PRACTICE INSIGHTS

Strategies for Resolving Adult Vaccination Needs by Community Pharmacists

With Consideration of Personalized Vaccine Action Plans

APhA
American Pharmacists Association

APhA Foundation

Contents

This report was developed by the American Pharmacists Association (APhA) and APhA Foundation, with support from GSK, Sanofi, Pfizer, Merck, and Seqirus.

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Introduction

Pharmacists play a vital and well-established role in supporting public health in the United States through the delivery of vaccination services. This role was expanded and reinforced during the COVID-19 pandemic, when more than half of all combined COVID-19 vaccinations were administered by pharmacists and their teams.[1] Various declarations and amendments to the Public Readiness and Emergency Preparedness Act (PREP Act) supported the delivery of COVID-19 vaccinations in pharmacies through actions such as uniform liberal authorizations for pharmacists, pharmacy interns, and pharmacy technicians nationwide to administer vaccines.[1,2]

The pandemic also accelerated the shift to community pharmacies for the administration of influenza and other vaccines. During the 2019–2020 influenza season, 35.4 million influenza vaccine doses were administered in pharmacies, and 36.9 million were administered in physician offices. By the 2022–2023 season, 41.5 million influenza vaccine doses were administered in pharmacies, compared with 27.9 million that were administered in physician offices.[3] Pharmacies are also common locations for administration of other routine adult vaccinations, including pneumococcal, tetanus-diphtheria-pertussis (Tdap), and zoster vaccines. The delivery of these vaccination services in community pharmacies is growing.

Although the increased administration of vaccines in community pharmacies has been a success story, overall national vaccination coverage rates remain below public health goals (Table 1).[4,5] Further, the COVID-19 pandemic resulted in a decline in the administration of non–COVID-19 vaccines. In January 2021, rates of routine adult vaccinations ranged from 28% to 55% lower than January 2019 levels, depending on vaccine type.[6] Vaccination rates began to improve in 2022, and this improvement continued into 2023. Improvements were greater among adults with Medicare coverage than among adults with commercial insurance. Despite these improvements, substantial gaps remain. Taken together, there are hundreds of millions of adults in the United States with unmet vaccine needs.[6] Further, the 2023 licensing of respiratory syncytial virus (RSV) vaccines for adults 60 years of age and older as well as for certain pregnant individuals has added to the tally of adult vaccination needs.

Table 1. ***Vaccination Rates for Selected Routine Adult Vaccines***

Vaccine (by age group)	Vaccination Coverage	Corresponding Unprotected Rate
Pneumococcal (≥65 years of age)	70.1% (2021)	29.9%
Pneumococcal (18–64 years of age at increased risk)	29.7% (2021)	70.3%
Td or Tdap (≥18 years of age)	70.5% (2019)	29.5%
Zoster (≥60 years of age)	40.5% (2020)	59.5%

Td = tetanus-diphtheria vaccine; Tdap =tetanus-diphtheria-pertussis vaccine.
Source: References 4 and 5.

To explore strategies for pharmacists to help address gaps in adult vaccination coverage, the American Pharmacists Association (APhA) and the APhA Foundation convened a stakeholder conference in Washington, DC, on November 16, 2023. The conference was attended by leaders from pharmacy membership organizations, pharmacy chains, independent pharmacy networks, public health researchers, and vaccine manufacturers. The goals of the meeting included gathering insights and perspectives to guide a profession-wide practical approach in order to advance planned administration of vaccines by pharmacists and to establish patient expectations for managing vaccination needs across their lifespan.

A Look at What is Possible—Project IMPACT: Immunizations

The conference began with a review of data from the innovative care model assessed by Project IMPACT: Immunizations. In the pilot phase of this project, participating pharmacists were provided with access to individual patient vaccine histories at the point of care as well as forecasts of patient vaccination needs. Studies of this model assessed the impact of this approach on the pharmacist's ability to identify unmet vaccination needs and increase vaccination rates for routine adult vaccinations. Three of the studies of this model have been published; one is being prepared for publication (Project IMPACT: Vaccine Confidence).[7-9]

Pharmacists reviewed these data and used clinical judgment to determine which vaccines to recommend to the patient. Patients were educated by the pharmacists about the recommendations and could accept or decline the vaccinations, which the pharmacist could then administer and document in the immunization information system (IIS). Pharmacists were compensated for their time spent delivering the service. This payment was in addition to compensation for the vaccine product and its administration.

