Update on Immunizations for Adults with Diabetes

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Advancements in Diabetes Webinar
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Disclaimer

The findings and opinions expressed in this presentation are those of the author and do not necessarily reflect the view of the Indian Health Service (IHS) or the Centers for Disease Control and Prevention (CDC).
Overview

• Background
• Immunization Recommendations
  • Adults
  • Persons with Diabetes
  • Adolescents
• Current Immunization Coverage
• Improving immunization coverage
  • RPMS/EHR reporting and tools
  • Strategies and Best Practices
• Resources
Why Do People with Diabetes Need Immunizations?

• People with diabetes may have a harder time fighting off infections due to weaker immune systems and could be at increased risk for more serious complications from an illness compared to people without diabetes
  • Influenza can raise blood glucose levels to very high levels
  • Higher rates of hepatitis B among people with diabetes than compared to people without diabetes
  • Increased risk for illness or death from pneumonia
• Immunization provides the best protection against vaccine-preventable diseases
• Vaccines are one of the safest ways for people with diabetes to protect their health
Table 1: Recommended Adult Immunization by Age Group, United States, 2020

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>19–26 years</th>
<th>27–49 years</th>
<th>50–64 years</th>
<th>≥65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza inactivated (IV) or</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Influenza recombinant (RIIV)</td>
<td></td>
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<tr>
<td>Influenza live, attenuated (LAIV)</td>
<td></td>
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<td></td>
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<tr>
<td>Tetanus, diphtheria, pertussis (Tdap or Td)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella (VZV)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Zoster recombinant (RZV) (preferred)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoster live (ZVL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human papillomavirus (HPV)</td>
<td>2 or 3 doses depending on age at initial vaccination or condition</td>
<td>27 through 45 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal conjugate (PCV13)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A (HepA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis B (HepB)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal A, C, W, Y (MenACWY)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal B (MenB)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenza type b (Hib)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Recommended vaccination for adults who meet age requirements, lack documentation of vaccination, or lack evidence of past infection
- Recommended vaccination for adults with additional risk factor or another indication
- Recommended vaccination based on shared clinical decision-making
- No recommendation/Not applicable
Advisory Committee on Immunization Practices (ACIP)
Routine Adult Immunization Recommendations

- **Td**
  - Booster every 10 years
- **Tdap**
  - 1 dose, regardless of interval with Td
- **Human Papillomavirus Vaccine (HPV)**
  - 19–26 years (Females and Males)
  - 27–45 (depending on shared clinician and patient decision-making)
- **Zoster**
  - 50 years+

- **Influenza**
  - Annually
- **Meningococcal B (Men B)**
  - 19-23 years (depending on shared clinician and patient decision-making)
- **Pneumococcal**
  - Polysaccharide, 23-valent (PPSV23, a.k.a. Pneumovax®) 65 years
  - PCV13 (65 years+, depending on shared clinician and patient decision-making)
  - May start earlier for certain high-risk populations – e.g., AI/AN in certain geographic regions

Adult Vaccine Schedule:
https://www.cdc.gov/vaccines/schedules/hcp/imz/adult.html
Immunizations for Those with Diabetes

- Pneumococcal
- Influenza
- Hepatitis B
- Zoster
- Tdap
Table 2: Recommended Adult Immunization Schedule by Medical Condition and Other Indications, United States, 2020

