



**QUEEN'S  
UNIVERSITY  
BELFAST**

## **Interventions to optimise medication prescribing and adherence in older people with cancer: A systematic scoping review (protocol)**

Murphy, M., Bennett, K., Hughes, C. M., Lavan, A., & Cadogan, C. A. (2020). Interventions to optimise medication prescribing and adherence in older people with cancer: A systematic scoping review (protocol). *Research in Social and Administrative Pharmacy*. <https://doi.org/10.1016/j.sapharm.2020.02.021>

### **Published in:**

Research in Social and Administrative Pharmacy

### **Document Version:**

Peer reviewed version

### **Queen's University Belfast - Research Portal:**

[Link to publication record in Queen's University Belfast Research Portal](#)

### **Publisher rights**

Copyright 2020 Elsevier.

This manuscript is distributed under a Creative Commons Attribution-NonCommercial-NoDerivs License

(<https://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits distribution and reproduction for non-commercial purposes, provided the author and source are cited.

### **General rights**

Copyright for the publications made accessible via the Queen's University Belfast Research Portal is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

### **Take down policy**

The Research Portal is Queen's institutional repository that provides access to Queen's research output. Every effort has been made to ensure that content in the Research Portal does not infringe any person's rights, or applicable UK laws. If you discover content in the Research Portal that you believe breaches copyright or violates any law, please contact [openaccess@qub.ac.uk](mailto:openaccess@qub.ac.uk).

1 **Interventions to optimise medication prescribing and adherence in older people with cancer:**  
2 **A systematic scoping review (protocol)**

3

4 Melanie Murphy<sup>a</sup>, Kathleen Bennett<sup>b</sup>, Carmel M. Hughes<sup>c</sup>, Amanda Lavan<sup>d,e</sup>, Cathal A. Cadogan<sup>a</sup>

5

6 <sup>a</sup> School of Pharmacy and Biomolecular Sciences, Royal College of Surgeons in Ireland, Dublin,  
7 Ireland

8 <sup>b</sup> Population Health Sciences Division, Royal College of Surgeons in Ireland, Dublin, Ireland

9 <sup>c</sup> School of Pharmacy, Queen's University Belfast, Belfast, United Kingdom

10 <sup>d</sup> Geriatric Medicine, Cork University Hospital, Cork, Ireland

11 <sup>e</sup> Department of Medicine for the Elderly, St James's Hospital, Dublin

12

13

14

15

16

17

18

19 Corresponding author: Dr. Cathal Cadogan, School of Pharmacy and Biomolecular Sciences, Royal  
20 College of Surgeons in Ireland, 111 St. Stephen's Green, Dublin, Ireland

21 Tel.: +353 1 402 5194

E-mail: [cathalcadogan@rcsi.ie](mailto:cathalcadogan@rcsi.ie)

22

23

24

25 **Abstract**

26 **Background:** Older adults with cancer often require multiple medications including cancer-  
27 specific treatments and supportive care medications (e.g. analgesics), as well as medications for  
28 pre-existing medical conditions. Increasing numbers of medications pose risks of potentially  
29 inappropriate prescribing, drug-drug interactions and drug-disease interactions. The burden of  
30 treatment (i.e. the workload of healthcare and its impact on patient functioning and well-being)  
31 may also negatively affect the way patients take their medications. Non-adherence to medication  
32 in patients with cancer is associated with treatment failure and increased healthcare costs.  
33 Therefore, it is crucial that medicines are optimised for older adults with cancer to enhance  
34 appropriate prescribing, reduce the complexity of treatment regimens and minimise the risk of  
35 non-adherence.

36 **Objective:** To provide an overview of evaluations of interventions aimed at optimising  
37 medication prescribing and/or adherence in older adults with cancer.