The initial pilot of this program took place at eight community pharmacy practice sites in 2015 and 2016.[7] Pharmacists reviewed vaccination forecasts for 1,080 patients receiving influenza vaccinations. These forecasts predicted 1,566 additional vaccination needs. Pharmacist assessments of the information in the forecasts identified 36 contraindications and 196 potential duplications, leaving a net of 1,334 unmet vaccination needs. Of these needs, 447 were resolved during the 6-month study period, representing a 41.4% increase in the number of vaccines administered. The remainder of patients received information about their vaccination needs and recommendations to schedule their vaccinations for a later date.

Following the success of the Project IMPACT: Immunizations pilot study, an expanded demonstration study was conducted at 22 practice sites from 2017 to 2019.[8] Pharmacists reviewed vaccination forecasts for 6,234 patients, which predicted 11,789 unmet vaccination needs (1.9 per person). Of these needs, 6,405 (54.3%) were met during the study period (including 60% on the same day), 1,085 (9.2%) were found to be previously administered, and 59 (0.5%) were contraindicated. The remaining patients received information about their personal vaccination needs and recommendations to be vaccinated.

Efforts to further expand this care model in 34 states with bidirectional IIS registries are ongoing, and results from the next phase of the project are expected to be published in 2024. Attendees at the November 2023 conference were shown a summary of preliminary findings, including the preliminary finding that adult participants were often overwhelmed because of the large numbers of vaccinations they needed in order to get caught up with recommendations of the Advisory Committee on Immunization Practices (ACIP) (e.g., COVID-19, influenza, pneumococcal, zoster, Tdap, hepatitis B). Participants who were offered the opportunity to plan future vaccination visits to follow up on vaccinations that were delivered on the day of vaccination assessment showed a higher willingness to be vaccinated than those who considered only vaccinations on that single day.

Exploring How to Expand the Project IMPACT: Immunizations Model

During the conference, stakeholders discussed factors that made the Project IMPACT: Immunizations model successful and explored how to expand it on a nationwide scale in a sustainable manner. An optimized process of care that involves the pharmacist and provides patients with a consistent and predictable experience when they enter a pharmacy for their vaccination needs was seen as important for program expansion. Key factors that were identified as critical for success of such a program included access to a bidirectional IIS to support more complete and accurate vaccination decision-making, a structured approach to addressing individualized patient needs, and compensation to pharmacists for their time assessing patient vaccine needs.

Complete Record of Vaccinations

In current practice, statewide IIS data may be incomplete because vaccine providers are not universally required to record vaccines in IISs. Further, pharmacists may not always have the ability to access or update records, particularly outside of their own state. Patients who move between states may have records of their vaccinations fragmented across multiple IISs that are not integrated and often cannot be accessed from other states.

Conference participants agreed that pharmacists should gather pertinent vaccination information from an IIS or electronic health record (EHR), and they should have vaccination needs prospectively identified through an algorithm applying ACIP recommendations similar to the process that was used to generate forecasts in Project IMPACT: Immunizations. Participants agreed on the value of a centralized, pharmacist-authenticated, accurate, and current record of patients' vaccination for supporting patient understanding of their personal vaccination status and future needs. Anecdotally, pharmacists participating in these studies reported that patients were often overwhelmed when provided with a lengthy list of vaccinations needed. Correspondingly, the pharmacists acknowledged the burden of the workload of trying to deliver so many vaccinations on the same day.