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Pregnancy</th>
<th>Immune-compromised (excluding HIV infection)</th>
<th>HIV infection</th>
<th>Asplenia, complement deficiencies</th>
<th>End-stage renal disease or on hemodialysis</th>
<th>Heart or lung disease, alcoholism</th>
<th>Chronic liver disease</th>
<th>Diabetes</th>
<th>Health care personnel</th>
<th>Men who have sex with men</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIIV or RIV</td>
<td>1 dose annually</td>
<td>NOT RECOMMENDED</td>
<td>1 dose annually</td>
<td>PRECAUTION</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OP LAIV</td>
<td>1 dose</td>
<td>1 dose Tdap each pregnancy</td>
<td>1 dose Tdap, then Td or Tdap booster every 10 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tdap or Td</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMR</td>
<td>NOT RECOMMENDED</td>
<td>1 or 2 doses depending on indication</td>
<td>2 doses</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>VAR</td>
<td>NOT RECOMMENDED</td>
<td>2 doses</td>
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<td></td>
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<td></td>
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<tr>
<td>RZV (preferred)</td>
<td>DELAY</td>
<td>2 doses at age ≥50 years</td>
<td>1 dose at age ≥60 years</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>ZVL</td>
<td>NOT RECOMMENDED</td>
<td>DELAY</td>
<td>3 doses through age 26 years</td>
<td>2 or 3 doses through age 26 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPV</td>
<td>DELAY</td>
<td>3 doses through age 26 years</td>
<td>2 or 3 doses through age 26 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCV13</td>
<td>1 dose</td>
<td>1, 2, or 3 doses depending on age and indication</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPSV23</td>
<td>2 doses depending on vaccine</td>
<td>2 or 3 doses depending on vaccine</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HepA</td>
<td>2 doses depending on vaccine</td>
<td>2 or 3 doses depending on vaccine</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HepB</td>
<td>1 dose</td>
<td>3 doses HSCT recipients only</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MenACWY</td>
<td>1 or 2 doses depending on indication, see notes for booster recommendations</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MenB</td>
<td>PRECAUTION</td>
<td>2 or 3 doses depending on vaccine and indication, see notes for booster recommendations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hib</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

*Recommended vaccination for adults who meet age requirement, but discontinuation of vaccination, or lack, avoidance of past infections.*
Pneumonia and Influenza

- American Indian and Alaska Native people are almost two times more likely to die from pneumonia and influenza than non-Hispanic whites\(^1,2\)
- Significant variation by region and age group
- During the 2009 H1N1 influenza pandemic, AI/AN people were four times more likely to die from influenza-related complications than other racial groups\(^2\)
- Reasons for this disparity include a higher rate of chronic medical conditions, including DIABETES

  - [https://www.lung.org/getmedia/98f088b5-3fd7-4c43-a490-ba8f4747bd4d/pi-trend-report.pdf.pdf](https://www.lung.org/getmedia/98f088b5-3fd7-4c43-a490-ba8f4747bd4d/pi-trend-report.pdf.pdf)
- Source 3. Deaths Related to 2009 Pandemic Influenza A (H1N1) Among American Indian/Alaska Natives – 12 States, 2009
  - [http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5848a1.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5848a1.htm)
Pneumococcal

• Two vaccines help protect against pneumococcal disease:
  • Pneumococcal conjugate vaccine (PCV13)
  • Pneumococcal polysaccharide vaccine (PPSV23)

• Diabetes is a risk factor for invasive pneumococcal disease

Source: https://www.cdc.gov/pneumococcal/vaccination.html
Pneumococcal (PPSV23) Recommendations for Adults with Diabetes

Patients with diabetes should receive one dose of PPSV23 before age 65 and then a second dose after they turn 65 years old, at least 5 years after the last dose.
Pneumococcal Conjugate Vaccine (PCV13) for Adults

- PCV13 vaccination is no longer routinely recommended for all adults 65 years and older. Instead, shared clinical decision making for PCV13 use is recommended for adults age 65 years and older who do not have an immunocompromising condition, cerebrospinal fluid (CSF) leak, or cochlear implant.

- PCV13 continues to be recommended for all adults with immunocompromising conditions, cerebrospinal fluid (CSF) leak, or cochlear implant.

- Immunocompromising conditions include chronic renal failure, nephrotic syndrome, congenital or acquired immunodeficiency, iatrogenic immunosuppression, generalized malignancy, human immunodeficiency virus, Hodgkin disease, leukemia, lymphoma, multiple myeloma, solid organ transplants, congenital or acquired asplenia, sickle cell disease, or other hemoglobinopathies.

- Diabetes is NOT considered an immunocompromising condition for this vaccine

ACIP Pneumococcal Recommendations: https://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/pneumo.html
PCV13 Vaccine for Immunocompromised Adults

• PCV 13 for immunocompromised ONLY

Source: ACIP PCV13 and PPSV23 Updated recommendations:
https://www.cdc.gov/mmwr/volumes/68/wr/mm6846a5.htm
Influenza Vaccine

• Flu is a contagious respiratory illness caused by influenza viruses.

