As described elsewhere in this supplement to JAOA—The Journal of the American Osteopathic Association,1,2 the Shingles Prevention Study3 revealed statistically significant reductions in the incidence of herpes zoster and postherpetic neuralgia (PHN) and the burden of illness among older adults who received a vaccine for varicella-zoster virus. However, in the first year the zoster vaccine became available, only 2% of eligible patients actually received the vaccine.4 Although only one perception-based study5 on the herpes zoster vaccine has been published, researchers6-9 have identified several contributors to poor influenza and pneumococcal polysaccharide (PPS) vaccine uptake in adults. Lessons learned from these studies might provide strategies to increase the uptake of the zoster vaccine and reduce the incidence of herpes zoster and PHN in older adults.

**Lessons Learned**

In 1989, 14% of adults aged 65 years or older received the PPS vaccine and 30% received the influenza vaccine.10 Immunization rates steadily increased through 2000, when they reached more than 50% and 60%, respectively. However, since then, immunization rates for both of these vaccines have plateaued.10 Many people have speculated as to why immunization rates have not continued to rise. In a 2008 study, Johnson et al6 surveyed consumers and healthcare providers in an attempt to “provide a better understanding of why many adults fail to receive recommended immunizations.”

Consumer respondents, who were aged 19 years or older, most commonly cited that they were healthy and did not believe the vaccine was necessary (60%).4 A similar percentage cited vaccine shortages, and concern for possible side effects was reported by 43% of consumers. Perhaps most distressing, 38% and 51% of patients indicated that their physicians never recommended the influenza or PPS vaccine, respectively. A small percentage of consumer respondents (<15%) cited cost as a reason for failure to receive the influenza and pneumococcal polysaccharide vaccines.5 Thus, financial concerns do not seem to be a major obstacle to receiving the influenza or PPS vaccine, which are both covered by Medicare Part B for those aged 65 years or older.

The Medicare Current Beneficiaries Survey7 was conducted to analyze the reasons beneficiaries aged 65 or older were not receiving influenza or PPS vaccines. The major reason provided by respondents in this study7 was again that they “didn’t know they needed” the vaccines—19.4% of patients cited this reason for not receiving the influenza vaccine, and 57.4% for not receiving PPS vaccine. A minority of patients (6.8% for influenza and 4.3% for PPS) cited concerns of “catching” the illness from the vaccine. In addition, 13.7% of respondents were afraid of adverse effects of the influenza vaccine, but only 2.4% cited this reason for PPS vaccine. Again, concern about the cost of the vaccines was minimal, reported by less than 1% of respondents for both vaccines.7

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The herpes zoster vaccine has proven to reduce the incidence of herpes zoster and postherpetic neuralgia, a debilitating condition that can remain for years after zoster rash has resolved. However, few eligible adults have received the vaccine. Findings from survey-based studies on patient uptake of influenza and pneumococcal polysaccharide vaccines suggest that physician recommendations and standing orders can increase vaccine uptake. However, certain barriers unique to zoster vaccination (eg, reimbursement concerns) will need to be addressed.

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Immunization rates may vary by ethnicity, as observed on examination of influenza vaccine uptake in the Veterans Affairs Healthcare System. African American and Hispanic respondents (aged 50 years or older) were much less likely than non-Hispanic white patients to be immunized.

Compared with patient responses, healthcare provider perceptions reveal a different perspective. In identifying why influenza and PPS vaccines were not administered, providers most often cite patients not attending “well” visits (85%) but also noted vaccine shortages (87% for influenza), patient refusal to be vaccinated (fear of needles, 70%; concern the vaccine would cause illness, 65%–87%; or other reasons), and vaccine cost (51%–62%). Overall, the data suggest that physicians’ perceptions of why patients do not receive influenza and PPS vaccine frequently differ from those of their patients.

Several strategies have been shown to effectively overcome barriers to vaccine uptake and improve influenza and PPS immunization rates. The two most effective strategies are strong provider recommendation for immunization and standing orders that allow nurses and other trained personnel—other than physicians—to initiate the discussion and provide vaccination if indicated for patients.

