LEVERAGING IMPROVED VACCINE TECHNOLOGY AND THE HEALTHCARE TEAM TO PROTECT OLDER ADULTS

A PART OF THE MOMENTUM DISCUSSION SERIES

SUPPORTED BY THE GSA NATIONAL ADULT VACCINATION PROGRAM AND SEQIRUS
Panelists

- KEVIN W. O’NEIL, MD, FACP, CMD
- JANET E. MCELHANEY, MD, FRCPC, FACP
- STEFAN GRAVENSTEIN, MD, MPH
- APRIL D. GREEN, PHARMD
OVERVIEW OF ADULT IMMUNIZATION RATES AND CHALLENGES TO IMPROVEMENT

PRESENTED BY: KEVIN W. O’NEIL, MD, FACP, CMD
Setting the Stage

Kevin W. O’Neil, MD, FACP, CMD
Chief Medical Officer
Affinity Living Group
Sarasota, Florida
Disclosures

- I have no commercial relationships to disclose.
Adult Immunization Rates

- Adult vaccination rates remain low in the United States and far below national targets, leaving millions of adults susceptible to vaccine-preventable diseases and potentially severe consequences.

- Not so fun facts
  - Approximately 45,000 adults and 300 children in the United States die each year from vaccine-preventable diseases.
  - Persons who go without recommended vaccinations cost the American health system approximately $10 billion annually.
# Adult Immunization Rates

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Most Recent Data (Year)</th>
<th>Healthy People 2020 Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INFLUENZA VACCINE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adults 18 to 64 years</td>
<td>36% (2015-2016)</td>
<td>80%</td>
</tr>
<tr>
<td>High-risk adults 18 to 64 years</td>
<td>46% (2015-2016)</td>
<td>90%</td>
</tr>
<tr>
<td>Adults 65 years +</td>
<td>63% (2015-2016)</td>
<td>90%</td>
</tr>
<tr>
<td>Institutionalized adults 18 years +</td>
<td>62% (2006)</td>
<td>90%</td>
</tr>
<tr>
<td>Healthcare personnel</td>
<td>45% (2014)</td>
<td>90%</td>
</tr>
<tr>
<td><strong>PNEUMOCOCCAL VACCINE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adults 65 years +</td>
<td>60% (2014)</td>
<td>90%</td>
</tr>
<tr>
<td>High-risk adults 18 to 64 years</td>
<td>20% (2014)</td>
<td>60%</td>
</tr>
<tr>
<td>Institutionalized adults / In CMS certified facilities</td>
<td>66% (2006) / 71% (2015)</td>
<td>90%</td>
</tr>
<tr>
<td><strong>HERPES ZOSTER VACCINE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adults 60 years +</td>
<td>28% (2014)</td>
<td>30%</td>
</tr>
</tbody>
</table>

Surveillance of Vaccine Coverage Among Adult Populations – United States 2014. *MMWR.* Available at: https://www.cdc.gov/mmwr/volumes/65/ss/ss6501a1.htm

Healthy People 2020. Immunization and Infectious Diseases. Available at: www.healthypeople.gov/2020
"I can install this virus software if you bend over. But a flu shot would be easier for both of us."
Barriers to Vaccination

• Patient-Specific
  • Lack of knowledge; perception that vaccination not necessary
  • Lack of provider recommendation for immunization
  • Financial impediments to vaccinations; lack of insurance
  • Lack of access to, and utilization of, healthcare services
  • Concern about adverse effects

• Healthcare System
  • Incomplete, uncoordinated health records
  • Lack of utilization of reminder or assessment systems
  • Racial/ethnic disparities

• Provider-Related
  • Lack of training
  • Poor reimbursement
  • Vaccine costs and implementation obstacles
  • Other clinical priorities

Source: National Vaccine Advisory Committee 2011
The Big 5 Adult Immunizations

Table 1: Recommended Adult Immunization Schedule by Age Group
United States, 2019

