Take a STAND!™
Use Standing Orders to Vaccinate Adults

Session 1

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Disclosure

The Immunization Action Coalition has been responsible for all aspects of content development for the enclosed presentation and all other assets supporting the Take a Stand™ program. Any questions should be directed to the Immunization Action Coalition.

Pfizer is supporting this initiative because it provides focus on the importance of adult immunization. Pfizer has had no role in the creation of content for this presentation or other assets supporting the Take a Stand™ program workshops and therefore accepts no responsibility for the content.
Disclosures

Dr. Marshall

• Ad hoc consultant
• Principal investigator
• Companies
  – GlaxoSmithKline
  – Merck
  – Novartis
  – Pfizer
  – sanofi pasteur
Disclosures

Dr. Marshall

Children
Disclosures

Dr. Marshall

Children

Adults
### Top Three Pediatric Vaccine Questions

1. Should the baby gorilla at the zoo receive a flu shot?
2. What happens if the rotavirus vaccine is given intramuscularly?
3. Do you agree with the recommendation for a second dose of varicella vaccine?
Top Three Pediatric Vaccine Questions

1. 

2. 

3. Do you agree with the second dose of varicella vaccine?
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>2.</strong> What happens if the rotavirus vaccine is given intramuscularly?</td>
<td></td>
</tr>
<tr>
<td><strong>3.</strong> Do you agree with the second dose of varicella vaccine?</td>
<td></td>
</tr>
</tbody>
</table>
Top Three Pediatric Vaccine Questions

1. Should the baby gorilla at the zoo receive a flu shot?

2. What happens if the rotavirus vaccine is given intramuscularly?

3. Do you agree with the second dose of varicella vaccine?
This is particularly important when the recommended agent is a new or infrequently employed drug. Some drugs and medical devices presented in this publication may have Food and Drug Administration (FDA) clearance for limited use in restricted research settings. It is the responsibility of healthcare providers to ascertain the FDA status of each drug or device planned for use in their clinical practice.

Some of the material from the first edition (The Vaccine Handbook: A Practical Guide for Clinicians, 2004, Lippincott Williams & Wilkins, Philadelphia, PA), contributed by Drs. Penelope H. Dennehy, David P. Greenberg, Paul A. Offit, and Tina Q. Tan, is retained here with the respective authors’ express permission. In addition, some of the material in this book was previously published in The Vaccine Quarterly (©2007-2010, Wolters Kluwer Health) and is reprinted here with permission.

Acknowledgements

The author is deeply indebted to Drs. Dennehy, Tan, Greenberg, and Offit for their contributions to the first edition. Appreciation is also extended to the many other people who contributed to this work through conversation and comment, including Dr. Litjen Tan from the American Medical Association and Drs. Yabo Boydaow and Bill Atkinson from the Centers for Disease Control and Prevention. Finally, the author would like to thank Dr. Sharon Hamilton from the University of Rochester and Dr. Jim Conway from the University of Wisconsin for their superb, comprehensive review of the manuscript and many helpful suggestions.

Dedication

For Cherie, Emily, and Cullen.
And for Grandpa, who got his flu shot even though his friend said it would give him the flu.
“...and for Grandpop, who got his flu shot even though his friend said it would give him the flu”
“...and for Grandpop, who got his flu shot even though his friend said it would give him the flu”
1) ≥6 months of age
2) Immunosuppressive medications
3) No reason to delay inactivated vaccines because of chemotherapy
Session 1
Why Adult Immunization Matters

Gary S. Marshall, MD
Professor of Pediatrics
University of Louisville School of Medicine
Outline

• Vaccine-preventable diseases among adults
• Adult vaccination coverage
• Changing environment
Burden of Vaccine-Preventable Diseases Among Adults
VPDs Among U.S. Adults

*Influenza*

- 3,000–49,000 deaths per year
- 80%–90% of deaths occur in adults ≥65 years of age

CDC. MMWR. 2010;59:1057 (data from 1976-2007)

Kostova. [http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0066312](http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0066312)
VPDs Among U.S. Adults