38 **Methods:** A systematic scoping review will be undertaken. Four databases will be searched from  
39 inception: PubMed, EMBASE, CINAHL and PsycINFO. In order to meet inclusion criteria, studies  
40 must evaluate an intervention seeking to improve medication prescribing and/or adherence in  
41 older adults (aged  $\geq 65$  years) with an active cancer diagnosis using a comparative evaluation (e.g.  
42 inclusion of a control group). Two reviewers will independently screen titles and abstracts for  
43 inclusion and extract data relating to study population, intervention characteristics, outcome  
44 assessments and key findings. Extracted data will be collated using tables, figures and  
45 accompanying descriptive summaries. The review will be reported using the Preferred Reporting  
46 Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR)  
47 guidelines.

48 **Project impact:** The scoping nature of this review will serve to provide an overview of the existing  
49 literature on interventions aimed at optimising medication prescribing and adherence in older  
50 adults with cancer. The review findings will help to identify research gaps and highlight areas to  
51 explore further in future research.

52

53 **Key words:** cancer, oncology, older adults, intervention, prescribing, adherence

54 **Abbreviations:**

55 ADE: adverse drug event

56 EPOC: Effective Practice and Organisation of Care

57 PIP: potentially inappropriate prescribing

58 PRISMA-ScR: Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension  
59 for Scoping Reviews

60 RCT: randomised controlled trial

61 STOPP/START: Screening Tool of Older Person's Prescriptions / Screening Tool to Alert doctors  
62 to Right Treatment

63

64

65 **Introduction**

66 The population is ageing and by 2050, it is predicted that 17% of the global population will consist  
67 of individuals aged  $\geq 65$  years (conventionally described as “older”) (1). Advancing age is a major  
68 risk factor for cancer (2). In 2012, 48% of all cancer diagnoses worldwide occurred in older adults  
69 and, by 2038, this is expected to rise to 58% (2). At diagnosis, older patients with cancer often  
70 have existing health conditions necessitating the use of polypharmacy, which is commonly  
71 defined as the prescribing of five or more medications (3-5). The reported prevalence of  
72 polypharmacy in older patients with cancer ranges from 13% to 92% (6). Polypharmacy  
73 contributes to patients’ overall treatment burden (i.e. the workload of healthcare and its impact  
74 on patient functioning and well-being) (7). Treatment burden may be further increased by  
75 cancer-specific treatments and any additional supportive care medications (e.g. analgesics) that  
76 are required. Consequently, interventions aimed at optimising treatment regimens in cancer  
77 patients are required.

78  
79 Medicines optimisation is an approach to care that aims to ensure the greatest clinical benefits  
80 for patients, through the safe and effective use of medicines (10). Medicines optimisation is  
81 individual to each patient and accounts for their specific needs, preferences and values (11).  
82 Optimising prescribing involves examining potentially inappropriate prescribing, as well as  
83 encouraging the appropriate use of medications in a way that the patient is willing to adhere to  
84 (12).The concept of medicines optimisation is particularly relevant to older adults as  
85 observational studies have highlighted associations between polypharmacy and potentially  
86 inappropriate prescribing (PIP), as well as negative clinical consequences, such as adverse drug  
87 events (ADEs) (8). This has also been observed in oncology settings, whereby a high proportion  
88 (21%) of admissions to cancer services among older patients are related to adverse drug reactions  
89 arising from both the use of systemic anticancer treatments and non-cancer specific treatments  
90 (9).

91  
92 The term PIP encompasses a range of suboptimal prescribing practices, including inappropriate  
93 doses or durations of medication, prescribing medications associated with high risks of ADEs and

94 errors of omission (13). Various criteria have been developed and validated to assess and  
95 optimise medication prescribing in the general older population (14-17). These criteria can largely  
96 be classified as explicit (criterion-based, e.g. Screening Tool of Older Person's  
97 Prescriptions/Screening Tool to Alert doctors to Right Treatment (STOPP/START) (17, 18)) or  
98 implicit (judgement-based, e.g. Medication Appropriateness Index (19)). Application of these  
99 criteria in clinical settings has been shown to improve the appropriateness of prescribing for older  
100 people (20). However, the applicability of these criteria to older patients with cancer is often  
101 limited, as prescribing for this patient cohort requires additional considerations, such as life  
102 expectancy and time until treatment benefit (21). In addition, these tools frequently recommend  
103 the cessation or avoidance of drugs that may be clinically appropriate for older adults with cancer  
104 (e.g. non-steroidal anti-inflammatory drugs can be of particular benefit for various forms of  
105 cancer pain) (22, 23). A deprescribing guideline has been developed that is specific to cancer  
106 populations at the palliative stage of illness (24). However, the extent of its clinical impact has  
107 yet to be determined.