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>19–21 years</th>
<th>22–26 years</th>
<th>27–49 years</th>
<th>50–64 years</th>
<th>≥65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza inactivated (IF) or Influenza recombinant (IV)</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenza live attenuated (LAIV)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetanus, diphtheria, pertussis (Tdap or Td)</td>
<td>1 dose Tdap, then Td booster every 10 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 dose</td>
</tr>
<tr>
<td>Varicella (VAR)</td>
<td></td>
<td></td>
<td></td>
<td>2 doses (if born in 1980 or later)</td>
<td></td>
</tr>
<tr>
<td>Zoster recombinant (HZV) (preferred)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoster live (ZVL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 doses</td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Female</td>
<td>2 or 3 doses depending on age at initial vaccination</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Male</td>
<td>2 or 3 doses depending on age at initial vaccination</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal conjugate (PCV13)</td>
<td></td>
<td></td>
<td></td>
<td>1 dose</td>
<td></td>
</tr>
<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
<td></td>
<td></td>
<td></td>
<td>1 dose</td>
<td></td>
</tr>
<tr>
<td>Hepatitis A (HepA)</td>
<td></td>
<td></td>
<td></td>
<td>1 or 2 doses depending on indication</td>
<td></td>
</tr>
<tr>
<td>Hepatitis B (HepB)</td>
<td></td>
<td></td>
<td></td>
<td>2 or 3 doses depending on vaccine</td>
<td></td>
</tr>
<tr>
<td>Meningococcal A, C, W, Y (MenACWY)</td>
<td></td>
<td></td>
<td></td>
<td>2 or 3 doses depending on vaccine</td>
<td></td>
</tr>
<tr>
<td>Meningococcal B (MenB)</td>
<td></td>
<td></td>
<td></td>
<td>1 or 2 doses depending on indication, then booster every 5 yrs if risk remains</td>
<td></td>
</tr>
<tr>
<td>Hemophilus influenza type b (Hib)</td>
<td></td>
<td></td>
<td></td>
<td>2 or 3 doses depending on vaccine and indication</td>
<td></td>
</tr>
</tbody>
</table>

Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended vaccination for adults with an additional risk factor or another indication

No recommendation
# The Big 5 Adult Immunizations

## Table 2: Recommended Adult Immunization Schedule by Medical Condition and Other Indications

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Pregnancy</th>
<th>Immuno-compromised (excluding HIV infection)</th>
<th>HIV infection CD4 count</th>
<th>Asplenia, complement deficiencies</th>
<th>End-stage renal disease, on hemodialysis</th>
<th>Heart or lung disease, arthritis</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>Tdap or Td</td>
<td>1 dose each pregnancy</td>
<td>CONTRAINDICATED</td>
<td>1 dose annually</td>
<td>PRECAUTION</td>
<td>CONTRAINDICATED</td>
<td>1 dose annually</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMR</td>
<td>CONTRAINDICATED</td>
<td>1 or 2 doses depending on indication</td>
<td>2 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAR</td>
<td>CONTRAINDICATED</td>
<td>2 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RZV (preferred) or ZVL</td>
<td>DELAY</td>
<td>2 doses at age ≥50 yrs</td>
<td>CONTRAINDICATED</td>
<td>1 dose at age ≥60 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPV Female</td>
<td>DELAY</td>
<td>3 doses through age 26 yrs</td>
<td>2 or 3 doses through age 26 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPV Male</td>
<td>3 doses through age 26 yrs</td>
<td>2 or 3 doses through age 21 yrs</td>
<td>2 or 3 doses through age 26 yrs</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></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPSV23</td>
<td>1, 2, or 3 doses depending on age and indication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HepA</td>
<td>2 or 3 doses depending on vaccine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HepB</td>
<td>2 or 3 doses depending on vaccine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MenACWY</td>
<td>1 or 2 doses depending on indication, then booster every 5 yrs if risk remains</td>
<td></td>
<td></td>
<td></td>
<td></td>
<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</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hib</td>
<td>3 doses HVT recipients only</td>
<td>Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Recommended vaccination for adults with an additional risk factor or another indication.
2. Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection.
3. Precaution—vaccine might be indicated if benefits of protection outweigh risks of adverse reaction.
4. Delay vaccination until after pregnancy if vaccine is indicated.
5. Contraindicated—vaccine should not be administered.
6. No recommendation.
AN OUNCE OF PREVENTION

