

Supplementary File D Interventions and summary of the evidence of all included reviews.

Reviews with complete FITT-criteria AND risk of bias analysis highlighted in in *italic*

Article author year	Number/ type of relevant studies, Number (n) of participants, Group	Characteristics of the intervention	Summary of the evidence	Conclusion
Ada 2010	3 RCT n=348 Cardiovascular disease	F: 5 session/week I: NOT REPORTED T: 20 to 60 minutes/session T: Any type of mechanically assisted walking and assisted overground walking	The short-term effect (after 4 weeks training) of additional mechanically assisted walking on walking capacity in patients after stroke (6MWT) is not statistically significant (35 m; 95%CI -13 to 84). The quality of the underlying studies was high.	MA: <u>not statistically significant</u> result
Angevaren 2008	11 RCT n=667 Frail older adults	Total duration: 4 to 6 weeks or until discharge from inpatient rehabilitation F: 2 to 7 session/week I: 70% HRmax, HR at VT, HR of 95 to 125, 50 to 75% VO ₂ max, 50 to 65% HRR or 85% HRR T: 8 to 60 minutes/session T: Aerobic exercise programs (walking, cycling, jogging, running, mixed exercise)	<i>Eight out of 11 studies reported that aerobic exercise interventions in older people with known cognitive impairment resulted in increased aerobic capacity in the intervention group (increase in VO₂max of 14%)</i> <i>10/11 of the underlying studies had an unclear risk of bias.</i>	NAn: <u>positive</u> result for >75% of all studies
Anthony 2013	1 RCT n=82 Frail older adults	Total duration: 8 to 26 weeks F: 2 session/week I: NOT REPORTED T: NOT REPORTED T: Chair based exercise	The effect of chair based exercise in frail older persons on aerobic performance (6MWT) is not statistically significant (2.1 % increase, p=0.23). The quality of the underlying study is low, and allocation was not concealed	NAn: <u>not statistically significant</u> result
Baker 2007	4 RCT n=479 Frail older adults	Total duration: 3 months F: 3 session/week I: 13 to 16 RPE on Borg scale, 70% HRmax, 70% HRR, 65 to 70% VO ₂ peak T: 8.3 to 45 minutes/session T: Walking, cycling ergometer training, rowing ergometer training	Multimodal exercise training in frail older people has a statistically significant effect on aerobic performance (6MWT) in only one out of three studies, and a statistically significant increase in aerobic capacity in the one study (VO ₂ peak increase ES 0.84). The effect of risk of bias was not evaluated.	NAn: <u>inconclusive</u>
		Total duration: 12 weeks to 6 months		

Aerobic fitness training in vulnerable older adults, Visser & Wattel, Supplementary File D

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Blankevoort 2010	4 RCT, 1 nonRCT n=255 Cognitive impairment	F: 2 to 3 session/week I: start at 30% $\dot{V}O_2$ max up to 60% $\dot{V}O_2$ max T: 30 to 60 minutes/session T: Walking, strength, balance & aerobic exercises, functional skills Total duration: 12 weeks to 2 years	Physical exercise in older people with dementia has a statistically significant effect on aerobic performance in 5 out of 5 studies (several walking tests, mean ES 1.08; 95%CI 0.31 to 3.79), with longer duration showing larger effects. Four out of 5 studies were high quality RCT's, 1 study was a case series. Risk of bias was moderate to high (1 to 5 /7 points, with 7 points = low risk of bias.	NAn: <u>positive</u> result for all studies
Bouaziz 2015	15 RCT, 11 nonRCT n=832 Metabolic diseases	F: 3 to 7 session/week I: 40 to 85% HRR, 50 to 75% $\dot{V}O_2$ max, 60 to 85% HRmax T: 12 to 90 minutes/session T: Cycling on ergometer, walking, treadmill walking Total duration: 12 to 36 weeks	Exercise therapy in obese people has a statistically significant effect on aerobic capacity (increase $\dot{V}O_2$ max 11 to 34%) in 7 out of 8 studies. Exercise therapy combined with diet has a statistically significant effect on aerobic capacity (increase $\dot{V}O_2$ max 1 to 25%), larger than diet alone. The type of diet does not affect the effect. The quality of the underlying studies was not assessed.	NAn: <u>positive</u> result for >75% of all studies
Bouaziz 2016	1 RCT, 1 nonRCT n=NOT REPORTED (Healthy) older adults	F: 3 session/week I: NOT REPORTED T: 90 minutes/session T: Combination of endurance, strength, balance and flexibility training or combination of endurance, strength, balance, flexibility and coordination training. Total duration: 10 to 36 weeks	Multicomponent training in older adults shows positive effects on cardiorespiratory capacity (Increase in $\dot{V}O_2$ max 10 to 20%) compared to baseline (2/2 studies) or to controls (1/1 study) The quality and risk of bias of the underlying studies was not assessed.	NAn: <u>positive</u> result for all studies

