

SUPPLEMENTAL DIGITAL CONTENT (SDC)

Appendix S1. Characteristics of included studies

Author	Country	Year	Time post-transplant (weeks)	Treatment duration (weeks)	Intervention*	n	Comparison*	n	Outcomes measured*
Cardiac transplant recipients									
Bernardi (1)	Italy	2007	24	24	50rpm exercycle at home for 30 min 5 days/week at 60-70% VO ₂ max	13	Standard medical care	11	VO ₂ peak, HRrest, SBP, DBP, Wmax, VEpeak, ventilatory equivalent for oxygen and carbon dioxide, RR interval, exercise time
Braith (2)	USA	1996	8	24	Supervised lumbar extension 1 day/wk, variable resistance exercises 2 days/wk	8	Standard medical care	8	BMD, FM (%), FFM (%), muscle strength, Body fat %, BW
Braith (3)	USA	2008	8	12	12 weeks supervised treadmill exercise	9	Standard medical care	7	VO ₂ peak, MAP, BW, Glucose, TC, HDL, LDL, Triglycerides, Endocardial rejection grade, brachial flow-mediated dilation, absolute brachial diameter, plasma norepinephrine, plasma 8-iso-PFG ₂ , exercise duration,
Haykowsky (4)	Canada	2009	260	12	12 weeks supervised aerobic and strength training	22	Standard medical care	21	VO ₂ peak, Peak HR, Peak SBP, Peak DBP, Wmax, Maximal strength, Peak RER, FFM, reactive hyperaemia, endothelial-dependent vasodilation, endothelial-independent vasodilation, rest and submaximal end-diastolic and systolic cavity area, stroke area and area ejection fraction

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Hermann (5)	Denmark	2010	336	8	8 week supervised aerobic interval training program	14	Standard medical care	13	VO ₂ peak, flow mediated vasodilation, SBP, DBP, HADS-A, HADS-D, WH ratio, SBP, DBP, HR, glucose, TC, triglycerides, HbA1c%, Creatinine, hsCRP, IL-6, TNF- α , Adiponectic, Pro-ANP, Pro-BNP, Copeptin, flow-mediated vasodilation, brachial artery diameter, NTG induced vasodilation
Karapolat (6)	Turkey	2007	78	8	Hospital-based exercise program- flexibility, stretching, aerobic (60-70% VO ₂ max, 13-15RPE) , strengthening and relaxation exercises for 8 weeks	15	Home-based exercise program- flexibility, stretching, aerobic (60-70% VO ₂ max, 13-15RPE), strengthening and relaxation exercises for 8 weeks	13	VO ₂ peak, QoL (SF-36), BDI, STAI, Duke Treadmill Score, HR reserve, HR recovery,
Kobashigawa(7)	USA	1999	2	26	Individualized program of muscular strength and aerobic training under guidance of physiotherapist	14	Usual care	13	VO ₂ peak, workload (W), Ventilatory equivalent for Carbon dioxide/oxygen, duration of exercise, resting HR, Hrmax, SBP at rest/peak, VE, sitting-to-standing rate, time to estimated lactic acidosis threshold
Tegthbur (8)	Germany	2003	265	24	Outpatient and home-based program- cycling 28 min/day at 10% below anaerobic threshold.	20	Standard medical care	12	BMI, fat %, HR, RPE, SBP, DBP, CRP, Glucose, Cholesterol, HDL-C, LDL-C, lactate, triglyceride, Hb, haematocrit, QoL
Wu (9)	Taiwan	2008	130	8	Home-based exercise at least 3 times a week incl. lightweight strengthening exercises. 15-20min walked at a prescribed intensity of 60-	14	Standard medical care	23	VO ₂ peak, Peak torque of right knee extensors (N), Fatigue index of right knee extensors (%), Sit-to-stand repetitions in 1 min (per

