A-S, Lehrs kov LL, et al. Effect of aerobic and resistance exercise on cardiac adipose tissues: secondary analyses from a randomized clinical trial. *JAMA Cardiol.* Published online July 3, 2019. doi:10.1001/jamacardio.2019.2074

eFigure. Relative changes in cardiac fat mass

eTable 1. Intention to treat analysis

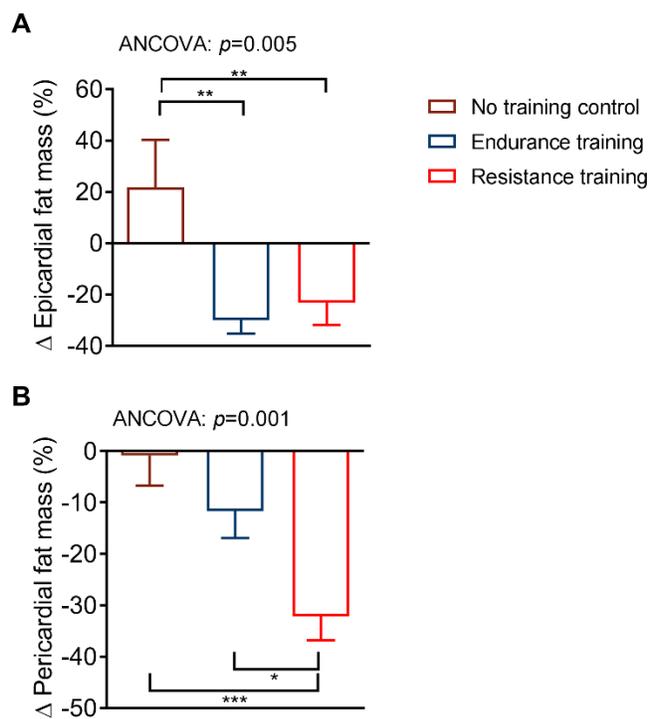
eTable 2. Measures of cardiometabolic and inflammatory profile

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This supplementary material has been provided by the authors to give readers additional information about their work.

eFigure. Relative changes in cardiac fat mass



Relative change in epicardial fat mass (**A**) and pericardial fat mass (**B**) from baseline to follow up across the three groups. Comparisons of changes between groups and P -values by ANCOVA.

eTable 1. Intention to treat analysis

	Endurance	Resistance	Control	Difference Control vs. Endurance	Difference Control vs. Resistance
Epicardial fat mass	n=15	n=14	n=12		
ΔAO (g)	-7.7 (-11.4 to -3.9)	-5.4 (-9.3 to -1.6)	1.1 (-3.0 to 5.3)	8.8 (3.1 to 14.4)	6.6 (0.9 to 12.2)
	n=16	n=16	n=18		
ΔBOCF (g)	-7.1 (-10.5 to -3.9)	-4.8 (-8.1 to -1.5)	0.8 (-2.4 to 3.9)	7.9 (3.4 to 12.5)	5.5 (1.0 to 10.1)
ΔWorst case (g)	-6.2 (-11.0 to -1.4)	-2.7 (-7.5 to 2.1)	6.2 (1.7 to 10.7)	12.4 (5.8 to 19.0)	8.9 (2.3 to 15.4)
ΔBest case (g)	-9.0 (-15.4 to -2.6)	-8.5 (-14.9 to -2.2)	-9.2 (-15.9 to -3.3)	-0.2 (-8.9 to 8.5)	-0.7 (-9.4 to 8.0)
Pericardial fat mass	n=15	n=14	n=12		
ΔAO (g)	-18.1 (-31.9 to -4.3)	-45.8 (-60.0 to 31.6)	-10.4 (-26 to 4.8)	7.7 (-12.9 to 28.3)	35.4 (14.8 to 56.0)
	n=16	n=16	n=18		
ΔBOCF (g)	-17.1 (-30.0 to -4.2)	-39.9 (-52.7 to 27.1)	-6.9 (-18.9 to 5.1)	10.2 (-7.5 to 27.9)	33.1 (15.6 to 50.5)
ΔWorst case (g)	-14.8 (-31.9 to 2.4)	-34.7 (-51.7 to -17.7)	6.7 (-9.1 to 22.6)	21.48 (-2.0 to 45.0)	41.4 (18.3 to 64.6)
ΔBest case (g)	-24.4 (-48.4 to -0.3)	-56.2 (-80.0 to -32.4)	-49.2 (-71.4 to -26.9)	-24.8 (-57.8 to 8.1)	7.0 (-25.4 to 39.5)

