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Title

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Journal

Journal of the American Geriatrics Society, 70(6)

ISSN

0002-8614

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Publication Date

2022-06-01

DOI

10.1111/jgs.17730

Supplemental Material

<https://escholarship.org/uc/item/4m79d3r5#supplemental>

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Peer reviewed

Attitudes Toward Deprescribing among Older Adults with Dementia in the US

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Running title: Deprescribing attitudes in dementia

Word count: 3,407; Tables: 1; 2 figures; 1 supplemental figure; 3 supplemental tables; abstract word count: 297

2

43 **Funding Sources:** This work was supported by grant P01AG066605 from the National Institute
44 on Aging (NIA). Dr. Zullo was supported by grants R01AG045441, RF1AG061221,
45 R01AG065722, and R21AG061632 from the NIA. Dr. Yaffe was supported by the grant
46 R35AG071916 from the NIA. Dr. Steinman was supported by grants 1R24AG064025 and
47 K24AG049057 from the NIA.

48

49 **Key Points** (291/300 characters including spaces)

- 50 • A majority of PWD were willing to stop a medication if a doctor said it was possible
- 51 • Deprescribing attitudes were similar across sociodemographic and clinical factors

52

53 **Why does this matter?**

54 Deprescribing unnecessary or harmful medications represents an opportunity to improve quality
55 of life for adults with dementia.

56

57

3
58 **ABSTRACT**

59

60 **BACKGROUND:** People with dementia (PWD) take medications that may be unnecessary or
61 harmful. This problem can be addressed through deprescribing, but it is unclear if PWD would
62 be willing to engage in deprescribing with their providers. Our goal was to investigate attitudes
63 toward deprescribing among PWD.

64

65 **METHODS:** This was a cross-sectional study of 422 PWD aged ≥ 65 years who completed the
66 Medications Attitudes module of the National Health and Aging Trends Study (NHATS) in
67 2016. Proxies provided responses when a participant was unable to respond due to health or
68 cognitive problems. Attitudinal outcomes comprised responses to 2 statements from the Patients'
69 Attitudes Towards Deprescribing questionnaire and its revised version (representing belief about
70 the necessity of one's medications and willingness to deprescribe); another elicited the maximum
71 number of pills that a respondent would be comfortable taking.

72

73 **RESULTS:** The weighted sample represented over 1.8 million PWD; 39% were 75 to 84 years
74 old and 38% were 85 years or older, 60% were female, and 55% reported 6 or more regular
75 medications. Proxies provided responses for 26% of PWD. Overall, 22% believed that they may
76 be taking one or more medicines that they no longer needed, 87% were willing to stop one or
77 more of their medications, and 50% were uncomfortable taking 5 or more medications.

78 Attitudinal outcomes were similar across sociodemographic and clinical factors. PWD taking

79 ≥ 6 medications were more likely to endorse a belief that at least one medication was no longer

4
80 necessary compared to those taking <6 (adjusted probability 29% [95% CI, 22%-38%] vs 13%
81 [95% CI, 8%-20%]; p=0.004); the same applied for willingness to deprescribe (92% [95% CI,
82 87%-95%] vs 83% [95% CI, 76%-89%]; p=0.04).

83

84 **CONCLUSIONS:** A majority of PWD are willing to deprescribe, representing an opportunity to
85 improve quality of life for this vulnerable population.

86

87 **KEY WORDS:** deprescribing, dementia, medications, attitudes

88

89

90 Introduction

91 People with dementia (PWD) have a higher prevalence of polypharmacy than those
92 without dementia and in many cases receive medications that may be unnecessary, discordant
93 with goals of care, or harmful.^{1,2} A large body of research has demonstrated that polypharmacy in
94 older adults increases the risk of exposure to potentially inappropriate medications and is
95 associated with a higher likelihood of adverse drug reactions, drug-drug interactions, falls,
96 cognitive decline, and even mortality.^{3,4,5} Given that PWD are particularly vulnerable to the
97 occurrence and adverse outcomes of polypharmacy and potentially inappropriate prescribing,⁶
98 current efforts are underway to develop and implement deprescribing interventions in this
99 population.^{7,8,9}

100 Deprescribing refers to the clinically supervised process of tapering or stopping drugs,
101 with the goal of minimizing inappropriate polypharmacy and improving patient outcomes.¹⁰
102 Successful approaches to deprescribing are grounded in a shared decision-making process with
103 patient involvement; in caring for adults with dementia, this process necessarily includes
104 caregivers in many cases.^{8,11} As such, attaining an understanding of the views and attitudes of
105 PWD and their caregivers is critical to the ongoing development of deprescribing interventions
106 for PWD.