• People with diabetes, even when well managed, are at high risk of serious flu complications, often resulting in hospitalization and sometimes even death.
Influenza 2020–2021 Vaccine Recommendation

• Annual influenza vaccination is recommended for all persons aged 6 months and older who do not have contraindications.
# Influenza Vaccines: Egg Based

<table>
<thead>
<tr>
<th>Influenza Type</th>
<th>Presentation</th>
<th>Licensed Age</th>
<th>Contraindications</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIV4 (inactivated)</td>
<td>Standard dose</td>
<td>6 months and older</td>
<td>• History of severe allergic reaction to the vaccine or any of its components</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• ACIP recommends that persons with <strong>egg allergy of any severity receive</strong> influenza vaccine</td>
</tr>
<tr>
<td>HD-11V4 (inactivated)</td>
<td>High Dose</td>
<td>65 years+</td>
<td></td>
</tr>
<tr>
<td>aIIV4 (inactivated)</td>
<td>Standard Dose</td>
<td>65 years +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(adjuvant)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>aIIV3 (inactivated)</td>
<td>Standard Dose</td>
<td>65 years +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(adjuvant)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Trivalent only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAIV4 (FluMist®) (live-attenuated)</td>
<td>Intranasal spray</td>
<td>Healthy 2- to 49-year-olds</td>
<td>Contraindicated in people with severe allergic reaction to vaccine component, and those with chronic medical conditions (e.g. diabetes, asthma), pregnant women, immunosuppressed, caregivers of those with severe immunosuppression (e.g. protective environment)</td>
</tr>
</tbody>
</table>

Source: [https://www.cdc.gov/flu/professionals/acip/summary/summary-recommendations.htm](https://www.cdc.gov/flu/professionals/acip/summary/summary-recommendations.htm)
Influenza Vaccines: Non-Egg Based (Egg Free)

- Standard dose, cell culture based (ccIIV4)
  - Quadrivalent
  - Licensed age 4 years and older
  - Egg-free
  - Contraindicated in people with severe allergic reaction to a vaccine component
- Recombinant, RIV4
  - Quadrivalent
  - Licensed 18 years and older
  - Egg-free
  - Contraindicated in people with severe allergic reaction to a vaccine component
Recommendations for Person with Egg Allergy

• Persons who have experienced only hives after exposure to egg may receive any licensed, recommended, age-appropriate influenza vaccine (i.e., IIV, RIV4, or LAIV4).

• Persons reporting symptoms other than hives after exposure to egg (such as angioedema, respiratory distress, lightheadedness, or recurrent emesis; or who required epinephrine or another emergency medical intervention) may also receive any licensed and recommended influenza vaccine that is otherwise appropriate.

• If a vaccine other than ccIIV4 or RIV4 is selected for such a person, it should be administered in an inpatient or outpatient medical setting and supervised by a health care provider who is able to recognize and manage severe allergic reactions.

• A previous severe allergic reaction to influenza vaccine, regardless of the component suspected of causing the reaction, is a contraindication to future receipt of any influenza vaccine.

• Source: https://www.cdc.gov/flu/prevent/egg-allergies.htm
Hepatitis B in Patients with Diabetes

• Hepatitis B virus (HBV) causes acute and chronic infection of the liver
• Risk of acute HBV infection is 2.1 times higher among diabetics compared to those without diabetes
• Sharing blood glucose meters, fingerstick devices, or other diabetes-care related equipment such as syringes or insulin pens increases risk for hepatitis B
• Numerous Hepatitis B outbreaks in people with diabetes living in assisted living, long-term care facilities, and nursing homes related to sharing blood glucose monitoring supplies and equipment.
• Source: ACIP Hepatitis B Recommendations for people with diabetes: https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6050a4.htm
Hepatitis B Vaccine Recommendations

- Hepatitis B vaccination should be administered to unvaccinated adults with diabetes who are 19–59 years of age.
  - Vaccination should occur as soon as possible after diagnosis of diabetes;
  - Vaccination should also be given to adults diagnosed with diabetes in the past.

