# Report supplementary material 2 Characteristics of studies

## Characteristics of included studies

Archer et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** to: 1) compare the effectiveness of a CBPT Program and an Education Program for improving pain, disability, general health, and PA, 2) determine how the CBPT Program improves outcomes and 3) determine which subgroups of patients are most likely to benefit from the CBPT Program |
| **Participants** | **Total number of randomised participants:** 248  **Inclusion criteria:** English-speaking adults; having surgical treatment of a lumbar degenerative condition (spinal stenosis, spondylosis with or without myelopathy, and degenerative spondylolisthesis) using laminectomy with or without arthrodesis (i.e., fusion)  **Exclusion criteria:** a microsurgical technique as the primary procedure, such as an isolated laminotomy or microdiscectomy; spinal deformity as the primary indication for surgery; spine surgery secondary to pseudarthrosis, trauma, infection, or tumour; back and/or lower extremity pain < 3 months indicating no history of sub-acute or chronic pain; history of neurological disorder or disease, resulting in moderate to severe movement dysfunction; schizophrenia or other psychotic disorder; had surgery under a workman’s compensation claim; unable to return to clinic for standard follow-up visits with surgeon; unable to provide a stable address and access to a telephone  **Type of surgery (condition):** laminectomy (spinal degenerative disorder)  **Country:** USA  **Baseline Characteristics**  **Intervention group (CBPT)**   * *Type of surgery, n (%)*: laminectomy without fusion: 51 (41.1); laminectomy with fusion: 73 (58.9) * *Age, mean (SD)*: 62.94 (± 11.50) years * *Gender, M/F*: 64/60 * *BMI, mean (SD)*: 32.18 (± 6.12) kg/m2 * *Relevant clinical variables, n*: comorbidities: none: 53; one: 49; two or more: 22 * *Race/ethnicity, n (%)*: white: 107 (86.3); non-white: 17 (13.7) * *Education level, n (%)*: < 12th grade: 5 (4); 12th grade, diploma or GED: 26 (21); some college, no degree: 33 (26.6); associate degree: 16 (12.9); college degree: 24 (19.4); graduate degree: 20 (16.1) * *Employment status, n*: employed: 45; retired (not due to illness): 41; disabled and/or retired due to illness: 35; looking for work: 1; elected not to work (e.g., homemaker): 0; attending school: 2   **Intervention group (Education)**   * *Type of surgery, n (%)*: laminectomy without fusion: 33 (26.6); laminectomy with fusion: 91 (73.4) * *Age, mean (SD)*: 61.44 (± 12.22) years * *Gender, M/F*: 58/66 * *BMI, mean (SD)*: 32.59 (± 7.01) kg/m2 * *Relevant clinical variables, n*: comorbidities: none: 64; one: 38; two or more: 22 * *Race/ethnicity, n (%)*: white: 108 (87.1); non-white: 16 (12.9) * *Education level, n (%)*: < 12th grade: 3 (2.4); 12th grade, diploma or GED: 32 (25.8); some college, no degree: 43 (34.7); associate degree: 11 (8.9); college degree: 19 (15.3); graduate degree 16 (12.9) * *Employment status, n*: employed: 46; retired (not due to illness): 41; disabled and/or retired due to illness: 31; looking for work: 0; elected not to work: 5; attending school: 1   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, current involvement in regular PA, illness severity scores |
| **Interventions** | **Details of interventions**  Approach 1: cognitive behavioural physical therapy; individualised PA plan with goal setting; delivered one-to-one by telephone; weekly, over 6 weeks by physical therapist  Approach 2: educational advice, including importance of PA, back healing, staying healthy, and preventing injury; delivered one-to-one by telephone; weekly, over 6 weeks by physical therapist  Context: Laminectomy with and without fusion patients; starts post-surgery; patient exercises at home / independently  Comparison: between two interventions, see above  **Intervention group (approach 1)**: number randomised = 124; reported losses = 10 (withdrawal = 4; lost to follow-up = 5; death = 1) some attrition is unexplained; analysed for PA = 98; analysed for HRQoL = 114  **Comparison group (approach 2):** number randomised = 124; reported losses = 7 (withdrawal = 4; lost to follow-up = 3; death = 0) some attrition is unexplained; analysed for PA = 100; analysed for HRQoL = 115  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors:** pain intensity and interference (BPI); general physical and mental health (PCS; MCS); amount of PA (accelerometer); fear of movement; pain self-efficacy; depressive symptoms; adverse events. Measured preoperatively and at 6 weeks (baseline), 6 months and 12 months after lumbar spine surgery  **Outcomes relevant to the review**   * Amount of PA: measured using accelerometer (ActiGraph GT3X-BT); assessed using total volume of PA expressed as the mean counts per minute over the duration of accelerometer monitoring; 12 months post-surgery * HRQoL: measured using the PCS component of SF-12; 12 months post-surgery * Pain: measured using BPI (back and leg pain); 12 months post-surgery * Adverse events   **Study primary outcome:** disability (ODI) |
| **Notes** | **Sponsorship source:** supported by funding from the Patient-Centered Outcomes Research Institute. Declarations of interest not reported  **Study dates:** August 2014 to January 2018 |
| **Reference(s)**  **\* primary reference** | \* Archer KR, Coronado RA, Haug CM, Vanston SW, Devin CJ, Fonnesbeck CJ*, et al.* A comparative effectiveness trial of postoperative management for lumbar spine surgery: changing behavior through physical therapy (CBPT) study protocol. *BMC Musculoskeletal Disorders* 2014; **15**: 325  Coronado RA, Henry A, Pennings JS, Haug C, Vanston S, Skolasky RL et al. Resilience and self-efficacy are protective psychological factors for 12-month outcomes after lumbar spine surgery. The Spine Journal 2019;**19** **(Supplement 9)**: S28-S29  NCT02184143. Postoperative management for degenerative spinal conditions [Comparative effectiveness of postoperative management for degenerative spinal conditions]. <Https://clinicaltrials.gov/ct2/show/NCT02184143> (first received 9 July 2014) |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Block randomised using computer-generated scheme |
| Allocation concealment (selection bias) | Low risk | External randomisation with concealed allocation |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were assessed using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adverse events (detection bias) | Unclear risk | Observation method not specified for this outcome |
| Incomplete outcome data (attrition bias) | Low risk | We noted few losses which were generally balanced between groups, and reasons for losses were sufficiently explained by study authors |
| Selective reporting (reporting bias) | Low risk | Prospective registration with a clinical trials register (NCT02184143; first received July 2014); all reported review outcomes were consistent with the clinical trials register documents |
| Other bias | Low risk | No other sources of bias detected |

Artz **et al.**

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to evaluate the feasibility of conducting a RCT comparing group-based outpatient physiotherapy with usual care in patients following TKR |
| **Participants** | **Total number of randomised participants:** 46  **Inclusion criteria:** patients undergoing a primary TKR for OA at study hospital  **Exclusion criteria:** knee replacement for conditions other than osteoarthritis, revision knee surgery, inability to participate in exercise for any medical reason such as unstable cardiovascular or cardio-respiratory disease, diagnosis of severe neurological disorders, inability to provide informed consent, and inability to complete study questionnaires in English as the study was using measures that had not all been validated in other languages  **Type of surgery (condition):** TKR (OA)  **Country:** UK  **Baseline Characteristics**  **Intervention group**   * *Age, median (range)*: 70.0 (57 to 81) years * *Gender,* *M/F*: 11/12 * *Current involvement in regular PA, mean (SD)*: KOOS sport/recreation: 12.2 (± 24.4)   **Comparison Group**   * *Age, median (range)*: 67.2 (51 to 82) years * *Gender, M/F*: 11/12 * *Current involvement in regular PA, mean (SD)*: KOOS sport/recreation: 18.1 (± 15.8)   Note:   * study authors do not report the following characteristics: BMI, weight, height, baseline level of fitness, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: physiotherapy exercise class; group classes focused on general fitness, lower-limb strength, function and confidence, some individual preferences, provision of longer-term exercise plan, financial support with travel to classes; delivered by physiotherapists, weekly, for 6 weeks  Context: TKR; post-surgery; physiotherapy clinic gym  Comparison: usual care  **Intervention group:** number randomised = 23; reported losses = 2 (withdrawals at 2 weeks) some attrition is unexplained; analysed for PA = 20; analysed for HRQoL = 21  **Comparison group:** number randomised = 23; reported losses = 8 (1 = surgery delayed beyond study period; 5 = non-responders 6 months; 2 = withdrawals at 2 weeks) some attrition is unexplained; analysed for PA = 15; analysed for HRQoL = 14  **Setting:** hospital |
| **Outcomes** | **All outcomes measured/reported by study authors:** patient reported outcome measures to assess knee pain and function, recreational activity, balance, self-efficacy, participation, general health, and satisfaction with surgery and rehabilitation; KOOS; LEFS; amount of PA (UCLA); AbIAP; ABC; SER; VAS for pain; MYMOP. Measured before surgery at 2 weeks, 3 months, and 6 months after surgery;  **Outcomes relevant to the review**   * Amount of PA: measured using the self-reported UCLA activity score which produces a score on a scale of 1 to 10, where a higher score indicates more PA; 6 months post-surgery * HRQoL: measured using KOOS; 6 months post-surgery * Pain: measured using VAS; 6 months post-surgery * Adherence: measured as number of people attending classes * Participant experience   **Study primary outcome:** feasibility of intervention |
| **Notes** | **Sponsorship source:** supported by grant funding from the National Institute for Health Research. Study authors declare no conflicts of interest  **Study dates:** July 2012 to February 2013  Note:   * of those that were eligible and approached for involvement in the study, 72 people chose not to participate. The most frequent reasons (54% of reported reasons) were related to travelling distance, transportation, and commitment to attend the exercise class if randomised to the intervention group. Other reasons included: concerns around existing co-morbidities, caring responsibilities, dislike of completing questionnaires, planned vacations after surgery, unwillingness to exercise in a group, and anxiety about the forthcoming surgery at the time of approach about the study |
| **Reference(s)**  **\* primary reference** | \* Artz N, Dixon S, Wylde V, Marques E, Beswick AD, Lenguerrand E*, et al.* Comparison of group-based outpatient physiotherapy with usual care after total knee replacement: a feasibility study for a randomized controlled trial. *Clinical Rehabilitation* 2017; **31**: 487-99  ISRCTN13579789. Activity orientated rehabilitation following knee arthroplasty: feasibility study [Activity orientated rehabilitation following knee arthroplasty (ARENA): feasibility randomised control trial]. [isrctn.com/ISRCTN13579789](Https://isrctn.com/ISRCTN13579789) (first received 3 March 2016) |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Computer-generated randomisation |
| Allocation concealment (selection bias) | Unclear risk | No details |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Outcomes were measured using subjective measurement tools, and participants were not blinded to the intervention |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to the intervention |
| Blinding of outcome assessment: adherence (detection bias) | Low risk | Objective measurement of class attendance |
| Incomplete outcome data (attrition bias) | High risk | The sample size was small and we noted more losses in the comparison group and this could influence outcome data |
| Selective reporting (reporting bias) | Unclear risk | Retrospective registration with clinical trials register (ISRCTN13579789; first received November 2015); it is not feasible to use these documents to effectively assess the risk of selective reporting bias |
| Other bias | Low risk | No other sources of bias detected |

Baillot et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to evaluate the effect of Pre-Surgical Exercise Training (PreSET) on PA level, physical fitness, PA barriers, and HRQoL 1 year after bariatric surgery |
| **Participants** | **Total number of randomised participants:** 30  **Inclusion criteria:** BMI ≥ 35 kg/m2 and with comorbidities or ≥ 40 kg/m2; between 18 and 65 years of age; without uncontrolled neuropsychiatric illnesses; receiving a laparoscopic Roux-en-Y gastric bypass or sleeve gastrectomy; expected to be operated within 3 to 6 months; and undertaken < two weekly supervised exercise sessions  **Exclusion criteria:** inabilities to regularly attend supervised exercise sessions; medical contraindications for PA; functional limitations not allowing them to complete 6MWT; inability to speak fluently the language in which the intervention was provided (French); uncontrolled neuropsychiatric illnesses. After enrolment, participants were excluded if they had an injury or an incident resulting in > 2 weeks of an inability to perform PA  **Type of surgery (condition):** bariatric surgery  **Country:** Canada  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 44.5 (± 8.8) years * *Gender, M/F*: 2/11 * *Current involvement in regular PA*: sitting time, mean (SD): 422.5 (± 205.0) minutes/day. Total MET, mean (SD): 2023.6 (± 2548.0) minutes/week * *Relevant clinical variables, n*: smoker: 0; hypertension: 8; diabetes: 5; heart and vascular disease: 1; asthma 3 * *Non-surgical participants, n*: 0 * *Education, %*: post-secondary education: 46.1 * *Economic status, %*: employed: 76.9. Family annual income ≥ $60,000: 38.5   **Comparison group**   * *Age, mean (SD)*: 41.1 (± 10.3) years * *Gender, M/F*: 3/9 * *Current involvement in regular PA*: sitting time, mean (SD): 454.6 (± 208.2) minutes/day; Total MET, mean (SD): 2328.5 (± 1708.9) minutes/week * *Relevant clinical variables, n*: smoker: 1; hypertension: 3; diabetes: 5; heart and vascular disease: 1; asthma: 0 * *Non-surgical participants, n*: 0 * *Education, %*: post-secondary education: 25.0 * *Economic status, %*: employed: 50.0. Family annual income ≥ $60,000: 58.3   Note:   * baseline characteristics are only for those with long-term outcome data. No significant difference between any baseline characteristics * study authors do not report the following characteristics: BMI, weight, height, baseline level of fitness, illness severity |
| **Interventions** | **Details of interventions**  Approach: counselling, exercise classes and voluntary group education; walking, tread-mill, circuit, dance and aerobic sessions and monthly aqua-gym, voluntary group education sessions focused on PA, nutrition and psychological issues related to weight management; group exercise sessions with one-to-one counselling; counselling every 6 to 8 weeks, exercise sessions 3 per week; delivered by PA specialist (counselling and exercise sessions) and dietician (counselling only) over 18 months  Context: bariatric patients; starts 6 months pre-surgery at clinic  Comparison: usual care counselling sessions at same time points as (intervention every 6 to 8 weeks in the 6 months pre surgery, and 3, 6, 9, and 12 months after surgery) with a dietician and PA specialist; optional educational sessions relating to PA, nutrition and weight management  **Intervention group:** number randomised = 15; losses = 2 (1 plaster for > 2 weeks; 1 didn't receive surgery); analysed = 13  **Comparison group:** number randomised = 15; losses = 2 (2 lost to follow-up; 1 hospitalised for > 2 weeks); analysed = 12  **Setting:** home and clinical setting |
| **Outcomes** | **All outcomes measured/reported by study authors:** amount of PA according to IPAQ (self-reported in previous 7 days), and using accelerometer and a diary for 7 days; physical fitness (symptom-limited cardiac exercise test; 6MWT; sit and stand test, half-squat, arm curl tests); physical exercise belief questionnaire; weight related QoL (Laval questionnaire); anthropometric parameters; haemodynamic variables; adherence data (duration of training sessions, median % of people attending total number of recommended sessions; number of participants attending more than 70% of sessions)  **Outcomes relevant to the review**:   * Amount of PA: mean number of steps using an accelerometer (Actigraph® GT3X+, Pensacola, FL, USA) for 7 days; 12 months post-surgery * Amount of PA: IPAQ; self-reported in previous 7 days; 12 months post-surgery * Physical fitness: using 6MWT; data based on changes from baseline to 12 months post-surgery * Physical fitness: using symptom-limited cardiac exercise test; 12 months post-surgery * Physical fitness: using sit-to-stand test; 12 months post-surgery * Physical fitness: using arm curl test; 12 months post-surgery * HRQoL: using Laval questionnaire; 12 months post-surgery * Adherence: number of participants attending more than 70% of sessions   **Study primary outcome:** PA (listed first) |
| **Notes** | **Sponsorship source:** supported by funding from the Canadian Institutes of Health Research and the University of Quebec in Outaouais. Study authors declare no conflicts of interest  **Study dates:** October 2011 to September 2018  Notes:   * this study is the long-term follow-up of an earlier trial (PreSET) which only measured outcomes at 12 weeks. |
| **Reference(s)**  **\* primary reference** | Baillot A, Mampuya WM, Dionne IJ, Comeau E, Méziat-Burdin A, Langlois MF. Impacts of Supervised Exercise Training in Addition to Interdisciplinary Lifestyle Management in Subjects Awaiting Bariatric Surgery: a Randomized Controlled Study. Obesity Surgery 2016; **26**: 2602–10.  \* Baillot A, Vallee CA, Mampuya WM, Dionne IJ, Comeau E, Meziat-Burdin A*, et al.* Effects of a Pre-surgery Supervised Exercise Training 1 Year After Bariatric Surgery: a Randomized Controlled Study. *Obesity Surgery* 2018; **28**: 955-62  Prebariatric Surgery Physical Activity Program. <Https://clinicaltrials.gov/show/nct01452230> 2011 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Computer-generated randomisation |
| Allocation concealment (selection bias) | Unclear risk | Allocation is kept in sealed envelopes; however, does not state if envelopes are opaque and sequentially numbered |
| Blinding of participants and personnel (performance bias) | High risk | Not feasible to blind participants and personnel to group allocation |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Outcomes were measured using subjective and objective measurement tools, and participants were not blinded to the intervention. We judged detection bias to be high risk when outcomes are measured with subjective tools, and low risk when measured with objective tools |
| Blinding of outcome assessment: fitness outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to the intervention |
| Blinding of outcome assessment: adherence (detection bias) | Low risk | Objective measurement of class attendance |
| Incomplete outcome data (attrition bias) | Low risk | Small number of losses, which were balanced between groups and unlikely to influence outcome data |
| Selective reporting (reporting bias) | High risk | Study has clinical trials registration (NCT01452230). However, not all reported outcomes are included in the registration documents which may indicate high risk of reporting bias. Because the study report does not include study dates, it is not clear if registration was prospective |
| Other bias | Low risk | We identified no other sources of bias |

Barberan-Garcia et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to assess the midterm clinical impact and costs from a hospital perspective of an endurance-exercise-training-based prehabilitation programme in high-risk patients undergoing major digestive surgery |
| **Participants** | **Total number of randomised participants:** 144  **Inclusion criteria:** undergoing elective major digestive surgery; high risk for surgical complications defined by age > 70 years and ASA physical status 3/4; minimum waiting period allowing 4 weeks of programme  **Exclusion criteria:** DASI > 46  **Type of surgery (condition):** major digestive surgery  **Country:** Spain  **Baseline Characteristics**  **Intervention group**   * *Type of surgery, n (%)*: oesophagectomy: 8 (13); pancreaticoduodenectomy: 3 (5); total gastrectomy: 0 (0); gastric bypass: 3 (5); total colectomy: 3 (5); rectal resection: 7 (11); major liver resection: 2 (3); pancreas resection: 2 (3); partial gastrectomy: 1 (2); sleeve gastrectomy: 5 (8); segmental colon resection: 28 (45); minor liver resection: 0 (0) * *Age, mean (SD)*: 71 (± 11) years * *Gender, M/F*: 43/19 * *BMI, mean (SD)*: 21 (± 7) kg/m2 * *Baseline level of fitness, mean (SD)*: 6MWT: 472 (± 94) m * *Current involvement in regular PA, mean (SD)*: YPAS index: 34 (± 17) * *Relevant illness severity scores (e.g., ASA,* *APACHE II), n (%)*: ASA Index: II: 19 (30); III: 43 (68); IV: 1 (2)   **Comparison group**   * *Type of surgery, n (%):* oesophagectomy: 5 (8); pancreaticoduodenectomy: 1 (2); total gastrectomy: 5 (8); gastric bypass: 6 (10); total colectomy: 1 (2); rectal resection: 10 (16); major liver resection: 1 (2); pancreas resection: 1 (2); partial gastrectomy: 2 (3); sleeve gastrectomy: 4 (6); segmental colon resection: 26 (41); minor liver resection: 1 (2) * *Age, mean (SD)*: 71 (± 10) years * *Gender, M/F*: 51/12 * *BMI, mean (SD)*: 22 (± 7) kg/m2 * *Baseline level of fitness, mean (SD)*: 6MWT: 471 (± 95) m * *Current involvement in regular PA, mean (SD)*: YPAS index: 41 (± 16) * *Relevant illness severity scores (e.g., ASA, APACHE II), n (%)*: ASA Index: II: 24 (38); III: 36 (56); IV: 4 (6)   Note:   * study authors do not report the following characteristics: weight, height, current involvement in regular PA, baseline level of fitness, relevant clinical variables |
| **Interventions** | **Details of interventions**  Approach: PA prehabilitation: motivational interviewing, PA recommendation, and individualised high-intensity exercise sessions; 1 to 3 sessions per week delivered by specialised physiotherapist; standard preoperative protocol included nutritional counselling, and advice on smoking cessation and alcohol reduction; delivered over average 4 to 6 weeks  Context: elective major surgery patients; starts at least 4 weeks pre-surgery at hospital and outpatient clinic  Comparison: usual care: included PA recommendations, nutritional counselling and advice on smoking cessation and alcohol reduction, as provided to intervention group  **Intervention group:** number randomised = 73; losses = 11 (did not undergo surgery); analysed = 62  **Comparison group:** number randomised = 71; losses = 8 (did not undergo surgery); analysed = 63  **Setting:** hospital (outpatient) |
| **Outcomes** | **All outcomes measured/reported by study authors:** postoperative complications; number and severity of postoperative complications; hospital and ICU length of stay; ET; physical fitness (6MWT); amount of PA (YPAS); HRQoL (SF-36); psychological status (HADS); standard CPEX; resting pulmonary function testing. Measured at baseline, pre-surgery, 30 days, 3 and 6 months post-surgery  **Outcomes relevant to the review:**   * Amount of PA: using YPAS; 6 months post-surgery * HRQoL: using SF-36 (PCS); 6 months post-surgery   **Study primary outcome:** postoperative complications |
| **Notes** | **Sponsorship source:** supported by grant funding from the European Commission, European Society of Anaesthesiology, Instituto de Salud Carlos III, and Generalitat de Catalunya. The authors declare no conflicts of interest  **Study dates:** February 2014 to January 2017 |
| **Reference(s)**  **\* primary reference** | \* Barberan-Garcia A, Ubre M, Pascual-Argente N, Risco R, Faner J, Balust J*, et al.* Post-discharge impact and cost-consequence analysis of prehabilitation in high-risk patients undergoing major abdominal surgery: secondary results from a randomised controlled trial. *British Journal of Anaesthesia* 2019; **123**: 450-6.  Barberan-Garcia A, Ubre M, Roca J, Lacy AM, Burgos F, Risco R, et al. Personalised prehabilitation in high-risk patients undergoing elective major abdominal surgery: a randomised controlled trial. European Respiratory Journal 2017; **50** **(Supplement 61)**: OA1767.  Barberan-Garcia A, Ubre M, Roca J, Lacy AM, Burgos F, Risco R, et al. Personalised prehabilitation in high-risk patients undergoing elective major abdominal surgery: a randomized blinded controlled trial. Annals of Surgery 2018; **267**: 50-56.  NCT02024776. Effectiveness of prehabilitation program for high-risk patients underwent abdominal surgery [The effectiveness of tailored physical training intervention (prehabilitation) in high-risk patients underwent major abdominal surgery on postoperative complications: randomized controlled trial]. <Https://clinicaltrials.gov/show/nct02024776> (first received 31 December 2013) |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Computer-generated randomisation |
| Allocation concealment (selection bias) | Low risk | Randomisation managed by external independent organisation |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Outcomes were measured using subjective measurement tools, and participants were not blinded to the intervention |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to the intervention |
| Incomplete outcome data (attrition bias) | Low risk | Losses are balanced between groups, and are explained and justifiable losses (participants did not have surgery) |
| Selective reporting (reporting bias) | High risk | Prospectively registered with a clinical trials register (NCT02024776). We noted that HRQoL was listed as a study outcome in the clinical trials report but measurement of PA (using YPAS) was not listed. We judged risk of reporting bias to be high for PA, but low for HRQoL |
| Other bias | Low risk | No other sources of bias detected |

Barnason et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** to examine the effect of a symptom management telehealth intervention on PA and functioning and to describe the health care use of older adult patients, ≥ 65 years of age, after CABS by group (symptom management intervention group and usual care group) |
| **Participants** | **Total number of randomised participants:** 280  **Inclusion criteria:** postoperative CABS patients; ≥ 65 years of age  **Exclusion criteria:** not reported  **Type of surgery (condition):** CABS  **Country:** USA  **Baseline Characteristics**  **Overall**   * *Type of surgery, n (%)*: CABG: 173 (74.57); OPCAB: 57 (24.57); other: 2 (0.86) * *Age, mean (SD)*: 71.21 (± 4.91) years * *Gender, M/F*: 194/40 * *BMI, mean (SD)*: 28.47 (± 4.59) kg/m2 * *Relevant clinical variables*: NYHA classification, n: I: 112; II: 95; III: 23; IV: 1. Charlson Comorbidity Index (average no. of comorbidities), mean (SD): 1.13 (± 1.23) * *Education status, mean (SD)*: 13.34 (± 3.04) years   Note:   * baseline characteristics of analysed study participants (N = 232) * study authors do not report the following characteristics: weight, height, baseline level of fitness, current involvement in regular PA, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: telehealth recovery; strategies around self-efficacy and self-care including progressing PA incrementally, pain management and rest; 'one-to-one’ daily ‘sessions’ from telehealth device; delivered over 6 weeks  Context: CABS patients; post-surgery; at home  Comparison: usual care  **Intervention group:** number randomised = 143; reported losses = 34 (burden = 24; died = 1; equipment malfunction = 3; complications = 2; non-compliance with intervention = 3; lost to follow-up = 1) some attrition is unexplained; analysed for PA = 73  **Comparison group:** number randomised = 137; losses = 14 (burden = 12; extended care facility = 1; lost to follow-up = 1) some attrition is unexplained; analysed for PA = 83  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors:** physical, role-physical, and vitality functioning (sub-scales of MOS SF-36); modified 7-day Activity Interview; amount of PA (RT3 accelerometer (Stayhealthy, Inc, Monrovia, CA)); PA and exercise diary; health care use. Measured at time of discharge (baseline), 3 and 6 weeks and 3 and 6 months post-surgery  **Outcomes relevant to the review:**   * Amount of PA: given in energy expenditure measures; using an accelerometer (Stayhealthy, Inc, Monrovia, CA) worn on participants waistband continuously, except during bathing and sleeping times, for 3 consecutive days each data-collection period; 6 months post-surgery   **Study primary outcome:** PA |
| **Notes** | **Sponsorship source:** supported by funding from the National Institutes of Health/National Institute of Nursing Research. Declarations of interest not reported  **Study dates:** December 2002 to August 2006 |
| **Reference(s)**  **\* primary reference** | \* Barnason S, Zimmerman L, Nieveen J, Schulz P, Miller C, Hertzog M*, et al.* Influence of a symptom management telehealth intervention on older adults' early recovery outcomes after coronary artery bypass surgery. *Heart & Lung* 2009; **38**: 364-76 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Described as randomised but no further details; we noted that baseline characteristics were not reported by group in the study and we could not use this information to ascertain whether an effective randomisation method was used |
| Allocation concealment (selection bias) | Unclear risk | No details |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants and personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Incomplete outcome data (attrition bias) | High risk | Although losses (and reasons for losses) were clearly reported by study authors, we noted that overall loss was high, with more losses in the intervention group than the usual care group |
| Selective reporting (reporting bias) | Unclear risk | Study authors do not report clinical trials registration or reference to a pre-published protocol; it is not feasible to effectively assess risk of selective reporting bias without these documents |
| Other bias | Low risk | No other sources of bias detected |

Boesch et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to assess exercise capacity, blood lipids, and PA patterns 2 years after completing a concentrated residential CR program in Switzerland |
| **Participants** | **Total number of randomised participants:** 51  **Inclusion criteria:** consecutive patients referred to a residential rehabilitation centre in Seewis, Switzerland after a myocardial event (usually MI or CABS)  **Exclusion criteria:** no details  **Type of surgery (condition):** overall 41 (52%) participants had undergone CABS (myocardial event)  **Country:** Switzerland  **Baseline Characteristics**  **Intervention group 1 (heart rate)**   * *Age, mean (SD)*: 54.3 (± 12) years * *Gender, M/F*: 21/3 * *Weight, mean (SD)*: 83.5 (± 12.6) kg * *Height, mean (SD)*: 173.8 (± 7.8) cm * *Relevant clinical variables*: myocardial infarction, n (%): 8 (33); ejection fraction, mean (SD) %: 68.6 (± 12) * *Non-surgical participants, n (%)*: PTCA: 12 (50)   **Intervention group 2 (self-regulation)**   * *Age, mean (SD)*: 60.9 (± 10) years * *Gender, M/F*: 23/4 * *Weight, mean (SD)*: 77.9 (± 11.4) kg * *Height, mean (SD)*: 172.6 (± 8.5) cm * *Relevant clinical variables*: myocardial infarction, n (%): 15 (55); ejection fraction, mean (SD) %: 60.8 (± 13) * *Non-surgical participants, n (%)*: PTCA: 15 (55)   **Intervention group 3 (objective/subjective)**   * *Age, mean (SD)*: 55.4 (± 9) years * *Gender, M/F*: 23/4 * *Weight, mean (SD)*: 79.2 (± 12.1) kg * *Height, mean (SD)*: 172.0 (± 8.0) cm * *Relevant clinical variables*: myocardial infarction, n (%): 13 (48); ejection fraction, mean (SD) %: 60.8 (± 14) * *Non-surgical participants, n (%)*: PTCA: 12 (44)   Note:   * study authors do not report the following characteristics: BMI, baseline level of fitness, current involvement in regular PA, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: residential exercise and lifestyle rehabilitation; supervised outdoor walking and indoor cycling; 5 cycling and twice-daily walks per week; delivered over 1 month; individualised to HR\*; delivered by medical residents and exercise physiologists; further lifestyle elements included education sessions and freshly prepared low-fat meals  \* 3 matching approaches but for the determination of exercise intensity  (1) HR reserve group: HR reserve method  (2) self-regulation group: patient perception of “somewhat hard” Borg scale 12 to 14  (3) objective / subjective group: combination of HR reserve (60 to 80%) and patient perception of “somewhat hard” Borg scale 12 to 14  Context: myocardial event usually MI or CABS; starts approximately 2 weeks following coronary event; rehabilitation centre in rural, high-altitude setting  Comparison: between 3 approaches to exercise intensity determination, see above  **Intervention group 1:** number randomised = 24; losses = 2 (deaths); analysed = 22  **Intervention group 2:** number randomised = 27; losses = 4 (deaths); analysed = 23  **Intervention group 2:** number randomised = 27; losses = 2 (deaths); analysed = 25  **Setting:** residential rehabilitation centre |
| **Outcomes** | **All outcomes measured/reported by study authors:** maximal exercise testing; amount of PA (questionnaire); standard blood lipids; adverse events. Measured at baseline and 2 years post-surgery  **Outcomes relevant to the review:**   * Amount of PA: using a questionnaire modelled on the Harvard Alumni Questionnaire; responses were used to compute energy expenditure in kcals/week; 2 years post-surgery * Adverse events   **Study primary outcome:** not specified but exercise testing first reported outcome |
| **Notes** | **Sponsorship source:** supported by grant funding from RAHN-Medizinfonds, Zurich, Schweizerische Herzstiftung, Switzerland, the Instituto Nacional de Cardiologia Ignacio Chavez, Mexico City, and Bonizzi-Theler-Stiftung, Zurich, Switzerland. The authors declare no conflicts of interest  **Study dates:** January 2001 to June 2001 with a 2-year follow-up |
| **Reference(s)**  **\* primary reference** | Boesch C, Myers J, Habersaat A, Ilarraza H, Kottman W, Dubach P. Maintenance of exercise capacity and physical activity patterns 2 years after cardiac rehabilitation. *Journal of Cardiopulmonary Rehabilitation* 2005; **25**: 14-21; quiz 2-3 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Described as randomised but no additional details |
| Allocation concealment (selection bias) | Unclear risk | Insufficient details |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Outcomes were measured using subjective measurement tools, and participants were not blinded to the intervention |
| Blinding of outcome assessment: adverse events (detection bias) | Unclear risk | Observation method not specified for this outcome |
| Incomplete outcome data (attrition bias) | Low risk | We noted few losses which were generally balanced between groups, and reasons for losses were sufficiently explained by study authors |
| Selective reporting (reporting bias) | Unclear risk | Study authors do not report clinical trials registration or reference to a pre-published protocol; it is not feasible to effectively assess risk of selective reporting bias without these documents |
| Other bias | Low risk | No other sources of bias detected |

Bond et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** to examine the effects of a PA intervention prior to bariatric surgery on postoperative PA |
| **Participants** | **Total number of randomised participants:** 80  **Inclusion criteria:** BMI of ≥ 35 kg/m2; 18 to 70 years of age; seeking bariatric surgery; had obtained written consent from a surgeon to participate; reported insufficient PA (i.e., < 150 weekly minutes of MVPA); ability to walk ≥ 2 blocks unassisted  **Exclusion criteria:** scheduled for a bariatric operation within 10 weeks of initial study screening or during the intervention period; current participation in another PA or weight loss program; intention to move to another geographic location during the course of the study; medical, psychiatric, or language barriers that would interfere with ability to participate in and follow the study protocol  **Type of surgery (condition):** anticipating bariatric surgery (severe obesity)  **Country:** USA  **Baseline Characteristics (only reported for those that received the intervention)**  **Intervention group**   * *Age, mean (SD)*: 44.2 (± 9.2) years * *Gender, M/F*: 6/34 * *BMI, mean (SD)*: 45.6 (± 7.0) kg/m2 * *Weight, mean (SD)*: 125.7 (± 21.0) kg * *Current involvement in regular PA, mean (SD)*: total MVPA: 32.0 (± 23.1) minutes/day; bout-related MVPA: 4.3 (± 5.1) minutes/day; steps: 5163 (± 2901) steps/day * *Race (%)*: American Indian: 5.0; black: 5.0; white: 77.5; other: 12.5 * *Ethnicity (%)*: Hispanic: 12.5; non-Hispanic: 87.5 * *Education status (%)*: high school or less: 17.5; some college: 55.0; college or university degree: 20.0; graduate degree: 7.5 * *Employment status (%)*: employed: 70.0; unemployed: 27.5   **Comparison group**   * *Age, mean (SD)*: 48.1 (± 8.1) years * *Gender, M/F*: 4/31 * *BMI, mean (SD)*: 44.4 (± 5.8) kg/m2 * *Weight, mean (SD)*: 114.9 (± 18.9) kg * *Current involvement in regular PA, mean (SD)*: total MVPA: 38.8 (± 41.0) minutes/day; bout-related MVPA: 10.4 (± 22.9) minutes/day; steps: 5069 (± 2696) steps/day * *Race (%)*: American Indian: 0.0; black: 5.7; white: 80.0; other: 14.3 * *Ethnicity (%)*: Hispanic: 11.4; non-Hispanic: 88.6 * *Education status (%)*: high school or less: 37.1; some college: 34.3; college or university degree: 22.9; graduate degree: 5.7 * *Employment status (%)*: employed: 54.3; unemployed: 45.7   Note:   * study authors do not report the following characteristics: height, baseline level of fitness, illness severity scores, relevant clinical variables |
| **Interventions** | **Details of interventions**  Approach: PA behaviour change; one-to-one counselling sessions, moderate-intensity walking monitoring and planning; weekly counselling and incremental bout-related walking increases; counselling delivered by psychiatrist (study author) across 6 weeks  Context: bariatric patients; pre-surgery; hospital (counselling) and home (walking)  Comparison: usual care; scheduled clinical visits included advice to begin exercising but no PA prescription, requirements or strategies to adopt this behaviour  **Intervention group:** number randomised = 42; losses = unknown; analysed = unknown (see below)  **Comparison group:** number randomised = 38; losses = unknown; analysed = unknown (see below) |
| **Outcomes** | **All outcomes measured/reported by study authors:** amount of PA (using an SWA monitor). Measured at pre- (baseline, post-intervention) and postoperative (6-month postoperative follow up)  **Outcomes relevant to the review:**   * Amount of PA: bout-related MVPA mins/day; using SWA monitor (BodyMedia, Inc., Pittsburgh, PA, USA); participants wear SWA monitor during waking hours for 7 consecutive days at all assessments (monitor wear time of ≥ 6 hours/day on ≥ 4 days for all assessments was required for inclusion in analysis); 6 months post-surgery * Amount of PA: steps per day; using SWA monitor (BodyMedia, Inc., Pittsburgh, PA, USA); 6 months post-surgery   **Study primary outcome:** Amount of PA |
| **Notes** | **Sponsorship source:** supported by grant funding from the National Institutes of Health/National Institute of Diabetes & Digestive & Kidney Diseases. Declarations of interest not reported  **Study dates:** April 2010 to January 2014 |
| **Reference(s)**  **\* primary reference** | Bond D. Bari-active: a preoperative intervention to increase physical activity. Obesity Surgery 2011; **21**: 1042.  Bond DS, Graham TJ, Vithiananthan S, Webster J, Unick J, Ryder BA, et al. Changes in enjoyment, self-efficacy, and motivation during a randomized trial to promote habitual physical activity adoption in bariatric surgery patients. Surgery for Obesity & Related Diseases 2016; **12**: 1072-1079.  Bond DS, Raynor HA, Thomas GJ, Unick J, Webster J, Ryder B, Vithiananthan S. Greater Adherence to Recommended Morning Physical Activity is Associated With Greater Total Intervention-Related Physical Activity Changes in Bariatric Surgery Patients. Journal of Physical Activity & Health 2017; **14**: 492-498. [DOI: <https://dx.doi.org/10.1123/jpah.2016-0529>]  Bond DS, Thomas GJ, King WC, Vithiananthan S, Trautvetter J, Unick JL, Ryder BA, Pohl D, Roye DG, Sax HC, Wing RR. Exercise improves quality of life in bariatric surgery candidates: results from the Bari-Active trial. Obesity 2015; **23**: 536-42. [DOI: <https://dx.doi.org/10.1002/oby.20988>]  \* Bond DS, Thomas JG, Vithiananthan S, Unick J, Webster J, Roye GD*, et al.* Intervention-related increases in preoperative physical activity are maintained 6-months after Bariatric surgery: results from the bari-active trial. *International Journal of Obesity* 2017; **41**: 467-70  Bond DS, Vithiananthan S, Thomas GJ, Trautvetter J, Unick JL, Jakicic JM, Pohl D, Ryder BA, Roye DG, Sax HC, Wing RR. Bari-Active: a randomized controlled trial of a preoperative intervention to increase physical activity in bariatric surgery patients. Surgery for Obesity & Related Diseases 2015; **11**: 169-77. [DOI: <https://dx.doi.org/10.1016/j.soard.2014.07.010>]  NCT00962325. Increasing physical activity among inactive bariatric surgery patients (Bari-Active). <Https://clinicaltrials.gov/ct2/show/NCT00962325> (first received 20 August 2009) |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Quote: "Participants were then randomly assigned 1:1 to 6 weeks of PAI or SC using a computer-generated random-permuted blocking procedure." |
| Allocation concealment (selection bias) | Unclear risk | No details |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Incomplete outcome data (attrition bias) | High risk | Study authors did not report numbers of participants analysed in each group. However, we noted a large number of losses, as data were reported only for those who completed a postintervention survey, had surgery, and completed postoperative follow-up; we noted that more participants in the intervention group had surgery |
| Selective reporting (reporting bias) | Unclear risk | Study is retrospectively registered with a clinical trials register (NCT00962325; first received August 2009). It is not feasible to effectively assess risk of selective reporting bias from these documents |
| Other bias | Low risk | No other sources of bias found |

Brandes et al.

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| **Methods** | Q-RCT, parallel design; single centre  **Design features:** patients were pseudo-randomised into an intervention group, (n = 28), receiving the standard rehabilitation program and the individualised activity counselling, and a control group, (n = 37), receiving the standard rehabilitation program only. Pseudo-randomisation was performed by assigning a block of 10 patients to the intervention group and having them complete the inpatient rehabilitation. After the last of the intervention group patients left the institution, a block of 10 patients was assigned to the control group and also completed the inpatient rehabilitation. This procedure was repeated alternatively until the overall number of patients was enrolled into the study. Pseudo-randomization was favoured to avoid verbal exchange between intervention and control group.  **Study aim/objective:** to improve PA, well-being and clinical outcome after TKA or THA through tailored activity counselling during inpatient rehabilitation |
| **Participants** | **Total number of randomised participants:** 65  **Inclusion criteria:** primary, unilateral joint replacement due to OA of the knee or hip  **Exclusion criteria:** revision joint replacements; previous joint replacement in the knee or hip on either side; any comorbidities with severe impact on the ability to perform PA, such as COPD, walking with crutches, and metabolic syndrome  **Type of surgery (condition):** unilateral joint replacement (OA)  **Country:** Germany  **Baseline Characteristics**  **Intervention group**   * *Type of surgery, n (%)*: THA 16 (69.6); TKA 7 (30.4) * *Age, mean (95% CI)*: 70.7 (68.0 to 73.5) years * *Gender, M/F*: 11/12 * *BMI, mean (95% CI)*: 27.5 (25.7 to 29.3) kg/m2 * *Current involvement in regular PA, mean (95% CI)*: 9513 (8692 to 10,335) steps/day * *Weight, mean (95% CI)*: 82.2 (74.2 to 90.2) kg * *Height, mean (95% CI)*: 171.6 (166.8 to 176.4) cm   **Comparison group**   * *Type of surgery, n (%)*: THA 18 (69.2); TKA 8 (30.8) * *Age, mean (95% CI)*: 69.9 (67.3 to 72.5) years * *Gender, M/F*: 12/14 * *BMI, mean (95% CI)*: 27.1 (24.1 to 30.1) kg/m2 * *Current involvement in regular PA, mean (95% CI)*: 9519 (8737 to 10,301) steps/day * *Weight, mean (95% CI)*: 81.1 (76.0 to 86.2) kg * *Height, mean (95% CI)*: 170.0 (166.3 to 173.6) cm   Note:   * study authors do not report the following characteristics: baseline level of fitness, illness severity scores, relevant clinical variables |
| **Interventions** | **Details of interventions**  Approach: PA counselling as add-on to usual care (residential rehabilitation); twice weekly one-to-one counselling encouraging use of restored walking capabilities; delivered by students trained in counselling and familiar with rehabilitation programme over 19.4 (1.4) days; usual care included mobility and strength training  Context: hip or knee replacement; starts 13.4 (± 5.4) days after surgery; residential rehabilitation centre  Comparison: usual care; residential rehabilitation centre standard rehabilitation components as provided to intervention group  **Intervention group:** number randomised = 28; losses = 10 (withdrawal of consent and implant loosening; one loss unaccounted for); analysed = 18 (both measurements)  **Comparison group:** number randomised = 37; losses = 17 (withdrawal of consent, wound healing disorders, and comorbidities); analysed = 20 (both measurements)  **Setting:** inpatient rehabilitation centre |
| **Outcomes** | **All outcomes measured/reported by study authors:** PA steps per day (Step Activity Monitor); OKS and OHS; well-being (SF-36). Measured at baseline (first day of arrival at inpatient rehabilitation centre), 1 and 6 months after completing the inpatient rehabilitation  **Outcomes relevant to the review:**   * Amount of PA: steps per day; using the Step Activity Monitor (SAM; Step Activity Monitor 3.0); device does not give feedback to participants and acts as a black box; calculates number of steps (twice the number of gait cycles), and movement intensity (gait cycles per minute), as well as active minutes/day with at least 60 steps/minute; 6 months post-intervention * HRQoL: using SF-36 (overall); 6 months post-intervention * Pain: measured using SF-36 (pain subscore); 6 months post-intervention   **Study primary outcome:** average number of daily steps |
| **Notes** | **Sponsorship source:** funding support not reported.The authors declare no conflicts of interest  **Study dates:** not reported |
| **Reference(s)**  **\* primary reference** | Brandes M, Wirsik N, Niehoff H, Heimsoth J, Möhring B. Impact of a tailored activity counselling intervention during inpatient rehabilitation after knee and hip arthroplasty - an explorative RCT. *BMC Musculoskeletal Disorders* 2018; **19**: 209 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | High risk | Quasi-randomisation performed by alternative allocation in blocks of 10 |
| Allocation concealment (selection bias) | High risk | It is not feasible to conceal allocation because of the quasi-randomised methods to allocate groups |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Incomplete outcome data (attrition bias) | High risk | High number of losses which were unbalanced between groups, with more losses in the control group |
| Selective reporting (reporting bias) | Unclear risk | Study is registered retrospectively with a clinical trials register (DRKS00012682). It is not feasible to effectively assess reporting bias from these retrospectively published documents |
| Other bias | Low risk | No other sources of bias detected |

Cadmus et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to determine the effect of exercise on QoL among recently diagnosed breast cancer survivors undergoing adjuvant therapy |
| **Participants** | **Total number of randomised participants:** 50  **Inclusion criteria:** pre- or post-menopausal women; 35 to 75 years of age; AJCC Stages 0–IIIa breast cancer; recently diagnosed; not yet begun or recently begun adjuvant treatment (≤ 2 weeks radiation or ≤ 2 cycles chemotherapy); physically able to exercise and physician consent to begin an exercise program; any activity level  **Exclusion criteria:** diagnosis of other recurrent or primary cancer event; current smoker  **Type of surgery (condition):** various (breast cancer)  **Country:** USA  **Baseline Characteristics**  **Intervention group**   * *Type of surgery, %*: lumpectomy: 92; unilateral mastectomy: 0; bilateral mastectomy: 4; unknown: 4 * *Age, mean (SD)*: 54.5 (± 8.2) years * *Gender*: all female * *BMI, mean (SD)*: 27.9 (± 5.3) kg/m2 * *Current involvement in regular PA, mean (SD)*: PAQ: 106 (± 98) minutes/day; DAL: 111 (± 104) minutes/day; pedometer: 5637 (± 3051) steps/day * *Relevant clinical variables*: time since diagnosis, mean (SD): 11.1 (± 4.5) weeks. Cancer staging, %: stage 0: 8; stage I: 52; stage II: 32; stage IIIa: 0; don't know: 8 * *Race/ethnicity, %*: white: 96 * *Education status, %*: college degree or higher: 68   **Comparison group**   * *Type of surgery, %*: lumpectomy: 72; unilateral mastectomy: 28; bilateral mastectomy: 0; unknown: 0 * *Age, mean (SD)*: 54.0 (± 10.9) years * *Gender*: all female * *BMI, mean (SD)*: 27.5 (± 5.4) kg/m2 * *Current involvement in regular PA, mean (SD)*: PAQ: 73 (± 93) minutes/day; DAL: 84 (± 89) minutes/day; pedometer: 5437 (± 2392) steps/day * *Relevant clinical variables*: time since diagnosis, mean (SD): 11.0 (± 5.2) weeks. Cancer staging, %: stage 0: 4; stage I: 36; stage II: 32; stage IIIa: 12; don't know: 16 * *Race/ethnicity, %*: white: 92 * *Education status, %*: college degree or higher: 72   **Note:**   * study authors do not report the following characteristics: weight, height, baseline level of fitness, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: telephone behavioural model for increasing or maintaining PA; self-selected MVPA (most selected walking) 5 days per week for six months, weekly telephone support reviewing activity, barriers, strategies and planning for the coming week  Context: breast cancer patients; before or in early days of adjuvant therapy; delivered via telephone, at home  Notes: person delivering telephone support not specified, described as staff member only  Comparison: usual care, programme materials, though no support, offered at the end of study follow-up  **Intervention group:** number randomised = 25; losses = 3 (reasons not provided); analysed = 25 ITT  **Comparison group:** number randomised = 25; losses = 2 (reasons not provided); analysed = 25 ITT  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors:** HRQoL (happiness assessed using 2 item Fordyce Happiness Measure (HM); self-esteem (Rosenberg Self-Esteem Scale); depression (CES-D); Anxiety (STAI); FACT-B; MOS SF-36; amount of PA (7 Day PAL); anthropometric measurements. Measured at baseline and 6 months post-surgery  **Outcomes relevant to the review:**   * Amount of PA: minutes per week; using 7 Day PAL; participants recorded type, duration, and perceived intensity of any recreational/fitness activity performed on each of 7 consecutive days; 6 months post-surgery * HRQoL: using SF-36 (general); 6 months post-surgery * Pain: using SF-36 (pain subscore); 6 months post-surgery * Adverse events * Adherence: number who met goal of 150 mins of exercise per week; number returning weekly logs   **Study primary outcome:** after adherence PA first reported outcome |
| **Notes** | **Sponsorship source:** supported by grant funding from the National Center of Research Resources, National Institutes of Health. Declarations of interest not reported  **Study dates:** July 2004 to May 2006 (recruitment); data collection completed November 2006  Notes:   * this study is also known as the IMPACT study * this study reports an additional trial of a similar intervention (called YES by the study authors). We have not included data from this study because participants were recruited at least 12 months following diagnosis |
| **Reference(s)**  **\* primary reference** | Cadmus LA, Salovey P, Yu H, Chung G, Kasl S, Irwin ML. Exercise and quality of life during and after treatment for breast cancer: results of two randomized controlled trials. *Psycho-Oncology* 2009; **18**: 343-52 (including unpublished communication from study authors) |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Computer-generated randomisation |
| Allocation concealment (selection bias) | Low risk | Randomisation codes were only obtained after collection of baseline characteristics, and were not shared with personnel involved in clinic visits |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible for participants or personnel to be blinded to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Outcomes were measured using subjective measurement tools, and participants were not blinded to the intervention |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adverse events (detection bias) | Unclear risk | Observation method not specified for this outcome |
| Blinding of outcome assessment: adherence (detection bias) | High risk | Use of self-reported outcome measurement tools |
| Incomplete outcome data (attrition bias) | Low risk | Although reasons for losses were not explained, there were few losses that were reasonably balanced between groups |
| Selective reporting (reporting bias) | Unclear risk | Pre-published protocol or trial registration is not reported; it is not feasible to effectively assess the risk of selective reporting bias without these documents |
| Other bias | Low risk | No other sources of bias detected |

Carnero et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** to investigate the associations of both PA time and energy expenditure with weight and fat mass loss in patients following RYGB surgery |
| **Participants** | **Total number of randomised participants:** 128  **Inclusion criteria:** male and female patients; between 21 and 60 years of age; BMI < 55 kg/m2; underwent RYGB 1 to 3 months previously; able to walk without assistance  **Exclusion criteria:** diagnosis of diabetes, hypertension, anaemia, hypothyroidism, elevated liver enzymes, current malignancy or history of cancer within past 5 years, or stent placement within the past 3 years; history of MI, angioplasty, angina, liver disease, or neuromuscular disease; use of anticoagulation therapy, steroids or other drugs that would alter metabolism, glucose homeostasis, or medications that would confound study results; physically active, defined as participating in planned exercise (> 30 minutes in duration) > 1 day a week, as determined by self-report  **Type of surgery (condition):** RYGB  **Country:** USA  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 39.4 (± 9.7) years * *Gender, M/F*: 4/42 * *BMI, mean (SD)*: pre-surgery and intervention: 45.8 (± 7.4) kg/m2; post-surgery but pre-intervention: 39.3 (± 6.3) kg/m2 * *Weight, mean (SD)*: 109.8 (± 20.8) kg * *Baseline level of fitness, mean (SD)*: VO2 max: 17.84 (± 3.13) mL/kg/min; VO2 max: 1890 (± 340) mL/min * *Current involvement in regular PA, mean (SD)*: steps: 5,765 (± 2,613) steps/day; MVPA: 39.5 (± 30.2) minutes/day * *Race/ethnicity, n*: Caucasian: 37; African American: 8   **Comparison group**   * *Age, mean (SD)*: 41.7 (± 9.8) years * *Gender, M/F*: 7/43 * *BMI, mean (SD)*: pre-surgery and intervention: 44.4 (± 7.5) kg/m2; post-surgery but pre-intervention: 38.5 (± 7.2) kg/m2 * *Weight, mean (SD)*: 106.4 (± 25.3) kg * *Baseline level of fitness, mean (SD)*: VO2 max: 17.96 (± 3.74) mL/kg/min; VO2 max: 1,863 (± 480) mL/min * *Current involvement in regular PA, mean (SD)*: steps 6,186 (± 2,751) steps/day; MVPA: 42.4 (± 31.2) minutes/day * *Race/ethnicity, n*: Caucasian: 42; African American: 8   Note:   * study authors do not report the following characteristics: height, relevant clinical variables, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: PA and health education; walking or cycling, supervised and self-directed sessions, health education including nutrition and stretching; weekly supervised and additional self-directed PA, monthly group lifestyle education sessions; delivered by exercise physiologist over 6 months  Context: bariatric patients; 1 to 3 months post-surgery; home and clinic  Comparison: lifestyle education sessions; delivered monthly by exercise physiologist; this group also reported PA habits at these monthly sessions  **Intervention group:** number randomised = 66; reported losses = 6 (time commitment = 5; could not be reached = 1; plus 14 excluded from analysis due to non-valid PA data) some attrition is unexplained; analysed for PA = 46  **Comparison group:** number randomised = 62; reported losses = 3 (moved city = 1; could not be reached = 1; pregnancy = 1; plus 9 excluded due to non-valid PA data) some attrition is unexplained; analysed for PA = 50  **Setting:** home and clinic |
| **Outcomes** | **All outcomes measured/reported by study authors:** measurements of body composition by DXA and CT; amount of PA given as steps per day; accelerometry (PA and EE); cardiorespiratory fitness (VO2 max). Measured before the intervention (baseline) and after the intervention (6 months)  **Outcomes relevant to the review:**   * Amount of PA: TDPA (minutes/day); measured with a triaxial accelerometer/temperature sensor (SenseWear Armband, Pittsburgh, Pennsylvania); participants wear device on their right arm over a minimum of 7 days, within 3 weeks of the beginning of intervention and during the last week of intervention; only data collected over 21 hours and 30 minutes per day (90% of day duration) and over 4 days were accepted for statistical analysis; data based on changes from baseline to 6 months post-intervention * Amount of PA: TDEE (kcal/day) measured with a triaxial accelerometer/temperature sensor (SenseWear Armband, Pittsburgh, Pennsylvania); data based on changes from baseline to 6 months post-intervention * Amount of PA: steps per day; measured with a triaxial accelerometer/temperature sensor; data based on changes from baseline to 6 months post-intervention * Physical fitness: VO2 max measured during a progressive exercise test on a cycle ergometer; data based on changes from baseline to 6 months post-intervention   **Study primary outcome:** body composition: 3-hour insulin-modified IVGTT insulin action parameters (listed first) |
| **Notes** | **Sponsorship source:** supported by grant funding from the National Institutes of Health/National Institute of Diabetes and Digestive and Kidney Diseases. John M. Jakicic is a scientific advisor for Weight Watchers International; co-investigator on a research grant awarded to the University of Pittsburgh by Weight Watchers International; co-investigator on a research grant awarded to the University of Pittsburgh by Human Scale. The other authors declare no conflicts of interest  **Study dates:** September 2008 to March 2012 |
| **Reference(s)**  **\* primary reference** | \* Carnero EA, Dubis GS, Hames KC, Jakicic JM, Houmard JA, Coen PM*, et al.* Randomized trial reveals that physical activity and energy expenditure are associated with weight and body composition after RYGB. *Obesity* 2017; **25**: 1206-16  NCT00692367. Physical activity following surgery induced weight loss. <Https://clinicaltrials.gov/ct2/show/NCT00692367> (first received 6 June 2008). |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Permuted random blocks stratified by gender |
| Allocation concealment (selection bias) | Unclear risk | No details |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: fitness outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Incomplete outcome data (attrition bias) | High risk | This was a secondary analysis of only data from those who completed the study and for whom PA data were available. We noted that losses were high, and were not balanced between groups, with a 30% loss from those who received the PA and health education intervention and a 19% loss from those who received the lifestyle education intervention |
| Selective reporting (reporting bias) | High risk | Study is prospectively registered with a clinical trials register (NCT00692367). However, the data for this review is from a secondary analysis and reports outcomes which are not listed in this prospective document |
| Other bias | Low risk | No other sources of bias detected |

Christiansen et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to test whether a physical therapist administered PA intervention increases PA in people after TKR, in terms of steps/day and time in MVPA |
| **Participants** | **Total number of randomised participants:** 43  **Inclusion criteria:** > 45 of age; not planning or did not have another lower extremity surgery within the next and preceding 6 months; seeking outpatient physiotherapy for a unilateral TKR; interested in increasing their PA  **Exclusion criteria:** comorbidities that would preclude participation in a PA intervention  **Type of surgery (condition):** unilateral TKR  **Country:** USA  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 67 (± 7) years * *Gender, M/F*: 7/4 * *BMI, mean (SD)*: 29.5 (± 4.7) kg/m2 * *Current involvement in regular PA, median (**IQR)*: steps: 1868 (1270 to 3154) steps/day. MVPA: 3.0 (0.6 to 5.0) minutes/day   **Comparison group**   * *Age, mean (SD)*: 67 (± 7) years * *Gender, M/F*: 4/7 * *BMI, mean (SD)*: 30.8 (± 5.8) kg/m2 * *Current involvement in regular PA, median (IQR)*: steps: 1829 (1523 to 2453) steps/day. MVPA: 1.6 (0.6 to 3.9) minutes/day   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, relevant clinical variables |
| **Interventions** | **Details of interventions**  Approach: usual care physical therapy rehabilitation + FitBit and phone support; FitBit use to facilitate meeting PA goals, face-to-face followed by telephone support around goal-setting and barriers; delivered weekly at usual care rehabilitation and by telephone following discharge at 6 to 8 weeks; delivered over 7 to 8 months by physical therapist  Context: TKR patients; post-surgery; clinic followed by home via telephone  Comparison: usual care physical therapy 6 to 8 weeks  **Intervention group:** number randomised = unclear; trial register reports 43 overall; analysed at 6 months = 11  **Comparison group:** number randomised = unclear; trial register reports 43 overall; analysed at 6 months = 11  **Setting:** clinic and home |
| **Outcomes** | **All outcomes measured/reported by study authors:** objectively measured steps/day and minutes in MVPA/day  **Outcomes relevant to the review:**   * Amount of PA: minutes in MVPA per day; measured using an accelerometer (ActigraphGT3X) worn at the right hip for 1 week at initial PT evaluation (baseline), discharge from physiotherapy (DC) and 6 months post-intervention * Amount of PA: steps per day; measured using an accelerometer (ActigraphGT3X); measured at 6 months post-intervention   **Study primary outcome:** PA steps/day and minutes in MVPA/day measured by the Actigraph GT3X monitor |
| **Notes** | **Sponsorship source:** supported with institutional funding from the University of Delaware. Declarations of interest not reported  **Study dates:** April 2016 to November 2018  Note:   * this is an interim report for which data is only available for those who have completed the 6-month follow-up |
| **Reference(s)**  **\* primary reference** | \* Christiansen CL, Miller MJ, Murray AM, Stephenson RO, Stevens-Lapsley JE, Hiatt WR*, et al.* Behavior-Change Intervention Targeting Physical Function, Walking, and Disability After Dysvascular Amputation: A Randomized Controlled Pilot Trial. *Archives of Physical Medicine & Rehabilitation* 2018b; **99**: 2160-7  NCT02724137. A novel physical therapy administered physical activity intervention after TKR: a pilot study. <Https://clinicaltrials.gov/ct2/show/NCT02724137> (first received 31 March 2016) |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Described as randomised, but no additional details; abstract only |
| Allocation concealment (selection bias) | Unclear risk | No details |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Incomplete outcome data (attrition bias) | Unclear risk | This is an interim report that presents data only for those that have currently the 6-month follow-up. We note this is a smaller number of participants than the number that are reported as randomised in the clinical trials register report, but we are uncertain whether this indicates participant loss, or is because data for the remaining participants is not yet available |
| Selective reporting (reporting bias) | High risk | Prospectively registered with a clinical trials register (NCT02724137; first received March 2016). We note that the abstract does not report all outcomes consistent with the clinical trials report |
| Other bias | High risk | The study was reported only as an abstract which limited our ability to effectively determine risks of other bias. However, because the abstract is unlikely to be peer-reviewed, we judged it to be at high risk of other bias |