Personalized Vaccine Action Plans

Participants discussed the value of developing and implementing personalized plans for patients to gradually have all vaccination needs met. The National Adult and Influenza Immunization Summit (NAIIS) developed a template for personal vaccination action plans in August 2023 to help adults set specific dates to receive the vaccines they need that aligns with appointments for other clinical services and multidose vaccination series.[10]

The Project IMPACT: Vaccine Confidence study provides insight into adult vaccine acceptance, willingness, and declination behaviors not described elsewhere.[7–9] Vaccines were recommended to patients based on the pharmacist's assessment of the patient's vaccination forecast. In some cases, patients accepted the recommendations immediately and vaccines were administered at the time of the assessment. In other cases, particularly when multiple vaccines were recommended, patients were reluctant to receive all recommended vaccines simultaneously or wanted time to consider certain vaccines. These patients did not refuse the vaccines; rather, they needed a plan to receive the vaccines over the course of future months. When patients were offered the opportunity to receive some vaccines on the day of assessment and receive other vaccines over the next few months, their willingness to receive all recommended vaccines increased.

Conference participants discussed various options for establishing patient care expectations for how personalized vaccine action plans could be created and shared with patients. Initially, the idea of creating a calendar approach to vaccination scheduling was proposed, with some vaccines designated for extra attention at particular times of the year. This approach offered some advantages (e.g., the potential to smooth out clinical workload and inventory); but conference participants observed that this approach may not provide enough impetus for patients to achieve immunity for themselves as quickly as possible and that this approach potentially reduces the

ability or accountability of pharmacists to counsel and help prioritize individuals' vaccine needs and timing based on age, underlying medical conditions, or other risk factors.

As an alternative to designating a calendar slot to emphasize each vaccine, participants proposed that a pharmacist-provided vaccination assessment could provide a personalized vaccine action plan building on the NAIIS action plan.[10] This personalized plan would consider the patient's current vaccination needs and lead to specific appointments for patients to have those needs met. The creation of each patient's plan would include consideration of various factors, including how many vaccines the patient is willing to receive at each visit and the relative urgency of each needed vaccine.

At the end of a vaccine assessment visit, patients would be provided with documentation of their current vaccination status and needs. If the patient did not have any current vaccination needs, the documentation would identify vaccines that will be needed in the future (e.g., seasonal vaccines, vaccines needed based on age thresholds).

Compensation for Vaccine Assessments

Despite the time pressures placed on community pharmacists, participants believed that pharmacists were well-positioned within the health care system to be the providers who routinely assess adult vaccine needs, educate patients about those needs, develop a plan to address those needs, and administer vaccinations. They noted that pharmacists are particularly well-suited to educate patients about vaccines, engage patients in the decision-making process about vaccine acceptance, and move them along the continuum of adopting healthy behaviors.

Pharmacists' time is valuable, and the vaccine assessment process must be fairly compensated to support necessary staffing and facilitate adoption of the service on a broad scale. Participants expressed a belief that compensation to pharmacists for assessing vaccine needs was a key component of the success of Project IMPACT: Vaccine Confidence.

Participants brainstormed various strategies for compensation, including the use of evaluation and management cases, but noted that there are multiple challenges for pharmacists due to the lack of provider status for pharmacists in Medicare.

Payment for Vaccines

In addition to the discussion of payment for pharmacists' vaccination services, conference participants explored selected specific challenges related to payment for vaccine products, including the Vaccines for Children (VFC) program and payment for vaccines through various components of Medicare.

Routine vaccines for underserved children are distributed through the VFC program, which is federally funded and state-coordinated. Providers obtain vaccines for free through this program. In some instances, a patient may be charged a small administration fee, but no child may be turned away because of the inability to pay. Any provider participating in the VFC program must agree to site auditing of vaccine storage and handling, documentation, and administration procedures. They also must agree to report statistical information (e.g., how many children in each patient group received specific vaccines).

Participants suggested that a similar program might be reasonable for underserved adults but noted that there would be significant administrative challenges for pharmacists who interface with the program. They indicated that these challenges would need to be addressed for a similar program to be viable for meeting the needs of underserved adults. Addressing some of the variability that can be found in a state-by-state administered program, and removing administrative burdens for community pharmacies would benefit the implementation of an adult program.

For adults who receive Medicare benefits, the current system covers some vaccine products through Medicare Part B and others through Medicare Part D. Participants indicated that this system creates challenges for efficient processing of claims and stated that ideally Congress would act to have all vaccines covered through Part B.