107 Prior work has underscored that older adults in the US hold skeptical attitudes toward
108 some medications and welcome deprescribing efforts.¹² Additionally, qualitative studies have
109 elucidated the importance of culturally competent approaches to deprescribing among PWD
110 from diverse communities¹³ and the importance of ensuring robust non-pharmacologic strategies
111 and caregiver supports when addressing medications used for symptom management in

6
112 dementia.¹⁴ However, the broad attitudes toward medications and deprescribing of PWD and/or
113 their caregivers remain undocumented in a widely generalizable U.S. sample. With the goal of
114 aiding efforts to identify PWD and caregivers particularly amenable to reductions in medication
115 usage, we described attitudes toward medications and deprescribing among PWD in a nationally
116 representative sample and elucidated factors associated with these attitudes.

117

118 **Methods**

119 **Study design and data sources**

120 This was a cross-sectional study of the National Health and Aging Trends Study
121 (NHATS), a nationally representative sample of Medicare beneficiaries 65 years and older
122 designed to delineate trends in and dynamics of function in later life.¹⁵ NHATS participants were
123 initially recruited in 2011; the cohort was replenished in 2015. Participants or their proxy
124 respondents undergo annual interviews that assess multiple domains of the study participant,
125 including their physical, cognitive, and functional capacity; social, physical, and technological
126 environment; and socioeconomic status. Proxies were asked to provide responses when a
127 participant was unable to respond due to health or cognitive problems, with preference given to
128 someone who lived with the study participant or was otherwise familiar with the participant's
129 daily routine and health. The study conforms to the Strengthening the Reporting of Observational
130 Studies in Epidemiology (STROBE) statement¹⁶ (**Supplementary Table S4**); the protocol was
131 not pre-registered. Our study protocol was approved by the institutional review board at the
132 University of California, San Francisco.

133

7 134 **Study population**

135 This analysis draws from 2016 NHATS during which the Medication Attitudes module
136 was fielded to a random sample of one-third of respondents (unweighted, N=2,124); the
137 weighted response rate for this module was 95%.¹² Our study population includes all respondents
138 to the Medication Attitudes module who had possible or probable dementia, as determined by the
139 NHATS dementia criteria.¹⁷ Those who did not respond to the outcome prompts were excluded
140 from the analysis (17 individuals). The NHATS dementia classification scheme organizes
141 respondents into 3 categories (probable, possible, or no dementia) based on a combination of
142 factors, including: (1) self or proxy report that a doctor told the subject he or she had a diagnosis
143 of dementia [indicating probable dementia]; (2) cognitive testing evaluating memory, orientation,
144 and executive functioning [indicating possible or probable dementia depending on number of
145 domains affected and standardized scoring]; (3) for subjects unable to participate, proxy
146 responses to the AD8 Dementia Screening Interview [with a score of 2 or higher indicating
147 probable dementia].¹⁸ Validated against a criterion standard involving a comprehensive in-home
148 clinical assessment with dementia adjudication¹⁹, the combined NHATS definition of probable or
149 possible dementia has a sensitivity of 86% and specificity of 62%.¹⁷ Both self and proxy
150 respondents were included.

151

152 **Medication Attitude Measures**

153 The NHATS Medication Attitudes module included 10 prompts from the validated
154 Patients' Attitudes Towards Deprescribing (PATD) questionnaire and revised PATD (older
155 adults version; rPATD) survey, which overlap substantially with an additional version of the

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156 rPATD that was specifically developed for people with mild cognitive impairment and mild
157 dementia.^{20,21,22} We selected items that addressed 3 key domains: beliefs about the necessity of
158 one's medications, willingness to deprescribe, and discomfort with polypharmacy. The selected
159 prompts were: (1) "You feel that you may be taking one or more medicines that you no longer
160 need" (belief about necessity of one's medications); (2) "If your doctor said it was possible, you
161 would be willing to stop one or more of your regular medications" (willingness to deprescribe);
162 and (3) "What is the maximum number of pills you would be comfortable taking daily?"
163 (discomfort with polypharmacy). For the first 2 items, respondents indicated their level of
164 agreement with prompts based on a 4-item Likert scale ranging from strongly disagree to
165 strongly agree. The third item instructed respondents to choose one of 6 photos, each showing a
166 cluster of pills ranging from 4 to 24 pills (eg, 4, 8, 12, 16, 20, or 24; **Supplementary Figure S1**).

