doi.org/10.58931/cdet.2025.3242

About the Author

Wayne Ghesquiere, MD, FRCPC

Dr. Wayne Ghesquiere is a Clinical Infectious Diseases, Tropical Diseases, and Internal Medicine consultant in Victoria BC as well as the former section chief for infectious diseases with the Island Health Authority. Wayne is a Clinical Assistant Professor of Medicine with University of British Columbia. He teaches internal medicine residents and infectious diseases fellows. He is also a lecturer with the Island Medical School Program, UBC. He is an attending physician at the Royal Jubilee and the Victoria General Hospitals in Victoria, BC. He has an inpatient and a private outpatient practice in infectious diseases.

Affiliations: Infectious Diseases Consultant, Victoria, BC
Clinical Assistant Prof of Medicine, UBC

Vaccinating Your Adult Diabetic Patient: What Vaccines Would You Recommend?

Wayne Ghesquiere, MD, FRCPC

Introduction

Adults with diabetes (type 1 or type 2) are at substantially higher risk of infections and complications from vaccine-preventable diseases. As a result, persons with diabetes experience higher rates of serious illnesses such as influenza, pneumonia, and other infections. Epidemiological studies show that during flu epidemics, persons with diabetes are hospitalized at much higher rates and are more likely to suffer serious complications (e.g., myocardial infarction, heart failure, stroke) than their non-diabetic peers. Globally, diabetes is one of the most common comorbidities among patients with severe COVID-19. In short, diabetes—especially when poorly controlled or long-standing—is a risk factor for viral, bacterial, and fungal infections. People with diabetes are more likely to be hospitalized or die from illnesses such as influenza, pneumonia, and COVID-19. Clinicians should understand that diabetes itself impairs immunity, making timely immunization critical. Notably, the Canadian Immunization Guide confirms that there is no evidence suggesting that vaccines adversely affect blood glucose control.

General Immunization Recommendations for Diabetes

Canadian guidelines emphasize that patients with diabetes should receive all age-appropriate routine immunizations, along with any additional vaccines indicated for chronic disease. Both the Canadian Immunization Guide and Diabetes Canada advise that “routine immunization, including annual influenza vaccine, is important for persons with endocrine (e.g., diabetes) and other metabolic disorders.” In other words, adults with diabetes require the same vaccines as other healthy adults (e.g., childhood series, tetanus/diphtheria/pertussis, measles, mumps, and rubella (MMR), varicella, human papillomavirus (HPV), hepatitis A and B when indicated), with an extra focus on vaccines that prevent against respiratory and invasive infections. In general, persons with diabetes may have a reduced response

to vaccines, making vaccination early in the disease course, ideally before complications or immunosuppression develop especially important. In Canada, the National Advisory Committee on Immunization (NACI) considers people with diabetes "at increased risk of complications" and recommends that they should be immunized according to both standard and high-risk schedules. Diabetes Canada guidelines likewise advise annual flu and pneumococcal vaccination for all adult diabetics.

Key point: At every diabetes-related visit, clinicians must review immunization status, ensuring both routine vaccines (MMR, varicella, tetanus, diphtheria, and acellular pertussis [Tdap], HPV, among others), as well as disease-specific vaccines are up-to-date, (see below). A recent Canadian study revealed that although most adults think they are fully immunized, fewer than 10% have received all recommended adult vaccines. Given this gap, proactive vaccine review is strongly recommended.

Influenza (Flu) Vaccination

Recommendation: All diabetic adults should receive an annual influenza vaccine before each flu season. Influenza causes more severe disease in those with diabetes. Canadian data show that those with diabetes have markedly higher rates of hospitalization for influenza/pneumonia and related cardiac events than those without diabetes. Diabetic patients hospitalized with flu have worse outcomes, and flu vaccination reduces these risks dramatically. For example, Diabetes Canada notes that flu vaccinations can reduce hospitalizations by ~40% in high-risk populations. Meta-analyses involving mixed-age cohorts (including persons with diabetes) confirm that vaccination lowers influenza-related mortality and hospitalization in adults.

The Canadian Immunization Guide explicitly lists diabetes among the conditions warranting annual flu vaccine NACI recommends the inactivated flu vaccine for all individuals aged ≥6 months, with particular emphasis on those with chronic illnesses (including diabetes) or those aged ≥60 years. In Canada, most immunization programs offer quadrivalent inactivated flu vaccines free to people with diabetes each fall. There are no diabetes-specific contraindications, apart from the usual precautions (e.g., anaphylaxis to vaccine components). Flu vaccines are safe for persons with diabetes and do not destabilize blood glucose levels. (For patients with severe egg allergies, egg-free formulations are available).

