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Physician Perspectives on Deprescribing Cardiovascular Medications for Older Adults

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Abstract

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Author Contribution:

Dr. Goyal and Dr. Anderson had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: All authors

Acquisition, analysis, or interpretation of data: Anderson, Goyal, Weissman

Drafting of the manuscript: Anderson and Goyal

Critical revision of the manuscript for important intellectual content: All authors

Statistical analysis: Anderson and Goyal

Administrative, technical, or material support: Steinman and Rich

Study supervision: Steinman and Rich

Background/Objectives: Guideline-based management of cardiovascular disease often involves prescribing multiple medications, which contributes to polypharmacy and risk for adverse drug events in older adults. Deprescribing is a potential strategy to mitigate these risks. We sought to characterize and compare clinician perspectives regarding deprescribing cardiovascular medications across three specialties.

Design: National cross-sectional survey

Setting: Ambulatory

Participants: Random sample of geriatricians, general internists, and cardiologists from the American College of Physicians

Measurements: Electronic survey assessing clinical practice of deprescribing cardiovascular medications, reasons and barriers to deprescribing, and choice of medications to deprescribe in hypothetical clinical cases.

Results: In each specialty, 750 physicians were surveyed with a response rate of 26% for geriatricians, 26% for general internists, and 12% for cardiologists. Over 80% of respondents within each specialty reported that they had recently considered deprescribing a cardiovascular medication. Adverse drug reactions were the most common reason for deprescribing for all specialties. Geriatricians also commonly reported deprescribing in the setting of limited life expectancy. Barriers to deprescribing were shared across specialties and included concerns about interfering with other physicians' treatment plans and patient reluctance. In hypothetical cases, over 90% of physicians in each specialty chose to deprescribe when patients experienced adverse drug reactions. Geriatricians were most likely and cardiologists were least likely to consider deprescribing cardiovascular medications in cases of limited life expectancy (all $p<0.001$) such as recurrent metastatic cancer (84% of geriatricians, 68% of general internists, and 45% of cardiologists), Alzheimer's dementia (92% of geriatricians, 81% of general internists, and 59% of cardiologists), or significant functional impairment (83% of geriatricians, 68% of general internists, and 45% of cardiologists)

Conclusions: While barriers to deprescribing cardiovascular medications are shared across specialties, reasons for deprescribing, especially in the setting of limited life expectancy, varied. Implementing deprescribing will require improved processes for both physician-physician and physician-patient communication.

Keywords

Deprescribing; polypharmacy; cardiovascular medications; variation in care

INTRODUCTION

Cardiovascular medications, such as anti-platelet, antihypertensive, and lipid-lowering agents, are among the most commonly prescribed medication classes in the United States.[1] While the benefits of these medications for reducing primary and secondary cardiovascular events are well established and they are recommended in clinical practice guidelines, they have also contributed to rising rates of polypharmacy and adverse drug events in older adults.[2] As adults age, many develop multiple chronic conditions and impairments in core

domains such as function and cognition. As a result, the risk-benefit profile of cardiovascular medications can change whereby risks may increase and benefits may decrease.[3] Moreover, some cardiovascular medications may not provide any additional value to older adults in select contexts.[4,5] Deprescribing has emerged as a strategy to optimize medication prescribing practice through the discontinuation of agents for which the risks outweigh the benefits in the context of an individual's care goals, level of functioning, life expectancy, values, and preferences.[6] Deprescribing has been shown to reduce polypharmacy and medication-related adverse events,[7] and thus may be particularly applicable to improving cardiovascular medication prescribing practice for older adults.

Although deprescribing has attracted increased attention over the last few years,[8] the real-world practice of deprescribing cardiovascular medications is not well characterized. Physicians report multiple barriers to deprescribing, including lack of awareness, lack of self-efficacy, clinical inertia, and the perception that patients are reluctant to stop medications;[9–13] however, prior literature has primarily examined potentially-inappropriate medications (PIMs) for which high levels of risk outweigh low potential for benefit in many older adults.[14,15] The risk-benefit ratio for cardiovascular medications may seem less clear to clinicians, and frequently depends on the context of the individual older adults' health. Prior studies have focused on primary care physicians' perspectives on deprescribing.[9,10,12] Accordingly, there are important gaps in our knowledge regarding differences in perspectives on deprescribing cardiovascular medications across three specialties that often provide care to older adults.

Understanding specialty-based differences in deprescribing practice and attitudes is important as older adults are frequently co-managed by a geriatrician or general internist and a cardiologist.[16] Identifying discordance between specialties has implications on the use of deprescribing, as disagreements between clinicians could undermine effective implementation. Therefore, we sought to determine how frequently physicians from different specialties reported deprescribing cardiovascular medications in their clinical practice, to identify reasons for and barriers to deprescribing, and to compare medication deprescribing priorities across disciplines. To meet this objective, we surveyed a national sample of geriatricians, general internists, and cardiologists from the American College of Physicians (ACP) membership list.