108

109 The challenges that polypharmacy present are not limited to prescribing. Increasing numbers of  
110 medications may negatively impact the way in which patients take their medications. The World  
111 Health Organisation defines adherence as “the extent to which a person’s behaviour-taking  
112 medication, following a diet, and/or executing lifestyle changes, corresponds with agreed  
113 recommendations from a healthcare provider” (25). Rates of medication adherence in patients  
114 with cancer vary widely, ranging from 46% to 100% (26). Previous studies have indicated that  
115 polypharmacy and complex medication regimens negatively impact on medication adherence  
116 (25, 27). Non-adherence to medication in patients with cancer has been associated with  
117 treatment failure, poor clinical outcomes, and increased healthcare costs (28, 29). Therefore, it  
118 is crucial that medicines are optimised in older adults with cancer to reduce the complexity of  
119 treatment regimens, minimise the risk of non-adherence and, ultimately, improve clinical  
120 outcomes.

121

122 Several systematic reviews have examined interventions to improve the appropriate use of  
123 polypharmacy in older adults across a variety of settings (13, 20, 30, 31). However, none of these  
124 reviews have focussed specifically on older adults with cancer. For example, a Cochrane review  
125 on interventions to improve appropriate prescribing of polypharmacy for older people  
126 specifically excluded studies of interventions targeting patients with terminal illnesses and  
127 patients receiving chemotherapy (20). This has implications in terms of the generalisability of  
128 existing evidence to older patients with cancer. Furthermore, relatively few of the included  
129 studies (5/32 studies) assessed adherence as an outcome.

130 A scoping review will be undertaken of interventions, evaluated to date, that have focussed on  
131 two key aspects of medicines optimisation for older people with cancer: appropriate prescribing  
132 and medication adherence. As the aim of this review is to provide a broad overview of the existing  
133 literature, a scoping review is preferable to a systematic review. Systematic reviews tend to be  
134 more specific in nature and normally focus on a more precise review question (32). Scoping  
135 reviews aim to identify and map the key concepts underpinning a research area (33). Additionally,  
136 they can help to identify research gaps and to highlight areas to explore further in future research  
137 (34). The objectives of this scoping review are to:

- 138
- 139 1. Identify the types of interventions aimed at optimising medication prescribing and/or  
140 adherence in older adults with cancer.
  - 141 2. Characterise key features of the interventions (i.e. content, delivery, setting).
  - 142 3. Examine the intervention development process (i.e. underpinning evidence and theory).
  - 143 4. Characterise the study populations.
  - 144 5. Identify the outcome measures that have been used to evaluate the interventions.
  - 145 6. Establish key findings of the evaluations.

146

## 147 **Methods**

148 This review protocol has been developed in accordance with relevant methodological guidance  
149 (34, 35). The final review will be reported using the Preferred Reporting Items for Systematic  
150 Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR) guidelines (36).

151

152 **Search strategy**

153 Searches of the following electronic databases will be conducted using established search  
154 methods for scoping reviews: PubMed, EMBASE, CINAHL and PsycINFO (34). All databases will be  
155 searched from inception. The search strategy will comprise three stages:

- 156 1. Preliminary searches of each database will be conducted to identify relevant keywords and  
157 index terms.
- 158 2. A comprehensive search strategy for each electronic database will be developed with input  
159 from a research librarian.
- 160 3. Following database searching, reference lists of all included studies and any relevant review  
161 articles will be screened for additional studies.