As observed change (**AO**) (n=41) comprises the final population (n=39) including the participants excluded at analysis (n=3). One out of these three did not have post MRI scans available with available MRI scans (n=2 of 3). The baseline carried forward (**BOCF**) analysis includes all randomized participants (n=50). Where pre-intervention/baseline epicardial and pericardial adipose tissue mass were not available, the mean baseline value of epicardial and pericardial adipose tissue mass were inserted and carried forward. Worst-case imputations were conducted by inserting the greatest increase in fat mass observed (epicardial adipose tissue: 16 g; pericardial adipose tissue 41 g) i.e. no/negative effect of the intervention. Best-case imputations were conducted by inserting the greatest reduction in fat observed (epicardial adipose tissue: -30 g; pericardial adipose tissue -126 g) i.e. an ideal effect of the intervention. These approaches were applied for all participants missing the post intervention measure (n=9).

eTable 2. Measures of cardiometabolic and inflammatory profile

	Endurance	Resistance	Control	P ANCOVA
Insulin	n=14	n=13	n=12	
12 weeks (pmol/l)	86 (61 to 111)	90 (63 to 118)	118 (90 to 146)	0.21
Change (pmol/l)	-12 (-38 to 13)	-8 (-36 to 19)	19 (-9 to 47)	0.21
Relative change (%)	-8 (-28 to 12)	3 (-18 to 25)	13 (-9 to 36)	0.35
Glucose				
12 weeks (mmol/l)	5.1 (4.9 to 5.3)	5.1 (4.8 to 5.3)	5.0 (4.7 to 5.3)	0.72
Change (mmol/l)	-0.2 (-0.4 to 0.0)	-0.2 (-0.4 to 0.1)	-0.1 (-0.3 to 0.2)	0.72
Relative change (%)	-4.2 (-8.8 to 0.4)	-3.2 (-8.5 to 2.0)	-1.7 (-6.8 to 3.5)	0.75
HbA1c				
12 weeks (mmol/mol)	36 (35 to 36)	35 (34 to 36)	35 (34 to 36)	0.39
Change (mmol/mol)	1 (0 to 2)	0 (0 to 1)	1 (0 to 2)	0.39
Relative change (%)	4 (1 to 6)	1 (-1 to 4)	3 (0 to 6)	0.36
Total cholesterol				
12 weeks (mmol/l)	4.9 (4.6 to 5.2)	4.9 (4.6 to 5.2)	4.7 (4.4 to 5.0)	0.65
Change (mmol/l)	-0.1 (-0.4 to 0.2)	-0.1 (-0.4 to 0.2)	0.1 (-0.2 to 0.4)	0.65
Relative change (%)	-1.2 (-6.3 to 4.0)	-2.3 (-7.6 to 3.1)	1.1 (-4.7 to 7.0)	0.68
LDL				
12 weeks (mmol/l)	3.0 (2.8 to 3.2)	2.9 (2.7 to 3.2)	3.3 (3.0 to 3.5)	0.15
Change (mmol/l)	-0.1 (-0.3 to 0.1)	-0.2 (-0.4 to 0.0)	0.1 (-0.1 to 0.4)	0.15
Relative change (%)	-3.6 (-10.9 to 3.70)	-6.0 (-13.5 to 1.6)	5.0 (-3.2 to 13.2)	0.13