Christiansen et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** to determine the preliminary efficacy of a home-based behaviour-change intervention to promote exercise, walking activity, and disease self-management following dysvascular TTA |
| **Participants** | **Total number of randomised participants:** 38  **Inclusion criteria:** type II DM and/or PAD; unilateral TTA < six months prior; household ambulation (or better) using a prosthesis; between 50 and 85 years of age; living within 45 minutes of a participating clinic  **Exclusion criteria:** walking not primary form of locomotion; ankle-level or more proximal contralateral amputation; traumatic or cancer-related amputation etiology; unstable heart condition  **Type of surgery (condition):** dysvascular TTA  **Country:** USA  **Baseline Characteristics**  **Intervention group**   * *Age, mean (95% CI)*: 62 (59 to 65) years * *Gender, M/F*: 16/3 * *BMI, mean (95% CI)*: 31 (26 to 36) kg/m2 * *Current involvement in regular PA, mean (95% CI)*: 1305 (726 to 1883) steps/day * *Relevant clinical variables, mean (95% CI)*: time since amputation: 16 (13 to 19) weeks. Comorbidity Index, score out of 20: 6.1 (4.8 to 7.3); Chakrabarty Grade, score out of 100: 77.3 (69.5 to 85.1)   **Comparison group**   * *Age, mean (95% CI)*: 65 (60 to 71) years * *Gender, M/F*: 19/0 * *BMI, mean (95% CI)*: 30 (27 to 33) kg/m2 * *Current involvement in regular PA, mean (95% CI)*: 1369 (724 to 2014) steps/day * *Relevant clinical variables, mean (95% CI)*: time since amputation: 20 (17 to 23) weeks. Comorbidity Index, score out of 20: 7.1 (6.0 to 8.2); Chakrabarty Grade, score out of 100: 82.4 (75.2 to 89.6)   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, current involvement in regular PA, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: behaviour change, walking and disease management; goal-setting relating to home or community walking activities and disease management, strength and stretching exercises; weekly telephone session with physical therapist; delivered over 12-weeks  Context: dysvascular TTA; following completion of conventional prosthesis rehabilitation; home and / or community  Comparison: weekly telephone sessions led by physical therapist discussing current health status, life activities planned by participant, and study schedule  **Intervention group:** number randomised = 19; losses = 2 (unable to contact = 1; unable to complete performance measures = 1); analysed = 17  **Comparison group:** number randomised = 19; losses = 3 (hospitalisation = 1; unable to complete performance measures = 2); analysed = 16  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors:** TUG; 2MWT; gait speed; PEQ-MS; walking activity (steps/day); WHO-DAS 2.0; 6 item SEMCD scale; adverse events  **Outcomes relevant to the review:**   * Amount of PA: steps per day; measured using an accelerometer-based activity monitor (GT3X-BT, Actigraph) on a waist-belt over a 10-day period walking activity; 6 months post-intervention * Physical fitness: distance walked in 2MWT; 6 months post-intervention * Physical fitness: TUG; 6 months post-intervention * Adverse events   **Study primary outcome:** TUG test |
| **Notes** | **Sponsorship source:** supported by institutional funding from the National Institutes of Health. Declarations of interest not reported  **Study dates:** October 2013 to December 2016 |
| **Reference(s)**  **\* primary reference** | \* Christiansen MB, Thoma LM, Master H, Mathews D, Schmitt LA, White DK. Preliminary findings of a novel physical therapist administered physical activity intervention after total knee replacement. *Osteoarthritis and cartilage* 2018a; **26 (Supplement 1)**: S334-S  NCT01929018. Collaborative-care rehabilitation after dysvascular amputation [Collaborative-care rehabilitation to improve functional outcomes after dysvascular amputation]. <Https://clinicaltrials.gov/ct2/show/NCT01929018> (first received 27 August 2013) |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Random-number generator |
| Allocation concealment (selection bias) | Low risk | Quote: "An investigator who was blinded to and had no interaction with participants managed the randomized group allocation." |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: fitness outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: adverse events (detection bias) | Unclear risk | Observation method not specified for this outcome |
| Incomplete outcome data (attrition bias) | Low risk | We noted few losses which were generally balanced between groups, and reasons for losses were sufficiently explained by study author |
| Selective reporting (reporting bias) | Low risk | Prospectively registration with clinical trials register (NCT01929018; first received August 2013); all reported outcomes are consistent with trials register documents |
| Other bias | Low risk | No other sources of bias detected |

Courneya et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** to identify the key predictors of aerobic and resistance exercise during the follow-up phase of the START trial |
| **Participants** | **Total number of randomised participants:** 242  **Inclusion criteria:** women ≥ 18 years old with stage I–IIIA breast cancer initiating adjuvant chemotherapy  **Exclusion criteria:** incomplete axillary surgery or reconstructive surgery; uncontrolled illnesses; completed more than one cycle of chemotherapy; not approved by their oncologist  **Type of surgery (condition):** various (breast cancer)  **Country:** Canada  **Baseline Characteristics**  **Intervention group (AET)**   * *Age, mean (range)*: 49 (30 to 75) years * *Gender, M/F*: all female * *BMI, mean (SD)*: 26.7 (± 5.6) kg/m2 * *Weight, mean (SD)*: 69.4 (± 13.3) kg * *Relevant clinical variables, n (%)*: disease stage: I (T1N0): 18 (23.1); IIa (T1N1, T2N0): 33 (42.3); IIb (T2N1, T3N0): 17 (21.8); IIIa (T1N2, T2N2, T3N1-2): 10 (12.8) * *Current involvement in regular PA, n (%)*: current exerciser: 15 (19.2); current weight trainer: 4 (5.1) * *Economic status, n (%)*: > $80,000/year: 28 (38.4) * *Education status, n (%)*: completed university: 51 (65.4)   **Intervention group (RET)**   * *Age, mean (range)*: 49.5 (25 to 76) years * *Gender, M/F*: all female * *BMI, mean (SD)*: 26.1 (± 5.5) kg/m2 * *Weight, mean (SD)*: 69.7 (± 14.4) kg * *Relevant clinical variables, n (%)*: disease stage: I (T1N0): 22 (26.8); IIa (T1N1, T2N0): 36 (43.9); IIb (T2N1, T3N0): 9 (11.0); IIIa (T1N2, T2N2, T3N1-2): 15 (18.3) * *Current involvement in regular PA, n (%)*: current exerciser: 22 (26.8); current weight trainer: 6 (7.3) * *Economic status, n (%)*: > $80,000/year: 41 (53.9) * *Education status, n (%)*: completed university: 51 (62.2)   **Comparison group (usual care)**   * *Age, mean (range)*: 49 (26 to 78) years * *Gender, M/F*: all female * *BMI, mean (SD)*: 27.1 (± 5.4) kg/m2 * *Weight, mean (SD)*: 72.6 (± 15.2) kg * *Relevant clinical variables, n (%)*: disease stage: I (T1N0): 20 (24.4); IIa (T1N1, T2N0): 30 (36.6); IIb (T2N1, T3N0): 22 (26.8); IIIa (T1N2, T2N2, T3N1-2): 10 (12.2) * *Current involvement in regular PA, n (%)*: current exerciser: 27 (32.9); current weight trainer: 9 (11.3) * *Economic status, n (%)*: > $80,000/year: 34 (42.5) * *Education status, n (%)*: completed university: 53 (64.6)   Note:   * study authors do not report the following characteristics: height, baseline level of fitness, illness severity scores |
| **Interventions** | **Details of interventions**  Approach 1: aerobic exercise training; use of cycle ergometer, treadmill or elliptical trainer with goal VO2 peak; 3 times per week throughout duration of chemotherapy (median 17 weeks); supervised by fitness professional; access to fitness facility for 1 month post intervention.  Approach 2: resistance training; repetitions at 60 to 70% of estimated 1 repetition maximum; 3 times per week throughout duration of chemotherapy, (median 17 weeks); supervised by fitness professional; access to fitness facility for 1 month post intervention  Context: breast cancer; onset of chemotherapy; fitness facility  Comparison: usual care; asked not to exercise during treatment but offered a 1 month supervised programme after the post intervention assessments  **Intervention group (****AET):** number randomised = 78; losses = 10 (most common reason for loss to follow-up was that the participant was unreachable after multiple attempts); analysed at 6-month follow-up = 68  **Intervention group (****RET):** number randomised 82; losses = 9 (most common reason for loss to follow-up was that the participant was unreachable after multiple attempts); analysed at 6-month follow-up = 73  **Comparison group (usual care):** number randomised = 82; losses = 22 (most common reason for loss to follow-up was that the participant was unreachable after multiple attempts); analysed = 60  **Setting:** fitness centre |
| **Outcomes** | **All outcomes measured/reported by study authors:** measured at baseline (1 to 2 weeks after first chemotherapy infusion), postintervention (3 to 4 weeks after final chemotherapy infusion), and 6-month follow-up: QoL and fatigue (FACT-An) scale; psychosocial functioning; physical fitness variables included peak oxygen consumption (VO2 peak), muscular strength, and body weight and height; whole body fat and lean tissue; assessment of exercise behaviour at 6-month follow-up  **Outcomes relevant to the review:**   * Engagement in PA: participants asked to recall their exercise over the past 6 months using a modified version of the Godin leisure time exercise questionnaire (LTEQ); adapted by study investigators to included separate question about resistance training (e.g. free weights or universal equipment at home or at a fitness club); participants were then categorized into meeting or not meeting current guidelines for aerobic exercise (60 min of vigorous or 150 min of moderate-to-vigorous exercise/week) and resistance exercise (2 resistance training sessions/week); six months post-intervention * HRQoL: using FACT-An; 6 months post-intervention * Adherence: measured as attendance to, and duration and intensity of, exercise sessions, as well as completion of the prescribed exercises   **Study primary outcome:** cancer-specific QoL |
| **Notes** | **Sponsorship source:** supported by grant funding from the Canadian Breast Cancer Research Alliance. KSC is supported by the Canada Research Chairs Program. CMF is supported by a health scholar award from the Alberta Heritage Foundation for Medical Research. JKV was supported by a scholarship from Canada Institute Health Research and an incentive award from the Alberta Heritage Foundation for Medical Research. Declarations of interest not declared  **Study dates:** February 2003 to July 2005 |
| **Reference(s)**  **\* primary reference** | Courneya KS, Friedenreich CM, Reid RD, Gelmon K, Mackey JR, Ladha AB, Proulx C, Vallance JK, Segal RJ. Predictors of follow-up exercise behavior 6 months after a randomized trial of exercise training during breast cancer chemotherapy. Breast Cancer Research & Treatment 2009; **114**: 179-87. [DOI: <https://dx.doi.org/10.1007/s10549-008-9987-3>]  \* Courneya KS, Segal RJ, Mackey JR, Gelmon K, Reid RD, Friedenreich CM*, et al.* Effects of aerobic and resistance exercise in breast cancer patients receiving adjuvant chemotherapy: a multicenter randomized controlled trial. *J Clin Oncol* 2007; **20**: 4396-404  Six-month follow-up of patient-rated outcomes in a randomized controlled trial of exercise training during breast cancer chemotherapy. Cancer Epidemiol Biomarkers Prev 2007; **16**: 2572-578. |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Computer-generated randomisation |
| Allocation concealment (selection bias) | Low risk | Allocation sequence was generated centrally and concealed from the project directors |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adherence (detection bias) | Low risk | Objective measurement of class attendance |
| Incomplete outcome data (attrition bias) | High risk | We noted a high number of losses which were unbalanced between groups; we noted that more participants in the usual care group were lost to follow-up |
| Selective reporting (reporting bias) | Unclear risk | Study authors do not report whether study is registered with a clinical trials register; it is not feasible to effectively assess risk of selective reporting bias without these documents |
| Other bias | Low risk | No other sources of bias detected |

Creel et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to test the effectiveness of two levels of PA interventions before and up to 6 1/2 months after bariatric surgery |
| **Participants** | **Total number of randomised participants:** 150  **Inclusion criteria:** morbidly obese patients planning to undergo bariatric surgery at study bariatric centre; men and women ≥ 18 years of age; motivated to enrol in a study assessing PA before and after bariatric surgery; able to understand and comply with the study; agree to return for scheduled visits; able to ambulate without a walker or cane  **Exclusion criteria:** history of MI within the past 3 months; unstable AP; sustained or episodic cardiac arrhythmias that could be aggravated by PA; symptomatic PVD or any other medical condition that the medically responsible investigator deems inappropriate; abnormal ECG, assessed at the pre-treatment screening visit that the medically responsible investigator deems inappropriate for participation in a PA program; unable to progress toward 30 minutes of continuous walking during the 6 months of study participation  **Type of surgery (condition):** bariatric surgery (morbid obesity)  **Country:** USA  **Baseline Characteristics**  **Intervention group (counselling)**   * *Age, mean (SD)*: 43.6 (± 11.9) years * *Gender, M/F*: 8/40 * *BMI, mean (SD)*: 46.9 (± 7.8) kg/m2 * *Baseline level of fitness, mean (SD)*:METs: 4.23 (± 1.21) * *Relevant clinical variables, n (%)*: RYGB: 38 (79.2) * *Race/ethnicity, n (%)*: Caucasian: 41 (85.4) * *Education status, mean (SD)*: 14.1 (± 2.5) years * *Employment status, n (%)*: full-time: 32 (66.7)   **Intervention group (pedometer)**   * *Age, mean (SD)*: 41.8 (± 10.8) years * *Gender, M/F*: 8/ 44 * *BMI, mean (SD)*: 48.4 (± 9.5) kg/m2 * *Baseline level of fitness, mean (SD)*:METs: 4.27 (± 1.18) * *Relevant clinical variables, n (%)*: RYGB: 37 (71.2) * *Race/ethnicity, n (%)*: Caucasian: 44 (84.6) * *Education status, mean (SD)*: 14.4 (± 1.9) years * *Employment status, n (%)*: full-time: 29 (55.8)   **Comparison group**   * *Age, mean (SD)*: 44.2 (± 11.0) years * *Gender, M/F*: 8/42 * *BMI, mean (SD)*: 47.6 (± 8.0) kg/m2 * *Baseline level of fitness, mean (SD)*:METs: 4.09 (± 1.27) * *Relevant clinical variables, n (%)*: RYGB: 38 (76.0) * *Race/ethnicity, n (%)*: Caucasian: 43 (86.0) * *Education status, mean (SD)*: 14.4 (± 2.3) years * *Employment status, n (%)*: full-time: 30 (60.0)   **Pre-treatment:** although most participants in the ITT analysis had primary RYGB, 9.4% had sleeve gastrectomy, 5.7% gastric banding, 5.7% revision RYGB, and 3.8% duodenal switch (all groups)  Note:   * study authors do not report the following characteristics: weight, height, current involvement in regular PA, illness severity scores |
| **Interventions** | **Details of interventions**  Approach 1: counselling and pedometer PA intervention; counselling and motivational interviewing, with educational pamphlet exercise promotion; and PA goal-setting and monitoring; delivered by certified exercise professional as add on to usual clinical contacts pre- and post-surgery, over approximately 26 weeks  Approach 2: pedometer and educational pamphlet exercise promotion; daily pedometer use, steps journal, and promotion of 10,000 steps/day; initial instruction for pedometer provided by study administrator; over approximately 26 weeks  Context: bariatric patients; pre- (approximately 2 weeks) and post-surgery (usual clinical contacts); bariatric centre  Comparison: usual care; received no exercise support by the bariatric centre beyond the educational pamphlet or what was discussed at non-study clinic visits  **Intervention group (approach 1):** number randomised = 48; losses = 23 (reasons not broken down by group); analysed = 25 at 6 1/2 months post-surgery  **Intervention group (approach 2):** number randomised = 52; losses = 30 (reasons not broken down by group); analysed = 22 at 6 1/2 months post-surgery  **Comparison group:** number randomised = 50; losses = 17 (reasons not broken down by group); analysed = 33 at 6 1/2 months post-surgery  Note:   * overall reasons for participants loss are: not having surgery = 6; moving/transportation issues = 4); family issues/time = 4; surgical complications/injuries = 3; did not want to wear device = 1; and unspecified reasons or did not return telephone calls = 25 |
| **Outcomes** | **All outcomes measured/reported by study authors:** submaximal exercise testing; PA (GT3X accelerometer ActiGraphTM); weight; BP; and HR; measured at baseline, 2, 4, and 6 1/2 months postoperatively  **Outcomes relevant to the review:**   * Amount of PA: minutes of bout-related MVPA per week; using GT3X accelerometer, worn on the hip for approximately 2 weeks; 6 1/2 months post-surgery * Amount of PA: steps per day; using GT3X accelerometer, worn on the hip for approximately 2 weeks; 6 1/2 months post-surgery   **Study primary outcome:** changes in PA (listed first) |
| **Notes** | **Sponsorship source:** supported with grant funding from the St. Vincent Foundation. The authors declare no conflicts of interest  **Study dates:** March 2010 to July 2014 (recruitment); data collection completed February 2015 |
| **Reference(s)**  **\* primary reference** | \* Creel DB, Schuh LM, Reed CA, Gomez AR, Hurst LA, Stote J*, et al.* A randomized trial comparing two interventions to increase physical activity among patients undergoing bariatric surgery. *Obesity* 2016; **24**: 1660-8  Promoting Physical Activity Among Bariatric Surgery Patients. <Https://clinicaltrials.gov/show/nct01722357> 2012 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Methods use to generate a random sequence are not adequately described |
| Allocation concealment (selection bias) | Low risk | "The random allocation sequence was kept by study staff not involved in baseline assessments." |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Incomplete outcome data (attrition bias) | High risk | Although there were losses in all groups, we noted most losses were in the group who used the pedometer. The imbalance in losses was not explained by study authors and could influence outcome data |
| Selective reporting (reporting bias) | Unclear risk | Retrospectively registered (part-way through recruitment) with clinical trials register (NCT01722357; first received November 2012); it is not feasible to effectively assess risk of selective reporting bias with these documents |
| Other bias | Low risk | No other sources of bias detected |

Dantas et al.

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| **Methods** | BA; single centre  **Study aim/objective:** to describe the implementation of a nurse-monitored protocol and the adherence to cardiac therapeutic regimen of 17 male patients after CABG surgery |
| **Participants** | **Total number of included participants:** 24  **Inclusion criteria:** patients who had undergone CABG surgery between 1 January and 31 May 1998  **Exclusion criteria:** if CABG surgery was performed at the same time as another cardiac surgery; psychiatric diagnosis of manic-depression, dementia, or depression; unable to communicate with the researcher due to physical and emotional status  **Type of surgery (condition):** cardiac surgery  **Country:** Brazil  **Baseline Characteristics**  **Intervention group**   * *Type of surgery:* most patients (52.9%) received both arterial and venous graft bypass and had between 2 and 3 (70.5%) coronary arteries bypassed * *Age, mean (SD)*: 56 (± 10.9) years * *Gender, M/F*: 17/0 * *Current involvement in regular PA, n (%)*: sedentary lifestyle: yes: 9 (52.9); no: 8 (47.0) * *Relevant clinical variables, %*: MI before cardiac surgery: 70.6. Hypertension: 82.3. Dyslipoproteinemia: 70.5. Diabetes: 23.5 * *Education status, n (%)*: < 8 years of formal education: 14 (82.4)   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: lifestyle counselling with progressive walking programme; progressive walking plan and educational materials including on activity progression and benefits, managing the physical and emotional experiences after CABG, diet and use of medication; delivered to individuals with family if possible, monthly by research nurse and physiotherapist.  Context: CABG patients; post-surgery on hospital discharge; hospital on discharge only, outpatient clinic or home via telephone  Comparison: no comparator group  **Intervention group:** number included = 24; reported losses = 7 (female excluded from analysis as only one female undergoing the rehabilitation process = 1; did not return for consulting visits or complete study protocol = 6) some attrition is unexplained; analysed for PA = 15  **Setting:** clinic and home |
| **Outcomes** | **All outcomes measured/reported by study authors:** anthropometrical data (hospital discharge and 30, 90, and 180 days after hospital discharge); BMI, BP and HR, lipid and glycoside levels; CR process experienced by the patient was also collected by using open-ended interviews (including return to work, sexual life, diet, smoking cessation, physical exercises); observations focused on the perception of patients regarding their family participation in recovery; adherence  **Outcomes relevant to the review:**   * Engagement in PA: measured as adherence at 6 months post-surgery   **Study primary outcome:** anthropometrical data |
| **Notes** | **Sponsorship source:** funding and declarations of interestnot reported  **Study dates:** January 1998 to May 1998 |
| **Reference(s)**  **\* primary reference** | Dantas RAS, Aguillar OM, Barbeira CBS. Implementation of a nurse-monitored protocol in a Brazilian hospital: A pilot study with cardiac surgery patients. *Patient Education and Counseling* 2002; **46**: 261-6 |

Demark-Wahnefried et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** cancer survivors are at increased risk for cardiovascular disease, diabetes, osteoporosis, and second primary tumours. Healthful lifestyle practices may improve the health and well-being of survivors. The FRESH START trial tested the efficacy of sequentially tailored versus standardized mailed materials on improving cancer survivors’ diet and exercise behaviours. |
| **Participants** | **Total number of randomised participants:** 543  **Inclusion criteria:** early-stage (in situ, localized, or regional) breast and prostate cancer patients; within 9 months of diagnosis  **Exclusion criteria:** conditions precluding unsupervised exercise (uncontrolled congestive heart failure or angina, recent MI, or breathing difficulties requiring oxygen use or hospitalisation); walker or wheelchair use; plans to have hip or knee replacement); conditions precluding a high fruit and vegetable (F&V) diet (kidney failure or chronic warfarin use); progressive cancer or additional primary tumours; non-English speakers/writer; practiced two or more goal behaviours (exercised 150 minutes/week or adhered to a low-fat or high-F&V diet)  **Type of surgery (condition):** not specified (breast and prostate cancer)  **Country:** US and Canada  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 57 (± 10.4) years * *Gender, M/F*: 118/153 * *BMI, mean (SD)*: 27.4 (± 5.0) kg/m2 * *Current involvement in regular PA*: stage of readiness for exercise, %: pre-contemplator 9; contemplator 9; preparation 67; action 15. PA, mean (SD): 53.4 (± 112.7) minutes/week * *Relevant illness severity scores (e.g., ASA, APACHE II), %*: breast cancer staging: stage 0: 7; stage I: 30; stage II: 15; stage III: 4. Prostate cancer staging: stage I: 18; stage II: 23. Unknown: 3 * *Relevant clinical variables, mean (SD)*: number of comorbid conditions: 2.01 (± 1.77) * *Number of non-surgical participants, n (%)*: 37 (14) * *Race, n (%)*: white: 226 (83); black: 32 (12); other: 13 (5) * *Education status, n (%)*: < high school graduate: 30 (11); some college or associate: 79 (29); college graduate/postgraduate: 162 (60)   **Comparison group**   * *Age, mean (SD)*: 56.9 (± 11.2) years * *Gender, M/F*: 119/153 * *BMI, mean (SD)*: 27.7 (± 5.4) kg/m2 * *Current involvement in regular PA*: stage of readiness for exercise, %: pre-contemplator 10; contemplator 11; preparation 67; action 12. PA, mean (SD): 44.6 (± 89.1) minutes/week * *Relevant illness severity scores (e.g., ASA, APACHE II), %*: breast cancer staging: stage 0: 8; stage I: 28; stage II: 18; stage III: 2. Prostate cancer staging: stage I: 17; stage II: 24. Unknown 4 * *Relevant clinical variables, mean (SD)*: number of comorbid conditions: 2.18 (± 1.67) * *Number of non-surgical participants, n (%)*: 46 (17) * *Race, n (%)*: white: 226 (83); black: 40 (15); other: 6 (2) * *Education status, n (%)*: < high school graduate: 34 (13); some college or associate: 85 (31); college graduate/postgraduate: 153 (56)   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, illness severity scores * study authors noted statistically significant differences between groups with BMI, race, and sex |
| **Interventions** | **Details of interventions**  Approach: individualised workbooks and goals; personalised workbook and newsletters addressing barriers to exercise, encouraging weekly exercise and dietary goals; received via post every 6 weeks in response to 6-weekly participant survey; received over 10 months  Context: breast and prostate cancer patients; within nine months of diagnosis; at home  Comparison: control; non-tailored mailed materials readily available in the public domain; six-weekly over 10 months  **Intervention group:** number randomised = 271; losses = 18 (no longer wanted to participate = 13; death = 2; illness = 2; not able to contact = 1); analysed = 253 (PP)  **Comparison group:** number randomised = 272; losses = 6 (no longer wanted to participate = 2; not able to contact = 4); analysed = 266 (PP)  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors:** baseline only: sociodemographic information, cancer coping style and barriers to exercise and eating a low-fat, high-F&V diet. Baseline and 12 months: The 7 Day PAR; DHQ (output specific to practice of goal behaviours used to evaluate intervention success (i.e., minutes per week of moderate, hard, or very hard PA of at least 5 METs (kcal/kg/hour)); HRQoL (FACT); risk for depression; social support; comorbidity; perceived health; self-efficacy for exercising 150 min/wk, eating 5 or more servings of F&V a day, and eating a low-fat diet; stage of readiness for dietary and exercise change; tobacco use; weight status. Adverse events collected continuously. 12 months only: participants’ opinions regarding the helpfulness of specific intervention materials in promoting behaviour change. scale; weight status was expressed as BMI; phlebotomy: total and high-density lipoprotein cholesterol and high-sensitivity C-reactive protein; insulin via radioimmunoassay; and interleukin-6 via enzyme-linked immunosorbent assay  **Outcomes relevant to the review:**   * Amount of PA: minutes per week of PA; using a 7-day PA recall questionnaire; 12 months post-surgery * HRQoL: using FACT-G; 12 months post-surgery * Adverse events   **Study primary outcome:** percentage of patients who achieved goal behaviour in at least 2 of the 3 behavioural domains |
| **Notes** | **Sponsorship source:** supported by grant funding from the NIH, the American Institute of Cancer Research, and the Susan G. Komen Foundation. Study authors declare no conflicts of interest  **Study dates:** July 2002 to October 2005 |
| **Reference(s)**  **\* primary reference** | Demark-Wahnefried W, Clipp EC, Lipkus IM, Lobach D, Snyder DC, Sloane R*, et al.* Main outcomes of the FRESH START trial: a sequentially tailored, diet and exercise mailed print intervention among breast and prostate cancer survivors. *Journal of Clinical Oncology* 2007; **25**: 2709‐18 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Computer-generated block randomisation |
| Allocation concealment (selection bias) | Low risk | Quote: "The process of random assignment was implemented in blinded fashion and at an office that was physically removed from the main study office." |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to intervention groups |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Outcomes were measured using subjective measurement tools, and participants were not blinded to the intervention |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adverse events (detection bias) | Unclear risk | Observation method not specified for this outcome |
| Incomplete outcome data (attrition bias) | Low risk | We noted few losses which were generally balanced between groups, and reasons for losses were sufficiently explained by study authors |
| Selective reporting (reporting bias) | Unclear risk | Study authors do not report clinical trials registration or reference to a pre-published protocol; it is not feasible to effectively assess risk of selective reporting bias without these documents |
| Other bias | Low risk | No other sources of bias detected |

Doganay et al.

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| **Methods** | BA; single centre  **Study aim/objective:** to evaluate the effect of a surgical cancer prehabilitation program on the long-term physical and psychological health in a cohort of patients undergoing surgery for esophagogastric cancer |
| **Participants** | **Total number of included participants:** 39  **Inclusion criteria:** > 18 years of age; who had undergone resection for primary OG cancer and completed the PREPARE program between January 2015 and January 2018  **Exclusion criteria:** failure to complete the program in its entirety or disease recurrence (local or distant)  **Type of surgery (condition):** OG cancer surgery  **Country:** UK  **Baseline Characteristics**  **Intervention group**   * *Type of surgery, n (%)*: esophagectomy: 26 (67); total gastrectomy: 9 (23); extended total gastrectomy: 2 (5); subtotal gastrectomy: 2 (5) * *Age, median (range)*: 64 (55 to 73) years * *Gender, M/F*: 30/9 * *Current involvement in regular PA, median (IQR)*: LTPA: 3 (0 to 25) * *Baseline level of fitness, median (IQR)*: Chester-Step Test: 16.3 (13.9 to 19.7) VO2 max, mL.kg-1.min-1   Note:   * study authors do not report the following characteristics: race, socio-economic status, weight, height, BMI, relevant clinical variables, illness severity scores |
| **Interventions** | **Detail of intervention**  Approach: coaching and tailored support; weekly personalised exercise programme, focus on physical fitness, respiratory exercises, eating well, psychological well-being, medication and removing bad habits; PA reiterated by patients’ clinical team; begins prior to neo-adjuvant chemo/radiotherapy with final consultation 6 to 8 weeks post-surgery  Context: esophagogastric cancer surgery; perioperatively  Comparison: no comparator group  Notes: not clear who delivers intervention or where the intervention was delivered; length of intervention varies by patient  **Intervention group:** number included = 39; losses = not reported; analysed for PA, engagement in PA, and fitness using HGS = 39; analysed for fitness using the Chester-Step test = 34  **Setting:** clinic and home |
| **Outcomes** | **All outcomes measured/reported by study authors:** amount of PA (GSLTPAQ); engagement in PA; fitness (Chester-Step Test); self-efficacy (Lorig 6-item scale); HGS (dynamometer). Measured at diagnosis, completion of NAC or baseline for the non-NAC patients (3-6 weeks prior to surgery), within 1 week prior to surgery, 6 to 8 weeks post-surgery, and 13 months post-surgery  **Outcomes relevant to the review:**   * Engagement in PA: 13 months post-surgery * Amount of PA: using the GSLTPAQ; 13 months post-surgery * Physical fitness: using the Chester-Step Test; given as VO2 max, mL.kg-1.min-1; 13 months post-surgery * Physical fitness: using HGS; 13 months post-surgery   **Study primary outcome:** amount of PA (GSLTPAQ) |
| **Notes** | **Sponsorship source:** Sponsorship source not reported. The authors declare no conflicts of interest  **Study dates:** January 2015 and January 2018 |
| **Reference(s)**  **\* primary reference** | Doganay E, Wynter-Blyth V, Halliday L, Mackinnon T, Osborn H, Moorthy K. Study of Long-Term Follow-up of Exercise Levels following Participation in a Prehabilitation Program in Esophagogastric Cancer. *Rehabilitation Oncology* 2020; **38**: 110-5 |

Duculan et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to determine the sustainability of an intervention to increased PA, primarily walking, after 12 months |
| **Participants** | **Total number of randomised participants:** 230  **Inclusion criteria:** 3 months after complex lumbar surgery; cleared by surgeons to increase PA  **Exclusion criteria:** not reported  **Type of surgery (condition):** complex lumbar surgery  **Country:** US  **Baseline Characteristics**  **Intervention group**   * *Age, mean*: 64 years * *Gender, M/F*: 61/49 * C*urrent involvement in regular PA, mean*: PAEI overall total: 1,786 kcal/ week   **Comparison group**   * *Age, mean*: 63 years * *Gender, M/F*: 61/59 * C*urrent involvement in regular PA, mean*: PAEI overall total: 1,754 kcal/ week   Note:   * study authors do not report the following characteristics: race, socio-economic status, weight, height, BMI, relevant clinical variables, baseline level of fitness |
| **Interventions** | **Details of interventions**  Approach: psychosocial intervention; education and guidelines relating to increasing PA, support with goal-setting, provision of pedometer; one clinic-contact with periodic telephone contact during early part of intervention; over 12 months.  Context: lumbar spine surgery; post-surgery within routine post-op clinic and periodic telephone encouragement (home)  Comparison: received information about safe PA during routine post-op clinic.  Notes: not clear who delivered intervention  **Intervention group:** number randomised = 110; losses = 0; analysed = 110  **Comparison group:** number randomised = 120; losses = 0; analysed = 120  **Setting:** clinic and home |
| **Outcomes** | **All outcomes measured/reported by study authors:** amount of PA (PAEI). Measured at baseline and 12 months post-intervention  **Outcomes relevant to the review:**   * Amount of PA: using overall total kcal/week on the PAEI; 12 months post-intervention   **Study primary outcome:** amount of PA (PAEI) |
| **Notes** | **Sponsorship source:** not reported  **Study dates:** not reported |
| **Reference(s)**  **\* primary reference** | Duculan R, Rigaud M, Cammisa FP, Sama AA, Hughes AP, Mancuso CA*, et al.* Fostering physical activity after complex lumbar spine surgery: long-term results of a randomized trial. *Spine Journal* 2020; **20**: S96-S7 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Insufficient information; abstract only |
| Allocation concealment (selection bias) | Unclear risk | Insufficient information; abstract only |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Incomplete outcome data (attrition bias) | Unclear risk | Insufficient information; abstract only |
| Selective reporting (reporting bias) | Unclear risk | Study authors did not report clinical trials registration or reference to a pre-published protocol; it is not feasible to effectively assess risk of selective reporting bias without these documents |
| Other bias | High risk | Study is published only as an abstract and we had limited information in which to effectively assess risks of other bias. We judged the study to be at high risk of bias because it is not peer-reviewed |

Eakin et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** to evaluate the feasibility and effectiveness of a telephone-delivered, mixed aerobic and resistance exercise intervention for non-urban Australian women with breast cancer |
| **Participants** | **Total number of randomised participants:** 143  **Inclusion criteria:** women with a first diagnosis of invasive breast cancer; between 20 and 69 years of age; treated at 1 of the 8 regional, or 4 large metropolitan, Queensland hospitals and residing within a postal code considered inner regional, outer regional, remote or very remote according to the Australian Standard Geographical Classification  **Exclusion criteria:** pregnancy or lactating; plans for additional surgery (e.g., breast reconstruction) during the study period; medical conditions that would prohibit participation in the home-based exercise intervention (e.g., unstable hypertension)  **Type of surgery (condition):** predominantly lumpectomy and mastectomy (breast cancer)  **Country:** Australia  **Baseline Characteristics**  **Intervention group**   * *Type of surgery, n*: most extensive surgery: lumpectomy: 29; mastectomy: 39 * *Age, mean (SD)*: 51.7 (± 9.0) years * *Gender*: all women * *BMI, mean (SD)*: 26.8 (± 5.4) kg/m2 * *Current involvement in regular PA, %*: four or more sessions and at least 180 min/week of MVPA: 22.1 * *Relevant clinical variables, n (%)*: cancer staging: stage 0/I: 26 (35.6); stage II+: 38 (52.1) * *Economic status, n*: annual income: < $52,000: 36; $52,000 to 93,599: 22; $93,600 to 130,000+: 7 * *Education status, n (%)*: > 12 years: 35 (47.9) * *Employment status, n*: currently working: no: 49; full-time: 11; part-time/casual/other: 13   **Comparison group**   * *Type of surgery, n*: most extensive surgery: lumpectomy: 37; mastectomy: 30 * *Age, mean (SD)*: 54.1 (± 8.7) years * *Gender*: all women * *BMI, mean (SD)*: 27.7 (± 7.8) kg/m2 * *Current involvement in regular PA, %*: four or more sessions and at least 180 min/week of MVPA: 31.3 * *Relevant clinical variables, n (%)*: cancer staging: stage 0/I: 31 (44.3); stage II+: 32 (45.7) * *Economic status, n*: annual income: < $52,000: 43; $52,000 to 93,599: 13; $93,600 to 130,000+: 5 * *Education status, n (%)*: > 12 years: 12: 32 (45.7) * *Employment status, n*: currently working: no: 46; full-time: 10; part-time/casual/other: 13   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: telephone-delivered aerobic and resistance training; remote guiding through exercise workbook with support focused on self-efficacy exploring barriers, treatment-related symptoms and goals; delivered weekly, by telephone by exercise physiologist; for 8 months  Context: breast cancer; 6 weeks post-surgery; at home via telephone  Comparison: usual care; exercise workbook and activity tracker mailed to participants  **Intervention group:** number randomised = 73; reported losses = 5 (4 = health concerns; 1 = no longer had cancer) some attrition is unexplained; analysed = 68 at 12 months (assessments: telephone interviews (n = 68); postal survey (n = 67). For engagement in PA = 67; for HRQoL = 66)  **Comparison group:** number randomised = 70; reported losses = 1 (health concerns) some attrition is unexplained; analysed = 69 at 12 months (assessments: telephone Interviews (n = 69); postal survey (n = 63). For engagement in PA = 67; for HRQoL = 60)  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors:** PA (Active Australia Survey); total minutes of PA; strength training (CHAMPS); HRQoL (FACT-B+4); fatigue (FACIT); anxiety (STAI-Sf); subjective upper body function (DASH); confidence to exercise (self-efficacy; using 5-point Likert scale); measured at baseline (5 to 6 weeks post-surgery), 6 and 12 months post-surgery (approx. 2 months post-intervention):  **Outcomes relevant to the review:**   * Engagement in PA: 12 months post-surgery * HRQoL; using FACT-B+4; using postal questionnaires; based on changes from baseline to 12 months post-surgery * Adverse events * Adherence: number completing calls with exercise physiologist * Participant experience   **Study primary outcome:** the primary study outcomes were meeting EfH targets for aerobic activity (≥ 4 times/week and ≥ 180 minutes MVPA) and resistance training (≥ 2 sessions/week) |
| **Notes** | **Sponsorship source:** supported by grant funding fromThe National Breast Cancer Foundation and Queensland Health Core. EGE is supported by a National Health and Medical Research Council Senior Research Fellowship. SCH is supported by an Early Career Research Fellowship from the NBCF. The authors declare no conflicts of interest  **Study dates:** data collected April 2007 to April 2009; analysis February to October 2010 |
| **Reference(s)**  **\* primary reference** | Eakin EG, Lawler SP, Winkler EAH, Hayes SC. A Randomized Trial of a Telephone-Delivered Exercise Intervention for Non-urban Dwelling Women Newly Diagnosed with Breast Cancer: Exercise for Health. *ann behav med* 2012; **43**: 229-38 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Computer-generated randomization |
| Allocation concealment (selection bias) | Unclear risk | Insufficient information |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adverse events (detection bias) | Unclear risk | Observation method not specified for this outcome |
| Blinding of outcome assessment: adherence (detection bias) | Unclear risk | Objective measurement of call completion |
| Incomplete outcome data (attrition bias) | Low risk | We noted few losses which were generally balanced between groups, and reasons for losses were sufficiently explained by study authors |
| Selective reporting (reporting bias) | Low risk | Prospective registration with a clinical trials register (ACTRN12609000809235); all reported review outcomes were consistent with the clinical trials register documents |
| Other bias | Low risk | No other sources of bias detected |

Engblom et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to investigate whether rehabilitation influences QoL and work status after CABS |
| **Participants** | **Total number of randomised participants:** 201  **Inclusion criteria:** male; < 65 years of age; underwent elective CABS at Turku University Central Hospital from February 1986 to December 1987  **Exclusion criteria:** other serious disease; ≥ 65 years of age  **Type of surgery (condition):** CABS (severe CAD)  **Country:** Finland  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 54 (± 6) years * *Gender, M/F*: 104/15 * *Relevant clinical variables, %*: severity of coronary disease: single vessel disease: 7; double vessel disease: 29; triple vessel disease: 64; left main disease: 15; diffuse sclerosis: 5   **Comparison group**   * *Age, mean (SD)*: 54 (± 6) years * *Gender, M/F*: 97/12 * *Relevant clinical variables, %*: severity of coronary disease: single vessel disease: 10; double vessel disease: 35; triple vessel disease 55; left main disease 17; diffuse sclerosis 2   Note:   * study authors do not report the following characteristics: BMI, weight, height, baseline level of fitness, current involvement in regular PA, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: 3 phase residential rehabilitation programme; phase 1 preoperative focus on operation and recovery, phase 2 group discussion about CHD risk factors, nutritional advice, supervised exercise training, phase 3 refresher course; 3 inpatient stays (lasting 2 days, 3 weeks, and 2 days) over 9 months, supported by physician, psychologist and nutritionist  Context: CABS patients; begins 2 to 3 weeks pre-surgery; residential rehabilitation clinic  Comparison: usual care; verbal instructions on home care; written instructions on the treatment of wounds, PA, diet and education  **Intervention group:** number randomised = 104; losses = 2 (perioperative deaths); analysed = 102 (complete PA data was available for 93 participants)  **Comparison group:** number randomised = 97; losses = 5 (deaths = 4; withdrawal = 1); analysed = 92 (complete PA data was available for 78 participants)  **Setting:** clinic |
| **Outcomes** | **All outcomes measured/reported by study authors:** weight; BP; physical exercise (questionnaire); smoking habits (questionnaire); serum cholesterol; triglycerides; cholesterol; plasma insulin; whole blood glucose; oral glucose test. Measured at baseline (1 to 2 days preoperatively at the surgical ward), 6 and 12 months postoperatively at outpatient clinic  **Outcomes relevant to the review:**   * Engagement in PA: using a questionnaire; 12 months post-surgery   **Study primary outcome:** physiological variables (listed first) |
| **Notes** | **Sponsorship source:** supported by grant funding from the Finnish Heart Foundation. Declarations of interest not reported  **Study dates:** recruitment February 1986 to December 1987 |
| **Reference(s)**  **\* primary reference** | Engblom E, Hämäläinen H, Lind J, Mattlar CE, Ollila S, Kallio V, Inberg M, Knuts LR. Quality of life during rehabilitation after coronary artery bypass surgery. Quality of Life Research 1992; **1**: 167‐175.  Engblom E, Hietanen EK, Hämäläinen H, Kallio V, Inberg M, Knuts LR. Exercise habits and physical performance during comprehensive rehabilitation after coronary artery bypass surgery. European Heart Journal 1992; **13**: 1053-9.  Engblom E, Korpilahti K, Hämäläinen H, Ronnemaa T, Puukka P. Quality of life and return to work 5 years after coronary artery bypass surgery. Long-term results of cardiac rehabilitation. Journal of Cardiopulmonary Rehabilitation 1997; **17**: 29-36  \* Engblom E, Ronnemaa T, Hämäläinen H, Kallio V, Vanttinen E, Knuts LR. Coronary heart disease risk factors before and after bypass surgery: results of a controlled trial on multifactorial rehabilitation. *European Heart Journal* 1992; **13**: 232-7 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Described as consecutively randomised, no further details Insufficient details |
| Allocation concealment (selection bias) | Unclear risk | Insufficient details |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Incomplete outcome data (attrition bias) | Low risk | We noted few losses which were generally balanced between groups, and reasons for losses were sufficiently explained by study authors |
| Selective reporting (reporting bias) | Unclear risk | Study authors did not report clinical trials registration or reference to a pre-published protocol; it is not feasible to effectively assess risk of selective reporting bias without these documents |
| Other bias | Low risk | No other sources of bias detected |

Fontana et al.

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| **Methods** | BA; single centre  **Design features:** subjects were drawn from 95 men who were consecutively admitted to the medical centre for either an uncomplicated, acute MI or for CABG. Patients were approached in the medical centre and asked to participate in the study approximately 5 days after infarction or surgery. Convenience sample?  **Study aim/objective:** to examine the relationship of exercise adherence and aerobic fitness to a spectrum of biologic and psychologic benefits in the context of a 3-stage model of exercise training |
| **Participants** | **Total number of included participants:** 50  **Inclusion criteria:** men admitted to the Veterans Administration Medical Centre for either an uncomplicated acute MI or for CABG  **Exclusion criteria:** died during hospital stay; physical condition precluding staff expectation that they were capable of exercising on a treadmill; those living > 40 miles from the medical centre  **Type of surgery (condition):** CABG  **Country:** USA  **Baseline Characteristics**  **Intervention group**   * *Age, mean (range)*: 59.4 (35 to 73) years * *Gender, M/F*: all male * *Baseline level of fitness, mean (SD)*: 6.4 (± 1.3) METs * *Socioeconomic status, n (%)*: Hollingshead scale: white-collar workers (classes I-III): 20 (40); blue-collar workers (classes IV and V): 30 (60)   Note:   * study authors do not report the following characteristics: BMI, weight, height, current involvement in regular PA, illness severity scores, clinical variables |
| **Interventions** | **Details of interventions**  Approach: supervised exercise training; treadmill walking at 85% maximal heart rate; 3 times per week, over 12 weeks; medically-supervised  Context: cardiac patients; 2 weeks post-hospital discharge (average 4 weeks post-surgery or infarction); outpatient clinic  Comparison: no comparator  **Intervention group:** number included = 50; reported losses = 0, some attrition is unexplained; analysed = 50 (assessed for engagement in PA = 38; assessed for fitness = unknown)  **Setting:** clinic |
| **Outcomes** | **All outcomes measured/reported by study authors:** ETT baseline (start of training programme), 12 weeks (end of training programme), 3, 6, and 9 months after training programme; on completion of training and at 3 and 9 months: aerobic fitness, mood state, ischemic and dyspneic symptoms, participation in exercise activity  **Outcomes relevant to the review:**   * Engagement in PA: 9 months post-intervention * Physical fitness: using work capacity (METS); 9 months post-intervention * Adherence: measured as attendance to exercise sessions   **Study primary outcome:** ETT |
| **Notes** | **Sponsorship source:** funding and declarations of interest not reported  **Study dates:** not reported |
| **Reference(s)**  **\* primary reference** | Fontana AF, Kerns RD, Rosenberg RL. Exercise training for cardiac patients: Adherence, fitness, and benefits. *Journal of Cardiopulmonary Rehabilitation* 1986; **6**: 4-15 |

Foster et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to evaluate the effects of an exercise-based rehabilitation program on the return of work capacity and on left ventricular function in patients after MRS |
| **Participants** | **Total number of randomised participants:** 40  **Inclusion criteria:** referred for outpatient cardiac rehabilitation after MRS (aortocoronary saphenous vein bypass grafts and internal mammary CABG)  **Exclusion criteria:** unwilling or unable to enter the protocol (mostly because of unwillingness to be randomly assigned to a control group or because of geographic distance from the medical centre); patients with physicians unwilling to participate in the protocol; unable to complete the 6-month protocol without an intervening clinical episode or who had attendance of < 75%  **Type of surgery (condition):** myocardial revascularization surgery  **Country:** USA  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 56.0 (± 8.6) years * *Weight, mean (SD)*: 76.4 (± 10.6) kg * *Height, mean (SD)*: 173.4 (± 6.4) cm * *Baseline level of fitness, mean (SD)*: work capacity: 3.9 (± 0.7) METs; maximal heart rate: 117.1 (± 18.4) beats/min * *Relevant clinical variables*: preoperative left ventricular ejection fraction (LVEF), mean (SD): 54 (± 17)   **Comparison group**   * *Age, mean (SD)*: 58.2 (± 10.4) years * *Weight, mean (SD)*: 78.7 (± 16.4) kg * *Height, mean (SD)*: 174.3 (± 9.5) cm * *Baseline level of fitness, mean (SD)*: work capacity: 3.7 (± 0.6) METs; maximal heart rate: 109.7 (± 18.8) beats/min * *Relevant clinical variables*: preoperative left ventricular ejection fraction (LVEF), mean (SD): 52 (± 15)   Note:   * study authors do not report the following characteristics: gender, BMI, baseline level of fitness, current involvement in regular PA, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: supervised exercise training; initial ambulation and motion training followed by supervised progressive treadmill exercise training, additional home walking training on hospital discharge; daily during inpatient stay, 3 weekly nurse supervised sessions and 2 home sessions on discharge; delivered over 6 months.  Context: myocardial revascularization surgery patients; within 48 hours of surgery; hospital followed by outpatient clinic and home following discharge  Comparison: control; limited supervised treadmill ambulation not exceeding 60% maximal heart rate reserve and deep muscle relaxation exercises, plus home deep muscle relaxation exercises  **Intervention group:** number randomised = unknown; losses = unknown; analysed for other study outcomes = 19; analysed for engagement in PA = 14  **Comparison group:** number randomised = unknown; losses = unknown; analysed for other study outcomes = 9; analysed for engagement in PA = 3  Note: to eliminate the confounding effect of self-prescribed exercise that might have been performed by the control group, the details of the home program were monitored to prevent the control group from performing significant amounts of aerobic exercise at home  **Setting:** clinic and home  Note:   * 40 participants were randomised, but study authors do not report to which group participants were assigned. Study authors only reported data for those who finished the 6 months rehabilitation protocol. Overall losses = 12 (7 dropped out for reasons of geographic inconvenience, 2 because of orthopedic complications, 1 because of a return of limiting angina pectoris, and 2 because they refused to remain in the control group for the duration of the study) |
| **Outcomes** | **All outcomes measured/reported by study authors**: measured at hospital discharge (approx. 2 weeks after surgery); 8 and 24 weeks after surgery. A subset of patients (n = 16 [experimental] and n = 6 [control]) were also studied before surgery (T1). The remaining 6 patients were not because of the emergent need for surgery. Another subset of patients (n = 11 [experimental] and n = 4 [control]) were studied 1 year after surgery (T5): resting haemodynamics; exercise haemodynamics; haemoglobin and haematocrit  **Outcomes relevant to the review:**   * Engagement in PA: 12 months post-surgery * Physical fitness: using a cardiopulmonary exercise capacity test; reported as work capacity (METs); 6 months post-surgery   **Study primary outcome:** resting haemodynamics (first reported outcome) |
| **Notes** | **Sponsorship source:** funding and declarations of interest not reported  **Study dates:** not reported |
| **Reference(s)**  **\* primary reference** | Foster C, Pollock ML, Anholm JD, Squires RW, Ward A, Dymond DS*, et al.* Work capacity and left ventricular function during rehabilitation after myocardial revascularization surgery. *Circulation* 1984; **69**: 748-55 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Described as randomised with a 2:1 ratio (to account for potential losses in the exercise group); no additional details provided |
| Allocation concealment (selection bias) | Unclear risk | Insufficient information |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: fitness outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Incomplete outcome data (attrition bias) | High risk | Numbers of participants randomised to each group is not reported, and losses are reported only overall. In addition, there are further drop-outs for follow-up data which includes outcomes relevant to this review with only a small number of participants with available data |
| Selective reporting (reporting bias) | Unclear risk | Study authors do not report clinical trials registration or reference to a pre-published protocol; it is not feasible to effectively assess risk of selective reporting bias without these documents |
| Other bias | Low risk | No other sources of bias detected |

Frawley et al.

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| **Methods** | CBA, parallel design; single centre  **Design features:** a non-randomised controlled before-and-after study. An invitation letter and study information were posted 6 weeks after the cessation of patients’ surgical and medical treatments. Follow-up telephone contact was made directly by the research team to assess the patient’s interest and eligibility and to facilitate informed consent. Following consent, patients attended for baseline assessment. Eligible patients were recruited consecutively to the 8-week group-based education and exercise oncology rehabilitation program (‘rehabilitation’ group). If patients were unable or unwilling to attend the rehabilitation program, they were invited to complete the postal questionnaires only and were used as the comparator group in this study. Rationale for comparator: "The study was originally set up as a single-group trial with colorectal cancer only; however, due to the slow recruitment, eligibility criteria were extended to include patients with colorectal, prostate or gynaecological cancer. A second, questionnaire-only arm was added to the study, which acted as a comparator group (referred to as comparator group hereafter)."  **Study aim/objective:** to investigate the feasibility of conducting a rehabilitation program for patients following surgery for abdominopelvic cancer |
| **Participants** | **Total number of included participants:** 188  **Inclusion criteria:** undergone surgery for histologically confirmed, stage I-III abdominopelvic cancer; ECOG performance status of between 0 and 2 (0 = fully active to 2 = up and about for 50% of a day); sufficient English language skills to participate  **Exclusion criteria:** > 85 years; pregnant or ≤ 12 months postpartum; physical or psychiatric impairments that prevented participation in the exercise programs; other malignancies; had participated in a rehabilitation program in the prior 12 months  **Type of surgery (condition):** surgery for abdominopelvic cancer  **Country:** Australia  **Baseline Characteristics**  **Intervention group**   * *Type of cancer, n (%)*: colon: 14 (16.7); rectum: 2 (2.4); prostate: 55 (65.5); uterus: 10 (11.9); ovary: 2 (2.4); cervix: 1 (1.2); vulva: 0 (0) * *Age, mean (SD)*: 66.1 (± 9.5) years * *Gender, M/F*: 66/18 * *BMI, mean (SD)*: 26.4 (± 3.5) kg/m2 * *Baseline level of fitness, mean (SD)*: 6MWT: 556.7 (± 88.8) m * *Current involvement in regular PA, mean (SD)*: IPAQ-SF total: 2230.3 (± 2351.5) MET-min/week * *Education status, n (%)*: high school or less: 20 (23.8); some college or university: 25 (24); completed bachelor’s degree: 21 (25); completed masters or PhD degree: 12 (14.3); other: 4 (4.8); missing: 2 (2.4%) * *Time since surgery at enrolment, mean (SD)*: 78.4 (± 70.0) days   **Comparison group**   * *Type of cancer, n (%)*: colon: 14 (13.5); rectum: 3 (2.9); prostate: 70 (67.3); uterus: 14 (13.5); ovary: 1 (1.0); cervix: 0 (0); vulva: 2 (1.9) * *Age, mean (SD)*: 67.1 (± 7.9) years * *Gender, M/F*: 78/26 * *BMI, mean (SD)*: not collected * *Baseline level of fitness*: not reported * *Current involvement in regular PA*: not reported * *Education status, n (%)*: high school or less: 31 (29.9); some college or university: 25 (29.8); completed bachelor’s degree: 27 (26.0); completed masters or PhD degree: 13 (12.5); other: 5 (4.8); missing: 3 (2.9) * *Time since surgery at enrolment, mean (SD)*: 64.0 (± 39.0) days   Note:   * study authors do not report the following characteristics: weight, height, illness severity scores, clinical variables |
| **Interventions** | **Details of interventions**  Approach: multidisciplinary behavioural exercise programme; education sessions (diet, emotional management and PA); supervised group aerobic and resistance training, home resistance training, steps goals and PA diary, telephone motivational coaching sessions; twice weekly sessions for 8 weeks, followed by monthly coaching session for 12 weeks; delivered by exercise physiologists, physiotherapists, dietician and psychologist over 6 months  Context: abdominopelvic cancer surgery patients; post-surgery 78.4 (70.0) days; rehabilitation centre and home  Comparison: usual care (declined intervention)  **Intervention group:** number included = 84; reported losses = 12 (7 = lost to follow-up, medical reasons; 1 = overseas; 4 = unable to contact) some attrition is unexplained; analysed = 75 (analysed for amount of PA using IPAQ-SF = 73; analysed for steps/day = 31; analysed for walking test = 66; analysed for hand grip strength = 70; analysed for HRQoL using EORTC QLQ C30 = 73)  **Comparison group:** number included = 104; reported losses = 14 (lost to follow-up, unable to contact) some attrition is unexplained; analysed = 94 (analysed for amount of PA using IPAQ-SF = 92; analysed for steps/day = N/A; analysed for walking test = N/A; analysed for hand grip strength = N/A; analysed for HRQoL using EORTC QLQ C30 = 93)  **Setting:** clinic and home |
| **Outcomes** | **All outcomes measured/reported by study authors**: questionnaire-based patient-reported outcome measures were obtained at T1 and immediately post-intervention or at 8-weeks following baseline (time-point 2 [T2]) and at 6 months following baseline (time-point 3 [T3]) for both groups. Performance measures were collected from the rehabilitation group only by a physiotherapist who was involved in the program at T1, T2 and T3: feasibility; functional exercise capacity; muscle strength, using handgrip dynamometry; pelvic floor symptoms (colorectal and gynaecological cancer cohorts); patient reported PA levels; anxiety and depression were assessed with the 14-item HADS. HRQoL (EORTC QLQ-C30); PESE; NSE sub-scales of the Health-Specific Self-Efficacy Scale. Pelvic floor symptoms using the bladder and bowel domains of the APFQ, ICIQ-B; ICIQ-UI SF.  **Outcomes relevant to the review:**   * Amount of PA: using IPAQ-SF; 6 months post-intervention * Amount of PA: steps per day; using a pedometer; 6 months post-intervention * Physical fitness: using 6MWT; 6 months post-intervention * Physical fitness: using hand grip strength; 6 months post-intervention * HRQoL: using EORTC QLQ C30 (global); 6 months post-intervention * Pain: using EORTC QLQ C-30 (pain); 6 months post-intervention * Adverse events * Adherence: measured as attendance to scheduled sessions, completed telephone sessions, and self-reported attainment of the PA guidelines   **Study primary outcome:** feasibility (measures included referral, recruitment/consent, attendance, adherence, withdrawals and adverse events) |
| **Notes** | **Sponsorship source:** supported by grant funding from the Cabrini Foundation and Cabrini Allied Health Department, Victoria, Australia. The authors declare no conflicts of interest  **Study dates:** April 2014 to December 2016 |
| **Reference(s)**  **\* primary reference** | Frawley HC, Lin KY, Granger CL, Higgins R, Butler M, Denehy L. An allied health rehabilitation program for patients following surgery for abdomino-pelvic cancer: a feasibility and pilot clinical study. *Supportive Care in Cancer* 2020; **28**: 1335-50 |

Goedendorp et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** to evaluate whether an intervention (a minimal or a more intensive one) during treatment of cancer is effective in managing fatigue and whether these interventions can prevent fatigue becoming persistent, 1 year after the curative treatment has ended |
| **Participants** | **Total number of randomised participants:** 240  **Inclusion criteria:** diagnosed with a primary tumour; scheduled to receive treatment with curative intent; between 18 and 75 years of age; able to speak, read, and write Dutch  **Exclusion criteria:** patients with lung cancer, head or neck cancer; comorbidities causing fatigue; seeking treatment for pre-existing chronic fatigue; receiving psychiatric or psychological treatment in the preceding 3 months  **Type of surgery (condition):** not specified (various cancers)  **Country:** Netherlands  **Baseline Characteristics**  **Intervention group (BNI)**   * *Type of cancer, n (%)*: breast cancer: 35 (49); prostate cancer: 19 (26); other tumour 18 (25) * *Age, mean (SD)*: 57.1 (± 10.0) years * *Gender, M/F*: 28/44 * *Non-surgical patients, n (%)*: 6 (8) * *Education status, mean (SD)*: 1 (low) to 7 (high): 4.31 (± 1.87)   **Intervention group (CBT)**   * *Type of cancer, n (%)*: breast cancer: 36 (47); prostate cancer: 15 (20); other tumour: 25 (33) * *Age, mean (SD)*: 55.6 (± 11.3) years * *Gender, M/F*: 28/48 * *Non-surgical patients, n (%)*: 5 (3) * *Education status, mean (SD)*: 1 (low) to 7 (high): 3.93 (± 1.59)   **Comparison Group**   * *Type of cancer, n (%)*: breast cancer: 34 (47); prostate cancer: 17 (24); other tumour: 21 (29) * *Age, mean (SD)*: 57.3 (± 11.1) years * *Gender, M/F*: 25/47 * *Non-surgical patients, n (%)*: 8 (10) * *Education status, mean (SD)*: 1 (low) to 7 (high): 3.74 (± 1.63)   Note:   * study authors do not report the following characteristics: BMI, weight, height, baseline level of fitness, current involvement in regular PA, illness severity scores * significantly more participants in the BNI group than in the UC group were married (P value = 0.022) |
| **Interventions** | **Details of interventions**  Approach 1: brief nursing intervention; assessment of current PA level with a focus on fatigue, remaining active throughout treatment and aiming for an hour’s daily exercise, 5 days per week; 2 sessions across 3 months, delivered by a nurse  Approach 2: CBT plus PA information; CBT sessions focused on PA, fatigue, sleep, effects of cancer and treatment and planning for the future, recommendations for goal daily exercise; up to 10 sessions delivered by therapist, over 6 months  Context: cancer patients (primary tumour diagnosis); on diagnosis; hospital (outpatient)  Comparison: usual care  **Intervention group (approach 1):** number randomised = 77; losses = 5 (died = 1; treated for secondary tumour = 1; received palliative treatment = 2; severe comorbidity during the study = 1); analysed ITT = 72. An intention-to-treat analysis was performed for all outcomes except for the actometer and the DOA. Completers were used for these measures, because < half the participants wore the actometer and completed the DOA at both assessments; analysed for actometer = 35; analysed for DOA = 34; analysed for QPA = 72  **Intervention group (approach 2):** number randomised = 82; losses = 6 (died = 2; secondary tumour = 1; palliative treatment = 2; severe complications during the study = 1); analysed ITT = 76. An intention-to-treat analysis was performed for all outcomes except for the actometer and the DOA. Completers were used for these measures, because < half the participants wore the actometer and completed the DOA at both assessments; analysed for actometer = 30; analysed for DOA = 29; analysed for QPA = 76  **Comparison group:** number randomised = 81; losses = 9 (died = 3; received palliative treatment = 2; diagnosed with metastases = 1; severe comorbidity during study = 1; diagnosis was benign = 2) analysed ITT = 72. An intention-to-treat analysis was performed for all outcomes except for the actometer and the DOA. Completers were used for these measures, because < half the participants wore the actometer and completed the DOA at both assessments; analysed for actometer = 25; analysed for DOA = 31; analysed for QPA = 72  **Setting:** hospital |
| **Outcomes** | **All outcomes measured/reported by study authors**: fatigue severity using the fatigue sub-scale of the CIS; functioning using the SF-36; psychological distress using SCL-90; HRQoL using the EORTC QLQ-C30; PA (actometer; DOA; QPA). Measured at baseline and 6 months post-intervention  **Outcomes relevant to the review:**   * Amount of PA: using an actometer; given as daily activity score where a higher score indicates higher levels of PA; 6 months post-intervention * Amount of PA: DOA; 6 months post-intervention * Amount of PA: QPA: 6 months post-intervention   **Study primary outcome:** fatigue severity assessed using the fatigue sub-scale of the CIS |
| **Notes** | **Sponsorship source:** supported by grant funding from the Dutch Cancer Society  **Study dates:** November 2005 to August 2007 |
| **Reference(s)**  **\* primary reference** | \* Goedendorp MM, Peters MEWJ, Gielissen MFM, Witjes JA, Leer JW, Verhagen CAHHVM*, et al.* Is increasing physical activity necessary to diminish fatigue during cancer treatment? Comparing cognitive behaviour therapy and a brief nursing intervention with usual care in a multicenter randomised controlled trial. *The Oncologist* 2010; **15**: 1122-32  ISRCTN20583070. Evaluation of intervention strategies to manage fatigue during active treatment and to prevent persistent fatigue after curative treatment for cancer. isrctn.com/ISRCTN20583070 (first received 21 February 2007).  NL148 (NTR183). Evaluation of intervention strategies to manage fatigue during active treatment and to prevent persistent fatigue after curative treatment for cancer. [NTR (trialregister.nl)](https://www.trialregister.nl/trial/148) (first received 5 September 2005). |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Randomization was performed in blocks separately for each hospital, using labelled cards in numbered closed envelopes prepared by a statistician not involved in the study |
| Allocation concealment (selection bias) | Low risk | Allocation was prepared by a statistician not involved in the study |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the interventions |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Incomplete outcome data (attrition bias) | High risk | Although an ITT analysis was performed for all outcomes (except for the actometer and the DOA data), we noted that this analysis included a large number of losses (more than half the participants) |
| Selective reporting (reporting bias) | Unclear risk | Retrospective registration with a clinical trials register (ISRCTN20583070; first received in February 2007); it is not feasible to effectively assess risk of selective reporting bias |
| Other bias | Low risk | No other sources of bias detected |

Golsteijn et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** to evaluate the efficacy of the OncoActive intervention at 3 months (during the intervention) and at 6 months (2 months after the intervention ended) |
| **Participants** | **Total number of randomised participants:** 478  **Inclusion criteria:** ≥18 years; diagnosed with colorectal or prostate cancer; undergoing treatment with a curative intent, or if they successfully completed primary treatment (surgery, chemotherapy or radiation) up to 1 year ago; at least 6 weeks post-surgery; proficient Dutch reading and speaking skills were required for the questionnaires and for reading the tailored PA advice  **Exclusion criteria:** participants with severe medical, psychiatric or cognitive illness (e.g., Alzheimer’s disease, severe mobility limitations) were excluded from participation. Proficient Dutch reading and speaking skills were required for the questionnaires and for reading the tailored PA advice.  **Type of surgery (condition):** not specified (colorectal and prostate cancer)  **Country:** The Netherlands  **Baseline Characteristics**  **Intervention group**   * *Type of condition, n*: prostate: 149; colorectal: 100 * *Type of treatment, n (%)*: surgery: 186 (81.2); chemotherapy: 41 (17.9); radiotherapy: 63 (27.5); hormonal treatment: 8 (3.5) * *Age, mean (SD)*: 66.55 (± 7.07) years * *Gender, M/F*: 212/37 * *BMI, mean (SD)*: 26.39 (± 3.38) kg/m2 * *Baseline level of fitness, mean (SD)*: MVPA SQUASH: 798 (± 721); MVPA ActiGraph: 271 (± 211); days ≥ 30 min PA SQUASH: 3.67 (± 2.05); days ≥ 30 min PA ActiGraph: 3.23 (± 2.46); PA intention: 7.61 (± 1.35) * *Education status, n (%)*: low: 109 (44.0); middle: 70 (28.2); high 69 (27.8)   **Comparison group**   * *Type of condition, n*: prostate: 143; colorectal: 86 * *Type of treatment, n (%)*: surgery: 192 (77.1); chemotherapy: 44 (17.7); radiotherapy: 80 (32.1); hormonal treatment: 10 (4.0) * *Age, mean (SD)*: 66.38 (± 8.21) years * *Gender, M/F*: 204/25 * *BMI, mean (SD)*: 26.74 (± 4.41) kg/m2 * *Baseline level of fitness, mean (SD)*: MVPA SQUASH: 873 (± 764); MVPA ActiGraph: 293 (± 230); days ≥ 30 min PA SQUASH: 3.86 (± 2.07); days ≥ 30 min PA ActiGraph: 3.38 (± 2.38); PA intention: 7.74 (± 1.48) * *Education status, n (%)*: low: 114 (50.0); middle: 47 (20.6); high: 67 (29.4)   Note:   * study authors do not report the following characteristics: weight, height, current involvement in regular PA, illness severity scores, relevant clinical variables |
| **Interventions** | **Details of interventions**  Approach: home-based lifestyle package; computer-generated tailored advice based on behaviour change theories targeting self-efficacy, motivation, action and coping planning, exercise instruction and role modelling videos, goal-setting with pedometers; 3 computer-generated advice sessions in response to patient questionnaires, over 3 months.  Context: colorectal and prostate cancer patients; post-surgery at least 6 weeks; home  Comparison: usual care; offered the intervention at end of study follow-up 12 months after baseline  **Intervention group:** number randomised = 249; reported losses = 28 (missing questionnaires = 2; missing ActiGraph = 17; lost to follow-up = 9) some attrition is unexplained; analysed for ActiGraph data = 208; analysed for HRQoL = 223  **Comparison group:** number randomised = 229; reported losses = 13 (missing questionnaire = 1; missing ActiGraph = 7; lost to follow-up = 5) some attrition is unexplained; analysed for Actigraph data = 211; analysed for HRQoL = 216  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors**: PA was (SQUASH and accelerometer); HRQoL (EORTC QLQ-C30 Global). Measured at baseline and 6 months post-intervention  **Outcomes relevant to the review:**   * Amount of PA: using accelerometer; measured as mins per week; 6 months post-intervention * HRQoL: using the EORTC QLQ-C30 Global; 6 months post-intervention   **Study primary outcome:** PA |
| **Notes** | **Sponsorship source:** supported by grant funding from the Dutch Cancer Society. Authors declare the following competing interests: Hein de Vries is the scientific director of Vision2Health, a company that licenses evidence-based innovative computer-tailored health communication tools  **Study dates:** 2015 to 2016 (recruitment) |
| **Reference(s)**  **\* primary reference** | \* Golsteijn RHJ, Bolman C, Volders E, Peels DA, de Vries H, Lechner L. Short-term efficacy of a computer-tailored physical activity intervention for prostate and colorectal cancer patients and survivors: a randomized controlled trial. *Int J Behav Nutr Phys Act* 2018; **15**: 106  NTR4296. The OncoActive+ project. <http://www.who.int/trialsearch/Trial2.aspx?TrialID=NTR4296> 2013 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Computer-generated randomization |
| Allocation concealment (selection bias) | Unclear risk | No details |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Incomplete outcome data (attrition bias) | High risk | We noted some imbalance between groups, with more losses in the intervention group |
| Selective reporting (reporting bias) | Low risk | Prospectively registered with the Dutch Trial Register (NTR4296). Reported outcomes are consistent with those in the clinical trials documents |
| Other bias | Low risk | No other sources of bias detected |

Hackshaw-McGeagh et al.

