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# RECOMMENDED VACCINATIONS FOR PATIENTS WITH TYPE 2 DIABETES IN POLAND: AN ANALYSIS AND REVIEW OF CURRENT RECOMMENDATIONS

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## ABSTRACT

**Research objectives:** Type 2 diabetes (T2D) represents a significant global public health challenge. The core of the disease is impaired carbohydrate metabolism, primarily manifesting as chronic hyperglycemia, which results from a relative or absolute deficiency in insulin secretion, accompanied by varying degrees of peripheral insulin resistance. Hyperglycemia is thought to impair immune function, thereby reducing the body's capacity to contain and eliminate invading pathogens effectively. Therefore, individuals with diabetes are more susceptible to infections. This article aims to provide an overview of adult vaccination recommendations, with a particular focus on modifications relevant to individuals with type 2 diabetes.

**Methods:** The authors searched the PubMed, Scopus, and Google Scholar databases using phrases such as “Type 2 Diabetes Mellitus,” “Vaccination,” “Recommendations,” and “Immunization”. Boolean operators such as “AND” and “OR” were applied to refine and optimize the search results. Articles published in English between January 2016 and June 2025 were considered. Additional articles were identified by screening the bibliographies of studies retrieved through the database searches.

**Key findings and conclusions:** T2D is a risk factor for severe infectious diseases, as well as infectious diseases can worsen the control of T2D. Therefore, patients burdened with this disease should be especially encouraged to receive immunizations during any contact with health care.

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## KEYWORDS

Type 2 Diabetes, Vaccination, Immunization, Risk Group, Vaccine Effectiveness

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## Introduction

Type 2 Diabetes (T2D) is a major health problem worldwide. The essence of this disease is abnormal carbohydrate metabolism, characterized by hyperglycemia. It is associated with a relative or absolute impairment in insulin secretion, along with varying degrees of peripheral resistance to the action of insulin. Elevated blood glucose levels have an impact on the immune system. An inflammatory response occurs as a result of the immune response to high blood glucose levels as well as the presence of inflammatory mediators produced by adipocytes and macrophages in fat tissue. Hyperglycemia associated with diabetes is believed to impair the immune response, compromising its ability to effectively contain and eliminate invading pathogens in affected individuals. Consequently, individuals with diabetes exhibit increased susceptibility to infections. As the prevalence of T2D continues to rise, a corresponding increase in the incidence of infectious diseases and their associated comorbidities is anticipated<sup>1-4</sup>.

Vaccination is one of the best and safest forms of prevention of severe infection. In an era of growing concerns and numerous myths about vaccinations, physicians should be particularly keen and educated about vaccinations and risk groups to effectively reduce the risk of infection. This article will summarize recommendations for preventive vaccination for adults, emphasizing any differences due to T2D.

## Methods

The authors searched the PubMed, Scopus, and Google Scholar databases using phrases such as “Type 2 Diabetes Mellitus,” “Vaccination,” “Recommendations,” and “Immunization”. Boolean operators such as “AND” and “OR” were applied to refine and optimize the search results. Articles published in English between January 2016 and June 2025 were considered. Additional articles were identified by screening the bibliographies of studies retrieved through the database searches.

## Results

### *Type B Hepatitis*

In the case of the hepatitis B virus, it is imperative to identify unvaccinated individuals at any age and administer the vaccine according to the 0-1-6-month schedule.

T2D may predispose to a lower immune response to hepatitis vaccination. The cause is thought to be excessive adipose tissue, which often coexists with T2D. In individuals with higher adiposity, the vaccine is more likely to be distributed into adipose tissue rather than muscle, potentially reducing its absorption and increasing the risk of enzymatic degradation. This altered distribution may contribute to the diminished immunogenic response observed in overweight individuals following vaccination<sup>3</sup>. When previously vaccinated persons are found to have a titer of anti-HBs antibodies < 10 IU/l, revaccination with 1-3 doses of vaccine is recommended. If a protective concentration of antibodies is not achieved after 3 doses of vaccine (4-12 weeks after the last vaccination), it is advised to refrain from further vaccination<sup>5,6</sup>.

### *Pneumococcal disease*

Diseases caused by *Streptococcus pneumoniae* (*S. pneumoniae*) can be either invasive or non-invasive. In adults, pneumococcal infections most often occur as pneumonia and are one of the leading causes of hospitalization in these patients in Poland<sup>7</sup>. Patients with diabetes are at high risk of pneumonia, which is among the most frequent causes of hospitalization<sup>8</sup>. It has also been reported that pneumococcal disease increased the risk of mortality in diabetic patients<sup>9</sup>.

