

Knowledge, Attitudes, and Behaviors Regarding Pneumococcal Vaccines in Adults 65 Years and Older in Primary Care in Wisconsin

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ABSTRACT

Introduction: Although shared decision-making is highly valued, its implementation in clinical practice is suboptimal. Shared decision-making was included in the Centers for Disease Control and Prevention (CDC) recommendations for the pneumococcal conjugate vaccine 13 valent for older adults. As a first step to develop and test clinician educational resources to facilitate shared decision-making for pneumococcal vaccines for older adults, we completed a needs assessment to identify knowledge gaps, attitudes, and behaviors.

Methods: Primary care clinicians, pharmacists, and patient care staff completed a questionnaire on shared decision-making and pneumococcal vaccines. After the CDC recommended new pneumococcal vaccines and eliminated the role of shared decision-making, a revised questionnaire was distributed to additional clinicians in an effort to increase the sample size.

Results: Knowledge of pneumococcal vaccine recommendations was high among those who responded to knowledge questions (48 of 75 respondents). Although 96% of respondents believed shared decision-making for use of pneumococcal vaccines in adults 65 years or older was feasible, 25% responded that it would be “somewhat difficult” to explain potential harms and benefits of PCV13.

Discussion: Although shared decision-making was reported to be feasible, challenges implementing it are ongoing. Knowledge gaps regarding pneumococcal vaccines were observed, highlighting the need for ongoing medical education with changing vaccine recommendations.

INTRODUCTION

Shared decision-making (SDM), the process by which clinicians and patients make health-related decisions together based on available evidence, is a component of patient-centered care.¹ Despite clinicians placing a high value on SDM, its implementation in

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clinical practice continues to be suboptimal, with inconsistencies in application of its core elements.¹⁻⁴

In 2019, the US Centers for Disease Control and Prevention (CDC) recommended that the use of the pneumococcal conjugate vaccine 13 valent (PCV13; Pevnar13) be “based on shared clinical decision-making for adults 65 years or older who do not have an immunocompromising condition, cerebrospinal fluid leak, or cochlear implant and have never received a dose of PCV13.”⁵ Since 2012, CDC recommendations for PCV13 to protect adults 65 years and older against pneumococcal disease have been modified multiple times.^{5,6} Multiple changes in recommendations likely contribute to gaps in clinician knowledge of adult pneumococcal vaccine recommendations, which may be a factor in suboptimal coverage

rates for pneumococcal vaccines.⁵⁻⁹

This project, designed in 2020, aimed to develop and subsequently evaluate clinician educational materials to facilitate SDM for PCV13 in adults 65 years or older. The project began with a needs assessment to understand knowledge gaps, attitudes, and behaviors related to use of SDM and pneumococcal vaccines. Given the SARS-CoV-2 pandemic, we also asked about coronavirus vaccines and use of telehealth for SDM.

METHODS

Needs Assessment Development

As a first step in the development of clinician education materials, the study team developed a 20-question online needs assessment in Qualtrics (Provo, Utah) for knowledge, attitudes,

and behaviors regarding SDM and pneumococcal vaccines (See Appendix A).¹⁰ Answers to the knowledge questions and supporting references were provided at the end of the questionnaire after submission of responses.

Questionnaire Dissemination and Analysis

In order to reach a broad audience of health care professionals in primary care throughout Wisconsin and in a large health care system, the questionnaire link was disseminated by email during April 2021 to August 2021 to approximately 1200 persons in the Wisconsin Research and Education Network (WREN), UW Health clinicians in the University of Wisconsin-Madison Department of Family Medicine and Community Health (mailing list of 300), and the Pharmacy Practice Enhancement and Action Research Link (PearlRx) of Wisconsin (600 members). We revised our questionnaire after a CDC meeting in October 2021, which resulted in new recommendations for pneumococcal vaccines that did not include SDM or PCV13, given that we wished to collect additional responses.⁹ Revisions included removing questions on SDM and PCV13 that were no longer relevant and asking which new pneumococcal vaccines would be used by their clinic or health care system (Appendix A). The revised questionnaire was disseminated to a smaller group of clinicians at UW Health General Internal Medicine (GIM) during December 2021 to January 2022 through a targeted email in an effort to reach an audience different from those who responded to the initial questionnaire. A maintenance of certification (MOC) Part IV toolkit and a continuing education lecture were developed.¹¹

Descriptive results were analyzed with Qualtrics using all responses. Write-in responses to open-ended questions were compiled.

