Don’t Procrastinate – Vaccinate!

Roger Wilcox, PharmD, BCPS

The speaker has no actual or potential conflict of interest in relation to this presentation

Objectives

- Pharmacists
  - Discuss the impact of vaccination rate changes on public health
  - Identify counseling strategies to improve vaccination schedule compliance
- Pharmacy Technicians
  - Discuss the impact of vaccination rate changes on public health
  - Identify how pharmacy technicians can help promote vaccination in the community

Vaccinations and Public Health

Benefits of Vaccines

- Each birth cohort receiving routine immunizations:
  - Prevent 14 million illnesses
  - Saves 33,000 lives
  - Reduces direct health care costs $9.9 billion dollars
  - Eliminates $33.4 billion dollars of indirect health care costs

Vaccinations Decrease Vaccine Preventable Diseases

<table>
<thead>
<tr>
<th>Disease</th>
<th>Vaccine Available</th>
<th>Peak Cases (Year)</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphtheria</td>
<td>1928</td>
<td>30,508 (1938)</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Hib Type B</td>
<td>1985</td>
<td>20,000 (1986)</td>
<td>23</td>
<td>14</td>
<td>30</td>
<td>31</td>
</tr>
<tr>
<td>Measles</td>
<td>1963</td>
<td>763,094 (1958)</td>
<td>63</td>
<td>220</td>
<td>55</td>
<td>187</td>
</tr>
<tr>
<td>Pertussis</td>
<td>1914</td>
<td>265,269 (1934)</td>
<td>27,550</td>
<td>18,719</td>
<td>48,277</td>
<td>24,231</td>
</tr>
<tr>
<td>Polio</td>
<td>1955</td>
<td>42,033 (1949)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Rubella</td>
<td>1969</td>
<td>488,796 (1964)</td>
<td>5</td>
<td>4</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Tetanus</td>
<td>1933</td>
<td>601 (1948)</td>
<td>26</td>
<td>36</td>
<td>37</td>
<td>26</td>
</tr>
</tbody>
</table>

Among 13-17 year olds which vaccine has the lowest vaccination rate?

A. Influenza
B. Human papillomavirus (HPV)
C. Measles
D. Varicella
E. Pertussis
### Vaccination Rates in Children 19-35 Months in 2012

<table>
<thead>
<tr>
<th>Vaccine (Population)</th>
<th>US Vaccination Rate (%)</th>
<th>IL Vaccination Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTaP (&gt;=4 doses)</td>
<td>82.5</td>
<td>85.3</td>
</tr>
<tr>
<td>Polio (&gt;=3 doses)</td>
<td>92.8</td>
<td>93.2</td>
</tr>
<tr>
<td>MMR (&gt;=1 doses)</td>
<td>90.8</td>
<td>91.6</td>
</tr>
<tr>
<td>Hib Type B (Primary Series)</td>
<td>93.6</td>
<td>93.8</td>
</tr>
<tr>
<td>Hepatitis B (Birth Dose)</td>
<td>71.6</td>
<td>71.3</td>
</tr>
<tr>
<td>Hepatitis B (&gt;=3 doses)</td>
<td>89.7</td>
<td>89.9</td>
</tr>
<tr>
<td>Hepatitis A (&gt;=2 doses)</td>
<td>53</td>
<td>48.2</td>
</tr>
<tr>
<td>Pneumococcal (&gt;=4 doses)</td>
<td>81.9</td>
<td>81.9</td>
</tr>
<tr>
<td>Rotavirus (Complete Series)</td>
<td>68.6</td>
<td>67.2</td>
</tr>
<tr>
<td>Varicella (&gt;=1 doses)</td>
<td>90.2</td>
<td>90.6</td>
</tr>
</tbody>
</table>