162 The initial search terms will include combinations of terms such as: “cancer”, “older adults”,  
163 “prescribing” and “adherence”, as well as relevant variants and synonyms. This will inform the  
164 development of a comprehensive search strategy. The full search strategy will be included in the  
165 final review manuscript.

166

167

168 **Inclusion criteria**

169 **Types of participants**

170 This review will include studies involving older adults ( $\geq 65$  years) with an active cancer diagnosis.  
171 Eligible studies will not be limited by the number or types of medicines prescribed, nor will they  
172 be restricted to patients with any specific type of cancer or patients who are receiving treatment  
173 in any particular healthcare setting. Studies which also involve other patient groups (e.g. patients  
174  $< 65$  years, patients with other medical conditions) will be eligible for inclusion provided that data  
175 for the subgroup of older cancer patients are available separately (either as published study data  
176 or available separately from the study authors).

177

178 **Types of interventions**



179 This review will include interventions seeking to optimise medication prescribing or adherence  
180 in older adults (aged  $\geq 65$  years) with an active cancer diagnosis. Interventions must align with  
181 key principles of medicines optimisation which will be broadly categorised as: interventions to  
182 optimise prescribing and interventions to improve medication adherence (10). For the purpose  
183 of this review, interventions to optimise prescribing will include interventions that target any of  
184 the following: misprescribing (prescribing that significantly increases the risk of ADEs, including  
185 incorrect dosing, frequency or duration), overprescribing (prescribing in the absence of a clinical  
186 indication) and underprescribing (omission of medications for specific clinical indications aimed  
187 at either treatment or prevention) (37). Interventions aimed at improving medication adherence  
188 will include any intervention that seeks to promote adherence to prescribed medication in older  
189 patients with cancer. Eligible interventions can be targeted at the level of healthcare professional  
190 or patient. In order to meet inclusion criteria, interventions must specifically target medication  
191 prescribing or adherence in individuals aged  $\geq 65$  years or a study population with a mean age of  
192  $\geq 65$  years.

193

#### 194 Types of outcome measures

195 Due to the lack of an existing review of evaluations of interventions aimed at optimising  
196 medication prescribing and adherence in older adults with cancer, all outcomes for studies that  
197 meet the above inclusion criteria will be included in the review. This will allow for an overview to  
198 be provided of the range of outcomes that have been evaluated on this topic to date.

199

#### 200 Types of studies

201 In order to meet inclusion criteria, studies must have included some form of comparative  
202 evaluation (e.g. inclusion of a control group or use of a controlled before/after design). . Only  
203 full-text manuscripts published in English will be eligible for inclusion. Published conference  
204 abstracts will not be included in the review.

205

#### 206 Study selection

207 Following deduplication, two reviewers will independently screen titles and abstracts for  
208 inclusion. If an abstract appears to meet inclusion criteria or cannot be excluded based on the  
209 title or abstract alone, the full-text article will subsequently be retrieved and assessed for  
210 inclusion by both reviewers independently. Any disagreements will be resolved through  
211 discussion and consultation with a third reviewer if necessary.

212

### 213 **Data extraction**

214 Two reviewers will independently perform data extraction (commonly referred to as ‘charting  
215 the results’ in the scoping review literature) using a data extraction form that has been developed  
216 in accordance with relevant methodological guidance (Appendix A) (34). The data extraction form  
217 will be piloted on one study that meets inclusion criteria and amended if necessary. Data will be  
218 extracted relating to each of the following:

- 219 1. *Study*: Authors, year of publication, country of origin, study design, study setting, study  
220 aims/purpose.
- 221 2. *Population*: Sample size, patient demographics (e.g. age, gender, type of cancer, stage of  
222 cancer, life expectancy, other medical conditions, numbers and types of medicines).
- 223 3. *Intervention details*: Intervention category (classified according to the Effective Practice  
224 and Organisation of Care (EPOC) taxonomy i.e. ‘Delivery arrangements’, ‘Financial  
225 arrangements’, ‘Governance arrangements’, ‘Implementation strategies’ (38));  
226 intervention targets/recipients and deliverers, mode of intervention delivery,  
227 intervention duration, intervention costs/resource requirements.
- 228 4. *Intervention development*: details of any underpinning evidence base/theory base for the  
229 intervention.
- 230 5. *Outcome measures used to evaluate the intervention*: Reported outcomes, assessment  
231 methods and assessment time points.
- 232 6. *Key findings*: summary details of key results.

