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## PHARMACISTS INCREASE VACCINATION RATES

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Pharmacists play a crucial role in the delivery of immunizations. Their role takes on a multi-faceted approach, as advocates, providers, and interdisciplinarians who help increase vaccination awareness. The following article will focus on the ability of pharmacists to deliver immunizations and how this enables better patient outcomes. As an accessible health care professional within the community, pharmacist-driven immunizations help increase vaccination rates and combat inadequate coverage.

Key Points
An increase in exemption beliefs have led to a resurgence of vaccine-preventable diseases (VPDs)
Inadequate vaccination rates can have a significant health economic burdern
Pharmacists are a valuable resource for increasing vaccination awareness
Pharmacists help improve clinical outcomes by administering vaccines

### The consequences of a growing movement

High vaccination levels in the United States, and much of the developed world, have traditionally helped people avoid serious and debilitating illnesses. While infectious diseases have historically plagued mankind, the development of vaccines over time has enabled people to live healthier lives. However, the risk of infectious disease becomes a major concern as the safety of vaccinations (or lack thereof, as some will claim) continues to frequent headlines and the popularity of vaccine-free lifestyles grows. Even with vaccine-preventable diseases (VPDs) at an all-time low, an upward trend in personal belief exemptions – be they religious or philosophical – highlights the obvious

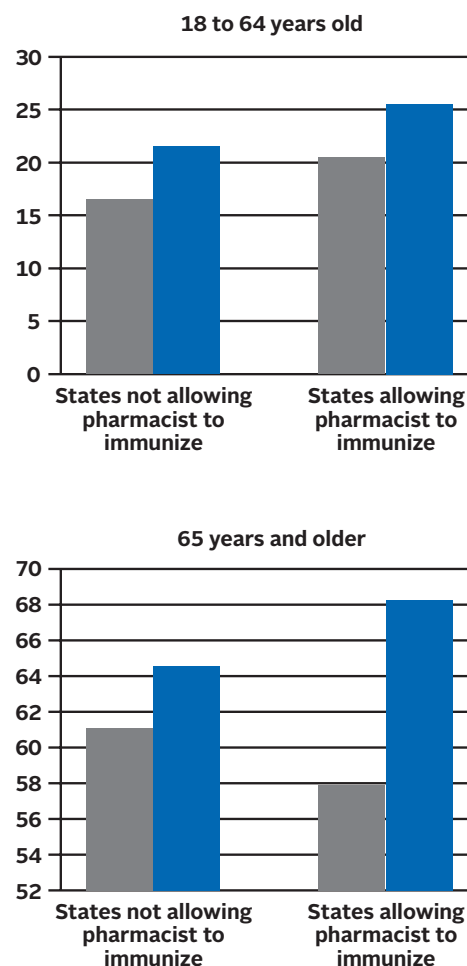
vulnerabilities that come with inadequate coverage, as seen during the 2015 measles outbreak in California. Despite state law mandating kindergartners be vaccinated against measles and pertussis (whooping cough), among others, an analysis by the Los Angeles Times revealed that the rate of personal belief exemptions at California kindergartners rose dramatically in the past decade. Overall, belief exemptions in the state more than doubled from 1.5 percent in 2007 to 3.1 percent in 2014.<sup>1</sup> The growing movement to forego immunizations has turned into a heavily debated issue and captured the attention of public health officials. On average, estimates report that vaccine-preventable infections such as influenza, pneumococcal disease, and hepatitis B claim upwards of 90,000 lives annually in the United States.<sup>2</sup> Influenza and pneumonia, taken together, are the fifth leading cause of death in Americans 65 years of age and older, and the eighth leading cause overall.<sup>2</sup> With the re-emergence of certain VPDs, health care providers should be prepared to manage diseases that were once thought to be well controlled. Pharmacists, in particular, are poised to serve as advocates of preventive medicine and combat the long-standing failure to adequately immunize the U.S. population.

