Immunization Update

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Objectives

Pharmacists
• Summarize vaccine safety principles for immunization programs including proper administration techniques and emergency management
• Describe methods for overcoming the common reasons for vaccine hesitancy
• Apply key considerations for the various CDC-recommended immunizations to determine which are indicated for a given patient
• Identify opportunities for increased pharmacist involvement in providing immunizations through collaborative practice agreements (CPAs) and other means

Technicians
• List important vaccine safety principles and how they may impact pharmacy workflow
• Describe methods for overcoming the common reasons for vaccine hesitancy
• Recognize the various CDC-recommended immunizations and what diseases they prevent in certain eligible patients
• Explain the role pharmacies can play in providing immunizations to the patients they serve

Vaccine Hesitancy

• WHO Definition
  – Delay in acceptance or refusal of vaccines despite availability of vaccination services.
  – Vaccine hesitancy is complex and context specific varying across time, place and vaccines. It includes factors such as complacency, convenience and confidence.


Recent Outbreaks

- 189 measles cases in 2015 in United States
  - 110 cases linked to Disneyland
  - 49 unvaccinated, 47 unknown vaccination status

Outbreaks in South Dakota

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles</td>
<td>0</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Pertussis</td>
<td>67</td>
<td>109</td>
<td>14</td>
</tr>
</tbody>
</table>

Causes of Vaccine Hesitancy

- Religious or cultural
- Personal or philosophical beliefs
- Safety concerns
- Past experiences
- Lack of knowledge & information providers
- Media influence
- Others
Religious or Cultural Reasons

- Often cited as reason for school exemption
- Amish faith
- Animal products (bovine or pork)
- In 1960s, rubella vaccine developed from cell lines from fetal tissue

Personal/Philosophical

- Belief that natural immunity is superior to acquired immunity
- Belief that vaccine preventable illness are “not that bad” and are easily treated
- Perception of minimal risk of contracting rare diseases

Safety

- Often media driven
- Thimerosal
  - Removed from vaccines intended for children <6 years
  - Methylmercury → neurotoxin
  - Thimerosal is a derivative of ethyl mercury
  - FDA review in 2001 found no evidence of harm
- Toxicity of adjuvants
- Concern for too many vaccines at once
Safety

• Autism
  – Over 20 peer-reviewed articles have refuted the link between MMR and autism
  – Andrew Wakefield barred from medical practice and The Lancet retracted the article in 2010
  – There is no scientific evidence that supports the link between MMR and autism

Lack of information

• Desire more information from healthcare providers
• Benefits versus risks
• Important to provide information to avoid patients/parents seeking info from internet or other sources

Pharmacists role
“ASK” approach

- **Acknowledge** the parent’s or patient’s concerns
- **Steer** the conversation
- **Know** the facts


“CASE” Approach

- **Corroborate**
- **About**
- **Science**
- **Explain**


Pharmacist’s Role in Vaccine Hesitancy

- Provide information to patients to help them make informed decisions
- Avoid judgmental conversations
- Avoid scare tactics
- Stay informed on vaccines and schedules to be prepared to answer questions
- Face-to-face conversations about vaccines
- Anticipate anti-vaccine comments and be prepared with a response
- Ongoing research needed on best ways to approach patient/parents

Vaccine Reactions in Children & Adults

- Screen patients for precautions and contraindications
- Reactions may vary from minor to life threatening
- Identifying and treating severe events
- Action plan for contacting EMS


Anaphylaxis is highly likely when any ONE of the following is present

1. Acute onset of an illness (minutes to several hours) with involvement of skin, mucosal tissue, or both
   - AND at least one of the following:
     - Respiratory compromise
     - Reduced BP or symptoms of end-organ dysfunction
2. Two or more of the following that occur rapidly after exposure to a likely allergen for that patient
   - Involvement of skin-mucosal tissue
   - Respiratory compromise
   - Reduced BP or associated symptoms
   - Persistent GI symptoms
3. Reduced BP after exposure to a known allergen
   - Infants/children – Low systolic BP (age specific) or more than 30% decrease is SBP
   - Adults – SBP of less than 90 mmHg or more than 30% decrease from baseline


Anaphylaxis

- Sudden or gradual onset
- Generalized itching, erythema, or urticaria
- Angioedema
- Severe bronchospasm
- Shortness of breath
- Shock
- Abdominal cramping
- Cardiovascular collapse

- Incidence: <1-10 cases of anaphylaxis per 1 million vaccine doses

Did my patient faint?
Or is this anaphylaxis?