Pneumococcal vaccination is recommended for all adults with diabetes, with free vaccination for diabetic patients over 65 years of age<sup>6</sup>.

### *Influenza*

In the case of the influenza virus, an increased risk of hospitalization and death among people with diabetes has been proven<sup>10</sup>. According to the available data, a significant reduction in the risk of death and hospitalization among patients with diabetes was achieved through influenza vaccination<sup>11</sup>.

It is therefore recommended that children over 6 months of age and adults be vaccinated annually. Vaccination with standard vaccines is free for children from the age of 6 months to the age of 18 and people 65+, while for adult patients aged 18-64, it is available with 50% refunds, regardless of the coexistence of T2D<sup>1,4,6</sup>.

### *COVID-19*

Tis an independent risk factor for severe COVID-19, including an increased risk of death. Concurrently, Sars-CoV-2 virus infection can significantly worsen glycemic control in people with T2D<sup>12-14</sup>. Similar to responses observed with other vaccines, individuals with T2D may exhibit a diminished immunological response to SARS-CoV-2 vaccination compared to the general population<sup>15</sup>.

It is recommended to take booster doses of COVID-19 vaccine, adjusted to the current epidemiological situation<sup>6</sup>.

### *Herpes Zoster*

Patients with diabetes mellitus are substantially at increased risk for the development of herpes zoster, with patients with T2D over the age of 65 having the highest risk<sup>16</sup>. Moreover, the incidence of post-herpetic neuralgia is higher in these patients, and neuralgia is more severe and persistent<sup>17</sup>. Vaccination of adults for herpes zoster is primarily aimed at preventing complications of herpes zoster, such as postherpetic neuralgia, which has a complex and lengthy treatment and can affect the course of comorbidities. Non-immunized adults, especially after the age of 50, should be vaccinated against herpes zoster (2 doses at 2-6 months intervals).

### *Respiratory syncytial virus (RSV)*

T2D, due to its pathomechanism, is a risk factor for severe RSV infection, but specific data on morbidity and immune response to vaccination in this group of patients are insufficient.

The U.S. Centers for Disease Control and Prevention (CDC) recommends a single dose of RSV vaccination for individuals at increased risk of severe disease, including older adults, those with chronic heart or lung conditions, immunocompromised individuals, and residents of nursing homes or long-term care facilities<sup>18,19</sup>. According to Polish guidelines, it is recommended to receive one dose of the vaccination for people over 60 years of age, regardless of existing risk factors, but the vaccination is not refunded<sup>1,6</sup>.

### *Human papillomavirus (HPV)*

HPV vaccination is recommended in children from age 9 and young adults aged 19-26<sup>6,20</sup>.

Following Polish guidelines, in people aged 27-49, the decision to vaccinate is made on a case-by-case basis, after discussion with a doctor and consideration of the benefits of vaccination<sup>1,6</sup>. It should be considered that if a patient is at risk for infection with one type of HPV, he or she can still benefit from immunization

against the other 8 types with the nine-valent vaccine<sup>20</sup>. Vaccination of the 26–45-year-old population showed the 4vHPV vaccine to be 100% effective in preventing CIN I genital warts up to a decade after vaccination, while the 2vHPV vaccine showed 90.5% effectiveness in reducing persistent HPV infection. In addition, both vaccine types showed a significant reduction in the risk of CIN, vaginal intraepithelial neoplasia (VaIN), or anal intraepithelial neoplasia grade 2 or higher (AIN2+), as well as a reduction in persistent vaccine-type cervical HPV infection<sup>20-23</sup>.

For patients over 49 years of age, HPV vaccination is not recommended due to limited supporting evidence<sup>21</sup>. There are no specific recommendations for patients with T2D regarding this vaccine.

#### *Diphtheria, Tetanus, and Pertussis*

Vaccination against diphtheria, tetanus, and pertussis is recommended for all adults, regardless of additional disease history. A booster dose is recommended every 10 years. If the patient has an unknown vaccination history, they should be vaccinated according to the 0, 1, 6-month schedule<sup>1,6</sup>.

In addition, it is one of the vaccinations recommended for pregnant women, between 27 and 36 weeks of pregnancy<sup>26</sup>. This uses a vaccine with reduced diphtheria and pertussis antigens (Tdap). The vaccination should be performed in every pregnancy. The purpose of such treatment is to protect the newborn from severe or fatal pertussis during the first 3-6 months of life, but it has been proven that vaccinated women also gain benefits from the vaccine<sup>25-28</sup>.