METHODS

Study sample

We surveyed a random sample of 750 geriatricians, 750 general internists, and 750 cardiologists from the ACP membership list. ACP is the second-largest medical-specialty organization in the United States, comprising approximately 120,000 physicians who have completed internal medicine residency training; this includes geriatricians, general internists, and cardiologists among other medical specialties. From July-September 2018, an ACP administrator contacted potential respondents using a standardized email invitation with an embedded link to complete a 24-question web-based survey inquiring about their practice and perspectives relating to deprescribing cardiovascular medications. Participants were offered a $10 honorarium to complete the survey. Between July and September 2018,

potential respondents were contacted every 2-3 weeks up to eight times until either they completed the survey or the survey period ended. Responses were collected anonymously, and member email addresses were not released to the study team. We excluded respondents who reported that they were not clinically active, did not provide ambulatory care, were trainees, and did not practice geriatrics, general internal medicine, or cardiology. This research study was approved by the Weill Cornell Institutional Review Board.

Survey design

This survey was designed by investigators who attended a multidisciplinary workshop on pharmacotherapy in older adults with cardiovascular disease co-sponsored by the National Institute on Aging, the American College of Cardiology, and the American Geriatrics Society.[16] Study team members spanning multiple disciplines (geriatrics, general internal medicine, cardiology, and pharmacy) and training levels (fellows-in-training, early-stage investigators, and senior faculty) from across the United States jointly developed a 24-question survey assessing perspectives on deprescribing cardiovascular medications in older adults. The survey was internally tested prior to dissemination.

Respondents were first asked four screening questions to confirm eligibility. Respondents were then asked a series of questions designed to assess deprescribing practices in the prior month, the most common reasons for deprescribing, and the most common barriers to deprescribing. Because patients frequently receive medications from multiple physicians,[17] respondents were asked about whether they considered deprescribing in their practice and whether they considered discussing deprescribing with another physician. Answer choices were based on previously published physician-based facilitators and barriers to deprescribing.[9,10,12,13] The sequence of answer choices was randomly assigned for each respondent to mitigate bias related to the order of answer choices.

Acknowledging that deprescribing practice could result from differences in the patient populations cared for by different specialists (e.g. geriatricians often care for patients that are older and/or more frail than do general internists), we sought to characterize differences in deprescribing practices across specialties by providing identical hypothetical patient scenarios to each respondent. Respondents were presented a clinical case of a 79-year-old woman with multiple chronic conditions who took several medications, including four cardiovascular medications. Respondents were asked to identify which (if any) cardiovascular medications they would consider deprescribing for nine clinical scenarios of the same patient with varied concerns, clinical events, and additional past medical history. Clinical scenarios incorporated several circumstances where the patient had no concerns, where the patient was symptomatic from a possible adverse drug reaction (lightheadedness with a recent fall, orthostatic symptoms, or hypotension), and where the patient had a limited life expectancy (recent metastatic recurrence of breast cancer, transfer to a skilled nursing facility with a new diagnosis of Alzheimer’s dementia, increased difficulty in activities of daily living, and age of 90 years).

Lastly, to determine the generalizability of our findings, all respondents were asked to provide demographic information, years in practice, prior training, and current clinical practice setting. The complete survey is provided in the Supplemental Appendix.

Statistical analysis

We determined descriptive characteristics of respondents by specialty, and compared them to the entire survey sample using chi-square for categorical variables. We determined the proportion of each specialty that considered deprescribing, their reported reasons for deprescribing, and their reported barriers to deprescribing. For hypothetical cases, we determined the proportion of respondents in each specialty who would deprescribe any cardiovascular medication and the proportion who would deprescribe any of the following cardiovascular medications: aspirin, atorvastatin, lisinopril, and metoprolol. We used chi-square analysis to test for statistical significance of differences between specialties, using a threshold $p < 0.05$. We performed all analyses using Stata version 14.

RESULTS

Among an overall sample of 2250 ACP members, 572 (25%) completed the survey. Among respondents, 119 were excluded for the following reasons: 67 were not clinically active, 29 did not provide ambulatory care, 8 were trainees, and 15 practiced other specialties. This resulted in an overall response rate of 21% (453/2131). The response rate was 26% for geriatricians, 26% for general internists, 12% for cardiologists (p<0.001). Respondents did not differ in age or gender from the sample surveyed; however, respondents were significantly more likely to have graduated from a United States medical school (Supplemental Table).

Table 1 shows respondent characteristics. All census regions were well-represented. The majority of the respondents had at least 20 years of clinical experience, and most spent over 75% of their time providing patient care. A third of respondents practiced in an academic-affiliated setting. A smaller proportion of cardiologist respondents were female and reported working exclusively in the outpatient setting compared to other specialties.