Invasive pneumococcal disease

- 33,900 total cases and 3,700 deaths
- 91% of cases and nearly all deaths occur among adults

2013 Active Bacterial Core Surveillance
VPDs Among U.S. Adults

*Herpes zoster*

- 1 million cases per year
- Post-herpetic neuralgia is common
VPDs Among U.S. Adults

**Pertussis**

- 24,000 cases
- >5,000 cases among adults ≥20 years of age


2014 pertussis surveillance


VPDs Among U.S. Adults

*Hepatitis B*

- 3,050 acute cases reported
- 19,800 estimated cases


2013 viral hepatitis surveillance
http://patient.info/doctor/jaundice-pro
<table>
<thead>
<tr>
<th>Disease</th>
<th>Cases</th>
<th>Cost (x $1,000,000)</th>
<th></th>
<th></th>
<th>Total</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Medical</td>
<td>Indirect</td>
<td></td>
<td></td>
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<tr>
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<td>7,503</td>
<td>810</td>
<td>8,313</td>
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<td>Pneumococcus</td>
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<td>3,572</td>
<td>215</td>
<td>3,787</td>
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<td>Herpes zoster</td>
<td>555,989</td>
<td>1,309</td>
<td>1,709</td>
<td>3,017</td>
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<tr>
<td>Pertussis</td>
<td>207,241</td>
<td>90</td>
<td>123</td>
<td>213</td>
<td></td>
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<tr>
<td>Total</td>
<td>5,223,176</td>
<td>12,474</td>
<td>2,856</td>
<td><strong>15,330</strong></td>
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</table>

# Adult Schedule by Age Group

<table>
<thead>
<tr>
<th>VACCINE</th>
<th>AGE GROUP</th>
<th>19-21 years</th>
<th>22-26 years</th>
<th>27-49 years</th>
<th>50-59 years</th>
<th>60-64 years</th>
<th>≥ 65 years</th>
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</thead>
<tbody>
<tr>
<td>Influenza*</td>
<td></td>
<td>1 dose annually</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetanus, diphtheria, pertussis (Td/Tdap)*</td>
<td></td>
<td>Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella*</td>
<td></td>
<td>2 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Female*</td>
<td></td>
<td>3 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Male*</td>
<td></td>
<td>3 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoster*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 dose</td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)*</td>
<td></td>
<td>1 or 2 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal 13-valent conjugate (PCV13)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1-time dose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal polysaccharide (PPSV23)*</td>
<td></td>
<td></td>
<td>1 or 2 doses</td>
<td></td>
<td></td>
<td>1 dose</td>
<td></td>
</tr>
<tr>
<td>Meningococcal*</td>
<td></td>
<td></td>
<td></td>
<td>1 or more doses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A*</td>
<td></td>
<td></td>
<td>2 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis B*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 doses</td>
</tr>
<tr>
<td>Neisseria meningitidis type b (MenB)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 or 3 doses</td>
<td></td>
</tr>
</tbody>
</table>

*Covered by the Vaccine Injury Compensation Program

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episodes of zoster.

Additional information about the vaccines in this schedule, extent of available data, and contraindications for vaccination is also available at www.cdc.gov/vaccines or from the CDC INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 8:00 a.m. - 8:00 p.m. Eastern Time, Monday - Friday, excluding holidays.

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

The recommendations in this schedule were approved by the Centers for Disease Control and Prevention’s (CDC) Advisory Committee on Immunization Practices (ACIP), the American Academy of Family Physicians (AAFP), the America College of Physicians (ACP), American College of Obstetricians and Gynecologists (ACOG) and American College of Nurse-Midwives (ACNM).