“I’m sorry, the computer made an error.
You’re not influential, you have influenza.”
Expert Panel

• 12:10 – 12:20pm Improving Vaccine Effectiveness in Older Adults: Advances in Vaccine Technology
   Janet E. McElhaney, MD, FRCPC, FACP

• 12:20 – 12:30pm Beyond Disease Prevention: The Building Benefits of Vaccination
   Stefan Gravenstein, MD, MPH

• 12:30 – 12:40pm Putting It Into Practice: Raising Vaccination Rates in Older Adults
   April D. Green, PharmD

• 12:40 – 1:00pm Discussion/Q&A
IMPROVING VACCINE EFFECTIVENESS IN OLDER ADULTS:

ADVANCES IN VACCINE TECHNOLOGY

PRESENTED BY: JANET E. McELHANEY, MD, FRCPC, FACP
VITALiTY
Vaccine Initiative To Add Life To Years

Janet E. McElhaney, MD, FRCPC, FACP
HSN Volunteer Association Chair in Healthy Aging
VP Research and Scientific Director
Health Sciences North Research Institute
Professor, Northern Ontario School of Medicine
Sudbury, Ontario, Canada
Disclosures

**DISCLOSURE TYPE 1**
Advisor or consultancy for GSK, Pfizer, and Sanofi, for which her institution has received honoraria or consulting fees.

**DISCLOSURE TYPE 2**
Received travel support for participation in advisory boards, data safety and monitoring boards, and academic presentations.

**DISCLOSURE TYPE 3**
Co-PI on NIH R01AG048023, a randomized study comparing antibody and cellular immune responses to high-dose vs. standard-dose influenza vaccination in older adults.
Older adults have increased prevalence of comorbid disease that fosters a risk of infections. Baseline performance of basic activities of daily living is a major determinant of survival after infections. Frailty Index > dynamic accumulation of biopsychosocial deficits.
Vaccine-Mediated Resilience to Influenza with Aging

Frailty Index

Multiple Chronic Conditions & Inflammaging

Vaccine Preventable Disability

**Catastrophic disability**

- Defined as a loss of independence in $\geq 3$ basic Activities of Daily Living
- 15%-19% of older adults hospitalized with influenza experience catastrophic disability
- Dysregulated immune responses are the “geriatric giant” of chronic diseases: the response to influenza increases the risk of catastrophic disability and:
  1. Strokes
  2. CHF
  3. Pneumonia and influenza
  4. Ischemic heart disease
  5. Cancer
  6. Hip fracture

---

2. Ferrucci et al. JAMA 1997;277:728.
Why Do A/H3N2 Strains Have Greatest Impact in Older Adults?

- Hemagglutinin
- Lipid membrane
- M1 protein
- M2
- Neuraminidase
- RNP
- Polymerase
- Nucleoprotein
- vRNA

Antibody correlates of protection
T cell correlates of protection
Targeting Immune Responses:
Developing More Effective Influenza Vaccines for Older Adults
VITALiTY
Vaccine Initiative To Add Life To Years

Finding your resilience:
“Keeping your glass half full”
BEYOND DISEASE PREVENTION

THE BUILDING BENEFITS OF VACCINATION

PRESENTED BY: STEFAN GRAVENSTEIN, MD, MPH
At the Heart of Influenza: More Than Just “the Flu”

Communicating Risk to Improve Influenza Vaccination

Stefan Gravenstein, MD, MPH
Professor of Medicine and Health Services, Policy and Practice
Center for Gerontology and Healthcare Research
Alpert Medical School of Brown University and Brown University School of Public Health
Providence, Rhode Island
Disclosures

DISCLOSURE TYPE 1

Advisory Board/Honoraria: Sanofi-Aventis; Seqirus

DISCLOSURE TYPE 2

Consultant/Speaker/Honoraria: Seqirus

DISCLOSURE TYPE 3

Principal Investigation/Grant Funding: Sanofi-Aventis; Seqirus
Objectives

- Providing context
  - Infection and outcomes
    - Strokes and heart attacks
  - The impact of age and disease
- InfluenZing outcomes by infection prevention
  - Influenza vaccine
### Age-Adjusted Incidence Ratios of First MI and First CVA After Vaccination or Infection