### Vaccination Rates in Adolescents 13-17 Years in 2013

<table>
<thead>
<tr>
<th>Vaccine (Population)</th>
<th>US Vaccination Rate (%)</th>
<th>IL Vaccination Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B (&gt;=3 doses)</td>
<td>93.2</td>
<td>95.7</td>
</tr>
<tr>
<td>HPV (&gt;=1 dose, female)</td>
<td>57.3</td>
<td>53.2</td>
</tr>
<tr>
<td>HPV (&gt;=3 doses, female)</td>
<td>37.6</td>
<td>33.8</td>
</tr>
<tr>
<td>HPV (&gt;=1 dose, male)</td>
<td>34.6</td>
<td>34.8</td>
</tr>
<tr>
<td>HPV (&gt;=2 doses, male)</td>
<td>13.9</td>
<td>16.5</td>
</tr>
<tr>
<td>Influenza (&gt;=1 dose, 2012-2013 season)</td>
<td>42.5</td>
<td>36.9</td>
</tr>
<tr>
<td>Meningococcal (&gt;=1 dose)</td>
<td>77.8</td>
<td>78</td>
</tr>
<tr>
<td>MMR (&gt;=2 doses)</td>
<td>91.8</td>
<td>93.5</td>
</tr>
<tr>
<td>Tdap (&gt;=1 dose after 10 years of age)</td>
<td>86</td>
<td>87.3</td>
</tr>
<tr>
<td>Varicella [Hx of disease or &gt;=2 doses]</td>
<td>84</td>
<td>86.2</td>
</tr>
</tbody>
</table>

### Vaccination Rates in Adults in 2012

<table>
<thead>
<tr>
<th>Vaccine (Population)</th>
<th>US Vaccination Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis A (&gt;=2 doses, 19-49 years)</td>
<td>12.2</td>
</tr>
<tr>
<td>Hepatitis B (&gt;=3 doses, 19-49 years)</td>
<td>35.3</td>
</tr>
<tr>
<td>Hepatitis B (&gt;=3 doses, &gt;= 60 years)</td>
<td>15.1</td>
</tr>
<tr>
<td>Hepatitis B (&gt;=3 doses, diabetes)</td>
<td>28.6</td>
</tr>
<tr>
<td>Herpes Zoster (&gt;=1 dose, &gt;= 60 years)</td>
<td>20.3</td>
</tr>
<tr>
<td>HPV (&gt;=1 dose, 19-26 years, female)</td>
<td>34.5</td>
</tr>
<tr>
<td>HPV (&gt;=1 dose, 19-26 years, male)</td>
<td>2.3</td>
</tr>
<tr>
<td>Influenza (&gt;=1 dose, &gt;= 18 years, 2012-2013 season)</td>
<td>41.5</td>
</tr>
<tr>
<td>Pneumococcal (&gt;=1 dose, 19-64 years, high risk)</td>
<td>20</td>
</tr>
<tr>
<td>Pneumococcal (&gt;=1 dose, &gt;65 years)</td>
<td>59.9</td>
</tr>
<tr>
<td>Tetanus, Past 10 years (&gt;=1 dose, 19-49 years)</td>
<td>64.2</td>
</tr>
<tr>
<td>Tdap, Past 7 years (&gt;=1 dose, &gt;= 19 years)</td>
<td>14.2</td>
</tr>
</tbody>
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### Vaccine Preventable Disease Risks

- **Preventable disease**
- **Outbreaks**
- **Annual deaths in the US**
  - 42,000 adults
  - 300 children

In 2014, despite high vaccination rates, this disease is at its highest level in 20 years:

A. Pertussis
B. Varicella
C. Measles
D. Polio

[Image: http://www.npr.org/assets/img/2014/01/24/outbreaksvaccineLoop.gif]
Vaccine Preventable Diseases in the US in 2008

Reference 11
http://www.npr.org/assets/img/2014/01/24/outbreaksvaccineLoop.gif

Vaccine Preventable Diseases in the US Between 2008-2014

Reference 11
http://www.npr.org/assets/img/2014/01/24/outbreaksvaccineLoop.gif

Increasing Pertussis Outbreaks

- 6930 cases
  - 352 (7%) were < 6 months
  - 3,629 (71%) in children 7-16 years
    - 11% never received pertussis vaccine
- 199 cases hospitalized
  - 37 (19%) required intensive care
  - 122 (62%) were infants < 4 months
    - 12% mothers vaccinated with Tdap in 3rd trimester
- 3 total deaths in 2014
  - All < 2 months of age at disease onset

2014 Pertussis Epidemic in California

- 6930 cases
  - 352 (7%) were < 6 months
  - 3,629 (71%) in children 7-16 years
    - 11% never received pertussis vaccine
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Measles Outbreak

- 2014 Philippines outbreak - 47,000 cases
  - 77 deaths
  - 22 US travelers returned with measles and initiated outbreaks
- 2014 Ohio outbreak - 377 Cases
  - Ohio vaccination rate for measles 92.9%
  - Outbreak source was unvaccinated travelers to the Philippines
  - Measles spreads throughout pocket of unvaccinated people
- Outbreak in Illinois?
  - IL vaccination rate for measles 93.5%
  - Overall IL school religious 0.53% and medical 0.17% measles vaccine exemption rates are low
  - 76 IL schools have greater than 10x this rate of exemption
  - Highest exemption rate in IL 15%