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| **Methods** | RCT, parallel group; single centre  **Study aim/objective:** to explore the feasibility of introducing modified nutrition (increased vegetables and fruit combined with reduced dairy milk) or lycopene supplements and PA (brisk walking) interventions in men treated with radical prostatectomy for localised prostate cancer |
| **Participants** | **Total number of randomised participants:** 81  **Inclusion criteria:** localised prostate cancer; undergoing radical prostatectomy; capacity to provide informed consent; ≥ 18 years of age; sufficient understanding of the English language  **Exclusion criteria:** inability to give informed consent; unavailability for follow-up; identified as unsuitable to participate by the treating clinician; comorbidities (this could include uncontrolled congestive heart failure or angina, recent MI or breathing difficulties requiring oxygen use or hospitalisation); allergies or religious beliefs that could prevent participation in the intervention (RCT only); and regularly taking lycopene supplements or routinely exercising vigorously (RCT only)  **Type of surgery (condition):** radical prostatectomy (prostate cancer)  **Country:** UK  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 65.5 (± 5.5) years * *Gender*: all male * *BMI, mean (SD)*: 26.6 (± 3.3) kg/m2 * *Current involvement in regular PA, mean (SD)*: baseline energy expenditure: 28.3 (± 25.0) kJ/ kg/day * *Presurgical prostate specific antigen, median (IQR)*: 8.9 (6.4 to 12.7) ng/mL * *Ethnicity, n, (%):* white British: 35 (89.7) * *Highest education level, n (%)*: standard or less (e.g., o-levels and GCSE): 13 (34.2); further education (e.g., A levels, HND and university degree): 25 (65.8)   **Comparison group**   * *Age, mean (SD)*: 62.5 (± 6.9) years * *Gender*: all male * *BMI, mean (SD)*: 26.6 (± 3.5) kg/m2 * *Current involvement in regular PA, mean (SD)*: baseline energy expenditure: 23.1 (± 23.0) kJ/ kg/day * *Presurgical prostate specific antigen, median (IQR)*: 8.4 (5.7 to 11.0) ng/mL * *Ethnicity, n, (%):* white British: 33 (86.8) * *Highest education level, n (%)*: standard or less (e.g., o-levels and GCSE): 20 (52.6); further education (e.g., A levels, HND and university degree): 18 (47.4)   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: remote supported walking intervention; brisk walking at least five days per week in addition to usual PA, remote structured support via method of choice **(**text message, telephone, email, post) from research nurse seven times over the 6 months. Additional nutritional intervention involving either usual diet, a lycopene supplement or a plant-based diet  Context: radical prostatectomy for prostate cancer patients; 8 weeks post-surgery; home  Comparison: usual care; behaviour as usual diet and usual PA  **Intervention group:** number randomised = 42; losses = 3 (all withdrawal); analysed at 6 months = 39  **Comparison group:** number randomised = 39; losses = 3 (lost to follow-up = 3); analysed at 6 months = 36  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors**: PA (PROMS); adherence; patient experience (qualitatively reported); adverse events; biochemical effects of nutrition intervention. Measured at trial baseline, three and six months, with daily adherence reported throughout  **Outcomes relevant to the review:**   * Amount of PA: using PROMS (kj/kg/day); 6 months post-surgery * Adherence to intervention: 90% adherence defined as 30+ minutes of walking on at least 18 of 28 days; measured at 28 days * Adverse events * Participant experience   **Study primary outcome:** adherence to intervention |
| **Notes** | **Sponsorship source:** supported by funding from the NIHR via the Bristol Randomised Trials Collaboration  **Study dates:** August 2014 to May 2016 (recruitment)  Note:   * study included additional study arms in which different nutritional approaches were compared. We did not include data from these study arms in the review |
| **Reference(s)**  **\* primary reference** | \* Hackshaw-McGeagh L, Lane AJ, Persad R, Gillatt D, Holly JMP, Koupparis A*, et al.* Prostate cancer - evidence of exercise and nutrition trial (PrEvENT): study protocol for a randomised controlled feasibility trial. *Trials [Electronic Resource]* 2016; **17**: 123  Hackshaw-McGeagh L, Penfold C, Shingler E, Lane A, Martin R. Phase II randomised control trial of a nutrition and physical activity intervention after radical prostatectomy for prostate cancer. Br J Cancer 2018; **119**: S14.  Hackshaw-McGeagh L, Penfold C, Shingler E, Robles LA, Perks CM, Holly JMP, et al. Phase II randomised control feasibility trial of a nutrition and physical activity intervention after radical prostatectomy for prostate cancer. BMJ Open 2019; **9**: e029480.  Shingler E, Hackshaw-McGeagh L, Robles L, Persad R, Koupparis A, Rowe E, et al. The feasibility of the prostate cancer: evidence of exercise and nutrition trial (Prevent) dietary and physical activity modifications: a qualitative study. Trials 2017; **18**: 106 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Use of an online system for randomisation |
| Allocation concealment (selection bias) | Unclear risk | Quote: "Random allocation was performed by the Bristol Randomised Trial Collaboration via an online system to ensure that the recruiting nurses could not uncover allocation of trial group in advance (concealment of allocation)" |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Outcomes were measured using subjective measurement tools, and participants were not blinded to the intervention |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adverse events (detection bias) | High risk | Outcome was self-reported |
| Incomplete outcome data (attrition bias) | Low risk | We noted few losses which were generally balanced between groups, and reasons for losses were sufficiently explained by study authors |
| Selective reporting (reporting bias) | High risk | Pre-published protocol reported, and the study is retrospectively registered with a clinical trials register shortly after the start of the study (ISRCTN 99048944; first received 30 October 2014). We noted that the registration documents report that step data will be used, but this is not reported in the published paper. Study authors acknowledge this in the published paper, but do not provide a reference or link to any supplementary material where this data maybe held |
| Other bias | High risk | Further arms of this study explored nutritional interventions. Participants were provided with information on the specifics of all trial groups and therefore there may have been crossover in behaviour, potentially diluting results |

Hauer et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to assess the feasibility, safety and efficacy of intensive, progressive physical training in rehabilitation after hip surgery |
| **Participants** | **Total number of randomised participants:** 28  **Inclusion criteria:** hip surgery; recent history of injurious falls; > 75 years of age; female; consent of the orthopaedic surgeon  **Exclusion criteria:** acute neurological impairment; severe cardiovascular disease; unstable chronic or terminal illness; major depression; severe cognitive impairment; severe musculoskeletal impairment  **Type of surgery (condition):** hip surgery  **Country:** Germany  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 81.7 (± 7.6) years * *Gender*: all female * *BMI, mean (SD)*: 23.1 (± 3.6) kg/m2 * *Weight, mean (SD)*: 56.9 (± 11.4) kg * *Height, mean (SD)*: 157.3 (± 9.2) cm * *Current involvement in regular PA, mean (SD)*: ADL: 89.6 (± 7.7). IADL: 6.2 (± 1.6)   **Comparison group**   * *Age, mean (SD)*: 80.8 (± 7.0) years * *Gender*: all female * *BMI, mean (SD)*: 24.8 (± 3.5) kg/m2 * *Weight, mean (SD)*: 62.2 (± 8.6) kg * *Height, mean (SD)*: 158.4 (± 6.7) cm * *Current involvement in regular PA, mean (SD)*: ADL: 89.1 (± 7.0). IADL: 6.1 (± 1.7)   **Overall**   * *Relevant clinical variables*: hip surgery performed, n: THR: 14; hemiarthroplasty: 4; various forms of osteosynthesis: 10. Length of inpatient rehabilitation, mean (SD): 23 (± 5) days. Duration of care in the surgical unit, mean (SD): 9 (± 2) days   Note:   * study authors do not report the following characteristics: baseline level of fitness, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: high intensity, group based progressive resistance training; small group walking, stepping, balance and resistance training, delivered 3 times per week by a therapeutic recreation specialist; load adjusted to individual; usual care physiotherapy; for 12 weeks  Context: hip surgery patients; on discharge from hospital or in-patient rehabilitation; rehabilitation clinic (transport provided)  Comparison: placebo activities including calisthenics, games and memory task; delivered at rehabilitation clinic transport provided); 3 times per week; usual care physiotherapy  **Intervention group:** number randomised = 15; losses = 3 (2 = did not start intervention; 1 = dropped out due to motivation); analysed = 12  **Comparison group:** number randomised = 13; losses = 1 (did not start intervention); analysed = 12  **Setting:** clinic |
| **Outcomes** | **All outcomes measured/reported by study authors**: medical status, comorbidities, medication, and functional status, using the Barthel/Mahoney ADL, the Lawton/Brody IADL and cognitive status using the MMSE; muscle strength; functional performance; adverse events; training events; adherence; PA (Physical Activity Questionnaire for the Elderly); emotional status. Measured at baseline (last week of in-patient rehabilitation), end of intervention, three months after cessation of intervention (approx. 6 months after baseline)  **Outcomes relevant to the review:**   * Amount of PA: using a PA Questionnaire for the Elderly (total activity score); 6 months post-intervention * Physical fitness: using hand grip strength; 6 months post-intervention * Physical fitness: using leg press; 6 months post-intervention * Physical fitness: using TUG; 6 months post-intervention * Adherence to group sessions * Adverse events   **Study primary outcome:** adherence |
| **Notes** | **Sponsorship source:** supported with funding from the Ministerium fur Wissenschaft, Forschung and Kunst Baden-Wuerttemberg University of Heidelberg. Declarations of interest not reported  **Study dates:** not reported |
| **Reference(s)**  **\* primary reference** | Hauer K, Specht N, Schuler M, Bartsch P, Oster P. Intensive physical training in geriatric patients after severe falls and hip surgery. *Age & Ageing* 2002; **31**: 49-57 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Patients were recruited consecutively and randomly assigned to either control or intervention group after baseline testing in the last week of in-patient rehabilitation. No additional details |
| Allocation concealment (selection bias) | Unclear risk | Insufficient details |
| Blinding of participants and personnel (performance bias) | Unclear risk | This is a placebo control study suggesting participants are not aware of group allocation. No details on personnel although assumed that they are aware of group allocation. |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Outcomes were measured using subjective measurement tools, and participants were not blinded to the intervention |
| Blinding of outcome assessment: fitness outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: adverse events (detection bias) | Unclear risk | Observation method not specified for this outcome |
| Blinding of outcome assessment: adherence (detection bias) | Low risk | Objective measurement of class attendance |
| Incomplete outcome data (attrition bias) | Low risk | Low losses, explained |
| Selective reporting (reporting bias) | Unclear risk | Study authors do not report clinical trials registration or reference to a pre-published protocol; it is not feasible to effectively assess risk of selective reporting bias without these documents |
| Other bias | Low risk | No other forms of bias detected No other sources of bias detected |

Hawkes et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** this study aimed to determine the effects of a telephone-delivered multiple health behaviour change intervention (Can Change) on health and behavioural outcomes among colorectal cancer survivors |
| **Participants** | **Total number of randomised participants:** 410  **Inclusion criteria:** ≥ 18 years of age; residing in Queensland; histologically confirmed diagnosis of primary colorectal cancer (i.e. C18 to C20, C218) within the previous 12 months and Queensland Cancer Registry notification from 1 October 2008 to 30 June 2009; ability to understand and provide written informed consent in English; a telephone; ≥ 1 poor health behaviour consistent with the Australian recommendations (i.e., exercise < 150 minutes per week, < two servings of fruit or < five servings of vegetables per day, or overweight (BMI > 25 kg/m2))  **Exclusion criteria:** metastatic disease (confirmed during screening interview); medical conditions limiting adherence to an unsupervised PA program (as confirmed by their referring physician)  **Type of surgery (condition):** not specified (colorectal cancer)  **Country:** Australia  **Baseline Characteristics**  **Intervention group**   * *Type of condition, n (%)*: colon cancer: 145 (70.7) * *Age, mean (SD)*: 64.9 (± 10.8) years * *Gender, M/F*: 106/99 * *BMI, mean (SD)*: 24.5 (± 4.8) kg/m2 * *Relevant clinical variables*: number of comorbidities, n: 0: 29; 1 to 3: 147; ≥ 4: 49. Dukes’s cancer staging, n (%): stage A: 36 (17.6); stage B: 65 (31.7); stage C: 45 (22.0); unknown: 59 (28.8). Currently receiving treatment, n (%): chemotherapy: 55 (26.8); radiotherapy: 1 (0.5); other therapy: 2 (1.0) * *Number of non-surgical participants, n*: 9 * *Education status, n (%)*: completed at least high school: 184 (89.8) * *Economic status, n*: employed: 78. Household income per annum: ≤ $25,000: 54; $25,001 to $40,000: 46; $40,001 to $65,000: 23; $65,001 to $100,000: 28; > $100,000: 23; unknown/do not wish to answer: 31 * *Time since diagnosis, mean (SD)*: 6.0 (± 2.3) months   **Comparison group**   * *Type of condition, n (%)*: colon cancer: 131 (63.9) * *Age, mean (SD)*: 67.8 (± 9.2) years * *Gender, M/F*: 115/90 * *BMI, mean (SD)*: 26.4 (± 4.7) kg/m2 * *Relevant clinical variables*: number of comorbidities, n: 0: 18; 1 to 3: 130; ≥ 4: 57. Dukes’s cancer staging, n (%): stage A: 39 (19.0); stage B: 53 (25.9); stage C: 48 (23.4); unknown: 65 (31.7). Currently receiving treatment, n (%): chemotherapy: 42 (20.5); radiotherapy: 1 (0.5); other therapy: 5 (2.4) * *Number of non-surgical participants, n*: 7 * *Education status, n (%)*: completed at least high school: 188 (91.7) * *Economic status, n*: employed: 84. Household income per annum: ≤ $25,000: 45; $25,001 to $40,000: 56; $40,001 to $65,000: 30; $65,001 to $100,000: 29; > $100,000: 14; unknown/do not wish to answer: 31 * *Time since diagnosis, mean (SD)*: 6.3 (± 2.5) months   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, current involvement in regular PA, illness severity scores * comparison of the treatment groups on baseline characteristics revealed that the HC group was significantly younger than the UC group (P value = 0.005). Otherwise, no differences were found |
| **Interventions** | **Details of interventions**  Approach: telephone delivered health coaching; coaching promoting self-management and maintenance of behaviours, goal and self-monitoring of 10,000 steps per day; delivered by health coach bi-weekly for 6-months  Context: colorectal cancer survivors; 6.3 (2.5) months of diagnosis; home  Comparison: usual care  **Intervention group:** number randomised = 205; losses = 46 (unable to contact = 8; deceased = 4; too ill = 4; refusals = 25; passive refusals = 5); analysed at 12 months = 159  **Comparison group:** number randomised = 205; losses = 42 (unable to contact = 7; deceased = 5; too ill = 4; refusals = 23; passive refusals = 3); analysed at 12 months = 163  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors**: PA (Godin Leisure-Time Exercise Questionnaire); HRQoL (SF-36); cancer-related fatigue; BMI; dietary intake; smoking. Measured at baseline, 6 and 12 months post-surgery  **Outcomes relevant to the review:**   * Amount of PA: total MVPA using the Godin Leisure-Time Exercise Questionnaire; given as mins per week; 12 months post-surgery * HRQoL: using SF-36 (PCS); 12 months post-surgery   **Study primary outcome:** PA |
| **Notes** | **Sponsorship source:** supported by funding from the Australian Government through Cancer Australia. Study authors declare no conflicts of interest  **Study dates:** 1 October 2008 to 30 June 2009 |
| **Reference(s)**  **\* primary reference** | Hawkes AL, Chambers SK, Pakenham KI, Patrao TA, Baade PD, Lynch BM*, et al.* Effects of a Telephone-Delivered Multiple Health Behavior Change Intervention (CanChange) on Health and Behavioral Outcomes in Survivors of Colorectal Cancer: A Randomized Controlled Trial. *Journal of Clinical Oncology* 2013; **31**: 2313-21 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Computer-generated randomisation |
| Allocation concealment (selection bias) | Low risk | Concealed from participants and staff |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Outcomes were measured using subjective measurement tools, and participants were not blinded to the intervention |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Incomplete outcome data (attrition bias) | High risk | Losses were explained and relatively balanced between groups. However, we noted a large number of losses |
| Selective reporting (reporting bias) | Low risk | Prospective registration with a clinical trials register (ACTRN12608000399392; first received August 2008); all reported review outcomes were consistent with the clinical trials register documents |
| Other bias | Low risk | No other sources of bias detected |

Heiberg et al.

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| **Methods** | RCT, parallel design; multi-centre (2 hospitals)  **Study aim/objective:** physiotherapy is a common practice after THA; the overall aim being to optimise functional outcomes like walking and thereby enable patients to regain a physically active lifestyle. The objectives of this long-term follow-up study 5 years after THA were 1) to examine whether the 1-year effects from a previous walking skill training programme on walking and stair climbing still persist 5 years following THA; 2) to examine recovery of physical functioning from before surgery to 5 years; 3) to identify predictors of PA 5 years after THA from preoperative measures. |
| **Participants** | **Total number of randomised participants:** 68  **Inclusion criteria:** diagnosis of hip OA and residence within a radius of approximately 30 kilometres to the hospital, so that attending an exercise program after surgery could be possible  **Exclusion criteria:** OA in a knee or contralateral hip that restricted walking, as well as neurologic disease, heart disease, dementia, drug abuse, or inadequate ability to read and understand Norwegian  **Type of surgery (condition):** THA (OA)  **Country:** Norway  **Baseline Characteristics**  **Intervention group**   * *Age,* mean (95% CI): 65 (63 to 68) years * *Gender, M/F*: 14/21 * *BMI,* mean (95% CI): 27 (26 to 29) kg/m2 * *Relevant illness severity scores (e.g., ASA, APACHE II), mean (95% CI)*: HOOS ADL: 81 (77 to 86) * *Relevant clinical variables, n*: comorbidities: cancer: 1; osteoporosis: 0; musculoskeletal disorders: 6; stomach/intestinal problem: 2; lung disease: 0; psychological disorder: 0 * *Education status, n*: ≤ 12 years: 14; > 12 years: 21   **Comparison group**   * *Age,* mean (95% CI): 66 (63 to 69) years * *Gender, M/F*: 19/14 * *BMI,* mean (95% CI): 27 (25 to 28) kg/m2 * *Relevant illness severity scores (e.g., ASA, APACHE II), mean (95% CI)*: HOOS ADL: 87 (84 to 90) * *Relevant clinical variables, n*: comorbidities: cancer: 2; osteoporosis: 2; musculoskeletal disorders: 3; stomach/intestinal problem: 2; lung disease: 1; psychological disorder: 1 * *Education status, n*: ≤ 12 years: 15; > 12 years: 18   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, current involvement in regular PA |
| **Interventions** | **Details of interventions**  Approach: exercise classes; group exercise classes (usually walking and balance), twice a week for 6 weeks; delivered by a physiotherapist  Context: THA patients; 3-months post-surgery; hospital (outpatient)  Comparison: usual care though encouraged to continue with exercise recommended during hospital or rehabilitation  **Intervention group:** number randomised = 35; losses = 5 (dropped out = 2; cancer treatment = 1; died = 1; psychological problems = 1); analysed at 5 years = 30  **Comparison group:** number randomised = 33; losses = 3 (dropped out = 2; leg fracture = 1); analysed at 5 years = 30  **Setting:** hospital (outpatient) |
| **Outcomes** | **All outcomes measured/reported by study authors**: physical fitness (6MWT); SCT; hip ROM; self-efficacy; adverse events; HRQoL (HOOS); amount of PA (UCLA). Measured at baseline (pre-surgery), 3 months; 5 months; 12 months, and 5 years  **Outcomes relevant to the review:**   * Amount of PA: using the UCLA (scale 1 to 10); 5 years post-surgery * Physical fitness: using 6MWT; 5 years post-surgery * HRQoL: using HOOS; 5 years post-surgery * Pain: using HOOS pain score: 5 years post-surgery * Adverse events   **Study primary outcome:** 6MWT (listed first) |
| **Notes** | **Sponsorship source:** supported by funding from theVestre Viken Hospital Trust. Study authors declare no conflicts of interest  **Study dates:** October 2008 to March 2010; assessments for 5-year follow-up conducted May 2014 to August 2014 |
| **Reference(s)**  **\* primary reference** | Heiberg KE, Figved W. Exercise, recovery of physical functioning, and prediction of physical activity after total hip arthroplasty. 5-year follow-up of a rct. Annals of the Rheumatic Diseases 2015; **74**: 1318‐1319. [DOI: 10.1136/annrheumdis-2015-eular.3078]  \* Heiberg KE, Figved W. Physical Functioning and Prediction of Physical Activity After Total Hip Arthroplasty: Five-Year Followup of a Randomized Controlled Trial. *Arthritis care & research* 2016; **68**: 454-62  NCT00808483. Walking skill training program effects in patients with total hip arthroplasty [Effect of a walking skill training program in patients who have undergone total hip arthroplasty: follow-up one year after surgery]. [Walking Skill Training Program Effects in Patients With Total Hip Arthroplasty - Full Text View - ClinicalTrials.gov](https://clinicaltrials.gov/ct2/show/NCT00808483) (first received 15 December 2008) |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Method used to generate random sequence is not reported |
| Allocation concealment (selection bias) | Unclear risk | Quote: "The patients were randomized to either the training group or the control group receiving no physiotherapy by drawing an opaque envelope containing a note assigning them to one of the groups."  Comment: study authors do not describe whether envelopes are sealed and sequentially numbered |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Outcomes were measured using subjective measurement tools, and participants were not blinded to the intervention |
| Blinding of outcome assessment: fitness outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adverse events (detection bias) | High risk | Outcome was self-reported |
| Incomplete outcome data (attrition bias) | Low risk | Low attrition and all explained |
| Selective reporting (reporting bias) | Low risk | Prospective registration with a clinical trials register (NCT00808483; first received December 2008); all reported review outcomes were consistent with the clinical trials register documents |
| Other bias | Low risk | No other sources of bias detected |

Heitkamp et al.

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| **Methods** | BA; multi centre (2 centres)  **Study aim/objective:** the aim of this study was to investigate changes of PA and aerobic capacity within a 12-month endurance-focused exercise intervention in colorectal cancer survivors |
| **Participants** | **Total number of included participants:** 50  **Inclusion criteria:** patients with colorectal cancer (UICC II/III) were included after surgery  **Exclusion criteria:** not reported  **Type of surgery (condition):** not specified (colorectal cancer)  **Country:** Germany  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 58.4 (± 10.3) years * *Gender, M/F*: 27/23 * *Relevant clinical variables, %*: colon cancer: 68   Note:   * study authors do not report the following characteristics: BMI, weight, height, baseline level of fitness, current involvement in regular PA, illness severity scores |
| **Interventions** | **Details of intervention**  Approach: supervised and home-based exercise training; 12-months  Context: colorectal cancer patients; post-surgery; supervised location and home  Notes: No further details on session design or delivery  Comparison: no comparator group  **Intervention group:** number included = 50; losses = 0; analysed = 50  **Setting:** supervised location and home |
| **Outcomes** | **All outcomes measured/reported by study authors**: amount of PA (IPAQ); HRQoL (EORTC QLQ-C30); anxiety and depression (HADS); psychosocial burden (FBK-R 23); cardiopulmonary exercise test (CPET). Measured at baseline and 12 months  **Outcomes relevant to the review:**   * Amount of PA: using IPAQ SF; 12 months post-surgery * Physical fitness: using VO2 Peak; 12 months post-surgery   **Study primary outcome:** PA and aerobic capacity  Note:   * *Extra outcome data*: compliance rate to the training sessions was 78%. 7 participants reported an activity level of ≥18 MET-hours/week in ≥ 70% of all training weeks |
| **Notes** | **Sponsorship source:** supported with funding fromthe Deutsche Krebshilfe. Study authors declare no conflicts of interest  **Study dates:** not reported |
| **Reference(s)**  **\* primary reference** | \* Heitkamp M, Spanier B, Von Korn P, Halle M. Feasibility of a 12 months exercise intervention in colorectal cancer patients-The F-PROTECT study. *Oncology research and treatment* 2018;**41 (Supplement 1)**:27  Von Korn P, Heitkamp M, Spanier B, Halle M. Improvement of physical activity and aerobic capacity in colorectal cancer patients after a 12-month-exercise intervention. Oncology research and treatment 2018; **41 (Supplement 1)**: 54. [DOI: <http://dx.doi.org/10.1159/000487109>] |

Hoorntje et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** objectively quantify PA changes after KA and to compare GAS-based rehabilitation to standard rehabilitation |
| **Participants** | **Total number of randomised participants:** 120  **Inclusion criteria:** < 65 years of age; suffering from debilitating knee osteoarthritis and awaiting KA; participating in a paid or voluntary job or working as an informal caregiver; able to define and perform personal rehabilitation goals  **Exclusion criteria:** cognitive or mental impairment; no adequate levels of reading and writing the Dutch language; any disabling condition apart from knee osteoarthritis that restricts patients from performing their normal activities (e.g., pulmonary or cardiac disease, systemic inflammatory disease or pre-existing arthroplasty of hip or contralateral knee)  **Type of surgery (condition):** KA  **Country:** Netherlands  **Baseline Characteristics**  **Intervention group**   * *Type of KA, n (%)*: total: 25 (54); unicompartmental: 21 (46) * *Age, mean (SD)*: 58.6 (± 5.0) years * *Gender, M/F*: 18/28 * *BMI, mean (SD)*: 30.7 (± 5.3) kg/m2 * *Relevant clinical variables, n (%)*: ASA classification: I: 9 (20); II: 26 (56); III: 11 (24) * *Current involvement in regular PA, mean % (SE)*: time spent during waking hours in active activity: 15.9 (± 0.9)   **Comparison group**   * *Type of KA, n (%)*: total: 27 (53); unicompartmental: 24 (47) * *Age, mean (SD)*: 58.2 (± 4.6) years * *Gender, M/F*: 23/28 * *BMI, mean (SD)*: 32.0 (± 5.6) kg/m2 * *Relevant clinical variables, n (%)*: ASA classification: I: 9 (18); II: 29 (57); III: 13 (25) * *Current involvement in regular PA, mean % (SE)*: time spent during waking hours in active activity: 16.9 (± 0.8)   Note:   * study authors do not report the following characteristics: race, education status, economic status, weight, height, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: goal-based physiotherapy; individualised goal-based rehabilitation activities, set for a period of 3 to 12 months, by participants with support from physiotherapist during one-off session, goals approved by interdisciplinary team; varied in length per participant.  Context: knee arthroplasty; post-surgery; physiotherapy clinic and home (self-directed)  Comparison: usual care physiotherapy rehabilitation, also provided to intervention group  **Intervention group:** number randomised = 60; losses = 14 (technical failure = 4; patient withdrawal = 7; < 3 consecutive measurement days = 2; lost in mail = 1); analysed = 46  **Comparison group:** number randomised = 60; losses = 9 (technical failure = 1; patient withdrawal = 2; lost in mail = 2; no diary data = 1; < 3 consecutive measurement days = 1; skin reaction = 2); analysed = 51  **Setting:** clinic and home |
| **Outcomes** | **All outcomes measured/reported by study authors**: changes in PA patterns using a triaxial Activ8 accelerometer (Remedy Distribution Ltd, Valkenswaard, The Netherlands). Measured at preoperative baseline and 6 months post-surgery  **Outcomes relevant to the review:**   * Amount of PA: using an accelerometer; based on changes in percentage of time spent active from baseline at 6 months post-surgery   **Study primary outcome:** changes in PA patterns |
| **Notes** | **Sponsorship source:** supported by FNO (grant no. 1403-026). The authors reported the following conflicts of interest: Dr Van Geenen is a paid consultant for Zimmer Biomet; the orthopaedic research foundation receives money from several companies (Stryker, Zimmer Biomet, Mathys) to support specific research projects and the foundation in general  **Study dates:** October 2015 to November 2017 |
| **Reference(s)**  **\* primary reference** | Hoorntje A, Witjes S, Kuijer PPFM, Bussmann JBJ, Horemans HLD, Kerkhoffs GMMJ*, et al.* Does Activity-Based Rehabilitation With Goal Attainment Scaling Increase Physical Activity Among Younger Knee Arthroplasty Patients? Results From the Randomized Controlled ACTION Trial. *Journal of Arthroplasty* 2020; **35**: 706-11 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Described as randomized in a 1:1 allocation, but no further details |
| Allocation concealment (selection bias) | Low risk | Consecutively numbered, sealed, opaque envelopes were used |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to intervention groups |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Incomplete outcome data (attrition bias) | High risk | Although balanced between groups, we noted a high number of losses |
| Selective reporting (reporting bias) | High risk | Prospective registration with a clinical trials register (NTR5251; first received June 2015). However, not all reported outcomes are included in the registration documents which may indicate high risk of reporting bias |
| Other bias | Low risk | No other sources of bias detected |

Hubbard et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** to assess whether or not CR is a feasible and acceptable model to aid the recovery of people with colorectal cancer and to test the feasibility and acceptability of the protocol design |
| **Participants** | **Total number of randomised participants:** 41  **Inclusion criteria:** ≥ 18 years of age; diagnosed with primary colorectal cancer; in the recovery period post-surgery; were/were not receiving adjuvant chemotherapy/radiotherapy (to reduce risk of infection, patients would have to wait 48 hours after each chemotherapy session before attending cardiac rehabilitation classes)  **Exclusion criteria:** advanced disease; failed clinical/risk assessment for rehabilitation and were deemed unsafe to participate in exercise classes; severe cognitive impairment; unable to communicate in English  **Type of surgery (condition):** colorectal surgery (colorectal cancer)  **Country:** UK  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 67.9 (± 11.49) years * *Gender, M/F*: 13/8 * *Current involvement in regular PA, mean (SD)*: MVPA: 21.1 (± 11.68) minutes/day * *Relevant clinical variables, n*: TNM, primary tumour: missing: 3; T0: 1; T1: 1; T2: 7; T3: 7; T4: 2   **Comparison group**   * *Age, mean (SD)*: 64.2 (± 11.10) years * *Gender, M/F*: 14/6 * *Current involvement in regular PA, mean (SD)*: MVPA: 29.0 (± 35.90) minutes/day * *Relevant clinical variables, n*: TNM, primary tumour: missing: 6; T0: 0; T1: 2; T2: 5; T3: 4; T4: 3   Note:   * study authors do not report the following characteristics: BMI, weight, height, baseline level of fitness, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: cardiac rehabilitation; exercise sessions, optional tailored home exercise material, health education and risk factors, behaviour change support from cardiac physiotherapist; exercise sessions once or twice a week over 6 to 12 weeks by a cardiac physiotherapist, physiotherapist assistant and/or cardiac nurse.  Context: colorectal surgery patients; hospital gym or sports centre; post-surgery and hospital discharge  Comparison: usual care; patients were given a booklet about staying healthy after bowel cancer  **Intervention group:** number randomised = 21 (site 1 = 6; site 2 = 9; site 3 = 6); reported losses = 8 (could not complete all classes = 3; did not begin = 5) some attrition is unexplained; analysed for PA = 6 (losses due to invalid data); analysed for HRQoL = 12  **Comparison group:** number randomised = 20 (site 1 = 7; site 2 = 9; site 3 = 4); losses = not reported; analysed for PA = 8 (losses due to invalid data); analysed for HRQoL = 13  **Setting:** gym or sports centre |
| **Outcomes** | **All outcomes measured/reported by study authors**: amount of PA (Actigraph); type of PA (SPAQ); HRQoL (EQ-5D and SF-36); cancer-specific QoL (FACT-C); adverse events; adherence; anxiety and depression (HADS); fatigue (FACIT); self-efficacy; risk perception; clinical variables. Measured at baseline, end of intervention (3 months), and second follow-up (6 months)  **Outcomes relevant to the review:**   * Amount of PA: MVPA using an Actigraph GT3X+ triaxial accelerometer (ActigraphLLC, Pensacola, FL, USA); 6 months post-surgery * HRQoL: EQ-5D-5L; 6 months post-surgery * Adherence: attending the programme * Adverse events * Participant experience   **Study primary outcome:** PA |
| **Notes** | **Sponsorship source:** supported by funding from theNational Institute for Health Research. Declarations of interest not reported  **Study dates:** the first participant was recruited on 13 January 2014 (site 1) and the last participant was recruited on 29 July 2014 |
| **Reference(s)**  **\* primary reference** | Hubbard G, Adams R, Campbell A, Kidd L, Leslie S, Munro J, et al. Cardiac rehabilitation to increase physical activity among cancer patients: is it feasible and acceptable? Psycho-Oncology 2016; **25** **(Supplement 3)**: 5  Hubbard G, Adams R, Campbell A, Kidd L, Leslie SJ, Munro J, et al. Is referral of postsurgical colorectal cancer survivors to cardiac rehabilitation feasible and acceptable? A pragmatic pilot randomised controlled trial with embedded qualitative study. BMJ Open 2016; **6**: e009284.  \* Hubbard G, Munro J, O'Carroll R, Mutrie N, Kidd L, Haw S*, et al.* The use of cardiac rehabilitation services to aid the recovery of colorectal cancer patients: a pilot randomised controlled trial (RCT) with embedded feasibility study. *NIHR Journals Library Health Services and Delivery Research* 2016; **08**  ISRCTN63510637. CRIB (cancer rehabilitation in bowel cancer): the use of cardiac rehabilitation services to aid the recovery of colorectal cancer patients: a pilot randomised controlled trial (RCT) with embedded feasibility study [The use of cardiac rehabilitation services to aid the recovery of colorectal cancer patients: a pilot randomised controlled trial (RCT) with embedded feasibility study]. isrctn.com/ISRCTN63510637 (first received 21 March 2013) |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | "Randomisation of individual participants to a particular treatment arm was undertaken using an automated online randomisation system." |
| Allocation concealment (selection bias) | Low risk | Randomisation was provided by an external clinical trials unit |
| Blinding of participants and personnel (performance bias) | High risk | “Because of the nature of the intervention, it was not possible to blind participants, investigators or the clinicians delivering the intervention (i.e., cardiac rehabilitation multidisciplinary team) to the treatment allocation.” |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adverse events (detection bias) | Unclear risk | Observation method not specified for this outcome |
| Blinding of outcome assessment: adherence (detection bias) | Low risk | Objective measurement of programme completion |
| Incomplete outcome data (attrition bias) | High risk | Large number of losses in both groups |
| Selective reporting (reporting bias) | Low risk | Prospective registration with a clinical trials register (ISRCTN63510637; first received December 2012); all reported review outcomes were consistent with the clinical trials register documents |
| Other bias | High risk | "There was recruitment bias; at baseline, participants were meeting or nearly meeting recommended levels for physical activity (i.e., 30 minutes of moderate physical activity per day), had good self-reported quality of life and low levels of fatigue and low anxiety and depression, high physical activity self-efficacy and risk perception." "There were no significant differences in age, gender and type of surgery (colon or rectal) between consenting and non-consenting eligible patients, but people with metastatic disease, having open surgery or who had a stoma were more likely not to participate. However, there was recruitment bias; although eligible, most participants were already meeting the recommended level for MVPA (i.e., 30 minutes per day)." |

Husebo et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** this study investigated the effects of a scheduled home-based exercise intervention in breast cancer patients during adjuvant chemotherapy, on cancer-related fatigue, physical fitness, and activity level |
| **Participants** | **Total number of randomised participants:** 67  **Inclusion criteria:** breast cancer patients; 18 to 70 years of age; surgically treated for early-stage breast cancer (mastectomy or lumpectomy); allocated to adjuvant chemotherapy according to the national treatment guidelines of the Norwegian Breast Cancer Group; able to read, write, and speak Norwegian; approved for participation in the study by a clinical oncologist  **Exclusion criteria:** not reported  **Type of surgery (condition):** mastectomy or lumpectomy (breast cancer)  **Country:** Norway  **Baseline Characteristics**  **Intervention group**   * *Type of surgery, n (%)*: lumpectomy: 21 (63.6); mastectomy: 12 (36.4) * *Age, mean (SD)*: 50.8 (± 9.7) years * *Gender*:all female * *Weight, mean (SD)*: 69.0 (± 11.6) kg * *Current involvement in regular PA, mean (SD)*: METS: 1333.66 (± 1367.67) minutes/week * *Relevant illness severity scores (e.g., ASA, APACHE II), n*: cancer stage (pTNM): stage I: 7; stage II: 19; stage III: 3 * *Ethnicity, n*: Norwegian: 27; other: 5; missing: 1 * *Education status, n (%)*: high school: 4 (12.5); college: 9 (28.2); university: 19 (59.3): missing 1 (3.0)   **Comparison group**   * *Type of surgery, n (%)*: lumpectomy: 24 (70.6); mastectomy 10 (29.4) * *Age, mean (SD)*: 53.6 (± 8.8) years * *Gender*: all female * *Weight, mean (SD)*: 72.0 (± 15.7) kg * *Current involvement in regular PA, mean (SD)*: METS: 1138.00 (± 1148.81) minutes/week * *Relevant illness severity scores (e.g., ASA, APACHE II), n*: cancer stage (pTNM): stage I: 12; stage II: 15; stage III: 4 * *Ethnicity, n*: Norwegian: 30; other: 4; missing: 0 * *Education status, n (%)*: high school: 8 (23.5); college: 14 (41.1); university: 12 (35.2); missing 0 (0)   Note:   * study authors do not report the following characteristics: BMI, height, baseline level of fitness, relevant clinical variables |
| **Interventions** | **Details of interventions**  Approach: exercise prescription with telephone support; aerobic prescription of a daily 30 minutes of brisk walking, recommended strength training three times per week, bi-weekly motivational telephone calls from the research team; duration, mean (SD): 16.7 (± 7.6) weeks  Context: breast cancer patients; during adjuvant chemotherapy; home  Comparison: usual care; advised to exercise at usual PA level; duration, mean (SD): 17.6 ± 7.9 weeks  **Intervention group:** number randomised = 33; losses = 8 (withdrawal); analysed = 25  **Comparison group:** number randomised = 34; losses = 6 (withdrawal); analysed = 28  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors**: amount of PA (IPAQ-SF); fatigue (SCFS-6); physical fitness (6MWT); data on exercise volume collected from exercise diaries; exercise adherence. Measured at baseline (after surgery, prior to chemotherapy), 18 to 24 weeks after baseline and at the end of chemotherapy, and approximately 6 months after completing the chemotherapy regimen  **Outcomes relevant to the review:**   * Amount of PA: using IPAQ-SF; 6 months post-intervention * Physical fitness: using 6MWT; 6 months post-intervention * Adherence: meeting general recommendations of 150 minutes/week of MVPA; meeting 210 minutes/week of MVPA; meeting prescribed number of strength training sessions per week * Adverse events   **Study primary outcome:** exercise volume (listed first) |
| **Notes** | **Sponsorship source:** funding support not reported. Study authors declare no conflicts of interests  **Study dates:** 2010 to 2012 |
| **Reference(s)**  **\* primary reference** | Husebo AML, Dyrstad SM, Mjaaland I, Soreide JA, Bru E. Effects of scheduled exercise on cancer-related fatigue in women with early breast cancer. *The scientific world journal* 2014 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Insufficient details |
| Allocation concealment (selection bias) | Unclear risk | Use of concealed envelopes; however, study authors do not report whether envelopes are sealed, opaque, or sequentially numbered |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Outcomes were measured using subjective measurement tools, and participants were not blinded to the intervention |
| Blinding of outcome assessment: fitness outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: adverse events (detection bias) | Unclear risk | Observation method not specified for this outcome |
| Blinding of outcome assessment: adherence (detection bias) | High risk | Outcome was self-reported |
| Incomplete outcome data (attrition bias) | High risk | Although losses were relatively balanced between groups, the sample size was small and the losses were high |
| Selective reporting (reporting bias) | Unclear risk | Pre-published protocol or trial registration is not reported; it is not feasible to effectively assess the risk of selective reporting bias without these documents |
| Other bias | Low risk | No other sources of bias detected |

Ilves et al.

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| **Methods** | RCT, parallel design; multi-centre (2 hospitals)  **Study aim/objective:** to evaluate the effects of a 12-month postoperative back-specific exercise programme combined with aerobic training on fear of movement and PA in people with isthmic or degenerative spondylolisthesis |
| **Participants** | **Total number of randomised participants:** 104  **Inclusion criteria:** scheduled for non-urgent lumbar spine fusion surgery for isthmic or degenerative spondylolisthesis; > 18 years of age  **Exclusion criteria:** severe cardiorespiratory or musculoskeletal disease; fracture; tumour; severe psychiatric disorder; extensive lower limb paresis; alcohol abuse; immediate complications after surgery which prevented participation in a postoperative rehabilitation programme  **Type of surgery (condition):** lumbar spine fusion surgery (spondylolisthesis)  **Country:** Finland  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 59 (± 12) years * *Gender, M/F*: 14/34 * *BMI, mean (SD)*: 28.3 (± 4.8) kg/m2 * *Length of education, mean (SD)*: 12 (± 3.7) years   **Comparison group**   * *Age, mean (SD)*: 58 (± 12) years * *Gender, M/F*: 12/38 * *BMI, mean (SD)*: 28.3 (± 4.8) kg/m2 * *Length of education, mean (SD)*: 12.6 (± 3.6) years   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, current involvement in regular PA, illness severity scores, clinical variables |
| **Interventions** | **Details of interventions**  Approach: home exercise with clinic booster sessions and telephone support; home walking and resistance training, physiotherapy booster sessions and support with barriers and pain; delivered one-to-one by physiotherapist; independent exercise three times per week, clinic sessions bi-monthly and telephone support if needed  Context: lumber spine fusion surgery patients; three-month post-surgery; home-based, some clinic visits  Comparison: usual care; one guidance session with a physiotherapist 3 months after surgery with guidance for usual care home exercise  **Intervention group:** number randomised = 52; losses = excluded before intervention = 4 (declined = 1; moved = 2; re-operation = 1); lost to 12-month follow-up = 1 (died = 1 - but was included in ITT); analysed = 48  **Comparison group:** number randomised = 52; losses = 2 (MI = 1; re-operation = 1); lost to 12-month follow-up = 0; analysed = 50  **Setting:** 2 hospitals |
| **Outcomes** | **All outcomes measured/reported by study authors**: intensity of back and lower limb pain (VAS); disability due to back pain (ODI); HRQoL (Finnish version of the SF-36); physical function/fitness; maximal isometric forces of the trunk flexors and extensors (using a strain-gauge dynamometer); endurance strength of the trunk extensors (Biering-Sorensen test); spinal mobility towards flexion (Schober and Stibor tests; FTF); lateral bending by the method described by Frost *et al.*;1 functional mobility (TUG); subjective experience of fear of movement (TSK); PA (IPAQ-SF); training diaries will capture the frequency of the back-specific exercises and pedometers will be used to assess the total amount of daily steps in the intervention arm. The number of aerobic steps (10 minutes of continuous walking more than 60 steps per minute) during 1 week will be reported at least every second month. Measured at baseline (3 months postoperatively), at the end of the exercise intervention period (15 months postoperatively), and at 1 year follow-up  **Outcomes relevant to the review:**   * Amount of PA: using IPAQ-SF; 12 months post-intervention * Adherence: compliance with exercises reported as frequency per week * Pain: using VAS (back and leg pain); 12 months post-intervention   **Study primary outcome:** intensity of back and lower limb pain; disability due to back pain; HRQoL |
| **Notes** | **Sponsorship source:** supported byfunding from the Academy of Finland and grant funding from the Medical Research Funds of Tampere University Hospital and Central Finland Central Hospital. Study authors declare no conflicts of interest  **Study dates:** September 2009 to January 2012 |
| **Reference(s)**  **\* primary reference** | \* Ilves O, Häkkinen A, Dekker J, Wahlman M, Tarnanen S, Pekkanen L*, et al.* Effectiveness of postoperative home-exercise compared with usual care on kinesiophobia and physical activity in spondylolisthesis: a randomized controlled trial. *Journal of Rehabilitation Medicine* 2017; **49**: 751‐7  NCT00834015. Spinal fusion and rehabilitation study [Outcome of lumbar spinal fusion patients and significance of postoperative exercise therapy: randomized controlled trial and spine register study]. <Https://clinicaltrials.gov/ct2/show/NCT00834015> (first received 2 February 2009).  Neva M, Ilves O, Dekker J, Pekkanen L, Marttinen I, Vihtonen K, Piitulainen K, Jarvenpaa S, Hakkinen A. Quality of life and disability: can they be improved by active postoperative rehabilitation after spinal fusion surgery? a randomised controlled trial with 12-month follow-up. European Spine Journal 2015; **24**: S692‐. [DOI: 10.1007/s00586-015-4129-1]  Neva M, Ilves OE, Pekkanen LT, Dekker J, Marttinen IH, Hakkinen A. Effect of lumbar spine fusion and postoperative exercise therapy on physical activity and kinesiophobia: a randomized controlled trial. Spine Journal 2014; **14**: S47. [DOI: 10.1016/j.spinee.2014.08.124]  Tarnanen S, Neva MH, Dekker J, Hakkinen K, Vihtonen k, Pekkanen L, Hakkinen A. Randomized controlled trial of postoperative exercise rehabilitation program after lumbar spine fusion: study protocol. BMC Musculoskeletal Disorders 2012; **13**: 123. [DOI: <https://dx.doi.org/10.1186/1471-2474-13-123>] |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | "Allocation to LSF-EX or LSF-UC was performed randomly using computer-generated 4-block randomization lists compiled by a biostatistician" |
| Allocation concealment (selection bias) | Low risk | "Concealed randomization was used, and was conducted by nurses who were not otherwise involved in the study" |
| Blinding of participants and personnel (performance bias) | High risk | Quote: "physiotherapists could not be blinded." |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Outcomes were measured using subjective measurement tools, and participants were not blinded to the intervention |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adherence (detection bias) | High risk | Outcome self-reported |
| Incomplete outcome data (attrition bias) | Low risk | Few losses; all explained |
| Selective reporting (reporting bias) | Low risk | Prospective registration with a clinical trials register (NCT00834015; first received February 2009); all reported review outcomes were consistent with the clinical trials register documents |
| Other bias | Low risk | No other sources of bias detected |

Jiménez-Loaisa et al.

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| **Methods** | Q-RCT, parallel design; single centre  **Design features:** a quasi-experimental design with pseudo-random assignment was chosen to carry out this study. The first 10 participants who consulted the clinical psychologist were assigned to the MPAI-G, whereas the next 10 visitors were assigned to the CG. This procedure was repeated with the following 20 bariatric patients, such that the next 10 patients were assigned to the MPAI-G and started the PA program from the beginning after surgery, whereas the next 10 were assigned to the CG. This pseudo-random assignment was chosen because, considering the tenets of SDT, participation in a group-PA program was a key aspect to improve relatedness, motivation, wellbeing, and adherence to PA. Taking into account that only 2 to 4 patients were operated per month, the most reasonable way to develop a group program with enough participants was to select patients for each group (MPAI-G and CG) in batches of 10 participants.  **Study aim/objective:** to examine the effects of a 6-month motivational PA intervention on bariatric patients’ PA levels and HRQoL from pre-surgery to the end of the intervention (7 months post-surgery); additionally, a re-test was performed 13 months post-surgery |
| **Participants** | **Total number of randomised participants:** 40  **Inclusion criteria:** BMI > 40 kg/m2 or > 35 kg/m2 with an associated comorbidity; between 18 and 60 years of age; experienced previous failed obesity treatments with restrictive-caloric diets and medications; having followed endocrinology and nutritional monitoring, adequately adhering to the therapeutic instructions; having no medical, physical, psychological, or social contraindications; consent of the surgeon and the clinical psychologist  **Exclusion criteria:** unavailability to attend the program regularly; any physical complication derived from sleeve gastrectomy (SG); any other medical or psychological condition that prevented habitual participation in PA during the course of the study  **Type of surgery (condition):** bariatric surgery  **Country:** Spain  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 47.5 (± 8.8) years * *Gender, M/F*: 3/14 * *BMI, mean (SD)*: 43.8 (± 5.3) kg/m2 * *Weight, mean (SD)*: 114.9 (± 21.4) kg * *Race, %*: white: 94.1; Hispanic: 5.9 * *Education status, %*: without/incomplete primary school: 5.9; primary school: 35.3; high school: 52.9; college or university degree: 5.9   **Comparison group**   * *Age, mean (SD)*: 42.6 (± 10.9) years * *Gender, M/F*: 4/11 * *BMI, mean (SD)*: 43.1 (± 4.5) kg/m2 * *Weight, mean (SD)*: 116.6 (± 16.8) kg * *Race, %*: white: 100 * *Education status, %*: without/incomplete primary school: 26.7; primary school: 33.3; high school: 40.0; college or university degree: 0   Note:   * study authors do not report the following characteristics: height, baseline level of fitness, current involvement in regular PA, illness severity scores, relevant clinical variables |
| **Interventions** | **Details of interventions**  Approach: exercise sessions; progressively frequent sessions from two to four sessions per week, across 6 months, home-based exercise plan, behaviour change approach; delivered by exercise and sport science professionals  Context: bariatric patients; one-month post-surgery; public fitness centre and home  Comparison: usual care  **Intervention group:** number randomised = 20; losses = 3 (dropped out for personal reasons = 1; invalid accelerometer = 2); analysed = 17  **Comparison group:** number randomised = 20; losses = 5 (invalid accelerometer = 1; declined to participate = 4); analysed = 15  **Setting:** fitness centre and home |
| **Outcomes** | **All outcomes measured/reported by study authors**: amount of PA (accelerometer); HRQoL (SF-36). Measured at baseline (2 weeks before surgery) and post-intervention (7 and 13 months post-surgery)  **Outcomes relevant to the review:**   * Amount of PA: using an accelerometer and reported as minutes per day; 13-month post-surgery * HRQoL: using SF-36 (general); 13-month post-surgery   **Study primary outcome:** PA |
| **Notes** | **Sponsorship source: supported by funding** this study was supported by institutional funding from the Escuela de Estudios Universitarios Real Madrid-Universidad Europea de Madrid and funding from the Fundación MAPFRE. Alejandro Jiménez-Loaisa was supported by the Valencian Council of Education, Research, Culture and Sports. Manuel Alcaraz-Ibáñez was supported by grant funding from the Spanish Ministry of Education. Declarations of interest not reported  **Study dates:** November 2011 to May 2013  **Comments:** this was originally known as NCT03666481 2018 |
| **Reference(s)**  **\* primary reference** | González-Cutre D, Megías Á, Beltrán-Carrillo VJ, Cervelló E, Spray CM. Effects of a physical activity program on post-bariatric patients: a qualitative study from a self-determination theory perspective. J Health Psychol 2018; DOI: 10.1177/1359105318770729  \* Jiménez-Loaisa A, González-Cutre D, Beltrán-Carrillo VJ, Alcaraz-Ibáñez M. Changes in bariatric patients’ physical activity levels and health-related quality of life following a postoperative motivational physical activity intervention. *Obesity Surgery* 2020; **30**: 2302-12  NCT03666481. Physical activity in bariatric patients [Psychosocial effects of a motivational physical activity program in bariatric patients]. <Https://clinicaltrials.gov/ct2/show/NCT03666481> (first received 11 September 2018) |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | High risk | Quasi-randomisation performed by alternative allocation in blocks of 10 |
| Allocation concealment (selection bias) | High risk | It is not feasible to conceal allocation because of the quasi-randomised methods to allocate groups |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Incomplete outcome data (attrition bias) | High risk | Slightly more participants lost in the comparison group. The sample size is small and the relative number of losses is high |
| Selective reporting (reporting bias) | Low risk | Study is registered prospectively with a clinical trials register (NCT03666481; first received September, 2018); all reported outcomes were consistent with these prospectively prepared documents |
| Other bias | Low risk | No other sources of bias recorded |

Johansson et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** to compare the effects of a regular, clinic-based, behaviour-oriented physiotherapy programme with a home-based exercise programme on disability; activity level; behavioural aspects such as kinesiophobia and coping; pain; global health measures; and patient satisfaction |
| **Participants** | **Total number of randomised participants:** 59  **Inclusion criteria:** scheduled for planned (not acute) first-time lumbar disc surgery; between 18 and 60 years of age; had a lumbar disc herniation confirmed by MRI  **Exclusion criteria:** comorbidity influencing daily activities and not being fluent in the Swedish language  **Type of surgery (condition):** standard lumbar discectomy (lumbar disc herniation)  **Country:** Sweden  **Baseline Characteristics**  **Intervention group (clinic based)**   * *Age, median (range)*: 43 (35 to 47) years * *Gender, M/F*: 17/12 * *Relevant illness severity scores (e.g., ASA, APACHE II)*: level of disc herniation, n: L5–S1: 15; L4-L5: 14. Duration of symptoms before surgery, median (range): 10 (6 to 24) months   **Comparison group (home based)**   * *Age, median (range)*: 38 (31 to 43) years * *Gender, M/F*: 18/12 * *Relevant illness severity scores (e.g., ASA, APACHE II)*: level of disc herniation, n: L5–S1: 15; L4-L5: 12; L3-L4: 1; L2-L3: 2. Duration of symptoms before surgery, median (range): 6 (4 to 17) months   Note:   * study authors do not report the following characteristics: BMI, weight, height, baseline level of fitness, current involvement in regular PA, relevant clinical variables * the median age in the clinic-based training group was 43 years (range 30 to 59), which was significantly higher than the home-based training group with a median of 38 years (range 25 to 57) |
| **Interventions** | **Details of interventions**  Approach (clinic based): behavioural approach to physiotherapy; mobility, resistance and walking sessions with a focus on fear and avoidant behaviour, encouraged to take independent daily walks; delivered by physiotherapist, weekly over 8-weeks  Approach (home based): behavioural approach to physiotherapy; mobility, resistance and walking sessions with a focus on fear and avoidant behaviour, encouraged to take independent daily walks; delivered by physiotherapist, weekly over 8-weeks  Context: standard lumbar discectomy patients; physiotherapy clinic and home  **Intervention group:** number randomised = 29; losses = 1 (did not return questionnaire); analysed = 28  **Comparison group:** number randomised = 30; losses = 1 (did not return questionnaire); analysed = 29  **Setting:** physiotherapy clinic and home |
| **Outcomes** | **All outcomes measured/reported by study authors**: back pain-related disability (self-report questionnaire); engagement in PA (self-reported); kinesiophobia; coping strategies; the intensity of back and leg pain; generic HRQoL (EQ-5D); patient satisfaction; therapies given by other caregivers; change in leg pain; adherence. Measured before randomisation/pre-surgery, 3 and 12 months post-surgery  **Outcomes relevant to the review:**   * Engagement in PA: self-reported; 12 months post-surgery * HRQoL: using EQ-5D; 12 months post-surgery * Pain: using VAS (back and leg pain); 12 months post-surgery   **Study primary outcome:** back pain-related disability (ODI) |
| **Notes** | **Sponsorship source:** supported by grant funding from the County Council of Vastmanland (Vastmanlands lans Landsting). Declarations of interest not reported  **Study dates:** March 2003 to March 2005 |
| **Reference(s)**  **\* primary reference** | Johansson AC, Linton SJ, Bergkvist L, Nilsson O, Cornefjord M. Clinic-based training in comparison to home-based training after first-time lumbar disc surgery: a randomised controlled trial. *European Spine Journal* 2009; **18**: 398-409 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Computer-generated randomisation |
| Allocation concealment (selection bias) | Low risk | Use of numbered, concealed envelopes |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention. The same physiotherapist delivered the intervention to both groups |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Incomplete outcome data (attrition bias) | Low risk | Only one participant was lost in each group |
| Selective reporting (reporting bias) | Unclear risk | Pre-published protocol or clinical trials registration is not reported. It is not feasible to effectively assess risk of selective reporting bias without this information |
| Other bias | Low risk | We identified no other sources of bias |

Jolly et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** to evaluate the relative effectiveness and cost-effectiveness of a home-based CR programme using the Heart Manual, with centre-based programmes; to explore the reasons for non-adherence to CR programmes |
| **Participants** | **Total number of randomised participants:** 525  **Inclusion criteria:** adult patients following an MI or revascularization (PTCA/CABG) with no upper age limit were eligible. Any adult patient was eligible if they had had 1 of the following events within the previous 12 weeks: an acute MI and had been informed of their diagnosis; a coronary angioplasty with or without stenting; a CABG operation  **Exclusion criteria:** inability to speak either English or Punjabi; case-note reported dementia; severe hearing impairment; sight defects of sufficient severity to prevent them from reading the Heart Manual; serious persisting complications which had not been stabilised at the time of proposed randomisation, including: unstable angina (angina at rest or minimal exertion, with ECG changes and requiring medical or non-medical intervention); clinically significant heart failure; important cardiac arrhythmias; any other condition which, in the consultant’s opinion, would preclude safe home exercise; complications during the angioplasty/CABG procedure or significant lesions remaining  **Type of surgery (condition):** PTCA/CABG (MI)  **Country:** UK  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 60.3 (± 10.5) years * *Gender, M/F*: 203/60 * *BMI, mean (SD)*: 28.07 (± 4.94) kg/m2 * *Current involvement in regular PA, mean (SD)*: Godin score: 6.24 (± 3.75) * *Relevant clinical variables, n*: diagnosis: MI: 129; PTCA: 101; CABG: 33 * *Ethnicity, n*: white: 211; Asian: 43; other: 9 * *Years in full-time education: mean (SD)*: 10.4 (± 3.5) * *Currently employed: n*: 109   **Comparison group**   * *Age, mean (SD)*: 61.8 (± 11.0) years * *Gender, M/F*: 199/63 * *BMI, mean (SD)*: 27.72 (± 4.88) kg/m2 * *Current involvement in regular PA, mean (SD)*: Godin score: 6.08 (± 3.80) * *Relevant clinical variables, n*: diagnosis: MI: 129; PTCA: 110; CABG: 23 * *Ethnicity, n*: white: 207; Asian: 46; other: 8 * *Years in full-time education: mean (SD)*: 10.5 (± 3.3) * *Currently employed: n*: 111   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, illness severity scores * during the first 6 weeks of the home-based CR programme, 11 patients crossed over from the home- to the hospital-based programme. In 8 cases this was due to the development of additional cardiac or medical complications, requiring closer monitoring, and in 3 cases a lack of motivation to exercise at home was the predominant factor. These participants were analysed on an ITT basis as part of the home-based group |
| **Interventions** | **Details of interventions**  Approach 1: centre-based exercise and education programme; programme varied slightly between sites but generally included individualised, supervised training sessions and optional group education and relaxation sessions; delivered by cardiac rehabilitation staff, usually twice a week for 8 to 12 weeks  Context: cardiac patients; within 12-weeks of cardiac event; clinic  Approach 2: home based lifestyle programme; home visits and telephone support focused on risk factors, medication and lifestyle change, daily walking progressing to other physical activities; delivered by a nurse at four points across the 12-week intervention  Context: cardiac patients; within 12-weeks of cardiac event; home  Comparison: between two interventions, see above  **Intervention group (approach 1):** number randomised = 262; reported losses = 29 (died = 3; withdrawn = 3; did not attend follow-up = 23) some attrition is unexplained; analysed for PA = 233; analysed for fitness = 163; analysed for HRQoL = 231  **Setting:** clinic  **Intervention group (approach 2):** number randomised = 263; reported losses = 35 (died = 6; withdrawn = 8; did not attend follow-up = 21) some attrition is unexplained; analysed for PA = 228; analysed for fitness = 179; analysed for HRQoL = 223  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors**: smoking cessation; BP; total and high-density lipoprotein cholesterol; physical fitness (ISWT); psychological status (HADS); self-reported diet; PA (Godin Score); cardiac symptoms; HRQoL (EQ-5D). Health service resource use and costs of rehabilitation programmes from health service and societal perspectives were also measured. Adherence to the PA element of the rehabilitation programmes was measured by questionnaire at 6, 9 and 12 weeks; further measurements at 12 and 24 months  **Outcomes relevant to the review:**   * Amount of PA: using Godin Score (higher score indicates more PA); 24 months post-surgery * Physical fitness: using ISWT; 24 months post-surgery * HRQoL: using EQ-5D; 24 months post-surgery * Pain: using self-reported chest pain; 24 months post-surgery * Adverse events * Participant experience   **Study primary outcome:** smoking cessation; BP; total and high-density lipoprotein cholesterol; physical fitness (ISWT); psychological status measured (HADS) |
| **Notes** | **Sponsorship source:** funded by NIHR Health Technology Assessment Programme. Declared competing interests of authors: J Raftery is Director of NCCHTA, but was not involved in the editorial process for this report  **Study dates:** 1 February 2002 to 1 February 2004 |
| **Reference(s)**  **\* primary reference** | Jolly K, Taylor R, Lip GYH, Greenfield S, Raftery J, Mant J*, et al.* The Birmingham Rehabilitation Uptake Maximisation Study (BRUM). Home-based compared with hospital-based cardiac rehabilitation in a multi-ethnic population: cost-effectiveness and patient adherence. *Health technology assessment* 2007; **11**: 1-118 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Use of computer-generated randomisation |
| Allocation concealment (selection bias) | Low risk | Allocation was managed by an independent clinical trials unit |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the interventions |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Outcomes were measured using subjective measurement tools, and participants were not blinded to the intervention |
| Blinding of outcome assessment: fitness outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adverse events (detection bias) | Unclear risk | Used a combination of objective and self-reported measurement tools |
| Incomplete outcome data (attrition bias) | Low risk | Most losses were owing to mortality, other losses were few and were balanced between groups |
| Selective reporting (reporting bias) | Unclear risk | Study authors do not report clinical trials registration. It is not feasible to effectively assess reporting bias without this document |
| Other bias | Low risk | No other sources of bias detected |

Kinsey et al.