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Bouaziz 2018	10 RCT n=348 Mixed	F: 3 to 4 session/week I: 50% to 85% of $\dot{V}O_2$ peak, 40 to 80% of HRR, 50% to 95% of HRmax T: 15 to 60 minutes/session T: Walking, cycling on ergometer, treadmill walking and walking / running on a mini-trampoline Total duration: 12 to 26 weeks	Aerobic training in older adults has a statistically significant positive effect on aerobic capacity in 9/10 studies (increase in $\dot{V}O_2$ max 6.5 to 30%). Pooled analyses of all studies, and adjusted to health status all showed positive results. Statistically significant heterogeneity was detected in all analyses. Greater gain was measured when subjects trained at 40 (sedentary) to 85% of $\dot{V}O_2$ peak, and after 16 weeks training (average) and 24 to 26 weeks for sedentary individuals. None of the included studies was at high risk of bias.	MA: <u>positive</u> result for all comparisons
Bruns 2016	3 RCT, 2nonRCT n=353 Oncologic disease	F: 3 to 7 session/week I: 40 to 80% peak HR T: 20 to 30 minutes/session T: Cardiopulmonary aerobic exercise Total duration: 24 to 38 days	<i>Physical prehabilitation in older colectoral surgery patients has a positive effect on aerobic capacity ($\dot{V}O_2$ at ventilatory threshold, 2.9 ml/kg/min increase) in one study, in aerobic performance (6MWT, 42, (p<0.01)) in 2 out of 3 studies. Inconclusive results were found in one study with several outcome measures. Studies had a moderate risk of bias.</i>	NA: <u>inconclusive</u>
Bueno de Souza 2018	3 RCT n=156 (Healthy) older adults	F: 2 to 3 session/week I: NOT REPORTED T: 60 minutes/sessions T: Pilates Total duration: 8 to 24 weeks	Pilates in older people has a statistically significant effect on aerobic performance (6MWT increase of 30 to 130m, SMD 2.00; 95%CI 1.44 to 2.56) and no effect on aerobic capacity ($\dot{V}O_2$ max). The evidence for aerobic performance is rated "moderate", the evidence for aerobic capacity "limited".	MA: <u>positive</u> result for all comparisons

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Bullo 2018	5 RCT, 4nonRCT n=536 Mixed	F: 2 to 3 session/week I: 60 to 70% max ability, progressive intensity up to 12 to 14 RPE, 50 to 60% HRmax, moderate intensity (12 to 14 RPE), moderate to high intensity (HR 100 to 120 bpm), comfortable pace T: 20 to 80 minutes/session T: Nordic walking Total duration: 6 to 35 weeks	Nordic walking (NW) in older people has a statistically significant effect on aerobic performance in 8 out of 9 studies (6MWT, 12MWT, 2 min step test, 5m WT: increase of 9 to 22%). NW showed a large effect compared to sedentary(ES 0.91; 95%CI 0.56 to 1.28) and resistance training (ES 0.75; 95%CI 0.03 to 1.47) controls, but walking therapy was more effective (ES -0.21; 95%CI -.64 to 0.21). The effect on aerobic capacity is also statistically significant ($\dot{V}O_2$ max increase of 2.4 to 13.6%). The studies were rated low quality and heterogeneous.	MA: <u>positive</u> result, only for comparisons with non-exercise controls

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Cugusi 2017	15 RCT n=766 Cardiovascular disease	F: 2 to 5 session/week I: NOT REPORTED T: 30 to 60 minutes/session or 2.5 to 3km T: Nordic walking Total duration: 3 to 24 weeks	Nordic Walking (NW) additional to conventional cardiovascular rehabilitation (CCVR) in individuals with coronary artery disease has a positive effect on exercise capacity (METs: SMD 0.49; 95%CI 0.04 to 0.93) and no effect on aerobic performance (6MWT: SMD 0.12; 95% CI -0.32 to 0.56). For peripheral artery disease patients NW has a statistically significant effect compared to non-exercise controls on aerobic capacity (exercise duration: SMD 0.93; 95%CI 0.52 to 1.34; $\dot{V}O_2$ max: SMD 0.64; 95%CI 0.23 to 1.04). But compared to traditional walking (TW), NW is less effective (TW vs NW ES 0.1 to 0.6 for exercise duration and $\dot{V}O_2$ max). For patients with heart failure NW showed positive but not always statistically significant results compared to CCVR and usual care. In a meta-analysis these findings were not established ($\dot{V}O_2$ max SMD 0.29; 95%CI -0.10 to 0.68; 6MWT 0.29; 95%CI -0.04 to 0.62). For post-stroke survivors NW-treadmill training showed positive results compared to traditional treadmill training (SMD: 0.80; 95%CI 0.08 to 1.52). Due to the overall low to moderate quality of the studies included in the present review (median PEDro score: 5), cautious interpretation of the studies' findings is recommended.	MA: <u>positive</u> result, only for comparisons with non-exercise controls
Dale 2015	2 RCT n=39 Respiratory disease	F: 2 to 3 session/week I: 80% of walking speed on initial 6MWT and progressed weekly, initial intensity of 60% peak work at baseline incremental cycle test and progressed weekly T: 15 to 30 minutes/session T: Cycling, walking Total duration: 8 weeks	For patients with non-malignant dust-related respiratory diseases exercise training has a positive effect on aerobic performance (6MWT increase of 54m; 95%CI 34 to 73) and no effect in maximal exercise capacity (peak work rate increase of 10 watts; 95%CI -0.4 to 4.4). The quality of this evidence is rated very low, although the risk of bias is judged very low.	MA: <u>inconclusive</u>