In a Centers for Disease Control and Prevention study, provider attitude appeared to be the most profound factor influencing vaccine uptake. In that study, patient and provider attitudes before a visit were examined, and the percentage of patients immunized during the visit was measured. When the patient and provider had positive attitudes toward vaccination, nearly 90% of patients were immunized during the visit. If the patient planned not to receive the vaccine but the provider recommended immunization, 70% of patients received the vaccine. When the opposite was true—ie, the patient had a positive attitude toward immunization but the provider did not advocate immunization—only 8% were immunized. Thus, it is vital that physicians strongly advocate vaccine uptake because it can help patients overcome preconceived negative opinions toward vaccination.

Standing orders provide nurses with universal orders to screen all patients for indications and contraindications, and, if the patient fits appropriate criteria, administer the vaccine without the physician having to write a separate order. This protocol has been shown effective in increasing patient uptake of influenza and PPS vaccines and has been recommended by the Advisory Committee on Immunization Practices. In one study, a provider education program was initiated to educate healthcare providers on the need to administer influenza vaccine. The program, initiated in 1983, was associated with an increase in influenza immunization rates from 10% to 30% in 2 years. In the second phase of the study, standing orders implemented after a provider education program increased vaccine uptake from 30% to 80% in 2 years.

In summary, much has been learned about the duration of protection needed for influenza and PPS vaccine uptake. Most patients who do not receive a vaccine do not think they need the vaccine. Also, cost is not a major impediment for patient influenza or PPS vaccination. For reluctant patients, physician attitude is extremely important and can overcome patient misperceptions regarding vaccine efficacy and safety. Implementation of standing orders is an effective means of increasing influenza and PPS vaccine uptake, but a multifaceted approach will likely be the most effective strategy overall.

Barriers to Zoster Vaccine
Although no published survey data are available regarding patient attitudes toward zoster vaccine uptake, a recent national survey of general internal medicine and family physicians examined barriers perceived by primary care physicians (Figure). Results of the survey demonstrated that the three most commonly perceived barriers to zoster vaccine administration (ie, ranked “definitely a barrier”) were lack of reimbursement for vaccination (38%), patients being unwilling to pay for the vaccine if it is not covered by insurance (37%), and high “up-front” cost for the physician to purchase the vaccine (30%).

These reasons were followed closely by many physicians’ opinion that their patients did not need the zoster vaccine (perceived as “definitely a barrier” by 22%). The same percentage of respondents also listed insufficient information about the duration of protection as a definite barrier. In the same study, bivariate and multivariate analyses of characteristics associated with the intention to recommend the vaccine were also conducted.

Results demonstrated that only “strongly agreeing” that zoster and PHN cause significant burden of disease in older patients was associated with being very likely to recommend vaccination to adults aged 60 to 79 years. Physician beliefs and perceptions associated with a reduced tendency to recommend zoster vaccination included the following:

- insufficient information about the duration of protection
- need to store the vaccine in a freezer as opposed to a refrigerator
- patients did not need the vaccine
- patients would not be willing to pay for the vaccine out of pocket

Thus, in accord with the foregoing data for influenza and PPS vaccines, a perceived lack of patient need for the vaccine is a major impediment to zoster vaccine uptake. In addition, physicians perceive that cost is also a major obstacle.

Reimbursement
Because cost of the zoster vaccine is a perceived barrier for zoster vaccine uptake, differences in reimbursement for zoster vaccine versus influenza or PPS vaccine should be noted. Influenza and PPS vaccines are covered under Part B of Medicare, so the physician can bill Medicare directly for the cost of the vaccine and an administration fee. However, as described elsewhere, the zoster vaccine is mandated as a benefit under Medicare Part D. Under this plan, the cost of the vaccine is covered but the patient is subject to each plan’s deductibles, co-payments, and “doughnut-hole” provisions. These requirements render the reimbursement of the vaccine much more complicated.

Physician payment may be garnered through Part D by an in-network provider charging the plan for both vac-
cine and administration. Another option is for physicians to give the patient a prescription to purchase the zoster vaccine at a local pharmacy and have the patient return to the office for administration (and charge Medicare Part B for the administration fee). However, care must be taken to keep the virus frozen during transport from the pharmacy to the physician’s office. Of course, this situation demands patient education and is subject to many potential pitfalls.