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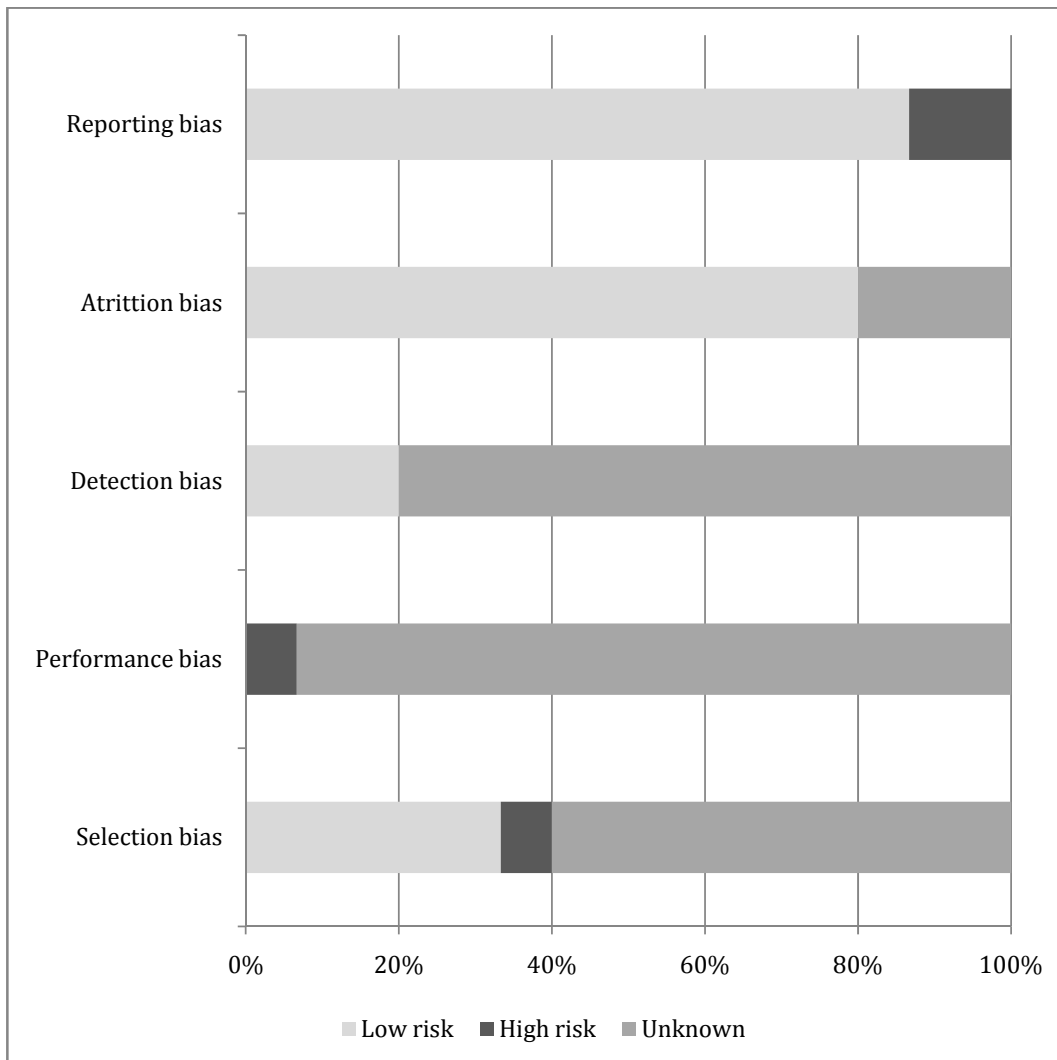
					70% VO ₂ peak, 10 min of stepping exercise				min), HR, SBP, DBP, peak VO ₂ (relative), peak workload (W), peak HR, peak VE (L/min), peak RPE, WHO-QOL assessment, PA kcal/day, dietary intake kcal/day
Lung transplant recipients									
Ihle (10)	Germany	2011	234	4	Inpatient rehabilitation program	30	Standard medical care (physiotherapy)	30	Sub-max EC, VO ₂ Peak, 6MWT, SF-36, SGRQ and QoL profile, Ventilatory reserve (%), anaerobic threshold, HRmax
Langer (11)	Belgium	2012	Immediately upon discharge	13	Supervised exercise 3x per week including aerobic exercise and resistance exercise	18	Standard medical care	16	Minutes spent sedentary, standing and walking per day, walking distance per day, steps per day, time spend > 3 METs per day, quadriceps force, 6MWD, FEV1, Wmax, VO ₂ max, BMD, lipid profiles, Anxiety and Depression scale, fasting glucose, incidence of diabetes,, anxiety and depression, HRQOL, muscle strength and graft function
Mitchell (12)	USA	2003	8	24	Supervised lumbar extension exercises for 6 months	8	Standard medical care	8	BMD, degree of lumbar flexion
Kidney transplant recipients									
Juskowa (13)	Poland	2006	1	5	Physiotherapist- supervised strengthening exercises for 15-30min every second hospital day, repeated program alone on alternate days	32	Standard medical care	37	PEF, upper limb strength, IL-18, homocysteine, Hb, fibrinogen, creatinine, glucose, t-Hcy, folate, Vit B12, Total protein, Albumin, TC, LDL-C, HDL-C, Triglycerides