Approaches to Vaccine Needs Assessments and Personalized Plans

Participants discussed opportunities and challenges associated with establishing a standardized pharmacy service that provides vaccination assessments and personalized action plans. They agreed that several features identified from Project IMPACT: Vaccine Confidence could help in community pharmacy practice settings. Participants stressed that program expansion will require buy-in from practicing pharmacists and that the model will need to be provided in the form of tools that pharmacists can implement.

Prioritizing and Scheduling Vaccinations

Administering multiple vaccinations at the same visit is the standard of care, given that the sooner vaccinations are administered, the sooner the patient is protected against serious preventable diseases.[11] The Centers for Disease Control and Prevention and partner organizations such as NAIIS and Immunize.org offer guidance and resources to help clinicians induce immunity in their patients as quickly as possible.[10–13]

However, there are times when the number of vaccinations needed exceeds the number an adult is willing to accept simultaneously. In these situations, the choice may be between the patient declining all vaccines or being willing to accept the most pertinent vaccines during that encounter with follow-up to receive the others in subsequent weeks. (Such a decision should not be confused with ill-advised alternate childhood vaccination schedules proposed by unscientific writers. Alternate childhood schedules can be thinly veiled attempts to reduce the total number of vaccinations delivered.) In the adult situation considered here, the objective is to get the patient fully protected as quickly as reasonably possible, using a stepwise approach until completion.

Patient Case: Tom

Tom is a 65-year-old patient in the pharmacy today for prescription refills. None of the clinicians Tom sees have mentioned vaccines to him in at least 10 years, other than COVID-19 vaccination in 2021. Today, you perform a thorough clinical history of Tom's chronic diseases, his medications, and his vaccination history. Based on this review, Tom needs COVID-19, influenza, pneumococcal, Tdap, zoster, and hepatitis B vaccines. Tom and his wife are thinking about an overseas vacation next year, which could add more vaccines to that list (e.g., hepatitis A vaccine).

Immunologically, there is no maximum number of vaccinations a patient can receive on a single day. With two deltoid muscles and two vastus lateralis (anterolateral thigh) muscles, Tom has plenty of injection sites.[12] But Tom makes it perfectly clear to you that he will not receive six injections at the same visit. You didn't have the heart to tell Tom that several of those vaccines are administered as a multidose series, which would actually bring the required injection count up to nine (with multidose vaccines given over time).

Tom is already "off-schedule," but how can you move him from vulnerable to immune as quickly as possible? The goal is to move patients from inaction or reluctance to acceptance. For those patients unwilling to "fill up their tank" all in a day, the next best thing is stepwise resolution of vaccine needs.

If the six vaccines Tom needs are not all administered on the same day, then some will be given first and some will necessarily be last. What is a logical and clinically sound basis for prioritizing which vaccines go to the head of the line?

Forming a Personalized Vaccine Action Plan

Participants discussed the creation of business rules leading to automated algorithms that could generate personalized vaccine action plans. Inputs would consider the patient's age, chronic conditions, and other risk factors (e.g., occupation) to generate outputs in the form of a sequence of vaccines that could then be validated or customized by a pharmacist in consultation with the patient.

Recognizing that additional efforts to gain stakeholder consensus would be needed, an initial approach to a prioritizing algorithm presented during the conference focused on the following factors:

1. **Multidose series:** If a vaccine with a multidose series has been started, complete the series following the prescribing information's dosing schedule (e.g., zoster, human papillomavirus, hepatitis A, hepatitis B, meningococcal B).
2. **Seasonality:** Administer vaccines in the appropriate season (e.g., fall for influenza and maternal RSV; promptly after revised COVID-19 formulations are released).
3. **Severity or lethality:** Diseases with higher severity or lethality if contracted are prioritized before those with lower lethality (e.g., pneumococcal before zoster).
4. **Incidence:** Diseases with higher incidence are prioritized before those with lower incidence (e.g., zoster before Tdap or hepatitis B).
5. **Outbreak settings or personal situation:** The relevant vaccine overrides outputs from standard algorithms.

Participants noted that vaccine needs evolve as new products are licensed, including the release of new COVID-19 formulations. Such developments could require adjustments to vaccination prioritization algorithms. Finally, it is important to note that pharmacists should use their expertise to individualize vaccination plans for any given patient.