A more practical solution in some states is for the physician to write a prescription and allow the pharmacy to administer the vaccine and bill Medicare for both the vaccine and administration. There are differences between states regarding laws governing pharmacist administration of vaccines, so patients and physicians must check the regulations within their state.

**Vaccine Efficacy**

As previously noted, the strength of a provider’s recommendation often influences vaccine uptake rates. Thus, it is important for physicians to examine the data and determine whether they think the morbidity of the disease is great enough and the vaccine efficacy high enough to warrant recommending the vaccine.

A simple way to compare interventions is to use the “number needed to treat”—or, in this case, “number needed to vaccinate.” This outcome measure provides the number of individuals who would need to be vaccinated to prevent one case of herpes zoster or one case of PHN. In an analysis of data from the Shingles Prevention Study, Fekete18 suggests that in patients aged 60 years or older, 59 individuals need to be vaccinated to prevent one case of herpes zoster or one case of PHN. In an analysis of data from the Shingles Prevention Study, Fekete18 suggests that in patients aged 60 years or older, 59 individuals need to be vaccinated to prevent one case of herpes zoster, and 364 patients need to be immunized to prevent one case of PHN.

However, several caveats regarding this calculation are apparent. First, Fekete’s analysis18 assumes that the vaccine is only effective for 3.5 years, the duration of follow up in the Shingles Prevention Study. The longer the vaccine lasts, the lower the number needed to vaccinate becomes, and follow-up data suggest comparable efficacy of the vaccine persist at least 5 years (Michael N. Oxman, MD, oral communication, November 2008). Further, the cited calculation does not take into account the changing burden of disease with age.

In older age groups, the incidence of PHN is a more important endpoint than herpes zoster because it is much more debilitating. When the same analysis is limited to individuals aged 70 years or older, the number needed to vaccinate to prevent one case of PHN drops from 364 in the entire group to 250 for those aged 70 years or older.

**Coadministration**

Another practical issue in vaccine administration is the capacity to coadminister vaccines. For example, vaccine administration programs linked to annual influenza vaccine campaigns increase the rates of PPS uptake. Similar changes might be expected for zoster vaccine. The ability to be coadministered with other vaccines increases the likelihood of vaccine uptake.

A recent study19 examined whether the zoster vaccine can be coadministered with the influenza vaccine. In this trial, 762 subjects were randomly assigned to receive the influenza and zoster vaccines simultaneously or individually, separated by 4 weeks. Similar immune responses and safety profiles were
observed in both groups, suggesting zoster vaccine can be coadministered with influenza vaccine.

Preliminary data presented at the 2008 Infectious Diseases Society of America Annual Meeting in Washington, DC, regarding the coadministration of zoster vaccine and PPS vaccine suggested antibody responses to herpes zoster were modestly blunted. However, the clinical significance of this finding is unknown because antibody response is not a correlate of protection against herpes zoster. Regardless, some guidelines advise against administering these two vaccines together.

**Zoster Vaccine Supply**

As noted by Komara, inadequate or inconsistent supply of vaccines has been an obstacle to optimal immunization rates in adults. The supply of the zoster vaccine has been difficult to maintain because of problems growing this live-virus vaccine to adequate levels for industrial production. This problem is compounded by the fact that the same virus is used in all childhood and adult varicella vaccines as well as the zoster vaccine.

At the time of submission, there was a 10- to 14-week delay in shipment of the zoster vaccine. However, at the time of publication, this delay has been reduced to about 2 weeks. Weekly updates regarding the length of time needed for the vaccine to be shipped can be found at http://www.merck.com/e-business/reports/MVC_Supply_Status.pdf.

**Comment**

Physicians may not encourage zoster vaccination because of difficulty in reimbursement associated with Medicare Part D, because they are unsure of the need, because of problems with purchase and storage of the vaccine, and because they may have difficulty in obtaining a consistent supply. In order to increase zoster vaccine uptake, these issues will need to be addressed.

Based on lessons learned from attempts to increase influenza and PPS immunization rates, provider attitude and recommendations are likely to play an important role. Also, simplified payment plans would likely increase herpes zoster immunization rates.

**References**