<table>
<thead>
<tr>
<th>Event (Count) Before First MI</th>
<th>Days 1-14 (IR, n)</th>
<th>Days 15-28 (IR, n)</th>
<th>Days 29-91 (IR, n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flu vaccine (20,486)</td>
<td>~ 0.72, 357</td>
<td>0.87, 417</td>
<td>~ 1, 2154</td>
</tr>
<tr>
<td>Td (7966)</td>
<td>~ 1, 54</td>
<td>~ 1, 46</td>
<td>~ 1, 253</td>
</tr>
<tr>
<td>PPSV23 (5925)</td>
<td>~ 1, 39</td>
<td>~ 1, 43</td>
<td>~ 1, 177</td>
</tr>
<tr>
<td>SRTI (20,921)</td>
<td>~ 3.8, 1020</td>
<td>1.95, 576</td>
<td>1.4, 1658</td>
</tr>
<tr>
<td>UTI (10,448)</td>
<td>~ 1.6, 233</td>
<td>1.32, 217</td>
<td>1.23, 820</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event (Count) Before First CVA</th>
<th>Days 1-14</th>
<th>Days 15-28</th>
<th>Days 29-91</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flu vaccine (19,063)</td>
<td>~ 0.77, 365</td>
<td>0.88, 409</td>
<td>~ 1, 2051</td>
</tr>
<tr>
<td>Td (6155)</td>
<td>~ 1, 41</td>
<td>~ 1, 40</td>
<td>~ 1, 209</td>
</tr>
<tr>
<td>PPSV23 (4416)</td>
<td>~ 1, 38</td>
<td>~ 1, 29</td>
<td>~ 1, 160</td>
</tr>
<tr>
<td>SRTI (22,400)</td>
<td>~ 2.4, 849</td>
<td>1.68, 561</td>
<td>1.33, 1650</td>
</tr>
<tr>
<td>UTI (14,603)</td>
<td>~ 2.2, 555</td>
<td>1.71, 445</td>
<td>1.22, 1250</td>
</tr>
</tbody>
</table>
“Thrombometer” – The Propensity to Clot

Increases with age
- Inflammatory markers of age
- IL-6, IL-8, C-reactive protein

Increases with disease
- Obesity
- Diabetes
- Arthritis, vascular disease
- Dementia
- COPD

Increases with infection
- Influenza, pneumonia, shingles
- Bladder infection, pressure sores

Gravenstein S. Used with permission.

- Protein C and S
- Serum Amyloid A
- Cytokines
- Catecholamines
- Hypoxia
- Vasoconstriction
- Platelet aggregations and coronary plaque disruption

Influenza virus infection

Atherosclerosis

Thrombogenesis

Emboli

Acute myocardial infarction
Influenza, Specifically Can Cause Heart Attacks and Strokes

- Several investigators have epidemiologically linked influenza infection, specifically, to risk of an acute cardiovascular event
- Of these, two stand out: laboratory-confirmed infection:
  - Kwong J et al: Flu in 19k of 277k respiratory virus tests
    - 499 hospitalized for AMI, 332 with flu in prior week
    - AMI Risk (incidence ratio) 6-fold higher in week post flu
    - AMI Risk also ~3-fold post-RSV and other viruses
  - Blackburn R et al: RI time series (2004-15) for AMI, CVA (English)
    - 1347 weekly admissions for MI, 1175 for CVA age ≥45 years
    - All respiratory viruses (except parainfluenza) associated with AMI, ischemic CVA for age ≥75 years; 0.4% to 5.7% of AMI/CVA admissions attributable to respiratory virus infection

Influenza and Morbidity in Frail Elderly

Hypothesis:

If influenza can cause these vascular outcomes, there must be a lesser morbidity signal (measure) associated with influenza severity

Activities of Daily Living (ADLs)
ADLs: Basic Functions of Daily Life

FUNCTIONS

- Dressing
- Bathing
- Eating
- Toileting
- Transferring
- Bed mobility
- Locomotion

SCORING (0-4)

- Independent
- Independent/supervision
- Limited assistance
- Extensive assistance (or activity has not occurred in 7 days)
- Complete dependence

Influenza Negatively Affects Functional Status in Nursing Home Residents


Figures:
- Red = Influenza City-Level Mortality
- Blue = Quarterly Patterns of Functional Outcomes

Legend:
WORSE
BETTER
If Influenza Can Lead to MI or CVA, Can an Influenza Vaccine Prevent Them?