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Doyle 2019	11 RCT, 7 nonRCT n=2175 Cardiovascular disease	F: 1 to 14 session/week I: 3 to 7 RPE (10pt scale), 10 to 13 RPE, 65 to 75% max HR, anaerobic threshold T: 3 to 60 minutes/session T: Walking, stationary cycling or both Total duration: length of hospital stay to 6 months	Aerobic exercise early after cardiac surgery has a positive effect on aerobic fitness, both when started immediate postoperative (6MWT mean difference 69.5m; 95%CI 39.2 to 99.7) and when started early postoperative (VO ₂ peak mean difference 3.20ml/kg/min; 95%CI 1.45 to 4.95). However, for the early started aerobic exercise for 6MWT the number of patients was too small, and controls tend to improve a little more.	MA: <u>positive</u> result for all comparisons
Fukuta 2016	5 RCT n=245 Cardiovascular disease	F: 2 to 3 session/week I: NOT REPORTED T: 20 to 60 minutes/session T: Walking, walking and cycling, cycling and cycling and resistance training	Exercise training in patients with heart failure with preserved ejection fraction has a positive effect on aerobic capacity (VO ₂ peak: weighted mean difference 2.283 ml/kg/min; 95%CI 1.318 to 3.248) and on aerobic performance (6MWD: weighted mean difference 30.275; 95%CI 4.315 to 56.234)	MA: <u>positive</u> result for all comparisons
Gardner 2014	5 RCT, 5 nonRCT n=565 Oncologic disease	Total duration: 12 to 24 weeks F: 1 to 5 session/week I: 55% to 85% HRmax, 11 to 15 RPE, 50% to 75% peak oxygen uptake T: 15 to 60 minutes/session T: Walking, aerobic exercises Total duration: 12-24 weeks	<i>Exercise training in patients with prostate cancer receiving androgen-deprivation therapy has inconclusive effects on aerobic capacity (VO₂max: a positive effect in 1 study and not statistically significant in 3 studies), and in exercise performance (6MWT: positive in 2 studies, not statistically significant in 1 study; 400m walk: positive in 2 studies, not statistically significant in 1 study; Time to reach rate of perceived exertion of 15 in treadmill protocol: 1 positive study). Risk of bias scores of the underlying studies are low to moderate (scores 4 to 6 out of 7), due to the fact that not all underlying studies were RCTs and participants and therapists were not blinded.</i>	NA: <u>inconclusive</u>

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<i>Golledge 2019</i>	<i>11 RCT n=524 Cardiovascular disease</i>	<i>F: 3 to 5 session/week I: until severe leg discomfort experienced, a speed that evokes strong claudication pain, severe discomfort (12–14 on Borg rating), a brisk pace that elicits pain within 3–5minutes T: 10 to 50 minutes/session T: Walking</i>	<i>Structured home based exercise programs in patients with peripheral artery disease has a positive effect on aerobic performance (6MWT: SMD 0.28; 95%CI 0.09 to 0.47; walking distance treadmill SMD 0.32; 95%CI 0.15 to 0.50; claudication onset distance on treadmill SMD 0.45; 95%CI 0.27 to 0.62) compared to non-exercise controls. The majority of the underlying studies did not report on blinding of the assessors.</i>	<i>MA: <u>positive</u> result for all comparisons</i>
Gomes-Neto 2019	2 RCT n=59 Metabolic diseases	Total duration: 6 to 36 weeks F: 3 session/week I: NOT REPORTED T: 12 to 24 minutes/session T: Whole to body vibration training alone or in combination with exercises on the spot	Whole body vibration in older patients with diabetes type 2 has a positive effect on aerobic performance (6MWT/1 mile track walk: SMD 0.73; 95%CI 0,20 to 1.27) compared to not-descried controls. The included studies scored 2/10 and 5/10 on Pedro scale.	MA: <u>positive</u> result for all comparisons
Halloway 2015	1 RCT n=30 Frail older adults	Total duration: 8 to 12 weeks F: 2 to 4 session/week I: NOT REPORTED T: 30 minutes/session T: Walking, individual exercises	Prehabilitation prior to elective total hip surgery in frail patients has a positive effect on aerobic performance in 1 out of 1 study (6MWT: Effect Size (d) 0.37) compared to controls that received usual care. Risk of bias of the underlying study was not assessed.	NAn: <u>positive</u> result for all studies
Hernandez 2015	5 RCT n=131 Cognitive impairment	Total duration: 3 to 6 weeks F: 3 to 5 session/week I: moderate to intensive (subjective inability to speak a sentence) T: 15 to 45 minutes/session T: Walking, multimodal exercise, cycling Total duration: 2 to 6 months	Exercise programs (both multimodal and aerobic programs) in patients with Alzheimer's disease (AD) show positive effects in aerobic capacity in 1 out of 1 study (VO ₂ at cycle ergometer test) and aerobic performance in 3 out of 3 studies(shuttle walk (1/1), 6MWT (2/2)) in all studies. One study showed different effects for moderate and for severe AD, with negative results for severe AD. Other studies showed a positive effect for severe AD. 2/5 studies had no control group. In the other 3 studies assessors AND participants were blinded in 1 of 3.	NAn: <u>positive</u> result for all studies