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| **Methods** | RCT, parallel design; single centre  The 48 patients who participated in this four-year follow-up study previously had CABG at a local metropolitan hospital. All patients received individual, in-depth, patient education regarding coronary risk factor modification during hospitalisation. Before discharge from the hospital, these patients had a low-level exercise test after which they were given a home-exercise prescription of either short walks (n = 23) or a cycle ergometry protocol (n = 25).  **Study aim/objective:** to determine if an in-hospital CR program consisting of progressive activity and in-depth education regarding CAD risk factors; followed by an intensive 12-week home-monitored exercise program; had an impact on long-term compliance of risk factor modification in patients following CABG |
| **Participants** | **Total number of randomised participants:** 48  **Inclusion criteria:** male; hospitalised (post coronary bypass surgery) patients; ≤ 69 years of age  **Exclusion criteria:** not reported  **Type of surgery (condition):** CABG (heart disease)  **Country:** USA  **Baseline Characteristics**  **Intervention group (short walks)**   * *Age, mean*: 56.2 years * *Gender*: all male * *Weight, mean*: 77.9 kg * *Relevant illness severity scores (e.g., ASA, APACHE II), n (%)*: decreased left ventricular function: 9 (39)   **Comparison group (cycle ergometry)**   * *Age, mean*: 53.8 years * *Gender*: all male * *Weight, mean*: 83.4 kg * *Relevant illness severity scores (e.g., ASA, APACHE II), n (%)*: decreased left ventricular function: 12 (52)   Note:   * study authors do not report the following characteristics: BMI, height baseline level of fitness, current involvement in regular PA, relevant clinical variables |
| **Interventions** | **Details of interventions**  Approach 1: home walking programme, with counselling and long-term exercise plan; 12-week walking programme followed by review, counselling and development of individualised long-term exercise plan  Approach 2: home cycling programme, with counselling and long-term exercise plan; 12-week cycling programme followed by review, counselling and development of individualised long-term exercise plan  Context: CABG patients; post-surgery (mean 7.6 days); home with one clinic appointment  Notes: no details on person delivering interventions  Comparison: between two interventions, see above  **Intervention group (approach 1):** number randomised = 23; losses = 3 (overall: 7 = died, 2 = lost to follow-up); analysed = 20  **Intervention group (approach 2):** number randomised = 25; losses = 6 (overall: 7 = died, 2 = lost to follow-up); analysed = 19  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors**: ECG results phoned in three times per week before and after exercise; BP reported by telephone; exercise test at hospital discharge and three months at hospital; this study collected data four years after the three-month evaluation. Nurse delivered survey: occupational status; smoking history; BP including medication; leisure time activity and exercise including frequency, duration, intensity and mode; blood cholesterol; dietary regime; body weight; subsequent cardiovascular hospitalisations; current medications. Serum cholesterol level tested in 31 of 39 patients  **Outcomes relevant to the review:**   * Engagement in PA: measured 4 years post-surgery   **Study primary outcome:** coronary risk factors |
| **Notes** | **Sponsorship source:** not reported  **Study dates:** not reported  Note:   * we used information in the associated report (Fletcher 1984) to determine that this study was randomised |
| **Reference(s)**  **\* primary reference** | Fletcher GF, Chiaramida AJ, LeMay MR, Johnston BL, Thiel JE, Spratlin MC. Telephonically-monitored home exercise early after coronary artery bypass surgery. Chest 1984; **86**: 198-202  \* Kinsey MG, Fletcher BJ, Rice CR, Watson PH, Fletcher GF. Coronary risk factor modification followed by home-monitored exercise in coronary bypass surgery patients: A four-year follow-up study. *Journal of Cardiopulmonary Rehabilitation* 1989; **9**: 207-12 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | "They were randomly assigned to a home exercise program of either short walks or stationary bicycle exercise." No further details. |
| Allocation concealment (selection bias) | Unclear risk | No details |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Incomplete outcome data (attrition bias) | Low risk | Although the sample size is small and the relative number of losses is large, most losses are owing to mortality, which is expected in this population group and therefore we believed that these losses did not indicate a high risk of bias |
| Selective reporting (reporting bias) | Unclear risk | Study authors do not report or pre-published protocol or registration with a clinical trials register. It is not feasible to effectively assess risk of bias without these documents |
| Other bias | Low risk | No other sources of bias detected |

Komatsu et al.

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| **Methods** | BA; single centre  **Study aim/objective:** to describe changes in PA; BMI; psychological distress; and QoL before and after surgery in patients who underwent oesophagectomy and received nurse counselling for PA |
| **Participants** | **Total number of included participants:** 29  **Inclusion criteria:** ≥ 20 years of age; undergoing thoracoscopic oesophagectomy in the prone position or right open transthoracic oesophagectomy with curative intent  **Exclusion criteria:** history of cancer; had undergone tracheostomy or secondary surgery; their primary surgeon had determined they were inappropriate for the study  **Type of surgery (condition):** oesophagectomy (thoracic oesophageal cancer)  **Country:** Japan  **Baseline Characteristics**  **Intervention group**   * *Type of surgery, n (%)*: TSEP with three-field lymphadenectomy: 21 (72.4); right open transthoracic oesophagectomy: 8 (27.6) * *Age, median (range)*: 65.9 (44.9 to 78.7) years * *Gender, M/F*: 27/2 * *BMI, median (range)*: 21.7 (20.7 to 22.8) kg/m2 * *Baseline level of fitness, median (range)*: MET: 1,382.5 (0 to 16,065) minutes/week * *Relevant clinical variables, n (%):* pTNM staging: IA: 7 (24.1); IB: 2 (6.9); IIA: 1 (3.4); IIB: 6 (20.7); IIIA: 9 (31.0); IIIB: 4 (13.8) * *Employment status, n*: employed: 20; unemployed: 9   Note:   * study authors do not report the following characteristics: weight, height, current involvement in regular PA, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: counselling; one-to-one counselling exploring benefits, motivations and barriers to PA; delivered by nurse at three time points from before surgery to three months after hospital discharge  Context: oesophageal cancer patients; pre surgery; clinic  Comparison: no comparator  **Intervention group:** number included = 29; losses at 2 to 4 weeks = 3 (hospital transfer = 2; withdrawn consent = 1); losses at 3 months = 2 (withdrawn consent); losses at 6 months = 2 (withdrawn consent); analysed at 6 months = 22  **Setting:** clinic |
| **Outcomes** | **All outcomes measured/reported by study authors**: PA (IPAQ-SV); PA (MET minutes per week); HRQoL (Japanese versions of EORTC QLQ-C30); psychological distress; BMI  **Outcomes relevant to the review:**   * Amount of PA: using IPAQ-SV; 6 months post-surgery * Engagement in PA: 6 months post-surgery * HRQoL: using EORTC QLQ-C30 (global); 6 months post-surgery * Pain: using esophageal pain; 6 months post-surgery   **Study primary outcome:** PA |
| **Notes** | **Sponsorship source:** supported by a Health Labour Sciences Research Grant. Declarations of interest not reported  **Study dates: Study dates:** August 2013 to January 2014 |
| **Reference(s)**  **\* primary reference** | \* Komatsu H, Watanuki S, Koyama Y, Iino K, Kurihara M, Uesugi H*, et al.* Nurse Counseling for Physical Activity in Patients Undergoing Esophagectomy. *Gastroenterology Nursing* 2018; **41**: 233-9  UMIN000011416. Feasibility study of the STEP Program: facilitating postsurgical recovery of thoracic esophageal cancer patients through partnership between patients, surgeons, and nurses. <http://www.who.int/trialsearch/Trial2.aspx?TrialID=JPRN-UMIN000011416> 2013. |

Kraal et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to investigate whether home-based exercise training with tele-monitoring guidance results in better long-term physical fitness and activity levels than regular centre-based exercise training |
| **Participants** | **Total number of randomised participants:** 90  **Inclusion criteria:** outpatient CR patients; MI, unstable angina, PCI or CABG with low to moderate risk of further events; access to internet and PC at home  **Exclusion criteria:** high risk according to the Dutch CR practice guideline; systolic heart failure (LVEF of more than 40 percent; NYHA class III-IV (i.e., breathlessness during light exercise or at rest); severe arrhythmia; haemodynamically significant valvular disease; ICD implantation; heart transplantation; chronic angina or silent ischemia; comorbidity impairing exercise capacity (e.g., COPD, DM, PVD and orthopaedic or neurological conditions); severe psychological or cognitive impairments  **Type of surgery (condition):** CABG (heart disease)  **Country:** Netherlands  **Baseline Characteristics**  **Intervention group (centre-based)**   * *Age, mean (SD)*: 57.7 (± 8.7) years * *Gender, M/F*: 40/5   **Comparison group (home-based)**   * *Age, mean (SD)*: 60.5 (± 8.8) years * *Gender, M/F*: 40/5   Note:   * study authors do not report the following characteristics: weight, height, BMI, physical fitness, current involvement in regular PA, illness severity scores, relevant clinical variables |
| **Interventions** | **Details of interventions**  Approach 1: group-based training; individually tailored programme on a treadmill or cycle ergometer, at least twice weekly for 12-weeks, delivered by physical therapist specialised in cardiac rehabilitation  Context: cardiac patients; post cardiac event/surgery; clinic  Approach 2: home-based training with telephone motivational interviewing; initial supervised sessions followed by exercise prescription with remote support delivered weekly through motivational interviewing techniques by a physical therapist  Context: cardiac patients; post cardiac event/surgery; clinic and home  Comparison: between two interventions, see above  **Intervention group (approach 1):** number randomised = 45; losses = 4 (reasons not reported); analysed = 41  **Intervention group (approach 2):** number randomised = 45; losses = 8 (reasons not reported); analysed = 37  **Setting:** clinic and home |
| **Outcomes** | **All outcomes measured/reported by study authors**: PA (PAL); physical fitness (VO2 Peak); HRQoL (MacNew Questionnaire); patient satisfaction; adherence; cost-effectiveness. Measured at baseline, 3 months, and 12 months; some measures also at 26 weeks  **Outcomes relevant to the review:**   * Amount of PA: using PAL score (higher score indicates more PA); 12 months post-intervention * Physical fitness: using VO2 Peak; 12 months post-intervention * HRQoL: using the MacNew Questionnaire; 12 months post-intervention * Adverse events * Adherence: measured as number of exercise sessions completed   **Study primary outcome:** PA; physical fitness |
| **Notes** | **Sponsorship source:** supported by funding from ZonMw, the Netherlands Organisation for Health Research and Development. Authors declare the following declarations of interest: the FIT@Home study is executed in collaboration with Philips Research; the heart rate monitors and accelerometers used during the assessment of PAEE and during home-based training are provided by Philips Research.  **Study dates:** March 2013 to March 2014 |
| **Reference(s)**  **\* primary reference** | Kraal JJ, Peek N, Van den Akker-Van Marle ME, Kemps HMC. Effects of home-based training with telemonitoring guidance in low to moderate risk patients entering cardiac rehabilitation: short-term results of the FIT@Home study. Eur J Prev Cardiol 2014; **21**: 26-31  Kraal JJ, Peek N, van den Akker-Van MME, Kemps HMC. Effects and costs of home-based training with telemonitoring guidance in low to moderate risk patients entering cardiac rehabilitation: the FIT@Home study. *BMC Cardiovascular Disorders* 2013; **13**  NCT01732419. Homebased training with telemonitoring guidance in low to moderate risk patients entering cardiac rehabilitation (FIT@Home) [Effects of homebased training with telemonitoring guidance in low to moderate risk patients entering cardiac rehabilitation]. <Https://clinicaltrials.gov/ct2/show/NCT01732419> (first received 22 November 2012) |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Computer-generated randomisation |
| Allocation concealment (selection bias) | Low risk | Use of numbered, sealed, opaque envelopes |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants or personnel to intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: fitness outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adverse events (detection bias) | Unclear risk | Used a combination of objective and self-reported measurement tools |
| Blinding of outcome assessment: adherence (detection bias) | Low risk | Objective measurement of class completion |
| Incomplete outcome data (attrition bias) | High risk | Although losses were relatively few, reasons for these losses were not explained and we noted more losses in the home-based intervention group |
| Selective reporting (reporting bias) | Low risk | Study was prospectively registered with a clinical trials register (NCT01732419; first received November 2012); all reported outcomes were consistent with these prospectively prepared documents |
| Other bias | Low risk | No other sources of bias recorded |

Kummel et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to describe the effects of a group intervention involving heath counselling, guidance, and adjustment education on health, health behaviours, and functional abilities among CABG patients aged ≥ 65 years |
| **Participants** | **Total number of randomised participants:** 173  **Inclusion criteria:** elective CAB with cardio pulmonary bypass surgery at Helsinki University Hospital between May 7, 1998 and December 31, 2001; resident in Uusimaa, Finland; ≥ 65 years of age; voluntary participation; completion of all four measurements at baseline and three follow-up measurements.  **Exclusion criteria:** acute CAB  **Type of surgery (condition):** CAB  **Country:** Finland  **Baseline Characteristics (for participants who completed baseline and follow-up questionnaires)**  **Intervention group**   * *Age, mean (SD)*: male: 70.2 (± 3.9) years; female: 70.3 (± 3.9) years * *Gender, M/F*: 34/15 * *Current involvement in regular PA, n (%)*: exercise during free-time: regularly: male: 2 (7); female: 2 (14); overall: 4 (10). Every once in a while: male: 15 (54); female: 6 (46); overall: 21 (51). Occasionally or not at all: male: 11 (39); female: 5 (38); overall: 16 (39)   **Comparison group**   * *Age, mean (SD)*: men: 70.2 (± 4.0) years; women: 71.5 (± 4.1) years * *Gender, M/F*: 51/17 * *Current involvement in regular PA, n (%)*: exercise during free-time: regularly: male: 6 (13); female: 1 (7); overall: 7 (11). Every once in a while: male: 23 (48); female: 5 (33); overall: 28 (44). Occasionally or not at all: male: 19 (40); female: 9 (60); overall: 28 (44)   Note:   * study authors do not report the following characteristics: BMI, weight, height, baseline level of fitness, illness severity scores, relevant clinical variables |
| **Interventions** | **Details of interventions**  Approach: health counselling and education; group-based sessions, including patients significant other, focused on health, health behaviours and functional abilities, additional telephone counselling where requested; delivered pre surgery and then every three months on discharge for 12-months, by a nurse with additional specialist input into education sessions  Context: elective cardiac patients; pre surgery; clinic with some home telephone support  Comparison: usual care; included counselling and guidance during hospital stay and follow up care  **Intervention group:** number randomised = not reported; losses unknown; analysed = 49  **Comparison group:** number randomised = not reported; losses unknown; analysed = 68  **Setting:** not specified - assumed to be a clinic setting  Note:   * we were not easily able to ascertain the total number of randomised participants. Study authors report that 365 participants completed baseline assessments that were all ages and included acute and non-acute patients. Only 173 participants entered the study, as a subset of 365 participants, and these participants were non-acute and > 65 years of age. Data is only reported by group for those that completed baseline and 3 follow-up measurements (117 participants) |
| **Outcomes** | **All outcomes measured/reported by study authors**: PA; exercise during free-time; frequency of eating fresh greens and vegetables/week; eating visible fat in meat; use of alcohol. Measured at baseline (prior to surgery), 3, 6, and 12 months  **Outcomes relevant to the review:**   * Engagement in PA: 12 months post-surgery   **Study primary outcome:** AP (listed first) |
| **Notes** | **Sponsorship source:** supported by funding fromFinland's Slot Machine Association, the Miina Sillanpӓӓ Foundation, the Turku University of Applied Sciences, and grant funding from the Hospital District of Southwest Finland. Authors report support but do not report whether this support was financial, from the Red Reather Campaign of the Nordic Lions Club. Declarations of interest are not reported  **Study dates:** May 1998 to December 2001 |
| **Reference(s)**  **\* primary reference** | Kummel M, Vahlberg T, Ojanlatva A, Kärki R, Mattila T, Kivelä SL. Effects of an intervention on health behaviors of older coronary artery bypass (CAB) patients. *Archives of gerontology and geriatrics* 2008; **46**: 227-44 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Authors state randomisation occurred but no details provided for randomisation method used |
| Allocation concealment (selection bias) | Unclear risk | No details |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Incomplete outcome data (attrition bias) | High risk | Study authors do not report numbers randomised to each group, or numbers of losses in each group. In addition, study authors report only data for a sub-set of the full set of participants and the reason for this is not explained |
| Selective reporting (reporting bias) | Unclear risk | Pre-published protocol or clinical trials registration is not reported. It is not feasible to effectively assess risk of selective reporting bias without this information |
| Other bias | Low risk | We identified no other sources of bias |

Lear et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** to investigate a randomised, 1-year multi-factorial risk factor and lifestyle intervention in men and women with IHD following a CR programme with the primary outcome of global cardiovascular risk; this was an effectiveness study utilising a resource-sparing intervention based on current national guidelines |
| **Participants** | **Total number of randomised participants:** 302  **Inclusion criteria:** men and women with IHD (at least one of: MI, revascularization procedure, positive coronary angiogram or episodes of angina)  **Exclusion criteria:** patients who had difficulty with the English language; plans to leave the treatment area or a medical condition non-cardiovascular in nature which would make participation or survival for the study’s duration unlikely  **Type of surgery (condition):** CABG (IHD)  **Country:** Canada  **Baseline Characteristics**  **Intervention group**   * *Type of surgery, n (%)*: CABG: 46 (30) * *Age, mean (SD)*: 64.8 (± 8.8) years * *Gender, M/F*: 125/26 * *BMI, mean (SD)*: 28.1 (± 4.2) kg/m2 * *Baseline level of fitness*: METs: 9.8 (± 2.7)   **Comparison group**   * *Type of surgery, n (%)*: CABG: 62 (41) * *Age, mean (SD)*: 63.4 (± 10.2) years * *Gender, M/F*: 124/27 * *BMI, mean (SD)*: 27.0 (± 3.7) kg/m2 * B*aseline level of fitness*: METs: 10.0 (± 2.5)   Note:   * study authors do not report the following characteristics: weight, height, current involvement in regular PA, illness severity scores, relevant clinical variables |
| **Interventions** | **Details of interventions**  Approach: combined rehabilitation, exercise and lifestyle sessions through a case management model; cardiac rehabilitation exercise sessions with lifestyle and risk factor counselling and home exercise plan, delivered monthly with exercise specialist, dietician and case manager over a 12-month period  Context: cardiac patients; after usual care cardiac rehabilitation about 16-weeks post-surgery; outpatient clinic and home  Comparison: usual care  **Intervention group:** number randomised = 151; losses = 9 (medical reasons = 4; did not return any attempt at contact = 3; withdrew believing he would not be a reliable participant = 1; died = 1); analysed = 142  **Comparison group:** number randomised = 151; losses = 15 (did not return any attempt at contact = 10; moved out of the treatment area = 2; died = 3); analysed = 136  **Setting:** clinic and home |
| **Outcomes** | **All outcomes measured/reported by study authors**: global cardiovascular risk (Framingham and Procam risk scores); risk factors; lifestyle behaviours; PA (LTPA). Measured at baseline, and 12 months  **Outcomes relevant to the review:**   * Amount of PA: using LTPA questionnaire (kcal per week); 12 months post-intervention * Adherence: attendance at exercise sessions   **Study primary outcome:** global cardiovascular (Framingham and Procam risk scores) |
| **Notes** | **Sponsorship source:** supported byfunding from the British Columbia Health Research Foundation. Salary support for Dr. Lear was provided by the Medical Research of Canada/Heart and Stroke Foundation of Canada. Declarations of interest are not reported  **Study dates:** not reported |
| **Reference(s)**  **\* primary reference** | Lear SA, Ignaszewski A, Linden W, Brozic A, Kiess M, Spinelli JJ*, et al.* The Extensive Lifestyle Management Intervention (ELMI) following cardiac rehabilitation trial. *European Heart Journal* 2003; **24**: 1920‐7 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Computer-generated randomisation |
| Allocation concealment (selection bias) | Unclear risk | Insufficient details |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Outcomes were measured using subjective measurement tools, and participants were not blinded to the intervention |
| Blinding of outcome assessment: adherence (detection bias) | Low risk | Objective measurement of class attendance |
| Incomplete outcome data (attrition bias) | Low risk | We noted slightly more losses in the usual care group, and these losses were because participants did not return attempts at contact. However, losses for this reason were < 10% and we did not expect this to influence outcome data |
| Selective reporting (reporting bias) | Unclear risk | Study authors did not report pre-published protocol or clinical trials registration; it is not feasible to effectively assess risk of selective reporting bias without these documents |
| Other bias | Low risk | No other sources of bias detected |

Li et al.

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| **Methods** | RCT, parallel design  **Study aim/objective:** to provide evidence of the effect of education regarding daily PA on OA after TKA using accelerometry |
| **Participants** | **Total number of randomised participants:** 50  **Inclusion criteria:** female; between 55 and 75 years of age; diagnosis of knee OA with the Kellgren/Lawrence grade 4; BMI < 35; affected by the unilateral knee OA undergoing primary TKA; living in Beijing  **Exclusion criteria:** infectious joint diseases; hip joint disease or ankle joint disease which affected daily PA; comorbidities such as COPD which affected daily PA  **Type of surgery (condition):** TKA (knee OA)  **Country:** China  no baseline characteristics for either group as study is reported in an abstract only |
| **Interventions** | **Details of interventions**  Approach: monthly telephone education sessions  Context: TKA patients; post-surgery; home  Notes: no details about person delivering intervention, length of intervention or type of daily PA recommended  Comparison: usual care  **Intervention group:** number randomised = 25; losses = none described; analysed = 25  **Comparison group:** number randomised = 25; losses = none described; analysed = 25  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors**: PA measured as steps per day (accelerometer - Fitbit Inc., US); physical fitness (30s CST; 40m FPWT; SCT, TUG, 6MWT); knee function (WOMAC and KSS score); HRQoL (SF-12); pain (VAS); satisfaction (CASI). Measured before surgery, 2 and 6 weeks after surgery, 3 and 6 months after surgery  **Outcomes relevant to the review:**   * Amount of PA: using an accelerometer; measured as steps per day; 6 months post-surgery   **Study primary outcome:** PA steps (first/only reported) |
| **Notes** | **Sponsorship source:** funding support and declarations of interest not reported  **Study dates:** not reported |
| **Reference(s)**  **\* primary reference** | Li Z, Jiang L, Lin J. The effect of education for daily physical activity level recovery of osteoarthritis patients after total knee arthroplasty. A prospective randomized controlled clinical trial using accelerometry. *Osteoarthritis and cartilage* 2015; **23**: A373 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Insufficient information; abstract only |
| Allocation concealment (selection bias) | Unclear risk | Insufficient information; abstract only |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to intervention groups |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Incomplete outcome data (attrition bias) | Low risk | No apparent losses |
| Selective reporting (reporting bias) | Unclear risk | Study authors did not report clinical trials registration or pre-published protocol. It is not feasible to effectively assess risk of selective reporting bias without these documents |
| Other bias | High risk | Study is published only as an abstract and we had limited information in which to effectively assess risks of other bias. We judged the study to be at high risk of bias because it is not peer-reviewed |

Lier et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to assess if attendance of a preoperative counselling program improved weight loss or adherence to treatment guidelines in patients who underwent bariatric surgery |
| **Participants** | **Total number of randomised participants:** 99  **Inclusion criteria:** referred for bariatric surgery from GPs to the Department of Surgery at Haugesund Hospital on the West coast of Norway  **Exclusion criteria:** pregnancy; bariatric surgery at private hospitals; did not want bariatric surgery; lack of consent; severe mood or eating disorder; serious comorbid somatic disorders  **Type of surgery (condition):** bariatric surgery  **Country:** Norway  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 43.5 (± 11.1) years * *Gender, M/F*: 13/36 * *BMI, mean (SD)*: 45.5 (± 4.3) kg/m2 * *Non-surgical participants, n*: 5 * *Education status, n*: < 10 years: 15; 10 to 13 years: 25; > 13 years: 7 * *Work status, n*: employed: 26   **Comparison group**   * *Age, mean (SD)*: 42.4 (± 9.1) years * *Gender, M/F*: 16/32 * *BMI, mean (SD)*: 45.1 (± 5.9) kg/m2 * *Non-surgical participants, n*: 5 * *Education status, n*: < 10 years: 15; 10 to 13 years: 24; > 13 years: 7 * *Work status, n*: employed: 30   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, current involvement in regular PA, illness severity scores, relevant clinical variables |
| **Interventions** | **Details of interventions**  Approach: counselling; semi-structured group therapy with a focus on bariatric surgery, appropriate eating and PA behaviour change; delivered weekly for six weeks pre surgery and then at 6, 12 and 24 months post-surgery; delivered by a psychiatrist, psychologist and physiotherapist  Context: bariatric patients; pre surgery  Notes: note clear where the intervention was delivered  Comparison: usual care; included one preoperative and one postoperative educational seminars focused on surgery, diet and nutrition  **Intervention group:** number randomised = 49; losses = 15 (premature discontinuation = 1; did not receive allocated intervention = 7; died = 1; changed their mind = 3; did not meet for surgery = 1; missing to follow-up = 2); analysed = 34  **Comparison group:** number randomised = 50; losses = 20 (refused to participate in follow-up = 2; no surgical treatment = 5; missing to follow-up = 13); analysed = 30  **Setting:** hospital |
| **Outcomes** | **All outcomes measured/reported by study authors**: weight loss; eating habits; PA measured as minutes per week (total activity using self-reported data); engagement in PA; satisfaction. Measured at 12-month follow-up  **Outcomes relevant to the review:**   * Amount of PA: total activity using self-reported data; measured as minutes per week; 12 months post-surgery * Engagement in PA: 12 months post-surgery   **Study primary outcome:** weight loss (listed first) |
| **Notes** | **Sponsorship source:** supported by grant funding from the Western Regional Health Authority, Norway. Study authors declare no conflicts of interest  **Study dates:** not reported |
| **Reference(s)**  **\* primary reference** | Lier H, Biringer E, Stubhaug B, Tangen T. The impact of preoperative counseling on postoperative treatment adherence in bariatric surgery patients: A randomized controlled trial. *Patient Education & Counseling* 2012; **87**: 336-42 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Block randomisation used |
| Allocation concealment (selection bias) | Low risk | Concealment at separate research facility |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Outcomes were measured using subjective measurement tools, and participants were not blinded to the intervention |
| Incomplete outcome data (attrition bias) | High risk | High number of losses, and we noted more participants in the usual care group were lost to follow-up |
| Selective reporting (reporting bias) | Unclear risk | Study authors did not report clinical trials registration or pre-published protocol. It is not feasible to effectively assess risk of selective reporting bias without these documents |
| Other bias | Low risk | No other sources of bias detected |

Lindback et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to study if pre-surgery physiotherapy improves function, pain, and health in patients with degenerative lumbar spine disorder scheduled for surgery |
| **Participants** | **Total number of randomised participants:** 197  **Inclusion criteria:** between 25 and 80 years of age; scheduled for surgery for degenerative lumbar spine disorder; presence of LBP or leg pain because of disc herniation, spinal stenosis, spondylolisthesis (grades 1–2), DDD; diagnosis confirmed by MRI; pain level high enough to indicate surgical intervention; fluency in Swedish  **Exclusion criteria:** patients who were in need of acute surgery or re-surgery on the same level; had severe spinal pathology (such as osteoporosis or fusion > 4 levels); or other severe diagnoses  **Type of surgery (condition):** surgery for degenerative lumbar spine disorder  **Country:** Sweden  **Baseline Characteristics**  **Intervention group**   * *Type of condition, n (%)*: spinal stenosis: 59 (60); disc herniation: 23 (23); spondylolisthesis: 8 (8); DDD: 9 (9) * *Age, mean (SD)*: 58 (± 13.3) years * *Gender, M/F*: 45/54 * *Current involvement in regular PA, n (%)*: PA last 12 months: inactive: 9 (9.4); mildly active: 15 (15.6); walking: 48 (50); moderately active: 22 (22.9); very active: 2 (2.1) * *Employment status, n*: currently working: 37; unemployed: 2; retired: 37; sick leave or retired because of health problems: 19   **Comparison group**   * *Type of condition, n (%)*: spinal stenosis: 70 (71); disc herniation: 17 (17); spondylolisthesis: 7 (7); DDD: 4 (4) * *Age, mean (SD)*: 61 (± 11.5) years * *Gender, M/F*: 47/51 * *Current involvement in regular PA, n (%)*: PA last 12 months: inactive: 19 (19.6); mildly active: 20 (20.6); walking: 40 (41.2); moderately active: 15 (15.5); very active: 3 (3.1) * *Employment status, n*: currently working: 27; unemployed: 0; retired: 45; sick leave or retired because of health problems: 24   Note:   * study authors do not report the following characteristics: BMI, weight, height, baseline level of fitness, illness severity scores, relevant clinical variables |
| **Interventions** | **Details of interventions**  Approach: physiotherapy and exercise sessions; supervised mobilisation and motor control exercises and a tailored exercise programme, behavioural approach to reduce fear and avoidance of activity; delivered twice a week for 9-weeks by physiotherapist  Context: degenerative lumbar spine disorder patients; pre surgery, clinic  Comparison: usual care (waiting list group)  **Intervention group:** number randomised = 99; losses = 60 (administrative loss in part of the PROMs = 9; did not receive allocated intervention = 14; loss of questionnaire = 37); analysed = 99 ITT  **Comparison group:** number randomised = 98; losses = 25 (administrative loss in part of the PROMs = 5; loss of questionnaire = 20); analysed = 98 ITT  **Setting:** clinic |
| **Outcomes** | **All outcomes measured/reported by study authors**: leg and back pain (VAS); ODI; HRQoL (EQ-5D; SF-36); HADS; SES; FABQ-PA; PGIC; engagement in PA. Measured at baseline, after 9 weeks intervention (pre-surgery), 3 months, and 1-year post-surgery  **Outcomes relevant to the review:**   * Engagement in PA: at 12 months post-surgery * HRQoL: using EQ-5D; based on changes from baseline to 12 months post-surgery * Pain: using VAS (back and leg pain); based on changes from baseline to 12 months post-surgery   **Study primary outcome:** ODI |
| **Notes** | **Sponsorship source:** supported by funding from the regional research. Study authors declare no conflicts of interest  **Study dates:** October 2012 to March 2015 |
| **Reference(s)**  **\* primary reference** | \* Lindback Y, Tropp H, Enthoven P, Abbott A, Oberg B. PREPARE: presurgery physiotherapy for patients with degenerative lumbar spine disorder: a randomized controlled trial. *Spine Journal: Official Journal of the North American Spine Society* 2018; **18**: 1347-55  NCT02454400. Pre-surgery physiotherapy for patients with specific low back pain (PREPARE). <Https://clinicaltrials.gov/ct2/show/NCT02454400> (first received 27 May 2015). |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Block randomisation |
| Allocation concealment (selection bias) | Low risk | Use of sealed, opaque envelopes |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Incomplete outcome data (attrition bias) | High risk | Although we noted that the study authors used ITT analysis, we noted a large number of losses which included administrative loss of data and loss of questionnaires. We noted that more questionnaires were lost in the comparison group |
| Selective reporting (reporting bias) | Low risk | Study is prospectively registered with a clinical trials register (NCT02454400; first received May 2015); all reported review outcomes are consistent with these prospectively prepared documents |
| Other bias | Low risk | No other sources of bias detected |

Losina et al.

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| **Methods** | RCT, parallel design; single centre (women's only centre)  **Study aim/objective:** to evaluate the efficacy of financial incentives and health coaching to improve PA following TKR |
| **Participants** | **Total number of randomised participants:** 202  **Inclusion criteria:** women with knee OA scheduled for primary, unilateral TKR by 1 of 5 orthopaedic surgeons at study hospital  **Exclusion criteria:** < 40 years of age; did not speak English; resident in a nursing home; scheduled for contralateral TKR or other surgery requiring hospitalisation within 6 months; previous inflammatory arthritis or osteonecrosis affecting the knee; comorbidity preventing safe performance of moderate ambulatory PA, including epilepsy, Parkinson’s disease, neuropathy, or dementia, or who required a wheelchair or walker to ambulate preoperatively; persons with no regular access to the internet  **Type of surgery (condition):** TKR (knee OA)  **Country:** USA  **Baseline Characteristics**  **Intervention group (THC)**   * A*ge, mean (SD)*: 65.0 (± 6.9) years * *Gender, M/F*: 19/30 * *BMI, n*: < 30.0 kg/m2: 19; 30.0 kg/m2 to 34.9 kg/m2: 16; ≥ 35.0 kg/m2: 14 * *Education status, n (%)*: high school or less: 7 (14.3); some college: 12 (24.5); ≥ bachelor's degree: 30 (61.2) * *Race/ethnicity, n (%)*: white: 44 (89.8); black: 2 (4.1); Asian: 0 (0); Native American: 0 (0); other: 3 (6.1)   **Intervention group (FI)**   * A*ge, mean (SD)*: 65.0 (± 8.3) years * *Gender, M/F*: 17/33 * *BMI, n*: < 30.0 kg/m2: 22; 30.0 kg/m2 to 34.9 kg/m2: 11; ≥ 35.0 kg/m2: 17 * *Education status, n (%)*: high school or less: 3 (6.0); some college: 11 (22.0); ≥ bachelor's degree: 36 (72.0) * *Race/ethnicity, n (%)*: white: 44 (88.0); black: 4 (8.0); Asian: 0 (0); Native American: 0 (0); other: 2 (4.0)   **Intervention group (FI + THC)**   * A*ge, mean (SD)*: 65.7 (± 8.1) years * *Gender, M/F*: 27/25 * *BMI, n*: < 30.0 kg/m2: 29; 30.0 kg/m2 to 34.9 kg/m2: 13; ≥ 35.0 kg/m2: 10 * *Education status, n (%)*: high school or less: 3 (5.8); some college: 13 (25.0); ≥ bachelor's degree: 36 (69.2) * *Race/ethnicity, n (%)*: white: 46 (90.2); black: 2 (3.9); Asian: 2 (3.9); Native American: 0 (0) other: 1 (2.0)   **Comparison group** **(Attention control)**   * A*ge, mean (SD)*: 65.8 (± 6.9) years * *Gender, M/F*: 24/27 * *BMI, n*: < 30.0 kg/m2: 22; 30.0 kg/m2 to 34.9 kg/m2: 17; ≥ 35.0 kg/m2: 12 * *Education status, n (%)*: high school or less: 6 (11.8); some college: 9 (17.6); ≥ bachelor's degree: 36 (70.6) * *Race/ethnicity, n (%)*: white: 46 (90.2); black: 2 (3.9); Asian: 0 (0); Native American: 1 (2.0); other: 2 (3.9)   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, current involvement in regular PA, illness severity scores, relevant clinical variables |
| **Interventions** | **Details of interventions**  Approach 1: telephone PA health counselling; weekly and subsequently bi-weekly calls with a health coach focused on short- and long-term PA goals; delivered over 6-months  Approach 2: general health coaching and financially incentivised self-monitoring of PA; weekly and subsequently bi-weekly calls with a health coach focused on general aspects of recovery and rehabilitation (staff avoided motivational interviewing techniques and discussion of PA), incentivised up to $305, web-based logging of PA on short- and long-term PA goals; delivered over 6-months  Approach 3: telephone PA health counselling and financially incentivised self-monitoring of PA; weekly and subsequently bi-weekly calls with a health coach focusing on short- and long-term PA goals; incentivized up to $305, web-based logging of PA on short- and long-term PA goals; delivered over 6-months  Context: Total knee replacement patients; one-week post-surgery; home or as a resident in rehabilitation facility  Comparison: general health messaging, receiving calls on the same basis as the intervention groups  **Intervention group (THC):** number randomised = 49; losses = 10 (withdrawn or provided sub-optimal accelerometer data); analysed = 39  **Comparison group (attention control):** number randomised = 51; losses = 14 (withdrawn or provided sub-optimal accelerometer data); analysed = 37  **Intervention group (FI):** number randomised = 50; losses = 10 (withdrawn or provided sub-optimal accelerometer data); analysed = 40  **Intervention group (FI + THC):** number randomised = 52; losses = 18 (withdrawn or provided sub-optimal accelerometer data); analysed = 34  **Setting:** home or rehabilitation centre |
| **Outcomes** | **All outcomes measured/reported by study authors**: mean amount of steps/day at 6 months post-TKR; change in mean amount of steps/day between baseline and 6 months; change in weekly minutes of MVPA from baseline to 6 months; number of calls made to participants  **Outcomes relevant to the review:**   * Amount of PA: measured as total MVPA minutes per week; using an accelerometer; 6 months post-surgery. To derive the MVPA duration, bouts were calculated during which the study participant took ≥ 100 steps/minute during a Fitbit valid day. It was required that bouts be at least 10 minutes long, in accordance with PA guidelines, within a single bout up to 2 grace minutes were allowed, during which the participant’s step count could fall below the 100 steps/minute threshold. The 100 steps/minute threshold has previously been shown to correspond to an energy expenditure of 3 METs and has been used in analyses of older adults * Amount of PA: measured as steps per day; using an accelerometer; 6 months post-surgery   **Study primary outcome:** study reported primary outcome: mean amount of steps/day at 6 months post-TKR |
| **Notes** | **Sponsorship source:** supported by funding from the NIH/National Institute of Arthritis and Musculoskeletal and Skin Diseases. Declarations of interest not reported  **Study dates:** November 2013 to January 2016 |
| **Reference(s)**  **\* primary reference** | \* Losina E, Collins JE, Deshpande BR, Smith SR, Michl GL, Usiskin IM*, et al.* Financial Incentives and Health Coaching to Improve Physical Activity Following Total Knee Replacement: a Randomized Controlled Trial. *Arthritis care & research* 2018;**70**:732‐40-‐40  NCT01970631. The study of physical activity rewards after knee surgery (SPARKS). <Https://clinicaltrials.gov/ct2/show/NCT01970631> (first received 28 October 2013) |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Block randomisation in block sizes of 4 |
| Allocation concealment (selection bias) | Unclear risk | Insufficient information |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: adherence (detection bias) | Low risk | Objective measurement of call completion |
| Incomplete outcome data (attrition bias) | High risk | Overall participant loss was 26%, with variable loss in each group |
| Selective reporting (reporting bias) | Low risk | Study was prospectively registered with a clinical trials register (NCT01970631; first received October 2013); reported review outcomes were consistent with these prospectively prepared documents |
| Other bias | Low risk | We identified no other sources of bias |

Lotzke et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** to investigate whether a person-centred physiotherapy prehabilitation program based on a cognitive-behavioural approach is more effective than conventional care in reducing disability and improving functioning after lumbar fusion surgery in patients with DDD |
| **Participants** | **Total number of randomised participants:** 118  **Inclusion criteria:** between 18 to 70 years of age; dominating chronic LBP with degenerative changes in 1 to 3 segments of the lumbar spine; additional minor radiating symptoms; reproducible pain at clinical examination in the relevant segment(s); and scheduled for lumbar fusion surgery  **Exclusion criteria:** previous decompression surgery for spinal stenosis; spinal malignancy; dominating radiculopathy; confirmed neurological or rheumatic disorder; deformities in the thoracolumbar spine (e.g., idiopathic scoliosis); and poor understanding of Swedish  **Type of surgery (condition):** lumbar fusion surgery (chronic LBP)  **Country:** Sweden  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 44.8 (± 8.2) years * *Gender, M/F*: 26/33 * *BMI, mean (SD)*: 26.3 (± 3.9) kg/m2 * *Relevant illness severity scores (e.g., ASA, APACHE II), n (%)*: back pain duration: > 2 years: 41 (34.7); leg pain duration: > 2 years: 28 (47.5); missing data: 1 (1.7) * *Relevant clinical variables*: fusion levels, n (%): 1 level: 32 (59.3); 2 level: 20 (37.0); 3 level: 2 (3.7). Comorbidity, n: 6 * *Non-surgical participants, n*: 5 * *Education status, n*: elementary school: 1; high school: 24; university: 23; vocational education: 11; missing data: 0   **Comparison group**   * *Age, mean (SD)*: 46.7 (± 8.5) years * *Gender, M/F*: 29/30 * *BMI, mean (SD)*: 26.4 (± 3.4) kg/m2 * *Relevant illness severity scores (e.g., ASA, APACHE II), n (%)*: back pain duration: > 2 years: 46 (39.0); leg pain duration: > 2 years: 24 (40.7); missing data 0 (0) * *Relevant clinical variables*: fusion levels, n (%): 1 level: 30 (55.6); 2 level: 21 (38.9); 3 level: 3 (5.6). Comorbidity, n: 7 * *Non-surgical participants, n*: 5 * *Education status, n*: elementary school: 6; high school: 27; university: 19; vocational education: 6; missing data: 1   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, current involvement in regular PA |
| **Interventions** | **Details of interventions**  Approach: physiotherapy and counselling; educational and therapeutic sessions aimed at self-efficacy, goal setting and pain and PA; delivered by physical therapist across four sessions pre surgery and one post-surgery booster session over 14 weeks  Context: lumbar fusion surgery patients; about 8 weeks pre surgery; clinic and via telephone at home  Comparison: usual care; included a single session with a physical therapist  **Intervention group:** number randomised = 59; losses = 9 (could not be reached = 4; cancelled surgery = 5); analysed = 59 ITT  **Comparison group:** number randomised = 59; losses = 8 (could not be reached = 5; cancelled surgery = 2; withdrew = 1); analysed = 59 ITT  **Setting:** clinic and home |
| **Outcomes** | **All outcomes measured/reported by study authors**: ODI; back and leg pain intensity; pain catastrophizing (PCS); kinesiophobia (TSK); self-efficacy for exercise (SEE); anxiety and depression (HADS); HRQoL (EQ-5D); patient-specific functioning (PSFS); objective PA; physical fitness (5MWT; 50FWT; TUG; SCT; OLS); adverse events. Measured at baseline and at 5 follow-up sessions (1 week before surgery, 3 and 8 weeks, 3 and 6 months postoperatively)  **Outcomes relevant to the review:**   * Amount of PA: MVPA using an accelerometer (ActiGraph GT3X+; ActiGraph, Pensacola, FL, USA); measured as mins/day; based on changes from baseline to 6 months post-surgery * Amount of PA: steps per day using an accelerometer (ActiGraph GT3X+; ActiGraph, Pensacola, FL, USA); based on changes from baseline to 6 months post-surgery * Physical fitness: using 5MWT; based on changes from baseline to 6 months post-surgery * Physical fitness: using TUG; based on changes from baseline to 6 months post-surgery * HRQoL: using EQ-5D; based on changes from baseline to 6 months post-surgery * Pain: using VAS (back and leg pain); based on changes from baseline to 6 months post-surgery * Adverse events   **Study primary outcome:** PROM; degree of disability (ODI) |
| **Notes** | **Sponsorship source:** supported by grant funding from AFA Research, Eurospine, the Swedish Research Council, the Health and Medical Care Executive Board of the Västra Götaland Region (VGR), and Doctor Felix Neubergh grants. Authors declare no conflicts of interest  **Study dates:** April 2014 to June 2017 |
| **Reference(s)**  **\* primary reference** | ISRCTN17115599. PREPARE (prehabilitation, physical activity and exercise) persons with severe low back pain for an optimal functional outcome after lumbar fusion surgery [PREPARE (prehabilitation, physical activity and exercise) persons with severe low back pain for an optimal functional outcome after lumbar fusion surgery: a randomised controlled trial]. [isrctn.com/ISRCTN17115599](Https://isrctn.com/ISRCTN17115599) (first received 18 May 2015)  \* Lotzke H, Brisby H, Gutke A, Hagg O, Jakobsson M, Smeets R*, et al.* A Person-Centered Prehabilitation Program Based on Cognitive-Behavioral Physical Therapy for Patients Scheduled for Lumbar Fusion Surgery: A Randomized Controlled Trial. *Physical Therapy* 2019; **99**: 1069-88  Lotzke H, Jakobsson M, Brisby H, Gutke A, Hagg O, Smeets R, den Hollander M, Olsson LE, Lundberg M. Use of the PREPARE (PREhabilitation, Physical Activity and exeRcisE) program to improve outcomes after lumbar fusion surgery for severe low back pain: a study protocol of a person-centred randomised controlled trial. BMC Musculoskeletal Disorders 2016; **17**: 349. [DOI: <https://dx.doi.org/10.1186/s12891-016-1203-8>] |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Computer-generated randomisation |
| Allocation concealment (selection bias) | Low risk | Use of numbered, sealed envelopes, with allocation sheets of information wrapped in coloured paper |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: fitness outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adverse events (detection bias) | Unclear risk | Observation method not specified for this outcome |
| Incomplete outcome data (attrition bias) | Low risk | Few losses which are balanced between groups |
| Selective reporting (reporting bias) | Unclear risk | Study is retrospectively registered with a clinical trials register (ISRCTN17115599; first received 4 April 2015). It is not feasible to effectively assess risk of reporting bias using these retrospective documents |
| Other bias | Low risk | We identified no other sources of bias |

Macchi et al.

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| **Methods** | BA, single arm; single centre  **Design features:** participants were enrolled from 289 consecutive patients admitted as inpatients to the rehabilitation centre from July 2006 to June 2007, for an intensive 3-week CR program soon after cardiac surgery (mean time interval between surgery and admission to the rehabilitation centre, 7.6 days (2.8 SD))  **Study aim/objective:** understanding whether current inpatient CR programs that are conceived for elderly patients who have recently undergone cardiac surgery are actually effective in promoting an active lifestyle is very important and goes beyond the specific targets of CR. Accordingly, this study assessed the 1 year adherence to the physical exercise prescription received at the end of the CR program in a cohort of patients aged 65 years who have attended post-acute inpatient CR after cardiac surgery by using a questionnaire on PA and the 6MWT. |
| **Participants** | **Total number of included participants:** 143  **Inclusion criteria:** inpatient at rehabilitation centre from July 2006 to June 2007 following cardiac surgery; ≥ 65 years of age  **Exclusion criteria:** disability in one or more basic ADL; cognitive deterioration (corrected MMSE score < 21); relevant functional impairment resulting from a previous stroke; PAD; severe OA of weight-bearing joints or other chronic diseases able “per se” to remarkably limit PA; patients living far away from the rehabilitation centre  **Type of surgery (condition):** cardiac surgery  **Country:** Italy  **Baseline Characteristics**  **Intervention group**   * *Type of surgery, n*: CABG: 50; valve repair/replacement: 22; combined surgery: 29 * *Age, mean (SD)*: 75 (± 6) years * *Gender, M/F*: 86/45 * *BMI, mean (SD)*: 25 (± 3.4) kg/m2 * *Current involvement in regular PA, n (%)*: PA score: score 0: 7 (13.0); score 1: (59.5); score 2: 32 (24.5); score 3: (3.0); score 4: 0 (0.0) * *Education status, mean (SD)*: 4.6 (± 3.1) years   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, illness severity scores, relevant clinical variables |
| **Interventions** | **Details of interventions**  Approach: counselling and exercise sessions; rehabilitation programme combining education and counselling, prevention of falls, and an aerobic, flexibility and balance exercise prescription; 2 sessions per day over 3-weeks, with a 1-year booster session  Context: cardiac surgery patients; 1-week post-surgery (mean 7.6 (2.8) days); rehabilitation centre  Comparison: no comparator group  **Intervention group:** number included = 143; losses = 12 (died = 2; refusal or logistic or medical reasons = 10); analysed = 131  **Setting:** rehabilitation clinic and home |
| **Outcomes** | **All outcomes measured/reported by study authors**: physical fitness (6MWT); engagement in PA; smoking cessation; hypertension; diabetes; dyslipidaemia; obesity; adverse events  **Outcomes relevant to the review:**   * Engagement in PA: assessed by a staff physician during the medical interview by using a questionnaire modelled on the HAAS and adapted for Italian people (e.g., Italians use km instead of miles; city blocks are quite different in the old town centre and in the modern suburbs). Then, PA was scored into 5 progressive grades, which combined energy expenditure and PA duration; 1-year post-intervention * Physical fitness: using 6MWT; 1-year post-intervention * Adverse events   **Study primary outcome:** 6MWT (listed first) |
| **Notes** | **Sponsorship source:** supported by institutional funds. The authors declare no conflicts of interest  **Study dates:** July 2006 to June 2007 |
| **Reference(s)**  **\* primary reference** | Macchi C, Polcaro P, Cecchi F, Zipoli R, Sofi F, Romanelli A*, et al.* One-year adherence to exercise in elderly patients receiving postacute inpatient rehabilitation after cardiac surgery. *American Journal of Physical Medicine & Rehabilitation* 2009; **88**: 727-34 |

Macleod et al.

