Immunization Update
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Presented by
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Hosted by:
Community Health Association of Mountain/Plains States (CHAMPS)
Colorado Community Health Network (CCHN)
Colorado Children’s Immunization Coalition (CCIC)

Disclosure
- The Presenters and hosts of this teleconference have no financial interest in any vaccine and no conflict with any topic reviewed today
- Trade names and vaccine manufacturers, if they are named, are done so only for educational purposes and do not constitute endorsement

Objectives
- Review epidemiology of vaccine preventable diseases (VPD)
- Update recent vaccination changes
  - Hepatitis A
  - Meningococcal conjugate vaccine
  - Influenza
  - Haemophilus influenzae type b vaccine
- Identify future trends

Immunity
- Individual Immunity
  - A complex combination of cells, serological chemicals and tissue processes that protect one from a disease.
- Herd Immunity
  - Vaccination of a portion of the community that provides protection to unvaccinated individuals.

Diphtheria

Diphtheria - United States, 1940-2001*
Diphtheria

- Leathery pharyngeal exudate
- Complications:
  - Respiratory failure
  - Myocarditis
  - Dysphagia
- 2008 is the 4th consecutive year with no cases in USA

Tetanus

- Toxin-borne disease
  - Disrupts inhibitory neurons leading to unopposed muscular contraction
- 2005 – 27 cases
  - 2 fatalities
    - 94 year old, unvaccinated
    - 73 year old, unknown vaccination hx
- 2006 – 41 cases
- 2007 – 20 cases
Pertussis – Why the Increase?

- Pertussis has been underdiagnosed
  - By how much is uncertain
- Diagnostic bias – PCR, a more sensitive test for the bacterium
- Surveillance bias – education, we are looking more carefully for it
- Is the acellular vaccine as effective as the whole cell vaccine?
Tdap

- School regulation requirement
  - 2007 – 6th and 10th graders
  - 2008 – 6th, 7th, 10th and 11th graders...
- Tdap and DTaP are not equivalent
  - Small “p” = generally smaller amounts of pertussis antigens

Measles

- Prodrome:
  - Fever, cough, conjunctivitis, coryza, Koplik spots
  - Rash 2 – 4 days later
- Complications
  - Pneumonia, encephalitis
  - 0.2% fatality rate

Measles

<table>
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<th>Vaccination status</th>
<th>Imported</th>
<th>Visitor</th>
<th>U.S. resident</th>
<th>U.S. acquired</th>
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<tr>
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<td>1</td>
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<tr>
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<td>17</td>
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</table>

Measles

- CDC recommends:
  - Tdap vaccine for parents of newborns
- Minimum 2 year interval from Td
- One lifetime Tdap dose
Mumps Sequelae

- Orchitis
  - 50% of males
  - Testicular atrophy common
  - Infertility rare

- Hearing impairment 1 in 20,000 cases

- Inflammation of:
  - Joints, thyroid, breast, kidneys, heart, brain, spinal cord, pancreas, ovary

Mumps Epidemic 2006

- Mumps 2006 — 6,584 reported cases
- Mumps 2007 — 715 cases, preliminary data
Rubella

- In 1964 – 1965 in US
  - 12.5 million cases of rubella
  - 20,000 cases of congenital rubella syndrome
  - Cost of epidemic: $840,000,000
- Congenital rubella can cause: prematurity, mental retardation, micro-opthalmia, cataracts, deafness, cardiac defects, ...

Rubella - United States, 1966-2005*

Rubella - United States, 1966-2005*

- CRS: Congenital Rubella Syndrome

MMR, V, MMRV

- MMRV contains 7X the varicella PFUs compared to single-valent V vaccine.
- MMRV causes more fevers, more febrile seizures than MMR, V separately
  - Seizure rate MMRV 9/10,000 doses
  - Seizure rate MMR, V 4/10,000 doses
- ACIP cites “no preference” MMRV vs. MMR, V

Polio

[Image of people with polio]
Polio

Hepatitis B

Vaccination has decreased the risk of Hepatitis B in health care workers by more than 95%
- IVDA for 5 or more years: 80% risk of hepatitis B infection
- Perinatal infection: 90% risk of chronic infection

Haemophilus influenzae

Clinical Features*

*prevaccination era
**Haemophilus influenzae (Hib)**

- Current shortage –
  - Why?
  - When should the shortage be over?
  - Will there be recall?
  - Recommendations?