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Heyn 2008	14RCT, 1 nonRCT n=1057 Mixed	F: 2 to 5 session/week I: NOT REPORTED T: 30 to 90 minutes/session T: Aerobic training, variable-intensity group exercise program, multicomponent functional fitness training, endurance exercises	Exercise programs in cognitively intact older adults had a statistically significant positive effect on aerobic performance in 4 out of 6 studies (6MWT or other walking endurance test, ES 0.047 to 2.169). In cognitively impaired older adults 2 out of 9 studies showed positive results on aerobic performance (6MWT or other walking endurance test, ES 0,230 to 0.555). A quality assessment was performed but not used in the interpretation of results.	MA: <u>positive</u> result for all comparisons
Howes 2017	8 RCT n=427 Mixed	Total duration: 2 to 40 weeks F: 1 to 4 session/week I: NOT REPORTED T: 45 to 90 minutes/session T: Active computer gaming Total duration: 4 weeks to 6 months	Active computer gaming in older adults shows a small positive effect on aerobic performance (6MWT and other walking distance test: SMD 0.29; 95%CI 0.04 to 0.55). Subgroup analyses on types of control (active – no exercise) showed no effect in either group. Sensitivity analyses showed a dose-effect relation: a moderate effect for >120 minutes per week , and a large effect for studies >150 minutes per week. This evidence was graded as very low quality	MA: <u>positive</u> result for all comparisons
Huang 2002, 2005, 2016	23 RCT, 18 nonRCT n=2102 (Healthy) older adults	F: 1 to 4.9 session/week I: 60% to 85% HRmax, 50% to 82% $\dot{V}O_2$ max, 35% to 80% HRR, 107 to 129 bpm HRmax T: 20 to 60 minutes/session T: Walking, jogging, cycling, stair to climbing, aerobic dance, tai chi chuan, outdoor performance or aerobic games Total duration: 8 to 52 weeks	Aerobic exercise in sedentary older adults shows a positive effect on aerobic capacity ($\dot{V}O_2$ max: Standardized ES: 0,64; 95%CI 0,56 to 0,73, i.e. an increase of 3,50 ml/kg/min; 95%CI 1,83 to 5,17). A greater increase was seen in studies with a longer duration (>20/24/32 weeks), intensity 60 to 65% of $\dot{V}O_2$ max, time>30 min. The quality of the underlying studies was variable, but the risk of bias was not included in the interpretation of the results.	MA: <u>positive</u> result for all comparisons

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Hurst 2019	20 RCT, 4 nonRCT n=1131 (Healthy) older adults	<i>F: 2 to 3 session/week I: 50 to 75% HRmax, 60 to 80% HRR, 80% HRVT₂ or RPE 12 to 14 T: 30 to 90 minutes/session T: Combined (strength and endurance) training and endurance training ((Treadmill) walking, running, cycling, cross-trainer, stationary cycling, dance)</i> <i>Total duration: 6 to 52 weeks</i>	<i>Combined aerobic and strength training in healthy older adults shows a positive effect on aerobic capacity ($\dot{V}O_2$peak: increase of 3.6 ml/kg/min; 95%CI 2.8 to 4.4) and on aerobic performance (6MWT: increase of 29.6m; 95%CI 9.1 to 50.1) compared to non-exercise controls. There was a not statistically significant effect on aerobic capacity ($\dot{V}O_2$peak) compared to aerobic training alone and a not statistically significant effect on aerobic endurance (6MWT) compared to strength training alone. The risk of bias in underlying studies was low or unclear, and authors mentioned a possible bias due to the exclusion of studies with other outcome measures than the predefined ($\dot{V}O_2$peak and 6MWT)</i>	<i>MA: <u>positive</u> result, only for comparisons with non-exercise controls</i>
Hwang 2015	1 nonRCT n=97 (Healthy) older adults	<i>F: 2 session/week I: NOT REPORTED T: 50 minutes/session T: Dance</i> <i>Total duration: 12 weeks</i>	<i>Dancing interventions older adults improve aerobic capacity ($\dot{V}O_2$max) in 1 out of 1 study. No specific outcome measure was reported. The quality of the study was moderate, the design was quasi-experimental.</i>	<i>NAn: <u>positive</u> result for all studies</i>
Kanach 2018	4 RCT n=556 Older adults, hospitalized for acute medical illness	<i>F: 5 to 35 session/week I: 125% of best 6 MWD, 85% predicted $\dot{V}O_2$max T: 10 to 60 minutes/session T: Aerobic walking, combined training with aerobic component</i> <i>Total duration: hospital length of stay to 18 months</i>	<i>Structured exercise Interventions for older adults hospitalized with acute medical illness shows positive results on aerobic capacity ($\dot{V}O_2$max) in one single study, and on aerobic performance (6MWT and shuttle walk test) in 3 out of 4 studies, all compared to non-exercise controls. The evidence is of low quality.</i>	<i>NAn: <u>positive</u> result for >75% of all studies</i>