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| **Methods** | BA; multi-centre (two centres)  **Study aim/objective:** to assess the feasibility of delivering and evaluating a lifestyle programme for patients with colorectal cancer undergoing potentially curative treatments |
| **Participants** | **Total number of included participants:** 22  **Inclusion criteria:** > 18 years of age; capable of giving informed consent, considered to have stage I–III colorectal cancer, eligible for potentially curative treatment (had to be fit for major surgery). It should be noted that participants were recruited before CT scans and eligibility was based on clinical examination  **Exclusion criteria:** severe cognitive impairment, emergency surgery, or preoperative neoadjuvant therapy  **Type of surgery (condition):** not specified (colorectal cancer)  **Country:** UK  **Baseline Characteristics**  **Intervention group**   * *Type of treatment, n*: chemotherapy and radiotherapy: 3; chemotherapy only: 6; no oncology: 10; palliative care: 3 * *Age, median (IQR)*: 67.0 (60.0 to 74.3) years * *Gender, M/F*: 17/5 * *BMI, median (IQR)*: 28.3 (25.5 to 33.5) kg/m2 * *Current involvement in regular PA, median (IQR)*: total PA (work + leisure): median (IQR): 532 (228 to 886) minutes/week * *Relevant illness severity scores (e.g., ASA, APACHE II), n (%)*: cancer staging: Duke A: 3 (14); Duke B: 6 (27); Duke C: 8 (36) * *SMID*: 1 to 3 (most deprived): 5; 4 to 7: 10; 8 to 10 (most affluent): 7   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, relevant clinical scores |
| **Interventions** | **Details of interventions**  Approach: lifestyle intervention; behaviour change face-to-face (3 sessions) and telephone (at least 9 sessions) support with a focus on increasing PA, smoking cessation and diet; delivered by a lifestyle coach over approximately 31 weeks  Context: colorectal cancer patients; pre surgery (median 15-days), hospital outpatient clinic  Comparison: no comparator group  **Intervention group:** number included = 22; losses = 7 (died = 2; wife ill = 1; felt better = 1; too unwell = 1; still receiving treatment at end of study = 1; metastatic disease = 1); analysed = 15  **Setting:** clinic |
| **Outcomes** | **All outcomes measured/reported by study authors:** feasibility measures (recruitment, retention, programme implementation, achieved measures, fidelity, factors affecting protocol adherence and acceptability); changes in body weight; waist circumference; amount of PA (IPAQ-SF); physical fitness (6MWT); diet; smoking; alcohol intake; fatigue; bowel function; HRQoL (EORTC QLQ C30; EORTC QLQ C29). Measured at baseline and at the end of each phase of the study (phase 1 pre-surgery, phase 2 surgical recovery and phase 3 post-surgery / adjuvant therapy recovery)  **Outcomes relevant to the review:**   * Amount of PA: using IPAQ-SF; 31 weeks post-surgery   **Study primary outcome:** feasibility measures |
| **Notes** | **Sponsorship source:** supported by funding from the Chief Scientist Office. Study authors declare no conflicts of interest  **Study dates:** recruitment 1 April 2014 to 31 October 2014 |
| **Reference(s)**  **\* primary reference** | ISRCTN52345929. Study to assess the delivery of a lifestyle intervention for colorectal cancer patients undergoing potentially curative treatment. <http://www.who.int/trialsearch/Trial2.aspx?TrialID=ISRCTN52345929> 2014  \* Macleod M, Steele RJC, O'Carroll RE, Wells M, Campbell A, Sugden JA*, et al.* Feasibility study to assess the delivery of a lifestyle intervention (TreatWELL) for patients with colorectal cancer undergoing potentially curative treatment. *BMJ Open* 2018; **8**: e021117 |

Mundle et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to assess the impact of accelerometer device use on 6 month clinical and biochemical characteristics of patients attending CR who had recently undergone PCI or cardiac surgery; to determine if this resulted in an overall increase in PA in these patients |
| **Participants** | **Total number of participants:** 50 (number randomised is not reported)  **Inclusion criteria:** patients having undergone PCI or cardiac surgery and attending 10-week CR at New Brunswick Heart Centre  **Exclusion criteria:** not reported  **Type of surgery (condition):** cardiac surgery  **Country:** Canada  **Baseline Characteristics**  No baseline characteristics reported  Note:   * study authors only report number of participants who were included in the final analysis (50 participants). We have used this number as the number of participants randomised |
| **Interventions** | **Details of interventions**  Approach: accelerometer wear; add-on to usual care cardiac rehabilitation, use of accelerometer for at least 10 hours per day, three days per week for 30 days  Context: cardiac patients; post-surgery  Notes: patients assumed to be at home but this is not specified  Comparison: usual care cardiac rehabilitation  **Intervention group:** number randomised = not specified; losses = not reported; analysed = 30  **Comparison group:** number randomised = not specified; losses = not reported; analysed = 20  **Setting:** hospital/specialist heart centre  Note:   * study authors report the number included in the final analysis (i.e., 50 participants). Study authors also report that of these, 39 participants completed the 6-month assessment. We have assumed that the reported data in the abstract is ITT, and we have included 50 participants in analysis of data for PA |
| **Outcomes** | **All outcomes measured/reported by study authors**: clinical characteristics (lipid profile, cholesterol, fasting blood sugar, glycated haemoglobin, creatine); daily PA (sedentary, light-moderate, vigorous). Measured at baseline and 6 months  **Outcomes relevant to the review:**   * Amount of PA: total light to moderate PA using an accelerometer combined with self-reported data; 6 months post-surgery   **Study primary outcome:** not specified but self-reported daily activity only reported outcome data  Note:   * we only reported light-moderate exercise because we were less confident of the unit of measurement used for vigorous daily activity |
| **Notes** | **Sponsorship source:** funding support and declarations of interest not reported  **Study dates:** not reported |
| **Reference(s)**  **\* primary reference** | Mundle JS, MacLeod JB, Hassan A, Lutchmedial S. Assessing the impact of accelerometry device use on exercise motivation and clinical outcomes in patients attending cardiac rehabilitation following percutaneous coronary intervention or cardiac surgery. *Journal of cardiopulmonary rehabilitation and prevention* 2016; **36**: 386 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Described as randomised but no additional details |
| Allocation concealment (selection bias) | Unclear risk | Insufficient information |
| Blinding of participants and personnel (performance bias) | High risk | Not feasible to blind participants to interventions |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Use of an objective measurement tool to measure PA, as well as self-reported data. We have judged this as low risk of bias, but note a high risk of bias for the self-reported data |
| Incomplete outcome data (attrition bias) | Unclear risk | Study authors did not report losses. We were uncertain of attrition bias because study authors did not report numbers randomised to each group or numbers of losses per group |
| Selective reporting (reporting bias) | Unclear risk | Study authors did not report clinical trials registration or pre-published protocol. It is not feasible to effectively assess risk of selective reporting bias without these documents |
| Other bias | High risk | Study is reported as an abstract with insufficient information to effectively assess risks of other bias. We judged the study to be at high risk of bias because the abstract was unlikely to be peer-reviewed |

Painter et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to study the effects of an exercise intervention after renal transplant on health-related fitness (exercise capacity, muscle strength, body composition) and HRQoL |
| **Participants** | **Total number of randomised participants:** 167  **Inclusion criteria:** within 2 months following kidney transplantation at study hospital  **Exclusion criteria:** transplant rejection; psychiatric or neurologic disorder that would preclude participation; orthopedic limitations that precluded exercise testing or training; were unavailable for regular follow-up; had any absolute contraindications to exercise testing as established by AHA or ACSM; or had any medical complications that would prevent regular participation  **Type of surgery (condition):** renal transplantation  **Country:** USA  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 39.7 (± 12.6) years * *Gender, M/F*: 30/24 * *BMI, mean (SD)*: 24.8 (± 4.6) kg/m2 * *Weight, mean (SD)*: 70.0 (± 14.5) kg * *Height, mean (SD)*: 167.3 (± 0.9) cm * *Baseline level of fitness, mean (SD)*: Peak VO2: 24.0 (± 7.5) ml/kg/min. Peak VO2: 1.67 (± 0.62) L/min. % age-predicted VO2: 70.9 (± 19.7). Peak respiratory exchange ratio: 1.32 (± .17). Peak rating of perceived exertion: 16.7 (± 1.7). Peak torque: 53.6 (± 20.7) ft.lbs. Peak torque per body weight: 34.5 (± 11.8).ft.lbs/kg * *Current involvement in regular PA, %*: 50 * *Relevant clinical variables, n*: cause of renal failure: glomerulonephritis: 10; hypertension: 9; DM: 3; lupus: 6; PCKD: 1; IGA nephropathy: 4; unknown: 7; other: 14. Type of transplant: cadaveric: 35; living related: 15; living unrelated: 4 * *Race, n (%)*: Caucasian: 27 (50); Hispanic: 12 (22); African American: 6 (11); Asian: 5 (9); other: 4 (7)   **Comparison group**   * *Age, mean (SD)*: 43.7 (± 10.7) years * *Gender, M/F*: 30/13 * *BMI, mean (SD)*: 25.1 (± 4.8) kg/m2 * *Weight, mean (SD)*: 71.5 (± 16.6) kg * *Height, mean (SD)*: 167.6 (± 10.7) cm * *Baseline level of fitness*: Peak VO2: 24.7 (± 6.7) ml/kg/min. Peak VO2: 1.78 (± 0.63) L/min. % Age-predicted VO2: 71.6 (± 19.9). Peak respiratory exchange ratio: 1.38 (± .14). Peak rating of perceived exertion: 16.3 (± 2.3). Peak torque: 51.4 (± 17.7) ft.lbs. Peak torque per body weight: 33.7 (± 9.5) ft.lbs/kg * *Current involvement in regular PA, %*: 47 * *Relevant clinical variables, n*: cause of renal failure: glomerulonephritis: 2; hypertension: 8; DM: 8; lupus: 3; PCKD: 5; IGA nephropathy: 2; unknown: 6; other: 9. Type of transplant: cadaveric: 25; living related: 17; living unrelated: 1 * *Race, n (%)*: Caucasian: 20 (46.5); Hispanic: 10 (23.3); African American: 6 (13.9); Asian: 4 (9.3); other: 3 (6.9)   Note:   * study authors do not report the following characteristics: illness severity scores |
| **Interventions** | **Details of interventions**  Approach: exercise prescription; independent home-based exercise primarily walking or cycling, at least four times per week for 12 months, individualised prescription; telephone support from research staff  Context: renal transplant patients; two months post-surgery; home  Comparison: usual care  **Intervention group:** number randomised = 83; reported losses = 29 (disinterest = 9; lost to follow-up = 14; medical concerns = 5; death = 1) some attrition is unexplained; analysed for PA and HRQoL = 54; analysed for fitness = 52  **Comparison group:** number randomised = 84; losses = 41 (disinterest = 10; lost to follow-up = 16; medical concerns = 14; death = 1); analysed = 43 (all 3 outcomes)  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors:** cardiorespiratory fitness (VO2 Peak); muscle strength; body composition; HRQoL (SF-36); activity participation. Measured 1 (baseline), 6, and 12 months after transplant  **Outcomes relevant to the review:**   * Engagement in PA: self-reported; 12 months post-surgery * Physical fitness: using VO2 Peak; 12 months post-surgery * HRQoL: using SF-36 (PCS); 12 months post-surgery   **Study primary outcome:** exercise participation (listed first) |
| **Notes** | **Sponsorship source:** funding support and declarations of interest not reported  **Study dates:** January 1994 to November 1995 |
| **Reference(s)**  **\* primary reference** | Painter PL, Hector L, Ray K, Lynes L, Dibble S, Paul SM*, et al.* A randomized trial of exercise training after renal transplantation. *Transplantation* 2002; **74**: 42‐8 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Quote: "Randomization was performed using a restricted randomization procedure, which was managed using prepared sealed envelopes containing a card indicating the allocated treatment group. After the baseline testing, the next envelope was opened. It was expected that randomization would assure equal distribution between the groups of demographics, comorbidities, transplant function, and so forth." |
| Allocation concealment (selection bias) | Unclear risk | Quote: "Randomization was performed using a restricted randomization procedure, which was managed using prepared sealed envelopes containing a card indicating the allocated treatment group." Comment: study authors do not state if envelopes are sequentially numbered and opaque |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: fitness outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Incomplete outcome data (attrition bias) | High risk | Although losses are explained, losses are high with more losses in usual care group |
| Selective reporting (reporting bias) | Unclear risk | Study authors do not report clinical trials registration. It is not feasible to effectively assess reporting bias without this document |
| Other bias | Low risk | We identified no other sources of bias |

Piva et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** to compare the effectiveness of later-stage exercise programs after TKR and to explore heterogeneity of treatment effects |
| **Participants** | **Total number of randomised participants:** 240  **Inclusion criteria:** unilateral primary TKR; ≥ 60 years of age; TKR 2 to 4 months before screening; moderate functional limitations defined by WOMAC-PF of 9 or higher; ability to read and write English; willingness to be randomised; and medical clearance to exercise  **Exclusion criteria:** contraindications to exercise; neuromuscular disorders of the lower extremities; inability to independently walk 50 metres; regular participation in supervised exercise; terminal illness; intent to undergo another TKR; unavailability during the study period. Arthroplasty design, material and instrumentation, and fixation method were not considered for inclusion because they have been shown not to affect TKR outcomes.  **Type of surgery (condition):** TKR  **Country:** USA  **Baseline Characteristics**  **Intervention group (Clinic-based individualised physical therapy)**   * *Age, mean (SD)*: 69 (± 6) years * *Gender, M/F*: 37/59 * *BMI, mean (SD)*: 30.8 (± 5.3) kg/m2 * *Relevant illness severity scores (e.g., ASA, APACHE II), mean (SD)*: pain in surgical knee, measured by an 11-point numeric pain scale ranging from 0 (no pain) to 10 (extremely intense pain): 2.7 (± 2.1) * *Relevant clinical variables, mean (SD)*: number of comorbidities: 4.3 (± 2.0) * *Time since surgery, mean (SD)*: 124 (± 26) days * *Race, n (%)*: white: 86 (89.6); African American: 10 (10.4); American Indian/Alaskan Native: 0 (0) * *Education status, n (%)*: < college degree: 31 (32.3); completed college or technical training: 59 (61.5); other/missing: 6 (6.3)   **Intervention group** **(Community-based group exercise)**   * *Age, mean (SD)*: 70 (± 7) years * *Gender, M/F*: 38/58 * *BMI, mean (SD)*: 31.1 (± 6.3) kg/m2 * *Relevant illness severity scores (e.g., ASA, APACHE II), mean (SD)*: pain in surgical knee, measured by an 11-point numeric pain scale ranging from 0 (no pain) to 10 (extremely intense pain): 2.3 (± 1.7) * *Relevant clinical variables, mean (SD)*: number of comorbidities: 4.4 (± 1.7) * *Time since surgery, mean (SD)*: 124 (± 26) days * *Race, n (%)*: white: 77 (80.2); African American: 18 (18.8); American Indian/Alaskan Native: 1 (1) * *Education status, n (%)*: < college degree: 33 (34.4); completed college or technical training: 57 (59.4); other/missing: 6 (6.3)   **Comparison group**   * *Age, mean (SD)*: 70 (± 7) years * *Gender, M/F*: 17/31 * *BMI, mean (SD)*: 31.5 (± 5.1) kg/m2 * *Relevant illness severity scores (e.g., ASA, APACHE II), mean (SD)*: pain in surgical knee, measured by an 11-point numeric pain scale ranging from 0 (no pain) to 10 (extremely intense pain): 2.2 (± 1.8) * *Relevant clinical variables, mean (SD)*: number of comorbidities: 4.6 (± 1.9) * *Time since surgery, mean (SD)*: 127 (± 25) days * *Race, n (%)*: white: 37 (77.1); African American: 11 (22.9); American Indian/Alaskan Native: 0 (0) * *Education status, n (%)*: < college degree: 12 (25); completed college or technical training: 31 (64.6); other/missing: 5 (10.4)   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, current involvement in regular PA |
| **Interventions** | **Details of interventions**  Approach 1: supervised and clinic-based exercise session; supervised resistance, aerobic and functional activities plus instruction for home exercise; sessions delivered by physical therapist beginning twice per week and reducing to bi-monthly, over 12-weeks; additional home exercise encouraged at least twice per week  Context: TKR patients; approximately four months after surgery (mean 124 (26) days); clinic and home  Approach 2: community-based exercise classes for older adults; group classes focused on cardiovascular exercise, strength training, balance and flexibility; delivered by senior fitness instructors, twice weekly, for 12 weeks  Context TKR; approximately four months after surgery (mean 124 (26) days); community centre  Comparison: usual care; waiting list control offered intervention after 6-months  **Intervention group (approach 1):** number randomised = 96; reported losses = 7 (values for physical therapy were 1.0% (1 of 96) and cumulative 7.3% (7 of 96)) some attrition is unexplained; analysed for PA = 85; analysed for fitness = 83; analysed for HRQoL = 89  **Intervention group (approach 2):** number randomised = 96; reported losses = 8 (values for physical therapy were 4.2% (4 of 96) and cumulative 8.3% (8 of 96)) some attrition is unexplained; analysed for PA = 80; analysed for fitness = 76; analysed for HRQoL = 88  **Comparison group:** number randomised = 48; reported losses = 3 (values for physical therapy were 2.1% (2 of 48) and cumulative 6.3% (3 of 48)) some attrition is unexplained; analysed for PA = 40; analysed for fitness = 40; analysed for HRQoL = 45  **Setting:** community centre |
| **Outcomes** | **All outcomes measured/reported by study authors:** physical function (WOMAC-PF); physical fitness (composite score for 6 performance-based tests germane to TKR (6MWT, 40-m FWPT, SCT, OLS, CST, SRT)); satisfaction and performance (COPM); PROMIS-PF; HRQoL (RAND-36); PA (SenseWear accelerometer; CHAMPS); psychosocial factors (depression, anxiety, fear of movement, self-efficacy); adverse events; attrition; adherence; co-interventions. Measured at baseline, 3 months and 6 months post-surgery  **Outcomes relevant to the review:**   * Amount of PA: using an accelerometer; measured as energy expenditure measures; 6 months post-surgery * Physical fitness: using performance-based tests; 6 months post-surgery * HRQoL: using RAND-36 (PCS); 6 months post-surgery * Adverse events   **Study primary outcome:** physical function (WOMAC-PF) |
| **Notes** | **Sponsorship source:** supporting by funding from the Patient-Centered Outcomes Research Institute. Authors report the following conflict of interest disclosures: Dr Piva reported receiving grants from the Patient-Centered Outcomes Research Institute (PCORI). Dr Schneider reported receiving grants from PCORI, being a member of the National Chiropractic Mutual Insurance Company speaker’s bureau, and conducting medicolegal consulting for State Farm Insurance. Dr Moore reported receiving grants from PCORI. Ms Catelani reported receiving grants from the University of Pittsburgh. Dr Klatt reported receiving grants from the University of Pittsburgh, receiving royalties from SLACK Orthopedics and from Elsevier, reported serving on the editorial board for The Journal of Arthroplasty, and serving as a reviewer for Clinical Orthopaedics and Related Research and Journal of the American Academy of Orthopaedic Surgeons. Dr Irrgang reported receiving grants from PCORI. No other disclosures were reported.  **Study dates: Study dates:** 7 January 2015 to 9 November 2017 |
| **Reference(s)**  **\* primary reference** | NCT02237911. Comparison of treatments following total knee replacement [A comparison of treatment methods for patients following total knee replacement]. <Https://clinicaltrials.gov/ct2/show/NCT02237911> (first received 11 September 2014)  \* Piva SR, Moore CG, Schneider M, Gil AB, Almeida GJ, Irrgang JJ. A randomized trial to compare exercise treatment methods for patients after total knee replacement: Protocol paper Rehabilitation, physical therapy and occupational health. *BMC Musculoskeletal Disorders* 2015; **16**: 303  Piva SR, Schneider MJ, Moore CG, Catelani MB, Gil AB, Klatt BA. Effectiveness of later-stage exercise programs vs usual medical care on physical function and activity after total knee replacement: a randomized clinical trial. JAMA Network Open 2019; **2**: e190018 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Randomisation performed using an electronic data capture system |
| Allocation concealment (selection bias) | Low risk | Allocation was concealed until after baseline assessments |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: fitness outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adverse events (detection bias) | Unclear risk | Used a combination of objective and subjective observation methods |
| Incomplete outcome data (attrition bias) | Low risk | Losses were few and relatively balanced between groups |
| Selective reporting (reporting bias) | Low risk | Study was prospectively registered with a clinical trials register (NCT02237911; first received September 2014); reported review outcomes were consistent with these prospectively prepared documents |
| Other bias | Low risk | No other sources of bias detected |

Santa Mina et al.

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| **Methods** | RCT, parallel design; multi-centre (two health centres)  **Study aim/objective:** to assess the feasibility and effect of a personalised, home-based prehabilitation intervention on clinically-relevant outcomes in radical prostatectomy |
| **Participants** | **Total number of randomised participants:** 86  **Inclusion criteria:** men; between 40 to 80 years of age; with localized prostate cancer consenting for radical prostatectomy; proficient in English or French; and free from contraindications to exercise  **Exclusion criteria:** severe CAD; significant congestive heart failure (NYHA ≥ class III); uncontrolled pain; neurological or musculoskeletal comorbidity inhibiting exercise; diagnosed psychotic, addictive, or major cognitive disorders; no more than 2 ACSM coronary risk factors  **Type of surgery (condition):** radical prostatectomy (prostate cancer)  **Country:** Canada  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 61.2 (± 8.0) years * *Gender*: all male * *BMI, mean (SD)*: 27.1 (± 4.2) kg/m2 * *Non-surgical participants, n*: 2 * *Race/ethnicity, n*: white/Caucasian: 30; black/Afro-Caribbean/African: 6; Ashkenazi Jewish: 1; East and South Asian: 2; South East Asian: 1; other: 3; missing: 0 * *Education status, n*: < high school: 4; high school graduate: 8; community college: 6; university undergraduate or graduate degree: 22; other: 3; missing: 1 * *Economic status, n*: annual income: < $40,000: 5; $40,000 to $80,000: 26; > $80,000: 12; missing: 1   **Comparison group**   * *Age, mean (SD)*: 62.2 (± 6.9) years * *Gender*: all male * *BMI, mean (SD)*: 27.1 (± 4.4) kg/m2 * *Non-surgical participants, n*: 2 * *Race/ethnicity, n*: white/Caucasian: 30; Black/Afro-Caribbean/African: 5; Ashkenazi Jewish: 0; East and South Asian: 2; South East Asian: 0; other: 2; missing: 1 * *Education status, n*: < high school: 3; high school graduate: 10; community college: 9; university undergraduate or graduate degree: 17; other: 2; missing: 1 * *Economic status, n*: annual income: < $40,000: 18; $40,000 to $80,000: 11; > $80,000: 1; missing: 2   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness, current involvement in regular PA, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: home exercise programme; manual, aerobic and resistance training prescription (based on baseline assessment) and provision of exercise equipment (resistance band, stability balls, yoga mat), three or four times per week, pre surgery (typically 4-8 weeks); weekly contact with study team to facilitate and monitor compliance  Context: prostate cancer patients; pre surgery, once surgery scheduled; home  Comparison: usual care; advice on pelvic floor exercises and provision of a prostate cancer-specific lifestyle support book (also provided to intervention group)  **Intervention group:** number randomised = 44; losses = 11 (lost to follow-up = 3; no interest = 4; did not have surgery = 2; self-determined inability = 1; no reason recorded = 1); analysed = 33  **Comparison group:** number randomised = 42; losses = 14 (lost to follow-up = 3; no time = 1; no reason recorded = 5; did not have surgery = 2; no interest = 3); analysed = 28  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors**: adherence; pelvic floor exercise compliance; LOS; surgical complications; physical fitness (6MWT; HGS); maximal isometric strength for elbow flexion and extension; body composition; PA (CHAMPS); HRQoL (FACT-G); cancer-specific fatigue; adverse events; anxiety and depression; pain; urinary symptoms; erectile dysfunction. Measured at baseline and 6 months post-surgery  **Outcomes relevant to the review:**   * Amount of PA: using CHAMPS (kcal/kg/week); 6 months post-surgery * Physical fitness: using 6MWT; 6 months post-surgery * Physical fitness: using HGS; 6 months post-surgery * HRQoL: using FACT-G; 6 months post-surgery * Pain: using PDI; 6 months post-surgery * Adherence: meeting minimum target exercise volume for total exercise programme * Adverse events   **Study primary outcome:** feasibility |
| **Notes** | **Sponsorship source:** supported by funding from Prostate Cancer Canada, and the University of Guelph-Humber. Study authors declare no conflicts of interest  **Study dates:** February 2014 to September 2015 |
| **Reference(s)**  **\* primary reference** | NCT02036684. Prehabilitation for prostate cancer surgery [A multicentre, pilot randomized controlled trial to examine the effects of prehabilitation on functional outcomes after radical prostatectomy]. <Https://clinicaltrials.gov/ct2/show/NCT02036684> (first received 15 January 2014).  Santa Mina D, Matthew AG, Hilton WJ, Au D, Awasthi R, Alibhai SMH, Clarke H, Ritvo P, Trachtenberg J, Fleshner NE, Finelli A, Wijeysundera D, Aprikian A, Tanguay S, Carli F. Prehabilitation for men undergoing radical prostatectomy: a multi-centre, pilot randomized controlled trial. BMC Surgery 2014; **14**: 89. [DOI: <https://dx.doi.org/10.1186/1471-2482-14-89>]  \* Santa Mina D, Hilton WJ, Matthew AG, Awasthi R, Bousquet-Dion G, Alibhai SMH*, et al.* Prehabilitation for radical prostatectomy: A multicentre randomized controlled trial. *Surgical Oncology* 2018; **27**: 289-98 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Envelopes were shuffled to create a random order |
| Allocation concealment (selection bias) | Low risk | Use of sequentially-numbered, opaque envelopes |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to group allocation |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: fitness outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adverse events (detection bias) | Unclear risk | Observation method not specified for this outcome |
| Blinding of outcome assessment: adherence (detection bias) | High risk | Outcome self-reported |
| Incomplete outcome data (attrition bias) | High risk | Losses were well reported and were reasonably balanced between groups. However, overall, the losses were at 29%, which we judged to be high |
| Selective reporting (reporting bias) | Low risk | Prospectively registered with clinical trials register (NCT02036684); outcomes in the published report are largely comparable to those in the clinical trials documents |
| Other bias | Low risk | We identified no other sources of bias |

Sellberg et al.

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| **Methods** | RCT, parallel design; multi-centre (5 hospitals)  **Study aim/objective:** test early effects (study endpoint 2 years) of a dissonance-based group intervention on HRQoL (primary outcome) and wellbeing among women who underwent RYGB |
| **Participants** | **Total number of randomised participants:** 259  **Inclusion criteria:** female; severe obesity (BMI ≥ 35 kg/m2); able to understand and speak Swedish; the absence of any serious chronic disease such as stroke or myocardial infarction  **Exclusion criteria:** < 18 years of age; have not made previous serious attempts to lose weight; alcohol/substance abuse; recent heart disease or stroke or certain kinds of cancer  **Type of surgery (condition):** RYGB  **Country:** Sweden  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 43.6 (± 10.7) years * *Gender, M/F*: all female * *Weight, mean (SD)*: 110.8 (± 14.0) kg * *Height, mean (SD)*: 164.9 (± 6.6) cm * *BMI, mean (SD)*: 40.7 (± 4.3) kg/m2 * *Relevant clinical variables, n (%)*: diabetes type 2: 32 (20.5) * *Education status, n (%)*: primary: 19 (12.3); secondary: 87 (56.1); post-secondary: 49 (31.6) * C*urrent involvement in regular PA, mean (SD)*: MVPA: 26.4 (± 17.8) mins/day; steps: 6054.9 (± 2353.0) steps/day   **Comparison group**   * *Age, mean (SD)*: 45.1 (± 10.1) years * *Gender, M/F*: all female * *Weight, mean (SD)*: 111.0 (± 17.6) kg * *Height, mean (SD)*: 164.2 (± 6.7) cm * *BMI, mean (SD)*: 41.2 (± 5.2) kg/m2 * *Relevant clinical variables, n (%)*: diabetes type 2: 23 (22.3) * *Education status, n (%)*: primary: 9 (8.7); secondary: 56 (54.4); post-secondary: 87 (36.9) * *Current involvement in regular PA, mean (SD)*: MVPA: 27.4 (± 20.9) mins/day; steps: 6314.1 (± 2629.7) steps/day   Note:   * study authors do not report the following characteristics: race, economic status, baseline level of fitness, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: group-based wellbeing sessions; four dissonance-based small group peer discussion sessions, focus on PA fears, motivation and avoiding failure; delivered by researcher, once per week for four-weeks.  Context: Roux-en-Y gastric bypass surgery; delivered post-surgery (delayed) at hospital clinic  Comparison: usual care; varied between sites, generally included follow-up with dietician, nurse, or surgeon usually about medical complications, weight loss, and post-surgery diet a few weeks, 6 months, and 1 and 2 years after surgery; also provided to intervention group  **Intervention group:** number randomised = 156; reported losses = 36 (lost to follow-up = 34; did not want to participate = 1; sleeve gastrectomy = 1) some attrition is unexplained; analysed for PA = 98; analysed for HRQoL and pain = 120  **Comparison group:** number randomised = 103; reported losses = 20 (lost to follow-up = 19; did not want to participate = 1) some attrition is unexplained; analysed for PA = 63; analysed for HRQoL and pain = 83  **Setting:** clinic |
| **Outcomes** | **All outcomes measured/reported by study authors:** HRQoL (SF-36); eating behaviour (Three-Factor Eating Questionnaire); body esteem (Body Esteem Scale); satisfaction with social life (Social Adjustment Scale); amount of PA (ActiGraph GT3X1 accelerometer (ActiGraph, Pensacola, USA)); adverse effects. Measured at baseline and 1-year post-surgery  **Outcomes relevant to the review:**   * Amount of PA: MVPA mins/day (ActiGraph GT3X1 accelerometer); 1-year post-surgery * Amount of PA: steps/day (ActiGraph GT3X1 accelerometer); 1-year post-surgery * HRQoL: SF-36 (general); 1-year post-surgery * Pain: using SF-36 (pain subscore); 1-year post-surgery * Adverse events   **Study primary outcome:** HRQoL (SF-36) |
| **Notes** | **Sponsorship source:** supported by the Swedish Research Council (Vetenskapsradet), the Stockholm County Council (ALF Medicine) and the Research School of Caring Sciences, Karolinska Institutet. Study authors declare no conflicts of interest  **Study dates:** recruitment from January 2015 to August 2018 |
| **Reference(s)**  **\* primary reference** | Sellberg F, Possmark S, Willmer M, Tynelius P, Berglind D. One-year follow-up of a dissonance-based intervention on quality of life, wellbeing, and physical activity after Roux-en-Y gastric bypass surgery: a randomized controlled trial. *Surgery for obesity and related diseases* 2019; **15**: 1731-7 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Computer generated block randomisation |
| Allocation concealment (selection bias) | Unclear risk | Insufficient information |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to intervention groups |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adverse events (detection bias) | Unclear risk | Observation method not specified for this outcome |
| Incomplete outcome data (attrition bias) | High risk | Although balanced between groups, we noted a high number of losses |
| Selective reporting (reporting bias) | Low risk | Study is registered with a clinical trials register (ISRCTN16417174; first received 7 January 2015). Outcomes in the trails register documents are consistent with those in the study report |
| Other bias | Low risk | No other sources of bias detected |

Smith et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to compare the long-term effectiveness of hospital versus telephone-monitored home-based exercise training CR on exercise capacity and habitual PA |
| **Participants** | **Total number of randomised participants:** 242  **Inclusion criteria:** 35 to 49 days post-CABG surgery; achieved between 40% and 80% of age and sex-predicted maximum MET level on a progressive cycle ergometry exercise test at baseline; able to read and write English  **Exclusion criteria:** recurrent angina; had a positive graded exercise test (defined by drop in systolic blood pressure ≥ to 20 mm Hg, uncontrolled atrial or ventricular dysrhythmias or horizontal or down sloping ST segment displacement of 0.1 mV or more at 80 s after the J point); unable to attend rehabilitation 3 times per week; unable to participate due to physical limitations; had previously participated in an out-patient CR program  **Type of surgery (condition):** CABG  **Country:** Canada  **Baseline Characteristics**  **Intervention group (****CBE)**   * *Age, mean (SD)*: 63.4 (± 8.8) years * *Gender, M/F*: 81/21 * *Education status, %*: completed secondary school diploma: 28.4 * *Economic status, %*: annual income between $30,000 to $40,000: 29.4   **Comparison group (****HBE)**   * *Age, mean (SD)*: 65.1 (± 9.0) years * *Gender, M/F*: 80/16 * *Education status, %*: completed secondary school diploma: 31.3 * *Economic status, %*: annual income between $30,000 to $40,000: 25.0   Note:   * study authors do not report the following characteristics: BMI, weight, height, baseline level of fitness, current involvement in regular PA, illness severity scores |
| **Interventions** | **Details of interventions**  Approach 1: supervised exercise sessions; supervised aerobic and stretch sessions three times per week plus advised home exercise, use of exercise logs reviewed on a monthly basis; supervised by exercise specialist and kinesiologists over 6-months  Context: CABG; post-surgery (35-49 days); clinic with additional home training  Approach 2: exercise consultation, plus home training with telephone support; two exercise consultations baseline and 3 months, home training prescription five times per week, use of exercise log, bi-weekly telephone support and education; delivered over 6-months by exercise specialist  Context: CABG patients; post-surgery (35-49 days); home  Comparison: between two interventions, see above  **Intervention group (CBE):** number randomised = 122; reported losses at 12 months = 22 (reasons not explained); reported losses at 6 years = 26 (7 died; 7 Alzheimers Disease; 1 chronic pain; 1 away for summer; 1 refused; 2 work; 5 unable to contact; 2 moved); additional losses for engagement in PA = 14 (did not perform GXT; see note); analysed 6 years post-surgery for engagement in PA = 60; analysed 6 years post-surgery for fitness and HRQoL = 74  **Comparison group (HBE):** number randomised = 120; reported losses at 1 year = 24 (reasons not explained); reported losses at 6 years = 26 (10 died; 6 Alzheimers Disease; 1 chronic heart failure; 1 stroke; 1 away for summer; 3 refused; 1 work; 2 unable to contact; 1 moved); additional losses for engagement in PA = 22 (did not perform GXT; see note); analysed 6 years post-surgery for engagement in PA = 48; analysed 6 years post-surgery for fitness and HRQoL = 70  **Setting:** clinic and home  Note:   * data for engagement in PA was only collected for those who performed GXT. Study authors noted that 36 participants did not perform GXT and reasons were reported as overall data (6 arthritis; 1 back pain; 1 hypertension; 4 CHF; 3 cancer; 2 cataract surgery; 1 elbow surgery; 1 fall; 1 PVD; 1 problem walking; 4 stroke; 4 unable to attend because of transport issues; 3 work; 3 refused; 1 unknown) |
| **Outcomes** | **All outcomes measured/reported by study authors**: peak exercise capacity (symptom-limited GXT given as VO2 Peak); HRQoL (SF-36); social support; exercise maintenance; engagement in PA; anthropometric data. Measured upon entry to the study (baseline); after 6 months of CR (discharge); 1 year after cessation of CR (1 year); and 6 years later (LTFU)  **Outcomes relevant to the review:**   * Engagement in PA: 6 years post-surgery * Physical fitness: using VO2 Peak; 6 years post-surgery * HRQoL: using SF-36 (PCS); 6 years post-surgery   **Study primary outcome:** peak oxygen uptake measured in mL/min (VO2 peak) |
| **Notes** | **Sponsorship source:** supported by funding from the Heart and Stroke Foundation of Ontario. KMS was funded the Canadian Institutes of Health Research, the Canadian Federation of University Women and the Canadian Association of Cardiac Rehabilitation. HMA holds the Heart and Stroke Foundation of Ontario/Michael G DeGroote Endowed Chair in Cardiovascular Nursing Research. Study authors declare no conflicts of interest  **Study dates:** original RCT: July 1997 to June 2000 (including 1 year follow up); recruitment for 6-year follow-up began in February 2005 and was completed in October 2005 |
| **Reference(s)**  **\* primary reference** | Heather AH, Smith KM, Thorpe K, McKelvie RS. Changes in health-related quality of life and social support six-years after cardiac rehabilitation. European journal of cardiovascular prevention and rehabilitation 2011; **18**: S45. [DOI: 10.1177/1741826711407001]  Heather AH, Smith KM, Thorpe K, McKelvie RS. Six-year follow-up of a randomized controlled trial (RCT) supports home versus hospital-based exercise training after coronary artery by-pass graft surgery (CABGS). European journal of cardiovascular prevention and rehabilitation 2011; **18**: S28. [DOI: 10.1177/1741826711406999]  \* Smith KM, Arthur HM, McKelvie RS, Kodis J. Differences in sustainability of exercise and health-related quality of life outcomes following home or hospital-based cardiac rehabilitation. *European Journal of Cardiovascular Prevention & Rehabilitation* 2004; **11**: 313-9  Smith KM, McKelvie RS, Thorpe KE, Arthur HM. Six-year follow-up of a randomised controlled trial examining hospital versus home-based exercise training after coronary artery bypass graft surgery. Heart 2011; **97**: 1169-74. [DOI: <https://dx.doi.org/10.1136/hrt.2010.202036>]  Smith KM. Sustainability of exercise capacity and quality of life after home or hospital based exercise training in low-risk patients following coronary artery bypass graft surgery: A six-year follow-up of a randomized controlled trial. Dissertation Abstracts International: Section B: The Sciences and Engineering 2008; **69**: 220 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Block randomisation |
| Allocation concealment (selection bias) | Low risk | Use of opaque, sealed envelopes which were opened after the collection of baseline data |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to intervention groups |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: fitness outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Incomplete outcome data (attrition bias) | High risk | Losses at the six-year follow-up are explained and are comparable between groups. However, the number of overall losses is high at the 6-year follow-up |
| Selective reporting (reporting bias) | Unclear risk | Study authors do not report pre-published protocol or clinical trials registration. It is not feasible to effectively assess risk of selective reporting bias without these documents |
| Other bias | Low risk | No other sources of bias detected |

Stolberg et al.

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| **Methods** | RCT, parallel group; single centre  **Study aim/objective:** to test the hypotheses that RYGB increases PA as well as HRQoL, and that supervised physical training after RYGB causes additional improvements in PA and HRQoL |
| **Participants** | **Total number of randomised participants:** 60  **Inclusion criteria:** between 25 and 60 years of age; BMI > 35 with obesity‐related disease or BMI > 50 with obesity‐related social or physical complications; at least one of the following: DM, arterial hypertension, OSA, OA, or PCOS  **Exclusion criteria:** using hormones or anticoagulant therapy or became pregnant during the study period; severe musculoskeletal disabilities  **Type of surgery (condition):** RYGB  **Country:** Denmark  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 42.4 (± 9.0) years * *Gender, M/F*: 11/21 * *BMI, mean (SD)*: 33.3 (± 6.2) kg/m2 * *Weight, mean (SD)*: 99.8 (± 18.0) kg * *Baseline level of fitness, mean (SD)*: MVPA: 21.0 (± 16.5) minutes/day   **Comparison group**   * *Age, mean (SD)*: 42.3 (± 9.4) years * *Gender, M/F*: 7/21 * *BMI, mean (SD)*: 34.1 (± 5.4) kg/m2 * *Weight, mean (SD)*: 98.4 (± 19.3) kg * *Baseline level of fitness, mean (SD)*: MVPA: 22.1 (± 11.7) minutes/day   Note:   * study authors do not report the following characteristics: height, current involvement in regular PA, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: exercise classes; twice weekly physical training sessions, supervised by physiotherapist, access to fitness centre**,** delivered over 26 weeks  Context: bariatric patients; post-surgery (6 months); fitness centre  Comparison: usual care; clinic’s standard information about the importance of PA after bariatric surgery  **Intervention group:** number randomised = 32; losses = 10 losses (pregnancy = 2; declined to participate = 7; injury = 1); analysed = 22  **Comparison group:** number randomised = 28; losses = 8 losses (pregnancy = 3; declined to participate = 5); analysed = 20  **Setting:** fitness centre |
| **Outcomes** | **All outcomes measured/reported by study authors**: PA steps per day (accelerometer); PA MVPA minutes per day (accelerometer); self‑reported PA (RPAQ); HRQoL (SF-36). Measured pre-surgery, 6 months, 12 months, and 24 months post-surgery  **Outcomes relevant to the review:**   * Amount of PA: measured as steps per day; using an accelerometer (ActiGraph GT3X) worn all day for 7 full consecutive days; given as difference between groups 24 months post-surgery * Amount of PA: measured as minutes per day; using an accelerometer (ActiGraph GT3X) worn all day for 7 full consecutive days; given as difference between groups 24 months post-surgery * HRQoL: using SF-36 (PCS); given as difference between groups 24 months post-surgery * Adherence: compliance defined as attending ≥ 50% of the planned training sessions * Pain: using SF-36 (pain subscore); given as difference between groups 24 months post-surgery   **Study primary outcome:** aerobic capacity and muscle strength |
| **Notes** | **Sponsorship source:** supported by the Department of Regional Health Research, University of Southern Denmark and Hospital of Southwest Jutland, Denmark; the Department of Medicine/Endocrinology, Hospital of Southwest Jutland, Denmark; The Region of Southern Denmark; The Karola Jørgensen Research Foundation; The Edith and Vagn Hedegaard Jensens Foundation; and The Family Hede Nielsens Foundation. The authors declare no conflicts of interest  **Study dates:** October 2012 to November 2016 |
| **Reference(s)**  **\* primary reference** | Stolberg CR, Mundbjerg LH, Bladbjerg EM, Funch-Jensen P, Gram B, Juhl CB. Physical training following gastric bypass: effects on physical activity and quality of life-a randomized controlled trial. *Quality of Life Research* 2018; **27**: 3113-22 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Block randomisation, stratified by type 2 diabetes |
| Allocation concealment (selection bias) | Unclear risk | Sealed envelopes were used. However, study authors do not report whether these are opaque or numbered |
| Blinding of participants and personnel (performance bias) | High risk | It was not feasible to blind participants or personnel to intervention groups |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adherence (detection bias) | Low risk | Objective measurement of class attendance |
| Incomplete outcome data (attrition bias) | High risk | Losses were relatively balanced between groups, and reasons for losses were explained. However, the sample size was small and the relative number of losses was high |
| Selective reporting (reporting bias) | Low risk | Study was prospectively registered with a clinical trials register (NCT01970631; first received September 2012). Although PA (measured as number of steps) is listed in these prospective documents, we noted that some outcomes (PA measured as minutes per day, and HRQoL) were not listed in this prospective document and this may indicate high risk of selective bias for these outcomes |
| Other bias | Low risk | No other sources of bias detected |

Taraldsen et al.

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| **Methods** | RCT, parallel group; single centre  **Study aim/objective:** to evaluate the clinical effectiveness and cost-effectiveness of offering a 10-week, home-based, structured exercise program, targeting balance and gait, four months after hip fracture, as compared to routine follow-up of community-dwelling older persons after hip fracture |
| **Participants** | **Total number of randomised participants:** 143  **Inclusion criteria:** community-dwelling in Trondheim municipality prior to the fracture; ≥ 70 years of age; diagnosed and operated for intra-capsular or extra-capsular hip fractures (International Classification of Diseases ICD-10 S72.0-S72.2); identified by experienced physiotherapists by use of hospital admission lists  **Exclusion criteria:** at T0: pathological fracture; < 3-months life expectancy; inability to walk 10 m (with or without walking aids) before the fracture; participating in conflicting research projects. At T1: after a medical examination if they had contraindications for training (unstable medical conditions) or were bedridden  **Type of surgery (condition):** hip fracture surgery  **Country:** Norway  **Baseline Characteristics**  **Intervention group**   * *Type of fracture (surgery), n (%)*: intracapsular: 41 (59) (arthroplasty, n: 33); extracapsular: 29 (41) * *Age, mean (SD)*: 84.0 (± 6.6) years * *Gender, M/F*: 16/54 * *Baseline level of fitness, median (IQR)*: SPPB, 0–12: 4 (3) * *Current involvement in regular PA, mean (SD)*: 86.22 (± 19.43) steps/min   **Comparison group**   * *Type of fracture (surgery), n (%)*: intracapsular: 41 (56) (arthroplasty, n: 34); extracapsular: 32 (44) * *Age, mean (SD)*: 82.7 (± 5.7) years * *Gender, M/F*: 17/56 * *Baseline level of fitness, median (IQR)*: SPPB, 0–12: 5 (5) * *Current involvement in regular PA, mean (SD)*: 89.07 (± 17.55) steps/min   Note:   * study authors do not report the following characteristics: BMI, weight, height, relevant clinical scores, race, education status, economic status |
| **Interventions** | **Details of interventions**  Approach: tailored exercise sessions; two sessions per week with focus on balance and gait; during home visit by physiotherapist, over 10 weeks  Context: hip fracture surgery patients; delivered post-surgery (delayed) in patients’ homes  Comparison: usual care; usual care rehabilitation, varied by patient from no follow-up to extensive rehabilitation; intervention participants also offered usual care rehabilitation  **Intervention group:** number randomised = 70; losses = 14 (died = 4; lost to follow-up = 10); analysed (all 3 outcomes) = 56  **Comparison group:** number randomised = 73; losses = 16 (died = 4; lost to follow-up = 12); analysed (all 3 outcomes) = 57  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors:** gait speed using an electronic walkway (GAITRite); temporal-spatial gait variables; step length; cadence; walk ratio (ratio step length/cadence); double support time; single support asymmetry; step width; step length variability; PA using a single-axis accelerometer (activPALs from PAL Technologies ltd, Glasgow, UK) and given as mean upright time (standing and walking) and mean number of upright events (sit-to-stand transitions) per day; mobility; basic and instrumental ADL; cognitive function; depression; HRQoL (EQ-5D-3L); falls efficacy; chronic fatigue; adverse events. Measured at completion of the intervention, two months, and eight months after randomization  **Outcomes relevant to the review:**   * Amount of PA: minutes per day of upright time (standing and walking); using an accelerometer; based on between group differences from baseline at 6 months post-intervention (delayed) * Physical fitness: using SPPB (scale 0 to 12); based on between group differences at 6 months post-intervention (delayed) * HRQoL: using EQ-5D-3L; based on between group differences at 6 months post-intervention (delayed) * Adverse events   **Study primary outcome:** gait speed |
| **Notes** | **Sponsorship source:** supported by the Norwegian Women’s Health Association and the Norwegian Extra Foundation for Health and Rehabilitation through the EXTRA funds, the Norwegian Fund for Postgraduate Training in Physiotherapy, and the Liaison Committee between the Central Norway Regional Health Authority (RHA), Trondheim Municipality, and the Norwegian University of Science and Technology (NTNU). Study authors declare no conflicts of interest  **Study dates:** February 2011 to March 2014 |
| **Reference(s)**  **\* primary reference** | Taraldsen K, Thingstad P, Dohl O, Follestad T, Helbostad JL, Lamb SE*, et al.* Short and long-term clinical effectiveness and cost-effectiveness of a late-phase community-based balance and gait exercise program following hip fracture. The EVA-HIP randomised controlled trial. *PLoS ONE* 2019; **14**: e0224971 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Block randomisation, stratified by type of fracture and pre-fracture rollator use indoor, using a web-based randomization system |
| Allocation concealment (selection bias) | Low risk | randomisation was managed by an external independent administrative coordinator |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to intervention groups |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: fitness outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools and assessors were blind to participants' group allocation |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adverse events (detection bias) | Low risk | Observed and reported by physiotherapists |
| Incomplete outcome data (attrition bias) | High risk | Although balanced between groups, we noted a high number of losses |
| Selective reporting (reporting bias) | Low risk | Study was prospectively registered with a clinical trials register (NCT01379456; first received June, 2011); reported review outcomes were consistent with these prospectively prepared documents |
| Other bias | Low risk | No other sources of bias detected |

Turunen et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** this secondary analysis aimed to investigate whether an individually tailored, multi-component, home-based rehabilitation program increases the level of PA, and whether it is maintained over a 1-year follow-up among community-dwelling persons recovering from a hip fracture |
| **Participants** | **Total number of randomised participants:** 81  **Inclusion criteria:** > 60 years of age; community-dwelling men and women operated for hip fracture at the local hospital during 2008 and 2009; living in the city of Jyväskylä or neighbouring municipalities  **Exclusion criteria:** living in an institution; confined to bed at the time of the fracture; severe memory problems (MMSE < 19); alcoholism; severe cardiovascular or pulmonary disease; severe progressive disease (i.e., neoplasm, ALS); severe depression (BDI > 29); unwillingness to participate  **Type of surgery (condition):** various (hip fracture)  **Country:** Finland  **Baseline Characteristics**  **Intervention group**   * *Type of surgery, n (%)*: internal fixation: 19 (48); hemiarthroplasty: 15 (38); THR: 6 (15) * *Age, mean (SD)*: 80.9 (± 7.7) years * *Gender, M/F*: 9/31 * *BMI, mean (SD)*: 25.3 (± 3.6) kg/m2 * *Current involvement in regular PA, n (%)*: inactivity: 15 (38); light activity: 23 (57); moderate to heavy activity: 2 (5) * *Relevant illness severity scores (e.g., ASA, APACHE II)*: mobility at baseline, n (%): walking aid, outdoors: 30 (75). SPPB score, mean (SD): 5.8 (2.5) * *Relevant clinical variables, mean (SD)*: number of chronic diseases: 3 (± 2); time from surgery to baseline: 9.3 (± 2.3) weeks   **Comparison group**   * *Type of surgery, and/or condition*: internal fixation 19 (46%); hemiarthroplasty 18 (44%); THR 4 (10%) * *Age, mean (SD)*: 79.1 (± 6.4) * *Gender, M/F*: 9/32 * *BMI, mean (SD)*: 25.6 (± 3.9) kg/m2 * *Current involvement in regular PA, n (%)*: inactivity: 12 (29); light activity: 25 (61); moderate to heavy activity 4 (10) * *Relevant illness severity scores (e.g., ASA, APACHE II)*: mobility at baseline, n (%): walking aid, outdoors: 35 (85); SPPB score, mean (SD): 6.6 (2.2) * *Relevant clinical variables, mean (SD)*: number of chronic diseases: 3 (± 2); time from surgery to baseline: 9.2 (± 3.6) weeks   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness |
| **Interventions** | **Details of interventions**  Approach: Home based counselling and rehabilitation; combination of home visits, functional exercises and PA motivational counselling two face-to-face and two telephone); delivered by a physiotherapist at approximately 10 time points across 12-months  Context: Internal fixation, hemiarthroplasty, and total hip replacement patients; post-surgery (10-weeks); home through home visits and by telephone  Comparison: Usual care; included written information on home exercises given by a physiotherapist  **Intervention group:** number randomised = 40; losses = 11 (dropout = 1; died = 1; not received = 9); analysed = 29  **Comparison group:** number randomised = 41; losses = 13 (dropout = 2; not received = 11); analysed = 28  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors:** health and fracture status (chronic conditions, prescribed medication, fracture date and status, and date of surgery) confirmed according to questionnaire, current prescriptions, and medical records; baseline cognitive status (MMSE); depressive mood (BDI); height; weight; engagement in PA; physical function and mobility (SPPB). Measured at baseline (as soon as possible after hospital discharge), 3, 6, and 12 months after baseline (PA also collected 24 months after baseline)  **Outcomes relevant to the review:**   * Engagement in PA: 24 months post-surgery * Adherence: compliance with home-based exercises   **Study primary outcome:** compliance (listed first) |
| **Notes** | **Sponsorship source:** supported by funding from the Ministry of Education and Culture, and Kelad the Social Insurance Institution of Finland. Declarations of interest not reported  **Study dates:** original recruitment of participants 1 March 2008 to 31 December 2010; this a secondary analysis |
| **Reference(s)**  **\* primary reference** | Turunen K, Salpakoski A, Edgren J, Törmäkangas T, Arkela M, Kallinen M*, et al.* Physical Activity After a Hip Fracture: effect of a Multicomponent Home-Based Rehabilitation Program-A Secondary Analysis of a Randomized Controlled Trial. *Archives of physical medicine and rehabilitation* 2017; **98**: 981‐8 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Unclear risk | Described as randomised. However, study authors describe some potential selection bias at follow-up, but there are no further details. |
| Allocation concealment (selection bias) | Unclear risk | No details |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants or personnel to the intervention |
| Blinding of outcome assessment: PA outcomes (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Blinding of outcome assessment: adherence (detection bias) | Low risk | Objective measurement of exercise compliance |
| Incomplete outcome data (attrition bias) | High risk | Although balanced between groups, we noted a high number of losses |
| Selective reporting (reporting bias) | Unclear risk | Study is retrospectively registered with a clinical trials register (ISRCTN53680197). It is not feasible to effectively assess risk of selective reporting bias without these documents |
| Other bias | Low risk | We identified no other sources of bias |

Turunen et al.

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| **Methods** | RCT, parallel design; multi-centre  **Study aim/objective:** to evaluate the effects of multi-component rehabilitation on PA, SB, and mobility in older people recently discharged from hospital |
| **Participants** | **Total number of randomised participants:** 117  **Inclusion criteria:** community-dwelling men and women aged 60 and older who had been admitted to a health centre hospital due to a lower limb or back musculoskeletal injury or disorder, including limb or back surgery (e.g., hip fracture, joint replacement, aggravated arthritis), or a fall-related injury  **Exclusion criteria:** suffered from severe cognitive deficit (MMSE < 20), alcoholism, or a severe progressive disease were excluded  **Type of surgery (condition):** joint replacement and back surgery (lower limb or back musculoskeletal injury or disorder)  **Country:** Finland  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 79.9 (± 8.4) years * *Gender, M/F*: 9/50 * *BMI, mean (SD)*: 27.1 (± 4.7) kg/m2 * *Weight, mean (SD)*: 72.9 (± 14.4) kg * *Height, mean (SD)*: 163.9 (± 7.7) cm * *Baseline level of fitness, mean (SD)*: SPPB: 4.7 (± 2.5) * *Current involvement in regular PA (prior to hospitalisation), n*: inactivity: 9; low-level activity: 38; medium- to high-level activity: 12. LSA score, mean (SD): 48.1 (± 21.9) * *Relevant illness severity scores (e.g., ASA, APACHE II), n (%)*: mobility prior to hospitalisation: walking aid, indoors: 22 (37); walking aid, outdoors: 41 (68) * *Relevant clinical variables*: number of chronic diseases, mean (SD): 3 (± 2). Length of hospital stay, mean (SD): 14 (± 12) days. FES-I score, mean (SD): 39.4 (± 11.3). Reasons for hospitalization, n (%): traumatic fracture: 23 (39); intensified pain in back or lower extremity (i.e., following falling): 10 (17); intended joint replacement: 23 (39); intended back surgery: 3 (5) * *Length of education, mean (SD)*: 10.2 (± 4.6) years   **Comparison group**   * *Age, mean (SD)*: 79.7 (± 8.1) years * *Gender, M/F*: 8/50 * *BMI, mean (SD)*: 27.7 (± 5.3) kg/m2 * *Weight, mean (SD)*: 74.0 (± 15.0) kg * *Height, mean (SD)*: 163.1 (± 7.1) cm * *Baseline level of fitness, mean (SD)*: SPPB: 4.6 (± 2.5) * *Current involvement in regular PA (prior to hospitalisation), n*: inactivity: 5; low-level activity: 41; medium- to high-level activity: 12. LSA score, mean (SD): 50.2 (± 20.8) * *Relevant illness severity scores (e.g., ASA, APACHE II), n (%)*: mobility prior to hospitalisation: walking aid, indoors: 21 (36); walking aid, outdoors: 40 (69) * *Relevant clinical variables*: number of chronic diseases, mean (SD): 3 (± 2). Length of hospital stay, mean (SD): 18 (± 17) days. FES-I score, mean (SD): 38.8 (± 11.1). Reasons for hospitalization, n (%): traumatic fracture: 24 (41); intensified pain in back or lower extremity (i.e., following falling): 12 (21); intended joint replacement: 18 (31); intended back surgery: 4 (7) * *Length of education, mean (SD)*: 8.9 (± 3.1) years |
| **Interventions** | **Details of interventions**  Approach: physiotherapy home visits and telephone support, counselling and exercise plan; seven physiotherapy home visits supervising and adjusting exercise plan with three telephone support calls, independent exercise and outdoor walking; delivered over 6-months  Context: lower limb or back musculoskeletal injury, surgery, or disorder patients; post hospital discharge (approximately two weeks); at home  Comparison: usual care  **Intervention group:** number randomised = 59; losses = 7 (died = 1; withdrew = 1; hospitalised = 1; unknown = 4); analysed at 12 months = 52  **Comparison group:** number randomised = 58; losses = 13 (died = 2; withdrew = 1; hospitalised = 2; unknown = 8); analysed at 12 months = 45  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors**: PA total minutes per day (accelerometer) including light, moderate, and vigorous activity; average daily time spent in light and MVPA, the average number of activity bouts, the average time accumulated in active bouts, the average number of sedentary bouts, and total time of SB per day are reported; engagement in PA; physical fitness (SPPB); mobility function. Measurements taken at baseline and at 3, 6, and 12 months  **Outcomes relevant to the review:**   * Amount of PA: total minutes per day (moderate and high combined); using an accelerometer (Hookie AM20 Activity Meter, Hookie Technologies Ltd., Espoo, Finland and UKK RM42, UKK Institute, Tampere, Finland); 6 months post-surgery * Engagement in PA: 12 months post-surgery * Physical fitness: using SPPB; 6 months post-surgery * Adherence: compliance with home-exercise programme * Adverse events   **Study primary outcome:** total PA per day |
| **Notes** | **Sponsorship source:** supported by funding from the Finnish Ministry of Social Affairs and Health, National Institute for Health and Welfare; the Social Insurance Institution of Finland (Kela), the Ministry of Social Affairs and Health (for Kuopio University Hospital Catchment Area, and the Finnish Association of Physiotherapists. Study author(s) declare no conflicts of interest  **Study dates:** 1 February 2016 to 28 February 2018 |
| **Reference(s)**  **\* primary reference** | ISRCTN13461584. Promotion of physical activity and mobility among older people with musculoskeletal disorders. <http://www.who.int/trialsearch/Trial2.aspx?TrialID=ISRCTN13461584> 2016  \* Turunen KM, Aaltonen-Määtä L, Törmäkangas T, Rantalainen T, Portegijs E, Keikkala S*, et al.* Effects of an individually targeted multicomponent counseling and home-based rehabilitation program on physical activity and mobility in community-dwelling older people after discharge from hospital: a randomized controlled trial. *Clinical Rehabilitation* 2020; **34**: 491-503 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Used computer-generated random number sequence |
| Allocation concealment (selection bias) | Low risk | Used concealed opaque envelopes |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants or personnel to intervention. |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: fitness outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: adverse events (detection bias) | Unclear risk | Observation method not specified for this outcome |
| Blinding of outcome assessment: adherence (detection bias) | Low risk | Objective measurement of exercise compliance |
| Incomplete outcome data (attrition bias) | High risk | Relatively high number of losses, with reasons for losses not explained for all participants |
| Selective reporting (reporting bias) | Low risk | Study was prospectively registered with a clinical trials register (ISRCTN13461584); all reported review outcomes are consistent with these documents |
| Other bias | Low risk | We identified no other sources of bias |

Van der Walt et al.

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| **Methods** | RCT, parallel design; single centre  **Study aim/objective:** to determine if feedback from a commercial activity monitor improves activity levels over the first 6 weeks after THA or TKA |
| **Participants** | **Total number of randomised participants:** 202  **Inclusion criteria:** adults undergoing primary elective hip or knee arthroplasty under the care of one of the investigating surgeons between May 2016 and December 2016  **Exclusion criteria:** rheumatoid arthritis or other inflammatory disease; arthroplasty after acute femoral fracture; patients not contactable within 2 weeks of surgery  **Type of surgery (condition):** hip or knee arthroplasty  **Country:** Australia  **Baseline Characteristics**  **Intervention group**   * *Type of surgery, n (%)*: THA: 52 (64); TKA: 29 (36) * *Age, mean (SD)*: 67 (± 9) years * *Gender, M/F*: 45/36 * *BMI, mean (SD)*: 27.8 (± 4.5) kg/m2 * *Current involvement in regular PA*: preoperative daily step count, mean: 6953 * *Relevant illness severity scores (e.g., ASA, APACHE II), n (%)*: KOOS symptoms: 45 (18); pain: 47 (16); function: 50 (18); QoL: 30 (19). EQ-5D: mobility: 2.8 (0.9); self-care: 1.5 (0.8); usual activities: 2.6 (1.0); pain, 3.2 (0.9); anxiety/depression: 1.6 (0.9); general health: 71 (18)   **Comparison group**   * *Type of surgery, n (%)*: THA: 43 (53); TKA: 39 (48) * *Age, mean (SD)*: 66 (± 9) years * *Gender, M/F*: 36/46 * *BMI, mean (SD)*: 28.2 (± 4.1) kg/m2 * *Current involvement in regular PA*: preoperative daily step count, mean: 7655 * *Relevant illness severity scores (e.g., ASA, APACHE II), n (%)*: KOOS symptoms: 45 (18); pain: 45 (19); function: 51 (21); QoL: 33 (18). EQ-5D: mobility, 2.7 (0.9); self-care: 1.4 (0.8); usual activities: 2.4 (0.9); pain, 3.3 (0.6); anxiety/depression: 1.6 (0.8); general health: 72 (16)   Note:   * study authors do not report the following characteristics: weight, height, baseline level of fitness |
| **Interventions** | **Details of interventions**  Approach: Activity tracking; daily step goal and activity tracker; delivered by researcher (contact at beginning only), over 6-8 weeks; in addition to usual care  Context: THA and TKA patients; two weeks prior to surgery; home  Comparison: Usual care; wearing of activity tracker with screen obscured and no daily step goal  **Intervention group:** number randomised = 100; losses = 19 (surgery cancelled or postponed = 6; insufficient data for baseline step count = 13); analysed = 81 ITT (6-month step data analysis = 77)  **Comparison group:** number randomised = 102; losses = 20 (surgery cancelled or postponed = 3; insufficient data for baseline step count = 17); analysed = 82 ITT (6-month step data analysis = 79)  **Setting:** home |
| **Outcomes** | **All outcomes measured/reported by study authors**: PA steps per day (Garmin Vivofit device); HRQoL (KOOS; HOOS; EQ-5D). Measured at 1, 2, and 6 weeks, and 6 months  **Outcomes relevant to the review:**   * Amount of PA: measured as steps per day; using an accelerometer (Garmin Vivofit device); 6 months post-surgery * HRQoL: using EQ-5D; 6 months post-surgery * Pain: KOOS pain score; 6 months post-surgery   **Study primary outcome:** PA steps per day |
| **Notes** | **Sponsorship source:** funding support is not reported. The activity trackers used in the study were supplied by 360Knee Systems. Study authors declare no conflicts of interest  **Study dates:** May 2016 to December 2016 |
| **Reference(s)**  **\* primary reference** | Van der Walt N, Salmon LJ, Gooden B, Lyons MC, O'Sullivan M, Martina K*, et al.* Feedback From Activity Trackers Improves Daily Step Count After Knee and Hip Arthroplasty: A Randomized Controlled Trial. *Journal of Arthroplasty* 2018; **33**: 3422-8 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Computer-generated randomisation |
| Allocation concealment (selection bias) | Low risk | Use of numbered, sealed, sequentially-numbered envelopes |
| Blinding of participants and personnel (performance bias) | High risk | It is not feasible to blind participants and personnel to intervention groups |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Blinding of outcome assessment: participant-reported outcomes to include HRQoL, pain, patient experience (detection bias) | High risk | Use of self-reported outcome measurement tools, and participants were not blinded to intervention |
| Incomplete outcome data (attrition bias) | High risk | Although losses are balanced between groups, we noted a high number of losses at 6 months |
| Selective reporting (reporting bias) | Unclear risk | Study authors did not report pre-published protocol or clinical trials registration. It is not feasible to effectively assess outcome reporting bias without these documents. |
| Other bias | Low risk | We identified no other sources of bias |

Yates et al.