<table>
<thead>
<tr>
<th></th>
<th>Faint</th>
<th>Anaphylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset</td>
<td>During or soon after</td>
<td>Usually 5-30 minutes after</td>
</tr>
<tr>
<td></td>
<td>injection</td>
<td>injection</td>
</tr>
<tr>
<td>Skin</td>
<td>Pale, sweaty, cold, clammy</td>
<td>Red, raised, itchy rash</td>
</tr>
<tr>
<td>Respiratory</td>
<td>Normal to deep breaths</td>
<td>Wheezing or stridor</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>Bradycardia, transient</td>
<td>Tachycardia, hypotension</td>
</tr>
<tr>
<td></td>
<td>hypotension</td>
<td></td>
</tr>
<tr>
<td>GI</td>
<td>Nausea, vomiting</td>
<td>Abdominal cramps</td>
</tr>
<tr>
<td>Neurologic</td>
<td>Transient loss of</td>
<td>Loss of consciousness with</td>
</tr>
<tr>
<td></td>
<td>consciousness with</td>
<td>response once prone</td>
</tr>
<tr>
<td></td>
<td>response once prone</td>
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</tbody>
</table>

Management of Anaphylaxis in Children & Adults

- Activate EMS ➔ call 911
- Assess airway, breathing, circulation
- Administer EPINEPHRINE 1 mg/mL INTRAMUSCULARLY
  - Dose=0.01 mg/kg up to 0.5 mg maximum dose
- Optional treatment: diphenhydramine or hydroxyzine
- Monitor patient until EMS arrives
- Maintain supine position (or elevate head if breathing difficulty)
- Repeat epinephrine every 5-15 minutes for up to 3 doses if symptoms persist
- Record the adverse event
  - Notify physician
  - Report incident to Vaccine Adverse Event Reporting System

Epinephrine

Dose: 0.01 mg/kg up to 0.5 mg maximum dose

<table>
<thead>
<tr>
<th>Weight</th>
<th>Autoinjector Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 10 kg</td>
<td>Consider weight-specific dose</td>
</tr>
<tr>
<td>10-25 kg</td>
<td>0.15 mg</td>
</tr>
<tr>
<td>Greater than 25 kg</td>
<td>0.3 mg</td>
</tr>
</tbody>
</table>

- Epinephrine
  - 1 mg/mL in ampules, vials, or prefilled syringes
  - If using autoinjectors, have at least 3 available of BOTH pediatric and adult
Administering Vaccines

• Injection Site
• Needle Size

Immunization Action Coalition

Human Papillomavirus

• What is HPV?
  – Common viral infection of epithelial tissue causing warts
  – Over 120 HPV types
  – High-risk types are linked to cancer
  – 79 million Americans are infected with HPV
  – Almost every person who is sexually active will acquire HPV at some point in their life
• ACIP recommendation: All adolescents 11-12 years
• 3 dose series given at months 0, 1-2, and 6
• May initiate at age 9 years

HPV Vaccine

Gardasil 9 ®
• 9vHPV
• Types 6, 11, 16, 18, 31, 33, 45, 52, and 58

Gardasil®
• 4vHPV
• Types 6, 11, 16, and 18

Cervarix®
• 2vHPV
• Types 16 and 18
• Indicated for FEMALES only
School Shots – Not just for kindergarten anymore

• New in 2016 – 6th Grade Requirements
• South Dakota Codified Law 13-28-7.1
• Tdap (tetanus, diphtheria, pertussis)
  – One dose before 6th grade entry IF child is 11 years old
• Meningococcal ACYW (MCV4)
  – One dose before 6th grade entry IF child is 11 years old

Meningococcal Vaccine

• What is meningococcal disease?
  – Infection caused by Neisseria meningitidis, including meningitis, bacteremia, and pneumonia
  – 800 – 1,200 cases are reported annually in the United States
• ACIP Recommendation: single dose at age 11-12 years, with a booster at age 16 years
  – Also recommended for certain high risk patients
• MenACWY-CRM (Menveo®)
• MenACWY-D (Menactra®)

Meningococcal B Vaccine

• Meningococcal B
  – MenB-4C (Bexsero®) – 2 dose series
  – MenB-FHbp (Trumenda®) – 3 dose series
  – Approximately 50 to 60 cases and five to 10 deaths reported annually
  – ACIP Recommendation
    • Not routinely recommended at this time
    • For age 16-23 years “individual clinical decision making”
    • Preferred age: 16-18 years
Live Attenuated Influenza Vaccine

- FluMist®
- CDC Advisory Committee of Immunization Practices (ACIP) voted that LAIV should NOT be used in the 2016-2017 season
- **Must be approved by CDC’s director – will have final recommendations in the late summer/early fall MMWR with other flu season recommendations
- Lower effectiveness than IIV/RIV for 2013-2016 seasons
- Reason for lack of efficacy is unknown

References