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Keogh 2012	8 RCT, 4 nonRCT n=289 Oncologic disease	F: 2 to 7 session/week I: NOT REPORTED T: NOT REPORTED T: Aerobics training or aerobics training combined with either strength or eccentric training Total duration: 8 to 26 weeks	Group based exercise in prostate cancer patients shows positive results for aerobic capacity in 2 out of 3 studies (increase in $\dot{V}O_2$ max 9%, in METs 47%), and for aerobic performance in 2 out of 4 studies (increase in 6MWT 9%, in 400m walk 11%). Homebased exercise in this group shows positive results for aerobic endurance in 2 out of 4 studies (increase in 6MWT 11%, shuttle walk 13%). The evidence for group based exercise is judged as grade A, and the evidence for home based evidence is judged as grade B.	NAn: <u>inconclusive</u>
Kuijlaars 2019	2 RCT n=67 Trauma	F: 1 to 2 session/week I: 65 to 75% predicted HRmax T: 30 to 40 minutes/session T: Walking and stair walking Total duration: 3 months	Supervised home-based exercise therapy in patients after hip fracture shows no statistically significant results for aerobic performance (6MWT). The evidence was of moderate quality, risk of bias of the underlying studies was moderate to due to the lack of allocation concealment, blinding of participants and therapists, and in one study blinding of assessors.	NAn: <u>not statistically significant</u> result
Lam 2018	7 RCT n=402 Cognitive impairment	F: 2 to 4 session/week I: 30 to 60% $\dot{V}O_2$ max, 62 or 40% of heart rate reserve that gradually progressed to 85% T: 30 to 90 minutes/session T: Aerobic training, walking exercise, or multimodal exercise Total duration: 9 weeks to 12 months	Physical exercise in older people with cognitive impairment shows a positive effect on aerobic performance (increase in 6MWT 50m; 95%CI 18 to 81) compared to non-exercise controls. In institutionalized programs these results could not be established. Trials that reported positive findings adopted either specific aerobic training, walking exercise, or multimodal exercise, with a training duration ranging from 30 to 90 minutes/session, 2 to 4 session/week, for a total of 9 weeks to 12 months. Reported effective training intensity was 30 to 60% $\dot{V}O_2$ max, or 40% of heart rate reserve that gradually progressed to 85%. Publication bias was present in this analysis. The quality of the evidence is moderate, risk of bias was low.	MA: <u>positive</u> result for all comparisons

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Lee 2017	4 RCT n=164 Respiratory disease	<i>F: 2 to 7 session/week I: 80% peak HR achieved on initial incremental exercise test, 75 to 85% of $\dot{V}O_2$max, 60% max of 6MWT T: 30 to 45 minutes/session T: (Treadmill) walking, cycling, stair climbing, ski machine</i>	<i>Exercise training in patients with non-cystic fibrosis bronchiectasis shows no effect on aerobic capacity ($\dot{V}O_2$max) in 1 single study, and a positive effect on aerobic performance (shuttle walk test: MD 66.62m; 95%CI 51.57 to 81.68; 6MWD: increase of 32m (1 study)). Risk of bias in the underlying studies was low or unclear.</i>	MA: <u>positive</u> result for all comparisons
Leggio 2019	9 RCT n=348 Cardiovascular disease	<i>Total duration: 8 weeks F: 2 to 3 session/week I: NOT REPORTED T: 20-40 to 60 minutes T: Aerobic exercise training, walking, and treadmill and bicycle ergometer</i>	Exercise training in patients with heart failure with preserved ejection fraction has a positive effect on aerobic capacity ($\dot{V}O_2$ peak) in 6 out of 6 studies, on aerobic performance (6MWD) in 2 out of 2 studies and on ventilatory threshold in 2 out of 2 studies. Risk of bias was moderate in all underlying studies.	NAn: <u>positive</u> result for all studies
Li 2019	11 RCT n=405 Respiratory disease	<i>Total duration: 4 to 16 weeks F: 3 to 5 session/week I: 40 to 80% of 1RM T: 40 minutes/session T: resistance training Total duration: 6 to 12 weeks</i>	<i>Resistance training in elderly patients with COPD shows a positive effect on aerobic performance in two out of three measures (6MWD WMD 54.52; 95%CI 25.47 to 83.56; 6min peg-and-ring test: WMD 25.17; 95%CI 10.17 to 40.16; no statistically significant effect in constant work rate endurance test) and on aerobic capacity in 1 out of 2 measures (UULEX: SMD 0.41 95%CI 0.03 to 0.79; no statistically significant effect in CPET). Risk of bias in the underlying studies was moderate to high.</i>	MA: <u>inconclusive</u>

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<i>Liao 2015</i>	<i>10 RCT n=333 Respiratory disease</i>	<i>F: 2 to 3 session/week I: 60% work rate, 1 level below the maximum level achieved on the unsupported arm test, intensity increased according to breathlessness and perceived arm exertion, 50% maximum work capacity, 3 metabolic equivalents, 60% $\dot{V}O_2$peak T: 20 to 60 minutes/session T: Treadmill walking, cycle ergometer, arm cranking</i>	<i>Resistance training in elderly patients with COPD shows no effect on aerobic performance (6MWD; 6 minute peg-and-ring test; max workload) and on aerobic capacity ($\dot{V}O_2$max). Risk of bias of the underlying studies was high, especially because in most studies no intention to treat analysis was performed.</i>	<i>NAn: <u>not statistically significant</u> result</i>
<i>Paneroni 2017</i>	<i>8 RCT n=396 Respiratory disease</i>	<i>Total duration: 8 to 12 weeks F: 1 to 5 session/week I: high intensity ranging from 70% to 90% of the maximum load or velocity reached during incremental tests in three studies T: 15 to 30 minutes/session T: Cycling, (treadmill) walking or a combination Total duration: 4 to 52 weeks</i>	<i>Aerobic training in patients with very severe COPD shows a positive effect on aerobic performance (6MWT: WMD 67.1m; 95%CI 37.9 to 98.9). Risk of bias of the underlying studies was high.</i>	<i>MA: <u>positive</u> result for all comparisons</i>