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| **Methods** | RCT, parallel design; multi-centre  As men comprise majority (65% to 70%) of CABG surgery patients, randomisation was stratified by clinical sites and patient gender so that a 70% male to 30% female proportion of patients was randomised to the 2 groups. Couples were randomly assigned.  **Study aim/objective:** to examine the differences between patients and spouses in 2 groups (Partners Together in Health [PaTH] intervention versus usual care) in changes over time in PA behaviour and PA biomarker (functional capacity); and in healthy eating behaviours and biomarkers (lipid profile) |
| **Participants** | **Total number of randomised participants:** 35  **Inclusion criteria:** ≥ 19 years of age; diagnosis of CABG surgery and enrolment in outpatient CR; married or living with partner for > 1 year; partner also willing to participate; no history of psychiatric illness; classified as low to moderate risk for the occurrence of cardiac events during exercise. Eligibility criteria for spouses: ≥ 19 years of age; no history of psychiatric illness; classified as low to moderate risk for the occurrence of cardiac events during exercise; married or living with the CABG surgery patient for > 1 year; written permission from the primary healthcare provider to participate in the study.  **Exclusion criteria:** orthopedic problems that would prevent them from walking on a treadmill to maximum effort; history of cardiac arrest, sudden death, or complex dysrhythmias at rest; resting systolic BP > 200 mm Hg or diastolic BP > 100 mm Hg; debilitating noncardiac disease such as renal failure or anaemia, severe chronic obstructive lung disease, or poorly controlled diabetics (diagnosed with diabetic ketoacidosis within the past 6 months or a current HbA1c level 911); diagnosis of HF with an ejection fraction < 35 and/or clinical evidence of decompensated HF  **Type of surgery (condition):** CABG surgery  **Country:** USA  **Baseline Characteristics**  **Intervention group**   * *Age, median (range)*: 64 (33 to 77) years * *Gender, M/F*: 15/2 * *Baseline level of fitness, median (range)*: SF-PF: 55 (15 to 95) * *Current involvement in regular PA, median (range)*: METs: 31.5 (0 to 250.3) * *Relevant clinical variables*: comorbidities, n: arthritis: 7; asthma: 1; COPD: 3; PVD: 2. Ejection fraction, median (range): 60 (37.5 to 65) * *Education status, median (range)*: 14 (12 to 17) years * *Race, n (%)*: white: 15 (88) * *Annual household income, n*: < $30,000: 2; $30,000 to $70,000: 8; > $70,000: 7   **Comparison group**   * *Age, median (range)*: 66 (40 to 77) years * *Gender, M/F*: 13/4 * *Baseline level of fitness, median (range)*: SF-PF: 55 (10 to 100) * *Current involvement in regular PA, median (range)*: METs: 28.0 (0 to 402.5) * *Relevant clinical variables*: comorbidities, n: arthritis: 7; asthma: 0; COPD: 0; PVD: 1. Ejection fraction, median (range): 57.5 (38 to 67.5) * *Education status, median (range)*: 16 (9 to 17) years * *Race, n (%)*: white: 17 (100) * *Annual household income, n*: < $30,000: 1; $30,000 to $70,000: 10; > $70,000: 6   Note:   * study authors do not report the following characteristics: BMI, weight, height, illness severity scores |
| **Interventions** | **Details of interventions**  Approach: Rehabilitation programme involving partner; individualised treatment plan PA aerobic, strength, and flexibility exercises) and counselling, carried out with partner, delivered by multidisciplinary team of nurses, dieticians, pharmacists, exercise specialists, and physicians; usual care group education sessions  Context: CABG; post-surgery between 3 days and 3 weeks (depending on delivery site)  Comparison: Usual care rehabilitation; exercise facilities and education sessions but no individualised plan or counselling, partners able to join sessions at one site  **Intervention group:** number randomised = 18; losses = 1 (withdrawn because did not tolerate the baseline exercise test due to orthopaedic problems); analysed = 17  **Comparison group:** number randomised = 17; losses = 0; analysed = 17  **Setting:** clinic and home-based |
| **Outcomes** | **All outcomes measured/reported by study authors**: PA measured as minutes per week (actiheart monitor); physical fitness (METs max); exercise and dietary intake behaviours and biomarkers; HRQoL (SF-PF). Patients and spouses measured at baseline (close to the start of CR), post-CR (3 months), and at 6 months  **Outcomes relevant to the review:**   * Amount of PA: measured as minutes of total PA > 3 METs per week; using an actiheart monitor worn on 2 standard ECG pads on the chest for 7 days at each data collection point; 6 months post-surgery * Physical fitness: measured as METs max; using an exercise tolerance test; 6 months post-surgery   **Study primary outcome:** PA/exercise and dietary intake behaviours and biomarkers |
| **Notes** | **Sponsorship source:** supported by funding from a Nellie House Craven Scholarship to L. Macken, and grant funding from the National Institute for Nursing Research, National Institutes of Health, and the University of Nebraska Clinical Research Center. Study authors declare no conflicts of interest  **Study dates:** not reported |
| **Reference(s)**  **\* primary reference** | Macken LC, Yates BC, Meza J, Norman J, Barnason S, Pozehl B. Health-related quality-of-life outcomes in coronary artery bypass surgery patients and partners. Journal of Cardiopulmonary Rehabilitation & Prevention 2014; **34**: 130-7. [DOI: <https://dx.doi.org/10.1097/HCR.0b013e3182a528ba>]  NCT00926848. Reducing Risk in Cardiac Rehabilitation: partners Together in Health (PaTH) Intervention Study. <Https://clinicaltrials.gov/show/nct00926848> 2009  \* Yates BC, Norman J, Meza J, Krogstrand KS, Harrington S, Shurmur S*, et al.* Effects of Partners Together in Health Intervention on Physical Activity and Healthy Eating Behaviors. *Journal of Cardiovascular Nursing* 2015; **30**: 109-20 |

Risk of bias table

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| **Bias** | **Authors' judgement** | **Support for judgement** |
| Random sequence generation (selection bias) | Low risk | Block randomisation, stratified by clinical sites and gender, using statistician-generated randomisation schedule |
| Allocation concealment (selection bias) | Unclear risk | Insufficient information |
| Blinding of participants and personnel (performance bias) | High risk | It is not possible to blind participants and personnel to intervention groups |
| Blinding of outcome assessment: PA outcomes (detection bias) | Low risk | Outcomes were measured using objective measurement tools |
| Incomplete outcome data (attrition bias) | Low risk | Loss of only one participant |
| Selective reporting (reporting bias) | Low risk | Prospectively registered with clinical trials register (NCT00926848; first received June 2009); reported review outcomes were consistent with these prospectively prepared documents |
| Other bias | Low risk | We identified no other sources of bias |

Zopf et al.

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| **Methods** | BA, parallel design; multi-centre  **Design Features:** a prospective, partially randomised and controlled patient preference trial. Based on the procedure of patient preference trial, patients that refused randomisation due to a strong group preference were to receive the intervention of their choice while patients who gave consent to randomisation were to be allocated randomly. Since all patients preferred a group, the study has to be classed as a non-randomised controlled trial.  **Study aim/objective:** to evaluate the exercise program offered in rehabilitative prostate cancer sports groups in Germany and determine whether it is beneficial for patients following prostatectomy |
| **Participants** | **Total number of included participants:** 85  **Inclusion criteria:** men with malignant prostate cancer disease; radical prostatectomy or combination therapy; surgery 6 to 12 weeks before scheduled enrolment  **Exclusion criteria:** metastatic disease; scheduled for hormone treatment or chemotherapy; severe cardiac disease; mental illness; chronic disease that ruled out PA; abused alcohol, drugs or medication; insufficient German language skills; exercised regularly more than 1 hour / week  **Type of surgery (condition):** radical prostatectomy or combination therapy (prostate cancer)  **Country:** Germany  **Baseline Characteristics**  **Intervention group**   * *Age, mean (SD)*: 64.21 (± 6.13) years * *Gender*: all male * *BMI, mean (SD)*: 26.62 (± 3.32) kg/m2 * *Weight, mean (SD)*: 83.49 (± 12.16) kg * *Current involvement in regular PA, mean (SD)*: MET: 36.32 (± 40.99) hours/week * *Relevant illness severity scores (e.g., ASA, APACHE II), n (%)*: tumour staging: stage 1: 0 (0); stage 2: 44 (78.6); stage 3: 11 (19.6); N/A: 1 (1.8)   **Comparison group**   * *Age, mean (SD)*: 65.17 (± 5.54) years * *Gender*: all male * *BMI, mean (SD)*: 27.03 (± 3.51) kg/m2 * *Weight, mean (SD)*: 85.27 (± 13.52) kg * *Current involvement in regular PA, mean (SD)*: MET: 28.29 (± 19.73) hours/week * *Relevant illness severity scores (e.g., ASA, APACHE II), n (%)*: tumour staging: stage 1: 1 (3.4); stage 2: 15 (51.7); stage 3: 5 (17.2); N/A: 8 (27.6)   Note:   * study authors do not report the following characteristics: height, baseline level of fitness |
| **Interventions** | **Details of interventions**  Approach: supervised group and home exercise; weekly supervised aerobic, resistance, pelvic floor, and flexibility exercises and games, recommendation for home exercise; delivered by personalised trainers over 15 months  Context: prostate cancer patients; post-surgery (mean 17.99 weeks) community sports centre  Comparison: usual care  **Intervention group:** number included = 56; losses = 6 losses (health problems = 2; no reason given or not reachable = 4); analysed for PA = 50; analysed for physical fitness = 48; analysed for HRQoL = 50  **Comparison group:** number included = 29; losses = 9 losses (health problems = 4; reason not given or not reachable = 5); analysed for PA = 20; analysed for physical fitness = 16; analysed for HRQoL = 20  **Setting:** community sports centre |
| **Outcomes** | **All outcomes measured/reported by study authors**: aerobic fitness (spiroergometry and submaximal test protocol on a treadmill); HRQoL, disease- and treatment-related side effects (EORTC QLQ-C30; EORTC QLQ-PR25); ED (IIEF); overall PA levels (FQPA); attendance; adverse events. Measured at baseline and 15 months  **Outcomes relevant to the review:**   * Amount of PA: measured as total MET-h per week; using FQPA; 15 months post-intervention * Physical fitness: using VO2 Peak; 15 months post-intervention * HRQoL: using EORTC QLQ-C30 (Global); 15 months post-intervention * Pain: using EORTC QLQ-C30 (pain subscore); 15 months post-intervention * Adverse events   **Study primary outcome:** aerobic fitness |
| **Notes** | **Sponsorship source:** supported by funding from the Cancer Society North Rhine Westphalia and Barmer GEK Health Insurance. Study author(s) declare no potential conflicts of interest  **Study dates:** October 2007 to October 2011 |
| **Reference(s)**  **\* primary reference** | \* Zopf EM, Bloch W, Machtens S, Zumbé J, Rübben H, Marschner S*, et al.* Effects of a 15-Month Supervised Exercise Program on Physical and Psychological Outcomes in Prostate Cancer Patients Following Prostatectomy. *Integrative Cancer Therapies* 2015; **14**: 409-18  Zopf EM, Braun M, Machtens S, Zumbe J, Bloch W, Baumann FT. Implementation and scientific evaluation of rehabilitative sports groups for prostate cancer patients: study protocol of the ProRehab Study. BMC Cancer 2012; **12**. [DOI: 10.1186/1471-2407-12-312] |

*Abbreviations in tables*

**6MWT (6MWD, also 2MWT):** six minute walk test (distance); **7 Day PAR/DAL/PAL:** Seven Day Physical Activity Recall; **30CST:** 30 second chair stand test (also sit to stand test); **40m/50ft FPWT:** 40m/50ft fast-paced walk test; **AACVPR:** American Association of Cardiovascular and Pulmonary Rehabilitation; **ABC:** Activities-specific Balance Confidence scale; **Ab-IAP:** Aberdeen Impairment, Activity Limitation and Participation Restriction; **ACS:** acute coronary syndrome; **ACS:** American Cancer Society; **ACSM:** American College of Sports Medicine; **ADL:** activities of daily living; **ADU:** accelerometer device use; **AET:** aerobic exercise training; **AHA:** American Heart Association; **AJCC:** American Joint Committee on Cancer; **ALS:** amyotrophic lateral sclerosis (motor neurone disease); **ANOVA:** analysis of variance; **AP:** angina pectoris; **APFQ:** Australian Pelvic Floor Questionnaire; **ASA:** American Society of Anaesthesiologists physical status classification system; **APACHE II:** Acute Physical and Chronic Health Evaluation II; **BA:** Before-and-after comparison; **BDI:** Beck Depression Inventory; **BDNF:** brain derived neurotrophic factor; **BMD:** bone mineral density; **BMI:** body mass index; **BMJ:** British Medical Journal; **BNI:** brief nurse intervention; **BNSG-S:** Basic Needs Satisfaction in General Scale; **Borg Scale:** perceived exertion scale; **BP:** blood pressure; **BPI:** Brief Pain Inventory; **BPNES:** Basic Psychological Needs in Exercise Scale; **BREQ-3:** Behavioural Regulation in Exercise Questionnaire - 3; **BSQ:** Body Shape Questionnaire; **CABG:** coronary artery bypass graft; **CABS:** coronary artery bypass surgery; **CAD:** coronary artery disease; **CASI:** Cardiff Arthroplasty Satisfaction Index; **CBA:** Controlled before-and-after study; **CBE:** clinic-based exercise; **CBPT:** Cognitive Behaviour Physical Therapy; **CBT:** cognitive behavioural therapy; **CESD:** Center for Epidemiologic Studies Depression Scale; **CG:** control group; **CHAMPS:** Community Health Activities Model Program for Seniors; **CHD:** chronic heart disease; **CHF:** congestive heart failure; **CI:** confidence interval; **CIS-fat:** Checklist Individual Strength - fatigue; **cm:** centimetre; **COPD:** chronic obstructive pulmonary disease; **COPM:** Canadian Occupational Performance Measure; **CPET/CPEX:** cardiopulmonary exercise test; **CR:** cardiac rehabilitation; **CRC:** colorectal cancer; **CRCI:** cancer-related cognitive impairment; **CRP:** c-reactive protein; **CST:** chair-stand test; **CT scan:** computerised tomography scan; **CTL:** control group; **DAL:** 7-Day Daily Activity Log; **DASH:** Disabilities of the Arm, Shoulder and Hand scale; **DASI:** Duke Activity Status Index; **DC or d/c:** discharge; **DDD:** degenerative disc disease; **DHQ:** Diet History Questionnaire; **DM:** diabetes mellitus; **DOA:** Daily Observed Activity; **DXA (DEXA):** Dual-energy X-ray absorptiometry; **ECG:** electrocardiogram; **ECOG:** Eastern Cooperative Oncology Group; **ED:** erectile dysfunction; **EE:** energy expenditure; **EfH:** Exercise for Health-rural; **eGFR:** estimated glomerular filtration rate; **ELISA:** enzyme linked immunosorbent assay; **ELMI:** extensive lifestyle management intervention; **EMS:** Elderly Motivation Scale; **EORTC-QLQ-C30:** European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire - Cancer; **EORTC-QLQ-PR25:** European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire - Prostate Cancer; **ESRD:** end-stage renal disease; **ET:** endurance time; **ETT:** exercise tolerance test; **EuroQol EQ-5D (VAS):** self-rated health scale (Visual Analogue Scale); **F&V:** fruit and vegetable; **FABQ-PA:** Fear Avoidance Belief Questionnaire - Physical Activity; **FACIT-F:** Functional Assessment of Chronic Illness Therapy - fatigue scale; **FACT-An:** Functional Assessment of Cancer Therapy - anaemia; **FACT-B4:** Functional Assessment of Cancer Therapy - breast cancer; **FACT-C:** Functional Assessment of Cancer Therapy-Colorectal; **FACT-G:** Functional Assessment of Cancer Therapy - general; **FACT-P:** Functional Assessment of Cancer Therapy - prostate cancer; **FB:** feedback group; **FBK-R 23:** Fragebogen zur Belastung von Krebskranken; **FES-I:** Falls Efficacy Scale-International; **FFQ:** Food Frequency Questionnaire; **FI:** financial incentives; **FPG:** fasting plasma glucose; **FPWT:** fast-paced walk test; **FQPA:** Freiburger Questionnaire of Physical Activity; **FTF:** fingertip-to-floor test; **GAS:** Goal Attainment Scaling; **GCSE:** General Certificate of Secondary Education; **GED:** General Educational Development; **GP:** General Practitioner; **GSLTPAQ:** Godin-Shephard Leisure-Time Physical Activity Questionnaire; **GXT:** graded exercise test; **HAAS:** Harvard Alumni Activity Score; **HADS:** Hospital Anxiety and Depression Scale; **HbA1c:** glycated haemoglobin; **HBE:** home-based exercise; **HDL:** high-density lipoprotein; **HF:** heart failure; **HGS:** hand-grip strength test; **HND:** Higher National Diploma; **HOOS:** Hip Injury or Dysfunction and Osteoarthritis Outcome Score; **HR (R):** heart rate (reserve); **HRQoL:** health-related quality of life; **HSS-TKRES:** Hospital for Special Surgery - Total Knee Replacement Expectations Survey; **IADL:** instrumental activities of daily living; **ICC:** intracluster correlation coefficient; **ICD:** implantable cardioverter defibrillator; **ICIQ- B:** International Consultation on Incontinence Questionnaire - Bowel module; **ICIQ - UI SF:** International Consultation on Incontinence Questionnaire - Urinary Incontinence Short Form; **ICU:** Intensive Care Unit; **IFG:** impaired fasting glucose; **IGA:** immunoglobulin A; **IGF-1:** insulin-like growth factor 1; **IHD:** ischemic heart disease; **IIEF:** International Index of Erectile Function; **IIRS:** Illness Intrusiveness Ratings Scale; **IL-6:** interleukin-6; MET(s): metabolic equivalent(s); **INT:** intervention; **IPAQ (SF):** International Physical Activity Questionnaire (Short Form); **IPAQ-SV:** International Physical Activity Questionnaire (Short version); **IQR:** interquartile range; **ISWT:** incremental shuttle walk test; **ITT:** intention to treat; **IVGTT:** intravenous glucose tolerance test; **KA**: knee arthroplasty; **kg:** kilogram; **KOOS:** Knee Injury or Dysfunction and Osteoarthritis Outcome Score; **KSS:** Knee Society Score; **LBP:** lower back pain; **LDL:** low-density lipoprotein; **LEFS:** Lower Extremity Functional Scale; **LOS:** (hospital) length of stay; **LSF:** lumbar spine fusion; **LTPA:** (Minnesota) Leisure Time Physical Activity questionnaire; **LTF:** lost to follow-up; **LTFU:** long-term follow-up; **LVEF:** left ventricular ejection fraction; **M/F:** Male/Female; **MCIC:** Minimally Clinical Important Change; **MCS:** (SF-12/SF-36) mental composite score; **MET:** metabolic equivalent; **MFI:** macrophage migration inhibiting factor; **MI:** moderate intensity exercise; **MI:** myocardial infarction; **MMSE:** Mini Mental State Examination; **MOS SF-36:** Medical Outcomes Study Short Form-36; **MPAI-G:** motivational PA intervention group; **MRI:** magnetic resonance imaging; **MRS:** myocardial revascularization surgery; **MVPA:** moderate to vigorous physical activity; **MYMOP:** Measure Yourself Medical Outcome Profile; **n:** number of participants; **N/A:** not applicable; **NAC:** neoadjuvant chemo/radiotherapy; **NBCF:** National Breast Cancer Foundation; **NCCHTA:** National Coordinating Center for Health Technology Assessment; **NFB:** no feedback group; **NHS:** National Health Service; **NIHR:** National Institute for Health Research; **NODAT:** new-onset diabetes mellitus; **NSE:** Nutrition Self-Efficacy; **NYHA:** New York Heart Association; **O2:** oxygen; **OA:** osteoarthritis; **ODI:** Oswestry Disability Index (also Oswestry Low Back Pain Disability Questionnaire); **OG:** esophagogastric cancer; **OHS:** Oxford Hip Score; **OKS:** Oxford Knee Score; **OLS:** one leg stand test; **OPCAB:** off-pump coronary artery bypass; **OSA:** obstructive sleep apnoea; **PA:** physical activity; **PAD:** peripheral arterial disease; **PAEE:** physical activity energy expenditure; **PAEI:** Paffenbarger Physical Activity and Exercise Index; **PAI:** physical activity intervention; **PAL:** physical activity level; **PAQ:** Physical Activity Questionnaire; **PAR:** physical activity recall; **PASE:** Physical Activity Scale for the Elderly; **PASSES:** Perceived Autonomy Support Scale for Exercise Settings; **PCI:** percutaneous coronary intervention; **PCKD:** polycystic kidney disease; **PCOS:** polycystic ovary syndrome; **PCS:** Pain Catastrophising Scale; **PCS:** (SF-12/SF-36) physical composite score; **PEQ-MS:** Prosthesis Evaluation Questionnaire - Mobility Section; **PESE:** Perceived Empathic Self-Efficacy scale; **PGIC:** Patient Global Impression of Change; **PI:** principal investigator; **PP:** per protocol; **PROMIS-PF:** Patient-Reported Outcomes Measurement Information System - physical function; **PROMs:** patient reported outcome measures; **PSA:** prostate-specific antigen; **PSADT:** prostate-specific antigen doubling time; **PSE:** physical self-efficacy; **PSFS:** Patient-Specific Functional Scale; **PSS:** Perceived Stress Scale; **PT:** physical therapy; **PTCA:** percutaneous transluminal coronary angioplasty; **PTH:** parathyroid hormone; **pTNM:** Classification of Malignant Tumors; **PVD:** peripheral vascular disease; **QPA:** questionnaire physical activity; **QoL:** quality of life; **Q-RCT:** quasi-randomised controlled trial; **RCT:** randomised controlled trial; **RET:** resistance exercise training; **ROB:** risk of bias; **ROM:** range of movement; **RPAQ18:** Recent Physical Activity Questionnaire; **RR:** relative risk; **RSES:** Rosenberg Self-Esteem Scale; **RYGB:** Roux-en-Y gastric bypass; **SB:** sedentary behaviour; **SC:** standard care; **SCFS-6:** Schwartz Cancer Fatigue Scale; **SCL-90:** Symptom Check-list - 90; **SCT:** stair climb test; **SD:** standard deviation; **SDT:** self-determination theory; **SEE:** Self-Efficacy for Exercise; **SEMCD:** Self-Efficacy for Managing Chronic Disease; **SER:** Self-Efficacy for Rehabilitation; **SERMs:** selective estrogen receptor modulators; **SES:** Self-Efficacy Scale; **SF-12:** 12-item Short-Form Health Survey; **SF-PF:** physical function version of the SF-36; **SF-36 (RAND-36):** 36-Item Short-Form Health Survey; **SG:** sleeve gastrectomy; **SIMD:** Scottish Index of Multiple Deprivation; **SM:** symptom management; **SNB:** sentinel node biopsy; **SPAQ:** Scottish Physical Activity Questionnaire; **SPPB:** Short Physical Performance Battery; **SQUASH:** Short Questionnaire to Assess Health Enhancing Physical Activity; **SRT:** sitting-rising test; **ST:** stair climbing test; **STAI:** State-Trait Anxiety Inventory - short form; **SWLS:** Satisfaction With Life Scale; **TDEE:** total daily energy expenditure; **TDPA:** total daily physical activity; **THA/THR:** total hip arthroplasty/replacement; **THC:** telephonic health coaching; **TKA/TKR:** total knee arthroplasty/replacement; **TNF-α:** tumour necrosis factor - alpha; **TSEP:** thoracoscopic esophagectomy in the prone position; **TSK:** Tampa Scale for Kinesiophobia; **TTA:** transtibial amputation; **TUG:** timed up and go test; **UC:** usual care; **UCLA (activity score):** University of California, Los Angeles activity score; **UI:** urinary incontinence; **UICC:** Union for International Cancer Control (cancer stage scale); **VAS:** Visual Analogue Scale; **VO2 max/VO2 peak:** measures of oxygen uptake; **WC:** waist circumference; **WHO-DAS 2.0:** WHO Disability Assessment Schedule; **WOMAC (PF):** Western Ontario and McMasters Universities Osteoarthritis Index (physical function); **YPAS:** Yale Physical Activity Survey

## Characteristics of studies awaiting classification

ACTRN12615000527561

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| **Methods** | Pilot RCT investigating the effects of exercise on young cancer patients |
| **Participants** | 40 participants, 15 to 25 years of age who have been diagnosed with a haematological malignancy or solid tumour; surgical patients are eligible only if adjuvant chemo-radiotherapy has been received also |
| **Interventions** | Arm 1: 10-week individualised intensive exercise programme with gym or home-based classes, participants are encouraged to exercise outside of the sessions; educational sessions regarding the importance of PA to which parents/partners are also invited  Arm 2: usual care - PA will not be restricted but they will not receive the intervention; this will be offered at the end of the study but not evaluated |
| **Outcomes** | Primary: all measured at 10 weeks: functional capacity (CPET; VO2 max etc.); QoL (AQoL-6D; EORTC-C30; FACT-G; Peds-QL (AYA modification)); fatigue (FACIT)  Secondary all measured at 6 months: functional capacity (CPET; VO2 max etc.); QoL (AQoL-6D; EORTC-C30; FACT-G; Peds-QL (AYA modification)); fatigue (FACIT); participation in physical fitness activities (GLTEQ) |
| **Notes** | This study is completed. We contacted the Principal Investigator who confirmed that results are due to be published soon and this will include PA data |
| **Reference** | ACTRN12615000527561. A pilot randomised controlled trial of a structured exercise intervention after the completion of cancer treatment in adolescents and young adults. apps.who.int/trialsearch/Trial2.aspx?TrialID=ACTRN12615000527561 (first received 26 May 2015). |

Barker 2016

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| **Methods** | RCT with a nested qualitative study and a health economic analysis |
| **Participants** | 620 participants ≥ 55 years of age undergoing TKA and assessed as being at risk of poor outcomes |
| **Interventions** | Following discharge from hospital, participants will receive a home-based exercise programme |
| **Outcomes** | Primary: function and disability (LLFDI; 6 and 12 months)  Secondary: (all at 6 and 12 months) knee pain and function (OKS); PA (PASE); QoL (EQ-5D-5L); functional co-morbidities (FCI) |
| **Notes** | A statistical analysis was undertaken in 2018; with the intention to publish data in the near future |
| **References** | \* Barker KL, Beard D, Price A, Toye F, Underwood M, Drummond A, et al. Community-based rehabilitation after knee arthroplasty (CORKA): study protocol for a randomised controlled trial. Trials [Electronic Resource] 2016; **17**: 501  ISRCTN13517704. Community-based rehabilitation after knee arthroplasty (CORKA) [Community-based rehabilitation after knee arthroplasty (CORKA): a prospective individually randomised two-arm randomised controlled trial]. isrctn.com/ISRCTN13517704 (first received 26 January 2015). |

Klaassen 2017

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| **Methods** | RCT with the aim of increasing physical activity, physical function and QoL |
| **Participants** | 221 participants ≥ 18 years of age who are > 1 year after renal transplantation |
| **Interventions** | Arm 1: usual care  Arm 2: exercise intervention, 12 weeks endurance and strength training followed by an individualised sport and PA advice and lifestyle coaching and counselling and 12-month active follow-up  Arm 3: exercise intervention as Arm 2 but with dietary advice |
| **Outcomes** | Primary: physical function (SF-36 PF; 12 weeks, 6 months and 15 months)  Secondary: (at 12 weeks, 6 months and 15 months) QoL (SF-36); physical function (VO2 and strength test); body composition (waist, body fat, BMI); cardiometabolic risk factors (lipid profiles, glucose metabolism); nutrition; psychological factors (motivation, kinesiophobia, coping styles); fatigue (CIS-20; NFR); cost-effectiveness (12 weeks, 6, 9, 12 and 15 months) |
| **Notes** | This study is completed and contact from the study authors has confirmed that they plan to publish data soon |
| **Reference** | Klaassen G, Zelle DM, Navis GJ, Dijkema D, Bemelman FJ, Bakker SJ, et al. Lifestyle intervention to improve quality of life and prevent weight gain after renal transplantation: design of the active care after transplantation (ACT) randomized controlled trial. BMC Nephrology 2017; **18**: 296 |

NCT02083913

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| **Methods** | Clinical trial, single group assignment investigating exercise training prior to bariatric surgery |
| **Participants** | Six participants, 18 to 65 years of age, scheduled to undergo bariatric surgery for morbid or severe obesity |
| **Interventions** | Telehealth supervised exercise training programme: endurance and strength training three times a week for the 12 weeks prior to surgery |
| **Outcomes** | Primary: physical fitness (6MWT, METs; 12 weeks and 1 year)  Secondary: (at 12 weeks and 1 year) QoL (Laval questionnaire); energy expenditure/PA (kCal/day; accelerometer; IPAQ); weight change; change in exercise beliefs including the benefits of exercise (EBQ); body composition; co-morbidities; satisfaction (12 weeks after intervention); adherence (at end of intervention) |
| **Notes** | This study is completed but we were unable to source the PA data |
| **Reference** | NCT02083913. Prebariatric surgery physical exercise training in telehealth (TelePreSET) [Feasibility and impacts of a prebariatric surgery exercise training in telehealth: a pilot study]. clinicaltrials.gov/ct2/show/NCT02083913 (first received 11 March 2014). |

NCT02381262

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| **Methods** | RCT investigating how wearable technology can improve healthy lifestyle behaviour |
| **Participants** | Estimated 213 participants ≥18 years of age who have been approved for laparoscopic VSG |
| **Interventions** | Post-surgery  Arm 1: participants trained in the use of a Fitbit and the data interface, appointment with the exercise physiologist/research coordinator to initiate lifestyle/activity data collection  Arm 2: participants will meet with exercise physiologist/research coordinator to initiate lifestyle/activity data collection (without Fitbit but will receive one at end of study)  Arm 3: historical control data |
| **Outcomes** | Primary: %EWL (1 year)  Secondary: changes in PA pattern (IPAQ-LF; 2 weeks, 1, 4 and 8 months, 1 year); resolution of co-morbidity (diabetes, hypertension, hyperlipidaemia, OSA; 2 weeks, 1, 4 and 8 months, 1 year) |
| **Notes** | This study is recorded as completed in the clinical trials register. We were unable to source a published report of the study findings |
| **Reference** | NCT02381262. Fitbit / healthy weight management study. clinicaltrials.gov/ct2/show/NCT02381262 (first received 6 March 2015). |

NCT02650661

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| **Methods** | RCT evaluating a programme designed to assist cancer patients cope with their illness proactively |
| **Participants** | 394 participants ≥ 19 years of age, recently finished primary cancer treatment for breast, lung, colorectal or gastric cancer; poor performance at baseline in PA minutes, BMI or PTGI score |
| **Interventions** | Arm 1: online health management programme using SMASH (Smart Management Strategy for Health), personalised health tele-coaching, group educational workshop  Arm 2: online health management programme only  Arm 3: standard health educational booklet |
| **Outcomes** | Primary: (all at 3, 6 and 12 months) % participants meeting exercise goal, % participants meeting BMI goal; % participants meeting PTGI goal  Secondary: (all at 3, 6 and 12 months) % participants meeting diet goal (MDI); healthy habits (10 Rules for Highly Effective Health Behavior); anxiety and depression (HADS); fatigue (BFI); self-management (SMASH assessment tool); social support and spiritual well-being (MQOL); cost-effectiveness analysis |
| **Notes** | This study is recorded as completed in the clinical trials register. We were unable to source a published report of the study findings |
| **Reference** | NCT02650661. Efficacy of a smart management strategy for health (SMASH) program for overcoming cancer crisis and growing positively [A randomized controlled trial of smart management strategy for health (SMASH) program for overcoming cancer crisis and growing positively in cancer survivors]. clinicaltrials.gov/ct2/show/NCT02650661 (first received 8 January 2016). |

NCT02720172

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| **Methods** | RCT "to gather preliminary evidence on the efficacy and safety of early postoperative exercise" |
| **Participants** | 30 participants, ≥ 21 years of age, having undergone surgical treatment (ACDF) for a degenerative cervical spine condition such as cervical stenosis, spondylosis or disc herniation |
| **Interventions** | 6-week early home exercise programme with weekly telephone calls to monitor adherence and progress versus usual postoperative care |
| **Outcomes** | Primary: (all at 12 months) neck disability (NDI); pain (NRS); general health (SF-12)  Secondary: PA level (accelerometer; 12 months)  Other: fusion rate (6 months) |
| **Notes** | We contacted the study author who confirmed that the PA data is not yet published |
| **Reference** | NCT02720172. Early postoperative home exercise program after cervical spine surgery [A randomized trial of an early postoperative home exercise program versus usual care after anterior cervical discectomy and fusion surgery]. clinicaltrials.gov/ct2/show/NCT02720172 (first received 25 March 2016). |

NCT03498157

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| **Methods** | RCT concerning a prehabilitation programme |
| **Participants** | 32 participants, ≥ 18 years of age, with non-metastatic primary breast cancer, scheduled for a lumpectomy or mastectomy with ≥ 2 weeks prior to surgery |
| **Interventions** | Arm 1: 2-hour group class followed by supervised resistance training and aerobic exercise for a week then home-based programme until surgery  Arm 2: 2-hour group class followed by home-based training until surgery  Arm 3: 2-hour group class only  Arm 4: not randomised, these are participants who were ineligible due to current PA level and are for comparison |
| **Outcomes** | Primary: safety, feasibility and acceptability  Secondary: (all measured to 6 months) QOL (EORTC QLQ C30); breast cancer-related symptoms and QOL (EORTC QLQ BR23); fatigue (MFI); sleep (PSQI); depression (CES-D); shoulder problems (PSS); PA behaviour (SQUASH); symptoms (6 weeks) |
| **Notes** | We contacted the study author who confirmed that the PA data is not yet published |
| **Reference** | NCT03498157. Impact of prehabilitation in oncology via exercise - breast cancer (IMPROVE-B). clinicaltrials.gov/ct2/show/NCT03498157 (first received 13 April 2018). |

NCT03902834

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| **Methods** | Clinical trial, single group assignment looking at wearable technology |
| **Participants** | 25 participants scheduled for pulmonary resection for NSCLC |
| **Interventions** | Participants were provided with a Fitbit prior to surgery and given proven behavioural change techniques for preconditioning |
| **Outcomes** | Primary: feasibility (> 70% completion rate; 12 months)  Secondary: (all at 12 months) rate of accrual; perioperative patient complications; cost per patient; QOL (EQ-5D-5L); PA (IPAQ-SF) |
| **Notes** | This study is completed and contact from the study authors has confirmed that they plan to publish data soon |
| **Reference** | NCT03902834. Move for surgery (MFS): evaluating the use of wearable technology for preconditioning before thoracic surgery. clinicaltrials.gov/ct2/show/NCT03902834 (first received 4 April 2019). |

Short 2012

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| **Methods** | RCT examining the effects of education, counselling and training to increase physical activity |
| **Participants** | 330 female participants ≥ 18 years of age who have completed all treatments for breast cancer |
| **Interventions** | Arm 1: participants will receive three newsletters over a 12-week period regarding PA adoption and maintenance tailored to the individual  Arm 2: participants will receive three newsletters over a 12-week period regarding PA adoption and maintenance but not tailored  Arm 3: control participants will receive a government-produced standardised brochure with national PA guidelines |
| **Outcomes** | Primary: PA (GLTEQ; 4 and 10 months)  Secondary: (all at 4 and 10 months) self-reported sitting time (MSQ); steps (pedometer and diary); adherence to PA guidelines; adverse events; QoL (FACT-B); fatigue (FACT-F); proposed mediators/self-efficacy |
| **Notes** | This study is completed with full results due for publication soon |
| **References** | \* Short CE, James EL, Girgis A, D'Souza MI, Plotnikoff RC. Main outcomes of the move more for life trial: a randomised controlled trial examining the effects of tailored-print and targeted-print materials for promoting physical activity among post-treatment breast cancer survivors. Psycho-Oncology 2015; **24**: 771-778  Short CE, James EL, Girgis A, McElduff P, Plotnikoff RC. Move more for life: the protocol for a randomised efficacy trial of a tailored-print physical activity intervention for post-treatment breast cancer survivors. BMC Cancer 2012; **12**: 172 |

Stammers 2015

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| **Methods** | RCT of a cardiac prehabilitation programme |
| **Participants** | 244 frail participants ≥ 60 years of age, waiting for elective cardiac surgery including CABG, AVR, MVR or a combination with a CFS of between 3 and 7 |
| **Interventions** | Arm 1: standard care, participants advised to rest and perform only very light intensity PA; preoperative assessment at 1-2 weeks prior to surgery with advice on healthy behaviour  Arm 2: in addition to standard care, an 8-week comprehensive exercise and education programme at a community-based CR facility, including supervised exercise classes and moderate to high intensity interval training; cardiac-related education programme |
| **Outcomes** | Primary: LOS > 7 days (9 weeks)  Secondary outcomes include PA behaviour (PPAQ, PASE, IPAQ, Fowles Third Survey of PA; 8 weeks, 5 and 14 months); QOL (SF-12v2, EQ-5D, EQ VAS; 5 and 14 months) |
| **Notes** | This study is recorded as completed in the clinical trials register. We were unable to source a published report of the study findings |
| **Reference** | Stammers AN, Kehler DS, Afilalo J, Avery LJ, Bagshaw SM, Grocott HP, et al. Protocol for the PREHAB study - pre-operative rehabilitation for reduction of hospitalization after coronary bypass and valvular surgery: a randomised controlled trial. BMJ Open 2015; **5**: e007250. |

van Vulpen 2017

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| **Methods** | Multicentre RCT investigating the effects of exercise of cancer patients |
| **Participants** | 150 participants ≥ 18 years of age with oesophageal cancer who have undergone surgery with curative intent |
| **Interventions** | Arm 1: exercise intervention - a 12 week supervised combined endurance and resistance training programme; participants are also required to be active for a minimum of 30 minutes every day  Arm 2: usual care |
| **Outcomes** | Primary: QoL (EORTC QLQ-C30; 12 and 24 weeks)  Secondary: oesophageal cancer-specific QoL; fatigue; anxiety and depression; sleep quality; work-related factors; cardiorespiratory fitness (VO2 peak); muscle strength; PA; malnutrition risk; anthropometry; blood markers; disease recurrence; survival; all measured at 12 and 24 weeks by test/questionnaire |
| **Notes** | This study is completed and contact from the study authors has confirmed that they plan to publish data soon |
| **References** | \* van Vulpen J, Siersema P, van Hillegersberg R, Nieuwenhuijzen G, Kouwenhoven E, Groenendijk R, et al. Physical exercise following esophageal cancer treatment (PERFECT) study: design of a randomized controlled trial. BMC Cancer 2017; **17**: 552.  van Vulpen JK, Siersema PD, van Hillegersberg R, Peeters PHM, May AM. The physical exercise following esophageal cancer treatment (perfect) study: rationale and study design. European journal of epidemiology 2015; **30**: 871-872. |

*Abbreviations in tables*

**6MWT**: six minute walk test; **ACDF:** Anterior cervical discectomy and fusion; **AQoL-6D**: Assessment of Quality of Life instrument; **AVR**: aortic valve replacement; **BFI**: Brief Fatigue Inventory; **BMI:** body mass index; **CABG**: coronary artery bypass graft; **CES-D:** Center for Epidemiologic Studies Depression Scale; **CFS**: Clinical Frailty Score; **CIS-20**: Checklist Individual Strength fatigue questionnaire; **CPET**: cardiopulmonary exercise testing; **EBQ**: Exercise Beliefs Questionnaire; **EORTC QLQ-C30**: European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire – cancer patients; **EQ-5D-5L**: Health Related Quality of Life 5 Dimensions; **%EWL**: percentage excess weight loss; **FACIT**: Functional Assessment of Chronic Illness Therapy **FACT-B**: Functional Assessment of Cancer Therapy - Breast cancer; **FACT-F**: Functional Assessment of Cancer Therapy - Fatigue; **FACT-G**: Functional Assessment of Cancer Therapy – General; **FCI**: Functional Co-morbidities Index; **GLTEQ**: Godin Leisure-Time Exercise Questionnaire; **HADS**: Hospital Anxiety and Depression Scale; **IPAQ (SF/LF)**: International Physical Activity Questionnaire; **LLFDI**: Late Life Function and Disability Index; **LOS**: (hospital) length of stay; **MDI**: Mini Diet assessment Index; **MET(s)**: metabolic equivalents; **MFI:** Multidimensional Fatigue Inventory; **MQOL**: McGill Quality of Life questionnaire; **MSQ**: Marshall Sitting Questionnaire; **MVR**: mitral valve repair/replacement; **NDI:** neck disability index; **NFR**: Need for Recovery scale - fatigue and work; **NRS:** numerical rating scale; **NSCLC**: non-small cell lung cancer; **OKS**: Oxford Knee Score; **OSA**: (obstructive) sleep apnoea; **PA**: physical activity; **PASE**: Physical Activity Scale for the Elderly; **Peds-QL**: Paediatric Quality of Life Inventory; **PPAQ**: Paffenbarger Physical Activity Questionnaire; **PSQI:** Pittsburgh Sleep Quality Index**; PSS:** Penn shoulder score; **PTGI**: Posttraumatic Growth Inventory; **QoL**: quality of life; **RCT:** randomised controlled trial; **SF-12v2**: Short Form 12 Health Survey Questionnaire; **SF-36 PF**: Short Form 36 Health Survey Questionnaire - physical function domain; **SMASH:** social mediation and self-help; **SQUASH:** Short QUestionnaire to Assess Health-enhancing physical activity; **TKA:** total knee arthroplasty; **VAS**: visual analogue scale; **VO2 (max/peak)**: volume oxygen uptake; **VSG**: vertical sleeve gastrectomy

## Characteristics of ongoing studies

ACTRN12617001267347

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| **Study name** | PEX trial: efficacy of a pre- and postoperative exercise medicine intervention on sexual function and urinary incontinence in men with prostate cancer |
| **Methods** | RCT, parallel design  **Study aim:** to examine the effect of a targeted pre- and postoperative exercise programme on treatment-related side-effects - sexual dysfunction and urinary incontinence - and other outcomes in individuals undergoing radical prostatectomy |
| **Participants** | **Estimated enrolment:** 100  **Inclusion criteria:** men diagnosed with localised prostate cancer scheduled for radical prostatectomy; prostatectomy to be performed by one of four selected surgeons; ≥ 18 years of age  **Exclusion criteria:** neoadjuvant prostate cancer treatment; medical condition that would increase risk of injury or inhibit exercise participation (as determined by participant's physician); inability to participate in minimum of two weeks exercise prior to prostatectomy; unable to read and speak English  **Type of surgery/condition:** radical prostatectomy for prostate cancer  **Country:** Australia  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: exercise prescription; supervised exercise class with additional home-based exercise; information giving/advice (pelvic floor)  **Details of intervention:** the physical exercise intervention is initiated 1-2 months before surgery and following a one-month recovery period, recommence for 3 months after surgery. Small groups of up to 10 participants will be supervised in resistance (e.g., weight-lifting) and aerobic (e.g., walking, jogging, cycling) exercise for approx. 60 minutes three times per week at exercise clinics/gyms. Participants will be encouraged to exercise at home with the goal of achieving a total of at least 150 minutes of moderate to vigorous intensity aerobic exercise each week. Exercise prescription will be progressive and modified according to individual response. Compliance and attendance (including the reason for any missed sessions) will be tracked throughout the program by the EP.  In addition, participants will receive best-practice pelvic floor physiotherapy treatment before and after surgery, including: 1) one-on-one session with a specialist continence physiotherapist prior to surgery; 2) educational booklet; 3) individualized home-based pelvic floor muscle training program; 4) one-on-one session with a specialist continence physiotherapist one month after surgery to review their home-based program.  **Details of comparison group:** standard care which includes the best-practice pelvic floor physiotherapy before and after surgery as in the intervention group |
| **Outcomes** | **Primary:** sexual function (IIEF; EPIC-sexual function; EORTC QLQ-PR-25-sexual domain; 1-2 months; 0 months; 1 month; 4 months; 12 months); urinary incontinence (EPIC-urinary domain; ICIQ-UI SF; -1-2 months; 0 months; 1 month; 4 months; 12 months)  **Secondary:** aerobic capacity (6MWT); body composition (DXA scans); cancer-specific psychological distress (BSI-18); functional mobility (TUG); gender-specific symptoms of psychological distress (MDRS-22); masculine self-esteem (MCD-I); PA levels (GLTEQ); prostate cancer-specific QOL (EORTC QLQ-C30; QLQ-PR25); QOL (SF-36): utilisation of sexual aids and incontinence aids (own scale) |
| **Starting date** | 1 October 2019 |
| **Reference** | ACTRN12617001267347. PEX trial: efficacy of a pre- and post-operative exercise medicine intervention on sexual function and urinary incontinence in men with prostate cancer [Efficacy of a pre- and post-operative exercise medicine intervention on sexual function and urinary incontinence in men with prostate cancer: a randomised controlled trial]. apps.who.int/trialsearch/Trial2.aspx?TrialID=ACTRN12617001267347 (first received 1 September 2017) |

ACTRN12617001283369

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| **Study name** | Cancer And Physical ACtivITY (CAPACITY) trial: A randomised control trial of exercise and self-management for people with lung cancer |
| **Methods** | RCT, parallel design  **Study aim:** to evaluate the effect of a self-management exercise and education programme on physical function and functional recovery on people undergoing surgery for lung cancer |
| **Participants** | **Estimated enrolment:** 120  **Inclusion criteria:** ≥ 18 years of age; able to provide consent; planned surgical treatment for NSCLC; life expectancy > 6 months; ECOG performance status of 0-2 at study entry; not currently meeting PA guidelines (150 minutes moderate or 75 minutes vigorous PA per week)  **Exclusion criteria:** non-English speaking; metastatic disease (stage IV lung cancer); acute uncontrolled cardiovascular or respiratory issues; decompensated heart failure, severe aortic stenosis, uncontrolled arrhythmia or acute coronary syndrome; non-ambulant; ECOG performance status 3-4 at study entry; unable to consent to surgery  **Type of surgery/condition:** surgical treatment for non-small cell lung cancer  **Country:** Australia  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: counselling; education; technology/equipment; goal-setting; family/carer involvement; telephone support  **Details of intervention:** in addition to usual care, participants randomised to the intervention arm will receive a postoperative exercise and education self-management program; two appointments with a physiotherapist prior to hospital discharge to: 1. assess the participant's readiness for PA behavioural change, goals and confidence, 2. educate participant and family/carer about PA, 3. provide resources (activity monitor, exercise diary, pamphlet), 4. set personalised PA goals, and 5. identify barriers and enablers to achieving PA goals; prescribed personalised home walking program progressing towards 150 minutes per week and a home resistance training program progressing to 2-3 times per week; weekly telephone calls to promote adherence, discuss issues and progress exercise; exercise diary will record daily exercise and PA levels **Details of comparison group:** usual care: inpatient ward based physiotherapy |
| **Outcomes** | **Primary:** physical function (EORTC QLQ-C30; 3, 6, and 12 months)  **Secondary:** functional exercise capacity (6MWT; 3 and 6 months); physical function (SPPB; 3 and 6 months); walking self-efficacy (3 and 6 months); self-reported PA levels (IPAQ; 3 and 6 months); sleep (PROMIS SD-SF 8b; 3 and 6 months); health-related QOL (EORTC QLQ-C30 LC13; 3, 6, and 12 months); health care usage (patient medical records; 12 months); survival (patient medical records; 12 months and 5 years); quadriceps muscle function (ultrasound; 48 hours, 3 and 6 months); barrier and task self-efficacy (Barrier and Task Self-Efficacy Scale; 3 and 6 months); self-reported PA levels (PASE; 3 and 6 months); objectively measured PA levels (wrist accelerometer; 3 and 6 months); economic analyses (EQ-5D-5L; 3, 6, and 12 months); cost of delivering the intervention (medical records and records of time and cost data linkage; 3 months); quadriceps muscle strength (hand held dynamometry; 3 and 6 months); fatigue (BFI; 3 and 6 months); financial toxicity (COST; 3 and 6 months); return to work (employment questionnaire; 3, 6, and 12 months); qualitative participant feedback (semi-structured qualitative interviews; 3 and 6 months); distress (DT; 3 and 6 months); hand grip strength (dynamometry; 3 and 6 months) |
| **Starting date** | 23 November 2017 |
| **Reference** | ACTRN12617001283369. Cancer and physical activIty (CAPACITY) trial: a randomised control trial of exercise and self-management for people with lung cancer [Cancer and physical activity (CAPACITY) trial: a randomised control trial to evaluate the effect of exercise and self-management on physical function in people with lung cancer]. apps.who.int/trialsearch/Trial2.aspx?TrialID=ACTRN12617001283369 (first received 6 September 2017) |

ACTRN12618000930280

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| **Study name** | Better knee, better me: effectiveness of two scalable health care interventions supporting self-management for knee osteoarthritis – a randomised controlled trial |
| **Methods** | RCT, parallel design  **Study aim:** to compare the effectiveness of two scalable interventions (exercise; exercise plus weight management) to each other and to an information only group in participants with knee OA who are overweight or obese; against primary outcomes of pain and function and a range of secondary outcomes including weight, PA, QOL, knee surgery |
| **Participants** | **Estimated enrolment:** 415  **Inclusion criteria:** between 45 and 80 years of age; reports activity-related knee pain; reports morning knee stiffness ≤ 30 minutes; history of knee pain on most days for ≥ 3 months; overall average knee pain in last week self-rated as ≥ 4 out of 10 on an 11-point scale; BMI ≥ 28 kg/m² and < 41 kg/m²; member of Medibank Private with cover for arthroplasty surgery; able to give consent and fully participate in the intervention and assessment procedures; wiling to follow advice and participate in the exercise/PA/weight loss program if part of their treatment; able to regularly weigh themselves  **Exclusion criteria:** booked for knee surgery on either knee; have had all eligible knee joints replaced (bilateral replacement or unilateral replacement with non-operated knee pain < 4 out of 10); knee surgery within previous 6 months; unable to speak or read English; self-reported diagnosis of rheumatoid arthritis or other inflammatory arthritis; other medical condition/upcoming procedure that would prelude participation; unable to access/use telephone and internet; non-clearance from GP for those at risk of falls; use of meal replacement products for weight loss in previous 6 months; undertaken regular knee strengthening exercise in the last 6 months; unable to follow very low energy/ketogenic diet for medical reasons, including: T1D, T2D requiring insulin or other medication excluding metformin, warfarin use, stroke or cardiac even in previous 6 months, unstable heart condition, fluid intake restriction  **Type of surgery/condition:** knee osteoarthritis  **Country:** Australia  **Setting:** hospital; multicentre |
| **Interventions** | **Type of intervention:** combination: telehealth; technology/equipment; goal-setting; information giving/advice; diet/lifestyle  **Details of intervention:** two intervention groups:  1. exercise intervention: information about OA; advice on treatment options and decision support; behaviour change support; other self-management strategies including coping with pain; structured exercise and PA plans; 6 physiotherapist consultations, goal-setting, individualised structured strengthening exercise and PA programme; access to study website; exercise resistance bands; exercise/PA log sheets; Fitbit to track and monitor PA goals  2. exercise plus weight management: in addition to the exercise intervention, 6 video-conference dietician consultations over 6 months; individualised weight management programme; educational materials; meal replacement products; resource folder **Details of comparison group:** information, advice and education about OA and its management via website, including treatment options, managing pain, the importance of exercise, PA and weight loss; links to external websites for further help and support |
| **Outcomes** | **Primary:** average overall knee pain (self-reported; 6 and 12 months); physical function (WOMAC physical function sub-scale; 6 and 12 months)  **Secondary:** all measured at 6 and 12 months unless otherwise stated: self-reported weight; PA (IPEQ-W); health-related QOL (AQoL-8D); global rating of change - overall improvement (self-reported 7 point Likert scale); self-reported appointment with an orthopaedic surgeon; self-reported knee joint replacement and/or knee arthroscopy procedures since enrolment; knee joint replacement/knee arthroscopy procedures beyond the life of the trial (2 and 5 years); economic evaluation (WHO HPQ short form); self-reported willingness to undergo surgery; depression (DASS-21); anxiety (DASS-21); stress (DASS-21) |
| **Starting date** | 20 August 2018 |
| **Reference** | ACTRN12618000930280. Better knee, better me: effectiveness of two scalable health care interventions supporting self-management for knee osteoarthritis – a randomised controlled trial. apps.who.int/trialsearch/Trial2.aspx?TrialID=ACTRN12618000930280 (first received 1 June 2018) |

ACTRN12618002020268

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| **Study name** | A text message program to support women’s physical and mental health after breast cancer treatments |
| **Methods** | RCT, parallel design  **Study aim:** to examine the effect of a six-month text message support programme on the mental and physical health of women following breast cancer treatment |
| **Participants** | **Estimated enrolment:** 160  **Inclusion criteria:** women ≥ 18 years of age; diagnosed with breast cancer; completed breast cancer treatment (surgery, RT and/or CT) within last 18 months but may still be on endocrine therapy; own mobile phone capable of sending and receiving text messages; written informed consent  **Exclusion criteria:** already participating in a text message-based study; diagnosed with distant metastatic breast cancer; unable to comply with study requirements  **Type of surgery/condition:** breast cancer  **Country:** Australia  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination:telehealth/text messaging; information giving/advice; diet/lifestyle; technology/equipment  **Details of intervention:** in addition to usual care, EMPOWER-SMS: a 6-month semi-personalised text message support programme, one-way texts covering 1) general breast cancer information; 2) social/emotional support; 3) diet/exercise; 4) medication adherence/side effects; subset will have accelerometers to measure PA  **Details of comparison group:** usual care; pts will also receive a welcome text but no further text message support; reminder towards 6 months of follow-up visit; pts in the control group will be offered the opportunity to receive the intervention at the end of the study |
| **Outcomes** | **Primary:** self-efficacy (SEMCD6; 6 months)  **Secondary:** all measured at 6 months: BMI; BFP; PA (GPAQ and accelerometer data); nutrition (STEPS); QOL (EORTC QLQ-C30); QOL (EORTC QLQ-BR23); depression and anxiety (DASS-21); patient's illness perception (B-IPQ) |
| **Starting date** | 8 April 2019 |
| **Reference** | ACTRN12618002020268. A text message program to support women’s physical and mental health after breast cancer treatments [A text message intervention to support women’s self-efficacy and physical and mental health outcomes after breast cancer treatments (EMPOWER-SMS): a randomized controlled trial]. anzctr.org.au/Trial/Registration/TrialReview.aspx?ACTRN=12618002020268 (first received 17 December 2018) |

Augustin 2017

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| **Study name** | Low glycemic index diet, exercise and vitamin D to reduce breast cancer recurrence (DEDiCa): design of a clinical trial |
| **Methods** | RCT, parallel design  **Study aim:** to investigate the effect of a 33-month lifestyle intervention - low GI diet, moderate PA - with vitamin D on breast cancer recurrence, health and well-being in women who had undergone surgery for breast cancer |
| **Participants** | **Estimated enrolment:** 506  **Inclusion criteria:** women ≥ 30 and < 75 years of age; within 12 months of primary diagnosis of histologically confirmed breast cancer (T1 with Ki67 ≥ 30%, T2, T3 without metastasis); able to consent and adhere to protocol **Exclusion criteria:** does not meet inclusion criteria; sarcoidosis or other glanulomatous diseases with hypercalcaemia (Ca > 11 mg/dL); previous or current concomitant malignant cancer; pregnant or lactating women; AIDS diagnosis; severe renal insufficiency; kidney stones; participating in other lifestyle clinical trials  **Type of surgery/condition:** surgery for primary breast cancer  **Country:** Italy  **Setting:** hospital; multicentre |
| **Interventions** | **Type of intervention:** combination: home-based exercise; diet/lifestyle; supplements; technology/equipment (step counter)  **Details of intervention:** high intensity (HIT) - low GI diet + exercise + vitamin D: low GI diet of legumes, barley, low GI rice, low GI bread, fruit and nuts; brisk walk for 30 minutes (≈ 5000 steps) per day on top of habitual PA; vitamin D supplement up to 4000 iu/day  **Details of comparison group:** lower intensity (LITE): general recommendations for health diet and PA; vitamin D supplement if required |
| **Outcomes** | **Primary:** % DFS (end of study, 33 months)  **Secondary:** all measured every three months throughout the 33-month period: glycaemic control (blood glucose; HbA1c); cardiometabolic variables (body weight, waist circumference, BMI, BP, CRP, lipids); hormone measures (insulin, IGF-1, E2, testosterone, SHBG); epigenetic markers (microRNA); number of daily steps (step counter, questionnaire); QOL (EQ-5D-3L, EORTC QLQ-C30, EORTC QLQ-BC23) |
| **Starting date** | November 2016 |
| **Reference** | Augustin LSA, Libra M, Crispo A, Grimaldi M, De Laurentiis M, Rinaldo M, et al. Low glycemic index diet, exercise and vitamin D to reduce breast cancer recurrence (DEDiCa): design of a clinical trial. BMC Cancer 2017; **17**: 1-13 |

Bruce 2018

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| **Study name** | Randomised controlled trial of exercise to prevent shoulder problems in women undergoing breast cancer treatment: study protocol for the prevention of shoulder problems trial (UK PROSPER) |
| **Methods** | RCT, parallel design  **Study aim:** to investigate the clinical and cost-effectiveness of an early supported exercise in preventing shoulder problems in high-risk breast cancer surgery patients, compared to best practice usual care; with outcomes of upper arm function, complications and QOL |
| **Participants** | **Estimated enrolment:** 350  **Inclusion criteria:** women ≥ 18 years of age; histologically confirmed invasive or non-invasive primary breast cancer scheduled for surgical excision; considered high risk for shoulder problems (axillary node clearance, RT to axilla or supraclavicular region, existing shoulder problems); BMI > 30; can comply with the protocol; can provide written informed consent; also 'late entry' inclusion if postoperative RT to the axilla and/or supraclavicular region increases risk to high if the decision for postoperative RT was made within 6 weeks of surgery; previous breast surgery or contralateral mastectomy only if high-risk of shoulder problems  **Exclusion criteria:** male; immediate reconstructive surgery; SLNB with or without breast surgery unless other high-risk criteria met; bilateral breast surgery; evidence of metastatic disease at time of recruitment  **Type of surgery/condition:** surgery for breast cancer  **Country:** United Kingdom  **Setting:** hospital; multicentre |
| **Interventions** | **Type of intervention:** combination: supervised and home-based exercise programme, information giving/advice  **Details of intervention:** in addition to usual care, participants randomised to the intervention will receive a structured individualised exercise programme of 3-6 face-to-face sessions or contacts with a physiotherapist; an individually tailored home exercise programme; guidance on rehabilitation, management of postoperative complications and returning to general PA and work **Details of comparison group:** best practice usual care: written leaflets informing about exercise, recovery after surgery and treatments for breast cancer |
| **Outcomes** | **Primary:** upper limb function (DASH; 12 months)  **Secondary:** function (DASH subscales; 6 months, 12 months); pain (FACT-B4, NRS, DN4; 6 weeks, 6 months, 12 months); complications (SSI and self-report; 6 weeks, 6 months, 12 months); lymphoedema (self-report; 6 weeks, 6 months, 12 months); health-related QOL (SF12, EQ-5D-5L; 6 months, 12 months); resource use (self-report; 6 months, 12 months); PA (PASE; 6 weeks, 6 months, 12 months) |
| **Starting date** | January 2016 |
| **Reference** | Bruce J, Williamson E, Lait C, Richmond H, Betteley L, Lall R, et al. Randomised controlled trial of exercise to prevent shoulder problems in women undergoing breast cancer treatment: study protocol for the prevention of shoulder problems trial (UK PROSPER). BMJ Open 2018; **8**: e019078 |

CTRI/2017/10/009981

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| **Study name** | Effect of yoga on recovery after heart surgery |
| **Methods** | RCT, parallel design  **Study aim:** to evaluate the long-term efficacy of yoga as an adjunctive to conventional medical management on clinical outcomes in post CABG rehabilitation |
| **Participants** | **Estimated enrolment:** 300  **Inclusion criteria:** participants willing and able to participate; 35-65 years of age; double or triple vessel disease scheduled for elective CABG; no contraindications to yoga  **Exclusion criteria:** emergency CABG; CABG with valve replacement; LVEF < 30%; acute or chronic renal failure with or without dialysis; regular yoga practitioners; physical disability precluding yoga; neuro-psychiatric illness; experience of yoga  **Type of surgery/condition:** CABG for disease in two or three coronary vessels  **Country:** India  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: exercise class/home based exercise; telephone support; diary/log book  **Details of intervention:** in addition to usual care, participants will be taught yoga over 6 weeks with follow-up instruction at 6 months, and encouraged to practice yoga every day at home throughout the 12-month intervention; telephone calls and a log book will measure compliance **Details of comparison group:** usual care which includes physiotherapy, lifestyle modifications and medications |
| **Outcomes** | **Primary:** all measured at 6 weeks, 3 months, 6 months and 12 months; clinical outcomes: risk factor control (blood pressure; glycaemic control - HbA1c; lipid profile; obesity - WHR, BMI; PA (IPAQ); neuropsychiatric outcomes: anxiety and depression (HADS); QOL (SF-36); rehabilitative outcomes: exercise capacity (modified Bruce protocol); pulmonary capacity (PFT)  **Secondary:** all measured at 6 weeks, 3 months, 6 months and 12 months: adverse outcomes (MACCE); inflammatory markers (hs-CRP; IL-6; TNF-a); LV dysfunction (echocardiogram); global gene expression |
| **Starting date** | 10 October 2017 |
| **Reference** | CTRI/2017/10/009981. Effect of yoga on recovery after heart surgery [Efficacy of yoga based cardiac rehabilitation on clinical outcomes in post CABG patients: a randomized controlled trial]. apps.who.int/trialsearch/Trial2.aspx?TrialID=CTRI/2017/10/009981 (first received 3 October 2017) |

DRKS00013972

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| **Study name** | Process optimization by interdisciplinary and cross-sectoral care using the example of patients with hip and knee prostheses |
| **Methods** | **RCT, parallel design**  **Study aim:** to investigate whether an optimised care process leads to sustainable improvement in terms of patient satisfaction, low complication rates, effective service provision; in the operative treatment of hip or knee arthrosis |
| **Participants** | **Estimated enrolment:** 2000  **Inclusion criteria:** indicated for THR or TKR for joint arthrosis; able to understand the protocol; ≥ 18 years of age  **Exclusion criteria:** life expectancy < 1 year; selective surgical procedure; medical or psychological reasons not to participate or which prevent the ability to give informed consent  **Type of surgery/condition:** THR or TKR for arthrosis of the hip or knee  **Country:** Germany  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** other (enhanced recovery)  **Details of intervention:** optimised care process, PROMISE, based on enhanced recovery: 1) best practice service provision; 2) cross-sectional optimised care process; 3) strong interdisciplinary interactions; 4) active involvement of patients in the healing process; 5) data collection and quality assurance with the use of databases **Details of comparison group:** selected data obtained from anonymised data set, of patients with the same indication but not subjected to new care process, provided from the health insurance involved in the project |
| **Outcomes** | **Primary:** presence of chronic pain (12 months)  **Secondary:** all measured at 12 months: proportion of patients with known pre-exiting conditions; PA; usage of medical service(s); QOL; interaction between partners within the process  all measured by questionnaire, interview and secondary data |
| **Starting date** | 27 March 2018 |
| **Reference** | DRKS00013972. Process optimization by interdisciplinary and cross-sectoral care using the example of patients with hip and knee prostheses [Process optimization by interdisciplinary and cross-sectoral care using the example of patients with hip and knee prostheses - PROMISE]. apps.who.int/trialsearch/Trial2.aspx?TrialID=DRKS00013972 (first received 23 March 2018) |