Clinical tip: Administer the flu vaccine early (e.g., October) to allow immunity before peak flu activity. When possible, consider co-administering it with other indicated vaccines during the same visit. NACI notes that COVID-19 and influenza vaccines may be given concurrently with no loss of efficacy.

Pneumococcal Vaccination

Pneumococcal disease risk: Public health guidance highlights that people with chronic illnesses (e.g., diabetes) are at a significantly increased risk for invasive pneumococcal infections. Persons with diabetes are hospitalized for pneumonia at significantly higher rates than those without diabetes, making immunization against *Streptococcus pneumoniae* essential. Pneumococcal vaccination has been shown to dramatically reduce severe outcomes; prior vaccination in adults is linked to lower mortality and fewer complications in cases of community-acquired pneumonia. Diabetes Canada guidelines state that persons with diabetes are "encouraged" to receive pneumococcal vaccination, noting that their risk profile is similar to other high-risk chronic diseases.

Recommendations in Canada: NACI's recent guidance (2024) explicitly includes diabetes as a chronic condition warranting pneumococcal conjugate vaccination (PCV). For example, one NACI statement lists "diabetes mellitus, particularly in those over 50 years" as a high-risk group that should receive high-valency PCV. Current Canadian practice generally involves:

- PCV followed by PPSV23: Adults with diabetes and other chronic conditions are recommended to receive one dose of a pneumococcal conjugate vaccine, either (PCV15 or PCV20), followed by one dose of the 23-valent polysaccharide vaccine (PPSV23) at least 8 weeks later. For example, a healthy 60-year-old with diabetes would receive one dose of PCV15 (Vaxneuvance) or PCV20 (Prevnar 20), followed by PPSV23 after at least 8 weeks. These higher-valency conjugate vaccines are now preferred because of their broader strain coverage and ability to induce immunologic memory. If PCV13 was previously administered,

updated guidance recommends giving PCV15/20 after one year.)

- Revaccination: Adults with diabetes who previously received PPSV23 before age 65 should receive one booster dose of PPSV23 at age 65 or older, provided that at least 5 years have passed since the previous dose. Those aged ≥65 years with diabetes are also candidates for PCV (either PCV15/20 alone or followed by PPSV23) if they have not previously received a conjugate vaccine. In short, diabetic adults aged 19–64 years receive at least one PPSV23, with a second dose at age ≥65. Diabetic adults aged ≥65 should receive a dose of PCV (now PCV15/20 or the new Pneu-C-21) in addition to PPSV23 for optimal protection.
- New conjugate vaccines: Recent NACI statements (2023–2024) incorporate the latest vaccines in Canada. Both 15-valent and 20-valent PCVs (Vaxneuvance, Prevnar-20) are now authorized, and a 21-valent PCV (Pneu-C-21) was approved in late 2024. NACI recommends these higher-valency PCVs for high-risk adults, including diabetic adults. For example, an adult diabetic who is recommended for pneumococcal vaccine should first be offered Pneu-C-21 (or PCV20/15 if Pneu-C-21 is not available), followed by PPSV23. These newer vaccines extend protection against more serotypes and may become the standard of care for adults with diabetes in provincial programs.

Key point: In practice, clinicians should ensure that all diabetic patients have received at least one pneumococcal vaccine during adulthood. If a patient has missed this, the immunization should be scheduled promptly. A helpful approach is to administer PCV15 or PCV20 first (as they provide broader coverage), followed later by PPSV23. This strategy has been shown in other immunocompromised adult populations to improve immune response

COVID-19 Vaccination

Adults with diabetes were prioritized for COVID-19 vaccination early in the pandemic because of their heightened risk of severe illness. The Public Health Agency of Canada (via NACI) lists “diabetes mellitus and other metabolic diseases” as underlying conditions that place people in a high-risk category for severe outcomes from COVID-19. Data consistently show that people living with diabetes, especially if aged ≥50 or with complications, are more likely to be hospitalized or die from COVID-19.

Recommendations: All patients with diabetes should receive the full COVID-19 vaccine series and stay up-to-date with booster doses, similar to the general population. NACI strongly recommends mRNA-based primary series and booster doses for everyone aged ≥6 months, with added emphasis on those with chronic conditions including diabetes. In fact, recent Canadian guidance advises that people at higher risk (adults aged 65 and older, and those with chronic illness) receive an updated COVID-19 vaccine each fall. The updated fall-2024 vaccines target the latest Omicron subvariants and are formulated as bivalent or monovalent mRNA vaccines. Diabetic patients, similar to others ≥65 or with comorbidities, can receive any authorized formulation (Pfizer or Moderna) and should follow NACI’s timing recommendations, generally one year after last dose or infection or fall booster.