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Parmenter 2013	24 RCT n=924 Cardiovascular disease	<i>F: 2 to 5 session/week I: intensity focussed on moderate to maximum pain or 60 to 90% $\dot{V}O_2$peak T: 16 to 60 minutes/session T: (Treadmill) walking, lower limb aerobics, pole striding, arm cranking</i> <i>Total duration: 6 to 76 weeks</i>	<i>Exercise in patients with intermittent claudication has a positive effect on aerobic performance in 10 out of 16 studies (6MWT-ICD 3/5 studies; 6 MWT-TWD 4/7 studies; shuttle walk-ICD: 1/2 studies; shuttle walk-TWD: 2/2 studies) and on aerobic capacity in 9 out of 24 studies ($\dot{V}O_2$peak 9/24 studies) compared to non-exercise controls. It has a positive effect on aerobic performance in 0 out of 9 studies (6MWT-ICD 0/2 studies; 6 MWT-TWD 0/3 studies; shuttle walk-ICD: 0/2 studies; shuttle walk-TWD: 0/2 studies) and on aerobic capacity ($\dot{V}O_2$peak) in 0 out of 14 studies compared to exercise controls. <i>The risk of bias is high due to the fact that assessors were not blinded.</i></i>	<i>NAn: inconclusive</i>
Patel 2012	4 RCT n=265 (Healthy) older adults	<i>F: 1 (+home exercise) to 2 session/week I: NOT REPORTED T: 60 to 90 minutes/session T: (Supervised) aerobic exercise, resistance training</i>	<i>Yoga in older adults shows a positive effect on aerobic capacity ($\dot{V}O_2$max SMD 0.54; 95%CI 0.08 to 1.00) compared to aerobic exercise. Risk of bias in the underlying studies is not clear.</i>	<i>MA: positive result for all comparisons</i>
Pengelly 2019	2 RCT, 7 nonRCT n=246 Cardiovascular disease	<i>Total duration: 16 to 26 weeks F: 5 to 7 session/week I: 60% 1RM (1 set 8 to 12 repetitions) , RPE 13 20, starting at 50% max power output T: 60 to 90 minutes/session T: aerobic strength and balance exercises, callisthenics</i> <i>Total duration: 3 to 4 weeks</i>	<i>Additional training (duration 60 to 90 minutes, and additional resistance training and balance training) in cardiac rehabilitation in patients following median sternotomy has a positive effect on aerobic performance (6MWT increase of 27m; 95%CI 7 to 47) an no effect on aerobic capacity ($\dot{V}O_2$max and maximal power output) compared to standard care consisting of aerobic and callisthenic exercises alone. <i>Risk of bias of the studies not properly reported for the two relevant studies, study quality was fair to good.</i></i>	<i>MA: inconclusive</i>

Supplementary File D Interventions and summary of the evidence of all included reviews.

Reviews with complete FITT-criteria AND risk of bias analysis highlighted in in *italic*

Article author year	Number/ type of relevant studies, Number (n) of participants, Group	Characteristics of the intervention	Summary of the evidence	Conclusion
Puhan 2016	18 RCT n=1368 Respiratory disease	F: 2 to 35 session/week I: NOT REPORTED T: 10 to 120 minutes/session T: Supervised and unsupervised inpatient and/or outpatient pulmonary rehabilitation (treadmill walking, walking, cycling, stair climbing, aerobic activities, endurance training)	Pulmonary rehabilitation following exacerbation of COPD shows a positive effect on aerobic performance (6MWT increase 62m; 95%CI 38 to 86; I ² =87% (13 studies), 3MWT no statistically significant increase (1 study)). The evidence was rated high quality, and was not downgraded for statistical heterogeneity because the pooled effect is large and well above MIC (i.e. 30m).	MA: <u>positive</u> result for all comparisons
Rezende Barbosa 2018	3 RTC n=227 (Healthy) older adults	Total duration: 4 days to 6 months F: NOT REPORTED I: 65 to 70% $\dot{V}O_2$ peak (15 min) T: 10 to 60 minutes/session T: Multimodal exercise programmes	Functional training in different populations has no effect on aerobic capacity ($\dot{V}O_2$ max difference -1.0; 95%CI -5.4 to 3.3). Risk of bias in the studies was high.	NA: <u>not statistically significant</u> result
Ribeiro 2017	5 RCT n=1797 Cardiovascular disease	Total duration: 12 weeks to 11 months F: 1 to 18 session/week I: intensity low to medium, 70% of HRmax predict or 14 RPE on Borgscale T: 30 minutes/session T: Aerobic exercise, cycling or cycle ergometer, treadmill or outdoor walking, (group) gymnastics Total duration: 2 to 3 weeks	<i>Cardiac rehabilitation programme after transcatheter aortic valve implantation (TAVI) and surgical aortic valve replacement (sAVR) has a positive effect on aerobic performance (6MWT increase of 71m (38%; SMD 0.69; 95%CI 0.47 to 0.91) post-TAVI, and an increase of 87m (38%, SMD 0.79; 95%CI 0.43 to 1.15) post-sAVR) compared to at the start of the programme.</i> <i>Due to the fact that the studies had no control groups the risk of bias is high.</i>	MA: <u>positive</u> result for all comparisons

Supplementary File D Interventions and summary of the evidence of all included reviews.