Gentry 2018

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| **Study name** | Protocol for exercise program in cancer and cognition (EPICC): A randomized controlled trial of the effects of aerobic exercise on cognitive function in postmenopausal women with breast cancer receiving aromatase inhibitor therapy |
| **Methods** | **RCT, parallel design**  **Study aim:** to examine the effect of an exercise program on cognitive function in postmenopausal women with early-stage breast cancer during the first six months of AI therapy, compared to usual care |
| **Participants** | **Estimated enrolment:** 254  **Inclusion criteria:** women who are postmenopausal; < 80 years of age (51 to 75 years of age according to trial register); diagnosed with stage 0, 1, 2, or 3a breast cancer; eligible for but not yet receiving AI therapy; English-speaking with minimum of 8 years education  **Exclusion criteria:** prior diagnoses of any type of cancer (excluding some skin cancers); clinical evidence of distant metastases; self-report of hospitalisation for psychiatric illness within last 2 years; history of neurological illness; breast cancer surgery complications; reconstructive surgery within study period; eating disorder; history of substance misuse; use of assisted walking device; history of falls or balance problems; any significant medical condition making exercising unsafe; furthermore, for the neuroimaging subgroup participants with any metal implants, or self-reported claustrophobia will not be included  **Type of surgery/condition:** surgery for early-stage breast cancer  **Country:** USA  **Setting:** hospital, cancer centres and community setting |
| **Interventions** | **Type of intervention:** combination: supervised exercise instruction/class; technology/equipment (accelerometer)  **Details of intervention:** within 2 weeks of beginning AI therapy: supervised exercise sessions either one-to-one or groups of 2-4; using treadmills, cycles, elliptical trainers, indoor walking track; 10-15 minutes three times a week for first 2 weeks, then increasing to reach 45-60 minutes 3 times a week to continue for 6 months; use of Polar HR monitor every 15 minutes, pts encouraged to maintain 60-75% age-predicted maximal HR **Details of comparison group:** usual care: pts instructed to continue usual activities for 6 months, either exercising or not, with no recommendations or intervention |
| **Outcomes** | **Primary:** change in cognitive function (neuropsychological battery to assess 6 domains: attention, learning and memory, executive function, mental flexibility, psychomotor efficiency, visuospatial ability; 6 months)  **Secondary:** brain health (fMRI to measure regional grey matter volume, white matter architecture, functional dynamics; 6 months); pro-inflammatory cytokines (6 months); cardiovascular fitness (submaximal VO2 test; 6 months); energy expenditure (SenseWear PA-monitoring armbands; 3.5 and 7 months); E2 levels (6 months); fatigue (PROMIS-Fatigue SF; 6 months); anxiety (PROMIS-Anxiety SF; 6 months); sleep problems (SenseWear PA-monitoring armbands; 6 months); sleep problems (PSQI; 6 months); sleep problems (ESS; 6 months); depressive symptoms (BDI; 6 months) |
| **Starting date** | April 2016 |
| **Reference** | Gentry AL, Erickson KI, Sereika SM, Casillo FE, Crisafio ME, Donahue PT, et al. Protocol for exercise program in cancer and cognition (EPICC): a randomized controlled trial of the effects of aerobic exercise on cognitive function in postmenopausal women with breast cancer receiving aromatase inhibitor therapy. Contemporary Clinical Trials 2018; **67**: 109-115 |

Heiman Ullmark 2018

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| **Study name** | PhysSurg-B – physical activity in relation to surgical operations |
| **Methods** | **RCT, parallel design**  **Study aim:** to evaluate the effect of PA prior to and following surgery for breast cancer on postoperative recovery and complications |
| **Participants** | **Estimated enrolment:** 400  **Inclusion criteria:** all female pts scheduled for surgery for breast cancer at the participating hospital  **Exclusion criteria:** inability to understand given information; assessed as unable to perform the intervention; withdrawal of informed consent; male; stage IV breast cancer at diagnosis; neoadjuvant treatment  **Type of surgery/condition:** surgery for breast cancer  **Country:** Sweden  **Setting:** hospital; single centre but potentially multicentre |
| **Interventions** | **Type of intervention:** home-based exercise programme  **Details of intervention:** following individual consultation with physiotherapist, 30 minutes individualised exercise added to usual daily routine preoperatively (from randomisation until surgery, 4 weeks +/- 2 weeks) and from hospital discharge to 4 weeks postoperatively **Details of comparison group:** no advice to change current level of PA |
| **Outcomes** | **Primary:** change in self-reported physical and psychological recovery (RAND-36, EQ-5D-5L, KASAM, AUDIT-C, BAI, BDI-II, Steineck concept questionnaire, BPI-SF, FACT-B, IPAQ, SGPALS; 4 weeks +/- 1 week; 12 months +/- 1 month); sick leave (total no. of days and reasons, data from Swedish Social Insurance Agency; 12 months)  **Secondary:** LOS (30 days); adverse events (Clavien-Dindo; 90 days); re-operations and re-admittances (12 months); mortality (National Death Register; 3 and 5 years); health economy (12 months) |
| **Starting date** | November 2016 |
| **Reference** | Heiman Ullmark J, Bock D, Fagevik Olsen M, Olofsson Bagge R, Haglind E. PhysSurg-B – physical activity in relation to surgical operations. European Journal of Cancer 2018; **92 (Supplement 3)**: S77 |

ISRCTN13543667

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| **Study name** | Trial to test the feasibility of an exercise and metformin intervention for men with prostate cancer |
| **Methods** | **RCT, parallel design**  **Study aim:** to explore the feasibility of randomising men to either exercise or taking metformin and also measuring the effects of the intervention, to inform a main study |
| **Participants** | **Estimated enrolment:** 183  **Inclusion criteria:** localised or locally advance prostate cancer; due to undergo RT, radical prostatectomy, or begin active surveillance pathway; treatment at Southmead Hospital, North Bristol NHS Trust or Bristol Haematology & Oncology Centre (University Hospitals Bristol NHS Trust); capacity to consent; ≥ 18 years of age; sufficient ability to read, write and understand English  **Exclusion criteria:** unable to give informed consent or unavailable for follow-up; clinician identified unsuitability; currently taking metformin or insulin; co-morbidities preventing participation; use of a mobility aid - other than a stick - that would prevent the brisk walking intervention  **Type of surgery/condition:** includes radical prostatectomy for prostate cancer but some of the pts may not have had surgery and may be undergoing different therapies  **Country:** UK  **Setting:** hospital; multicentre |
| **Interventions** | **Type of intervention:** combination: home-based exercise programme; technology/equipment; other  **Details of intervention:**  1. PA only: undertake brisk walking for 30 minutes per day, 5 days a week on top of usual activity, aiming for 10,000 steps per day; use of accelerometer for some pts; for the 6-month study duration  2. metformin only: 500 mg modified release metformin daily with food, for the 6-month study duration  3. PA and metformin: combination of above interventions **Details of comparison group:** no intervention |
| **Outcomes** | **Primary:** proportion of uptake in eligible men; measured at 3 months and 6 months: adherence to intervention - PA (step count); metformin (count of returned unused pills and blood test)  **Secondary:** at 6 months: intervention tolerability (interview); trial retention (proportion of those randomised attending follow-up); feasibility of measuring PSA levels (blood sample); feasibility of measuring IGF-I (blood sample); feasibility of demonstrating methylation and gene expression profiles (surgically and biopsy-removed tissue and blood); at 3, 6 and 12 months: feasibility of assessing self-reported PA levels (GLTEQ); urinary symptoms (ICSmale-SF); psychological factors (POMS-SF; BFS); function and bother (EPIC-26); health benefits (TPB questions; TTM); QOL (FACT-P); fatigue (FACIT-F; EQ-5D); general lifestyle factors (self-reported smoking and drinking); feasibility of use of wrist worn activity tracker (interview and monitoring form; 6 months); impact of tracker on PA adherence (3, 6 and 12 months); weight and BMI; attitudes and views of men towards PA and metformin and trial participation |
| **Starting date** | 12 June 2017 |
| **Reference** | ISRCTN13543667. Trial to test the feasibility of an exercise and metformin intervention for men with prostate cancer [Pre-EMpT: prostate cancer – exercise and metformin trial: a feasibility study]. apps.who.int/trialsearch/Trial2.aspx?TrialID=ISRCTN13543667 (first received 2 August 2018) |

ISRCTN16417174

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| **Study name** | Can group therapy improve well-being and mental health of overweight women after gastric bypass surgery? |
| **Methods** | **RCT, parallel design**  **Study aim:** to examine the effects of group sessions and the use of an accelerometer on the health and well-being - QOL, eating behaviour and PA of women following bariatric surgery |
| **Participants** | **Estimated enrolment:** 240  **Inclusion criteria:** women ≥ 18 years of age; eligible for gastric bypass surgery (BMI ≥ 35 kg/m², usually 18 to 65 years of age with some exceptions); able to speak and read Swedish  **Exclusion criteria:** current diagnosis of depression  **Type of surgery/condition:** gastric bypass surgery for obesity  **Country:** Sweden  **Setting:** hospital; multicentre |
| **Interventions** | **Type of intervention:** combined: group counselling; technology/equipment  **Details of intervention:** 2 months after surgery, four 1-hour researcher-led dissonance-based group sessions: discussions, role play, other activities covering eating behaviour, PA, social and intimate relations; allows discussion of difficult situations that may occur following surgery and identification of approaches and solutions, in a group setting **Details of comparison group:** usual postoperative follow-up |
| **Outcomes** | **Primary:** measured at 6, 12, 18 and 24 months: QOL (SF-36); eating behaviours (TFEQ; DEBS); body esteem (BES); social adjustment (SAS-SR); PA (accelerometer; 6, 12 and 24 months)  **Secondary:** all measured at 6, 12, 18 and 24 months: weight; height; waist circumference |
| **Starting date** | 1 December 2013 |
| **Reference** | ISRCTN16417174. Can group therapy improve well-being and mental health of overweight women after gastric bypass surgery? [Can a dissonance-based intervention improve quality of life, social adjustment, eating behaviour and physical activity in women after gastric bypass surgery? A randomised controlled study]. apps.who.int/trialsearch/Trial2.aspx?TrialID=ISRCTN16417174 (first received 23 February 2015) |

ISRCTN29770908

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| **Study name** | PEP-TALK: a study investigating whether having group discussions in addition to physiotherapy improves the amount of PA following hip and knee replacement |
| **Methods** | **RCT, parallel design**  **Study aim:** to determine how a group exercise and behaviour change intervention targeted at increasing PA will affect HR-QOL and clinical outcomes following THR or TKR |
| **Participants** | **Estimated enrolment:** 250  **Inclusion criteria:** ≥ 18 years of age; primary unilateral THR or TKR for degenerative joint pathology (OA) not trauma; do not meet PA levels to benefit health (using GPPAQ); CCI of one point or above; capacity to provide written informed consent (AMTS screening)  **Exclusion criteria:** absolute contraindication to exercise such as severe CVD or PVD (NYHA III to IV); revision joint surgery; care home resident; enrolled in other PA/exercise/behavioural therapy trial; cannot read/understand English; no access to working telephone  **Type of surgery/condition:** THR or TKR for OA  **Country:** UK  **Setting:** hospital; multicentre |
| **Interventions** | **Type of intervention:** combination: group counselling (behaviour change); supervised exercise class  **Details of intervention:** within 4 weeks of surgery, 6-weekly 30-minute group-based behavioural change intervention sessions, followed immediately by 30-minute group-based exercise sessions **Details of comparison group:** 6 weekly 30-minute group-based exercise sessions |
| **Outcomes** | **Primary:** PA (UCLA activity scale; 6 months and 12 months)  **Secondary:** all measured at 6 months and 12 months: lower limb function (LEFS); hip- and knee-specific disability (OHS; OKS); pain (NRS); self-efficacy (GSE); fear of movement (TSK); psychological distress (HADS); HR-QOL (EQ-5D-5L); complications and adverse events (self-reported questionnaire); health-resource use (self-reported questionnaire) |
| **Starting date** | 1 August 2018 |
| **Reference** | ISRCTN29770908. PEP-TALK: a study investigating whether having group discussions in addition to physiotherapy improves the amount of physical activity following hip and knee replacement. isrctn.com/ISRCTN29770908 (first received 15 October 2018) |

ISRCTN82233115

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| **Study name** | Supportive exercise programmes for accelerating recovery after major abdominal cancer surgery |
| **Methods** | **RCT, parallel design**  **Study aim:** to investigate the effects of exercise interventions on recovery and health and well-being in people undergoing curative colorectal surgery for cancer |
| **Participants** | **Estimated enrolment:** 1146  **Inclusion criteria:** ≥ 18 years of age; awaiting curative elective colorectal resection for cancer; ASA I - III; able and willing to consent; understand verbal and written instructions in English; those already participating in other trials may still be eligible but this will need agreeing in advance  **Exclusion criteria:** contraindication to exercise (e.g., lower limb amputation without prosthesis; orthopedic disorder; chronic lung disease; severe psychiatric health problem; cardiovascular contraindication (unstable angina; ALVF; uncontrolled cardiac arrhythmias; uncontrolled hypertension; cardiac event in previous 6 weeks; CeVD resulting in TIA; participant in other trial where agreement in advance between trials has not been reached  **Type of surgery/condition:** colorectal resection for cancer  **Country:** UK  **Setting:** hospital; multicentre |
| **Interventions** | **Type of intervention:** combination: counselling; supervised exercise class; home-based exercise programme; telephone support  **Details of intervention:**  intervention arm A (hospital-based supervised exercise): pre-surgery 45 minute exercise counselling incorporating behaviour modification techniques; up to 3 sessions per week cycle ergometer aerobic training; twice weekly resistance exercise; individualised using previous levels of activity, mobility, barriers; pts encouraged to comply with current PA recommendation of 150 minutes moderate-intensity aerobic and 2 sessions resistance a week until study end (12 months); signposted to local exercise facilities; monthly supervised exercise sessions  intervention arm B (supported home-based exercise): 45 minute exercise counselling incorporating behaviour modification techniques; pts then encouraged to undertake home exercise programme based on current recommendations of 150 minutes moderate intensity aerobic exercise and 2 sessions resistance training per week; individualised using previous levels of activity, mobility, barriers; continue until study end (12 months); signposted to local exercise facilities; 15 minute supportive and motivational telephone calls weekly then monthly **Details of comparison group:** TAU: patient information leaflets and study follow-up visits only |
| **Outcomes** | **Primary:** HR-QOL (SF-36; 12 months)  **Secondary:** postoperative mortality (30 days); CRF; HGS; LOS; fitness for discharge; readmission rate (90 days); postoperative mortality rate (90 days); PA behaviours (6 months and 12 months); psychological health status (6 months and 12 months) |
| **Starting date** | 1 November 2016 |
| **Reference** | ISRCTN82233115. Supportive exercise programmes for accelerating recovery after major abdominal cancer surgery. isrctn.com/ISRCTN82233115 (first received 7 July 2016) |

ISRCTN96374224

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| **Study name** | CLASP: pilot and randomised controlled trial |
| **Methods** | **RCT, parallel design**  **Study aim:** feasibility study evaluating an online intervention offering lifestyle and well-being support for cancer survivors in primary care; also looking at the effect of the intervention |
| **Participants** | **Estimated enrolment:** feasibility > 60; main study 2396  **Inclusion criteria:** ≥ 18 years of age; identifiable from GP case records; breast, prostate or colorectal cancer; finished primary cancer treatment at least 1 month ago and within 10 years (not including active surveillance for prostate cancer or any hormone therapy); have internet access; impaired QOL (measured by EORTC)  **Exclusion criteria:** currently have cancer; have had more than one other type of cancer within last 5 years; have metastatic cancer; receiving treatment for cancer (other than hormone) within last month; expecting to start any cancer treatment within study period; severe MH problems, major uncontrolled depression, schizophrenia, dementia; sarcoma/lymphoma of breast; another study participant living in the house; untreated cancer unless on active surveillance for prostate cancer  **Type of surgery/condition:** breast, prostate or colorectal cancer  **Country:** UK  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: telehealth; telephone support; goal-setting  **Details of intervention:**  group 1: usual medical care with brief advice (from NHS Livewell website)  group 2: in addition to usual medical care, access to website intervention (Renewed Online): this offers lifestyle advice and well-being support developed by HCPs and patient feedback, providing modules on healthy eating, weight management, PA, coping with emotional distress, reducing fatigue  group 3: in addition to usual medical care, website intervention (Renewed Online, as above) plus human support from practice nurse or HCA at their GP surgery, or a central support facilitator; face-to-face or telephone consultation 1 to 2 weeks after logging on then at weeks 4 and 8 and further up to a total of 6 sessions; brief encouragement to use website and patient-led goals |
| **Outcomes** | **Primary:** feasibility: suitability of recruitment screening measures; acceptability of trial procedures (6 and 12 months); acceptability of intervention; appropriateness of human support module; suitability of outcome measures (6 and 12 months); if no extensive changes required all data will be used as a pilot trial so taken forward to full trial (ACCEPT); 'stop-go' criteria: recruitment > 70% or 50 - 70% with monthly update, < 50% trial halted  **Secondary:** outcome measures for feasibility and main trial: Primary: QOL (EORTC QLQ-C30; 6 and 12 months); Secondary: physical function and emotional well-being (EORTC QLQ-C30 sub-scales); HRQOL (EQ-5D-5L; 6 and 12 months); perception of human support (TAQ; 6 months); all at 12 months: anxiety and depression (HADS); fear of relapse (FRRS); QOL (MYCAW); resource use, costs data for health economics; patient enablement (PEI); website satisfaction measure; self-reported adherence to website recommendations for PA, mental well-being and diet (PETS); website usage and entries; Other measures: baseline measures include PA amount by questionnaire |
| **Starting date** | 1 January 2016 |
| **Reference** | ISRCTN96374224. CLASP5 (renewed online): pilot and randomised controlled trial [CLASP renewed online feasibility study; Cancer: life affirming survivorship support in primary care (CLASP) programme]. isrctn.com/ISRCTN96374224 (first received 31 July 2017) |

Kastelz 2015

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| **Study name** | Experimental protocol of a randomized controlled clinical trial investigating the effects of personalized exercise rehabilitation on kidney transplant recipients' outcomes |
| **Methods** | **RCT, parallel design**  **Study aim:** to "investigate the effects of a personalized exercise rehabilitation regimen on return to work and find work rate, vascular health, functional capacity, quality of life, kidney function, and body composition in kidney transplant (KT) recipients" |
| **Participants** | **Estimated enrolment:** 120  **Inclusion criteria:** 18 - 65 years of age; 2- 18 months post successful kidney transplant surgery; cognitive ability to complete questionnaires, give consent and follow instructions  **Exclusion criteria:** any other transplant surgery; non-ambulatory or significant orthopaedic problems; bariatric or other weight-reducing surgery; cardiac/pulmonary disease precluding PA; contraindication to exercise testing per the American Heart Association; unable to comply with the training program  **Type of surgery/condition:** kidney transplantation for CKD/ESRD  **Country:** USA  **Setting:** university hospital; multicentre |
| **Interventions** | **Type of intervention:** combination: supervised exercise instruction/class; technology/equipment (accelerometer)  **Details of intervention:** individualised low intensity resistance-based exercise regime; 60 minutes rehabilitation sessions, twice weekly for 12 months; full body routine; increasing muscle endurance and strength over time whilst maintaining low intensity; delivered so as to change participant motivation from external to internal to increase adherence **Details of comparison group:** standard postoperative follow-up appointments and blood tests; no PA intervention |
| **Outcomes** | **Primary:** all measured at 6 months and 12 months:  vascular function (aortic blood pressure; IMT; regional arterial stiffness - aortic PWV; carotid artery compliance and β-stiffness index; CAVI and ABI; artery function - brachial artery reactivity); body composition (total body mass; lean mass; fat mass; body fat %; DXA); physical function (muscular strength; functional capacity - 6MWT; objective PA assessment - ActiGraph accelerometer); kidney function and lipid profile (metabolism and renal function changes - fasting plasma glucose, HbA1c, lipid profile; inflammatory markers, GFR); QOL (PROMIS-SF v1.1, PROMIS-29 Profile 2.0); adherence (participant attendance at exercise sessions and study visits)  **Secondary:** employment status (self-reported; full-time/part-time; seeking employment; 6 months and 12 months) |
| **Starting date** | October 2014 |
| **Reference** | Kastelz A, Tzvetanov IG, Fernhall B, Shetty A, Gallon L, West-Thielke P, et al. Experimental protocol of a randomized controlled clinical trial investigating the effects of personalized exercise rehabilitation on kidney transplant recipients' outcomes. Contemporary Clinical Trials 2015; **45**: 170-76 |

McGregor 2016

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| **Study name** | High-intensity interval training versus moderate-intensity steady-state training in UK cardiac rehabilitation programmes (HIIT or MISS UK): study protocol for a multicentre randomised controlled trial and economic evaluation |
| **Methods** | **RCT, parallel design**  **Study aim:** to compare the effects of HIIT or MIIS training within cardiac rehabilitation for chronic heart disease |
| **Participants** | **Estimated enrolment:** 510  **Inclusion criteria:** successful revascularization by PCI or CABG; non-obstructive CAD on angiograph; LVEF > 40%; clinically stable (symptoms and medication) > 2 weeks; 18 - 75 years of age  **Exclusion criteria:** symptoms of ischaemia; significant left main stem stenosis; NYHA class III - IV symptoms; compromising ventricular arrhythmia; significant valvular HD; inability to comply with guidelines for exercise testing and training; significant limiting comorbidities preventing full participation  **Type of surgery/condition:** CABG for CAD but also PCI, MI and angiographically documented CAD  **Country:** UK  **Setting:** community CR centres; multicentre |
| **Interventions** | **Type of intervention:** supervised exercise class with home-based exercise; technology/equipment (activity monitor)  **Details of intervention:** supervised HIIT within CR sessions twice weekly for 8 weeks using cycle ergometer; combined with (UK standard care) muscular strength and endurance programme; home based exercise recommended; minimum of 80% sessions to be completed, increasing intensity to achieve 10 x 1 minute protocol by week 4 **Details of comparison group:** current usual CR care MIIS training; combined with (UK standard care) muscular strength and endurance training programme |
| **Outcomes** | **Primary:** VO2 peak (CPET; 8 weeks, 12 months)  **Secondary:** compliance, adherence (continuous measure of compliance, adherence, drop-out rates; MSES; BREQ-2; PNSES; bipolar adjectival rating scale; SC-IAT; 8 weeks, 12 months); acceptability (semi-structured interviews; 8 weeks, 12 months); HR-QOL (EQ-5D; 8 weeks, 12 months); service and resource use (CSRI; 8 weeks, 12 months); lifestyle PA (PA monitor; 8 weeks, 12 months); cardiovascular reserve (CPET; 8 weeks, 12 months); cardiac remodelling (ECHO; 8 weeks, 12 months); arterial remodelling (arterial oscillometry; 8 weeks, 12 months); cardiovascular health (clinical examination; blood sampling; 8 weeks, 12 months); safety (continuous adverse event monitoring) |
| **Starting date** | August 2016 |
| **Reference** | McGregor G, Nichols S, Hamborg T, Bryning L, Tudor-Edwards R, Markland D, et al. High-intensity interval training versus moderate-intensity steady-state training in UK cardiac rehabilitation programmes (HIIT or MISS UK): study protocol for a multicentre randomised controlled trial and economic evaluation. BMJ Open 2016; **6**: e012843 |

NCT02647021

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| **Study name** | Therapeutic resistance group exercise training for head & neck cancer survivors (TARGET) |
| **Methods** | **RCT, parallel design**  **Study aim:** to compare the effects of a therapeutic exercise program which includes lower body resistance exercise with one that does not, on QOL and postoperative outcomes in people rehabilitating following head and neck cancer surgery |
| **Participants** | **Estimated enrolment:** 50  **Inclusion criteria:** ≥ 18 years of age; SCC, thyroid cancer, melanoma or lymphoma involving: oral cavity, oropharynx, larynx or hypopharynx, or lymph nodes in the neck region; surgical treatment: radical neck dissection, MRND, and other variants of functional/selective neck dissection; KPS ≥ 60%; no residual cancer or metastasis; must have completed cancer treatment (> 4 weeks post-treatment); complete PAR-Q+ and physician approval  **Exclusion criteria:** medical or psychiatric illness impacting ability to participate in the programme or follow-up  **Type of surgery/condition:** surgery for head and neck cancer  **Country:** Canada  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** supervised exercise class  **Details of intervention:** in addition to standard care, a progressive resistance exercise component will target 6-8 muscle groups of the lower body; core strengthening exercises **Details of comparison group:** standard care: therapeutic exercise programme - neck ROM and strengthening; posture retraining; shoulder specific progressive resistance training |
| **Outcomes** | **Primary:** cancer-related fatigue (FACT-F; 12 weeks)  **Secondary:** shoulder ROM (goniometer; 1 year); BMI (24 weeks); upper extremity strength (1RM seated row/vertical bench; 12 weeks); neck ROM (goniometer; 12 weeks); upper extremity muscular endurance (1RM seated row; 12 and 24 weeks, 1 year); lower extremity flexibility (sit and reach test; 12 weeks); functional capacity (6MWT; 24 weeks); neck dissection related QOL (NDII; 1 year); HGS (12 weeks); leg strength (1RM leg press; 12 weeks); upper body strength (1RM chest press; 12 weeks); leg strength (30CST in lieu leg press; 12 weeks); FACT-TOI (12 weeks)  **Other:** all measured at 1 year: change in monthly average PA (GLTEQ); cost analysis; exercise adherence (attendance); cancer-related fatigue (FACT-F) |
| **Starting date** | 31 March 2016 |
| **Reference** | NCT02647021. Therapeutic resistance group exercise training for head & neck cancer survivors (TARGET) [Evaluating outcomes from a combined supervised therapeutic and physical exercise program for post-surgical head and neck cancer survivors: a randomized controlled trial]. https://clinicaltrials.gov/ct2/show/NCT02647021 (first received 6 January 2016) |

NCT02997618

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| **Study name** | The AAA get fit trial: a pilot randomised controlled trial of community-based exercise in patients with abdominal aortic aneurysms |
| **Methods** | **RCT, parallel design**  **Study aim:** to examine the effect of a 20-week community (home or gym-based) exercise programme on peak VO2 and AT, QOL, habitual activity levels and cardiovascular risk; in AAA patients |
| **Participants** | **Estimated enrolment:** 58  **Inclusion criteria:** men with AAA ≥ 3.0 and < 5.0 cm and women with AAA ≥ 3.0 and < 4.5 cm; 60 - 85 years of age inclusive; willing and able to engage with an exercise programme and undergo CPET  **Exclusion criteria:** unable or unwilling to undergo CPET and exercise training; high level of habitual PA (high PASE score); medical conditions potentially making training unsafe or which may take priority over the study: severe liver disease; unstable angina, angina of < 2 month's duration, occurring more than twice daily, angina that is increasing in frequency or precipitated by less exertion, angina at rest; uncontrolled AF or other arrhythmia, untreated paroxysmal AF; moderate or severe AS; class II/II/IV HF and/or LVEF < 25%; pericarditis or myocarditis with last 6 months; . 2mm ST depression on exercise ECG; diagnosis or treatment for a malignancy in previous 12 months  **Type of surgery/condition:** surgery for AAA  **Country:** UK  **Setting:** community-based |
| **Interventions** | **Type of intervention:** combined: supervised exercise (gym-based) class or home-based exercise programme; technology/equipment  **Details of intervention:** in addition to usual care, a 20 week community based exercise programme either: home based without the need for specialist equipment, or gym based following and instructor designed programme on aerobic and resistance equipment and floor exercises; both for at least 50 minutes a day on 3 non-consecutive days of the week for 20 weeks **Details of comparison group:** usual care (AAA surveillance): 6 monthly or annual AAA ultrasound measurement, attendance at clinic, written and verbal advice on managing cardiovascular risk, based on current NHS advice on smoking, exercise, weight, diet |
| **Outcomes** | **Primary:** peak VO2 (CPET; 20 weeks)  **Secondary:** all at 20 weeks: A (CPET); biomarkers of cardiovascular risk; other cardiovascular risk factors (weight, BMI, waist circumference, BP); subjective habitual PA levels (PASE); objective habitual PA levels (accelerometry); HR-QOL; early changes in outcome measures - all outcomes measured at 10 weeks; sustainability of changes in outcome measures - all outcomes measured at 30 weeks and compared with other time measures |
| **Starting date** | November 2018 |
| **Reference** | NCT02997618. The AAA get fit trial: a pilot randomised controlled trial of community-based exercise in patients with abdominal aortic aneurysms [The AAA get fit trial: a pilot randomised controlled trial of community-based exercise to improve fitness and reduce morbidity and mortality of patients with abdominal aortic aneurysms]. clinicaltrials.gov/ct2/show/NCT02997618 (first received 20 December 2016) |

NCT03036007

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| **Study name** | Physiotherapy after anterior cervical spine surgery |
| **Methods** | **RCT, parallel design**  **Study aim:** to investigate the effects of structured neck-specific exercise or PA on pain, function and other outcomes in people who have had cervical spine surgery |
| **Participants** | **Estimated enrolment:** 140  **Inclusion criteria:** 18 to 75 years of age; ACDF due to cervical disc disease; postoperative residual disability at 3 months (NDI ≥ 30%); access to computer/tablet/smart phone and the internet; motivate to exercise  **Exclusion criteria:** myelopathy; previous fracture/dislocation of cervical spine; malignancy or benign spinal tumour; spinal infection, ongoing postoperative infection, previous spondylodiscitis; previous cervical spine surgery; any factors contraindicative to study participation or follow-up; known alcohol/drug abuse; unable to read/write Swedish  **Type of surgery/condition:** ACDF for cervical disc disease  **Country:** Sweden  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** telehealth with PT support  **Details of intervention:** internet-based NSE: individualised neck exercise training initially daily then 3 times per week; internet support to continue at home - videos, photos, information and FAQs provided on the internet platform; email access to PT; 3 visits to PT; encouragement to continue post-treatment **Details of comparison group:** PPA: motivational interview; identify PA that suits the individual to increase overall PA level as part of self-care wellness routine - walking, exercises (not NSE), aerobics; 3 further PT visits, advice to contact PT if not working; encouragement to continue PA post-treatment |
| **Outcomes** | **Primary:** neck-specific function (NDI; 3 months and 12 months)  **Secondary:** measured at 3 months and 12 months: pain intensity neck, arm, head (VAS); pain intensity neck, arm (NRS); distribution of pain (pain drawing); use of pain medication; global outcomes of the intervention (modified Odom criteria); dizziness (DHI); headache (VAS; HIT-6); disaster thoughts (PCS); confidence in ability (SES); neck-specific function related to pts chosen activities - daily function, work, spare time (PSFS); operating fear (FABQ); anxiety and depression (HADS); HR-QoL (EQ-5D); work ability (WAI); effort and support in the workplace (ERI); work ergonomics; sickness absence/presence at work (SPS); classification of occupations (SSY); patient enablement (PEI); satisfaction with symptoms (Cherkin scale); level of PA (2 questions, 4 point score); health care consumption; analgesic drug consumption; frequency of pain; sick leave registration; active neck ROM (CROM); neck muscle endurance; sensorimotor control; neurology (clinical exam); HGS; static balance (SOLEC); postoperative radiography; care use; overall change due to treatment (GRC scale); neck muscle strength and function (MRI - subgroup; 3 months); neck muscle function (US - subgroup; 3 months) |
| **Starting date** | 22 May 2017 |
| **Reference** | NCT03036007. Physiotherapy after anterior cervical spine surgery [Physiotherapy after anterior cervical spine surgery for cervical disc disease. A prospective randomised study to compare internet-based neck-specific exercise with prescribed physical activity]. clinicaltrials.gov/ct2/show/NCT03036007 (first received 30 January 2017) |

NCT03187028

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| **Study name** | Diet and exercise after pancreatic cancer (PACE) |
| **Methods** | **RCT, parallel design**  **Study aim:** to examine the feasibility of an RCT comparing the effects of diet alone versus diet and exercise on pancreatic cancer-related functional and disease outcomes; examine the effects on physical functioning and QOL; develop an intervention to improve survivorship care of pancreatic cancer patients |
| **Participants** | **Estimated enrolment:** 50  **Inclusion criteria:** ≥ 18 years of age with planned surgery or surgery within last 3 years for resectable pancreatic adenocarcinoma; English speaker; ECOG status 0, 1 or 2; ambulatory without assistance; able to obtain medical clearance  **Exclusion criteria:** pancreatic cancer recurrence; dementia or organic brain syndrome; severe emotional distress; medical, psychological or social characteristic preventing participation; another cancer diagnosis in last 5 years (excluding skin or cervical cancer in situ); oncologist refusal to allow screening; current participation in another exercise trial  **Type of surgery/condition:** surgical resection for pancreatic cancer  **Country:** USA  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: telehealth; technology/equipment; counselling; diet/lifestyle  **Details of intervention:** diet + exercise: 6-month counselling delivered via visual communication (e.g., Skype); computer tablet and fitness bracelet provided **Details of comparison group:** diet: 6-month counselling delivered via visual communication (e.g., Skype); computer tablet provided |
| **Outcomes** | **Primary:** feasibility measured throughout the 6-month study period: recruitment; adherence to study protocol activities; attrition rates; adverse events; at 6 months: participant satisfaction survey  **Secondary:** at 4 time-points including 3 months and 6 months: ECOG performance status; QOL (FACT); objective physical functioning; tumour markers (CA 19-9); prognostic blood cytokine biomarkers; prognostic blood tumour immunity biomarkers; PA (weekly minutes, activity monitor); at 6 months: completion of pancreatic cancer treatment; survival rates; pancreatic cancer recurrence rates |
| **Starting date** | 3 August 2017 |
| **Reference** | NCT03187028. Diet and exercise after pancreatic cancer (PACE) [Diet and exercise after pancreatic cancer: clinical and functional outcomes (non canonical WNT signaling in colorectal cancer)]. clinicaltrials.gov/ct2/show/nct03187028 (first received 14 June 2017) |

NCT03191630

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| **Study name** | Increasing activity post-kidney transplant with SystemCHANGE (CHANGE) |
| **Methods** | **RCT, parallel design**  **Study aim:** to study the effect of using health tracker technology to increase PA in older people who have had kidney transplant |
| **Participants** | **Estimated enrolment:** 60  **Inclusion criteria:** ≥ 65 years of age; KTR at The Ohio State University Wexner Medical Center, Kidney Transplant Program; healthcare provider clearance; able to speak and read English; possession or access to smart phone; no cognitive impairment; able to walk unaided; not currently hospitalised; ≥ 3 months post-Tx  **Exclusion criteria:** currently on dialysis; current participation in weight loss programme; current participation in structured exercise programme; currently using fitness tracker; planning to relocate in next 6 months  **Type of surgery/condition:** kidney transplant  **Country:** USA  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: supervised exercise class then home-based exercise programme; technology/equipment; telephone support  **Details of intervention:** SystemCHANGE and Fitbit: group sessions for 6 months and then 6 month maintenance phase without contact from study personnel until month 12; instructions on proper Fitbit use and sync to phone; telephone calls to increase step goal by 5% monthly; pts asked to identify people and things that influence their PA, what they are learning, if they want to make changes **Details of comparison group:** Fitbit: group sessions for 6 months then 6 month maintenance phase without contact from study personnel until month12; pts will not be asked to increase step goal; only asked about Fitbit use |
| **Outcomes** | **Primary:** change in perception of activity tracker use (9 open-ended questions - usability, sustainability, acceptability; 1 month, 2 months, 3 months, 6 months, 12 months)  **Secondary:** all measured at 3, 6 and 12 months: number of steps (Fitbit); functional ability (6MWT); resting BP; QOL (SF-12); BMI; radial pulse  Other: waist circumference (3, 6 and 12 months) |
| **Starting date** | 1 October 2017 |
| **Reference** | NCT03191630. Increasing activity post-kidney transplant with SystemCHANGE (CHANGE). clinicaltrials.gov/ct2/show/NCT03191630 (first received 19 June 2017) |

NCT03214471

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| **Study name** | Evaluation of a lifestyle intervention after bariatric surgery |
| **Methods** | **RCT, parallel design**  **Study aim:** to evaluate the effect of a 12-month postoperative lifestyle intervention on weight loss, body composition, fitness and activity levels, disease and quality of life in people who have had bariatric surgery, against usual care |
| **Participants** | **Estimated enrolment:** 153  **Inclusion criteria:** 18 to 65 years of age; primary gastric bypass or sleeve gastrectomy surgery fulfilling NICE eligibility for surgery; medically safe to participate in study; able to read and write English; willing and able to provide written informed consent; able to comply with study protocol; able to attend sessions at UCLH for 12 weeks; willing and able to use/wear provided devices  **Exclusion criteria:** > 200kg body weight (due to DXA scanner limitation); non-ambulatory; functional limitation; medical contraindication for exercise  **Type of surgery/condition:** gastric bypass or sleeve gastrectomy for obesity  **Country:** UK  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combined: diet/lifestyle; telephone support; technology/equipment; supervised exercise class  **Details of intervention:** in addition to usual care, BARI-LIFESTYLE intervention: regular nutritional and behavioural tele-counselling sessions of 15 minutes over 12 months using behavioural psychology techniques; at 3 months post-surgery assessment, enrolment on supervised exercise programme at health facility gyms for 12 weeks **Details of comparison group:** usual care |
| **Outcomes** | **Primary:** %WL (52 weeks)  **Secondary:** body fat (DXA; 52 weeks); BMD (DXA; 52 weeks); SMM (DXA; 52 weeks); measured at 12, 26 and 52 weeks: PA levels (Actigraph); 150 minutes MVPA (Actigraph); SB (Actigraph); physical fitness (6MWT); physical fitness (STS); HGS; QOL (SF-36); QOL (IWQOL); depression (BDI); obesity-associated co-morbidities (medical history) |
| **Starting date** | 20 February 2018 |
| **Reference** | NCT03214471. Evaluation of a lifestyle intervention after bariatric surgery [Evaluation of the effect of a lifestyle intervention compared to usual care on weight loss and changes in body composition, physical activity levels and health-related quality of life in the first year following bariatric surgery]. clinicaltrials.gov/ct2/show/NCT03214471 (first received 11 July 2017) |

NCT03215537

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| **Study name** | Development of patient tailored guideline of physical activity for lung cancer |
| **Methods** | **CT, sequential assignment**  **Study aim:** to investigate the effects of a perioperative comprehensive intervention based on health behaviour model on cardiopulmonary function and QOL in people who are due to have surgery for lung cancer |
| **Participants** | **Estimated enrolment:** 176  **Inclusion criteria:** ≥ 19 years of age; lung cancer patients before surgery  **Exclusion criteria:** ECOG performance status < 1; neoadjuvant therapy; multiple cancer; recurrent lung cancer  **Type of surgery/condition:** lung cancer  **Country:** South Korea  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: counselling; technology/equipment and other (pulmonary rehabilitation)  **Details of intervention:** comprehensive intervention: preoperative exercise counselling and postoperative symptom counselling and pulmonary rehabilitation **Details of comparison group:** observation |
| **Outcomes** | **Primary:** cardiopulmonary function (6MWT; 1 month, 6 months, 1 year after surgery)  **Secondary:** all measured at 1 month, 6 months, 1 year after surgery: complication (pneumonia); pulmonary function (FEV; FVC); PA (device); physical fitness (muscle strength); QOL (questionnaire); fatigue (questionnaire) |
| **Starting date** | 2 March 2016 |
| **Reference** | NCT03215537. Development of patient tailored guideline of physical activity for lung cancer [Development of patient tailored guideline of physical activity for lung cancer survivor after surgery; to improve the symptoms, complications and quality of life]. clinicaltrials.gov/ct2/show/NCT03215537 (first received 12 July 2017) |

NCT03306992

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| **Study name** | Precision-exercise-prescription for lung cancer patients undergoing surgery: the PEP study (PEP) |
| **Methods** | **RCT, parallel design**  **Study aim:** investigating the effects of a personalised exercise programme on physical and psychological outcomes in people undergoing surgical treatment for NSCLC and secondary lung cancer, against the current standard care |
| **Participants** | **Estimated enrolment:** 200  **Inclusion criteria:** ≥ 18 years of age; primary lung cancer stage I, II or IIIa or secondary lung cancer; surgically resectable; able to read and write English; willing to be randomised to either group  **Exclusion criteria:** ineligible for surgery; contraindications to exercise programme; alcohol or drug abuse; significant mental or emotional problems (e.g., NCCN DT < 7)  **Type of surgery/condition:** lung resection for NSCLC or secondary lung cancer  **Country:** USA  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: supervised exercise class and home-based exercise programme; telephone support  **Details of intervention:** personalised exercise programme (PEP): personalised, implemented and modified based on pts AM-PAC mobility stage - by licensed PT in face-to-face meeting or weekly telephone calls; combination of home-based and in-patient exercise; basic transfer and callisthenics mobility, aerobic and resistance exercise, and challenges; study-specific exercise manual for education on starting and maintaining the intervention **Details of comparison group:** standard care |
| **Outcomes** | **Primary:** change in mobility performance (6MWT; 2 months and 6 months)  **Secondary:** all measured at 2 months and 6 months: physical performance (SPPB); change in outcome measures (PROMIS); change in FACT-L; change in FACT-F; change in sleep quality (PSQI); change in BREQ-3 |
| **Starting date** | 1 November 2017 |
| **Reference** | NCT03306992. Precision-exercise-prescription for lung cancer patients undergoing surgery: the PEP study (PEP) [A phase III randomized study comparing the effects of a personalized exercise program (PEP) against no intervention in patients with stage I-IIIa primary non-small cell lung cancer or secondary lung cancer undergoing surgical resection]. clinicaltrials.gov/ct2/show/NCT03306992 (first received 11 October 2017) |

NCT03364673

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| **Study name** | Stepping into survivorship: harnessing behavioral economics to improve quality of life in ovarian cancer |
| **Methods** | **Clinical trial, single group assignment/single arm**  **Study aim:** to examine the effect of a wearable fitness tracker combined with a game-based mobile health intervention when working with a 'teammate' (family or friend) on PA and QOL in ovarian cancer survivors |
| **Participants** | **Estimated enrolment:** 20  **Inclusion criteria:** ≥ 18 years of age; newly diagnosed ovarian cancer; ≤ 6 months of completing chemotherapy; reads English; no cognitive, visual or orthopedic preclusion to participation; continuing treatment at Dana Faber Cancer Institute  **Exclusion criteria:** already participating in a mHealth intervention; non-ambulatory; no access to a smart phone for data from the tracker  **Type of surgery/condition:** ovarian cancer  **Country:** USA  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: technology/equipment; telehealth; family/carer involvement; goal-setting; incentives  **Details of intervention:** wrist-worn fitness tracker; social incentive - use of an automated information technology platform (The Way to Health) that manages the enrolment, surveys, incentives and captures data; participants will enrol with a teammate and collaborate to achieve set daily step goals, receiving feedback and incentives **Details of comparison group:** no comparison group |
| **Outcomes** | **Primary:** feasibility (≥ 60% completion rate; 1 year pilot); acceptability (Likert scale study burden questionnaire; 26 weeks)  **Secondary:** change in daily steps to estimate outcome parameters for future study (14 weeks, 26 weeks); perceived effectiveness (Likert scale "Participating in this study motivated me to increase my activity levels"; 26 weeks) |
| **Starting date** | 20 July 2018 |
| **Reference** | NCT03364673. Stepping into survivorship: harnessing behavioral economics to improve quality of life in ovarian cancer. clinicaltrials.gov/ct2/show/NCT03364673 (first received 6 December 2017) |

NCT03388983

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| **Study name** | Effectiveness of prehabilitation for patients undergoing lumbar spinal stenosis surgery |
| **Methods** | **RCT, parallel design**  **Study aim:** to compare the effects of a 6-week exercise prehabilitation against usual preoperative care, on outcomes from surgery for lumbar spine stenosis |
| **Participants** | **Estimated enrolment:** 120  **Inclusion criteria:** ≥ 50 years of age; signs of neurogenic claudication; MRI or CT signs of degenerative LSS; radiculopathy with or without low back pain > 3 months unresponsive to conservative intervention; ODI > 30%; open or minimally invasive laminotomy/laminectomy; willing to complete pre- and postoperative questionnaires and physical assessments  **Exclusion criteria:** unable to speak, read or understand Chinese or English; unable to give informed consent; surgical management for lumbar fracture, tumour, synovial cysts, scoliosis correction; revision LSS, diagnosis of chronic pain; neurological or systemic neuromuscular disease; planning for spinal fusion; discogenic nerve compression or instability  **Type of surgery/condition:** spinal decompression surgery for LSS  **Country:** Hong Kong  **Setting:** hospital; multicentre |
| **Interventions** | **Type of intervention:** Combination: supervised exercise class; technology/equipment  **Details of intervention:** 6-week prehabilitation: 3 sessions per week of PT supervised individualised cardiovascular training, stabilisation exercises and strength training; individually modified and progressive **Details of comparison group:** standard care: information about surgery from orthopedic surgeon and pamphlet on posture and staying active; standard care may include rehabilitation at surgeon's discretion |
| **Outcomes** | **Primary:** postoperative outcomes (Chinese/English ODI; 6 months)  **Secondary:** all at 6 months: pain medication; LOS; back/leg pain intensity (NPRS); PA levels (Actigraph); QOL (EQ-5D-3L); LSS-related outcomes (SSSQ); PA (IPAQ); patient's perceived changes (CGI of change) |
| **Starting date** | 10 August 2018 |
| **Reference** | NCT03388983. Effectiveness of prehabilitation for patients undergoing lumbar spinal stenosis surgery [Effectiveness of prehabilitation for patients undergoing lumbar spinal stenosis: a randomized clinical trial]. clinicaltrials.gov/ct2/show/NCT03388983 (first received 3 January 2018) |

NCT03452319

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| **Study name** | Effects of increased PA before thoracoabdominal esophageal surgery |
| **Methods** | **RCT, parallel design**  **Study aim:** to evaluate the effect of a preoperative training intervention on physical function, PA and QOL in people undergoing thoracoabdominal oesophageal resection for cancer |
| **Participants** | **Estimated enrolment:** 100  **Inclusion criteria:** anyone scheduled to undergo thoracoabdominal oesophageal resection at one of the five participating hospitals  **Exclusion criteria:** < 2 weeks between inclusion and surgery; benign reason for surgery; difficulty speaking and reading Swedish; other injury or disease precluding involvement  **Type of surgery/condition:** thoracoabdominal oesophageal resection for oesophageal cancer  **Country:** Sweden  **Setting:** hospital; multicentre |
| **Interventions** | **Type of intervention:** supervised exercise training/class  **Details of intervention:** in addition to standard care, inpatient pre-training: increased PA, daily strength training and breathing exercises starting directly after NAC and RT and until 3 months postoperatively **Details of comparison group:** standard care: including preoperative information; postoperative breathing exercises; mobilisation during hospital stay |
| **Outcomes** | **Primary:** physical capacity (6MWT; 3 months)  **Secondary:** measured at 3 months: vital capacity (spirometry); MIP and MEP; hand strength (Jamar dynamometer); leg strength (heel rise test); leg strength (chair stand test); ribcage range of motion (chest excursion, RMMI)  measured at 1 year: PA level (Grimby and Frändin scale); physical function (DRI); postoperative recovery (PRP); pain in the ribcage (NRS 0 - 10, 0 = no pain, 10 = worst imaginable pain); QOL (EORTC) |
| **Starting date** | 1 December 2017 |
| **Reference** | NCT03452319. Effects of increased physical activity before thoracoabdominal esophageal surgery [Effekt av ökad fysisk träning i samband med thorakoabdominell esofaguskirurgi]. clinicaltrials.gov/ct2/show/nct03452319 (first received 2 March 2018) |

NCT03480464

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| **Study name** | App-technology to improve the level of PA after bariatric surgery |
| **Methods** | **RCT, parallel design**  **Study aim:** to investigate the effect of app-based technology to increase the PA level in people undergoing bariatric surgery, compared to conventional postoperative information |
| **Participants** | **Estimated enrolment:** 150  **Inclusion criteria:** 18 to 60 years of age; accepted for bariatric surgery due to national guidelines, BMI > 35 kg/m²; able to give informed consent; able to read and understand Swedish; own and use smart phone  **Exclusion criteria:** disability preventing daily walking  **Type of surgery/condition:** bariatric surgery for obesity  **Country:** Sweden  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: telehealth; supplements; goal-setting; technology/equipment  **Details of intervention:** app-technology: use of newly developed smart phone app to register daily PA, intake of supplementary vitamins, set personal goals, receive feedback; daily reminders and notifications on the health benefits of PA, medications, vitamins and diet following surgery **Details of comparison group:** standard information given regarding the benefit of postoperative PA |
| **Outcomes** | **Primary:** change in PA level (accelerometer; 18 weeks, 6 months, 1 year, 2 years)  **Secondary:** all measured at 18 weeks, 6 months, 1 year, 2 years: BMI (kg/m²); body weight (kg); body fat (BFP); fat-free mass (kg); muscle mass (kg); total body water (kg); hand grip (kg); self-registered PA (app - minutes/day, minutes/week);  other outcomes all measured at 18 weeks, 6 months, 1 year, 2 years: change in eating behaviour (TFEQ-R21); HR-QOL (SF-36); change in the number of co-morbidities; change in supplementary vitamin intake adherence (MARS-5); change in supplementary vitamin intake adherence (MPR); change in beliefs and attitudes to medication (BMQ); sleeping habits (KSQ); dietary intake and eating habits (FFQ); urinary incontinence or prolapse symptoms (ICIQ); Hb (g/L); iron status (µmol/L); s-folate (nmol/L); p-calcium (mmol/L); s-albumin (g/L); s-cobalamin (pmol/L) |
| **Starting date** | 16 November 2017 |
| **Reference** | NCT03480464. App-technology to improve the level of physical activity after bariatric surgery [App-technology to increase physical activity after bariatric surgery: a randomized controlled trial]. clinicaltrials.gov/ct2/show/nct03480464 (first received 29 March 2018) |

NCT03497546

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| **Study name** | Exercise following bariatric surgery for severe/morbid obesity (EFIBAR) |
| **Methods** | **RCT, parallel design**  **Study aim:** to determine the effects of a 16-week supervised exercise programme on weight loss and other outcomes in people with severe or morbid obesity following bariatric surgery; to test the hypothesis that supervised exercise will result in greater weight loss than control |
| **Participants** | **Estimated enrolment:** 80  **Inclusion criteria:** 18 to 60 years of age; comply with local bariatric surgery criteria (BMI ≥ 40 kg/m² or 35 kg/m² with co-morbidities; acceptable surgical risk; obesity maintained for > 5 years; failure of previous treatments; signed informed consent for surgical treatment); no contraindications to supervised exercise; resident of Almeria or willing to attend training sessions  **Exclusion criteria:** severe psychiatric or neurological disorder; adrenal or thyroid pathology that may cause obesity; uncontrolled alcohol or drug addiction  **Type of surgery/condition:** bariatric surgery for obesity  **Country:** Spain  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: supervised exercise training/class; technology/equipment  **Details of intervention:** in addition to usual care: 16-week concurrent (aerobic and strength) supervised exercise programme, 3 weekly sessions of 60 minutes, progressing in volume and intensity, following CERT guidelines and conducted by exercise science professionals **Details of comparison group:** usual care: national and international recommendations focusing on nutritional status and diet/PA counselling |
| **Outcomes** | **Primary:** percent total weight loss (%TWL; 4 months, 1 year)  **Secondary:** measured at 4 months and 1 year: body composition - body fat, FFM, FFM index (BIA), central body fat (waist and hip circumference); lipid profile - total cholesterol, HDL cholesterol, LDL cholesterol, triglycerides (blood sample); blood markers of glucose metabolism - glucose, insulin, HOMA-IR, HbA1c; BP; arterial stiffness (PWV); plasma concentration of inflammatory markers - hs-CRP, TNF-a, IL-6; plasma concentration of liver metabolism enzymes - GGT, GPT, GOT; plasma levels of vitamin D; HRV (HR monitor); health-related physical fitness - CRF (maximal treadmill test), upper body muscular strength (handgrip dynamometer), lower body muscular strength (30CST), upper body flexibility (BSC); objectively measured PA (accelerometer); HR-QOL (SF-36, EQ-5D-5L); symptoms/function of hip/knee OA (WOMAC pain, stiffness, function scales); depression, anxiety and stress (DASS-21); emotional, psychological and social well-being (MHC-SF)  measured at 1 year: CEA; CUA |
| **Starting date** | 1 May 2018 |
| **Reference** | NCT03497546. Exercise following bariatric surgery for severe/morbid obesity (EFIBAR) [Supervised exercise following bariatric surgery in the treatment of severe/morbid obesity: a randomized controlled trial]. clinicaltrials.gov/ct2/show/study/NCT03497546 (first received 13 April 2018) |

NCT03502317

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| **Study name** | Prehabilitation to improve cancer surgery outcomes (PICaSO) |
| **Methods** | **RCT, parallel design**  **Study aim:** to investigate the effects of a behavioural physical and psychological prehabilitation on postoperative complications, QOL and LOS against usual care, in people who have undergone major GI cancer surgery |
| **Participants** | **Estimated enrolment:** 128  **Inclusion criteria:** ≥ 18 years of age; fluent in English; able to comply with consent form with study procedures and follow-up; GI cancer; operable GI cancer; expected LOS ≥ 5 days calculated on ACS Surgical Risk Calculator; > 21 days between randomisation and surgery; written informed consent to ICH GCP guidelines and local regulations  **Exclusion criteria:** < 18 years of age; not fluent in English; planned resection of bony pelvis, limbs or major lower extremity neurovascular structures; significant comorbidity including: CHD CCS Class III/IV; CHF NYHA III/IV; neurological or musculoskeletal disorder preventing exercise; major neuropsychiatric disorder  **Type of surgery/condition:** surgery for GI cancer  **Country:** Canada  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: home-based exercise programme; technology/equipment; counselling/psychological  **Details of intervention:** physical prehabilitation and psychological prehabilitation for 21 - 42 days before surgery, physical: personalised home-based RKin prescribed programme of 4 - 5 days 30+ minutes aerobic exercise and 2 - 3 days moderate intensity resistance training; Fitbit, resistance bands and stability ball; psychological: one 40 minute in-person RKin-led mindfulness intervention; practice at home for 20 minutes twice a day; audio file to support sessions **Details of comparison group:** usual care: counselled to continue usual level of activity and given information on exercise; Fitbit |
| **Outcomes** | **Primary:** global health score (EORTC QLQ-C30; 90 days)  **Secondary:** presence and severity of postoperative complications (30 days, 90 days); LOS (up to 6 months); measured at 1 month, 3 months and 6 months: functional capacity (6MWT); self-reported PA (GLTEQ); HRQOL (EQ-5D-5L); presence and severity of symptoms (ESAS); anxiety and depression (HADS); fatigue (FACIT-F); occupational performance and productivity (WLQ); multidimensional social support (MOS-SSS); attachment in close relationships (ECR-M16); healthcare utilisation (HSU inventory; 3 and 6 months) |
| **Starting date** | 14 August 2018 |
| **Reference** | NCT03502317. Prehabilitation to improve cancer surgery outcomes (PICaSO) [Prehabilitation to improve cancer surgery outcomes (PICaSO): a randomized controlled trial]. clinicaltrials.gov/ct2/show/NCT03502317 (first received 18 April 2018) |

NCT03509428

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| **Study name** | The Wessex fit-4-cancer surgery trial (WesFit) |
| **Methods** | RCT, 2 x 2 factorial assignment  **Study aim:** to examine the effects of a community-based exercise programme with behavioural support on surgical outcomes and disease-free overall survival on people undergoing major elective intra-cavity surgery for cancer with or without neoadjuvant therapy |
| **Participants** | **Estimated enrolment:** 1560  **Inclusion criteria:** male or female; ≥ 18 years of age; scheduled for major intra-cavity cancer surgery with curative intent (thoracic, colorectal, oesophagogastric, urologic and hepatobiliary inc. pancreatic); surgery alone (unimodal); surgery combined (multimodal) with adjuvant treatment; deemed potentially curable or undergoing neoadjuvant cancer treatments prior to restaging and surgery  **Exclusion criteria:** < 18 years of age; tumour is considered surgically non-resectable; absolute or relative contraindications to completing CPET; other coexisting acute illnesses or conditions that prohibit CPET; participant declines surgery; weight > 145 kg; participant unable to give informed consent; participants having > 2 mm ST depression if symptomatic or 4 mm if asymptomatic or > 1 mm elevation during any CPET will need to be withdrawn from the study  **Type of surgery/condition:** major intra-cavity surgery for cancer  **Country:** United Kingdom  **Setting:** hospital; multicentre |
| **Interventions** | **Type of intervention:** combination: supervised exercise training/class; counselling/psychological; technology/equipment  **Details of intervention:**  Structured Responsive Exercise Training Programme (SRETP) prior to surgery: CPET-derived individualised aerobic interval training - short burst of high intensity mixed with short bursts moderate intensity exercise  Psychological support prior to surgery: patient-centred sessions on coping, personal issues, practical issues; access to other resources including financial advice; pts deemed at risk of suicide or self-harm etc. report to GP  SRETP + psychological support prior to surgery **Details of comparison group:** usual care plus additional monitoring |
| **Outcomes** | **Primary:** Postoperative LOS (up to 1 year)  **Secondary:** CPET variables - VO2, AT (CPET; 15 weeks); overall survival 1 year); overall survival (5 years); disease free survival (1 year); postoperative morbidity (POMS; day 3, 5, 7 and 15); measured at 1 year: postoperative morbidity (Clavien-Dindo; CCI); PA (number of steps, accelerometer); PA (sleep efficiency, accelerometer); PA (METS, accelerometer); PA (GLTEQ); HRQOL (EQ-5D-5L); HRQOL (EORTC QLQ-C30); HRQOL (semi-structured interview); mental well-being (SEMCD); mental well-being (PAM); mental well-being (HADS); mental well-being (CD-RISC2); mental well-being (B-IPQ); complex health intervention evaluation (MRC RE-AIM); radiological markers of sarco-cachexia (CT); toxicity and adverse events (CTCAE v4); tumour outcome - TNM v7 (CT, MRI, PET CT); tumour outcome - venous invasion (CT, MRI, PET CT); tumour outcome - resection margin involvement (CT, MRI, PET CT); tumour outcome - metabolic activity (CT, MRI, PET CT); tumour outcome - RECIST staging (CT, MRI, PET CT); tumour activity - regression score (CT, MRI, PET CT); tumour outcome - TNM v7 (histopathology); tumour outcome - TNM v7 differentiation grading (histopathology); tumour outcome - TNM v7 extramural tumour extension (histopathology); tumour outcome - TNM v7 lymphovascular invasion (histopathology); tumour outcome - TNM v7 perineural invasion (histopathology); tumour outcome - TNM v7 venous invasion (histopathology); tumour outcome - TNM v7 resection margin status (histopathology); tumour outcome - TRG/Mandard score (histopathology); tumour outcome - TNM v7 lymph node status (histopathology); tumour outcome - TNM v7 number of lymph nodes (histopathology); disability adjusted survival (WHODAS v2.0); tumour microenvironment (biopsy +/- endoscopic US); nutrition (BMI); nutrition (PREMS: CNAQ); nutrition (online assessment); nutrition (MUST) |
| **Starting date** | 26 March 2018 |
| **Reference** | NCT03509428. The Wessex fit-4-cancer surgery trial (WesFit) [A pragmatic factorial design randomised controlled study to assess the efficacy of the implementation of a prehabilitation programme in patients undergoing elective major intra - cavity cancer surgery in Wessex]. clinicaltrials.gov/ct2/show/nct03509428 (first received 26 April 2018) |

NCT03564171

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| **Study name** | Prehabilitation for women undergoing pre-operative chemotherapy for breast cancer |
| **Methods** | **RCT, parallel design**  **Study aim:** to assess the effects of a multimodal prehabilitation protocol for women with breast cancer undergoing NAC against standard care |
| **Participants** | **Estimated enrolment:** 60  **Inclusion criteria:** ≥ 18 years of age; able to give consent; ECOG 0 - 1  **Exclusion criteria:** pregnant; > 80 years of age; medical contraindication to exercise; history of severe and persistent mental illness, cognitive impairment, recent suicide attempt, HADS score of > 11; GSLTPAQ score of > 24  **Type of surgery/condition:** NAC for breast cancer  **Country:** Canada  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination (multimodal): home-based exercise programme; diet/lifestyle; counselling/psychological  **Details of intervention:** in addition to standard care, a multimodal prehabilitation intervention including: exercise, nutritional counselling, stress counselling, smoking cessation, before commencing NAC **Details of comparison group:** standard care |
| **Outcomes** | **Primary:** measured at 18 months: recruitment rate; exercise compliance rate; attrition rate; stress consultation compliance rate  **Secondary:** QOL (FACT-B; 18 months); measured at 6 months: PA volume; aerobic fitness (6MWT); arm fitness (HGS test); exercise tolerance (FACT-An) |
| **Starting date** | 18 July 2018 |
| **Reference** | NCT03564171. Prehabilitation for women undergoing pre-operative chemotherapy for breast cancer [A randomized controlled feasibility study comparing a multimodal prehabilitation protocol to normal care for women undergoing neo-adjuvant chemotherapy for breast cancer]. clinicaltrials.gov/ct2/show/nct03564171 (first received 20 June 2018) |