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Painter (14)	USA	2002	8	48	Independent home-based exercise at least 4 days/week, at least 30 min/session, and intensity from 60-65% to 75 - 80% of HR max	52	Standard medical care	43	VO ₂ peak (relative and absolute), age-predicted VO ₂ , peak RER, peak RPE, peak torque (relative and absolute) TC, HDL-C, TC/HDL-C ratio, SBP, DBP, Total CVD risk, BMI, Maximum METs, Serum creatinine, blood urea nitrogen, haematocrit, Hb, BW, FM, FFM, % body fat, BMD
Liver transplant recipients									
Krasnoff (15)	USA	2006	8	84	Home-based cardiovascular exercise at least 3 days/week, at least 30 min/session at 60-65% HRmax progressing to 70-75%	49	Usual care	70	VO ₂ peak. Age-predicted VO ₂ , RER, quadricep muscle strength (peak torque), Peak torque/BW, stature, weight, BMI, Fat %, LBM, FM, total BMD, total calories/day, protein calories (%), carbohydrate calories (%), fat calories (%), SF-36

* 1-RM = 1 repetition maximum; 6MWT = 6 minute walk test distance (m); BDI = Beck Depression Inventory; BMD = bone mineral density (g/cm³); BMI = body mass index (kg/m²); BW = body weight (kg); CRP = C-reactive protein (mg/L); DBP = diastolic blood pressure (mmHg); FEV₁ = forced expiratory volume (L); FFM = fat free mass (kg); FM = fat mass (kg); HADS-A/D = Hospital Anxiety and Depression Scale - Anxiety/Depression; Hb = Haemoglobin (mg/dl); Haematocrit = Haematocrit volume percentage (%); HDL= high-density lipoproteins; HRreserve = reserve heart rate (BPM); HRrest = resting heart rate (BPM); HRmax = maximum heart rate (BPM); LDL = low-density lipoproteins; MAP = mean arterial pressure (mmHg); MET- Measure of Energy Transfer (3.5mL/min/kg); PA kcal/day – kcal/day used by physical activity; RER = respiratory exchange ratio; RPE – rate of perceived exertion; SBP = systolic blood pressure (mmHg); SF-36 = Short Form 36; STAI = State- Trait Anxiety Inventory; Sub-max EC= sub-maximal exercise capacity; TC = total cholesterol; WHR = waist-hip ratio; WHO-QOL = World Health Organisation Quality of Life Assessment; Wmax = maximal power output (W);

Appendix S2: Risk of bias assessment



Appendix S3: Search Strategies

Search term	CENTRAL	Embase	MEDLINE
1	Organ Transplantation	organ transplantation/	Organ Transplantation/
2	Heart Transplantation explode all trees	exp liver transplantation/	exp Heart Transplantation/
3	Kidney Transplantation, this term only	exp kidney transplantation/	Kidney Transplantation/
4	Liver Transplantation, this term only	exp lung transplantation/	Liver Transplantation/
5	Lung Transplantation explode all trees	exp heart transplantation/	exp Lung Transplantation/
6	Pancreas Transplantation, this term only	pancreas transplantation/	Pancreas Transplantation/
7	(#1 OR #2 OR #3 OR #4 OR #5 OR #6)	or/1-6	or/1-6
8	Exercise Therapy explode all trees	exp kinesiotherapy/	exp Exercise Therapy/
9	Exercise explode all trees	exp "physical activity, capacity and performance"/	exp Exercise/
10	Exercise Test, this term only	(exercise\$ or fitness or train\$).tw.	Exercise Test/
11	Physical Education and Training explode all trees	or/8-10	exp "Physical Education and Training"/
12	Physical Fitness, this term only	randomized controlled trial/	Physical Fitness/
13	Physical Exertion, this term only	crossover procedure/	Physical Exertion/
14	(exercise* or fitness or train*):ti,ab,kw in Clinical Trials	double-blind procedure/	(exercise\$ or fitness or train\$).tw.
15	(#8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14)	single-blind procedure/	or/8-14
16	(transplant*):ti,ab,kw in Clinical Trials	random\$.tw.	randomized controlled trial.pt.
17	(#7 OR #16)	factorial\$.tw.	controlled clinical trial.pt.
18	(#15 AND #17)	(crossover\$ or cross-over\$).tw.	randomized.ab.
19	-	placebo\$.tw.	placebo.ab.
20	-	(double\$ adj blind\$).tw.	clinical trials as topic/
21	-	(singl\$ adj blind\$).tw.	randomly.ab.
22	-	assign\$.tw.	(crossover or cross-over).tw.
23	-	allocat\$.tw.	Cross-over Studies/
24	-	volunteer\$.tw.	trial.ti.
25	-	or/12-24	or/16-24
26	-	and/7,11,25	animals/ not (humans/ and animals/)
27	-	limit 26 to yr="2010 - Current"	25 not 26
28	-	-	and/7,15,27

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