Measles Cases and Outbreaks

- January 1 to August 1, 2014
  - 593 Cases
    - 18 Outbreaks representing 3% of reported cases this year

Measles Outbreak

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Influenza Associated Pediatric Deaths by Season

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td>47</td>
<td>46</td>
<td>77</td>
<td>88</td>
<td>133</td>
<td>122</td>
<td>35</td>
<td>171</td>
<td>106</td>
<td></td>
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*Total of 830 deaths 2004 - 2012 (16% vaccinated)
  *43% had no high risk conditions

Chickenpox in a Healthy Child

- 15 yo with no PMH was admitted to the hospital
  - 3-day history of rash
  - 1 day history of fever and shortness of breath
  - Vaccines were incomplete DTaP x 4, HiB x 1, MMR x 2
  - She had a fever of 101.1, dyspnea, facial edema, petechiae rash, hypotension
  - She developed pneumonia, UTI, sepsis and multi-organ dysfunction
  - Vesicular fluid was positive for varicella-zoster virus
  - She died on day 21 of hospitalization

Who can answer the DHHS/CDC's call to vaccinate and administer vaccines in the state of Illinois?

A. Pharmacy Technicians
B. Pharmacists Only
C. Pharmacists and Pharmacy Technicians
D. Pharmacists and Pharmacy students

Pharmacist Roles in Vaccination

- Education
- Screening
- Immunizer
- Documentation
- Role Model
- Collaborate

Pharmacy Technician Roles in Vaccination

- Screen patients
- Advocate for vaccination
- Assemble pre-vaccination paperwork
- Prepare and store vaccine doses
- Assist with documentation and transmission
- Complete billing for vaccines
- Role Model
- Disseminate immunization awareness materials
Pharmacy Student Roles in Vaccination

- Technician roles plus
  - Administer vaccines under the supervision of a qualified pharmacist
  - Contribute to the establishment of pharmacy-based vaccine programs
  - Organize vaccine events

Who are Under and Unvaccinated Children

- Under vaccinated
  - Black
  - Young unmarried mother
  - No parental college degree
  - Live near poverty level in a central city
- Unvaccinated
  - White
  - Married mother
  - Parental College degree
  - Household Income > $75,000
  - Parents express concerns about safety of vaccines

Guiding Style to Counsel a Vaccine Hesitant Parent

- Show care with body language
- Acknowledge relationship
- Ask them to share their concerns
- Acknowledge their concerns and empathize
- Ask for permission to share information
- Share pertinent scientific information related to concerns (benefits and risks)
- Share appropriate resources

What Messages are Effective in Overcoming Parental Reluctance to Vaccinate

- Survey about child, vaccine attitudes and health care beliefs
- Randomized intervention using CDC messages
  - Correcting misinformation
  - Presenting information on disease risks
  - Using dramatic narratives
  - Displaying visuals to make risks more accessible
- Follow up survey
- Results
  - Correcting misinformation did reduce misperceptions
  - None of the interventions increased intent to vaccinate
  - Visuals and dramatic narratives increased serious vaccine side effect beliefs

Good Resources

- CDC’s
  - Vaccine web section
    http://www.cdc.gov/vaccines
  - Morbidity and mortality weekly report
    http://www.cdc.gov/mmwr
- Immunization Action Coalition
  - Vaccine concerns web section
    http://www.immunize.org/concerns
  - Talking with parents web section
    http://www.immunize.org/concerns/comm_talk.asp
  - Immunization action coalition’s quick Answers to tough questions

Good Resources

- AAP’s immunization website
  http://www.aap.org/immunization
- National Network for Immunization Information
  http://www.immunizationinfo.org
- APhA Immunization Center
  http://www.pharmacist.com/immunization-center
Pharmacy technicians can promote vaccination in the community by

A. Administering Tdap
   - Vaccine to 12 year olds
B. Screening patients for annual influenza vaccine
C. Administering vaccines under the supervision of a pharmacist
D. Picking and choosing which vaccines they will receive

References


When communicating with a vaccine hesitant parent to improve vaccine schedule compliance a pharmacist should?

A. Provide the pharmacists beliefs about vaccines to the parents
B. Use scare tactics to ensure compliance
C. Acknowledge the parents concerns and empathize
D. Provide parents with only the benefits of vaccines

References