Too many patients with chronic conditions remain at risk for pneumococcal infection.

Pneumococcal disease can be dangerous, and sometimes fatal, in people with certain chronic medical conditions. This may be true even when the chronic medical condition is well controlled with medication and/or lifestyle management. Pneumococcal vaccination needs to be used more consistently to reduce the risk of pneumococcal infection in these individuals. (See boxes on pages 3 and 4 for more information about the impact of pneumococcal disease.)

The Centers for Disease Control and Prevention (CDC) recommends pneumococcal vaccination for adults who smoke or have chronic medical conditions, such as liver, lung, or kidney disease; asthma; cardiovascular disease or stroke; diabetes; hemoglobinopathies; and immunocompromising conditions (see Table 1 for full list). Yet, only 17.5 percent of adults younger than age 65 years with one or more of these chronic conditions have been vaccinated according to a 2009 national survey.

One reason may be that too few healthcare professionals are recommending pneumococcal vaccination. In a survey of 100 physicians and 100 physician assistants, nurse practitioners, or registered nurses, fewer than 30 percent of physicians and 20 percent or fewer of the other healthcare professionals reported recommending pneumococcal vaccination for patients with a risk condition.

A recommendation by a healthcare professional is the greatest vaccination motivator for patients. Even patients who know about pneumococcal vaccination reported skipping it because their physician did not tell them to get vaccinated.

Increasing pneumococcal vaccination rates will take multiple strategies, and all healthcare professionals—specialists as well as generalists, nurses, pharmacists, and others—share the responsibility for ensuring at-risk patients are protected.

A multidisciplinary task force identified four main barriers to better immunization in adults with chronic conditions.

The National Foundation for Infectious Diseases (NFID) brought together a task force of healthcare professionals and consumer educators representing more than 20 organizations to prioritize barriers to pneumococcal vaccination among US adults and to identify solutions. Attendees participated in large group discussions and smaller working sessions that focused on specific patient populations.

Task force members identified the following as the biggest barriers to pneumococcal vaccine uptake in patients with chronic health conditions:

- Competing priorities during patient visits

### Table 1
Recommendations for Use of Pneumococcal Polysaccharide Vaccine

<table>
<thead>
<tr>
<th>All adults age ≥ 65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults 19 through 64 years with:</td>
</tr>
<tr>
<td>• Chronic medical conditions (eg, cardiovascular disease or stroke; liver, kidney or lung disease, including asthma; diabetes; sickle cell disease; alcoholism)</td>
</tr>
<tr>
<td>• Immunocompromising conditions (eg, lymphoma or leukemia, damaged or no spleen) or treatments (eg, steroids, radiation therapy)</td>
</tr>
<tr>
<td>• HIV/AIDS</td>
</tr>
<tr>
<td>• Environments with increased risk (eg, nursing homes)</td>
</tr>
<tr>
<td>• Cochlear implant or leaks of cerebrospinal fluid</td>
</tr>
</tbody>
</table>

**Adults age 19 through 64 years who smoke cigarettes**

**Footnotes**

- Most adults only need to be vaccinated once in their lifetime, but some will need revaccination.

The US Food and Drug Administration recently approved a 13-valent pneumococcal conjugate vaccine (PCV13) for use in adults age 50 years and older. The CDC’s Advisory Committee on Immunization Practices has not yet provided guidance for the use of PCV13 in adults.

Pneumococcal vaccines are contraindicated in anyone who has had a severe (ie, anaphylactic) reaction to a previous dose or to any component of the vaccine or to any diphtheria toxoid-containing vaccine (for conjugate vaccine only).

For more information, visit www.cdc.gov/vaccines.

Sources: CDC. MMWR. 2010;59(34):1102-1106. CDC. Chart of Contraindications and Precautions to Commonly Used Vaccines.
Lack of ownership among healthcare professionals for educating and vaccinating patients
Challenges in determining vaccination status
Complexity of recommendations for vaccination and revaccination

Competing Priorities: Developing systems in private practices, clinics, and hospitals can help pave the way for vaccination.

Vaccination may not be considered during most visits because acute problems and other ongoing concerns more directly related to the underlying condition are likely priorities for both patient and professional. This is a significant lost opportunity for professionals to have a positive impact. Ideally, pneumococcal vaccines should be stocked and administered in any healthcare setting where high-risk patients are treated, including private practices, clinics, and hospitals. At a minimum, professionals in settings where vaccination is not available should educate patients and refer them to a place in the community where they can be vaccinated.

