

**Supplemental materials for:**

Smith SM, Wallace E, Salisbury C, Sasseville M, Bayliss E, Fortin M. A core outcome set for multimorbidity research (COSmm). *Ann Fam Med*. 2018;16(2):132-138.

## **Appendix 1. Multimorbidity workshops at which outcome measures discussed and provisional list formulated**

### *Multimorbidity Workshop*

Society for Academic Primary Care (SAPC), Annual Scientific Meeting 2011, Galway, Ireland  
Smith SM, Mercer S

### *Multimorbidity Workshop*

Department of General Practice, University of Glasgow, UK. April 2012  
Mercer S, Gunn J and Fortin M

### *Multimorbidity research frameworks.*

NAPCRG Annual Meeting 2012, New Orleans, USA

Compiled as research paper:

Smith SM, Bayliss EA, Mercer SW, Gunn J, Vestergaard M, Wyke S, Salisbury C, Fortin M. How to design and evaluate interventions to improve outcomes for patients with multimorbidity. *Journal of Comorbidity*. 2013;3:10-17.

### *Multimorbidity Workshop*

Cochrane Collaboration Symposium 2013, Montreal, Canada  
SM Smith, C Boyd, M Fortin

### *Designing interventions For Multimorbidity in Primary Care*

AHRQ MCC Research Network Webinar 2013, co-ordinated by Dr J Fraser and Prof L Bayliss

Smith SM, Fortin M, Vestergaard M, Mercer S, Gunn J, and Salisbury C

### *Think-Tank on Outcomes for Patient-Centered Interventions for Persons with*

*Multimorbidity*. Fortin M, Stewart M., Bayliss E., Sasseville M., Little P., Mercer S., Furler J. NAPCRG Annual Meeting 2015, Cancun, Mexique.

## 1. Introduction

The COMET (Core Outcome Measures in Effectiveness Trials) is a new initiative which aims to develop agreed standardised sets of outcomes, known as 'core outcome sets' (COS) (<http://www.comet-initiative.org/>). These sets represent the minimum that should be measured and reported in all clinical trials of a specific condition or conditions, and are also suitable for use in clinical audit or research other than randomised trials. The existence or use of a core outcome set is not intended to restrict the use of other outcomes but the collection and reporting of a set of core outcomes will simplify trial comparison and combination for the purposes of systematic reviews in this area.

### Aim and objectives

The aim of this study is to undertake a Delphi process using an international panel of experts to formalise an agreed core outcome set for multimorbidity research studies.

The specific objectives of the proposed study are:

1. To develop an explicit list of multimorbidity outcomes for intervention studies
2. To validate these outcomes using a Delphi validation technique

If you choose to participate, you will be asked to be a Delphi Panel member and complete a simple online questionnaire. This will involve rating your level of agreement, on a five-point scale, with a series of statements about potential outcomes for multimorbidity studies. The initial list of all potential indicators has been drawn from existing literature in the area. After the first round of the survey, the research team will bring together all of the results and then present this back to the Delphi Panel members for a second round and they have an opportunity to review their first decision and amend it if they want to. We estimate this will take about 30-45 minutes for each round and can be completed anywhere that you have internet access.

There will be approximately six weeks between the two rounds to give everyone a chance to reply and to allow the research team to analyse the first round results.