- Hepatitis B vaccination may occur at the discretion of the health care provider for unvaccinated adults with diabetes who are 60 years and older.

- Hepatitis B vaccines
  - 2-dose (Heplisav-B) or 3-dose (Engerix-B, Recombivax HB) series

- Source: ACIP Hepatitis B Recommendations for people with diabetes: [https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6050a4.htm](https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6050a4.htm)
Zoster Vaccine

- Shingles is a painful skin rash with blisters and can occur anywhere on the body
- Also called herpes zoster or zoster
- Two shingles vaccines currently recommend
  - Zoster vaccine live (Zostavax)
    - Recommended at 60 years and older
    - One dose
    - No longer supplied in the US as of July 1, 2020. Patients can still receive until vaccine expires November 1, 2020
  - Recombinant zoster vaccine (Shingrix) *Preferred
    - Recommended for 50 years and older
    - 2 dose series, 2-6 months apart
Tdap Immunization Recommendations

- Booster vaccine can be either Td or Tdap
- The CDC recommends all adults get the Tdap vaccine one and a Td vaccine booster every 10 years to protect against tetanus, diphtheria, and pertussis
Immunizations for Adolescents with Diabetes (1)

• Young adults or adolescents may present for care with diabetes

• Adolescents should get vaccines recommend for persons with diabetes (PPSV23, Hep B) and recommended adolescent vaccines (see table)

• Provider reminder/recall for all routinely recommended vaccines
  • IHS RPMS/EHR
  • State IIS
## Immunizations for Adolescents with Diabetes (2)

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Recommended Age</th>
<th>Doses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meningococcal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal Conjugate (MenACWY)</td>
<td>11–12 years old</td>
<td>1 dose, booster at 16 years old</td>
</tr>
<tr>
<td>Serogroup B meningococcal (MenB)</td>
<td>16–18 years old</td>
<td>2 doses</td>
</tr>
<tr>
<td>HPV</td>
<td>11–12 years</td>
<td>2 doses, 6–12 months apart</td>
</tr>
<tr>
<td></td>
<td>15+ years</td>
<td>3 doses (if start after 15 years old)</td>
</tr>
<tr>
<td>Tdap</td>
<td>11–12 years</td>
<td>1 dose</td>
</tr>
<tr>
<td>Influenza</td>
<td>6 months+</td>
<td>1 dose, annually</td>
</tr>
</tbody>
</table>
Immunization Coverage
Adult Vaccine Coverage
IHS vs. U.S. Population

  https://www.cdc.gov/vaccines/imz-managers/coverage/adultvaxview/pubs-resources/NHIS-2016.html
- National Immunization Reporting System (NIRS):
  https://www.ihs.gov/NonMedicalPrograms/ihpes/immunizations/index.cfm?module=immunizations&option=home
Adolescent Vaccine Coverage
IHS All Region, 13–17 Year Olds

- Data source: National Immunization Reporting System (NIRS):
  https://www.ihs.gov/NonMedicalPrograms/ihpes/immunizations/index.cfm?module=immunizations&option=home
Challenges for Vaccinating Adults
Challenges

• Vaccine access
  • Transportation issues
  • Patients not coming to clinic for care
  • Address and phone numbers change frequently
• Vaccine Hesitancy
  • Refusals
• New adult vaccines, costs, and reimbursement
  • All ACIP recommended vaccines are included on the IHS Core Formulary
Challenges (2)

- Provider
  - Providers not giving a strong recommendation for vaccines
  - Missed Opportunities
    - Not routinely assessing vaccination status
- Patient
  - Vaccine hesitancy
  - Lack of patient awareness about health benefits of vaccines.
  - Most adults are not aware they need vaccines.
Strategies and Best Practices
Assess, Recommend, Vaccinate, and Document

• **Assess**
  • Provider reminders in the EHR
  • Monitor immunization coverage

• **Recommend**
  • Make a STRONG recommendation

• **Vaccinate**
  • Standing orders
  • Expanding access – nurse only visits, pharmacy visits, walk-in visits, extended clinic hours

