New pneumococcal conjugate vaccines for older and high-risk adults

British Columbia introduced the pneumococcal polysaccharide 23-valent (PPV23) vaccine in 1996 for bone marrow transplant recipients and asplenics. Over the next 2 years, the program expanded to residents of long-term care and adults 65 years and older, implemented in the year one turns 65. Select underlying medical conditions were added in later years, including people who are homeless, underhoused, or using illicit drugs, following a 2008 outbreak of serotype 5 disease.[1] A once-only second dose 5 years later is publicly funded for select groups but is not routinely provided in BC to older adults. Current indications are available on the PPV23 product page in the *BC Immunization Manual*.[2]

The PPV23 vaccine was designed to cover the majority of serotypes causing disease in adults. A recent systematic review and meta-analysis found no randomized trials of PPV23 efficacy but assessed results from nine observational studies of adults aged 60 years and older immunized within the prior 5 years and concluded that PPV23 vaccine effectiveness against vaccine-type invasive pneumococcal disease ranged from 42% to 64%, with slightly higher estimates for adults without immunocompromise; effectiveness against vaccine-type pneumonia has been variable, with some studies showing no effectiveness.[3]

Polysaccharides are T-cell-independent antigens and generally do not produce long-term B-cell memory or prime the immune system for subsequent response upon re-exposure (boosting). These vaccines are poorly immunogenic in infants, who experience the highest rates of invasive pneumococcal disease. As a result, conjugation technology to bind the polysaccharide to a protein carrier such as diphtheria toxoid was developed and results in a T-cell-dependent response with induction of B-cell memory.[4] Pneumococcal conjugate vaccines (PCVs) have been highly effective in young children, and their valencies have been designed around serotypes that cause disease in that age group. These vaccines have been used in the routine childhood immunization schedule since 2003, with initial introduction of a 7-valent vaccine (PCV7), replaced by a 13-valent vaccine (PCV13) in 2010. However, PCV13 had not been recommended for routine use in older adults by the Canadian National Advisory Committee on Immunization (NACI). This was despite favorable results in an efficacy trial of PCV13 published in 2015, conducted in the Netherlands, where polysaccharide vaccine had not been used in adults. The trial, Community-Acquired Pneumonia Immunization Trial in Adults (CAPiTA), found 75% efficacy against invasive pneumococcal disease due to PCV13 serotypes and 45% efficacy against noninvasive PCV13-type pneumonia among adults aged 65 years and older.[5] Routine use of PCV13 in older adults was recommended in 2014 by the US Advisory Committee for Immunization Practices on the heels of a ninefold reduction in PCV13-type invasive pneumococcal disease in those aged 65 and older between 2000 and 2014, following the introduction of PCV vaccines for children, attributed to indirect protection due to reduced nasopharyngeal carriage among immunized children.[6] Continued declines in older adult disease were expected with the addition of direct protection from PCV13, in addition to PPV23, but were not observed despite moderate uptake of both vaccines in the older adult population. As a result, the US recommendation for PCV13 use in older adults was modified to shared decision making.

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Two new PCVs have been authorized for use in adults in Canada: a 20-valent product (Prevnar20, Pfizer Canada ULC) and a 15-valent product (Vaxneuvance, Merck Canada Inc.). Approval was based on serological response, with comparisons to PCV13 and/or PPV23 serotypes. The immune response to some of the serotypes shared with PCV13 are lower, but the clinical relevance of this is unknown. Neither vaccine generates stronger response to serotype 3, the type most commonly associated with vaccine failure. Data on effectiveness will need to be generated in postmarketing use. NACI has recommended the use of PCV20 for older and high-risk adults to replace the use of PPV23. NACI has further recommended that if PCV15 is used in these adult populations, PPV23 should continue to be offered because of the benefit of protection from the additional strains.[7] Provincial and territorial public health programs will consider the introduction of these vaccines for older and high-risk adults in the coming months. In

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the meantime, these vaccines are commercially available for purchase in the private market. ■

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COHP

Continued from page 385

- Plant-based beverages (e.g., soy, oat, and almond milks) are not nutritionally equivalent to dairy milk and are not recommended before age 2. Soy-based formula is an acceptable alternative to dairy formula for vegan infants and others.
- Full-fat cow's or goat's milk can be introduced at 9 to 12 months (once infants are eating a wide variety of solids) and continued until 24 months.
- Providers are encouraged to use neutral and nonjudgmental language rather than talking about healthy, unhealthy, or junk foods. ■

—Ilona Hale, MD, FCFPC
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Continued from page 386

and cautions that "how you perform the physical exam, and how often you perform it, can change over time and become overly limited without you realizing the impact on patients."[2] Performing a physical exam can also increase patients' confidence in the physician and validate that they have been heard.

If you have questions about your patients with workplace injuries/illnesses and would like to speak with a physician at WorkSafeBC, please contact us through the RACE app at www.raceconnect.ca/race-app. ■

—Harvey Koochin, MD
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