Reviews with complete FITT-criteria AND risk of bias analysis highlighted in in *italic*

Article author year	Number/ type of relevant studies, Number (n) of participants, Group	Characteristics of the intervention	Summary of the evidence	Conclusion
Rodrigues-Krause 2016	3RCT, 1 nonRCT n=237 Mixed	F: 1 to 3 session/week I: 70% $\dot{V}O_2$ peak, 100 to 120 bpm, 13 to 14RPE T: 40 to 60 minutes/session T: Dance, aerobic training (cycle ergometer, treadmill or both) Total duration: 8 to 24 weeks	Dance interventions in older adults show an positive effect on aerobic capacity ($\dot{V}O_2$ peak increase of 3.4ml/kg/min; 95%CI 1.08 to 7.78) compared to non-exercise controls, and no effect on aerobic capacity ($\dot{V}O_2$ peak) compared to other exercises. Risk of bias was considered serious, due to lack of blinded assessment of the outcome, lack of intention to treat principle for data analysis and considerable heterogeneity among studies.	MA: <u>positive</u> result, only for comparisons with non-exercise controls
Rodrigues-Krause/2019	10 RCT, 2 nonRCT n=893 Mixed	F: 1 to 3 session/week I: 50 to 75% $\dot{V}O_2$ peak, 11 to 14 Borg scale (specifications unclear), 50 to 70% HRmax, 50 to 120 bpm music (salsa goes up to 180 bpm), 50 to 70% HRR, 4.0 to 7.5 METs/hour or low to moderate intensity (unspecified) T: 30 to 90 minutes/session T: Dance (folk dance, aerobic dance, Argentine tango, waltz, foxtrot). Aerobic training (cycle ergometer, treadmill or both). Total duration: 6 to 104 weeks	Dancing in older adults shows a positive effect compared to non-exercise controls on aerobic capacity ($\dot{V}O_2$ peak) in 4 out of 6 studies, and on aerobic endurance (6MWT) in all 8 studies. There were no effects on aerobic capacity compared to other exercise interventions (2 studies), although in one study the intensity of dance was higher than walking. Risk of bias in the majority of studies was high, due to a lack of appropriate description of the generation of randomized sequences and of the methods of allocation concealment.	NAn: <u>positive</u> result for >75% of all studies
Rosero 2019	9 RCT n=648 Oncologic disease	F: 3 to 14 session/week I: 60 to 80% peak work capacity T: 20 to 60 minutes/session T: Aerobic training, multicomponent training (aerobic exercise combined with IMT and or strength training) Total duration: 1 to 4 weeks	<i>Preoperative physical exercise interventions in patients with non-small-cell lung cancer has a positive effect on aerobic performance (6MWT SMD 0.27; 95%CI 0.11 to 0.44) and on aerobic capacity ($\dot{V}O_2$peak SMD 0.78; 95%CI 0.35 to 1.12) compared to controls.</i> <i>Risk of bias was moderate in the majority of the studies although participants and therapists could not be blinded.</i>	MA: <u>positive</u> result for all comparisons

Supplementary File D Interventions and summary of the evidence of all included reviews.

Reviews with complete FITT-criteria AND risk of bias analysis highlighted in in italic

Article author year	Number/ type of relevant studies, Number (n) of participants, Group	Characteristics of the intervention	Summary of the evidence	Conclusion
Rydwik 2004	4 RCT n=554 Frail older adults	F: 2 to 3 session/week I: 50 to 65% progressively, >70% or 80% (units of measurement unclear) T: 2 to 20 minutes/session T: Aerobic training	Physical training in institutionalized elder persons had a positive effect on 'endurance' in 2 out of 4 studies. The evidence was judged low to high, and risk of bias was also low to high	NAn: <u>inconclusive</u>
Ryrso 2018	11 RCT n=723 Respiratory disease	Total duration: 9 to 52 weeks F: 2 to 7 session/week I: 60 to 80% of max work load , >75% of max walking distance, 60 to 70% VO ₂ max or HRmax, Borg breathlessness score 3 to 4 T: 30 to 40 minutes/session T: (Treadmill) walking, cycling and/or tailored aerobic activities / exercise (supervised and unsupervised)	Early supervised pulmonary rehabilitation (PR) following COPD-exacerbations shows a positive effect on aerobic performance (6MWT increase 76.89m; 95%CI 21.34 to 132.45; SWT increase 54.70m; 95%CI 30.83 to 78.57) at the end of treatment compared to usual care. The subgroup analysis showed no difference in the effect between PR initiated during admission and after discharge. Risk of bias was serious, due to unclear sequence generation, allocation concealment and blinding of assessors.	MA: <u>positive</u> result for all comparisons
Scheerman 2018	3 RCT n=260 Older adults, hospitalized for acute medical illness	Total duration: 10 days to 6 months F: 3 to 18 session/week I: NOT REPORTED T: 1 to 45 minutes/session T: tai chi principles, muscle strengthening exercises, electrical stimulation, walking (backward and forward).	Physical interventions in older patients during hospitalization showed a positive effect on aerobic performance (6MWT) in 1 out of 3 studies. Risk of bias was moderate, due to the fact that blinding of therapists and patients is not possible. Assessors were blinded in all studies.	NAn: <u>inconclusive</u>
		Total duration: 1 to 6 weeks		

Supplementary File D Interventions and summary of the evidence of all included reviews.