233

234 Any inconsistencies in terms of data extraction will be resolved through discussion and  
235 consultation with a third reviewer if necessary.

236

237

238 **Data appraisal and synthesis**

239 As the aim of a scoping review is to provide a broad overview of the existing literature, formal  
240 assessments of methodological quality of included studies are not routinely undertaken (34).

241 Data collation will focus on summarising the information presented across included studies. A  
242 narrative synthesis will be undertaken in accordance with established guidance (40). This will  
243 involve the following key steps (40):

244 (1) Developing a preliminary synthesis of findings of included studies: study characteristics and  
245 findings will be tabulated to summarise key study information and describe patterns across  
246 the studies in terms of direction and size of intervention effects.

247 (2) Exploring relationships in the data: extracted study data will be reviewed to identify factors  
248 that might help to explain differences in the direction and size of intervention effects across  
249 the included studies.

250 (3) Assessing the robustness of the synthesis: the findings of the synthesis process will be  
251 critically reviewed by the review team, in terms of the evidence on which it is based and  
252 potential sources of bias from the evidence sources, as well as any discrepancies and  
253 uncertainties identified relating to study outcome assessments. This process will help to  
254 identify and highlight any gaps in the existing literature as part of the review.

255

256

257

258 **Presentation of results**

259 In accordance with methodological guidance on scoping reviews (34), it is recommended that a  
260 proposed plan for presenting results should be developed at the time of protocol development.

261 The findings of this review will be presented under the following headings to enable a logical and  
262 descriptive summary to be presented that aligns with the review's objectives:

- 263 • Search results
- 264 • Study designs
- 265 • Study aims/objectives
- 266 • Study populations

- 267 • Interventions
- 268 • Outcomes recorded
- 269 • Key findings

270

271 A PRISMA-ScR flow diagram will be used to depict study selection. Tables of the characteristics  
272 of included studies (Appendix B) and key study findings, together with accompanying descriptive  
273 summaries will be used to outline the data charted from included studies.

274

### 275 **Discussion**

276 Given the growing burden of cancer diagnoses among the older population, interventions  
277 targeting medicines optimisation are of considerable importance in terms of ensuring  
278 appropriate prescribing and use of medicines, and maximising their clinical benefits for patients.

279 This review will examine interventions aimed at optimising medication prescribing and/or  
280 adherence in older adults with cancer in any healthcare setting. The scoping nature of the review  
281 will serve to map existing literature on interventions that have been evaluated to date (e.g. in  
282 terms of how interventions were developed, delivered and assessed). The review's findings will  
283 lay important foundations in establishing current available evidence and informing future  
284 research on developing and evaluating interventions to improve the care of older patients with  
285 cancer in line with established methodological guidance (41).

286

### 287 **Acknowledgements**

288 None

289

### 290 **Conflicts of interest**

291 None

292

### 293 **Funding**

294 Melanie Murphy is supported by a Clement Archer Scholarship from the School of Pharmacy,  
295 Royal College of Surgeons in Ireland.

296 Cathal Cadogan is jointly supported by the Irish Cancer Society and All Ireland Institute of Hospice  
297 and Palliative Care [grant number: PAL17CAD].