Systems can be implemented in medical and social service settings to screen, educate, and either vaccinate or refer patients. One of the most effective strategies at an organizational level is the implementation of a standing orders program. Although standing orders can be applied in any practice setting, they may be particularly impactful for pneumococcal prevention when used in hospital settings. About 60 percent of patients who get pneumococcal disease that requires hospital treatment were hospitalized within the previous four years. Most of these were patients with high-risk conditions. Pneumococcal vaccination during a previous hospitalization may have prevented these infections and potential re-hospitalizations. The Joint Commission has included pneumococcal vaccination as a 2012 performance measure, and the potential effect on accreditation may be a strong motivator for compliance.

In any setting, multiple strategies should be considered and may include:

- Implement standing orders programs.
- Use screening tools at check-in to determine whether patients need pneumococcal vaccination.
- Include prompts, flags, notations, or standardized checklists in charts and electronic medical records (EMRs) to remind physicians, physician assistants, and nurse practitioners about the importance of pneumococcal vaccination for high-risk adults when they are seeing patients.
- Equip check-out staff with information to refer patients to venues for vaccination, such as a primary care practice, local health department, or pharmacy.
- Display educational materials (e.g., posters, fact sheets) in offices to prompt patients to ask about vaccination during their visit.
- Educate patients through practice websites, newsletters, on-hold/voicemail scripts, or other communications.
- Link pneumococcal prevention efforts with annual influenza vaccination activities (while using care to educate patients and staff that pneumococcal vaccination is not needed annually and it can be given at any time of the year).
- Encourage patients who participate actively in their disease management to make pneumococcal and other adult vaccines (e.g., influenza, Tdap, hepatitis B, shingles, HPV, etc) part of their wellness program as appropriate.
- Engage multiple professionals in vaccination activities (discussed further below).

### Annual Public Health Burden of Pneumococcal Disease in the US

<table>
<thead>
<tr>
<th>Disease</th>
<th>Annual Cases</th>
<th>Case-fatality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumococcal bacteremia</td>
<td>50,000</td>
<td>~20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Includes 25-30% of pneumonia cases that progress to bacteremia.</td>
</tr>
<tr>
<td>Pneumococcal meningitis</td>
<td>3,000-6,000</td>
<td>~30%</td>
</tr>
<tr>
<td>Pneumococcal pneumonia</td>
<td>175,000</td>
<td>5-7%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Patients hospitalized with pneumococcal pneumonia are at increased risk for concurrent cardiac events, such as myocardial infarction, arrhythmia, or congestive heart failure.</td>
</tr>
</tbody>
</table>

Annual Public Health Burden

- Pneumococcal bacteremia: 50,000 cases annually; case-fatality rate about 20 percent. Includes 25-30 percent of pneumococcal pneumonia cases that progress to bacteremia.
- Pneumococcal meningitis: 3,000 to 6,000 cases annually; case-fatality rate about 30 percent.
- Pneumococcal pneumonia: 175,000 people hospitalized each year; case-fatality rate of 5-7 percent. Patients hospitalized with pneumococcal pneumonia are at increased risk for concurrent cardiac events, such as myocardial infarction, arrhythmia, or congestive heart failure.
Lack of Ownership: Everyone from physicians to support staff has a role in prevention efforts; professional associations can increase accountability.

Through practice visits, hospital stays, and regular trips to a pharmacy for medication, patients with chronic conditions may interact with any number of professionals, including physicians, nurse practitioners, nurses, ancillary clinicians, pharmacists, physician assistants, public health nurses, and clerical staff. Every one of these professionals can play a role in pneumococcal prevention efforts.

- **All healthcare professionals** can educate patients and their caregivers and *strongly urge* patients to receive pneumococcal and other adult vaccines.

- **Physicians** can drive the implementation of systems in their practices to assure vaccination of all eligible at-risk patients.

- **Physician assistants** and **nurse practitioners** can prescribe and administer vaccines, and along with **nurses**, they can identify and educate patients in need of vaccination, anticipate and address patient questions or concerns, and lead in-office efforts to use educational materials like posters, signs, and fliers.

- **Specialists** can screen, educate, and refer patients to venues for vaccination.

- **Pharmacists**, where authorized, can administer pneumococcal vaccine to recommended adults. In other cases, pharmacists may be able to mention pneumococcal vaccination as a preventive health measure to patients filling prescriptions for medications commonly used to treat chronic conditions.