The project was reviewed by the University of Wisconsin-Madison Institutional Review Board.

RESULTS

Initial Questionnaire

A total of 75 health care professionals began the original questionnaire; however, only 48 continued the questionnaire beyond the knowledge questions. Respondents practiced in a variety of set-

Table 1. Demographic Data of Questionnaire Respondents

	Initial Questionnaire Respondents		Revised Questionnaire Respondents	
	n	%	n	%
Respondent occupation/job title (single best answer)	75	–	27	–
Physician (including residents)	30	40	18	67
Nurse	0	0	0	0
Pharmacist	36	48	0	0
Medical assistant	2	3	0	0
Physician assistant	5	7	4	15
Public health professional	1	1	0	0
Other, please describe	0	0	0	0
Nurse practitioner	1	1	5	19
Where respondents provide clinical services ^a	72	–	27	–
Rural clinic	13	18	1	4
Urban clinic	20	28	20	74
Hospital-based clinic	18	25	6	22
Public health clinic	0	0	0	0
Federally Qualified Health Center	6	8	0	0
Other, please describe	7	10	0	0
Tribal clinic	0	0	0	0
Pharmacy	21	29	0	0
Number of years in clinical practice	72	–	27	–
0–5 years	17	24	6	22
6–10 years	11	15	5	19
>10 years	41	57	16	59
Resident or in other training program	2	3	0	0
Not applicable	1	1	0	0
Age groups are vaccinated in your practice ^a	72	–	–	27
0–10 years old	45	62	1	2
11–17 years old	47	65	27	100
18–64 years old	66	92	27	100
>65 years	67	93	27	100
Not applicable	3	4	0	0

^aMore than 1 response could be selected.

Table 2. Results of the Initial Questionnaire Knowledge Questions

	Correct Responses
Number of adults need to be vaccinated with PCV13 to prevent 1 case of:	
CAP	28%
IPD	17%
Percent decrease in risk of CAP or IPD a healthy adult aged 65 years or older would get from being vaccinated with PCV13 for:	
CAP	21%
IPD	46%
True/False. The CDC recommends shared decision-making for PCV13 vaccination for healthy persons aged 65 years and older (ie, who do not have an immunocompromising condition, cerebrospinal fluid leak, or cochlear implant).	81%
True/False. In a clinical study, the PCV13 vaccine demonstrated 94% efficacy against vaccine-type pneumococcal pneumonia in adults 65 years and older.	77% ^a
True/False. The pediatric pneumococcal vaccination program that was started in 2010 is associated with a reduction in the risk for IPD in adults aged 65 years and older.	44%
I am not familiar with this information regarding PCV13.	28%

Abbreviations: PVC13, pneumococcal 13-valent conjugate vaccine; CAP, community-acquired pneumonia; IPD, invasive pneumococcal disease.

^aBased on assertion that respondents purposely (and correctly) left the choice unchecked to indicate it was false.

Table 3. Results of the Initial and Revised Questionnaire Attitude and Behavior Questions