Consideration of deprescribing

Over 80% of respondents within each specialty reported that they had considered deprescribing a cardiovascular medication in the prior month (Figure 1A). Among all specialties, the most common reason to consider deprescribing was adverse drug reactions (Figure 1B). Low likelihood to confer benefit due to a limited life expectancy was a common reason to consider deprescribing in the prior month among geriatricians (73%), but was not common among general internists (37%) or cardiologists (14%). No other reasons to consider deprescribing exceeded 50% for any specialty. Among the less common reasons to consider deprescribing, geriatricians more frequently reported concerns about cognition (26% of geriatricians, 13% of general internists, and 9% of cardiologists; p-value<0.001) and less frequently reported a lack of apparent indication (18% of geriatricians, 30% of general internists, and 30% of cardiologists; p-value=0.025) and medication cost (7% of geriatricians, 21% of general internists, and 31% of cardiologists; p-value<0.001) compared to other specialties.

Discussing deprescribing with other physicians

In the prior month, 55% of geriatricians, 38% of general internists, and 41% of cardiologists reported discussing deprescribing a cardiovascular medication with another clinician (p=0.005) (Figure 2A). The most common reason for discussing deprescribing with another physician irrespective of specialty was adverse drug reactions (Figure 2B). Notably, geriatricians were more likely to report limited life expectancy as a reason for discussing deprescribing with another clinician compared to other specialties (73% of geriatricians, 37% of general internists, and 14% of cardiologists; p-value=0.001).

Barriers to deprescribing

The most common barriers to deprescribing cardiovascular medications were similar across specialties and included concern about interfering with other clinicians' treatment plans, patient reluctance for deprescribing, and lack of patient understanding of deprescribing (Figure 3). Other potential reasons such as those related to time constraints, medico-legal concerns, insufficient evidence base, and limited training were infrequently reported. Among the less commonly-reported barriers to deprescribing, geriatricians were less likely to report insufficient evidence of deprescribing efforts as a barrier compared to other specialties (8% of geriatricians, 19% of general internists, and 24% of cardiologists; p-value<0.001), and less likely to report limited formal training on deprescribing (2% of geriatricians, 16% of general internists, and 6% of cardiologists; p-value<0.001) compared to other specialties.

Case-based deprescribing practices

Table 2 shows medications which respondents would consider deprescribing in hypothetical scenarios involving a 79-year-old woman taking four cardiovascular medications. In the base case where the patient had no specific concerns, 41% of geriatricians, 25% of general internists, and 23% of cardiologists reported that they would consider deprescribing at least one cardiovascular medication. For scenarios in which the patient was symptomatic from a potential adverse drug reaction (lightheadedness with a recent fall, orthostatic symptoms, or hypotension), 92-99% of respondents from each specialty would consider deprescribing at least one cardiovascular medication. For scenarios related to a limited life expectancy, responses were more heterogeneous across specialties. Recent metastatic recurrence of breast cancer (84% of geriatricians, 68% of general internists, and 45% of cardiologists; p-value <0.001), transfer to a skilled nursing facility with a new diagnosis of Alzheimer's dementia (92% of geriatricians, 81% of general internists, and 59% of cardiologists; p-value <0.001), and increased difficulty in activities of daily living (83% of geriatricians, 65% of general internists, and 49% of cardiologists; p-value <0.001) were more commonly reported as reasons to consider deprescribing by geriatricians compared to other specialties. Notably, a higher proportion of cardiologists considered deprescribing for an asymptomatic 90-year old compared to any of the other limited life expectancy scenarios

There was substantial variation across the specialties regarding the medications that they would consider deprescribing (Table 2). Aspirin and statins were commonly considered for deprescribing among geriatricians in several scenarios, while they were infrequently considered for deprescribing among cardiologists. Cardiologists also less frequently considered deprescribing metoprolol in several scenarios compared to other specialties.

DISCUSSION

This national physician survey showed that geriatricians, general internists, and cardiologists frequently consider deprescribing cardiovascular medications in the setting of adverse drug reactions, but variably consider deprescribing in the setting of other circumstances like limited life expectancy. We also found that physicians report similar barriers to deprescribing irrespective of specialty. These findings extend prior studies on physician attitudes toward deprescribing by specifically examining cardiovascular medications and comparing perspectives across three specialties from a national sample. Our results have important implications for future efforts to promote deprescribing as a strategy to optimize the use of cardiovascular medications and to provide quality comprehensive patient-centric care to older adults.