HDL				
12 weeks (mmol/l)	1.3 (1.2 to 1.4)	1.3 (1.2 to 1.3)	1.3 (1.2 to 1.4)	0.48
Change (mmol/l)	0.0 (-0.1 to 0.1)	0.0 (-0.1 to 0.0)	0.0 (-0.1 to 0.1)	0.48
Relative change (%)	-0.3 (-6.0 to 5.4)	-3.2 (-9.1 to 2.7)	2.3 (-4.0 to 8.7)	0.43
AI (TC/HDL)				
12 weeks	3.8 (3.5 to 4.1)	3.9 (3.6 to 4.2)	3.9 (3.5 to 4.2)	0.77
Change	-0.1 (-0.4 to 0.2)	0.1 (-0.3 to 0.4)	0.0 (-0.3 to 0.4)	0.77
Relative change (%)	-0.9 (-7.2 to 5.5)	0.9 (-5.6 to 7.3)	1.0 (-6.1 to 8.1)	0.91
Hs-CRP				
12 weeks (μmol/l)	3.2 (0.1 to 6.3)	5.9 (2.7 to 9.2)	3.1 (-0.4 to 6.6)	0.38
Change (μmol/l)	0.0 (-3.1 to 3.1)	2.7 (-0.5 to 6.0)	-0.1 (-3.6 to 3.4)	0.38
Relative change (%)	3 (-76 to 83)	64 (-19 to 147)	8 (-82 to 98)	0.52
TNF-α				
12 weeks (pg/ml)	2.4 (2.0 to 2.8)	2.5 (2.0 to 2.9)	2.4 (1.9 to 2.9)	0.93
Change (pg/ml)	0.1 (-0.3 to 0.5)	0.2 (-0.3 to 0.6)	0.1 (-0.4 to 0.6)	0.93
Relative change (%)	5.8 (-6.5 to 18.1)	7.7 (-5.1 to 20.6)	4.8 (-9.2 to 18.9)	0.95
IL-6				
12 weeks (pg/ml)	0.7 (0.4 to 1.1)	1.1 (0.7 to 1.5)	0.8 (0.4 to 1.2)	0.28
Change (pg/ml)	0.0 (-0.4 to 0.3)	0.4 (0.0 to 0.8)	0.1 (-0.3 to 0.5)	0.28
Relative change (%)	-2 (-52 to 49)	70 (16 to 124)	30 (-26 to 87)	0.16
IL-1β				
12 weeks (pg/ml)	0.09 (0.07 to 0.11)	0.09 (0.07 to 0.11)	0.08 (0.06 to 0.11)	0.82
Change (pg/ml)	0.02 (0.00 to 0.04)	0.02 (0.00 to 0.04)	0.01 (-0.02 to 0.03)	0.82
Relative change (%)	61.1 (14.6 to 107.6)	64.3 (15.1 to 113.6)	50.6 (-2.1 to 103.3)	0.92
IL-8	n=14	n=13	n=12	
12 weeks (pg/ml)	4.2 (3.6 to 4.9)	4.6 (3.9 to 5.3)	4.1 (3.4 to 4.9)	0.59
Change (pg/ml)	0.1 (-0.5 to 0.8)	0.5 (-0.2 to 1.1)	0.0 (-0.7 to 0.7)	0.59
Relative change (%)	10.8 (-4.5 to 26.1)	18.8 (3.0 to 34.6)	4.1 (13.4 to 21.5)	0.45

IL-10				
12 weeks (pg/ml)	0.22 (0.08 to 0.35)	0.26 (0.12 to 0.40)	0.39 (0.24 to 0.55)	0.21
Change (pg/ml)	0.01 (-0.12 to 0.15)	0.05 (-0.09 to 0.19)	0.18 (-0.10 to 0.19)	0.21
Relative change (%)	16.8 (-63.6 to 97.1)	51.9 (-31.3 to 135.1)	95.2 (4.9 to 185.5)	0.43
Table continued	Endurance	Resistance	Control	
Adiponectin				
12 weeks (pg/ml)	17295 (14943 to 19646)	16786 (14395 to 19213)	17496 (14812 to 20179)	0.92
Change (pg/ml)	-688 (-3039 to 1663)	-1197 (-3624 to 1230)	-487 (-3171 to 2196)	0.92
Relative change (%)	-2.5 (-17.1 to 12.2)	-9.5 (-24.7 to 5.7)	1.0 (-15.8 to 17.8)	0.62