### **Discussion and Conclusions**

T2D is a risk factor for severe infectious diseases, as well as infectious diseases can worsen the control of this disease. With growing concerns and myths surrounding vaccinations, physicians play an invaluable role in encouraging and promoting vaccinations among at-risk patients. Physicians must identify at-risk groups and inform patients about the serious, preventable consequences of infection. As long as vaccination is one of the best and safest forms of prevention of severe infection, patients burdened with this disease should be especially encouraged to receive immunizations during any contact with health care.

### **REFERENCES**

1. Araszkiwicz A, Borys S, Broncel M, Budzyński A, Cyganek K, Cypryk K, Cyranka K, Czupryniak L, Dąbrowski M, Dzida G, Dziedzic T, Franek E, Gajewska D, Gawrecki A, Górka M, Gumprecht J, Idzior-Waluś B, Jarosz-Chobot P, Kalarus Z, Karczewska-Kupczewska M, Klupa T, Kokoszka A, Korzon-Burakowska A, Kowalska I, Krętowski A, Kwiendacz H, Majkowska L, Małecki M, Mamcarz A, Matejko B, Matyjaszek-Matuszek B, Mianowska B, Mrozikiewicz-Rakowska B, Myśliwiec M, Nabrdalik K, Narkiewicz K, Sieradzki J, Skupień J, Solnica B, Stompór T, Strojek K, Szadkowska A, Szypowska A, Uruska A, Wender-Ożegowska E, Witek P, Wolnik B, Wyleżół M, Wylęgała E, Zmysłowska A, Zozulińska-Ziółkiewicz D. Zalecenia kliniczne dotyczące postępowania u osób z cukrzycą – 2025. Stanowisko Polskiego Towarzystwa Diabetologicznego. *Current Topics in Diabetes*. 2025;5:1–165.
2. Silvio E Inzucchi, MD, Beatrice Lupsa, MD Clinical presentation, diagnosis, and initial evaluation of diabetes mellitus in adults. In: UpToDate, Connor RF (Ed), Wolters Kluwer. (Accessed on June 5, 2025.)
3. Berbudi A, Rahmadika N, Tjahjadi AI, Ruslami R. Type 2 Diabetes and its Impact on the Immune System. *Curr Diabetes Rev*. 2020;16(5):442-449. doi: 10.2174/1573399815666191024085838. PMID: 31657690; PMCID: PMC7475801.
4. Su YW, Hsu CY, Guo YW, Chen HS. Usefulness of the plasma glucose concentration-to-HbA<sub>1c</sub> ratio in predicting clinical outcomes during acute illness with extreme hyperglycaemia. *Diabetes Metab*. 2017 Feb;43(1):40-47. doi: 10.1016/j.diabet.2016.07.036. Epub 2016 Sep 20. PMID: 27663631.[D8]
5. Hu J, Huang K, Zou H, Li J. Association between the systemic immune-inflammatory index and the immune response after hepatitis B vaccination: a cross-sectional analysis of NHANES data. *Front Public Health*. 2025 May 14;13:1480766. doi: 10.3389/fpubh.2025.1480766. PMID: 40438079; PMCID: PMC12116451.
6. <https://szczepienia.pzh.gov.pl/kalendarz-szczepien-2025/>
7. Kuchar E, Antczak A, Skoczyńska A, Fal A, Wysocki J, Walusiak-Skorupa J, Czajkowska-Malinowska M, Mastalerz-Migas A, Flisiak R, Nitsch-Osuch A. Pneumococcal vaccination among adults – updated Polish recommendations. *Fam Med Prim Care Rev* 2022; 24(3): 285–291, doi: <https://doi.org/10.5114/fmpcr.2022.119420>.
8. Liu J (2013) Impact of diabetes mellitus on pneumonia mortality in a senior population: results from the NHANES III follow-up study. *J Geriatr Cardiol* 10(3):267–271. <https://doi.org/10.3969/j.issn.1671-5411.2013.03.005>
9. Falcone M, Tiseo G, Russo A, Giordo L, Manzini E, Bertazzoni G, Palange P, Taliani G, Cangemi R, Farcomeni A, Vullo V, Violi F, Venditti M (2016) Hospitalization for pneumonia is associated with decreased 1-year survival in patients with type 2 diabetes: results from a prospective cohort study. *Medicine* 95(5):e2531. <https://doi.org/10.1097/MD.0000000000002531>