While deprescribing is important after a new symptom or adverse drug reaction occurs, stopping medications only after they have caused a negative outcome is unlikely to significantly stem the ongoing risks of polypharmacy and the complex medication regimens endemic to older adults. A recent systematic review showed that an active process of targeted patient-specific deprescribing interventions can safely reduce total medication burden and potentially reduce mortality,[18] supporting the role of deprescribing in select circumstances. To make significant progress toward decreasing rates of adverse drug events, it is important to adopt a more proactive approach to medication management. For example, for individuals with limited life expectancy, the benefits of many cardiovascular medications may be diminished or even absent,[16,19] while the risk for adverse drug events in the setting of functional and/or cognitive impairment may be elevated.[20–22] Consequently, the harms of polypharmacy and risk of adverse drug events posed by continuing multiple preventative cardiovascular medications may outweigh the benefits for some older adults, such as those with dementia and those who struggle with performing their activities of daily living. Our finding that specialties varied in the frequency with which they considered deprescribing in these scenarios implies that there may be additional factors such as those related to training, experience, and/or patient expectations that affect whether and to what extent different specialists consider deprescribing. In addition, there may be variability with regard to the way life expectancy is evaluated and incorporated into decision-making. For example, cardiologists were more likely to consider deprescribing for a 90-year old woman compared to any of the other limited life expectancy scenarios, suggesting that chronological age may supersede physiological age when making decisions in some situations. In light of these observations, efforts to generate evidence supporting the potential benefits and safety of deprescribing cardiovascular medications remain important, but may not be sufficient to improve prescribing practice for many older adults. There appears to be a need to sensitize clinicians to the growing body of evidence supporting the potential role of deprescribing, an effort that has begun in the cardiology community.[6] In addition, effective implementation strategies that can incorporate risk-benefit assessments, elicitation of health priorities, and deprescribing processes into routine clinical care in the primary and specialty care settings are much needed.[8,16]

We also found that medical specialties differed in the medications that they would consider deprescribing. Cardiologists less frequently considered deprescribing statins and/or aspirin

in several scenarios compared to geriatricians or general internists. Historically, data on preventing cardiovascular events in older adults have been limited by the exclusion of older adults from clinical trials.[23] While statins for primary prevention are well studied in adults less than 75 years of age, data in adults over age 75 are limited and have shown little benefit.[4] There were similar gaps in knowledge regarding the use of aspirin for primary prevention in older adults until recently.[5] Reasons for reluctance toward deprescribing statins and aspirin in the absence of robust data supporting their benefits, especially when life expectancy is limited and exceeded by the time horizon to benefit, merit additional investigation. Whether the ASPREE trial, which was published after conduct of this survey and showed that aspirin for primary prevention in older adults may be harmful,[5] will alter prescribing (and deprescribing) behavior remains to be seen. Tools like the Screening Tool of Older Persons Prescriptions in Frail adults with limited life expectancy (STOPPFRAIL)[19] could assist clinicians with identifying cardiovascular medications that provide limited benefit. Additionally, guidelines for safe methods of deprescribing cardiovascular medications are also needed; guidelines for deprescribing other medication classes have been developed, and could provide a useful starting point.[24–26]

We found that barriers to deprescribing were diverse but consistent across specialties and largely consistent with prior surveys of primary care physicians' perspectives on deprescribing PIMs.[9,10,12] Importantly, interfering with another clinicians' treatment plan was the most frequently reported barrier to deprescribing cardiovascular medications, extending observations from other countries.[10] This concern is especially important within the United States healthcare system where fragmentation is common[27] and older adults routinely see multiple physicians.[17] Thus, shared communication between specialties is crucial for cardiovascular medications, which may be co-managed by geriatricians, general internists, and/or cardiologists. Yet, our study found that fewer than 60% of geriatricians and 50% of general internists and cardiologists communicated with other clinicians about deprescribing cardiovascular medications when concerns arose. Some clinicians may have been comfortable with deprescribing without discussion with another clinician, especially those who believed that cardiovascular medications were in their purview of care. However, given the prevalence of adverse drug events among older adults, these findings point to a potential gap in care. When considering deprescribing, cross-specialty communication may be valuable, as different specialties can offer different perspectives regarding the potential risks and benefits of continuing or discontinuing medications. Interestingly, cardiologists reported concerns about interfering with other clinicians as a barrier to deprescribing medications that would typically fall under their purview. The reason for this observation was not clear, but could relate to a diffusion of responsibility. This highlights the complexities regarding the roles and responsibilities of specialists when it comes to deprescribing, and identifies an important area of research that warrants further investigation. Taken together, our findings provide additional empirical evidence for the need to develop deprescribing protocols that incorporate formal processes of interdisciplinary communication.[18,28] Pharmacist involvement, as was studied in the recent D-PRESCRIBE[28] randomized controlled trial, could offer a particularly appealing strategy to bridge these communication gaps and should be examined as a potential strategy to combat this important barrier to deprescribing.

