

## Supplement A – Secondary outcomes

## a. Secondary outcomes for studies with links to usual care

Two studies (Yoo et al., Rifkin et al.) with links to usual care reported clinical outcomes (Table 1A). There was a large and significant effect size (SES = 0.94) for Adiponectin (Yoo et al.) and small, non-significant effect sizes for Creatinine (SES = 0.12) and estimated glomerular filtration rate (SES = 0.22) (Rifkin et al.).

Table 1A. Clinical outcomes in studies with links to usual care (2)

Study	Multimorbidity	Outcomes	Intervention	Control	Results
Yoo et al.	DM Type 2 and hypertension	Adiponectin $\mu\text{g/ml}$ (3 months)	7.5 (SD 4.3)	3.5 (SD 4.2)	Absolut diff 4.0, Relative % diff 214.0%  p<0.001 SES = 0.94
Rifkin et al.	CKD and heart failure	Creatinine $\text{mg/dL}$ (6 months)	2.2 (SD 0.8)	2.3 (SD 0.84)	Absolut diff 0.15 Relative % diff 6.5  p=0.12 SES = 0.12
		Estimated glomerular filtration rate $\text{ml/min}$ (6 months)	37.9 (SD 16.7)	34.5 (SD 13.2)	Absolut diff 3.4 Relative % diff 9.0  p=0.14 SES = 0.22

SES = Standardized Effect Size, SD = Standard Deviation.

Three studies with links to usual care reported medication adherence outcomes (Mira et al., Wakefield et al. (2), Rifkin et al.) (Table 2A). The reported outcomes were the Morisky medication adherence scale (Mira et al., Rifkin et al.), the number of medication errors (Mira et al.), medication adherence for diabetes mellitus (Edward's) scale (Wakefield et al.), medication taking adherence for blood pressure (Wakefield et al.) and the total number of medication (Rifkin et al.). There were only two significant results (Mira et al.). Medication adherence (Morisky scale) was significantly improved, albeit with a

small effect size (SES = 0.12). Furthermore, with a moderate effect size of 0.47 the reduction of medication errors (Mira et al.) was reported.

Table 2A. Adherence outcome in studies with links to usual care

Study	Multimorbidity	Outcomes	Intervention	Control	Results
Mira et al.	DM type 2 and several comorbidities	Morisky Medication Adherence Scale-4 points (mean) (3 months)	7.4 (SD 0.9)	7.3 (SD 0.7)	Absolut diff 0.1 Relative % diff 1.4  p<0.001 SES = 0.12
		Medication errors (number)	Several subscales/timepoints		p=0.02 SES = 0.47
Wakefield et al. (2)	DM Type 2 and hypertension	Medication adherence for diabetes mellitus score on Edward's scale (6 months)	Low - 3.4 (SD 0.4) High - 3.2 (SD 0.5)	3.3 (SD 0.5)	Absolut diff (+0.1; -0.1) Relative % diff (3.1; -3.1)  High intensity p=0.21 SES = 0.18 Low intensity p=0.21 SES. = 0.17
		Medication adherence for diabetes mellitus – score on Edward's scale (12 months)	Low - 3.4 (SD 0.6) High - 3.2 (SD 0.5)	3.3 (SD 0.5)	Absolut diff (+0.2; -0.1) Relative % diff (+3.1; -3.1)  High intensity p=0.21 SES = 0.18 Low intensity p = 0.21 SES = 0.17
		Medication taking adherence % - blood pressure (12 months)	Low - 99.8 (SD 1.4) High - 99.6 (SD 2.0)	99.6 (SD 2.2)	Absolut diff (+0.2;0) Relative % diff (0.2;0)  High intensity p = 0.79 SES = 0.04 Low intensity p = 0.79

					SES = 0.04
		Medication taking adherence % - blood pressure (12 months)	Low - 99.7 (SD 1.4) High - 100 (SD 0)	98.9 (SD 6.0)	Absolut diff (+0.8; 1.1) Relative % diff (+0.8; +1.1)  High intensity p=0.20 SES = 0.18 Low intensity p = 0.2 SES = 0.18
Rifkin et al.	CKD and heart failure	Morisky Medication Adherence Scale points (6 months)	7 (SD 1.2)	7.2 (SD 1.4)	Absolut diff 0.2 Relative % diff 2.9  p=0.17 SES = 0.16
		Total number of medications (6 months)	12 (SD 4.6)	12.8 (SD 5.1)	Absolut diff 0.8 Relative % diff 6.2  p=0.33 SES = 0.17
		Number of blood pressure medication (6 months)	4 (SD 1.2)	3.9 (SD 1.3)	Absolut diff 0.1 Relative % diff 2.5  p=0.91 SES = 0.08

SES = Standardized Effect Size, SD = Standard Deviation.

Self-efficacy outcomes were reported by one study in this category (Wakefield et al. (2)). The results were non-significant (Table 3A).

