**SDC 3.** Summary of Reports from Other Populations Participating in CR Programs

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| **Citation** | **Purpose / Objectives** | | **Population Characteristics** | **Summary of Findings** |
| ***Heart Failure and Arrythmias*** | |  |  |  |
| Long et al44 | To determine the effects of exercise-based CR on mortality, hospital admission, and health-related quality of life of people with HF | | Review of 44 trials - 5783 participants with HF | CR may make little or no difference in all-cause mortality over the short term (1 yr), but may improve all-cause mortality in the long term (> 1 yr)  CR probably reduces overall hospital admissions in the short term (< 1 yr) and may reduce HF-specific hospitalization  After CR, a clinically important improvement in short-term disease-specific health-related QoL may  be evident |
| Cook et al43 | to explore how different patient  subgroups respond to exercise based CR | | used individual patient data from 23 randomized controlled trials of 4398 people with HF | 6MWT was improved with CR  Health related QoL improved slightly with CR  CR did not affect risk of all-cause or HF death  CR did not affect risk of any or HF hospitalization |
| Bjarnason 45-Wehrens et al | to evaluate whether CR is effective in reducing all-cause-mortality and hospitalization and improving exercise capacity QoL in HFrEF-patients on guideline-recommended pharmaco and device-therapy | | 25 randomized controlled trials including 4481 HFrEF-patients | CR did not affect risk of all-cause or mortality  CR did not affect risk of any or HF hospitalization  QoL (Kansas City Cardiomyopathy Questionnaire) improved, but no change (Minnesota Living with HF Questionnaire) with CR |
| Kamiya et al46 | multicenter retrospective cohort study to determine if participation in CR was associated with mortality and rehospitalization in patients with HF | | 3277 patients with a mean age of 74.9±14.9 yr, 26% participated in outpatient CR | CR participation was also associated reduced all-cause mortality and HF-related hospitalization |
| Imran et al47 | to compare functional capacity and health-related QoL)  outcomes in HF between center-based, home-based, and hybrid CR to usual care | | meta-analysis of 31 randomized controlled trials with a total of 1791 HF participants | HBCR had improvement of VO2peak and QoL vs. usual care  hybrid CR had greater improvements in VO2peak but not in QoL  there were similar improvements of VO2peak and QOLin both home-based CR and center-based CR |
| Brubaker et al48 | to determine the effect of endurance ET on the relationship between physical  function and HRQoL among patients with HFpEF. | | 116 patients (81% female) with HFpEF | ET group demonstrated significant improvement in measures of physical function and on the SF‑36  There were no significant correlations between change in any of  the physical function and HRQoL measures in the ET group |
| Kazukauskiene et al49 | to evaluate the association between stressful life events and HRQoL in patients with HF after acute coronary syndrome, both during CR and during 2 yr of follow-up. | | 481 Patients with HF, 58 ± 9 yr, 75% male | Stressful life events were associated with impaired  HRQoL independently of sociodemographic characteristics, clinical  factors, mental distress, social support, and type D personality |
| Braga et al50 | To study, using a retrospective analysis, the role of left ventricle systolic function in  CRF response in patients with stage B HF | | 691 patients with previous MI in CR, 3 HF groups: HFpEF,  mid-range (mrEF), HFrEF | HFmrEF and HFrEF had better CRFe response to CR than HFpEF  CI increased similarly in all groups.  There was a small effect of CR on resting HR |
| Araujo et al51 | systematic review to determine whether HIIT promoted a greater increase in exercise tolerance in comparison with continuous aerobic training in individuals  with HF | | 7 studies included in qualitative synthesis; total of 129 participants, both sexes, all had HFrEF | low quality of evidence demonstrating that HIIT is superior to continuous aerobic training for improving VO2peak  moderate quality of evidence in favor of HIIT regarding improved QOL and left ventricular EF |
| Tucker et al52 | Review of the pathophysiology of exercise intolerance  and the role of exercise training to improve VO2peak in  patients with HFpEF | | 7 RCT-Exercise Interventions  370 participants (HFpEF and controls) | moderate- to high-intensity endurance training alone or combined with resistance training is efficacious for increasing CRF and QoL in patients with HFpEF |
| Chirico et al53 | to assess the agreement between VO2peak predicted  by equations using 6MWT distance and measured VO2peak  estimate improvement in patients with HF enrolled in CR | | 54 patients with HF | There was a proportional bias between all prediction equations and the measured VO2peak  The poor agreement remained when comparisons were made between the estimated and measured VO2peak values at quartiles of CRF |
| Bostrom et al54 | To examine whether referral indication for patients with HFrEF or ischemic  heart disease predicted CR attrition | | 1111 patients (163 HFrEF), 64 yr, 31% female, 28% nonwhite, 7% Hispanic | Early termination occurred in 206 patients (18%) and was more common in HFrEF (26%) than in ischemic heart disease (17%) and this difference remained after multivariable adjustment |
| Adsett et al55 | to identify predictors of program attendance and meeting PA guidelines in patients recently hospitalized  with HF | | 140 patients with HFrEF or HFpEF, 36% > 70 yr, 77% male | New diagnosis of HF was a significant predictor of frequent program attendance  Predictors of meeting PA guidelines at follow-up included new HF diagnosis and being physically active at baseline |