- Concurrent administration: COVID-19 vaccines can be administered at the same time as other adult vaccines (e.g., flu) for added convenience.
- Safety: As with other vaccines, COVID-19 vaccines do not affect blood glucose control and have been shown to reduce severe outcomes in people with diabetes.

Herpes Zoster (Shingles) Vaccine

Varicella-zoster reactivation (shingles) is more common and often more severe in individuals with impaired immunity. One in three adults will develop shingles during their lifetime. While advancing age is the main risk factor (with two-thirds of cases occurring in those aged ≥50), diabetes also plays a contributing role. Evidence shows that diabetes is frequently accompanied by diminished cell-mediated immunity, and diabetic patients exhibit lower varicella zoster virus-specific T-cell responses than non-diabetic individuals. Some studies have also reported an association between diabetes and increased herpes zoster incidence.

Recommendations: All diabetic adults aged 50 and older should receive the recombinant zoster vaccine (RZV, Shingrix) as per NACI guidelines. The Canadian Immunization Guide explicitly recommends two doses of RZV, administered 2–6 months apart for everyone aged ≥50. Even patients who have previously had shingles or received the older live zoster

vaccine are advised to receive RZV once. Because immunity may wane more quickly for adults with diabetes, completing the series is important. Some provinces publicly fund RZV for those in their 60s, while others provide coverage for adults aged 50 and older with diabetes via private insurance or out-of-pocket payment. NACI now strongly recommends that individuals aged 18 and older who are or will become immunocompromised receive two doses of RZV to prevent herpes zoster and its associated complications.

Key Point: Diabetic patients should be counselled on shingles vaccination as they approach age 50. It markedly reduces the risk and severity of shingles and postherpetic neuralgia, conditions which can otherwise be quite debilitating in older adults. For patients with diabetes aged 18–49, the shingles vaccine may be considered based on shared clinical decision-making.

Respiratory Syncytial Virus Vaccine

Respiratory syncytial virus (RSV) can cause severe lower respiratory tract infections in older adults and those with chronic illnesses. In 2023, Canada approved its first RSV vaccines for adults

Practical Recommendations for Clinicians

- Review immunizations at each visit. Use checklists or electronic reminders to ensure each diabetic adult has received the recommended vaccines for their age and risk group. Verify that flu vaccines are administered annually, and pneumococcal vaccines are scheduled appropriately. A patient-held vaccine card or provincial immunization registry can support accurate tracking and documentation.
- Educate on risks and benefits. Emphasize that vaccines are both safe and crucial. Dispel myths by noting, for example, that flu and COVID-19 vaccines cannot worsen diabetes and in fact are shown to prevent hospitalizations. Highlight that <10% of adults are fully up-to-date with all recommended vaccines, making catch-up immunization a common part of care.
- Bundle vaccinations. Whenever possible, administer multiple vaccines during the same visit to improve coverage and convenience (e.g., pairing flu and COVID-19 vaccines, or flu and pneumococcal vaccines during the appropriate season). NACI affirms that co-administration of adult vaccines is acceptable.
- Monitor and follow-up. For multi-dose vaccines (COVID-19, RZV, hepatitis B), ensure patients complete the full series. Set reminders for follow-up doses (e.g., the second RZV dose should be administered 2–6 months after the first).
- Leverage primary care/pharmacy. Many patients with diabetes visit pharmacies regularly for insulin or supplies, making pharmacists well-positioned to check immunization status and administer vaccines. When available, use community programs (e.g., “Vaccination Clinics for Adults with Diabetes”).
- Address barriers. Some patients may feel hesitant about vaccines due to fear of needles or a belief that they are not at risk. Use concrete evidence (e.g., “Your risk of pneumonia is as high as someone with COPD if you have diabetes”) to motivate them. Also address financial concerns by noting that most provinces cover flu/pneumococcal vaccines for high-risk adults, and many provide coverage for shingles and COVID-19 boosters.
- Coordinate with specialists. Immunization should be reinforced by all members of the care team, including endocrinologists, diabetes educators, and primary care providers. For hospitalized patients with diabetes, an inpatient vaccine program can capture missed opportunities.