[www.cdc.gov/vaccines/schedules/hcp/adult.html](http://www.cdc.gov/vaccines/schedules/hcp/adult.html)
## Adult Schedule by Condition

**Table:**

<table>
<thead>
<tr>
<th>VACCINE</th>
<th>INDICATION</th>
<th>Pregnancy</th>
<th>Immune-compromising conditions (excluding human immunodeficiency virus [HIV])</th>
<th>HIV infection</th>
<th>Men who have sex with men (MSM)</th>
<th>Kidney failure, end-stage renal disease, receipt of hemodialysis</th>
<th>Heart disease, chronic lung disease, chronic alcoholism</th>
<th>Asplenia (including elective splenectomy and persistent complement component deficiencies)</th>
<th>Chronic liver disease</th>
<th>Diabetes</th>
<th>Healthcare personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza</td>
<td></td>
<td>1 dose IIV annually</td>
<td>1 dose IIV annually</td>
<td>1 dose IIV annually</td>
<td>1 dose IIV annually</td>
<td>Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetanus, diphtheria, pertussis (Td/Tdap)</td>
<td></td>
<td>1 dose each pregnancy</td>
<td>1 dose each pregnancy</td>
<td>1 dose each pregnancy</td>
<td>1 dose each pregnancy</td>
<td>1 dose each pregnancy</td>
<td>1 dose each pregnancy</td>
<td>1 dose each pregnancy</td>
<td>1 dose each pregnancy</td>
<td>1 dose each pregnancy</td>
<td>1 dose each pregnancy</td>
</tr>
<tr>
<td>Varicella</td>
<td></td>
<td>Contraindicated</td>
<td>Contraindicated</td>
<td>Contraindicated</td>
<td>Contraindicated</td>
<td>Contraindicated</td>
<td>Contraindicated</td>
<td>Contraindicated</td>
<td>Contraindicated</td>
<td>Contraindicated</td>
<td>Contraindicated</td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Female</td>
<td></td>
<td>3 doses through age 26 yrs</td>
<td>3 doses through age 26 yrs</td>
<td>3 doses through age 26 yrs</td>
<td>3 doses through age 26 yrs</td>
<td>3 doses through age 26 yrs</td>
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<td>3 doses through age 26 yrs</td>
<td>3 doses through age 26 yrs</td>
<td>3 doses through age 26 yrs</td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Male</td>
<td></td>
<td>3 doses through age 26 yrs</td>
<td>3 doses through age 26 yrs</td>
<td>3 doses through age 26 yrs</td>
<td>3 doses through age 26 yrs</td>
<td>3 doses through age 26 yrs</td>
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<td>3 doses through age 26 yrs</td>
<td>3 doses through age 26 yrs</td>
<td>3 doses through age 26 yrs</td>
</tr>
<tr>
<td>Zoster</td>
<td></td>
<td>Contraindicated</td>
<td>Contraindicated</td>
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<td>Contraindicated</td>
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<td>Contraindicated</td>
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</tr>
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<td>Measles, mumps, rubella (MMR)</td>
<td></td>
<td>Contraindicated</td>
<td>Contraindicated</td>
<td>Contraindicated</td>
<td>Contraindicated</td>
<td>Contraindicated</td>
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<td>Contraindicated</td>
<td>Contraindicated</td>
<td>Contraindicated</td>
<td>Contraindicated</td>
</tr>
<tr>
<td>Pneumococcal 13-valent conjugate (PCV13)</td>
<td></td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
<td>1 dose</td>
</tr>
<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
<td></td>
<td>1 or 2 doses</td>
<td>1 or 2 doses</td>
<td>1 or 2 doses</td>
<td>1 or 2 doses</td>
<td>1 or 2 doses</td>
<td>1 or 2 doses</td>
<td>1 or 2 doses</td>
<td>1 or 2 doses</td>
<td>1 or 2 doses</td>
<td>1 or 2 doses</td>
</tr>
<tr>
<td>Meningococcal</td>
<td></td>
<td>1 or more doses</td>
<td>1 or more doses</td>
<td>1 or more doses</td>
<td>1 or more doses</td>
<td>1 or more doses</td>
<td>1 or more doses</td>
<td>1 or more doses</td>
<td>1 or more doses</td>
<td>1 or more doses</td>
<td>1 or more doses</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td></td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
<td>2 doses</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td></td>
<td>3 doses</td>
<td>3 doses</td>
<td>3 doses</td>
<td>3 doses</td>
<td>3 doses</td>
<td>3 doses</td>
<td>3 doses</td>
<td>3 doses</td>
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<td>3 doses</td>
</tr>
<tr>
<td>Hemophilus influenzae type b (Hib)</td>
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<td>post-HSCT recipients only</td>
<td>post-HSCT recipients only</td>
<td>post-HSCT recipients only</td>
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<td>post-HSCT recipients only</td>
<td>post-HSCT recipients only</td>
<td>post-HSCT recipients only</td>
<td>post-HSCT recipients only</td>
</tr>
</tbody>
</table>