Values are presented as least square means (means adjusted for baseline) with (95% CI) by treatment group. Abbreviations: Analysis of covariance (ANCOVA), Atherogenic index (AI), High-sensitive (Hs), C-Reactive Protein (CRP), glycated hemoglobin (HbA_{1c}), high-density lipoprotein (HDL), Interleukin (IL), low-density lipoprotein (LDL), systolic blood pressure (SBP), total cholesterol (TC), Tumor Necrosis Factor alpha (TNF- α).

eTable 3. Training compliance and intensity

	Endurance	Resistance	Control	P value
Training Compliance, n (%)	32.7 (89)	33.4 (93)	-	<i>0.076</i>
HR max	156 (14)	158 (13)	-	<i>0.741</i>
HR average	146 (14)	127 (14)	-	0.003

Data are reported as number (n) and percentage (%), mean (SD). *P* values are obtained by Chi squared test or an unpaired Student's *t*-test. Abbreviations: Heart rate (HR).

eTable 4. Free-living physical activity and energy intake

	Endurance	Resistance	Control	P ANCOVA
Participants (number)	14	13	12	
Sedentary				
Before (hours/day)	14.7 (3.36)	14.8 (2.3)	14.2 (1.9)	
During (hours/day)	14.2 (1.96)	14.3 (1.6)	14.7 (2.2)	
After (hours/day)	13.7 (1.56)	14.5 (1.9)	14.8 (0.9)	
Change before-during (hours/day)	-0.4 (-1.51 to 0.72)	-0.3 (-1.5 to 0.8)	-0.2 (-1.0 to 1.3)	0.74
Change before-after (hours/day)	-0.7 (-1.64 to 0.26)	0.0 (-0.9 to 0.9)	0.3 (-0.7 to 1.3)	0.34
Light physical activity				
Before (hours/day)	5.1 (2.1)	5.6 (1.8)	6.38 (0.85)	
During (hours/day)	6.5 (1.7)	6.6 (1.2)	6.25 (1.21)	
After (hours/day)	6.6 (1.4)	6.8 (1.4)	6.70 (0.81)	
Change before-during (hours/day)	0.9 (0.0 to 1.7)	1.0 (0.1 to 1.8)	0.52 (-0.37 to 1.42)	0.76
Change before-after (hours/day)	0.7 (-0.1 to 1.5)	0.9 (0.1 to 1.6)	0.7 (-0.1 to 1.5)	0.91
Moderate/Vigorous physical activity				
Before (hours/day)	1.2 (0.7)	1.3 (0.9)	1.3 (0.6)	
During (hours/day)	1.7 (1.0)	1.3 (0.6)	1.4 (0.5)	
After (hours/day)	1.7 (1.0)	1.4 (0.7)	1.2 (0.5)	
Change before-during (hours/day)	0.5 (0.0 to 1.0)	0.1 (-0.4 to 0.5)	0.2 (-0.3 to 0.6)	0.41
Change before-after (hours/day)	0.2 (-0.2 to 0.6)	0.1 (-0.3 to 0.5)	-0.2 (-0.6 to 0.2)	0.36
Table continued	Endurance	Resistance	Control	P ANCOVA
Energy intake				
During (Kcal)	2094 (1850 to 2337)	2080 (1829 to 2332)	2047 (1783 to 2312)	
After (Kcal)	2057 (1743 to 2370)	2108 (1783 to 2433)	2105 (1751 to 2459)	
Change before-during (Kcal)	-99 (-343 to 145)	-146 (-363 to 140)	-146 (-410 to 119)	0.96
Change before-after (Kcal)	-97 (-411 to 217)	-45 (-370 to 280)	-48 (-402 to 306)	0.97

Data are presented as means and standard deviation (before, during and after values) and changes are presented as least square means adjusted for baseline with 95% CI. P-values are obtained by ANCOVA models adjusted for baseline.