298 Kathleen Bennett is supported by a HRB award [grant number:RL-15-1579].

299

300

301

302 **References**

- 303 1. He W, Goodkind D, Kowal P. U.S. Census Bureau, International Population Reports,  
304 P95/16-1, An Aging World: 2015, U.S. Government Publishing Office, Washington, DC. 2016.  
305 Available from:  
306 <https://www.census.gov/content/dam/Census/library/publications/2016/demo/p95-16-1.pdf>
- 307 2. Pilleron S, Sarfati D, Janssen-Heijnen M, Vignat J, Ferlay J, Bray F, et al. Global cancer  
308 incidence in older adults, 2012 and 2035: A population-based study. *International Journal of*  
309 *Cancer*. 2019;144(1):49-58.
- 310 3. Deliens C, Deliens G, Filleul O, Peppersack T, Awada A, Piccart M, et al. Drugs prescribed  
311 for patients hospitalized in a geriatric oncology unit: Potentially inappropriate medications and  
312 impact of a clinical pharmacist. *Journal of Geriatric Oncology*. 2016;7(6):463-70.
- 313 4. Sharma M, Loh KP, Nightingale G, Mohile SG, Holmes HM. Polypharmacy and potentially  
314 inappropriate medication use in geriatric oncology. *Journal of Geriatric Oncology*. 2016;7(5):346-  
315 53.
- 316 5. Masnoon N, Shakib S, Kalisch-Ellett L, Caughey GE. What is polypharmacy? A systematic  
317 review of definitions. *BMC Geriatrics*. 2017;17(1):230.
- 318 6. Maggiore RJ, Gross CP, Hurria A. Polypharmacy in older adults with cancer. *Oncologist*.  
319 2010;15(5):507-22.
- 320 7. Eton DT, Ramalho de Oliveira D, Egginton JS, Ridgeway JL, Odell L, May CR, et al. Building  
321 a measurement framework of burden of treatment in complex patients with chronic conditions:  
322 a qualitative study. *Patient Related Outcome Measures*. 2012;3:39-49.
- 323 8. Maher RL, Hanlon J, Hajjar ER. Clinical consequences of polypharmacy in elderly. *Expert*  
324 *Opinion on Drug Safety*. 2014;13(1):57-65.
- 325 9. Lavan AH, O'Mahony D, Buckley M, O'Mahony D, Gallagher P. Adverse drug reactions in  
326 an oncological population: Prevalence, predictability, and preventability. *Oncologist*.  
327 2019;24(9):e968-e977.
- 328 10. National Institute for Health and Care Excellence. NICE Guideline [NG5]: Medicines  
329 Optimisation: the safe and effective use of medicines to enable the best possible outcomes.  
330 United Kingdom; 2015. Available from: <https://www.nice.org.uk/guidance/ng5>.

- 331 11. Cadogan CA, Ryan C, Hughes CM. Appropriate polypharmacy and medicine safety: When  
332 many is not too many. *Drug safety*. 2016;39(2):109-16.
- 333 12. The King's Fund. Polypharmacy and medicines optimisation: making it safe and sound.  
334 London; 2013. Available from:  
335 [http://www.kingsfund.org.uk/sites/files/kf/field/field\\_publication\\_file/polypharmacy-and-  
336 medicines-optimisation-kingsfund-nov13.pdf](http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/polypharmacy-and-<br/>336 medicines-optimisation-kingsfund-nov13.pdf). Accessed 05 May 2019.
- 337 13. Clyne B, Fitzgerald C, Quinlan A, Hardy C, Galvin R, Fahey T, et al. Interventions to address  
338 potentially inappropriate prescribing in community-dwelling older adults: A systematic review of  
339 randomized controlled trials. *Journal of the American Geriatrics Society*. 2016;64(6):1210-22.
- 340 14. O'Mahony D, O'Sullivan D, Byrne S, O'Connor MN, Ryan C, Gallagher P. STOPP/START  
341 criteria for potentially inappropriate prescribing in older people: version 2. *Age and Ageing*.  
342 2015;44(2):213-8.
- 343 15. Lavan AH, Gallagher P, Parsons C, O'Mahony D. STOPPFrail (Screening Tool of Older  
344 Persons Prescriptions in Frail adults with limited life expectancy): consensus validation. *Age and  
345 Ageing*. 2017;46(4):600-7.
- 346 16. The 2019 American Geriatrics Society Beers Criteria® Update Expert Panel. American  
347 Geriatrics Society 2019 Updated AGS Beers Criteria for Potentially Inappropriate Medication Use  
348 in Older Adults. *Journal of the American Geriatrics Society*. 2019;67(4):674-694.
- 349 17. Gallagher P, Ryan C, Byrne S, Kennedy J, O'Mahony D. STOPP (Screening Tool of Older  
350 Person's Prescriptions) and START (Screening Tool to Alert doctors to Right Treatment).  
351 Consensus validation. *International Journal of Clinical Pharmacology and Therapeutics*.  
352 2008;46(2):72-83.
- 353 18. Mahony DO, Sullivan DO, Byrne S, Connor MNO, Ryan C, Gallagher P. Corrigendum:  
354 STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. *Age and  
355 Ageing*. 2018;47(3):489.
- 356 19. Samsa GP, Hanlon JT, Schmader KE, Weinberger M, Clipp EC, Uttech KM, et al. A  
357 summated score for the medication appropriateness index: development and assessment of  
358 clinimetric properties including content validity. *Journal of Clinical Epidemiology*. 1994;47(8):891-  
359 6.