*Covered by the Vaccine Injury Compensation Program*

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection, zoster vaccine recommended regardless of prior episode of zoster

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

No recommendation

---

[www.cdc.gov/vaccines/schedules/hcp/adult.html](http://www.cdc.gov/vaccines/schedules/hcp/adult.html)
Efficacy or Effectiveness

Influenza vaccine

CDC. MMWR 2013;62(RR-7):1
Medically-attended disease with good vaccine match
http://www.mynycdoctor.com/tests-for-influenza-a-b/
Efficacy or Effectiveness

PCV13

Bonten. NEJM 2015;372:1114
PCV13, vaccine-type infection
http://www.wisegeek.net/what-is-pneumococcal-pneumonia.htm
Efficacy or Effectiveness

Zoster vaccine

![Image of shingles](image)

Oxman. NEJM 2005;352:2271

PHN, post-herpetic neuralgia

![Graph showing efficacy or effectiveness](graph)
Efficacy or Effectiveness

*Pertussis vaccine*

![Infants chart](http://www.healthline.com/health/new-baby-vaccination-guide/pertussis-in-adults-signs-symptoms)
Efficacy or Effectiveness

Hepatitis B vaccine

CDC. MMWR 2011;60:1709
http://www.mcemcourses.org/caseoftheweek/case-9/
Pregnant Women

*Two-for-one vaccination!*

---

http://www.porticostory.org/content/BLOG/BLOG.asp
Adult Vaccine Coverage
Coverage Rates

Data from National Health Interview Survey

- Tetanus past 10 years, age ≥65
- Tetanus past 10 years, age 19-64
- Pneumococcal, age ≥65
- Pneumococcal, age 19-64, high risk
- Zoster, age ≥60

Percent Vaccinated

2013
2012
2011
2010

Take a STAND!
Coverage Rates

Data from National Health Interview Survey

- Tetanus past 10 years, age ≥65
- Tetanus past 10 years, age 19-64
- Pneumococcal, age ≥65
- Pneumococcal, age 19-64, high risk
- Zoster, age ≥60

Healthy People 2020 target

Percent Vaccinated
Coverage Rates

*HepB among diabetics*

Data from National Health Interview Survey
Coverage Rates

CDC. MMWR 2006;55:RR-17:1
Coverage Rates

*Influenza vaccine*

![Bar chart showing coverage rates for different age groups: Age ≥18, Age 18-49, Age 18-49, high risk, Age 50-64, Age ≥65. The chart indicates the percent vaccinated for each age group.](www.cdc.gov/flu/fluvaxview/index.htm)
## Coverage Rates
### Disparities

<table>
<thead>
<tr>
<th>Vaccination Group</th>
<th>Coverage Rate for Whites</th>
<th>Disparity</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Blacks</td>
<td>Hispanics</td>
<td>Asians</td>
</tr>
<tr>
<td>Tetanus, ≥65</td>
<td>59.6</td>
<td>-19.3</td>
<td>-14.3</td>
<td>-16.8</td>
</tr>
<tr>
<td>Tetanus, 19–49</td>
<td>69.0</td>
<td>-14.9</td>
<td>-16.5</td>
<td>-16.3</td>
</tr>
<tr>
<td>Pneumo, ≥65</td>
<td>63.6</td>
<td>-14.9</td>
<td>-24.4</td>
<td>-18.3</td>
</tr>
<tr>
<td>Zoster, ≥60 yrs</td>
<td>27.4</td>
<td>-16.7</td>
<td>-17.9</td>
<td>-4.8</td>
</tr>
<tr>
<td>HPV, females 19–26</td>
<td>41.7</td>
<td>-11.1</td>
<td>-11.4</td>
<td>-21.9</td>
</tr>
</tbody>
</table>
Consequences of Failure to Vaccinate