	Initial Questionnaire	Revised Questionnaire	Combined Results		Initial Questionnaire	Revised Questionnaire	Combined Results
How important is the prevention of invasive pneumococcal disease (eg, sepsis and/or meningitis) to your patients 65 years and older?				Revised question: How have you conducted discussions re: pneumococcal vaccinations with your patients older than 65 years?^a			
Not at all important	0%	0%	0%	I only discuss the PCV13 vaccine if a patient asks about this vaccine.	—	0%	—
Slightly important	6%	8%	7%	I routinely offer the PCV13 vaccine to my patients.	—	100%	—
Moderately important	15%	20%	16%	I have provided written information re: the PCV13 vaccine (eg, brochures, leaflets, etc).	—	0%	—
Very important	50%	36%	45%	I have discussed details and/or answered questions when a patient expressed vaccine hesitancy re: the PCV13 vaccine.	—	0%	—
Extremely important	29%	36%	32%	I have had discussions about the potential benefits and harms of the PCV13 vaccine.	—	0%	—
How strongly do you usually recommend the PCV13 vaccine for your patients 65 years and older?				Other. Please explain your answer.			
Do not recommend	0%	—	—	I have not discussed PCV13 vaccinations with my patients.	—	0%	—
Weakly discourage	2%	—	—				
Neutral, neither recommend or discourage	10%	—	—				
Weakly recommend	25%	—	—				
Strongly recommend	63%	—	—				
Revised question: Do you think it is worthwhile to give pneumococcal vaccines to your patients 65 years and older?				Is it feasible to implement SDM re: the PCV13 vaccine in your clinical practice?			
Do not recommend	—	0%	—	Yes	96%	—	—
Weakly discourage	—	0%	—	No	4%	—	—
Neutral, neither recommend or discourage	—	0%	—	How difficult is it (or would it be) to explain the potential benefits and harms of PCV13 to your older patients?			
Weakly recommend	—	4%	—	Very easy	19%	—	—
Strongly recommend	—	96%	—	Somewhat easy	36%	—	—
Do you think it is worthwhile to give the PCV13 vaccination to your patients 65 years and older?				Revised question: How difficult is it (or would it be) to explain the potential benefits and harms of pneumococcal vaccine(s) to your older patients?			
Yes	71%	—	—	Very easy	—	44%	—
Maybe	27%	—	—	Somewhat easy	—	32%	—
No	1%	—	—	Neither easy nor difficult	—	24%	—
Revised question: Do you think it is worthwhile to give pneumococcal vaccines to your patients 65 years and older?				During telemedicine visits, how difficult is it (or would it be) to explain the potential benefits and harms of PCV13 to your patients older than 65 years?			
Yes	—	100%	—	Very easy	17%	—	—
Maybe	—	0%	—	Somewhat easy	27%	—	—
No	—	0%	—	Neither easy nor difficult	33%	—	—
Given the potentially severe respiratory complications of SARS-CoV-2 infection, have your attitudes toward PCV13 vaccine in older adults changed since the onset of the pandemic?				Which of the following practices re: immunizations are used by you or your clinic?			
No	77%	—	—	Assess immunization needs of patients at every clinical encounter	72%	88%	78%
Yes. Please explain your answer.	23%	—	—	Use standing orders for vaccines based on established recommendations	72%	72%	72%
Revised question: Given the potentially severe respiratory complications of SARS-CoV-2 infection, have your attitudes toward pneumococcal vaccines in older adults changed since the onset of the pandemic?				Use electronic health records or other systems to automatically remind patients and clinic staff when vaccinations are due			
No	—	84%	—	Conduct special events to increase patient access to immunizations (eg, flu shot clinics, drive-through vaccinations, etc)	72%	92%	79%
Yes. Please explain your answer	—	16%	—	Offer patients older than 65 years the PCV13 vaccine [or pneumococcal vaccine(s) for the revised question] by letter, email, or through the EHR	0%	40%	14%
How have you conducted discussions re: PCV13 vaccinations with your patients older than 65 years?^a				Development and implementation of patient education to address vaccine hesitancy			
I only discuss the PCV13 vaccine if a patient asks about this vaccine.	13%	—	—		13%	8%	11%
I routinely offer the PCV13 vaccine to my patients.	60%	—	—				
I have provided written information re: the PCV13 vaccine (eg, brochures, leaflets, etc).	38%	—	—				
I have discussed details and/or answered questions when a patient expressed vaccine hesitancy re: the PCV13 vaccine.	46%	—	—				
I have had discussions about the potential benefits and harms of the PCV13 vaccine.	46%	—	—				
Other. Please explain your answer.	2%	—	—				
I have not discussed PCV13 vaccinations with my patients.	10%	—	—				

Table 3. Results of the Initial and Revised Questionnaire Attitude and Behavior Questions (Continued from previous page)