### History of pharmacy-based immunizations

Pharmacist involvement in immunization efforts has only recently taken on a more proactive approach. Dating back to the mid-1800s and until just before the 21st century, the pharmacist's role consisted primarily of vaccine storage, distribution, and providing general education to physicians and the public about vaccine use.<sup>3</sup> Only

20 years have passed since pharmacists began immunizing patients as part of their standard of practice. Formalized training started in 1994, when pharmacists at Washington State University, operating under collaborative practice agreements, began administering the influenza vaccine to their patients.<sup>3</sup> This would eventually

Figure 1: COMPARISON OF INFLUENZA VACCINATION RATES



help usher in the now nationally recognized training program offered by the American Pharmacists Association (APhA). As the gold standard for training pharmacists to deliver immunizations, APhA began to establish contractual agreements with schools of pharmacy and state institutions in 1999 in order to help facilitate pharmacist inclusion in immunization efforts.<sup>3</sup> As demonstrated by Figure 1, states who grant pharmacists the authority to provide immunizations can benefit from increased vaccination rates, which can lead to a decrease in the morbidity and mortality associated with inadequate coverage. Since the program's inception, nearly 300,000 pharmacists have been trained to administer vaccines, helping expand the scope of pharmacy practice as an integral part of health care delivery.<sup>3</sup>

**Pharmacists as vaccine advocates: A rising tide lifts all boats**

Key Points
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Pharmacists are a valuable resource for increasing vaccination awareness
Pharmacists help improve clinical outcomes by administering vaccines

The re-emergence of VPDs has led to a renewed focus on pharmacist-based immunizations. With the growing anti-vaccination movement and increased travel to and from regions with endemic disease, providing coverage has become a public health issue. Limited patient awareness, the complexity of vaccine schedules, and competing demands for providers' time are among some of the common barriers to achieving adequate coverage rates.<sup>4,5</sup> However, pharmacists can serve a multi-faceted role when it comes to immunizations: (1) advocate, (2) facilitator, and (3) immunizer. The accessibility of the pharmacist as a health care provider allows for direct patient care. This means raising awareness by both educating and motivating patients to get immunized. Providing reminders to patients, regardless of the pharmacy practice setting, can help increase coverage and reduce illness, hospitalization, and even death from VPDs. Traditional face-

to-face counseling aside, patient outreach can be done through personalized letters or telephone calls to members, dispensing patient package inserts with prescription medications, or simply by affixing reminder labels onto prescription vials. Indeed, higher vaccination rates can be achieved through pharmacist involvement. In a secondary analysis of pharmacist-driven delivery of influenza vaccinations, researchers from the Medical University of South Carolina confirmed that allowing pharmacists to provide immunizations increased local rates of influenza vaccines. Despite differences in state regulations, their study supported previous findings which showed the pharmacist's ability to administer vaccines raises greater awareness and encourages more people to get immunized.<sup>7</sup> As a reflection of a more mobile society, one of the objectives for Healthy People 2020 is to focus on technological advancements to help local, state, and federal institutions coordinate their efforts to stop disease transmission.<sup>8</sup> Raising awareness through pharmacy-enabled mobile technology can certainly impact immunization rates. Walgreens, for example, launched "Immunization Intelligence" within its mobile application to help customers self-manage their immunization history, get recommendations, and schedule appointments with their local pharmacy.<sup>9</sup>

There are times, however, when patients do not feel comfortable with pharmacists delivering immunizations, and even times when pharmacists themselves may be reluctant or unable to immunize patients because of competing workplace demands. In cases like this, other health professionals will stand to benefit from pharmacy-based vaccine advocacy.<sup>4,5</sup> Pharmacists can act as a secondary resource for immunizations by increasing vaccine demand through referrals. For example, community pharmacies may contract with nursing services and host others who immunize. While sometimes laborious, pharmacists can (and should) also promote immunizations by reviewing medication records and identifying at-risk patients for referral. In the ambulatory setting, pharmacists can serve as vaccine advocates by making recommendations to physicians during rounds or by reviewing hospital policies during pharmacy and therapeutics meetings. Ultimately, periodic

screening for patients who are eligible for vaccinations improves clinical outcomes and presents cost savings. Averting VPDs are as much a health economic outcome as providing optimal drug therapy.

**The economics of VPDs**

Increasing vaccine uptake in the United States has important economic implications. In 2015, VPDs cost nearly \$9 billion in direct costs and productivity losses, with 80 percent (\$7.1 billion) of that value attributed to unvaccinated individuals.<sup>10</sup> Unsurprisingly, influenza was the main source of the economic burden, accounting for 65 percent of total VPD cases (equivalent to \$5.8 billion).<sup>10</sup> Patients often expect to have immediate access to immunizations; however, physician offices may not always be able to accommodate them, highlighting the obvious need to expand provider accessibility. Recognizing pharmacists as qualified immunizers can surely help alleviate a significant portion of this burden. From a managed health care standpoint, billing and reimbursement disparities in terms of (1) what vaccinations pharmacists are allowed to administer and (2) which patient populations may receive the service, can lead to confusion and negatively impact vaccination rates. Therefore, all immunization stakeholders (i.e., regulators, payers, and other providers) should work to standardize the vaccine benefit design to ensure that all provider types, from physicians to pharmacists, are reimbursed for their efforts.<sup>11</sup> Doing so may incentivize a greater number of pharmacists to deliver immunization services and provide an economic benefit.