167

168 **Covariate Measures**

169 We investigated factors from NHATS that were potentially associated with the attitudinal
170 outcomes based on prior literature^{12,13} and clinical judgment. Patient factors included age, sex,
171 race/ethnicity, education (highest attainment), Medicaid insurance coverage (serving in part as a
172 proxy for socioeconomic status in line with prior studies²³), marital status, and proxy status (self
173 or proxy report). Health-related factors included number of regular medications (categorized as
174 fewer than six and six or more based on NHATS questionnaire), number of chronic conditions
175 ever reported by the respondent, self-rated health, dementia status (per NHATS classification
176 scheme), whether the respondent reported ever receiving a diagnosis of dementia from a
177 physician (separately from their NHATS dementia classification), fall in the past month, and

9
178 difficulties with activities of daily living (ADLs) and keeping track of one's medications
179 independently (representative of an instrumental activity of daily living). We included self-report
180 of a diagnosis of dementia in addition to diagnosis via the NHATS classification scheme given
181 prior literature indicating that the majority of older adults with dementia in the US are either
182 undiagnosed or unaware of their diagnosis, and given the possibility that awareness of a
183 diagnosis of dementia by an individual or proxy may affect attitudes toward medications.^{24,25}
184 Chronic conditions included reported history of myocardial infarction, hypertension, heart
185 disease, lung disease, diabetes, arthritis, osteoporosis, stroke, or cancer. Health services factors
186 included whether the respondent was hospitalized or saw a regular doctor in the previous year.

187

188 **Statistical analyses**

189 For the first two attitudinal outcomes, we created binary variables for agreement (strongly agree
190 and agree) and disagreement (strongly disagree and disagree). The third outcome, discomfort
191 with polypharmacy, was represented as a binary outcome indicating discomfort with taking five
192 or more pills daily given that five was the median response for the study population. Those who
193 refused to respond to the prompts or indicated not knowing were excluded from the analysis. The
194 total number of respondents to each individual outcome question varied slightly, ranging from
195 N=388 to N=403. We used the publicly available software *eulerAPE* version 3 to depict
196 overlapping attitudinal outcomes across the three domains in an area-proportional Venn diagram
197 with ellipses.²⁶ We used multivariable logistic regression models to examine the relationship
198 between predictors and the three outcomes, with adjustment for age, sex, chronic conditions,
199 dementia status (possible or probable), proxy status (self-respondent or proxy), and number of

10
200 medications. We used multiple imputation by chained equations to account for missing predictor
201 variables. Missingness was relatively uncommon, with the greatest occurring in the variable
202 capturing difficulty with keeping track of medications by oneself (7%). After fitting the logistic
203 regression models, we calculated marginal predicted probabilities that reflect a weighted average
204 over the distribution of the covariates and that corresponded to the covariate distribution in the
205 total study population.^{27,28} With this method, we determined the adjusted probabilities of the
206 attitudinal outcomes for each of the predictors (e.g., predicted probability of agreeing with one of
207 the medication attitude prompts in those taking fewer than six compared to those taking six or
208 more medications, adjusted for the other covariates in the model). To determine whether there
209 were any differences in results based on proxy status, we conducted a sensitivity analysis by
210 limiting the sample to self-respondents. All analyses were conducted with NHATS analytic
211 survey weights to provide nationally representative estimates and were performed using Stata
212 version 17 (Stata Corporation, College Station, TX) and R version 3.6.1 (R Foundation for
213 Statistical Computing, Vienna, Austria).

214

215 **Results**

216 **Characteristics of the study population**

217 The unweighted sample of individuals who responded to at least one outcome question
218 included 422 respondents, representing more than 1.8 million PWD in the United States; in
219 weighted analyses, 39% were 75 to 84 years old and 38% were 85 years or older, 60% were
220 female, and 55% reported being on 6 or more regular medications (**Table 1**). In our sample, 56%
221 had probable dementia, and 44% had possible dementia. Proxies provided responses for 26% of

11
222 PWD. Proxy respondents tended to be daughters (37%), spouses/partners (31%), and sons
223 (13%); 89% reported being very familiar with the routines of the study subject.