10. Lina B, Georges A, Burtseva E, Nunes MC, Andrew MK, McNeil SA, Ruiz-Palacios GM, Feng L, Kyncl J, Vanhems P, Ortiz JR, Paget J, Reiner RC; GHSN 2017–2018 study collaborators. Complicated hospitalization due to influenza: results from the Global Hospital Influenza Network for the 2017–2018 season. *BMC Infect Dis.* 2020 Jul 2;20(1):465. doi: 10.1186/s12879-020-05167-4. PMID: 32615985; PMCID: PMC7330273.
11. Goeijenbier, M., van Sloten, T. T., Slobbe, L., Mathieu, C., van Genderen, P., Beyer, W. E. P., & Osterhaus, A. D. M. E. (2017). Benefits of flu vaccination for persons with diabetes mellitus: A review. *Vaccine*, 35(38), 5095–5101. <https://doi.org/10.1016/j.vaccine.2017.07.095>
12. Nassar M, Daoud A, Nso N, Medina L, Ghernautan V, Bhangoo H, Nyein A, Mohamed M, Alqassieh A, Soliman K, Alfahawy M, Sachmechi I, Misra A. Diabetes Mellitus and COVID-19: Review Article. *Diabetes Metab Syndr.* 2021 Nov-Dec;15(6):102268. doi: 10.1016/j.dsx.2021.102268. Epub 2021 Sep 4. PMID: 34562865; PMCID: PMC8416292.
13. Holt RIG, Cockram CS, Ma RCW, Luk AOY. Diabetes and infection: review of the epidemiology, mechanisms and principles of treatment. *Diabetologia.* 2024 Jul;67(7):1168-1180. doi: 10.1007/s00125-024-06102-x. Epub 2024 Feb 20. PMID: 38374451; PMCID: PMC11153295
14. Ceriello A. Hyperglycemia and COVID-19: What was known and what is really new? *Diabetes Res Clin Pract.* 2020 Sep;167:108383. doi: 10.1016/j.diabres.2020.108383. Epub 2020 Aug 25. PMID: 32853690; PMCID: PMC7445137.[D9]
15. He YF, Ouyang J, Hu XD, Wu N, Jiang ZG, Bian N, Wang J. Correlation between COVID-19 vaccination and diabetes mellitus: A systematic review. *World J Diabetes.* 2023 Jun 15;14(6):892-918. doi: 10.4239/wjd.v14.i6.892. PMID: 37383586; PMCID: PMC10294060.
16. Lai SW, Liu CS, Kuo YH, Lin CL, Hwang BF, Liao KF. The incidence of herpes zoster in patients with diabetes mellitus: A meta-analysis of cohort studies. *Medicine (Baltimore).* 2021 Apr 23;100(16):e25292. doi: 10.1097/MD.00000000000025292. PMID: 33879659; PMCID: PMC8078473
17. Papagianni M, Metallidis S, Tziomalos K. Herpes Zoster and Diabetes Mellitus: A Review. *Diabetes Ther.* 2018 Apr;9(2):545-550. doi: 10.1007/s13300-018-0394-4. Epub 2018 Mar 8. PMID: 29520743; PMCID: PMC6104256.
18. Payne, A. B., Watts, J. A., Mitchell, P. K., Dascomb, K., Irving, S. A., Klein, N. P., Grannis, S. J., Ong, T. C., Ball, S. W., DeSilva, M. B., Natarajan, K., Sheffield, T., Bride, D., Arndorfer, J., Naleway, A. L., Koppolu, P., Fireman, B., Zerbo, O., Timbol, J., Goddard, K., ... Link-Gelles, R. (2024). Respiratory syncytial virus (RSV) vaccine effectiveness against RSV-associated hospitalisations and emergency department encounters among adults aged 60 years and older in the USA, October, 2023, to March, 2024: a test-negative design analysis. *Lancet (London, England)*, 404(10462), 1547–1559. [https://doi.org/10.1016/S0140-6736\(24\)01738-0](https://doi.org/10.1016/S0140-6736(24)01738-0)
19. <https://www.cdc.gov/rsv/hep/vaccine-clinical-guidance/older-adults.html>