	Initial Questionnaire	Revised Questionnaire	Combined Results
Use the WIR to run a report about vaccination rates in your clinic	40%	24%	35%
Other, please describe	0%	4%	1%
None of the above	2%	0%	1%
How often do you counsel patients on potential benefits and harms of vaccines in your practice (ie, how many times per week by age group)?			
0–10 years (including consults with parents)			
None	45%	100%	60%
1–3 times per week	32%	0%	23%
4–7 times per week	17%	0%	12%
8 or more times per week	6%	0%	5%
11–17 years (including consults with parents)			
None	33%	100%	52%
1–3 times per week	42%	0%	31%
4–7 times per week	19%	0%	14%
8 or more times per week	4%	0%	3%
Adults 18–64 years			
None	8%	3%	6%
1–3 times per week	35%	12%	28%
4–7 times per week	27%	21%	25%
8 or more times per week	29%	67%	42%
Adults older than 65 years			
None	6%	0%	4%
1–3 times per week	35%	8%	26%
4–7 times per week	25%	25%	25%
8 or more times per week	33%	67%	44%
Have you used the following materials for any SDM conversations in your practice?^a (Yes responses)			
Printed guide or brochure	59%	—	—
Printed decision aid	30%	—	—
Online tool with benefits/harms	24%	—	—
Decision aid or tool embedded in the EHR	39%	—	—
Other, please describe	21%	—	—
Have you used the following materials for discussions about immunizations with your patients?^a (Yes responses)			
Printed guide or brochure	—	36%	—
Printed decision aid	—	4%	—
Online tool with benefits/harms	—	9%	—
Decision aid or tool embedded in the EHR	—	9%	—
Other, please describe	—	12%	—
In general, have you used telemedicine (ie, video conferencing, phone) for SDM conversations with your patients?			
No	49%	—	—
Yes	51%	—	—
Has your clinic or health system notified you of whether the PCV20 vaccine or the PCV15 + PPSV23 vaccines will be used in your clinic for patients 65 years and older?			
Yes	—	8%	—
No	—	72%	—
Not sure	—	20%	—

Abbreviations: PCV13, pneumococcal 13-valent conjugate vaccine; CAP, community-acquired pneumonia; IPD, invasive pneumococcal disease; SDM, shared decision-making; EHR, electronic health record; WIR, Wisconsin Immunization Registry.

A total of 75 health care professionals began the first questionnaire (n = 48 completed beyond the knowledge questions); 27 began the second questionnaire (n = 25 completed).

^aMore than 1 response could be selected.

tings (eg, rural, urban, and hospital-based settings), and 57% had more than 10 years of experience (Table 1).

Knowledge: The percentage of correct responses to knowledge questions varied. Eighty-one percent correctly identified CDC recommendations, and 17% knew the number of adults needed to be vaccinated with PCV13 to prevent 1 case of invasive pneumococcal disease (Table 2).

Attitudes: Seventy-nine percent indicated that the prevention of invasive pneumococcal disease in their patients 65 years or older was “very important” or “extremely important.” Most (63%) strongly recommend the PCV13 vaccine, and 71% noted that it was “worthwhile” to give the PCV13 vaccine to their patients 65 years and older (Table 3). A range of attitudes regarding the PCV13 vaccine were reported (Appendix B), such as:

“I am concerned about waning community protection based on vaccination rates of children. My problem is the change in ACIP (Advisory Committee on Immunization Practices) guideline and uncertainty about insurance coverage in adults age 65+.”

“Not being sure of exact statistics, I see a fair amount of pneumococcal pneumonia, which has higher severity and care intensity needs compared to other causes of pneumonia so the vaccine appears to be well worth it.”

“Unlikely to provide much benefit if they receive PPSV23.”

A majority of respondents (77%) indicated that their attitudes toward the PCV13 vaccine in older adults had not changed since the onset of the COVID-19 pandemic (Table 3). Comments related to the SARS-CoV-2 pandemic included risk of respiratory infections as a reason to promote PCV13 and emphasis on coronavirus vaccines as a reason for decreased focus on PCV13 (Appendix B).

Behaviors: Ninety-six percent of respondents indicated that SDM regarding the PCV13 vaccine would be feasible in their practice; however, 25% noted that it would be “somewhat difficult” to explain the potential harms and benefits of PCV13 to their patients 65 years and older. Thirty-five percent of respondents reported that it would be “somewhat easy” to explain the potential harms and benefits of PCV13, and 27% answered that it would be “somewhat easy” using telemedicine (Table 3). Comments included (Appendix B):

“We do this every day when discussing vaccine recommendations.”