- **Public health professionals** can educate community members, and where possible, offer pneumococcal vaccination or arrange for vaccination opportunities elsewhere in the community.

- **Support staff** in any healthcare setting can be given ownership of important prevention activities, particularly patient screening, notification, and chart preparation with reminder materials for clinical staff.

- **Hospital staff** can advocate for and/or implement standing orders programs and make sure EMRs reflect needed vaccines.

### The Considerable Costs of Pneumococcal Disease

- In 2004, pneumococci caused an estimated 4 million illness episodes resulting in direct medical costs (inpatient and outpatient) of $3.5 billion. About half of these costs ($1.8 billion) were related to care of patients age 65 years and older, many of whom have chronic health problems.

- Factoring in lost work and productivity, costs related to pneumococcal infections in younger working adults nearly equal those for the older population. (Figure 1)

**Figure 1**

Direct and indirect costs of pneumococcal disease in the US, 2004

<table>
<thead>
<tr>
<th>Cost Type</th>
<th>Percentage</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatient and ED Costs</td>
<td>40%</td>
<td>$2.88 billion</td>
</tr>
<tr>
<td>Inpatient Costs</td>
<td>11%</td>
<td>$0.37 billion</td>
</tr>
<tr>
<td>Work Loss Costs</td>
<td>12%</td>
<td>$0.84 billion</td>
</tr>
<tr>
<td>Future Productivity Losses</td>
<td>37%</td>
<td>$2.53 billion</td>
</tr>
</tbody>
</table>


**Professional associations** can also support pneumococcal prevention by:

- Listing pneumococcal and other adult vaccines in the clinical guidelines for the treatment of individuals with chronic health conditions.

- Publicizing the inclusion of vaccines in the guidelines.

- Educating members about pneumococcal prevention.

- Adding pneumococcal vaccination to accountability measures.

### Vaccination Status: Better documentation can support increased vaccination rates.

Patients with chronic conditions might receive pneumococcal vaccination in any number of healthcare settings.
they are not always able to recall whether they have been vaccinated. In the absence of a record, professionals may hesitate to vaccinate, though CDC recommendations state that vaccination should be given when an adult’s status is uncertain. Activities that improve record keeping can help support increased vaccination rates:

- Use EMRs or paper-based trackers developed for adult vaccines to keep an office record of patient vaccinations.
- Check to see if your state’s Immunization Information System (IIS, or immunization registry) keeps records of adult vaccinations. If it does not, ask that your professional society advocates that it does so.
- Encourage patients to keep their own records by:
  - Including information about recommended vaccines, including administration dates, on medication cards carried by patients with chronic conditions.
  - Providing patients with a paper-based or electronic file they can keep at home and bring with them to appointments and/or encourage them to establish online personal health records that include a record of immunization.

Complexity of Recommendations: Teaching tools and chart-based prompts can help.

Most adults recommended for pneumococcal vaccination only need to be vaccinated once in their lifetime, but some will need revaccination. There is a lack of clarity among healthcare professionals about who should receive an initial dose of pneumococcal vaccine. A 2009 survey by NFID discovered that 13 percent of physicians did not know that everyone age 65 years and older needs pneumococcal vaccination, and more than 40 percent did not know that smokers and alcoholics should be vaccinated.

Determining a patient’s need for revaccination may also prove challenging. Several factors must be considered, including age at first vaccination, present age, specific chronic health condition, and contraindications. Finally, as mentioned above, uncertain vaccination status can deter physicians who are unfamiliar with CDC’s recommendation to vaccinate in this situation.

The following activities can help improve healthcare professionals’ knowledge about pneumococcal vaccination recommendations and overcome challenges in decision-making while a patient is in the office:

- Use flags in EMRs and paper-based charts as reminders for vaccination and revaccination.
- Use teaching tools to educate healthcare staff about vaccination recommendations.

Multiple strategies will be needed to improve pneumococcal vaccination rates; resources are available to support these efforts.

NFID has a Pneumococcal Disease Professional Practice Toolkit available with tools and materials to help practices improve adult pneumococcal vaccination rates and promote patient education among adults in their care. These include ready-to-use and template resources for healthcare professional and patient education, screening and tracking forms, and links to information about standing orders programs. To access the toolkit, visit: Adultvaccination.org/Pneumotools.

More than 20 medical and health organizations served on or supported the pneumococcal disease task force and helped shape the content of the meeting described in this document. Click here to see a full list.

References