224

225 **Description of attitudes toward deprescribing**

226 Of those responding to each question, 22% endorsed believing that they may be taking
227 one or medicines that they no longer needed, 87% endorsed willingness to stop one or more of
228 their regular medications if a doctor said it was possible, and 50% endorsed being uncomfortable
229 taking 5 or more medications. Many PWD who expressed skeptical attitudes in response to one
230 question had analogous attitudes with respect to other questions. Of the 360 individuals who
231 responded to all 3 outcome questions, thirteen percent of PWD or proxy respondents provided
232 affirmative responses to all 3 attitudinal outcomes; an additional 41% of individuals responded
233 affirmatively to 2 of 3 of these prompts (**Figure 1**).

234

235 **Factors associated with attitudinal outcomes**

236 *Overview*

237 Analyses linking sociodemographic and clinical attributes of older adults with dementia
238 to attitudinal outcomes are illustrated as predicted probabilities of the attitudinal outcomes in
239 **Figure 2**. Results from unadjusted analyses and those adjusted for age, sex, chronic conditions,
240 dementia status, proxy status, and number of medications were generally similar across the
241 outcomes (**Supplementary Table S1**); we present the adjusted results here. In general,
242 attitudinal outcomes were similar across a wide variety of factors, but differences emerged in a
243 few cases. As shown in **Figure 2**, there was less variation across strata of the predictors for the

12
244 first two attitudinal outcomes (belief about the necessity of one's medications and willingness to
245 deprescribe) compared to the final outcome (discomfort with polypharmacy).

246

247 *Belief about necessity of one's medications*

248 In terms of the first outcome (first column in **Figure 2**), those taking 6 or more
249 medications were more likely to endorse a belief that at least one medication was no longer
250 necessary than those taking fewer than 6 regular medications (adjusted probability 29% [95% CI,
251 22%-38%) vs 13% [95% CI, 8%-20%]; p=0.004). Those endorsing fair or poor self-rated health
252 were also more likely to endorse this outcome (adjusted probability of fair/poor, good, and very/
253 good/excellent of 31% [95% CI, 23%-41%], 17% [95% CI, 10%-30%], and 10% [95% CI, 5%-
254 19%]; p=0.01).

255

256 *Willingness to deprescribe*

257 In terms of the second attitudinal outcome (second column in **Figure 2**), those taking 6 or
258 more medications were more likely to endorse a willingness to deprescribe if a doctor said it was
259 possible compared to those taking fewer than 6 regular medications (92% [95% CI, 87%-95%]
260 vs 83% [95% CI, 76%-89%]; p=0.04). Those who did not fall in the past month were also more
261 likely to endorse this outcome compared to those who had fallen in the past month (91% [95%
262 CI, 87%-95%] vs 79% [95% CI, 63%-89%]; p=0.04).

263

264 *Discomfort with polypharmacy*

13
265 For the final outcome (third column in **Figure 2**), several factors emerged as significant.
266 PWD taking 6 or more regular medications were significantly less likely than those taking fewer
267 than 6 regular medications to endorse discomfort taking 5 or more pills (adjusted probability,
268 26% [95% CI, 20%-33%] vs 80% [95% CI, 71%-86%]; $p<0.001$). Other factors that
269 differentiated those endorsing discomfort taking 5 or more pills included requiring assistance
270 with fewer than 2 ADLs compared to requiring assistance with 2 or more ADLs (adjusted
271 probability, 59% [95% CI, 50%-67%] vs 33% [95% CI, 21%-48%]; $p=0.01$); being able to track
272 one's medications without difficulty compared to having difficulty tracking one's medications
273 (65% [95% CI, 54%-75%] vs 42% [95% CI, 32%-51%]; $p=0.01$); and not having a fall in the
274 past month compared to having fallen in the past month (55% [95% CI, 48%-62%] vs 33% [95%
275 CI, 23%-46%]; $p=0.004$).

276

277 **Sensitivity analysis**

278 The sensitivity analysis restricting to self-respondents (unweighted $N=311$;
279 characteristics in **Supplementary Table S2**) yielded qualitatively similar results to the main
280 analysis (**Supplementary Table S3**).