• **Document**
  • Reminder/Recall strategies
    • IHS/EHR reminders, reminder/ recall notices to patients who are due (letters, phone calls, postcards, etc)
  • Ensure patients return for additional vaccine doses if needed
  • Document vaccines given in other locations
RPMS/EHR Tools
RPMS/EHR

• Clinical Decision Support for Immunizations
  • Shows which vaccines patients are due for
    • Takes into account minimum intervals and ages
  • All routine, AGE-BASED recommendations
  • PPSV23 for high risk
  • Hepatitis B vaccine for adults only supported for patients who receive a dose
    • If an adult has received a previous dose of Hep B vaccine, the system will automatically generate reminders for additional doses (2 or 3)
• Utilize RPMS immunization package to identify patients with diabetes to ensure they receive all recommended vaccines
  • RPMS/EHR reminders
RPMS Immunization Package

• Lists and Letters in the RPMS Immunization package
  • Only available in the roll and scroll environment (NOT EHR)
  • Can be used to generate lists of patients who received or are due for specific vaccines for reminder/recall efforts

• IHS RPMS Immunization Package Resources
  https://www.ihs.gov/epi/immunization-and-vaccine-preventable-diseases/resources-for-providers/
Provider Reminders in the EHR

• Influenza
• PPSV23 for 65 years+
• PPSV23 for adults with high risk condition (Optional)
• PCV13 for adults 65 years+ (updating for shared clinical decision making)
• Tdap for everyone 19 years+
• HPV
  • 19–26 years
  • 27–45 (in development)
• Zoster for 50 years+
• Hepatitis A and B for all patients who receive first dose
• Hepatitis A and B for patients with Chronic Liver Disease or Hepatitis C (Optional)
• Hepatitis B for adults 19-59 years with diabetes (Optional)
Resources
Influenza Resources

- [https://www.ihs.gov/flu/](https://www.ihs.gov/flu/)
- IHS Weekly Surveillance Reports
  - Health Care Personnel vaccination policy and FAQ
Influenza Resources (2)

- [https://www.cdc.gov/flu/](https://www.cdc.gov/flu/)
- CDC Weekly Surveillance Reports, Flu Activity data
  - Influenza related information, education material, flu vaccine recommendations
Influenza Resources (3)

• Immunization Action Coalition
  • https://www.immunize.org/

• National Foundation for Infectious Diseases
  • https://www.nfid.org/infectious-diseases/influenza-flu/
Adult Immunization Resources

https://gptec.gptchb.org/infectious-disease/national-vaccination-project/
GPTEC Influenza Resources

- gptec.gptchb.org/infectious-disease/national-vaccination-project/
  - Adult and Flu Video Public Service Announcements (PSA)
  - Adult and Flu Posters
  - Radio PSA
  - Vaccine Cards
Healthy Living with Diabetes: The Simple Step You May Be Missing

While there is no cure yet for diabetes, there are steps you can take to stay healthy. You may know the basics:

- Make time for regular physical activity.
- Eat right.
- Keep up with medical care.

But there's an essential step you may be missing: staying up to date with vaccines.

Immunization Action Coalition Resources

• Immunization Action Coalition:
  • https://www.immunize.org/
  • https://www.immunize.org/catg.d/p4043.pdf
CDC Resources

- https://www.cdc.gov/vaccines
- https://www.cdc.gov/flu
Resources and Websites

- IHS Immunization Resources:
  - https://www.ihs.gov/epi/vaccine/resources/
  - https://www.ihs.gov/flu

- CDC Vaccine Resources
  - https://www.cdc.gov/vaccines
  - https://www.cdc.gov/diabetes/vaccines

- Immunization Action Coalition
  - http://www.immunize.org/

- Adult and Influenza Education Materials:
  - https://gptec.gptchb.org/infectious-disease/national-vaccination-project/

- Association of American Indian Physicians/ASTHO
  - Influenza media kit and PSA videos for AI/AN communities
    - https://www.aap.org/programs/capacity-building-assistance/influenza-vaccination/

- National Foundation for Infectious Diseases
  - https://www.nfid.org/infectious-diseases/influenza-flu/
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