Reviews with complete FITT-criteria AND risk of bias analysis highlighted in in *italic*

Article author year	Number/ type of relevant studies, Number (n) of participants, Group	Characteristics of the intervention	Summary of the evidence	Conclusion
Slimani 2018	11 RCT n=2624 Cardiovascular disease	F: 1 to 13 session/week I: NOT REPORTED T: 25 to 60 minutes/session T: Aerobic training, resistance training or a combination of both Total duration: 6 to 54 weeks	Physical Training in Older Patients With Heart Failure has a positive effect on aerobic performance (6MWT ES 0.43; 95%CI 0.15 to 0.71) compared to controls with unknown conditions. Resistance training had a larger effect (ES = 1.71; 95%CI 1.03 to 2.39), aerobic training had a smaller effect (ES = 0.51; 95%CI 0.30 to 0.72). Combined aerobic and resistance training had no statistically significant effect (ES = 0.15;95%CI -0.24 to 0.53). Dose-response analyses showed that none of the training variables predicted changes in aerobic capacity or cardiac function. Risk of bias of the underlying studies was not assessed.	MA: <u>positive</u> result for all comparisons
Vieira 2010	12 RCT n=728 Respiratory disease	F: 4 to 14 session/week I: 70% max SWT T: 15 to 45 minutes/session T: Walking, stair climbing, cycling or a combination Total duration: 3 to 52 weeks	<i>Home-based pulmonary rehabilitation in COPD-patients shows an increase in aerobic performance (diverse walking tests 8/9 increase in intervention group vs 2/9 in controls) and aerobic capacity (work rate and $\dot{V}O_2$max: 2/5 positive in intervention vs (0/5 increase AND 2/5 decrease in controls)). Compared to hospital-based rehabilitation no differences were found.</i> <i>Risk of bias was high in the majority of studies due to lack of concealed allocation and of blinding of assessors.</i>	NAn: <u>positive</u> result, only for all studies with non-exercise controls
Wee 2018	4 RCT n=227 Cardiovascular disease	F: 2 to 3 session/week I: moderate to high T: 22 to 45 minutes/session T: continuous exercise, high intensity training (HIT) Total duration: 4 to 12 weeks	<i>Preoperative exercise for patients with abdominal aortic aneurysm has a positive effect on $\dot{V}O_2$peak and in anaerobic threshold in 1 out of 2 studies. For patients without an indication for surgery no increase in $\dot{V}O_2$peak was found (0/2), but a positive effect on anaerobic (1/1) en ventilatory threshold (1/2).</i> <i>Risk of bias was high, due to lack of blinding of the assessors in the majority of studies.</i>	NAn: <u>inconclusive</u>

Appendix 3 Interventions and summary of the evidence of all included reviews.

Supplementary File D Interventions and summary of the evidence of all included reviews.

Reviews with complete FITT-criteria AND risk of bias analysis highlighted in in italic

Reviews with complete FITT-criteria AND with risk of bias analysis are highlighted *in italics*: these reviews are included in the subgroup analyses on categories with specific health status or diagnoses:

Type of relevant studies: *RCT*: Randomized controlled trial; *nonRCT*: other design than Randomized controlled trial

Characteristics of the intervention: Frequency, Intensity, Time and Type of exercise. *1RM*: 1 repetition maximum; *6MWD*: 6 minute walking distance; *6MWT*: 6 minute walking test; bpm: beats per minute; *HRmax*: Maximum heart rate; *HRR*: Heart rate reserve; *HRVT2*: Heart rate at the second ventilatory threshold; *MET*: metabolic equivalent; *RPE*: rate of perceived exertion; *VT*: ventilatory threshold; *VO₂max*: maximum oxygen consumption; *VO₂peak*: peak oxygen consumption

Summary of the evidence: *1RM*: one repetition maximum; *6MWD*: 6 minute walking distance; *6MWT*: 6 minute walking test; *CI*: confidential interval; *COPD*: chronic obstructive pulmonary disease; *CPET*: Cardio Pulmonary Exercise testing; *ES*: Effect size; *ICD*: initial claudication distance; *MD*: Mean difference; *MET*: metabolic equivalent; *sAVR*: Surgical aortic valve replacement; *SMD*: standardized mean difference; *SWT*: Shuttle walk test; *TAVI*: Transcatheter aortic valve implantation; *TWD*: total walking distance; *UULEX*: Unsupported Upper Limb Exercise test; *VO₂max*: maximum oxygen consumption; *VO₂peak*: peak oxygen consumption; *WMD*: weighted mean difference;

Conclusion: *MA*: Meta-analysis; *NAn*: Narrative analysis