The second most common barrier to deprescribing reported by physicians was patient reluctance, which is consistent with findings from older studies evaluating physician-reported barriers.[10] Importantly, this commonly held perception might not actually reflect patient attitudes toward deprescribing. In a recent analysis of the National Health and Aging Trends Study, the majority of older adults reported willingness to stop at least one of their medications if their physician said it was possible.[29] While it did not specifically assess attitudes toward cardiovascular medications or specify between primary and secondary prevention, that study coupled with our findings highlight a potentially important incongruity between patient attitudes and physician perceptions on deprescribing. This incongruity can erode patient-physician communication regarding deprescribing, and subsequently impair the shared decision-making process necessary for deprescribing.[13] Accordingly, our findings support the need to increase physician awareness about the role of deprescribing in providing patient-centered care, and the need to develop tools that can facilitate patient-physician communication about deprescribing.

A major strength of this study is the examination of a national sample of physicians drawn from a large medical-specialty organization in the United States. Respondents were diverse in age, practice setting, and geographic region. However, our findings should be interpreted in light of several limitations. First, the overall response rate to the survey was low, especially among cardiologists. Low response rates for surveys are common, and not specific to deprescribing. Nonetheless, it is possible that the low response rate here could reflect limited knowledge or perhaps even a lack of interest in this topic., Respondent characteristics were similar to the full sample. However, those who did not respond to the survey may have different perspectives on deprescribing compared to respondents who may have been more familiar with and/or more interested in the concept of deprescribing. Accordingly, our findings likely overestimate physician willingness to consider deprescribing, and probably represent the best-case scenario for the different specialties. Second, our findings were subject to social desirability bias as they were based on physician self-report. Third, differences in reported deprescribing practices between specialties may have reflected differences in the patient populations cared for by each specialty. To address this, our survey included identical hypothetical cases which allowed us to directly compare reported deprescribing practices across specialties. Fourth, our survey did not examine perspectives on who is responsible for deprescribing, or respondent familiarity with the concept of clinical inertia as it relates to medication prescribing practice; these areas will be important to explore in future work.

CONCLUSIONS

In this national survey, geriatricians, general internists, and cardiologists frequently considered deprescribing cardiovascular medications in the setting of adverse drug reactions. We also found that the frequency of other reasons for deprescribing like limited life expectancy varied substantially between specialties. In addition, shared barriers to deprescribing included interfering with another physicians' plan of care and perceived patient reluctance toward deprescribing. Though these findings should be interpreted cautiously due to a low survey response rate, these findings indicate that the development and implementation of communication strategies across physician specialties and with

patients are necessary to implement deprescribing cardiovascular medications as a effort to improve medication safety and mitigate polypharmacy.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Conflicts of Interests:

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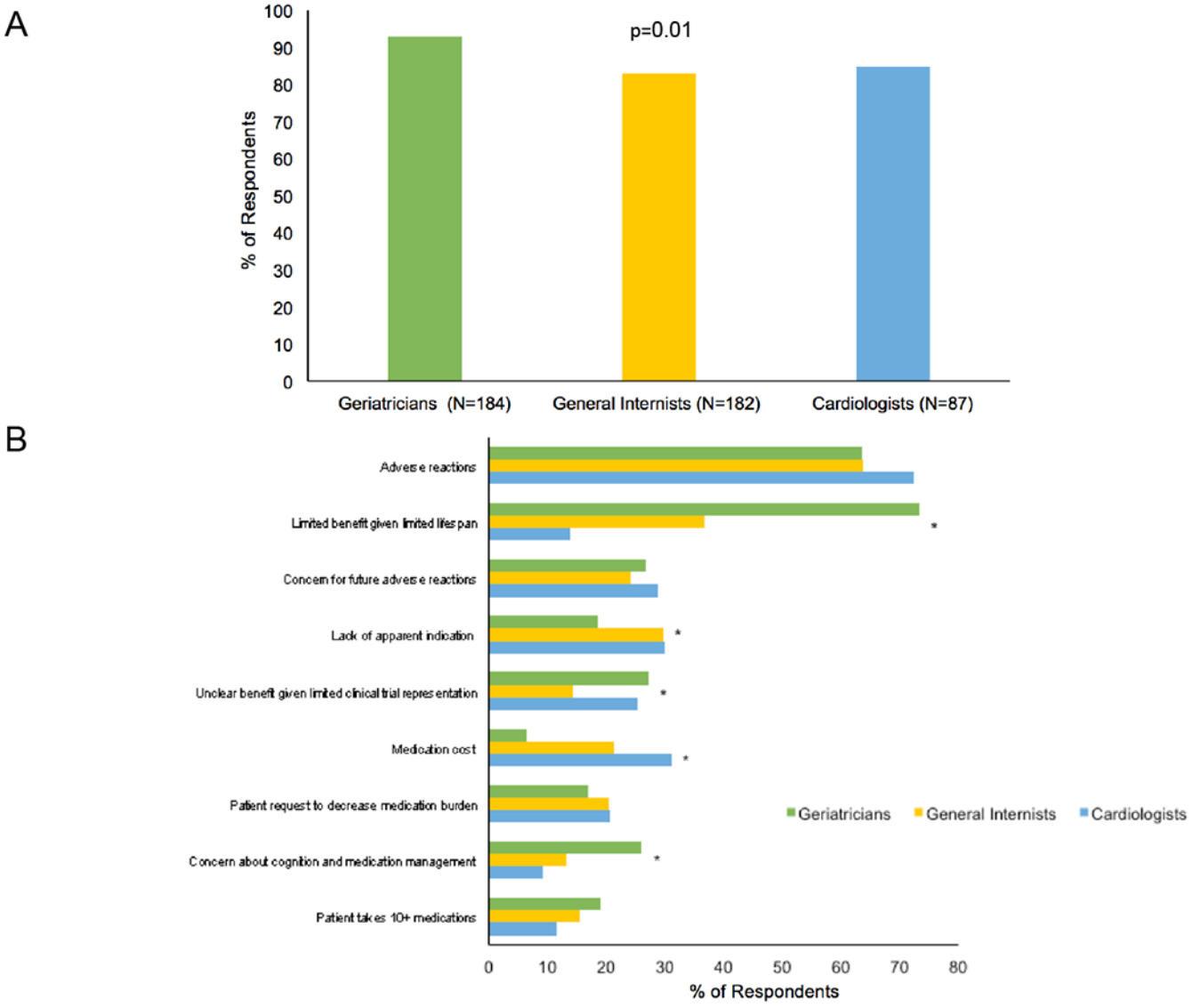