- There are now several observational and RCTs that indicate that standard influenza vaccines can reduce risk of MI and/or CVA (reviewed in LeBras MH et al.; Udell et al.)
- Cochrane review in 2015 concluded strength of evidence best for individuals with underlying cardiovascular disease
- Strength of evidence better for heart failure and MI than ischemic stroke
- Prevention effect size varies from 15%-45% for AMI, MACE; less clear effect size on ischemic stroke

Cardiovascular Protection from Vaccination

- Estimated efficacy of vaccine in preventing acute myocardial infarction ranges from 15% to 45%
- Compare with:

<table>
<thead>
<tr>
<th>Smoking Cessation</th>
<th>32%-43%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statins</td>
<td>19%-30%</td>
</tr>
<tr>
<td>Antihypertensive Therapy</td>
<td>17%-25%</td>
</tr>
</tbody>
</table>

- Author suggests that influenza vaccine should be considered as an integral part of cardiovascular disease management and prevention


<table>
<thead>
<tr>
<th>Outcome</th>
<th>Season*</th>
<th>Unadjusted model†</th>
<th>Adjusted model‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital admissions for acute myocardial infarction</td>
<td>Influenza</td>
<td>1.17 (1.01–1.36) §</td>
<td>0.76 (0.62–0.93)¶</td>
</tr>
<tr>
<td></td>
<td>Summer</td>
<td>1.27 (1.13–1.44)**</td>
<td>0.91 (0.77–1.08)</td>
</tr>
<tr>
<td>Hospital admissions for stroke</td>
<td>Influenza</td>
<td>1.07 (0.91–1.25)</td>
<td>0.86 (0.69–1.07)</td>
</tr>
<tr>
<td></td>
<td>Summer</td>
<td>1.44 (1.26–1.64)**</td>
<td>1.13 (0.93–1.36)</td>
</tr>
<tr>
<td>Hospital admission for heart failure</td>
<td>Influenza</td>
<td>1.25 (1.14–1.38)**</td>
<td>0.82 (0.72–0.93)¶</td>
</tr>
<tr>
<td></td>
<td>Summer</td>
<td>1.59 (1.45–1.74)**</td>
<td>1.03 (0.91–1.16)</td>
</tr>
<tr>
<td>Hospital admission for pneumonia/influenza</td>
<td>Influenza</td>
<td>0.97 (0.89–1.05)</td>
<td>0.76 (0.68–0.85)**</td>
</tr>
<tr>
<td></td>
<td>Summer</td>
<td>1.19 (1.09–1.28)**</td>
<td>0.89 (0.79–0.99)*</td>
</tr>
<tr>
<td>All-cause death</td>
<td>Influenza</td>
<td>0.87 (0.81–0.93)**</td>
<td>0.52 (0.47–0.58)**</td>
</tr>
<tr>
<td></td>
<td>Summer</td>
<td>1.14 (1.08–1.21)**</td>
<td>0.67 (0.61–0.73)**</td>
</tr>
</tbody>
</table>

CI, confidence interval; IRR, incidence rate ratio; T2DM, type 2 diabetes. § P ≤ .05; ¶ P ≤ .01, ** P ≤ .001.

*Flu season: onset to the end of influenza season, +4 weeks to capture delayed complications. Summer: May 1 to August 31 each year.
†Models with vaccination status as the only predictor.
‡Models adjusted for age, sex, index of multiple deprivation quintile, number of comorbid conditions, duration of diabetes, body mass index (BMI), smoking status, systolic and diastolic blood pressure (BP), serum cholesterol and HbA1c, use of lipid-lowering drugs, anticoagulants or antiplatelet drugs, BP meds, antihyperglycemic drugs or immunosuppressive drugs, number of hospitalizations during prior year, history of pneumococcal vaccination, influenza vaccination during previous year, and cohort year.