- 360 20. Rankin A, Cadogan CA, Patterson SM, Kerse N, Cardwell CR, Bradley MC, et al.  
361 Interventions to improve the appropriate use of polypharmacy for older people. The Cochrane  
362 Database of Systematic Reviews. 2018(9):CD008165.
- 363 21. Holmes HM, Hayley DC, Alexander GC, Sachs GA. Reconsidering medication  
364 appropriateness for patients late in life. Archives of Internal Medicine. 2006;166(6):605-9.
- 365 22. Whitman AM, DeGregory KA, Morris AL, Ramsdale EE. A comprehensive look at  
366 polypharmacy and medication screening tools for the older cancer patient. Oncologist.  
367 2016;21(6):723-30.
- 368 23. Polidori P PC. Introducing Palliative Care 5th Edition. European Journal of Hospital  
369 Pharmacy. 2017;24(131).
- 370 24. Lindsay J, Dooley M, Martin J, Fay M, Kearney A, Khatun M, et al. The development and  
371 evaluation of an oncological palliative care deprescribing guideline: the 'OncPal deprescribing  
372 guideline'. Supportive Care in Cancer. 2015;23(1):71-8.
- 373 25. Sabate E. World Health Organisation (WHO). Adherence to long-term therapies: evidence  
374 for action. 2003. Available from:  
375 [https://www.who.int/chp/knowledge/publications/adherence\\_report/en/](https://www.who.int/chp/knowledge/publications/adherence_report/en/)
- 376 26. Greer JA, Amoyal N, Nisotel L, Fishbein JN, MacDonald J, Stagl J, et al. A systematic review  
377 of adherence to oral antineoplastic therapies. Oncologist. 2016;21(3):354-76.
- 378 27. Kardas P, Lewek P, Matyjaszczyk M. Determinants of patient adherence: a review of  
379 systematic reviews. Frontiers in Pharmacology. 2013;4:91.
- 380 28. Neugut AI, Zhong X, Wright JD, Accordino M, Yang J, Hershman DL. Nonadherence to  
381 medications for chronic conditions and non-adherence to adjuvant hormonal therapy in women  
382 with breast cancer. JAMA Oncology. 2016;2(10):1326-32.
- 383 29. Partridge AH, Avorn J, Wang PS, Winer EP. Adherence to therapy with oral antineoplastic  
384 agents. Journal of the National Cancer Institute. 2002;94(9):652-61.
- 385 30. Smith SM, Wallace E, O'Dowd T, Fortin M. Interventions for improving outcomes in  
386 patients with multimorbidity in primary care and community settings. The Cochrane Database of  
387 Systematic Reviews. 2016;3:CD006560.