Figure 1.

Deprescribing behavior according to specialty

A. Percent of respondents that considered deprescribing cardiovascular medications in the prior month

B. Reported reasons for considering deprescribing cardiovascular medications (* indicates p-value<0.05)

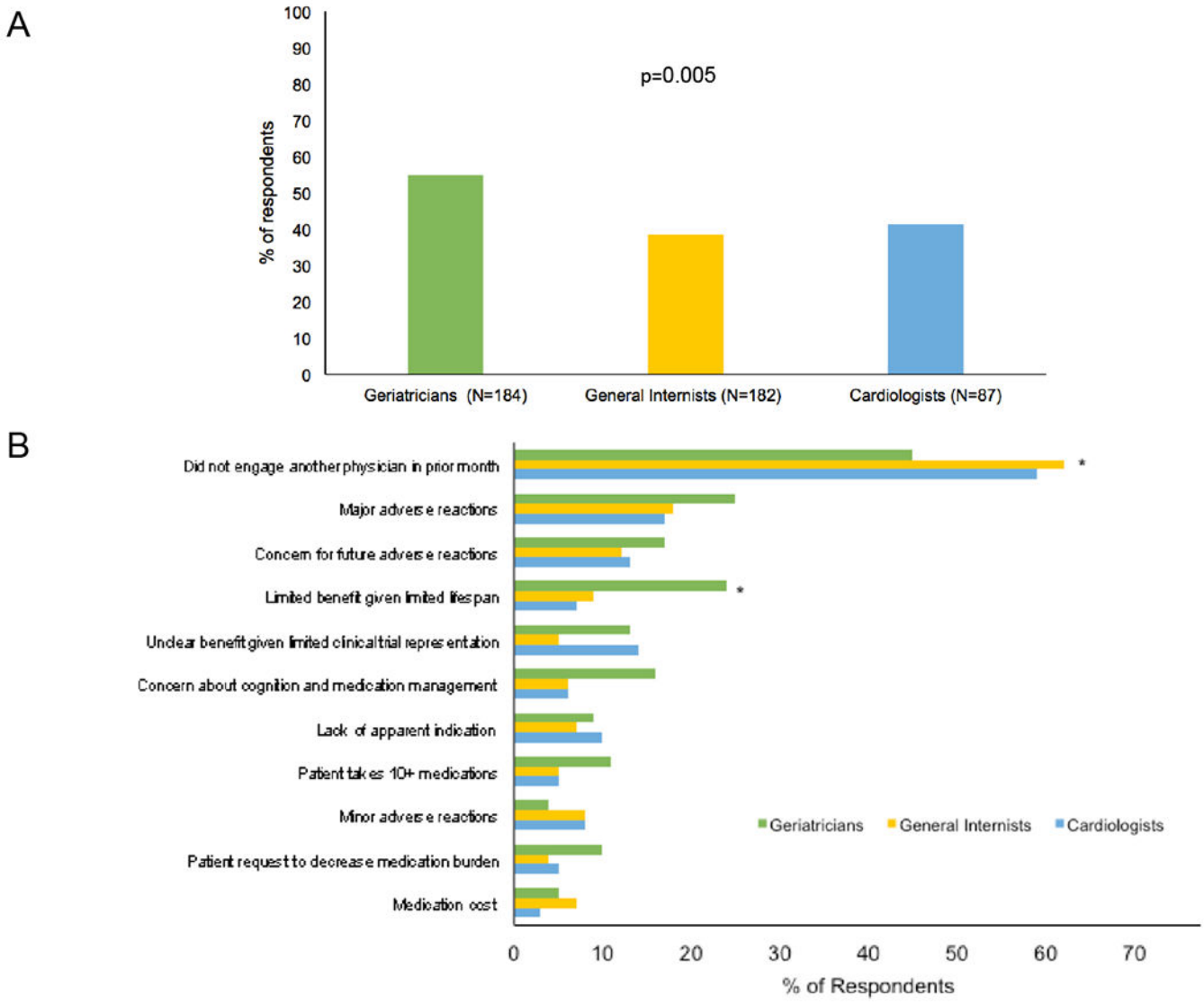

Figure 2.