281

282 **Discussion**

283 In a nationally representative sample of older adults, a substantial majority of people with
284 dementia endorsed a willingness to have at least one of their regular medications stopped if a
285 doctor said it was possible, but a smaller proportion endorsed the belief that at least one of their
286 medications was no longer needed. With a few exceptions, attitudes expressed by PWD and their

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287 proxies were consistent across a variety of sociodemographic and clinical factors. One factor—
288 number of regular medications—was predictive across the three attitudinal outcomes. PWD who
289 were taking a greater number of medications were more likely to endorse both a willingness to
290 deprescribe and the belief that at least one of their medications may be unnecessary.

291 Our study contributes to a growing body of literature regarding attitudes toward
292 deprescribing among older adults in the US and abroad. A 2021 review and meta-analysis
293 involving over 11,000 participants from multiple countries found that 88% of adults were willing
294 to deprescribe their medication based on a doctor’s recommendation, while 75% of caregivers
295 indicated the same²⁹; these estimates are similar to the corresponding figure of 87% from our
296 study. However, few studies have assessed these attitudinal outcomes specifically in PWD, a
297 population that may have distinct attitudes given cognitive and functional changes associated
298 with the disease and reduced life expectancy.³⁰ A 2018 study using NHATS found that a majority
299 of older adults in the US are open to deprescribing and analyzed probable dementia as a predictor
300 of attitudinal outcomes.¹² People with probable dementia were significantly less likely to endorse
301 wanting to reduce the number of medications they were taking compared to those without
302 dementia; the data were somewhat consistent with less willingness to deprescribe among those
303 with probable dementia compared to those without dementia. In contrast to this study, our
304 analysis was focused specifically on PWD, more broadly defined as having possible or probable
305 dementia, and included both self and proxy respondents.

306 Our findings provide important insights into the attitudes held by PWD and their
307 caregivers regarding their medications and are relevant to deprescribing interventions being
308 tested in clinical trials and implemented in this population.^{7,8} In clinical practice, understanding

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309 these attitudes and incorporating them into a shared decision-making process are crucial to
310 encourage behavioral changes by patients and providers that enable sustainable deprescribing
311 practices.^{10,11,31} Given that there were few external factors predictive of the attitudes under study,
312 our results underscore that it is crucial for conversations about deprescribing to be grounded in
313 an individual patient's goals of care, current level of functioning, life expectancy, and values and
314 preferences.¹⁰ These considerations are all the more important in the care of PWD given the
315 functional and cognitive decline associated with dementia and the integral role in medication
316 management that caregivers play as a result.³² We found that our data were partially consistent
317 with less willingness to deprescribe among proxy respondents compared to self-respondents.
318 Caregivers of older adults may hold different perspectives on medication value compared to the
319 person for whom they provide care in terms of side effects, ability to tolerate inconvenience or
320 discomfort, and degree of trust in prescribers' recommendations.³³ Prior qualitative work with
321 caregivers of PWD regarding management of the behavioral and psychological symptoms of
322 dementia identified prominent systemic barriers to accessing non-pharmacologic treatments as a
323 primary deterrent to avoiding use of medications such as antipsychotics.^{14,32} Therefore, robust
324 caregiver support and personalized non-pharmacologic approaches to symptom management
325 must go hand in hand with deprescribing in this population.

326 Two additional considerations are noteworthy. First, consistent with a prior study among
327 older adults,¹² we observed that far fewer PWD endorsed believing they were taking at least one
328 medication that was no longer necessary compared to a larger number who indicated a
329 willingness to stop a medication if advised by a physician. These sentiments likely represent a
330 biomedical culture of prescribing,^{34,35} deference on the part of patients and physicians to

16
331 prescribing decisions made by physicians,^{36,37} and information asymmetry between physicians
332 and patients.³⁸ Taken together, these findings highlight the importance and value of pursuing and
333 normalizing conversations about deprescribing to achieve high-quality and goal-concordant care
334 for people living with dementia. Second, qualitative research among PWD and their caregivers
335 has underscored the importance of racial, ethnic, cultural, and language concordance in
336 deprescribing interventions.¹³ We observed a trend in the direction of differential attitudes in
337 willingness to deprescribe by race/ethnicity, although this finding did not reach statistical
338 significance in the main analysis and should be interpreted cautiously in light of multiple
339 hypothesis testing. Given extensive prior scholarship regarding cultural competency in
340 healthcare delivery³⁹ and the centrality of establishing trust in successful deprescribing,
341 interventions should be designed to succeed against the backdrop of historical and ongoing
342 evidence of disparate healthcare treatment affecting minority groups in the United States.⁴⁰
343 Future research involving a larger sample and among diverse groups of PWD is needed to
344 delineate the potential role of race/ethnicity in attitudes toward deprescribing.