Recommendations for Patient Engagement Regarding Vaccination Needs

Participants brainstormed strategies for increasing patient interaction and engagement regarding vaccination needs. They recommended adoption of a shared nomenclature for communicating with patients about personalized vaccine action plans. For example, "make a vaccination plan," "schedule an appointment with your pharmacist to make a vaccine action plan," or "schedule your follow-up vaccines." Alignment with shared nomenclature across stakeholders would help produce unified messaging and be more effective for educating patients and prompting desired vaccination behaviors.

This report uses the term "vaccine action plan." Future efforts can assess whether "care plan," "follow-up visits," or alternate wordings resonate better with certain segments of the public.

For communicating directly with patients about needed vaccines, participants suggested praising patients for the vaccines they have already received. For example, pharmacists could use phrases such as "You have already received 70% of the vaccines that you need to protect yourself, and we can help you get that number up to 100%." Participants also emphasized that communication with patients about vaccines should use patient-friendly terminology (e.g., "tetanus shot" rather than "Td/Tdap"). Strategies to encourage patients to receive multiple vaccinations simultaneously (perhaps at the time of the vaccination assessment) were explored, but participants acknowledged that patients often are unwilling to receive all the vaccines that they need in a single visit.[10–13]

Figure 1 is an example of what a personalized vaccine status "dashboard" could look like. An example of what a personalized vaccine action plan could look like appears in Figure 2.

Figure 1. ***Sample Personalized Vaccine Status "Dashboard"***

Status Today: # good, # incomplete, # needed [_____]

[good] Influenza (next due YYYY)	[good] Tdap (next due YYYY)	[need] RSV (let's discuss)
[need] Pneumococcal (come in)	[need] Hepatitis A (come in)	[1 of 3] HPV (see us)
[good] Zoster (next due YYYY)	[good] Covid-19 (stay tuned)	[need] Hepatitis B (check)

Other vaccine needs: « click here »

If you received a vaccine not shown here, please let your pharmacist know.
Plan of Care: See sheet with personalized Vaccine Action Plan.

HPV = human papillomavirus; RSV = respiratory syncytial virus; Tdap = tetanus-diphtheria-pertussis.

My Vaccine Action Plan

Patient Name	Date
Patient Email	Patient Telephone
Vaccine Provider	Provider Contact

About me:	Personal Preferences:	Vaccines I need in next 12 months (check all that apply):
Age_____ DOB_____	❑ More shots per visit, fewer visits	
Health conditions	❑ Fewer shots per visit, more visits **Sooner vaccinated = sooner protected.** **Multiple shots per visit recommended.**	❑ COVID-19 ❑ Hepatitis A ____ doses needed ❑ Hepatitis B ____ doses needed ❑ Human papillomavirus (HPV) ❑ Influenza (flu, annual) ❑ Measles-mumps-rubella (MMR) ❑ Meningococcal ACWY ❑ Meningococcal B ❑ Mpox ❑ Other _____
Occupation Travel plans Life events Other	**My priorities:** **Notes:**	❑ Pneumococcal_____ ❑ Polio ❑ RSV (respiratory syncytial virus) ❑ Tetanus-diphtheria-pertussis (Tdap) or (Td) [circle] ❑ Varicella (chickenpox) ❑ Zoster (shingles) ❑ Travel _____ ❑ Other _____ ❑ Other _____

My Vaccine Action Plan *(complete with your vaccine provider)*

Jan_____	Feb_____	Mar_____	Apr_____	May_____	Jun_____
Jul_____	Aug_____	Sep_____	Oct_____	Nov_____	Dec_____
Jan_____	Feb_____	Mar_____	Apr_____	May_____	Jun_____

1. Enter year for this month and following months.
2. Fill in any upcoming appointments already scheduled.
3. Add vaccines based on recommendations personalized for you. Consider vaccine series not yet complete as well as seasonal vaccines and other vaccines.
4. Schedule appointments to fill these vaccine needs. Ask for reminders to come back for appointments.