**Conclusion**

Pharmacists are in a unique position to address the challenges facing adequate vaccination coverage. As an important member of the health care community, pharmacist-based immunizations have been shown to improve vaccination rates. Social perspectives on the safety of vaccines and who is skilled enough to administer them contribute to insufficient coverage. By working to challenge these misconceptions, the ability of pharmacists to save lives and improve patient outcomes can be achieved.

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## FDA Medwatch Update

### Direct-Acting Antivirals for Hepatitis C: Drug Safety Communication — Risk of Hepatitis B Reactivating

**Issue:** The U.S. Food and Drug Administration (FDA) is warning about the risk of hepatitis B virus (HBV) becoming an active infection again in any patient who has a current or previous infection with HBV and is treated with certain direct-acting antiviral (DAA) medicines for hepatitis C virus. In a few cases, HBV reactivation in patients treated with DAA medicines resulted in serious liver problems or death. HBV reactivation usually occurred within four to eight weeks. FDA identified 24 cases of HBV reactivation reported to FDA and from the published literature in HCV/HBV co-infected patients treated with DAAs during the 31 months from November 22, 2013 to July 18, 2016. This number includes only cases submitted to FDA, so there are likely additional cases about which FDA is unaware. Of the cases reported, two patients died and one required a liver transplant. HBV

reactivation was not reported as an adverse event in the clinical trials submitted for the DAA approvals because patients with HBV co-infection were excluded from the trials.

**Recommendations:** FDA is requiring a boxed warning about the risk of HBV reactivation to be added to the drug labels of these DAAs directing health care professionals to screen and monitor for HBV in all patients receiving DAA treatment. This warning will also be included in the patient information leaflet or medication guides for these medicines. Patients should contact their health care professional immediately if they develop fatigue, weakness, loss of appetite, nausea and vomiting, yellow eyes or skin, or light-colored stools, as these may be signs of serious liver problems.

### Pioglitazone-containing Medicines: Drug Safety Communication — Increased Risk of Bladder Cancer

**Issue:** As a result of an updated review, the FDA has concluded that use of the type 2

diabetes medicine pioglitazone (Actos, Actoplus Met, Actoplus Met XR, Duetact, Oseni) may be linked to an increased risk of bladder cancer. The labels of pioglitazone-containing medicines already contain warnings about this risk, and FDA has approved label updates to describe the additional studies reviewed.

**Recommendations:** Health care professionals should not use pioglitazone in patients with active bladder cancer, and should carefully consider the benefits and risks before using pioglitazone in patients with a history of bladder cancer. Patients should contact their health care professionals if they experience any of the following signs or symptoms after starting pioglitazone, as these may be due to bladder cancer: blood or a red color in the urine, new or worsening urge to urinate, pain when urinating.

### Chantix (varenicline) and Zyban (bupropion): Drug Safety Communication — Mental Health Side Effects Revised

**Issue:** Based on an FDA review of a large clinical trial that FDA required the drug companies to conduct, FDA determined the risk of serious side effects on mood, behavior, or thinking with the stop-smoking medicines Chantix (varenicline) and Zyban (bupropion) is lower than previously suspected. The risk of these mental health side effects is still present, especially in those currently being treated for mental illnesses such as depression, anxiety disorders, or schizophrenia, or who have been treated for mental illnesses in the past. However, most people who had these side effects did not have serious consequences such as hospitalization. The results of the trial confirm that the benefits of stopping smoking outweigh the risks of these medicines. As a result of the large clinical trial review, FDA is removing the boxed warning for serious mental health side effects from both the Chantix and Zyban drug label.

**Recommendations:** Health care professionals should counsel patients about the benefits of stopping smoking and how they can get help to quit, and discuss the benefits and risks of using medicines to help them quit smoking. Patients should stop taking Chantix or Zyban and call their health care professionals right away if they notice any side effects on mood, behavior, or thinking. Patients should also talk to their health care professionals for help and information about stopping smoking, including whether stop-smoking medicines may help.