Table 3A. Self-efficacy outcome in studies with links to usual care

Study	Multimorbidity	Outcomes	Intervention	Control	Results
Wakefield et al. (2)	DM Type 2 and hypertension	Self-efficacy score points (6 months)	Low - 8.1 (SD 1.9) High - 7.7 (SD 2.0)	8.1 (SD 1.8)	Absolut diff (0;0.4) Relative % diff (0;5.2)  High intensity p=0.19 SES = 0.19 Low intensity p = 0.19 SES = 0.18

		Self-efficacy scores (12 months)	Low - 8.3 (SD 2.0) High- 7.8 (SD 1.9)	8.3 (SD 1.9)	Absolut diff (0;0.5) Relative % diff (0;6.4)  High intensity p = 0.53 SES = 0.09 Low intensity p = 0.53 SES = 0.09
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SES = Standardized Effect Size, SD = Standard Deviation.

*a. Secondary outcomes for studies without links to usual care*

Both studies (Bernocchi et al., Donesky et al.) reported physical functioning outcomes (Table 4A). The outcomes were endurance at the 6-minute walk (6 MW) in feet (both studies), the Barthel score, the COPD assessment test, the medical research council dyspnoea scale, the physical activity scale for the elderly, arm curls in 30 seconds, chair stands in 30 seconds, shortness of breath after 6MWT and dyspnoea after the 6MWT.

Significant results with small to large effect sizes were reported for endurance at the 6 MW test (SES 0.87), shortness of breath after 6MWT (SES = 0.47) and dyspnoea after 6MWT (SES = 0.88) (Donesky et al.), the Barthel score (SES = 0.34), the CAT test (SES = 0.97), the MRC dyspnoea scale (SES = 0.31) and the physical activity scale for the elderly (SES = 0.91) (Bernocchi et al.).

Table 4A. Physical functioning outcomes in studies without links to usual care

Study	Multimorbidity	Outcomes	Intervention	Control	Results
Bernocchi et al.	COPD and heart failure	6MWT, feet (8 weeks)	389 (SD 141.1)	293 (SD 65.5)	Absolut diff 96 Relative % diff 24.7  p=0.004 SES = 0.87
		6MWT, feet (12 weeks)	336 (SD 69.5)	265 (SD 77.1)	Absolut diff 71 Relative % diff 21.2  p=0.004 SES = 0.97
		Barthel score (8 weeks)	95.3 (SD 6.7)	93.2 (SD 5.6)	Absolut diff 2.1 Relative % diff 2.2  P=0.0006 SES = 0.34

		Barthel score (12 weeks)	91.2 (SD 4.9)	91.3 (SD 3.4)	Absolut diff 0.1 Relative % diff 0.1  p=0.002 SES = 0.03
		COPD assessment test (CAT) score (8 weeks)	10.4 (SD 6.3)	17 (SD 7.3)	Absolut diff 6.6 Relative % diff 63.5  p=0.0001 SES = 0.97
		CAT score (12 weeks)	15.8 (SD 5.0)	16.2 (SD 7.3)	Absolut diff 0.4 Relative % diff 2.5  p=0.5525 SES = 0.06
		Medical research council (MRC) dyspnoea scale (8 weeks)	2.6 (SD 0.6)	2.8 (SD 0.7)	Absolut diff 0.14 Relative % diff 5.3  p=0.05 SES = 0.31
		MRC dyspnoea scale (12 weeks)	2.8 (SD 0.4)	2.7 (SD 0.9)	Absolut diff 0.05 Relative % diff 2  p=0.686 SES = 0.14
		Physical activity scale for the elderly score (8 weeks)	113.9 (SD 70.0)	56.9 (SD 53.6)	Absolut diff 57 Relative % diff 100  p=0.002 SES = 0.91
		Physical activity scale for the elderly score (12 weeks)	83.3 (68.9)	68.3 (SD 41.4)	Absolut diff 15 Relative % diff 18  p=0.8228 SES = 0.26
Donesky et al.	COPD and heart failure	6-minute walk (6 MW) endurance distance, feet (8 weeks)	751 (SD 324.9)	663 (SD 337.3)	Absolut diff 88 Relative % diff 13.3  p=0.75 SES = 0.27
		Arm curls in 30 seconds, number (8 weeks)	16.9 (SD 7.6)	19.2 (SD 7.8)	Absolut diff 2.3 Relative % diff 13.6  P=0.47 SES = 0.3
		Chair stands in 30 seconds,	13.3 (SD 6.1)	12.1 (SD 6.3)	Absolut diff 1.2 Relative % diff 9

		number (8 weeks)			P=0.82 SES = 0.19
		Shortness of breath after 6 MW score (8 weeks)	INT 2.8 (SD 3.0)	CON 4.3 (SD 3.3)	Absolut diff 1.5 Relative % diff 53.6  p=0.02 SES = 0.47
		Dyspnoea after 6 MW score (8 weeks)	0.5 (SD 1.5)	2.4 (SD 2.6)	Absolut diff 1.9 Relative % diff 79.1  p=0.03 SES = 0.88
		St. George's respiratory questionnaire score (8 weeks)	55.1 (SD 22.3)	44.3 (SD 22.4)	Absolut diff 10.8 Relative % diff 19.7  p=0.74 SES = 0.48
		Dyspnea-12 score (8 weeks)	10.7 (SD 8.1)	10.8 (SD 7.8)	Absolut diff 0.1 Relative % diff 1  p=0.79 SES = 0.01

SES = Standardized Effect Size, SD = Standard Deviation.