| Hildebran 56et al | to evaluate the characteristics, therapeutic needs, and scope of LVAD patients at admission to CR | | 69 LVAD patients  (51 ± 14 y; 59 male; 48 HVAD; 21 HeartMate II) | CR was started 44 ± 39 d after implantation; CR duration was 28 ± 10 d, a high degree of impairment was present, especially in the body function (80%) and activity and participation (96%) domains |
| Ferrario and Panzeri57 | is to explore caregiver strain and illness denial in LVAD patients and their caregivers, in  the context of CR | | 32 patients (64 ±8 yr, 4% female) and 26 caregivers (61 ±11 yr, 88% female) | Patients showed a significant negative association between the emotional variables and illness denial both admission and discharge  In caregivers the strain was negatively associated with illness  denial |
| Risom et al58 | to describe patient-reported outcomes including perceived  health, QoL, anxiety, depression, and PA compared with an age- and sex-matched reference population; readmissions and mortality; and  factors associated with suboptimal patient-reported outcomes | | 276 patients with AF  143 patients with atrial flutter  43 patients with mixed AF and atrial flutter | all subscales of SF-36 and leisure-time PA were lower in the patient population  59% of patients were readmitted; 10 patients died  Age > 59 yr, female sex, high comorbidity, and readmission were associated with low physical health, low perceived health, and low QoL |
| Kato et al58 | to evaluate the effects of CR on exercise capacity, inflammatory status, cardiac function, and safety in patients with persistent AF who had catheter ablation | | 61patients (80% male)  66 ± 9 yr | At 6 mo follow-up, AF recurrence was 21 in the rehabilitation group and 26% in the usual care group  increases in the 6MWT, handgrip and leg strength and left ventricular EF and decreases in high-sensitivity C-reactive protein and plasma pentraxin3 concentrations were observed at 6 mo follow-up |
| Keteyian et al60 | To provide a review of exercise testing and rehabilitation in patients with persistent or permanent AF | | Review paper – 47 references | AF is a common cardiac condition  Exercise rehabilitation favorably improves exercise capacity in AF patients |
| Tripp et al61 | To examined PA of patients post-MI prescribed a wearable cardiac defibrillator and the potential relationship between wear time and PA level | | 1952 patients (71% male) , Median age 63 yr | overall median wear time was 23.8 hr/d; PA was 5568 steps/d  Patient age and wear time significantly predicted PA; patient age also significantly predicted patient wear time |
| Steinhaus et al62 | A systematic review and meta-analysis to evaluate exercise interventions in patients  with ICDs and cardiac resynchronization therapy defibrillators to characterize study design, safety, and effectiveness of exercise | | 2547 participants in 16 different studies (8 were RCTs) | Exercise interventions varied widely in duration (range: 23-168 d), and follow-up time (range: 23 d to 48 mo  Exercise performance measures were the most common primary endpoints (88%), with most studies (81%) demonstrating improvement  ICD shocks rare (0.9% during active exercise and were less common in follow-up in patients receiving any exercise intervention |
| ***Women and Age*** |  | |  |  |
| Rengo et al63 | To examine VO2peak at entry  and exit in phase II CR and improvements by diagnosis and  sex differences that may influence change in VO2peak | | 3925 patients (24% female), 62 ± 11 yr | Surgical patients demonstrated greater improvement in VO2peak than  nonsurgical diagnoses  Women had lower VO2peak than men for all diagnoses and demonstrated less improvement  18% of patients (24% women, 16% men) failed to improve VO2peak |
| Flint et al64 | A review focusing on the use of physical frailty measures in older adults with CVD, and considerations for their clinical use in contemporary CR | | Review paper – 52 references | 10 different frailty measures were reviewed |
| Kellar et al65 | To stratified risk using novel indices of physical function as well as traditional indices of CVD in patients enrolling in phase II CR | | 489 patients (98% male), median age 67 | With functional RS, 97 patients were high risk  Using CVD RS in the same cohort, 227 patients had high risk.  Functional RS was consistent with CVD RS - 43% |
| Lutz et al66 | To study changes in physical  function among frail, intermediate-frail, and nonfrail older adults with CVD enrolled into CR | | 243 patients; 75 frail,  70 intermediate-frail, and 98 nonfrail | Each group improved in all measures of frailty except for tandem stand.  No differences in pre- to post-CR measures for 6MWT, gait speed, tandem stand, or hand grip strength between groups.  Frail patients showed greater improvement in TUG than other groups |
| Bush et al67 | to investigate effects of CR on  hospitalization following acute MI among older adults | | 32 851 Medicare beneficiaries  75 ±6.0 yr, male (52%), white (88%). | 21% initiated CR within the exposure window  At 1 yr post-discharge, CR initiators had a lower risk of recurrent MI  (4%), cardiovascular (16%), and all-cause (30%) hospitalization  than noninitiators (5%; 18.0%; and 33%, respectively). There  was no difference in fracture risk |
| Abbreviations: 6MWT, 6-min walk test; AF, atrial fibrillation; CR, cardiac rehabilitation; CRF, cardiorespiratory fitness; CVD, cardiovascular disease; EF, ejection fraction; ET, exercise test; HIIT, high-intensity interval training; HF, heart failure; HFPEF, heart failure preserved ejection fraction; HFREF, heart failure reduced ejection fraction; HRQOL, health-related quality of life; ICD, implantable cardioverter-defibrillator; LVAD, left-ventricular assist device; MI, myocardial infarction; PA, physical activity; PHQ-9, Patient Health Questionnaire-9; PTSD, post-traumatic stress disorder; QOL, quality of life; RCT, randomized control trial; RS, risk stratification; SCAD, spontaneous coronary artery dissection; VO2peak, peak oxygen uptake. | | | | |