Physician-physician communication about deprescribing cardiovascular medications according to specialty

A. Percent of respondents that discussed deprescribing cardiovascular medications with another clinician in the prior month

B. Reported reasons for discussing deprescribing cardiovascular medications with another clinician (* indicates p-value<0.05)

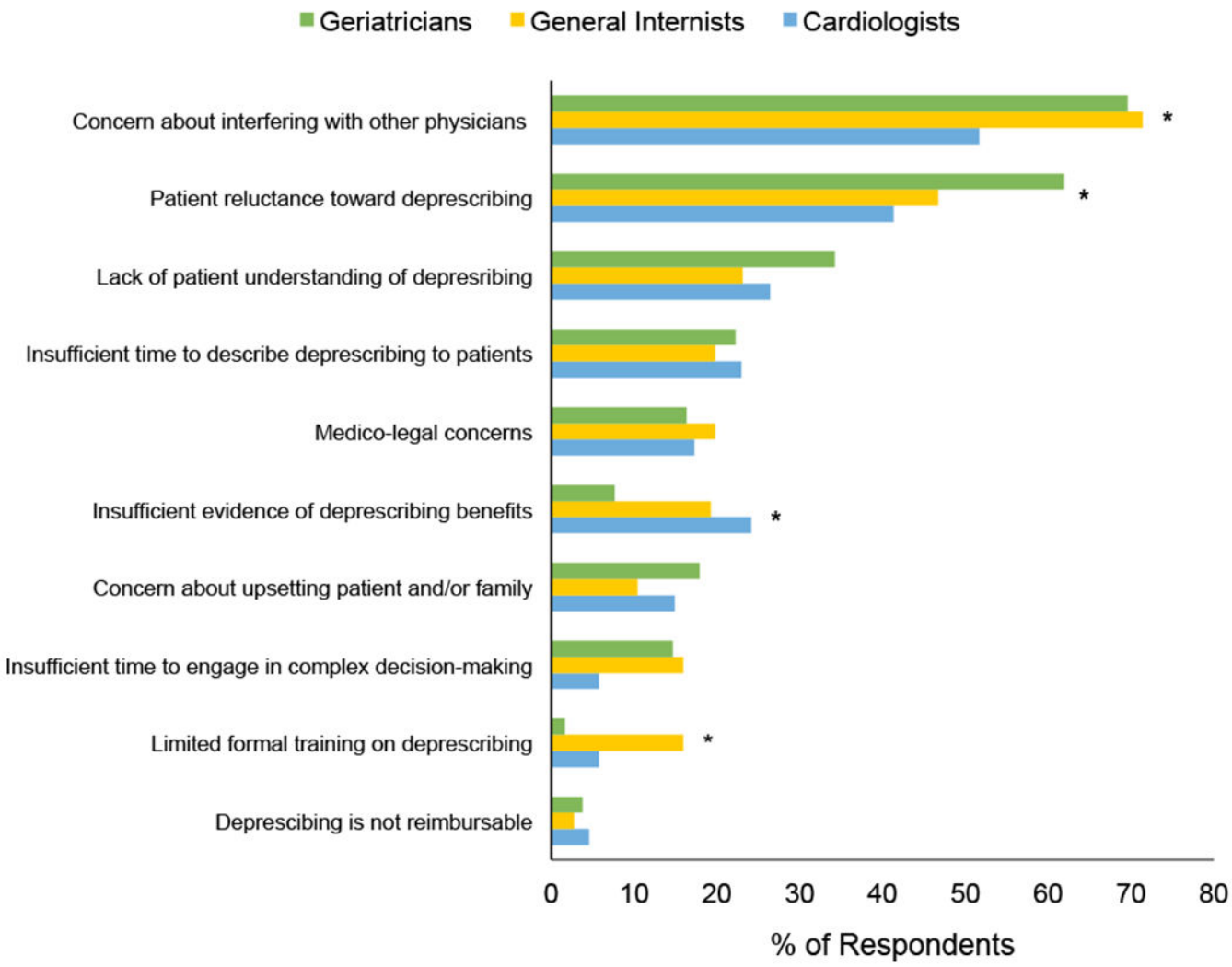

Figure 3.
Reported barriers to deprescribing cardiovascular medications according to specialty (* indicates p-value<0.05)

Table 1.