Primary Approach to Influenza Prevention: Vaccinate!

- Preventing disease spread: herd immunity
  - Universal vaccination
- Preventing primary disease in children and adults
- Preventing secondary complications
  - Children, older adults, people with underlying disease

ACP. www.acponline.org/newsroom/seasonal_flu_vaccine.htm.
Vaccine Response and Age

Declining response rate translates to less protection

- Influenza vaccine response
- Pneumococcal vaccine response
- Hepatitis vaccine response
- Zoster vaccine response

Since Vaccine Effectiveness Declines with Age, Can Enhanced Vaccines Do Better Yet?

- RCTs on available “enhanced” influenza vaccines include:
  - High-Dose (four times the antigen in the same vaccine volume)
    - One 32k ≥65 yo outpatient RCT (DiazGranados CA et al.): 24% reduction in laboratory-confirmed clinical influenza (LCI)
    - One 38k ≥65 yo nursing home cluster RCT (Gravenstein et al.): 17.5% reduction in pneumonia hospitalization in A/H1N1 year
  - Adjuvanted vaccine (same dose, plus adjuvant)
    - One 52k ≥65 yo nursing home cluster RCT (Gravenstein et al.): in A/H3N2 year (signal for reduced all-cause hospitalization)
  - Recombinant vaccine (triple dose, but only hemagglutinin)
    - One 9k ≥50 yo outpatient RCT (Dunkle et al.): 30% less LCI

Summary

- Regular influenza vaccine
  - Reduces risk for pneumonia and influenza
  - Reduces risk for combined cardiovascular events, with best evidence for heart attacks and strokes
  - Reduces risk for mortality

- Enhanced vaccines
  - Evidence for added benefit both immunologically and for influenza
    - Higher quality evidence for HD added benefit on outcomes for hospitalization and respiratory hospitalization
    - Emerging evidence for added benefit to cardiac protection
  
- Bottom line: vaccinate, any vaccine is better than none, and enhanced vaccines can offer added advantage to older adults
PUTTING IT INTO PRACTICE

RAISING VACCINATION RATES IN OLDER ADULTS

PRESENTED BY: APRIL D. GREEN, PHARMD
One Health System’s Story

April D. Green, PharmD
Ambulatory Clinical Pharmacist - Population Health
Co-chair System Vaccine Subcommittee
Ochsner Health System
New Orleans, LA
Disclosures

DISCLOSURE TYPE 1

Advisor or consultancy for Merck and Sanofi Pasteur, for which she has received honoraria or consulting fees.
Why Are Adult Vaccines Important?

Healthy People 2020 has set the following immunization goals for adults:

- Influenza 70%
- Pneumococcal (≥65 yo) 90%
- Zoster 30%
- Tetanus/Tdap N/A
- HPV 80%
Ways to Improve Adult Vaccination Efforts

- Creation of System Vaccine Subcommittee
  - Multidisciplinary team, meets monthly, addresses vaccine policies/procedures/concerns
- Find out your rates!
- Establish Nursing Immunization Standing Orders
  - Broaden the list of vaccines administered by nursing
  - Nursing education in ambulatory clinics
- Utilize Reminder-Recall Systems
- Decrease Administration Barriers
- Attend GSA ICAMP
  - Increase education and awareness of adult vaccinations
- Create Immunization Registry and Dashboard
- Participate in Collaboratives, Workgroups, and Summits
Ways to Improve Adult Vaccination Efforts

• Utilize State Immunization Registry
  o Bidirectional flow
  o Identify overdue vaccines in EHR for increased provider awareness

• Increase provider awareness and knowledge through grand rounds presentations focused on immunizations or vaccine-preventable diseases

• Create partnerships for educating staff and vaccinating patients
  o Industry
  o Internal and External Pharmacies
  o State Office of Public Health
  o American Cancer Society

• Educate, educate, EDUCATE!
Additional Pearls to Improve Adult Vaccination Rates

• Create a culture of immunization
  o Leadership support
  o NO MISSED OPPORTUNITIES!
• Follow-up on immunization referrals
• Immunization has to be a MEASURED value! Make it a quality measure
• Transparency of data
  o Monthly immunization data reports
  o Make rates public within your organization
Implementing Standing Orders for Immunization

10 Steps to Implementing Standing Orders for Immunization in Your Practice Setting

Introduction

Standing orders are written protocols approved by a physician or other authorized practitioners that allow qualified health care professionals (who are eligible to do so under state law, such as registered nurses or pharmacists) to access the need for and administer vaccine to patients meeting certain criteria, such as age or underlying medical condition. The qualified health care professionals are the most consistently effective means for increasing vaccination rates and reducing missed opportunities for vaccination, which improves the quality of care for patients.