20. Nowakowski, A., Jach, R., Szenborn, L., Bidziński, M., Jackowska, T., Kotarski, J., Mastalerz-Migas, A., Nitsch-Osuch, A., Pinkas, J., Sawicki, W., Sieroszewski, P., Stukan, M., & Wysocki, J. (2022). Rekomendacje Polskiego Towarzystwa Ginekologów i Położników, Polskiego Towarzystwa Pediatrycznego, Polskiego Towarzystwa Medycyny Rodzinnej, Polskiego Towarzystwa Ginekologii Onkologicznej, Polskiego Towarzystwa Wakcynologii oraz Polskiego Towarzystwa Kolposkopii i Patofizjologii Szyjki Macicy w zakresie szczepień profilaktycznych przeciwko zakażeniom wirusami brodawczaka ludzkiego w Polsce. *Lekarz POZ/General Practitioner*, 8(3). <https://ruj.uj.edu.pl/xmlui/handle/item/298184>.
21. Wolf, J., Kist, L. F., Pereira, S. B., Quessada, M. A., Petek, H., Pille, A., Maccari, J. G., Mutlaq, M. P., & Nasi, L. A. (2024). Human papillomavirus infection: Epidemiology, biology, host interactions, cancer development, prevention, and therapeutics. *Reviews in medical virology*, 34(3), e2537. <https://doi.org/10.1002/rmv.2537>
22. Lin KY, Lin IF, Wu PF, Tsai WC, Su LY, Chang CN, Huang WH, Wang CH, Hung MC, Huang CH, Chiu NC, Cheng MF, Hsieh SM, Wang NC, Lee PI, Lu CY, Wang HW, Wong SS, Lin PC, Tsai MH, Yang SC, Hsu YL, Lee SS, Chen YC, Wang FD; Infectious Diseases Society of Taiwan; Society of Colon and Rectal Surgeons, Taiwan; Taiwan AIDS Society; Taiwan Association of Family Medicine; Taiwan Association of Gynecologic Oncologists; Taiwanese Dermatological Association; Taiwan Society of Otorhinolaryngology Head and Neck Surgery; Taiwan Urological Association. Recommendations and guidance for human papillomavirus (HPV) vaccination for adults in Taiwan. *J Microbiol Immunol Infect.* 2025 Aug;58(4):383-396. doi: 10.1016/j.jmii.2025.03.009. Epub 2025 Mar 28. PMID: 40189439.
23. Menu, A. C. I. P., and ACIP GRADE Handbook. "Grading of Recommendations Assessment, Development and Evaluation (GRADE) for use of HPV vaccine in adults ages 27 through 45 years About." *Money* (2016): 11.
24. Lv, H., Wang, S., Liang, Z., Yu, W., Yan, C., Chen, Y.,... & Chen, Z. (2022). Immunogenicity and safety of the 9-valent human papillomavirus vaccine in Chinese females 9–45 years of age: A phase 3 open-label study. *Vaccine*, 40(23), 3263-3271.
25. Liang, J. L., Tiwari, T., Moro, P., Messonnier, N. E., Reingold, A., Sawyer, M., & Clark, T. A. (2018). Prevention of Pertussis, Tetanus, and Diphtheria with Vaccines in the United States: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR. Recommendations and reports: Morbidity and mortality weekly report. Recommendations and reports*, 67(2), 1–44. <https://doi.org/10.15585/mmwr.rr6702a1>
26. Seremak-Mrozikiewicz A., Nitsch-Osuch A., Czajkowski K. i wsp. „Guidelines of the Polish Society of Gynecologists and Obstetricians, the Polish Society for Vaccinology, and the Polish Society for Family Medicine on vaccinating women with reproductive plans and pregnant or breastfeeding women”, *Ginekol Pol* 2023; doi: 10.5603/gpl.95834, 94(8), 670–682.

27. Regan, A. K., Moore, H. C., Binks, M. J., McHugh, L., Blyth, C. C., Pereira, G., Lust, K., Sarna, M., Andrews, R., Foo, D., Effler, P. V., Lambert, S., & Van Buynder, P. (2023). Maternal Pertussis Vaccination, Infant Immunization, and Risk of Pertussis. *Pediatrics*, 152(5), e2023062664. <https://doi.org/10.1542/peds.2023-062664>
28. Baïssas T, Boisnard F, Cuesta Esteve I, et al. Vaccination in pregnancy against pertussis and seasonal influenza: key learnings and components from high-performing vaccine programmes in three countries: the United Kingdom, the United States and Spain. *BMC Public Health*. 2021; 21(1): 2182, doi: 10.1186/s12889-021-12198-2, indexed in Pubmed: 34844567.