- Susceptible individuals
- Susceptible contacts
- Susceptible communities
- Vulnerable infrastructure

CDC. MMWR. 2010;59:1057 (data from 1976-2007)
Consequences of Failure to Vaccinate

Armstrong. JAMA 1999
Failure to Vaccinate

**Patient factors**

- No primary care provider
- Focus on specialty care
- Inconvenient access
- Competing social and economic demands
- Lack of awareness of insurance coverage under the ACA
- Lack of insurance
- Risk perception
## Risk Perception

<table>
<thead>
<tr>
<th>What We’re Afraid Of</th>
<th>What The Real Risk Is</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shark attacks (28)</td>
<td>Dog bites (4.5 million)</td>
</tr>
<tr>
<td>Murder (14,180)</td>
<td>Suicide (33,289)</td>
</tr>
<tr>
<td>Death by peanut allergy (50)</td>
<td>Death by poisoning (27,531)</td>
</tr>
<tr>
<td>Death by plane crash (321)</td>
<td>Death by car crash (34,017)</td>
</tr>
</tbody>
</table>
Failure to Vaccinate

**Provider factors**

- Other health issues compete with preventive services
- Practice culture (vaccines are for children)
- Lack of effective vaccination reminders
- Lack of provider recommendation
Sources of Information About Vaccines

You win

Kennedy. Pediatrics 2011;127:S92
Provider Recommendations

Focus on disease

Horne. PNAS 2015;112:10321
Failure to Vaccinate

**Systemic factors**

- Few vaccination requirements
- State regulations differ on who can vaccinate
Failure to Vaccinate

The good news

• Most patients willing to be vaccinated
• Standing orders can result in higher uptake
US Community Services Task Force

Provider- or System-Based Strategies

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Status of Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provider reminder systems when used alone</td>
<td>Recommended (Strong evidence)</td>
</tr>
<tr>
<td>Provider assessment and feedback</td>
<td>Recommended (Strong evidence)</td>
</tr>
<tr>
<td>Standing orders</td>
<td>Recommended (Strong evidence)</td>
</tr>
<tr>
<td>Provider education when used alone</td>
<td>Insufficient evidence</td>
</tr>
<tr>
<td>Health care-based interventions when implemented in combination</td>
<td>Recommended (Strong evidence)</td>
</tr>
</tbody>
</table>
Interventions to Increase Adult Immunization

Meta-analysis

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Odds Ratio*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational change (e.g., standing orders)</td>
<td>16.0</td>
</tr>
<tr>
<td>Provider reminder</td>
<td>3.8</td>
</tr>
<tr>
<td>Provider education</td>
<td>3.2</td>
</tr>
<tr>
<td>Patient financial incentive</td>
<td>3.4</td>
</tr>
<tr>
<td>Patient reminder</td>
<td>2.5</td>
</tr>
<tr>
<td>Patient education</td>
<td>1.3</td>
</tr>
</tbody>
</table>

*Compared to usual care or control group, adjusted for all remaining interventions.
Standards for Adult Immunization Practice

• All providers should ensure patients are up to date
• Avoid missed opportunities
• Acknowledgements
  – Adult patients see different providers, some of whom do not stock vaccines
  – Adults get vaccinated in a medical home, at work, or in a retail setting

www.izsummitpartners.org/adult-immunization-standards
Standards for Adult Immunization Practice

Call to action

• Assess immunization status of all patients in every clinical encounter
• Strongly recommend vaccines that patients need
• Administer needed vaccines or refer to a vaccine provider
• Document vaccines given to patients and enter them into registries
First of its kind national initiative to assist practices to implement vaccination standing orders
Standards for Adult Immunization Practice

- Take A Stand™
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