### Appendix 3: COSmm Stakeholder Group (Delphi panel members)

Name and Position	Discipline	Location
Prof Stewart Mercer	General Practice	University of Glasgow, Scotland
Prof Frances Mair	General Practice	University of Glasgow, Scotland
Prof Bruce Guthrie	General Practice, Lead, NICE Guidance on Multimorbidity	University of Dundee, Scotland
Prof Peter Bower	Primary Care	University of Manchester, UK
Prof Cynthia Boyd	Gerontology	Johns Hopkins University School of Medicine, Baltimore, USA
Prof Jane Gunn	General Practice	University of Melbourne, Australia
Prof Marjan van den Akker	Epidemiology	Maastricht University, Maastricht, The Netherlands
Dr Christianne Muth	General Practice	Institute of General Practice, Johann Wolfgang Goethe University, Frankfurt, Germany
Prof Carmel Hughes	Pharmacy	School of Pharmacy, Queens University, Belfast, UK
Prof Deirdre Connolly	Occupational Therapy	Head of Occupational Therapy, Trinity College, Dublin, Ireland
Prof Rafael Perera	Methodology	University of Oxford, UK
Prof Allesandra Merengoni	Gerontology	University of Brescia, Italy
Prof Chris Harrison	Psychology	University of Sydney, Australia
Prof John Furler	General Practice	University of Melbourne, Australia
Prof Jenny Ploeg	Nursing	McMaster University, Canada
Prof Walter P Wodchis	Health economist	University of Toronto, Canada
Prof Amaia Calderon	Ageing Research	Karolinska Institute, Sweden
Prof. Matthew Maciejewski	Health Economics	Duke University, USA
Assoc Prof. Donna Zulman	General Internal Medicine	Stanford University, USA
Prof Anna Karin Welmer	Physiotherapy	Karolinska Institute, Sweden
Ms Sandra Cox	Journal editor	Journal of Co-morbidity
Patient/ public representatives		Ireland: Ms Sheila Barrett UK: Ms Mandie Lewis

	Canada: Ms Catherine Hofstetter. Canada: Ms Maureen Smith Canada: Ms Anne Lyddiatt
--	--

**Table 4. Appendix: Potential outcomes measures for multimorbidity core outcome domains**

<b>Included COS domains</b>	<b>Outcome measures for the domain (ref);</b>	<b>Number of respondents suggesting the measure</b>
HRQoL	EuroQol 5-Dimension (EQ-5D)	20
	Health Survey (SF-12 ( Short Form), SF-36)	19
	Global quality of life (WHOQOL-BREF)	17
	Assessment of Quality of Life (AQoL 8)	8
Mental Health	Beck Depression Inventory (BDI)	9
	Patient Health Questionnaire Depression (PHQ9)	16
	Hospital Anxiety and Depression Scale (HADS)	9
	Geriatric depression scale (GDS)	12
	Center for Epidemiological Studies Depression (CES-D)	11
	Symptom Checklist depression scale (SCL-20)	6
	Beck Anxiety Inventory (BAI)	5
	Generalized Anxiety Disorder scale (GAD-7)	10
	Cognitive symptom management score	8
	Montgomery–Åsberg Depression Rating Scale (MADRS)	2
Mortality	Not applicable	
ADL	Frenchay Activities Index (FAI)	10
	Nottingham Extended Activities of Daily Living (NEADL)	11
	Instructions for Activities of Daily Living questionnaire (ADL/ IADL)	19
	PROMIS Physical Function	2
Physical Function	Sheehan Disability scale	13
	Sherbrooke Postal Q	11
Self Rated Health	Self-rated health (single question)	22
	Health distress score	6
	Total unhealthy days	2
	Health Assessment Questionnaire (HAQ)	6
Treatment Burden	Burden Of Treatment Questionnaire (TBQ or TRAN)	17
	Number drugs	16
		3

	Patient experience with treatment scale (PETS)	
Communication	CARE	11
	Communication with physicians score	8
Healthcare Utilization	Provider visits	22
	All cause emergency admissions	18
	ACS admissions	14
	Emergency Department visits	19
	Emergency re-admissions	14
	Length hospital stay	19
Costs	Health and social service utilization survey	15
Economic Analysis	Cost per QALY	9
Adherence	Medication Event Monitoring System (MEMs)	8
	Medication Adherence Rating Scale MARs	11
	Edward scale	1
	Mean daily medication use/ % medications taken	8
Shared decision making	Healthcare Communication Questionnaire (HCCQ) [1];	15
Patient Enablement	Patient Enablement Instrument (PEI) [2];	14
Quality healthcare	Patient measures quality of care provided by healthcare provider (PACIC) [3]	14
	Picker patient experience questionnaire (X);	7
	Clinical quality indicators	6
Prioritization	Goal Attainment Scale [4] [5]	11
	Measures of patient preference LTC6 measure [6]	14
Self-management Behaviour	Health Education Impact Questionnaire (HEIQ) [7]	12
	Multilevel support for healthy lifestyles (CIRS) [8]	10
	PAM - patient activation measure (X)	3
Self-Efficacy	Self-efficacy score [9]	18
Physical Activity	Walking/aerobic exer: mins/week	10
	Daily PA logs	11
	International Physical Activity Questionnaire (IPAQ) [12]	8