Referral for travel consults:_____ Other consults:_____

Participants also noted that, ideally, personalized assessments of vaccination needs (as well as vaccine administration) would occur on a regular basis to help manage workflow (as well as vaccine inventory). The workflow in some pharmacy settings allows for walk-in vaccine assessments, whereas other settings may prefer that patients schedule vaccine assessments in advance. Participants encouraged the development and use of automated processes to perform several functions, including sending patients appointment reminders, prompting them to reschedule if the time is no longer convenient, and contacting them again if a vaccination becomes overdue.

Creating a Centralized Vaccination Information System

To address the fragmentation and other challenges associated with state IISs, participants proposed having a centralized, patient-centered, web-enabled system for patient vaccination information developed by a national organization. This system would have several key functions, including connecting with EHR systems (e.g., EPIC, Oracle Health) and state IISs through the use of tools that identify and authenticate users to allow for bidirectional exchange of information.

Such a system would indicate both the vaccines that the patient has received and those that the patient needs. If a patient did not currently need any vaccines, the system would indicate when in the future the patient would need vaccination (e.g., during the next influenza vaccination season, upon achieving a certain age).

Participants recommended that any system be designed to allow patients to access their own information and receive educational materials about disease risk and vaccine efficacy to help support patient engagement and involvement in the process. Thus, such a system could be used to both identify vaccine needs and structure educational efforts for the public. The system should also facilitate patients in scheduling appointments at their local pharmacy for vaccine needs assessments and/or vaccine administration. Participants noted that some manufacturers have already developed websites with some of these features for respiratory vaccines.

Additionally, participants noted that as indications for vaccines change or new vaccines enter the market, large groups of adults suddenly become eligible for a vaccine. Unfortunately, systems to communicate this information to all newly eligible adults are lacking. Participants proposed the use of a centralized vaccination information system to reach adults when new vaccine needs emerge. They also proposed educational campaigns that would be offered through the system and targeted by decades of age. For example, information about zoster vaccination could be directed specifically to adults 50 to 60 years of age.

Participants discussed various platforms for providing patients with access to their vaccination information. Ideally, the platform would incorporate vaccine forecasting and easily determine the recommended vaccines for an individual based on responses to questions such as date of birth, allergies, pre-existing conditions, and vaccine history. They suggested that an ideal format could be a smartphone app that is linked to a centralized vaccination registry. However, they noted that many people prefer to avoid adding apps to their phones and recommended that system developers explore options to have the system integrated with other user-interface platforms. They also recommended a hard-copy option for individuals who have challenges accessing digital formats (e.g., those without reliable technology access). Participants encouraged flexibility in the solutions to accommodate diverse patient needs.

Due to potential concerns about patient confidentiality and control over personal health information, participants recommended that the system be managed by a neutral nongovernmental entity such as a charitable nonprofit organization. They also indicated that it would be necessary to ensure secure authenticated patient access to the system and have a process for managing patient identity.

Participants recommended engaging a broad range of stakeholders in the development of any such system, including consumer advocacy groups, chain and independent pharmacy associations, state pharmacy associations, and the Centers for Disease Control and Prevention. Participants also noted that the system would ideally have a mechanism to integrate with health systems and long-term care settings.

Optimizing Pharmacy Technician Roles

Participants discussed the role of pharmacy technicians for the growth of pharmacy-based vaccination services. The expansion of technicians' ability to administer vaccinations through the PREP Act was an effective strategy for increasing vaccination capacity during the pandemic. Participants called for permanently allowing technicians to fill this role and noted that, ideally, technicians should be able to administer any vaccine. It is less efficient if the pharmacy technician can administer some of the vaccines needed, but a pharmacist must administer the others. Participants also indicated that there is a need for more pharmacy technicians to receive the required training for administering vaccines to optimize capacity.

Summary

Pharmacists are well-positioned to help improve adult vaccination rates. Stakeholder conference participants endorsed the development of personalized vaccine action plans for patients. They believed that a neutral entity such as the APhA Foundation could have a key role in the creation of a centralized online resource that would generate personalized plans that could then be validated or customized by pharmacists. Any such resource should be developed with other key vaccination partners. Finally, participants stressed that pharmacists must be adequately compensated for their time to assess patient vaccination needs and provide patient education for any such system to be viable.

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