Standing orders are straightforward to use. The challenge is to integrate them into the practice setting so they can be used to their full potential. This process requires some preparation up front to assure everyone in the practice understands the reasons why standing orders are being implemented. Suggested steps to help you work through this process are shown below.

Phase 1: Get Ready – Build Support of Leadership

G O T O www.immunize.org/ standing-orders for the most current versions of sample standing orders.

Using Standing Orders for Administering Vaccines: What You Should Know

What are standing orders?

Standing orders authorize nurses, pharmacists, and other appropriately trained healthcare personnel, when approved by state law, to assess a patient’s immunization status and administer vaccines, according to a protocol approved by an instructor, physician, or other authorized practitioners. Standing orders involve establishing and implementing standing orders for the patient without the need for clinician examination or direct order from the attending provider at the time of the interaction.

Standing orders can be established for the administration of one or more specific vaccines to a broad or narrow set of patients in healthcare settings such as clinics, hospitals, pharmacies, and long-term care facilities.

Who recommends standing orders for vaccination?

The Community Preventive Services Task Force (Task Force)’s recommendations standing orders for vaccinations based on strong evidence of effectiveness in improving vaccination rates:

- for adults and children,
- when used alone or when combined with additional interventions, and
- across a range of settings and populations.


The Centers for Disease Control and Prevention (CDC), CDC’s Advisory Committee on Immunization Practices (ACIP) specifically recommends standing orders for influenza and pneumococcal vaccinations and several other vaccines (e.g., Hepatitis B, Meningococcal) for use in Standing Orders Programs to Increase Adult Vaccination Rates: Recommendations of the ACIP, MMWR 2008; 57(RR-9) at www.cdc.gov/mmwr/preview/mmwrhtml/ rr5709a1.htm

What are the elements of a standing order?

A comprehensive standing order should include the following elements:

1. Who is targeted to receive the vaccine.
2. How to determine if a patient needs vaccine.
3. Procedures for administering the vaccine (e.g., vaccine name, schedule for vaccination, appropriate needle size, vaccine dosage, route of administration).
4. Provision of any federally required information (e.g., Vaccine Information Statement).
5. How to document administration in the patient record.
6. Approval for the management of any medical emergency related to the administration of the vaccine, and
7. How to report possible adverse events occurring after vaccination.

Who is authorized to administer vaccines under standing orders?

In general, standing orders are approved by an institution, physician, or authorized practitioner. State law or regulatory agency might authorize other healthcare professionals to sign standing orders.

What should be done with the standing orders after they have been signed?

Signed standing orders should be kept with all other signed medical documents and records that are operational in one’s clinic setting. A copy should also be readily available for clinic staff who order under those standing orders.

Do standing orders need to be renewed every year?

Generally, standing orders will include an implementation date as well as an expiration date. Periodic review of standing orders is important, because vaccine recommendations may change over time.

When can I find sample standing orders?

The Immunization Action Coalition has developed templates of standing orders for vaccines that are routinely recommended to children and adults. They are updated as needed and reviewed for technical accuracy by immunization experts at CDC. The most current versions can be accessed by going to www.immunize.org/standing-orders.

48
Important Resources

• Centers for Disease Control and Prevention (CDC) website - www.cdc.gov
• Your state Department of Health
• Immunization Action Coalition (IAC) website - www.immunize.org
• Individual manufacturer websites
• National Foundation for Infectious Diseases (NFID) - www.nfid.org
Questions?
“The return on investment in global health is tremendous, and the biggest bang for the buck comes from vaccines. Vaccines are among the most successful and cost-effective health investments in history.”

– Seth Berkley, MD

Thank you!