Respondent Characteristics by Specialty

No. (%)	Geriatricians (N=184)	General Internists (N=182)	Cardiologists [a] (N=87)
Provider characteristics			
Female	82 (45)	86 (47)	11 (13)
Foreign medical graduate	22 (12)	22 (12)	9 (10)
Years of practice			
1-10 years	38 (21)	34 (19)	14 (18)
11-20 years	41 (22)	43 (24)	15 (17)
21-30 years	47 (26)	69 (38)	22 (25)
>30 years	58 (32)	36 (20)	36 (41)
Percent of time in patient care			
<25%	21 (11)	8 (4)	8 (9)
25-49%	29 (16)	11 (6)	5 (6)
50-74%	35 (19)	26 (14)	10 (11)
>75%	99 (54)	137 (75)	64 (73)
Practice characteristics			
Primary work environment			
Outpatient only	104 (57)	121 (66)	12 (14)
Primarily outpatient, some inpatient	68 (37)	52 (29)	50 (57)
Primarily inpatient, some outpatient	12 (7)	9 (5)	25 (29)
Practice type			
Academic medical center	67 (36)	32 (18)	23 (26)
Academic medical center affiliate hospital	18 (9)	21 (12)	11 (13)
Non-academic hospital or consortium	4 (2)	7 (4)	8 (9)
Hospital-owned practice	18 (10)	38 (21)	12 (14)
Independent large group practice	27 (15)	31 (17)	8 (9)
Independent small group or solo practice	30 (16)	37 (20)	22 (25)
Other	21 (11)	16 (9)	3 (3)
Census region			
West	40 (22)	46 (25)	21 (24)
Midwest	29 (16)	40 (22)	13 (15)
South	55 (30)	55 (30)	24 (28)
Northeast	60 (33)	40 (22)	29 (33)

[a]Reported cardiology sub-specialties included general cardiology (n=61), interventional (n=14), electrophysiology (n=7), heart failure (n=4), and other cardiology specialty (n=1).

Table 2.

Deprescribing Practices in Hypothetical Clinical Scenarios

	Any deprescribing, %				Deprescribing specific medications, %				
	Geriatricians	General Internists	Cardiologists	P-value		Geriatricians	General Internists	Cardiologists	P-value
Patient with no specific concerns	41	25	23	<.001	Aspirin	17	5	8	.001
					Atorvastatin	18	11	5	.006
					Lisinopril	4	2	1	.17
					Metoprolol	21	14	15	.14
Patient with history of myocardial infarction and stent placement 6 years prior	13	8	11	.30	Aspirin	3	1	1	.45
					Atorvastatin	4	3	5	.65
					Lisinopril	3	1	1	.13
					Metoprolol	8	4	8	.19
Patient expresses desire to decrease the number of pills	85	69	57	<.001	Aspirin	30	16	10	<.001
					Atorvastatin	48	31	10	<.001
					Lisinopril	5	4	7	.69
					Metoprolol	45	34	35	.06
Symptomatic scenarios									
Recent hospitalization with lightheadedness and a fall	96	94	92	.46	Aspirin	22	20	9	.04
					Atorvastatin	9	3	1	.003
					Lisinopril	46	28	39	.002
					Metoprolol	82	82	64	.002
Patient reports orthostatic symptoms	99	99	93	.004	Aspirin	13	5	2	.005
					Atorvastatin	8	3	0	.006
					Lisinopril	67	47	62	.001
					Metoprolol	79	86	56	<.001
Patient blood pressure is routinely 90s/60s	99	99	95	.03	Aspirin	17	3	3	<.001
					Atorvastatin	13	4	0	<.001
					Lisinopril	91	72	71	<.001
					Metoprolol	85	91	68	<.001

	Any deprescribing, %				Deprescribing specific medications, %				
	Geriatricians	General Internists	Cardiologists	P-value		Geriatricians	General Internists	Cardiologists	P-value
Limted life expectancy scenarios									
Patient is diagnosed with a recurrence of metatstic breast cancer	84	68	45	<.001	Aspirin	40	21	13	<.001
					Atorvastatin	77	57	26	<.001
					Lisinopril	22	14	13	.045
					Metoprolol	33	26	18	.03
Patient moves to a skilled nursing facility due to her Alzheimer's disease	92	81	59	<.001	Aspirin	51	29	15	<.001
					Atorvastatin	86	70	43	<.001
					Lisinopril	26	16	11	.009
					Metoprolol	49	40	26	.001
Patient's children report concerns about difficulty with activities of daily living	83	65	49	<.001	Aspirin	34	16	10	<.001
					Atorvastatin	61	43	23	<.001
					Lisinopril	16	6	9	.006
					Metoprolol	49	37	36	.04
Patient is 90 years old	88	85	72	.01	Aspirin	45	37	23	.002
					Atorvastatin	78	70	49	<.001
					Lisinopril	27	23	21	.42
					Metoprolol	46	41	36	.28