NCT03626610

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| **Study name** | Prehabilitation of patients with oesophageal malignancy undergoing peri-operative treatment (Pre-EMPT) |
| **Methods** | **Non-randomised clinical trial, parallel design**  **Study aim:** to assess the effects of an exercise prehabilitation on patient outcomes after surgery for oesophageal cancer |
| **Participants** | **Estimated enrolment:** 66  **Inclusion criteria:** 18 to 79 years of age; operable oesophageal and gastro-oesophageal adenocarcinoma and scheduled to undergo standard NAC and oesophagogastric surgery; able to understand and independently consent; able to understand and complete questionnaires; willing to undergo assessments and intervention; willing and able to use Fitbit; ASA I - III and fit for surgical resection; BMI ≥ 18.5 with < 10% self-reported unintentional weight loss at diagnosis  **Exclusion criteria:** not medically fit for surgery; to undergo primary or palliative CT; recommended for chemoradiotherapy; < 18 years of age or > 79 years of age; unable to undergo CPEX testing; do not wish to undergo certain aspects of the trial; unable or unwilling to attend CHHP for assessment/advice; unable to give informed consent; unable to understand or complete questionnaire; unwilling to use Fitbit; ASA IV+; BMI < 18.5 with self-reported unintentional weight loss of ≥ 10% at diagnosis  **Type of surgery/condition:** surgical resection for oesophageal and gastro-oesophageal adenocarcinoma  **Country:** UK  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: supervised exercise training/class; technology/equipment  **Details of intervention:** exercise prehabilitation during NAC; monitored exercise training **Details of comparison group:** standard care |
| **Outcomes** | **Primary:** cardiopulmonary fitness (CPEX; 5 months)  **Secondary:** postoperative complications (Clavien-Dindo; ECCG; to date of discharge, up to 45 days); LOS (to date of discharge, up to 45 days); lean body mass (CT; 5 months); daily activity levels (Fitbit steps; 5 months); sleep quality (Fitbit; 5 months); measured at 12 months: HRQOL (EORTC QLQ-OES18); HRQOL (EORTC QLQ-C30); well-being (SWEMWEBS); disease recurrence (pathology, radiology); postoperative mortality |
| **Starting date** | November 2016 |
| **Reference** | NCT03626610. Prehabilitation of patients with oesophageal malignancy undergoing peri-operative treatment (Pre-EMPT) ['Pre-EMPT' - an interventional study to assess the effects of pre-emptive exercise, or 'prehabilitation', in patients undergoing peri-operative treatment for adenocarcinoma of the oesophagus and gastro-oesophageal junction]. clinicaltrials.gov/ct2/show/NCT03626610 (first received 13 August 2018) |

NCT03641027

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| **Study name** | Physical activity before obesity surgery (PABOS) |
| **Methods** | **RCT, parallel design**  **Study aim:** to investigate whether an intervention of individual coaching aimed at increasing PA before and after gastric bypass surgery changes the level of PA up to 2 years following surgery; and the effects on postoperative outcomes, QOL and resumption of habitual PA |
| **Participants** | **Estimated enrolment:** 300  **Inclusion criteria:** anyone scheduled for GBP at participating hospitals  **Exclusion criteria:** inability to understand given information; inability to perform intervention  **Type of surgery/condition:** GBP for obesity  **Country:** Sweden  **Setting:** hospital; multicentre |
| **Interventions** | **Type of intervention:** exercise prescription: home-based exercise programme with telephone support  **Details of intervention:** preoperative: individual PT coaching to increase PA to 30 minutes/day (≥ 150 minutes/week); decrease time spent sitting/lying; telephone follow-up 1 week in  at hospital: standard care, frequent mobilisation  postoperative: 1 week after discharge, telephone follow-up PT coaching to increase PA to 30 minutes/day (≥ 150 minutes/week); decrease sedentary time  PA on prescription, corresponding to 12-15 on Borg-RPE scale **Details of comparison group:** standard care |
| **Outcomes** | **Primary:** PA level (METS, IPAQ; 1 year); PA level (SGPALS; 1 year)  **Secondary:** surgery complication rates (30 days); LOS; sick-leave (1 year); blood tests - glucose metabolism, metabolic change lipids, HbA1c, fasting p-glucose, blood lipids (2 years); weight (measured during clinic visits; 2 years); QOL (EQ-5D-5L; 1 year); gastrointestinal pain (GSRS; 1 year); self-reported co-morbidity (diabetes, high BP, dyslipidaemia; 1 year) |
| **Starting date** | 16 February 2016 |
| **Reference** | NCT03641027. Physical activity before obesity surgery (PABOS). clinicaltrials.gov/ct2/show/NCT03641027 (first received 21 August 2018) |

NCT03659123

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| **Study name** | Prehabilitation & rehabilitation in oncogeriatrics: adaptation to deconditioning risk and accompaniment of patients with cancer (PROADAPT) |
| **Methods** | **Clinical trial, single assignment**  **Study aim:** to investigate the implementation and effects of a perioperative intervention for older people undergoing surgery for cancer |
| **Participants** | **Estimated enrolment:** 122  **Inclusion criteria:** ≥ 70 years of age; or ≥ 60 years of age with significant comorbid condition (modified CCI ≥ 3) or disability (ADL < 6/6); histologically or cytologically proven cancer; life expectancy > 3 months; written informed consent; covered by health system where applicable  **Exclusion criteria:** other malignancy within last 5 years (except cervical CIS, SCC or BCC, adequately treated/controlled); unable to be regularly followed for any reason; mental or physical contraindication to study; administrative or legal supervision  **Type of surgery/condition:** surgery or complex medico-surgical procedures for cancer in older population  **Country:** France  **Setting:** hospital; multicentre |
| **Interventions** | **Type of intervention:** combination: supervised exercise training/class; diet/lifestyle; other  **Details of intervention:**  prehabilitation: nutritional care - personalised evaluation of needs and weekly follow-up; total body rehabilitation - 2/3 times a week strengthening exercise, 2/3 times a week endurance exercise, twice weekly respiratory physiotherapy; pharmaceutical assessment  perioperative: nurse follow-up; optimisation of treatments including ERAS  postoperative: hospital-home transition, follow-up re personal data and care course; physical (nutritional, functional and/or comorbidities); medication conciliation results **Details of comparison group:** single arm, no comparator |
| **Outcomes** | **Primary:** implementation of at least one item of the PROADAPT standardised geriatric intervention (all at 12 months): preoperative PA; nutrition guidelines; patient education and coaching; achievement of procedures; rehabilitation; pharmaceutical medication conciliation and treatment optimisation; bridging interventions  **Secondary:** postoperative morbidity (Clavien-Dindo; 30 and 90 days); postoperative morbidity (NCI CTC; 90 days); therapeutic strategy (treatment plan completion rate; 12 months); progression-free survival (12 months); post-treatment complication (NCI CTC grade ≥ 3; 12 months) |
| **Starting date** | 3 July 2018 |
| **Reference** | NCT03659123. Prehabilitation & rehabilitation in oncogeriatrics: adaptation to deconditioning risk and accompaniment of patients with cancer (PROADAPT) [Prehabilitation & rehabilitation in oncogeriatrics: adaptation to deconditioning risk and accompaniment of patients with cancer: a multicenter pilot study]. clinicaltrials.gov/ct2/show/NCT03659123 (first received 6 September 2018) |

NCT03728257

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| **Study name** | Lung transplant G0 (LTGO): Improving Self-Management of Exercise After Lung Transplantation (LTGO) |
| **Methods** | **RCT, parallel design**  **Study aim:** to examine the effects of a behavioural exercise intervention offering individualised training with behavioural coaching in the participant's home to integrate PA into daily life by goal-setting and feedback, on physical function and PA; for lung transplant recipients who often restrict PA due to severe respiratory limitations, which can lead to muscle mass reduction and hypertension, etc. |
| **Participants** | **Estimated enrolment:** 112  **Inclusion criteria:** ≥ 18 years of age; discharged from hospital following lung Tx; 4 weeks since lung Tx; doctor report of difficulty walking 1/4 mile or 10 steps without rest  **Exclusion criteria:** concurrent participation in formal exercise programme e.g., pulmonary rehabilitation; contraindicative chronic condition e.g., cardiac, musculoskeletal or cognitive impairment; no access to Internet or smart device with Bluetooth; medical issue precluding participation; declining screening questions or introduction to hear about the research  **Type of surgery/condition:** lung Tx  **Country:** USA  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: home-based exercise programme; telehealth; telephone support; counselling/psychological; technology/equipment  **Details of intervention:** Lung Transplant GO (LTGO) home-based exercise  Phase 1: intensive home-based exercise training and behaviour coaching, delivered via real-time video conferencing platform (VISYTER), up to 12 sessions, behaviour contract for Phase 2  Phase 2: transition to self-management, 3 telephone sessions over 12 weeks (3 monthly sessions) providing behavioural coaching and exercise reinforcement **Details of comparison group:** enhanced usual care (EUC): monthly newsletter (6 in total) covering post-lung Tx management, e.g., exercise, food, mental health; provision of self-monitoring device |
| **Outcomes** | **Primary:** physical function, walking (6MWT; 3 months, 6 months); physical function, balance change (BBS; 3 months, 6 months); physical function, lower body strength (30CST; 3 months, 6 months); physical function, power-to-weight ratio (COET; 3 months); physical function, respiratory related QOL (SGRQ; 3 months, 6 months); PA change (activity units, METS, kcal; Actigraph GT3X accelerometer; 3 months, 6 months)  **Secondary:** hypertension onset/control (BP monitor; 3 months, 6 months) |
| **Starting date** | 25 March 2019 |
| **Reference** | NCT03728257. Lung transplant go (LTGO): improving self-management of exercise after lung transplantation (LTGO). clinicaltrials.gov/ct2/show/nct03728257 (first received 2 November 2018) |

NCT03783481

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| **Study name** | Distress reduction by activity tracking and activity enhancement by mobile support group in oncology (DRAAGON) |
| **Methods** | **RCT, parallel design**  **Study aim:** to investigate the effect of utilising social networks on smart phones on the level of PA and stress in breast cancer survivors |
| **Participants** | **Estimated enrolment:** 202  **Inclusion criteria:** women 20 to 60 years of age; stage 0 - III breast cancer; ECOG performance status 0; having undergone surgery for breast cancer; smart phone ownership and ability to use apps  **Exclusion criteria:** breast cancer recurrent or metastasis; severe medical illness; scheduled for adjuvant CT  **Type of surgery/condition:** breast cancer  **Country:** South Korea  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** telehealth (smart phone app)  **Details of intervention:** mobile community group: smart phone app, pts will join a mobile community to monitor their own and others daily steps and communicate with others **Details of comparison group:** no intervention |
| **Outcomes** | **Primary:** rate of moderate to severe distress (DT on smart phone app-based questionnaire; 6 months)  **Secondary:** total number of weekly steps (smart phone app; 6 months) |
| **Starting date** | 7 January 2019 |
| **Reference** | NCT03783481. Distress reduction by activity tracking and activity enhancement by mobile support group in oncology (DRAAGON). clinicaltrials.gov/ct2/show/nct03783481 (first received 21 December 2018) |

NCT03873597

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| **Study name** | Physical activity tele-coaching in lung transplant recipients |
| **Methods** | **RCT, parallel design**  **Study aim:** to assess the feasibility and clinical efficacy of PA tele-coaching on increasing daily PA and psychological outcomes in lung transplantation patients |
| **Participants** | **Estimated enrolment:** 40  **Inclusion criteria:** 18 to 70 years of age; referred for a single of double lung Tx for ILD, COPD, CF, bronchiectasis, PVD; able to provide informed consent; able to speak and read English  **Exclusion criteria:** severe post-Tx CINM; bilateral diaphragmatic weakness; any other significant disease or disorder contraindicative to participation or may influence the result of the study  **Type of surgery/condition:** lung Tx  **Country:** UK  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: telehealth; technology/equipment; goal-setting; education; counselling/psychological; telephone support  **Details of intervention:** tele-coaching and usual care: in addition to usual care, interview discussing motivational issues, favourite daily activities, strategies to become more active; a step counter; smart phone with tele-coaching app providing daily goals (steps), feedback, educational tips with targets revised weekly depending on performance; booklet with home exercises; weekly activity proposals; telephone contacts triggered by noncompliance, data not uploaded or lack of progress; for 3 months following hospital discharge **Details of comparison group:** sessions introducing behavioural strategies to promote a physically active lifestyle |
| **Outcomes** | **Primary:** change in daily PA (daily steps, triaxial accelerometer; pre-Tx, 1-2 months post-Tx, post 3-month intervention, 6 months, 12 months)  **Secondary:** change in anxiety and depression symptoms (HADS; pre-Tx, 1-2 months post-Tx, post 3 month intervention, 6 months, 12 months); change in HR-QOL (SF-36; pre-Tx, 1-2 months post-Tx, post 3 month intervention, 6 months, 12 months); time to first hospital admission post-hospital discharge from lung Tx (12 months); adherence to intervention (3 months); survival (12 months); change in functional capacity (6MWT; pre-Tx , 1-2 months post-Tx); patient acceptability (project tailored validated questionnaire; 3 months) |
| **Starting date** | 31 January 2020 |
| **Reference** | NCT03873597. Physical activity tele-coaching in lung transplant recipients [Efficacy of physical activity tele-coaching to optimise daily physical activity levels in lung transplant recipients]. clinicaltrials.gov/ct2/show/nct03873597 (first received 13 March 2019) |

NCT03885817

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| **Study name** | Physically active during cancer treatment (FAKT) |
| **Methods** | **RCT, parallel design**  **Study aim:** to investigate the effects of an individualised exercise programme and nutritional guide on self-reported peripheral sensory neuropathy and fatigue in colorectal cancer patients receiving adjuvant chemotherapy |
| **Participants** | **Estimated enrolment:** 64  **Inclusion criteria:** ≥ 18 years of age; radical resection for colon or rectal cancer within 3 months, scheduled for adjuvant CT; histologically confirmed adenocarcinoma; able to read and understand Norwegian; able to participate in intervention; PS 0 - 2  **Exclusion criteria:** serious co-morbidity contraindicative to exercise; unable to give informed consent; treated for another cancer within last 5 years (excluding BCC skin cancer and cervical CIS); prior treatment with Oxaliplatin  **Type of surgery/condition:** radical resection for colon or rectal cancer; adjuvant CT  **Country:** Norway  **Setting:** hospital; multicentre |
| **Interventions** | **Type of intervention:** combination: supervised exercise training/class; home-based exercise programme; diet/lifestyle  **Details of intervention:** in addition to standard follow-up care, throughout adjuvant CT (3 - 6 months): PT instructed exercise programme of 30 minutes sensorimotor and strength training twice weekly; 90 minutes moderate intensity or 45 minutes high intensity aerobic training per week; monthly completion of PG-SGA SF, referral to nutritionist if score is ≥ 2 **Details of comparison group:** standard follow-up care: recommendations regarding PA and nutrition during CT |
| **Outcomes** | **Primary:** patient reported peripheral sensory neuropathy (EORTC QLQ-CIPN20 sensory sub-scale; 3 months)  **Secondary:** measured at 3, 6, 9, 12, 24, and 36 months: fatigue (FQ); change in patient reported peripheral sensory neuropathy (CIPN20); change in patient reported motor neuropathy (CIPN20 motor sub-scale); change in patient reported autonomic neuropathy (CIPN20 autonomic sub-scale); measured at 3, 6 and 12 months: clinician reported neuropathy (CTCAE); change in BMI; change in sBP; change in dBP; change in waist circumference; change in HDL; change in triglycerides; change in HbA1c; change in glucose; change in body composition (DEXA); nutritional status (PG-SGA SF; 1, 2, 3, 4, 5 and 6 months); change in QOL (EORTC QLQ-C30; 3, 6, 9, 12, 24 and 36 months); completion of adjuvant therapy 1 (Oxaliplatin; 3 to 6 months); completion of adjuvant therapy 2 (Flourouracil or Capecitabine; 3 to 6 months); completion of adjuvant therapy 3 (days treatment course delayed; 3 to 6 months); physical capacity (MSWT; 3, 6 and 12 months); self-reported PA (HUNT; 3, 6, 9, 12, 24 and 36 months); muscle strength (30CST; 3, 6 and 12 months); balance 1 (30TST; 3, 6 and 12 months); balance 2 (OLST; 3, 6 and 12 months); haematological toxicity (CTCAE; 6 months); time before return to work (3, 6, 9, 12, 24 and 36 months); overall and disease free survival (5 years)  other outcomes: SAE (6 months); pts expectations and experiences (semi-structured interview; 3 and 6 months); medical treatment for hypertension (3, 6 and 12 months); T2D diagnosis (3, 6 and 12 months) |
| **Starting date** | 27 March 2019 |
| **Reference** | NCT03885817. Physically active during cancer treatment (FAKT). clinicaltrials.gov/ct2/show/nct03885817 (first received 22 March 2019) |

NCT03955627

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| **Study name** | REJOIN Trial for Older Breast Cancer Survivors |
| **Methods** | **RCT, parallel design**  **Study aim:** to examine the effect of a self-management approach (education and exercise) in comparison to enhanced standard care on arthralgia associated with AI and other outcomes in older breast cancer survivors |
| **Participants** | **Estimated enrolment:** 76  **Inclusion criteria:** biological females ≥ 65 years of age; planning to start AIs; stage I - III breast cancer; ER+ tumour (≥ 5% cells); completed surgery, RT and/or CT; independent ambulatory; physician approved to start exercise programme; currently sedentary (< 60 minutes PA per week); able to understand English and complete surveys; agree to random assignment to exercise or control group; can commit to the intervention; minimum cognitive impairment  **Exclusion criteria:** > 4 weeks into AI use; metastatic cancer or concurrent malignancy requiring treatment; stroke, MI, AF or HF class 3 or 4 within 6 months; recent joint surgery or conditions limiting PA  **Type of surgery/condition:** AI following breast cancer surgery  **Country:** USA  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: supervised exercise training/class followed by home-based programme  **Details of intervention:** in addition to enhanced standard care, Relieving Joint Pain and Improving AI Adherence in Older Breast Cancer Survivors (REJOIN): self-management programme, 8 weeks of supervised group exercise sessions followed by 8 weeks of home-based version **Details of comparison group:** enhanced standard care: standard care plus brochure about hormonal therapy use |
| **Outcomes** | **Primary:** change in pain experience (BPI-SF; 6 months); AI medication adherence (MPR; 30 days)  **Secondary:** measured at 4, 6 and 12 months: aggregated assessment of self-reported data on demography, daily activity, nutritional status, medication use, health behaviours (modified CARG plus NHANES and PROMIS Geriatric Assessment Study Patient Questionnaire); knowledge of breast cancer, treatment and side-effects (TINQ-BC); the individual's confidence in their ability to continue to exercise at 40+ minutes, 3 x week, moderate intensity in the future (ESES) |
| **Starting date** | 28 April 2020 |
| **Reference** | NCT03955627. REJOIN trial for older breast cancer survivors [Using exercise to relieve arthralgia (joint pain) and improve AI adherence in older survivors (REJOIN): a pilot study]. clinicaltrials.gov/ct2/show/nct03955627 (first received 20 May 2019) |

NCT03963986

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| **Study name** | Impacts of remote digital support on physical activity for patients in bariatric surgery (STIMUL) |
| **Methods** | **RCT, parallel design**  **Study aim:** to evaluate the effect of a digital device against standard care in the level of PA undertaken in individuals indicated for bariatric surgery |
| **Participants** | **Estimated enrolment:** 24  **Inclusion criteria:** women 30 to 50 years of age; candidate for bariatric with 4 to 6 months of inclusion (BMI > 40 kg/m² or 35 - 40 kg/m² with obesity-related co-morbidity; able to follow intervention; access to Internet via computer or smart phone; able to understand, read and write French  **Exclusion criteria:** contraindication to exercise; refusal to participate  **Type of surgery/condition:** bariatric surgery for obesity  **Country:** France  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: telehealth; technology/equipment; telephone support; diary/logbook  **Details of intervention:** device group (STIMUL): APA programme with access to online digital programme; starter kit including connected pedometer to measure PA indicators (steps, active minutes, sleep time, distance travelled), tape measure and starter guide; video-conference or telephone remote assessment and motivational interview at outset, month 1, month 3, month 6; during months 1, 2 and 3 pts exchange weekly written messages with educator on the platform; PA objectives planner **Details of comparison group:** pts do not receive access to online digital platform but receive an adapted advice sheet |
| **Outcomes** | **Primary:** PA profile (RG; 4 months)  **Secondary:** PA profile (RG; 10 and 16 months); measured at 4, 10 and 16 months: PA (IPAQ); BMI; waist circumference; hip circumference; lipid balance; BP; QOL (EQVOD) |
| **Starting date** | 28 November 2018 |
| **Reference** | NCT03963986. Impacts of remote digital support on physical activity for patients in bariatric surgery (STIMUL) [Impacts of remote digital support on adapted physical activity for patients in pre-bariatric surgery care pathways]. clinicaltrials.gov/ct2/show/nct03963986 (first received 28 May 2019) |

NCT04044963

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| **Study name** | The effect of a prehabilitation exercise program on physical functioning for patients undergoing kidney transplantation |
| **Methods** | RCT, parallel design  **Study aim:** to investigate if the introduction of a preoperative exercise intervention can mitigate preoperative functional decline; determine feasibility of a tailored home exercise program in participants with CKD and ESRD; determine if there are improvements in clinical outcomes within one week of KT as well as at 30 and 90 days; quantify these differences if any exist |
| **Participants** | **Estimated enrolment:** 150  **Inclusion criteria:** able to participate fully in a home-based prehabilitation program and all functional outcome measures; able to read and write in English; ≥ 19 years of age; receiving care at Vancouver General Hospital or St. Paul's Hospital; suitable for renal transplantation; received physician clearance to participate  **Exclusion criteria:** unstable pulmonary or symptomatic cardiac disease; recent fracture or musculoskeletal injury that precludes exercise; unable to understand or give consent  **Type of surgery/condition:** kidney transplantation for chronic kidney disease or end stage renal disease  **Country:** Canada  **Setting:** hospital; multicentre |
| **Interventions** | **Type of intervention:** combination: home-based exercise programme; technology/equipment; diary/logbook; education (instructional handout)  **Details of intervention:** prehabilitation programme: individualised in person instruction from a member of the research team with first aid and CPR-C training, instructional handout, exercise log and exercise resistance bands issued to participants in the intervention group; 4-5 days per week or mixed modality exercise: aerobic, resistance and flexibility training; prescribed based on the FITT principle (frequency, intensity, time and type); starting from enrolment until scheduled KT (minimum 4 weeks) **Details of comparison group:** regular care |
| **Outcomes** | **Primary:** measured at 1 week pre-Tx, 1-month post-Tx, 6 months post-Tx: physical function (6MWT); physical function (30CST); frailty (Fried frailty score); fatigue; QOL; time to first ambulation post-Tx (1 week); time to first bowel movement post-Tx (1 week); postoperative complications (Clavien-Dindo classification; 30 days and 90 days); LOS (1 week)  **Secondary:** adherence to home-based exercise programme (exercise tracker questionnaire; 24 months) |
| **Starting date** | 27 August 2019 |
| **Reference** | NCT04044963. The effect of a prehabilitation exercise program on physical functioning for patients undergoing kidney transplantation. clinicaltrials.gov/ct2/show/NCT04044963 (first received 5 August 2019) |

NCT04046367

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| **Study name** | Prehabilitation in Bariatric Surgery |
| **Methods** | **RCT, parallel design**  **Study aim:** to evaluate the effects of preoperatively including specific training to increase PA to education on nutrition and exercise combined with CBT, on weight loss, complications of obesity, PA, QOl and post-surgery complications following bariatric surgery |
| **Participants** | **Estimated enrolment:** 80  **Inclusion criteria:** ≥ 18 years of age with obesity (type II to IV) on the waiting list for bariatric surgery at University Hospital of the Canary Islands  **Exclusion criteria:** any factor that will limit intervention monitoring (language etc.)  **Type of surgery/condition:** bariatric surgery for obesity  **Country:** Spain  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: supervised exercise training/class; education; counselling/psychological; technology/equipment  **Details of intervention:** in addition to the comparison group intervention, physiotherapist led prehabilitation: practical instructions on aerobic and resistance PA and inspiratory muscle training **Details of comparison group:** educational programme and cognitive-behavioural intervention: training in nutrition; CBT; standard instruction to increase PA |
| **Outcomes** | **Primary:** weight change (between start of programme and time of surgery, 4 to 6 months)  **Secondary:** measured at 4 to 6 months: BMI; body composition (body fat and lean mass); associated complications: BP, lipids, HbA1c, treatment for associated cardiovascular risk factors, liver enzymes; adherence to the intervention; PA (pedometer, steps); PA (IPAQ); eating patterns - adherence to Mediterranean diet (validated food questionnaire); eating patterns - eating disorders (EDI); general health status (EQ-5D-5L); emotional state (HADS); subjective evaluation of satisfaction, perceived effort and motivation (Likert type scale); functional capacity: walking (6MWT), HGS, respiratory muscle strength (MEP and MIP), lung volume (plethysmography); spirometry (FEV1, FVC), OSA (STOP-BANG questionnaire); OSA polygraphy; surgical complications (< 30 days; 5 to 7 months after start of intervention); LOS (5 to 7 months after start of intervention) |
| **Starting date** | 22 August 2019 |
| **Reference** | NCT04046367. Prehabilitation in bariatric surgery [Prehabilitation in bariatric surgery: a randomized controlled clinical trial]. clinicaltrials.gov/ct2/show/NCT04046367 (first received 6 August 2019) |

NCT04054323

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| **Study name** | The efficacy of physical activity on improving health outcomes for renal transplant patients and their caregivers |
| **Methods** | RCT, parallel design  **Study aim:** "...to see whether a physical activity intervention improves fitness, strength and reduces sedentary behavior. The investigators are also interested in determining if changes will improve quality of life and outcomes associated with renal transplant waitlist." The primary caregiver will also be included in this study |
| **Participants** | **Estimated enrolment:** 20  **Inclusion criteria:**  Patient participant: wait-list for renal transplant; ≥ 21 years of age  Caregiver participant: primary caregiver for the patient; ≥ 21 years of age  **Exclusion criteria:**  Patient and caregiver participants: active suicidal ideation; thought disorder; delusions; hallucinations; recent MI, heart attack or stroke; planned elective surgery for joint replacement  **Type of surgery/condition:** renal transplant for chronic kidney disease  **Country:** USA  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: telehealth; technology/equipment; diary/logbook; family/carer involvement  **Details of intervention:** patient participants and their caregiver receive the PA intervention which instructs in the use of: the activPAL device to track time sitting, standing and walking; tools to monitor exercise intensity; an exercise calendar to set a schedule for completing the program using website-based videos; exercise equipment for use at home (Therabands); strategies to reduce sedentary behaviour  **Details of comparison group:** patient participants only receive the PA intervention as described above |
| **Outcomes** | **Primary:** change of gate speed (6 months)  **Secondary:** MET daily activity level (IPAQ; 6 months); QOL (SF-36; 6 months) |
| **Starting date** | May 2020 |
| **Reference** | NCT04054323. The efficacy of physical activity on improving health outcomes for renal transplant patients and their caregivers. clinicaltrials.gov/ct2/show/NCT04054323 (first received 13 August 2019) |

NCT04088968

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| **Study name** | Against all odds: prehabilitation in urologic cancer surgery |
| **Methods** | **RCT, parallel design**  **Study aim:** to evaluate the efficacy of a lifestyle intervention against usual care in people undergoing NAC before radical cystectomy, on postoperative complications |
| **Participants** | **Estimated enrolment:** 110  **Inclusion criteria:** ≥ 18 years of age; referral to NAC; screened positive for ≥ 1 SNAP factor; signed informed consent  **Exclusion criteria:** pregnancy and breastfeeding; allergy to pharmaceutical support (NRT, Disulfiram); contraindications to exercise  **Type of surgery/condition:** radical cystectomy following NAC for cancer of the bladder  **Country:** Denmark  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: counselling/psychological; diet/lifestyle  **Details of intervention:** prehabilitation: pts screened for ≥ 1 SNAP factor; 5 individualised counselling sessions over 6 weeks on risk reduction; introduced via surgical 'Engage in the process of change'; smoking and alcohol cessation, PA, nutritional support, stress reduction **Details of comparison group:** TAU: shorter interventions, e.g., advice, brief counselling, national advice folders; free to access lifestyle change support in the community |
| **Outcomes** | **Primary:** postoperative complication (CCI; 30 days)  **Secondary:** measured at 6 weeks, day of surgery, 6 months: adherence to intervention (≥ 75% adherence; attendance, log books); smoking and alcohol cessation (breath tests and alcohol biomarkers); PA and nutrition (6MWT; TUG; HGS); HRQOL (EORTC QLQ-C30); HRQOL (EORTC QLQ-BLM30); HRQOL (EQ5D); patient satisfaction (EORTC QLQ-SAT32) |
| **Starting date** | 1 February 2020 |
| **Reference** | NCT04088968. Against all odds: prehabilitation in urologic cancer surgery [Efficacy of intensive smoking nutrition alcohol physical activity (SNAP) intervention among patients with at least 1 SNAP factor and undertaking neoadjuvant chemotherapy before radical cystectomy - a randomised controlled trial]. clinicaltrials.gov/ct2/show/NCT04088968 (first received 13 September 2019) |

NCT04103970

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| **Study name** | The effect of graded activity and pain education (GAPE) for patients early after lumbar spinal fusion |
| **Methods** | **RCT, parallel design**  **Study aim:** to examine the effect of an early active rehabilitation intervention of activity and education against usual care in people who have undergone lumbar spine fusion for degeneration of the lumbar spine, on sedentary behaviour and other outcomes |
| **Participants** | **Estimated enrolment:** 144  **Inclusion criteria:** low back pain > 6 months; ≥ 18 years of age; instrumented posterior fusion of 1 - 2 spinal segments for degeneration of the lumbar spine (disc herniation, spinal stenosis, spondylosis with or without myelopathy and spondylolisthesis) with or without an invertebral cage placed from the anterior approach, posterior approach or lateral access; read and understand Danish; lives with 1.5 hours of the hospital  **Exclusion criteria:** previous LSF; one or more of infection, neoplasm, metastasis, metabolic bone disease, fractures, post-traumatic vertebral compression/deformity, other known autoimmune arthropathies; unable to give informed consent or adhere to the study; other conditions precluding participation  **Type of surgery/condition:** LSF for degeneration of the lumbar spine  **Country:** Denmark  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: counselling/psychological; education; home-based exercise programme; technology/equipment  **Details of intervention:** in addition to usual care, Graded Activity and Pain Education (GAPE): 9 sessions - 4 at hospital, 2 at home, 3 via telephone; pain education - individualised, targets cognitive attitudes and beliefs about pain; graded activity - positive reinforcement of health behaviours and activity; individualised short-term goals for exercise/activity **Details of comparison group:** preoperative seminar led by HCPs on LSF surgery; during hospitalisation PT guidance on mobilisation and return to normal activity level; 3 month postoperative PT led physical rehabilitation in a community centre |
| **Outcomes** | **Primary:** change in sedentary behaviour (SENS accelerometer; 3 months post-surgery)  **Secondary:** change in sedentary behaviour (SENS accelerometer; 12 months); measured at 3, 6 and 12 months: disability (ODI); pain (VAS); fear of movement (TSK); HRQOL (EQ-5D-3L); self-efficacy for exercise (SEES); patient satisfaction regarding movement and pain (VAS/questionnaire) |
| **Starting date** | 1 October 2019 |
| **Reference** | NCT04103970. The effect of graded activity and pain education (GAPE) for patients early after lumbar spinal fusion. clinicaltrials.gov/ct2/show/NCT04103970 (first received 26 September 2019) |

NCT04190719

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| **Study name** | Patient empowerment for major surgery preparation @ home (Paprika) |
| **Methods** | **Clinical trial, parallel design**  **Study aim:** to examine the effect of a multimodal prehabilitation programme of PA, nutritional support and mental preparation on postoperative complications in unfit people undergoing elective major surgery, against a historical comparative group |
| **Participants** | **Estimated enrolment:** 225  **Inclusion criteria:** eligible for elective major surgery (digestive, orthopaedic, vascular-thoracic, urologic); ≥ 70 years of age and/or ASA III - IV, or unfit - presence of ≥ two criteria (mental evaluation; PA; nutrition); able to give informed consent; affiliated to social security  **Exclusion criteria:** planned surgery within 4 weeks; emergency surgery; good to excellent baseline mental evaluation, PA, nutrition scores; not eligible for this programme for physical or psychological reasons; precluded for reasons (Articles L1121-5 to L1121-8 of the French code of public health: pregnancy, parturient, breastfeeding; judicial or administrative custody; under legal protection order)  **Type of surgery/condition:** elective major surgery (digestive, orthopaedic, vascular-thoracic, urologic)  **Country:** France-led, several European countries involved  **Setting:** hospital; multicentre |
| **Interventions** | **Type of intervention:** combination: telehealth; education; technology/equipment; diet/lifestyle; supplements; counselling/psychological; supervised exercise training/class; home-based exercise programme  **Details of intervention:** Paprika programme: individualised prehabilitation programme, reinforced by mobile app or leaflets according to pts preference; PA promotion - use of ebike, personalised gymnastics, daily step increase, use of wristband accelerometer and mobile app; nutrition optimisation plan - dietary advice and protein supplement if required; psychological support - auto-hypnosis sensibilisation or CBT stress management techniques **Details of comparison group:** comparison of historical group with similar characteristics |
| **Outcomes** | **Primary:** rate of postoperative complications (30 days)  **Secondary:** number and severity of postoperative complications (Clavien-Dindo Classification; 30 days); LOS (ICU and hospital; 30 days); hospital readmission (30 days); direct costs (1 month; care consumption at 6 months); PA health status (GPAQ; DASI; 6 months); nutritional health status (weight, appetite, ingesta measurement; 1 month and 6 months); psychological health status (HAD; PSS; 1 month and 6 months); patient participation rate (during Paprika inclusion period); patient participation rate per session (1 month); cohort comparison (other centres using Paprika programme; to 1 year) |
| **Starting date** | 3 January 2020 |
| **Reference** | NCT04190719. Patient empowerment for major surgery preparation @ home (Paprika) [Patient empowerment for major surgery preparation @ home: multimodal prehabilitation in major elective surgery]. clinicaltrials.gov/ct2/show/NCT04190719 (first received 9 December 2019) |

NCT04193397

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| **Study name** | Effects of physical training on health markers of post-bariatric patients (obesity) |
| **Methods** | **Clinical trial, single group assignment**  **Study aim:** to study the effect of a postoperative training programme on PA, body composition and other outcomes in people who have undergone bariatric surgery |
| **Participants** | **Estimated enrolment:** 160  **Inclusion criteria:** 18 to 45 years of age; physically inactive; undergone bariatric surgery  **Exclusion criteria:** smoking; alcohol addiction; pregnancy; menopause; andropause; severe CVD; COPD; neurological disease; hepatic disease; haematologic disease; renal disease; autoimmune disease; active malignant neoplasm; AIDS; presence of musculoskeletal limitations; neuromuscular limitations; cognitive limitations; use of drugs that interfere with bone and muscle metabolism  **Type of surgery/condition:** bariatric surgery for obesity  **Country:** Brazil  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** supervised exercise training/class; technology/equipment  **Details of intervention:** physical exercise programme - aerobic and resistance training 3 times a week for 6 months **Details of comparison group:** no intervention |
| **Outcomes** | **Primary:** changes all measured at 6 months: body composition (DEXA); bone micro architecture (HR-pQCT); muscle strength (1RMT; HGS); physical fitness (CPET); QOL (SF-36); PA level (accelerometer; IPAQ); endothelial function (vascular doppler US; VCP); BP; blood biomarkers of bone metabolism  **Secondary:** |
| **Starting date** | 1 January 2020 |
| **Reference** | NCT04193397. Effects of physical training on health markers of post-bariatric patients (obesity) [Effects of physical training on physical and functional fitness, physical activity level, endothelial function, hemodynamic variables, bone metabolism and quality of life of post-bariatric patients: a randomized controlled trial]. clinicaltrials.gov/ct2/show/NCT04193397 (first received 10 December 2019) |

O'Brien 2018

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| **Study name** | Improving physical activity, pain and function in patients waiting for hip and knee arthroplasty by combining targeted exercise training with behaviour change counselling: study protocol for a randomised controlled trial |
| **Methods** | **RCT, parallel design**  **Study aim:** to assess the effectiveness of a 12-week exercise intervention designed to improve long-term PA and functional abilities for people awaiting arthroplasty |
| **Participants** | **Estimated enrolment:** 100  **Inclusion criteria:** on surgery waiting list (< 6 months); ≤ 80 years of age; able to read and understand English; willing to participate in 12-week exercise intervention and provide informed consent  **Exclusion criteria:** unstable contraindicative medical condition; prior diagnosis of degenerative neurological condition (e.g., Parkinson's); confined to wheelchair  **Type of surgery/condition:** hip or knee arthroplasty for OA  **Country:** Australia  **Setting:** hospital; single centre |
| **Interventions** | **Type of intervention:** combination: supervised exercise class; counselling/psychological; education; goal-setting; technology/equipment  **Details of intervention:** ENHANCE programme: twice weekly one-hour long group exercise classes for 12 weeks combined with 5 group counselling sessions, delivered after the class; max 5 pts per class; individualised and progressive; counselling to increase self-efficacy for exercise, symptom management and promoting positive health behaviours based on HAPA; workbook re: OA and exercise, setting goals, forming habits and making plans with activities for counselling sessions or homework **Details of comparison group:** usual care; generic OA and exercise information brochure |
| **Outcomes** | **Primary:** daily PA - daily step count and % time spent in sedentary behaviour (activity monitor; at 6 months and 6 months after surgery)  **Secondary:** all measured at 6 months and 6 months after surgery: pain (VAS); QOL (SF-12); self-efficacy (specifically designed measure); function (OHS; OKS); habit behaviour (specifically designed measure); attitude (specifically designed measure); intention (specifically designed measure); mobility (TUG); social influences (specifically designed measure); perceived behavioural control (specifically designed measure); action planning (specifically designed measure) |
| **Starting date** | 11 August 2017 |
| **Reference** | O'Brien J, Hamilton K, Williams A, Fell J, Mulford J, Cheney M. Improving physical activity, pain and function in patients waiting for hip and knee arthroplasty by combining targeted exercise training with behaviour change counselling: study protocol for a randomised controlled trial. Trials 2018; **19**: 1-10 |

van Rooijen 2019

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| **Study name** | Multimodal prehabilitation in colorectal cancer patients to improve functional capacity and reduce postoperative complications: the first international randomized controlled trial for multimodal prehabilitation |
| **Methods** | **RCT, parallel design**  **Study aim:** an international RCT to study the effect of a 4-week prehabilitation for people undergoing surgery for colorectal cancer, on functional capacity, postoperative status and HRQoL |
| **Participants** | **Estimated enrolment:** 714  **Inclusion criteria:** ≥ 18 years of age; elective colorectal resection for cancer  **Exclusion criteria:** metastatic disease known about preoperatively; paralysis or mobility problems; conditions or orthopedic impairment contraindicative to exercise; cognitive disability; CKD; ASA ≥ IV; illiteracy  **Type of surgery/condition:** surgical resection for colorectal cancer  **Country:** international, coordinated in the Netherlands  **Setting:** hospital; multicentre and multinational |
| **Interventions** | **Type of intervention:** combination: education; supervised exercise training/class; home-based exercise programme; technology/equipment; diet/lifestyle; supplement; counselling/psychological  **Details of intervention:** four-week prehabilitation programme (with brochure for reference) comprising 4 elements:  1. exercise training: individualised, supervised, in-hospital interval and resistance training; 3 times per week for 4 weeks; instructed to aim for 60 minutes walking/cycling (minimum 30 minutes) per day; use of an accelerometer  2. nutrition: assessment; protein supplement; dietary advice; vitamin D supplement; multivitamin/mineral supplement  3. smoking cessation: intensive counselling; NRT  4. psychological coping: screening with GAD-7 and PHQ-9 and referral to psychologist as required; relaxation and breathing techniques; instructional CD **Details of comparison group:** perioperative care in accordance with ERAS; use of accelerometer |
| **Outcomes** | **Primary:** postoperative complications (CCI; 30 days); functional capacity (6MWT; 4 weeks, 8 weeks after surgery)  **Secondary:** all measured at 4 weeks, 8 weeks and 1 year after surgery: PROMS - HRQoL (EORTC QLQ-CR29; EORTC QLQ-C30; SF-36); depression and anxiety (GAD-7; PHQ-9); functional capacity (CPET: VO2 max; VO2 peak; AT; 30CST; SCT; HGS; PA level activity questionnaire); nutritional status (3-day food diary; PG-SGA; anthropometry); postoperative complications; LOS; study compliance; patient satisfaction; cost-effectiveness |
| **Starting date** | 1 June 2017 |
| **Reference** | van Rooijen S, Carli F, Dalton S, Thomas G, Bojesen R, Le Guen M, et al. Multimodal prehabilitation in colorectal cancer patients to improve functional capacity and reduce postoperative complications: the first international randomized controlled trial for multimodal prehabilitation. BMC Cancer 2019; **19**: 98 |

Vasankari 2019

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| **Study name** | Personalised eHealth intervention to increase physical activity and reduce sedentary behaviour in rehabilitation after cardiac operations: study protocol for the PACO randomised controlled trial |
| **Methods** | **RCT, parallel design**  **Study aim:** to examine the effect of a 90-day eHealth cardiac rehabilitation programme against standard rehabilitation on PA and sedentary behaviour |
| **Participants** | **Estimated enrolment:** 540  **Inclusion criteria:** 30 - 90 years of age; scheduled for CABG, AVR and/or MVR; willing to wear accelerometer; willing and capable of using smart phone app (also email/online bank account)  **Exclusion criteria:** severe disease or functional limitation contraindicative to exercise (other than CVD); ICU > 2 days; surgery type changes during operation; memory disorder; failure to use accelerometer as instructed  **Type of surgery/condition:** CABG, AVR and/or MVR for CVD  **Country:** Finland  **Setting:** hospital; multicentre |
| **Interventions** | **Type of intervention:** combination: telehealth; goal-setting; technology/equipment  **Details of intervention:** in addition to standard care, the PACO eHealth intervention: for 90 days postoperative rehabilitation personalised in-app PA and SB goals; accelerometer; guidance and motivation through the app; supportive PA video guidance from PT **Details of comparison group:** standard care |
| **Outcomes** | **Primary:** change in mean daily step count (accelerometer; 3 and 12 months)  **Secondary:** increase in mean daily total time and number of light PA and MVPA bouts (3 and 12 months); decrease in mean daily total time and bouts of SB (3 and 12 months); portion of restful sleep (3 and 12 months); VO2 peak change (3 months); QOL (15D, PHQ-2, SAQ-7, Rose Dyspnea Scale, SF-36; 3 and 12 months); postoperative outcomes (LVEF and other TTE parameters); incidence of major cardiovascular events (12 months); change in laboratory markers (3 months); HRV (3 months) |
| **Starting date** | April 2018 |
| **Reference** | Vasankari V, Halonen J, Husu P, Vaha-Ypya H, Tokola K, Suni J, et al. Personalised eHealth intervention to increase physical activity and reduce sedentary behaviour in rehabilitation after cardiac operations: study protocol for the PACO randomised controlled trial. BMJ Open Sport & Exercise Medicine 2019; **5**: e000539 |

*Abbreviations in tables*

**6MWT**: six minute walk test; **15D**:15-dimensional HRQOL instrument; **30CST**: 30 second chair stand test; **30TST**: 30 second tandem stance test; **AAA**: abdominal aortic aneurysm; **ABI**: ankle brachial index; **ACCEPT**: acceptance checklist for clinical effectiveness pilot trials; **ACDF**: anterior cervical discectomy and fusion; **ACS**: acute coronary syndrome; **ACS**: American College of Surgeons; **ADL**: Activities of Daily Living Index; activities of daily living; **AED**: automated external defibrillator; **AHA**: American Heart Association; **AI**: aromatase inhibitor; **ALVF**: acute left ventricular failure; **AM-PAC**: Activity Measure for Post-Acute Care; **AMTS**: abbreviated mental test score; **APA**: Adaptive Physical Activity; **AQoL-6D/8D**: Assessment of Quality of Life instrument; **AS/AoS**: aortic stenosis; **ASA**: American Society of Anaesthesiologists (physical status); **AT**: anaerobic threshold: **AUDIT-C**: Alcohol Use Disorders Identification Test; **AVR**: aortic valve repair/replacement; **BAI**: Beck Anxiety Inventory; **BBE**: Benefits and Barriers to Exercise (Myers-Roth scale); **BBS**: Berg Balance Scale; **BCC**: basal cell carcinoma; **BDI**: Beck Depression Inventory; **BES**: Body Esteem Scale; **BFFQ**: Block Food Frequency Questionnaire; **BFI**: Brief Fatigue Inventory; **BFP**: body fat percentage; **BFS**: Benefit Finding Scale; **BHPAQ**: Baecke Habitual Physical Activity Questionnaire; **BIA**: bioelectrical impedance analysis; **B-IPQ**: Brief Illness Perception Questionnaire; **BIS**: Body Image Scale; **BMD**: bone mineral density; **BMI**: body mass index; **BMQ**: Brief Medication Questionnaire; **Borg-RPE**: Rating of Perceived Exertion scale; **BP**: blood pressure (dBP: diastolic blood pressure; sBP: systolic blood pressure); **BPI-SF**: Brief Pain Inventory - Short Form; **BREQ-2/3**: Behavioural Regulation in Exercise Questionnaire; **BSC**: back scratch test; **BSI-18**: Brief Symptom Inventory 18; **CA 19-9**: blood test of carbohydrate antigen – tumour marker; **CABG**: coronary artery bypass graft; **CAD**: coronary artery disease; **CARG**: Cancer and Aging Research Group; **CAVI**: Cardio-ankle Vascular Index; **CBT**: cognitive behavioural therapy; **CCI**: Charlson Comorbidity Index; **CCI**; Comprehensive Complication Index; **CCS**: Canadian Cardiovascular Society; **CD-RISC2**: Connor-Davidson Resilience Scale; **CEA**: cost-effectiveness analysis; **CERT**: Consensus on Exercise Reporting Template; **CESD-10**: Center for Epidemiologic Studies Depression Scale – Short Form; **CeVD**: cerebrovascular disease; **CF**: cystic fibrosis; **CGI**: Clinical Global Impression; **CHD**: coronary heart disease; **CHF**: congestive heart failure; **CHHP**: Centre for Health and Human Performance Ltd; **CINM**: critical illness neuromyopathy; **CIS**: carcinoma in situ; **CKD**: chronic kidney disease; **CLD**: chronic liver disease; **CNAQ**: Council of Nutrition Appetite Questionnaire; **CNS**: Clinical Nurse Specialist; **COPD**: chronic obstructive pulmonary disease; **COST**: COmprehensive Score for financial Toxicity questionnaire; **CPET/CPEX/CPX**: cardiopulmonary exercise testing; **CPR-C**: cardiopulmonary resuscitation including use of AED; **CR**: cardiac rehabilitation; **CRF**: cardiorespiratory fitness; **CROM**: cervical range of motion; **CSRI**: client service receipt inventory; **CT**: chemotherapy; **CT (scan)**: computed tomography scan; **CTCAE**: Common Terminology Criteria for Adverse Events; **CUA**: cost-utility analysis; **CVD**: cardiovascular disease; **DASH**: Disabilities of Arm, Shoulder and Hand questionnaire; **DASI**: Duke Activity Status Index; **DASS-21**: Depression, Anxiety and Stress Scale; **DEBQ**: Dutch Eating Behaviour Questionnaire; **DEBS**: Disordered Eating after Bariatric Surgery; **DEXA/DXA**: dual energy x-ray absorptiometry (bone densitometry scan); **DFS**: disease free survival; **DHI**: Dizziness Handicap Inventory; **DN4**: Doleur Neuropathique (Neuropathic Pain); **DRI**: Disability Rating Index; **DT**: Distress Thermometer; **DVT**: deep vein thrombosis; **E2**: oestradiol hormone; **EBI**: Eating Behaviour Inventory; **ECCG**: Esophageal Complications Consensus Group; **ECG**: electrocardiogram; **ECHO**: echocardiogram; **ECOG**: Eastern Cooperative Oncology Group; **ECR-M16**: Experiences in Close Relationships Scale; **ED**: eating disorder; **EDE-Q**: Eating Disorder Examination Questionnaire; **EI**: Eating Inventory; **EIS**: Exercise Identity Scale; **EORTC QLQ-BLM30**: European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire – muscle invasive bladder cancer; **EORTC QLQ-BR23**: European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire – breast cancer; **EORTC QLQ-C30**: European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire – cancer patients; **EORTC QLQ-CIPN20**: European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire – Chemotherapy Induced Peripheral Neuropathy; **EORTC QLQ-CR29**: European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire – colorectal cancer; **EORTC QLQ-OES18**: European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire – oesophageal cancer; **EORTC QLQ-OG25**: European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire - oesophagogastric cancer; **EORTC QLQ-PR25**: European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire – prostate cancer; **EORTC QLQ-SAT32**: European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire – satisfaction with care; **EP**: exercise professional/practitioner; **EPIC (26)**: Expanded Prostate Cancer Index Composite; **EQ-5D-3L**: Health Related Quality of Life 3 Dimensions; **EQ-5D-5L**: Health Related Quality of Life 5 Dimensions; **EQVOD**: Echelle Qualite de Vie, Obesite e Dietitique (QOL, Obesity and Dietetics Scale); **ERAS**: enhanced recovery after surgery; **ERI**: Effort-Reward Imbalance; **ESAS**: Edmonton Symptom Assessment Scale; **ESES**: Exercise Self-Efficacy Scale; **ESRD**: end stage renal disease; **ESS**: Epworth Sleepiness Scale; **EUC**: enhanced usual care; **%EWL**: percentage excess weight loss; **FABQ**: Fear Avoidance Beliefs Questionnaire; **FACIT-F**: Functional Assessment of Chronic Illness Therapy – Fatigue; **FACIT-An**: Functional Assessment of Cancer Therapy – Anaemia; **FACT-B4**: Functional Assessment of Cancer Therapy - Breast; **FACT-F**: Functional Assessment of Cancer Therapy – Fatigue; **FACT-G**: Functional Assessment of Cancer Therapy – General; **FACT-L**: Functional Assessment of Cancer Therapy – Lung; **FACT-P**: Functional Assessment of Cancer Therapy – Prostate; **FEV(1)**: forced expiratory volume in 1 second; **FFM**: fat-free mass; **FFQ**: Food Frequency Questionnaire; **FITT**: frequency, intensity, time and type of exercise; **FQ**: Fatigue Questionnaire; **FRRS**: Fear of Relapse/Recurrence Scale; **FVC**: functional vitral capacity; **GBP**: gastric bypass procedure; **GFR**: glomerular filtration rate; **GGT**: gamma-glutamyl transferase; **GI**: gastrointestinal; **GLTEQ**: Godin Leisure-Time Exercise Questionnaire; **GOT**: glutamate-oxaloacetate transaminase; **GPAQ**: Global Physical Activity Questionnaire; **GPPAQ**: General Practice Physical Activity Questionnaire; **GPT**: glutamate-pyruvate transaminase; **GRC**: global rating of change; **GSE**: Generalised Self-Efficacy scale; **GSI**: Global Severity Index; **GSLTPAQ**: Godin-Shephard Leisure-Time Physical Activity Questionnaire; **GSRS**: Gastrointestinal Symptom Rating Scale; **GXT**: graded exercise test(ing); **HADS**: Hospital Anxiety and Depression Scale; **HAPA**: Health Action Process Approach; **Hb**: haemoglobin; **HbA1c**: glycated haemoglobin test; **HD**: heart disease; **HDL**: high-density lipoproteins; **HF**: heart failure; **HGS**: hand grip strength; **HHI**: Headache Handicap Inventory; **HIIT**: high-intensity interval training; **HOMA2**: homeostasis model assessment; **HOMA-IR**: Homeostasis Model Assessment of Insulin Resistance; **HR**: heart rate; **HR-pQCT**: high-resolution peripheral quantitative computed tomography; **HR-QOL**: health-related QOL; **HRV**: heart rate variability; **hs-CRP**: high-sensitivity C-reactive protein test; **HSU**: health service utilisation; **HUNT**: Health Survey in Nord-Trøndelag; **(ICH) GCP**: (International Conference in Harmonisation) Good Clinical Practice; **ICIQ**: International Consultation on Incontinence Questionnaire; **ICIQ-UI SF**: International Consultation on Incontinence Questionnaire – Urinary Incontinence Short Form; **ICSmale-SF**: International Continence Society (male) – Short Form; **ICU**: intensive care unit; **IIEF**: International Index of Erectile Function; **IGF-1**: insulin-like growth factor - 1; **IL-6**: interleukin-6; **ILD**: interstitial lung disease; **IMT**: intima media thickness; **IPAQ**: International Physical Activity Questionnaire; **IPEQ-W**: Incidental and Planned Exercise Questionnaire; **IPIP-NEO**: International Personality Item Pool – Neuroticism, Extraversion & Openness; **IR**: insulin resistance; **IWQOL**: Impact of Weight on Quality of Life; **KASAM**: Sense of Coherence (SOC) test (Swedish); **kcal**: kilocalorie; **Ki67**: protein indicating tumour aggressiveness; **KPS**: Karnofsky Performance Status; **KSQ**: Karolinska Sleep Questionnaire; **KT(x)**: kidney transplant(ation); **KTR**: kidney transplant recipient; **LDL**: low-density lipoproteins; **LEFS**: Lower Extremity Functional Scale; **LOS**: (hospital) length of stay; **LSS**: lumbar spine stenosis; **LTx**: lung transplantation; **LV**: left ventricular; **LVEF**: left ventricular ejection fraction; **MACCE**: major adverse cerebrovascular or cardiovascular events; **MAMC**: mid-arm muscle circumference; **MARS-5**: Medication Adherence Report Scale; **MBSRQ**: Multidimensional Body-Self Relations Questionnaire; **MCD-I**: Masculinity in Chronic Disease Inventory; **MDRS-22**: Male Depression Risk Scale; **MEP**: maximal expiratory pressure; **MET(s)**: metabolic equivalents; **MFI**: Multidimensional Fatigue Inventory; **MHC-SF**: Mental Health Continuum – Short Form; **MI**: myocardial infarction; **MIP**: maximal inspiratory pressure; **MISS**: moderate-intensity steady state exercise training; **MOS-SSS**: Medical Outcomes Study Social Support Scale (SF-20); **MPR**: Medication Possession Ratio; **MRI**: magnetic resonance imaging; **MRND**: modified radical neck dissection; **MSES**: Multidimensional Self-efficacy for Exercise Scale; **MSWT**: modified shuttle walk test; **MUST**: Malnutrition Universal Screening Tool; **MVPA**: moderate to vigorous physical activity; **MVR**: mitral valve repair/replacement; **MYCAW**: Measure Yourself Concerns and Well-being questionnaire; **NA**: neoadjuvant; **NAC**: neoadjuvant chemotherapy; **NCI CTC v4.4**: National Cancer Institute Common Toxicity Criteria; **NDI**: Neck Disability Index; **NHANES**: National Health and Nutrition Examination Survey; **NICE**: The National Institute for Health and Care Excellence; **NPRS**: numerical pain rating scale; **NRS**: numerical rating scale; **NRT**: nicotine-replacement therapy; **NSCLC**: non-small cell lung cancer; **NSE**: neck-specific exercise; **NYHA**: New York Heart Association (functional classification); **OA**: osteoarthritis; **ODI**: Oswestry Disability Index; **OHS**: Oxford Hip Score; **OKS**: Oxford Knee Score; **OLST**: one legged stance test; **OSA**: (obstructive) sleep apnoea; **PA**: physical activity; **PAM**: Patient Activation Measure; **PAR-Q+**: Physical Activity Readiness Questionnaire; **PASE**: Physical Activity Scale for the Elderly; **PASES**: Physical Activity Self-efficacy Scale; **PCI**: percutaneous coronary intervention; **PCS**: Pain Catastrophising Scale; **PEI**: Patient Enablement Instrument; **PET CT**: positron emission tomography – computed tomography; **PETS**: Problematic Experiences of Treatment Scale; **PFT**: pulmonary function test; **PG-SGA SF**: Patient-Generated Subjective Global Assessment – Short Form; **PHQ-2/9**: Patient Health Questionnaire; **PNSES**: Psychological Need Satisfaction in Exercise Scale; **POMS-SF**: Profile of Mood States – Short Form; **PPA**: prescribed physical activity; **PPAQ**: Paffenbarger Physical Activity Questionnaire; **PREMS**: Patient Reported Experience Measures; **PROMIS - SF**: Patient Reported Outcomes Measurement Information System – Short Form; **PROMIS-29 Profile 2.0**: PROMIS-SF with additional rating scale for pain intensity; **PROMIS SD-SF 8b**: PROMIS Sleep Disturbance – Short Form 8b; **PROMs**: patient reported outcome measures; **PRP**: Postoperative Recovery Profile; **PS**: performance status; **PSA**: prostate specific antigen; **PSDI**: Positive Symptom Distress Index; **PSS**: Perceived Stress Scale; **PSFS**: Patient Specific Functional Scale; **PSQI**: Pittsburgh Sleep Quality Index; **PSS**: Penn Shoulder Score; **PST**: Positive Symptoms Test; **PT**: physical therapist; **PWV**: pulse wave velocity; **QIDS-SR**: Quick Inventory of Depressive Symptomology – Self-Rating; **QOL**: quality of life; **RAND-36**: The RAND-36 (RAND = corporation name) measure of health-related quality of life; **RCT**: randomised controlled trial; **RECIST**: Response Evaluation Criteria in Solid Tumours; **RG**: Ricci-Gagnon PA questionnaire; **RKin**: Registered Kinesiologist; **RMMI**: Respiratory Movement Measurement Instrument; **RNY/RYGB**: Roux en-Y gastric bypass; **ROM**: range of motion; **RT**: radiotherapy; **RTW**: return to work; **SAE**: serious adverse event; **SAQ-7**: Seattle Angina Questionnaire (SF); **SAS-SR**: Social Adjustment Scale – Self-Report; **SB**: sedentary behaviour; **SBQ**: Sedentary Behaviour Questionnaire; **SCC**: squamous cell carcinoma; **SC-IAT**: Single Category Implicit Associations Test; **SCT**: stair climb test; **SEES**: Self-Efficacy for Exercise Scale; **SEMCD6**: Self-Efficacy for Managing Chronic Disease 6-item scale; **SF-12**: Short Form 12 Health Survey Questionnaire; **SF-36**: Short Form 36 Health Survey Questionnaire; **SGPALS**: Saltin-Grimby Physical Activity Level Scale; **SGRQ**: St. George’s Respiratory Questionnaire; **SHBG**: sex hormone binding globulin; **SLNB**: sentinel lymph node biopsy; **SM**: skeletal muscle; **SMM**: skeletal muscle mass; **SNAP**: smoking, nutrition, alcohol, physical activity; **SOLEC**: standing on one leg with eyes closed test; **SPPB**: short physical performance battery; **SPS**: Stanford Presenteeism Scale; **SQUASH**: Short Questionnaire to Assess Health-enhancing physical activity; **SSI**: surgical site infection; **SSSQ**: Swiss Spinal Stenosis Questionnaire; **SSYK**: Swedish Standard Classification of Occupations; **STEPS**: WHO STEPWise approach to Surveillance (chronic disease risk factor); **STS**: sit-to-stand test; **SWEMWBS**: Short Warwick-Edinburgh Mental Well-being Scale; **T1D**: type 1 diabetes; **T2D** (also **DM**): type 2 diabetes; **TAQ**: Treatment Appraisal Questionnaire; **TAU**: treatment as usual; **TBW**: total body water; **TFEQ**: Three-Factor Eating Questionnaire – R18; **THA/THR**: total hip arthroscopy/replacement; **TIA**: transient ischaemic attack; **TINQ-BC**: Toronto Informational Needs Questionnaire – Breast Cancer; **TKA/TKR**: total knee arthroscopy/replacement; **TNF-a**: tumour necrosis factor alpha; **TNM**: tumour node metastasis; **TPB**: Theory of Planned Behaviour; **TRG**: tumour regression grading; **TSFT**: triceps skinfold thickness; **TSK**: Tampa Scale for Kinesiophobia; **TTE**: transthoracic echocardiogram; **TTM**: Transtheoretical Model (of stages and processes of change); **TUG**: timed up and go test; **%TWL**: percentage total weight loss; **Tx**: organ transplantation; **US**: ultrasound; **VAS**: visual analogue scale; **VCP**: videocapilliaroscopy; **VISYTER**: Versatile and Integrated System for Tele-rehabilitation; **VO2 peak**: peak oxygen uptake; **WAI**: Work Ability Index; **WHO DAS**: World Health Organisation Disability Assessment Schedule; **WHO HPQ-SF**: World Health Organisation Health and Work Performance Questionnaire - Short Form; **WHOQOL-BREF**: World Health Organisation Quality of Life abbreviated assessment; **WHR**: waist-hip ratio; **WLQ**: Work Limitation Questionnaire; **WOMAC**: Western Ontario & McMasters University osteoarthritis index

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