#### References for Appendix 4

1. Gremigni, P., M. Sommaruga, and M. Peltenburg, *Validation of the Health Care Communication Questionnaire (HCCQ) to measure outpatients' experience of communication with hospital staff*. Patient education and counseling, 2008. **71**(1): p. 57-64.
2. Howie, J., et al., *A comparison of a Patient Enablement Instrument (PEI) against two established satisfaction scales as an outcome measure of primary care consultations*. Family Practice, 1998. **15**(2): p. 165-171.
3. Glasgow, R.E., et al., *Development and validation of the patient assessment of chronic illness care (PACIC)*. Medical care, 2005. **43**(5): p. 436-444.
4. Kiresuk, T.J., A. Smith, and J.E. Cardillo, *Goal attainment scaling: Applications, theory, and measurement*. 2014: Psychology Press.
5. Kloseck, M., *The use of Goal Attainment Scaling in a community health promotion initiative with seniors*. BMC geriatrics, 2007. **7**(1): p. 1.
6. Person-centred care resource centre, *LTC6 Questionnaire*. 2013: The health foundation.
7. Osborne, R.H., G.R. Elsworth, and K. Whitfield, *The Health Education Impact Questionnaire (heiQ): an outcomes and evaluation measure for patient education and self-management interventions for people with chronic conditions*. Patient education and counseling, 2007. **66**(2): p. 192-201.
8. Glasgow, R.E., et al., *The Chronic Illness Resources Survey: cross-validation and sensitivity to intervention*. Health Education Research, 2005. **20**(4): p. 402-409.
9. Lorig, K., et al., *Effect of a self-management program on patients with chronic disease*. Eff Clin Pract, 2001. **6**: p. 256 - 262.
10. Lorig, K., *Outcome measures for health education and other health care interventions*. 1996: Sage.
11. Vaglio, J., et al., *Testing the performance of the ENRICH Social Support Instrument in cardiac patients*. Health and Quality of Life Outcomes, 2004. **2**: p. 24-24.
12. Booth, M., *Assessment of physical activity: an international perspective*. Research quarterly for exercise and sport, 2000. **71**(sup2): p. 114-120.
13. Hudon, C., et al., *Measuring Patients' Perceptions of Patient-Centered Care: A Systematic Review of Tools for Family Medicine*. Annals of Family Medicine, 2011. **9**(2): p. 155-164.
14. Al-Janabi, H., J. Coast, and T.N. Flynn, *What do people value when they provide unpaid care for an older person? A meta-ethnography with interview follow-up*. Social Science & Medicine, 2008. **67**(1): p. 111-121.
15. Reeves, M.M., E.A. Winkler, and E.G. Eakin, *Fat and Fibre Behaviour Questionnaire: Reliability, relative validity and responsiveness to change in Australian adults with type 2 diabetes and/or hypertension*. Nutrition & Dietetics, 2015. **72**(4): p. 368-376.



16. Gibbons, C.J., et al., *Development of a multimorbidity illness perceptions scale (MULTIPIeS)*. PloS one, 2013. **8**(12): p. e81852.
17. Broadbent, E., et al., *The brief illness perception questionnaire*. Journal of psychosomatic research, 2006. **60**(6): p. 631-637.