- 388 31. Shafiee Hanjani L, Long D, Peel NM, Peeters G, Freeman CR, Hubbard RE. Interventions to  
389 optimise prescribing in older people with dementia: A systematic review. *Drugs & Aging*.  
390 2019;36(3):247-67.
- 391 32. Munn Z, Peters MDJ, Stern C, Tufanaru C, McArthur A, Aromataris E. Systematic review  
392 or scoping review? Guidance for authors when choosing between a systematic or scoping review  
393 approach. *BMC Medical Research Methodology*. 2018;18(1):143.
- 394 33. Arksey H, O'Malley L. Scoping studies: towards a methodological framework.  
395 *International Journal of Social Research Methodology*. 2005;8(1):19-32.
- 396 34. Peters MD, Godfrey CM, Khalil H, McInerney P, Parker D, Soares CB. Guidance for  
397 conducting systematic scoping reviews. *International Journal of Evidence-based Healthcare*.  
398 2015;13(3):141-6.
- 399 35. Peters MDJ GC, McInerney P, Baldini Soares C, Khalil H, Parker D. Methodology for JBI  
400 scoping reviews. In: Adelaide AE, editor. *The Joanna Briggs Institute reviewers' manual*. Australia:  
401 The Joanna Briggs Institute; 2015. Available from:  
402 [http://joannabriggs.org/assets/docs/sumari/reviewersmanual\\_methodology-for-jbi-scoping-](http://joannabriggs.org/assets/docs/sumari/reviewersmanual_methodology-for-jbi-scoping-reviews_2015_v2.pdf)  
403 [reviews\\_2015\\_v2.pdf](http://joannabriggs.org/assets/docs/sumari/reviewersmanual_methodology-for-jbi-scoping-reviews_2015_v2.pdf).
- 404 36. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for  
405 Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Annals of Internal Medicine*. 2018;  
406 169(7):467-73.
- 407 37. O'Connor MN, Gallagher P, O'Mahony D. Inappropriate prescribing: criteria, detection  
408 and prevention. *Drugs & Aging*. 2012;29(6):437-52.
- 409 38. Effective Practice and Organisation of Care (EPOC). The EPOC taxonomy of health systems  
410 interventions. 2016. Available from: [https://epoc.cochrane.org/resources/epoc-resources-review-](https://epoc.cochrane.org/resources/epoc-resources-review-authors)  
411 [authors](https://epoc.cochrane.org/resources/epoc-resources-review-authors)
- 412 39. Higgins J, Altman DG SJe. Chapter 8: Assessing risk of bias in included studies. In: Higgins  
413 JPT, Green S (editors). *Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0*  
414 (updated March 2011). The Cochrane Collaboration, 2011. Available from  
415 [www.handbook.cochrane.org](http://www.handbook.cochrane.org).
- 416 40. Ryan R; Cochrane Consumers and Communication Review Group. 'Cochrane

417 Consumers and Communication Review Group: data synthesis and analysis'.  
418 <http://cccr.org.cochrane.org>, March 2019  
419 41. Medical Research Council. Developing and evaluating complex interventions: New  
420 guidance. London: Medical Research Council. 2008. Available from:  
421 <https://mrc.ukri.org/documents/pdf/complex-interventions-guidance/>  
422  
423

424 **Appendices**

425 Appendix A: Data extraction form (outline)

426 Appendix B: Table of characteristics of included studies (key components)

427

428 **Appendix A: Data extraction form (outline)**

429 Data extraction fields

430 1. Author(s)

431 2. Year of publication

432 3. Country

433 4. Study design

434 5. Study aims/objectives

435 6. Study duration

436 7. Study population, setting and sample size

437 8. Intervention type

438 9. Details of intervention development

439 10. Assessment of intervention

440 11. Outcome measures

441 12. Results

442

443

444 **Appendix B: Table of characteristics of included studies (key components)**

445 1. Author, year of publication, country

446 2. Study design

447 3. Study duration

448 4. Study population, setting and sample size

449 5. Intervention type and comparison

450 6. Assessment of intervention

451 7. Outcome measures

452 8. Results