### Testosterone and Other Anabolic Androgenic Steroids (AAS): FDA Statement — Risks Associated With Abuse and Dependence

**Issue:** FDA approved class-wide labeling changes for all prescription testosterone products, adding a new warning and updating the abuse and dependence section to include new safety information from published literature and case reports regarding the risks associated with abuse and dependence of testosterone and other AAS. Testosterone and other AAS are abused by adults and adolescents, including athletes and body builders. Abuse of testosterone, usually at doses higher than those typically prescribed and usually in conjunction with other AAS, is associated with serious safety risks affecting the heart, brain, liver, mental health, and endocrine system. Reported serious adverse outcomes include heart attack, heart failure, stroke, depression, hostility, aggression, liver toxicity, and male infertility. Individuals abusing high doses of testosterone have also reported withdrawal symptoms, such as depression, fatigue, irritability, loss of appetite, decreased libido, and insomnia. The new warning will alert prescribers to the abuse potential of testosterone and the serious adverse outcomes, especially those related to heart and mental health that have been reported in association with testosterone/AAS abuse.

**Recommendations:** Health care professionals and patients are encouraged to report adverse events or side effects related to the use of these products to the FDA's MedWatch Safety Information and Adverse Event Reporting Program.

### General Anesthetic and Sedation Drugs: Drug Safety Communication — New Warnings for Young Children and Pregnant Women

**Issue:** FDA is warning that repeated or lengthy use of general anesthetic and sedation drugs during surgeries or procedures in children younger than 3 years or in pregnant women during their third trimester may affect the development of children's brains. Consistent with animal studies, recent human studies suggest that a single, relatively short exposure to general anesthetic and sedation drugs in infants or toddlers is unlikely to have negative effects on behavior or learning. However, further research is needed to fully characterize how early life anesthetic exposure affects children's brain development. To better inform the public about this potential risk, FDA is requiring warnings to be added to the labels of general anesthetic and sedation drugs.

**Recommendations:** Health care professionals should balance the benefits of appropriate anesthesia in young children and pregnant women against the potential risks, especially for procedures that may last longer than three hours or if multiple procedures are required in children under 3 years. Discuss with parents, caregivers, and pregnant women the benefits, risks, and appropriate timing of surgery or procedures requiring anesthetic and sedation drugs.

## Formulary additions

Drug	Indication	Mechanism of action (MOA)	Usual dose	Dosage forms and strength
<b>Prezcobix®</b>	Indicated for the treatment of HIV-1 infection in adult patients.	Prezcobix® is a fixed-dose combination of an HIV-1 antiviral drug, darunavir, and a CYP3A inhibitor, cobicistat.	One tablet taken daily with food.	Oral tablet: 800 mg of darunavir and 150 mg cobicistat
<b>Trulicity® (with step therapy)</b>	Indicated as an adjunct to diet and exercise to improve glycemic control in adults with type 2 diabetes mellitus.	Dulaglutide activates the GLP-1 receptor, a membrane-bound cell-surface receptor coupled to adenylyl cyclase in pancreatic beta cells. Dulaglutide increases intracellular cyclic AMP (cAMP) in beta cells leading to glucose-dependent insulin release. Dulaglutide also decreases glucagon secretion and slows gastric emptying.	Administer once weekly at any time of the day.	Single dose pens: 0.75 mg/0.5 ml Single dose pens: 1.5 mg/0.5 ml
<b>Generic Kytril® tablets (with step therapy)</b>	Indicated for: <ul style="list-style-type: none"> <li>Nausea and vomiting associated with initial and repeat courses of emetogenic cancer therapy, including high-dose cisplatin.</li> <li>Nausea and vomiting associated with radiation, including total body irradiation and fractionated abdominal radiation.</li> </ul>	Animal studies demonstrate that, in binding to 5-HT <sub>3</sub> receptors, granisetron blocks serotonin stimulation and subsequent vomiting after emetogenic stimuli such as cisplatin.	The recommended adult dosage of oral Kytril® is 2 mg once daily or 1 mg twice daily.	Oral tablet: 1 mg

**\* Only the generic equivalent of this product will process at the point of sale.**

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Prezcobix Package Insert. Available at <https://www.prezcobixhcp.com/sites/www.prezcobix.com-hcp/files/prescribing-information-prezcobix.pdf>

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Kytril Package Insert. Available at [https://www.gene.com/download/pdf/kytril\\_tablets\\_prescribing.pdf](https://www.gene.com/download/pdf/kytril_tablets_prescribing.pdf)

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