“Depends. Other agenda items may preclude time for discussion.”

“We should always discuss treatments and prevention options.”

“However, there are lots of competing priorities.”

Most respondents indicated that they or their clinic assessed the immunization needs of their patients at every clinical encounter, used standing orders for vaccines, or used electronic health records (EHR) or other systems for automatic reminders about immunizations for patients and clinic staff.

Opinions on telemedicine were divided with almost equal proportions using (51%) and not using (49%) telemedicine for SDM conversations (Table 3), which were reflected in comments (Appendix B).

“Telemedicine doesn’t make this conversation any more difficult than in person.”

“The issue here is if the patient so desires to get a vaccine (or any treatment for that matter) then one will need to schedule.”

“Telemed[icine] is extremely difficult to use effectively. Provider is unable to ascertain patient reaction, unable to view body language, eye contact, etc that help us gauge whether message offered is received in the right way.”

Revised Questionnaire

Twenty-seven additional health care professionals began the revised questionnaire and 25 completed it (Table 1). In general, results were similar to those of the initial questionnaire, although specific mention of PCV13 was replaced by pneumococcal vaccines. All respondents thought it was worthwhile to give pneumococcal vaccines and routinely offered them. Most respondents (84%) indicated that their attitudes toward pneumococcal vaccines in older adults had not changed since the onset of the pandemic. Forty-four percent and 32% noted that it would be “very easy” or “somewhat easy” to explain the potential harms and benefits of PCV13 to their older patients, respectively. Twenty-eight percent conducted special events to increase patient access to immunizations (eg, flu shot clinics, drive-through vaccinations). Seventy-two percent indicated that they had not been notified by their clinic or health system whether the PCV20 vaccine or the PCV15 + PPSV23 vaccines would be used by their clinic for patients 65 years and older (Table 3).

DISCUSSION

This project aimed to develop clinician educational materials to facilitate SDM conversations regarding pneumococcal vaccines for older adults. As a first step, we conducted a needs assessment to evaluate knowledge, attitudes, and behaviors related to SDM for the use of the PCV13 vaccine in adults 65 years and older. Most respondents correctly identified CDC recommendations, but knowledge gaps were observed for questions, such as the number needed to be vaccinated with PCV13 to prevent 1 case of invasive pneumococcal disease. These results are similar to those of a survey in which most physicians indicated that the current recommendations were clear (50% “very clear,” 38% “somewhat clear”),

but knowledge of recommendations varied.⁵ In that study, 83% of physicians identified PCV13 recommendations for adults ≥ 65 , but 21% identified the recommended interval between PCV13 and PPSV23 in a younger person (<65 years) at increased risk.⁷ More recently, a survey identified gaps in clinicians’ knowledge and perceived challenges to implementing recommendations, which were considered in CDC discussions of updated recommendations for conjugate pneumococcal vaccines in adults.⁹ Such results highlight the ongoing need for clinician education about vaccine use.^{7,9}

Although SDM for the use of PCV13 was deemed to be feasible, one-fourth of initial respondents indicated that it would be “somewhat difficult” to explain the potential harms and benefits of PCV13 to their older patients. Time, competing priorities, and resources, including availability of staff (eg, nurses), were listed as factors contributing to feasibility of SDM conversations (Appendix B). In a previous survey of 72 primary care clinicians at UW Health, 95% responded that SDM was “very important” to provide excellent patient care, but 8% consistently used decision aids in the electronic health record.⁴ This apparent disconnect between the value clinicians place on SDM and actual clinical practice suggests that support for SDM is needed. Opinions on the ease of use of telemedicine for SDM conversations varied from being similar to in-person to very difficult.

Limitations of our data include the use of a convenience sample, which could introduce bias as well as limiting generalizability of the results. Other limitations are the sample size and distribution of the revised questionnaire to general internal medicine clinicians within a single health care system after the initial questionnaire.

CONCLUSIONS

Although SDM for pneumococcal vaccines was deemed feasible, time and competing clinical priorities continue to be barriers to implementation in clinical practice. Knowledge gaps regarding pneumococcal vaccines highlight the need for ongoing education as recommendations change. Further studies of the impact of clinician education on coverage of pneumococcal disease in older adults are warranted.

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