345

346 **Limitations**

347 This study has several limitations. First, due to the limited subset of questions included in
348 the NHATS Medication Attitudes module, creation of factor scores as can be done from the
349 original validated questionnaires was not possible.²² To overcome this challenge, we designed
350 our study based on the *a priori* selection of one representative question from each of three
351 thematic attitudinal domains. However, it must be emphasized that these questions were not
352 validated as individual questions. Second, it is unknown if certain responses to questions from

17
353 the PATD and rPATD are predictive of actual medication discontinuation, and these
354 questionnaires may have low predictive validity for successful deprescribing.⁴¹ Third, questions
355 in the Medications Attitudes module are hypothetical and do not refer to specific classes of
356 medications. Thus, it is not known how individuals would respond to similar questions regarding
357 their attitudes about specific medications or clinical scenarios involving their doctors. Fourth, for
358 the third outcome domain (discomfort with polypharmacy, indicated using a photo prompt), the
359 maximum number of pills queried in the prompt may not match the number of medications,
360 given that many medications are taken multiple times per day, or with multiple pills per each
361 administration. It is thus impossible to know whether respondents viewed each pill as a separate
362 medication or not.¹² Additionally, while respondents were queried as to the maximum number of
363 pills they would be comfortable taking, it remains possible that their overall attitude toward
364 polypharmacy is more nuanced. This is likely given the rich and varied perspectives that
365 individuals may attach to their prescribed medications.^{42,43} Fifth, the severity or type of dementia
366 were not known and would be important considerations for conversations and decisions about
367 medication appropriateness and potential deintensification. Of note, attitudinal outcomes were
368 consistent across both possible and probable dementia as well as self and proxy respondents,
369 both of which likely capture aspects of dementia severity. Proxy respondents may not answer
370 questions in the same manner that subjects would if they were able to answer for themselves.
371 Nevertheless, proxy responses mirror real-world clinical encounters, in which clinicians often
372 must rely on caregiver reports and substituted judgment to guide decision-making. Finally, our
373 analysis involved multiple statistical comparisons; reported associations should be viewed as
374 exploratory and the basis for future confirmatory work.

18
375

376 **Summary**

377 Deprescribing represents an important opportunity to address potentially inappropriate
378 prescribing and to improve quality of life for people living with dementia.^{26,44} Physicians, clinical
379 pharmacists, and other healthcare professionals caring for PWD and their caregivers should
380 practice with the knowledge that the majority of PWD express a willingness to stop medications
381 if a doctor says it is possible.

382

19
383 **ACKNOWLEDGEMENTS**

384 Conflicts of Interest: Dr. Zullo is supported by grant funding from Sanofi Pasteur to Brown
385 University for work on the epidemiology of infections and vaccinations among nursing home
386 residents and infants. Dr. Steinman receives royalties from UpToDate and honoraria from the
387 American Geriatrics Society. All other authors have no relevant conflicts of interest to report.

388

389 Author Contributions:

390 1) Conception and design: Growdon, Boscardin, Yaffe, Boockvar, Steinman

391 2) Acquisition of data: Boockvar, Steinman

392 3) Analysis of data: Growdon, Espejo, Boscardin

393 4) Interpretation of data: All authors.

394 5) Drafting the article: Growdon

395 6) Supervision: Boockvar, Steinman

396 7) Revising it critically for important intellectual content: All authors.

397 8) Final approval of the version to be published: All authors.

398

399 Sponsors' Role: The sponsors had no role in the design and conduct of the study; collection,
400 management, analysis, and interpretation of the data; preparation, review, or approval of the
401 manuscript; and decision to submit the manuscript for publication.

402

403 Other Acknowledgements: Ms. Espejo, Mr. Jing, Dr. Zullo, Dr. Yaffe, Dr. Boockvar, and Dr.
404 Steinman are U.S. Government employees; the views expressed in this article are those of the

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405 authors and do not necessarily reflect the position or policy of the Department of Veterans
406 Affairs or the United States Government.