In summary, vaccination is a vital part of diabetes care in Canada. It reduces the risk of serious morbidity and mortality from infections to which persons with diabetes are particularly vulnerable. Both Diabetes Canada and NACI stress that persons with diabetes should be fully immunized according to the general schedules and receive the additional recommended vaccines shown below. By following current Canadian guidelines and evidence-based practices, clinicians can greatly improve outcomes for their diabetic patients by preventing vaccine-preventable diseases.

aged 60 and older. NACI now regards diabetes as a "clinically significant chronic condition" warranting RSV immunization. The vaccines (Arexvy®, Abrysvo®) are single-dose regimens that have shown high efficacy (82–95% in clinical trials) in preventing RSV-related pneumonia and bronchiolitis in older adults.

Recommendation: All diabetic adults aged 60 and older should be offered the RSV vaccine, ideally before the RSV season in the fall. This is especially important for those with diabetes who have lung or heart disease, though NACI lists diabetes itself as an indication for immunization. Given that RSV may exacerbate chronic conditions such as chronic obstructive pulmonary disease (COPD) and diabetes, vaccination can help reduce hospitalizations in this vulnerable group. At present, there is no specific recommendation for adults with diabetes under 60 who do not have other risk factors.

Other Routine Vaccines

In addition to the above, people living with diabetes should not neglect standard adult vaccines. Key points include:

- Tetanus and Diphtheria (Td)/Tdap: Ensure Td boosters are administered every 10 years. In particular, adults aged 19 and older should receive a one-time dose of Tdap to provide protection against pertussis, followed by Td boosters every decade. (While a single dose of Tdap is also recommended during each pregnancy, this falls outside the scope of routine adult diabetes care).
- MMR and Varicella: Adults with diabetes who have never had chickenpox or MMR infection, or did not receive the childhood vaccination series, should be tested for immunity and immunized if needed. These are live vaccines typically administered in childhood, but catch-up vaccination in adulthood is safe for those who are not immune. (Live vaccines should only be avoided in individuals with significant immunosuppression).
- Hepatitis. Hepatitis A: Not routinely indicated for individuals with diabetes unless there are additional risk factors (e.g., travel to endemic regions, liver disease, being a man who has sex with men, injection drug use). Hepatitis B: Serologic testing is recommended. If a patient's Hepatitis B surface antibody level is negative or below the cutoff for immunity, hepatitis B vaccination is advised.
- HPV: The HPV vaccine is recommended for all individuals with diabetes up to age 26 who have not completed the vaccine series. For adults aged 27–45 with diabetes, vaccination may be considered based on shared clinical decision-making, particularly if they are at ongoing risk

Recommended Vaccines for Adults with Diabetes: (according to NACI/Diabetes Canada)
• Annual Influenza (inactivated): annually each fall.
• COVID-19 (mRNA): full series plus boosters (with emphasis on receiving the updated fall booster).
• Pneumococcal: one dose PCV15 or PCV20 followed by PPSV23 at least 8 weeks later. Revaccinate with PPSV23 at age ≥65 if indicated.
• Shingles (RZV): two doses 2–6 months apart for adults aged ≥50.
• Tdap/Td: one dose of Tdap after age 19 (if not administered in adulthood), then Td booster every 10 years thereafter.
• RSV: one dose for all adults aged 60 and over (diabetes is an indication).
• Other vaccines as needed: MMR, varicella, hepatitis A & B, HPV, and others per routine adult immunization guidelines.

Sources: Canadian Immunization Guide (NACI) chapters and updates; Diabetes Canada guidelines; peer-reviewed studies on infection risk in diabetes; and patient-focused resources summarizing Canadian recommendations. The evidence is clear that staying up-to-date on these vaccines is a key preventive strategy in diabetes management.

for new HPV exposure. Diabetes itself is not a contraindication to HPV vaccination, and immunogenicity studies show that individuals with diabetes mount a strong immune response. Completing the full series—two doses if started before age 15, or three doses if started at age 15 or older—is essential for long-term protection.

- Meningococcal: Routine meningococcal vaccination is not required for adults with diabetes unless they have asplenia or risks associated with travel/study.
- Travel Vaccines: Diabetic patients planning travel should be advised to visit a travel and immunization clinic. Vaccines (e.g., yellow fever, typhoid, among others), may be recommended. It is important to note that immune responses to some vaccines may be slightly reduced in individuals with diabetes.

Case Presentation

A 45-year-old male patient with insulin dependent diabetes presents to you seeking advice on improving his blood glucose control. He expresses concern about his deteriorating overall health. He reports that he has likely not received any vaccinations since childhood. Question: Which vaccines would you recommend for this patient?

Correspondence

Wayne Ghesquiere, MD, FRCPC
Email: wghesquiere@novaclinical.com

Financial Disclosures

W.G.: None declared.

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