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537

538 **Table 1:** Characteristics of sampled older adults with dementia in the US (N=422), 2016

539 National Health and Aging Trends Study

Characteristic	Unweighted Respondents, No.	National Estimate, (%) Weighted N = 1.8 million
Age		
65 to 74	55	23%
75 to 84	165	39%
85+	202	38%
Female	260	60%
Race/Ethnicity		
White, Non-Hispanic	238	69%
Black, Non-Hispanic	121	14%
Hispanic	33	8%
Other	21	8%
Education (Highest Attainment)		
Below high school	171	37%
High school	101	25%
Beyond high school	150	38%
Marital Status		
Married or living with partner	142	37%
Separated, divorced, widowed, never married	280	63%
Medicaid-insured	121	28%
Chronic Conditions, no.		
0 to 1	88	25%
2 to 3	191	41%
>3	143	34%
≥ 6 Regular Medications	221	55%
Self-Rated Health		
Excellent/Very Good	111	28%
Good	128	30%
Fair/Poor	182	42%
Dementia Classification		
Possible dementia	174	44%
Probable dementia	248	56%
Dementia Diagnosis Reported by Respondent	156	35%
Proxy Respondent	111	26%
Hospitalized in Past Year	134	31%
Did Not See Doctor in Past Year	37	9%
≥ 2 Activity of Daily Living Difficulties	123	30%
Difficulty Tracking Medications	258	64%
Fell in Past Month	76	18%

540

541 The unweighted NHATS sample who answered at least one of the outcome questions of interest

542 included 422 respondents, representing over 1.8 million older adults with dementia. Results in

543 the rightmost column are adjusted for weights and survey design to provide nationally

544 representative estimates. Other race/ethnicity includes persons who reported their race/ethnicity

26
545 as American Indian, Asian, Native Hawaiian, Pacific Islander, other, do not know, or more than
546 one race/ethnicity. Chronic conditions include reported history of myocardial infarction,
547 hypertension, heart disease, lung disease, diabetes, arthritis, osteoporosis, stroke, or cancer.
548 Dementia was categorized as none, possible, or probable based on a validated algorithm using
549 the NHATS cognitive interview and caregiver report. Report of dementia diagnosis refers to
550 whether the sample person or proxy respondent reported a history of dementia or Alzheimer's
551 disease (separately from their NHATS dementia classification).
552

27

553 **Figure 1:** Overlap of Attitudes Toward Medications and Deprescribing Among Older Adults
554 with Dementia

555

556 **Legend:** Each of the 3 ellipses in the Venn diagram corresponds to one of the attitudinal

557 outcomes (belief about necessity of one's medications, willingness to deprescribe, and

558 discomfort with polypharmacy). The sample giving rise to the Figure comprises subjects who

559 responded to all 3 outcome questions (N=360). In this sample, 25% endorsed believing that they

560 may be taking one or more medicines that they no longer needed, 88% endorsed willingness to

561 stop one or more of their regular medications if a doctor said it was possible, and 49% endorsed

562 being uncomfortable taking 5 or more medications. The percentages incorporate NHATS

563 analytic survey weights, are rounded to the nearest integer, and reflect the proportions of the

564 sample who agreed to various combinations of the outcome prompts. Five percent of the sample

565 who disagreed with all 3 prompts are not depicted; due to these factors as well as rounding, the

566 depicted percentages do not sum to 100%.

28

567 **Figure 2:** Predictors of Medication Attitudes Among Older Adults with Dementia

568

569 **Legend:** Predictors are organized vertically along the left-hand side; attitudinal outcomes are
570 listed at the bottom and organized into three columns. Point estimates represent the adjusted
571 probability of each attitudinal outcome across strata of the predictors, along with 95% confidence
572 intervals. Results are adjusted for weights and survey design to provide nationally representative
573 estimates. Coloring of the bars is to help with ease of viewing of different levels between
574 covariates. Marginal predicted probabilities were estimated via multivariable logistic regression
575 models with adjustment for adjustment for age, sex, chronic conditions, dementia status (possible
576 or probable), proxy status (self-respondent or proxy), and number of medications. Blue
577 background shading denotes predictors associated with attitudinal outcomes at the $p < 0.05$ level
578 based on an F-test examining the overall effect of the predictor of interest when added to a
579 regression model containing the previously mentioned covariates.