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**Varicella incidence, immunization**

**FIGURE 1.** Number of reported cases of varicella disease among persons of all age groups* and estimated annual vaccination coverage among children aged 19-35 months,† by year and state — Michigan and Texas, 1999-2000

**FIGURE 2.** Varicella-related* hospitalization rates† among persons aged <60 years, by year and age group — United States, 1994-2002

†Source: National Immunization Survey.

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**Pneumococcal disease**

- Pneumonia
- Sepsis
- Meningitis
- Ear infection
Pneumococcal conjugate vaccine

PCV7 Lapsed Schedule

- Child’s age 7 – 11 mo
  - If one or two previous doses, give 2 additional doses (one of which is during 12 – 15 mo)
- Child’s age 12 – 23 mo
  - 1 previous dose, give 2 more with a 2 mo interval
  - 2 previous doses, give one more dose (2 mo minimum interval from previous)

PCV7 Lapsed Schedule

- Healthy 24 – 59 mo olds with lapse: 1 dose
- Underlying medical conditions 24 – 59 mo with lapse
  - < 3 doses: 2 doses > 2 mo apart
  - 3 doses: 1 additional dose, consider PPV23
PCV7 Late Starters, Healthy

- If you start between:
  - 2 and 6 months – 4 total doses
  - 7 and 11 months – 3 total doses
  - 12 and 23 months – 2 total doses
  - 24 and 59 months – 1 dose
- Catch children up once and they are done

Hepatitis A

- Postexposure prophylaxis
  - Less than 2 weeks since last exposure
    - Healthy person 1 yr – 40 yrs: vaccine preferred
    - Less than 1 year or over 40 years: IG preferred
  - IG should be used for:
    - Chronic liver disease
    - Immunocompromised persons
    - Persons in whom vaccine is contraindicated

Meningococcal conjugate vaccine

- 2006
  - 17 cases of GBS
    - 2 – 33 days after vaccination
  - CDC recommends continuing vaccination
  - History of Guillain-Barre syndrome a relative contraindication
- October 24, 2007: MCV4 approved for vaccination of 2 – 10 year olds with high-risk conditions.

Rotavirus
**Rotavirus**

Intussusception concern reported in 2006. Cases did not exceed expected numbers of cases. CDC continues to recommend routine rotavirus vaccination.

**Human papillomavirus**

- HPV genome found in 99.7% of cervical cancers
- HPV types 16 and 18 induce 58% and 12% of cervical cancer.
- HPV4 vaccine nearly 100% effective in preventing 16 and 18-associated CIN
- Good news: 30 to 40% cross protection against types 45/31/33/52/58.

**HPV4 rationale**

- 40% of 16 – 17 year olds are sexually active.
- Teenage female cervix appears to be more vulnerable to chronic infection, thus CIN and cancer.
- 9 – 15 year old immune response better than young adult response
- Squamous cell carcinoma of the head and neck is the next VPD frontier.

**Human papillomavirus infection**

- Sore arm – 50%
- Redness, swelling – 10%
- Contraindicated in pregnancy
  - Take a thorough menstrual history
  - Pregnancy test not required
  - No evidence of teratogenicity

**Rotavirus vaccine**

- Intussusception concern reported in 2006.
- Cases did not exceed expected numbers of cases
- CDC continues to recommend routine rotavirus vaccination
Vaccines and syncope

- Strongly consider observing patients for 15 minutes after they are vaccinated.
- Presyncopal symptoms
  - Weakness, dizziness
  - Usually a rapid onset after vaccination

Influenza

- 2007-08 season: 80+ pediatric deaths
- Composition of 2008-09
  - A/Brisbane/H1N1, A/Brisbane/H3N2, B/Florida
  - All three are new components
- Decision based on isolations, serology, epidemiology, availability of candidate vaccine strains

Influenza 2008-2009

- ACIP “strongly encourages” all children ages 6 months to 18 years of age be vaccinated for the 2008-09 influenza season.
- ACIP “recommends” all children ages 6 months to 18 years of age be vaccinated annually beginning with the 2009-10 influenza season.
Influenza 2008-2010
- With changes in recommendations, planning by providers essential to accommodate the increased number of children to be vaccinated.
- Stock availability in 2008 should not be an problem.

Influenza update
- LAIV approved for 2 – 5 year olds
  - Without recurrent wheezing history
- LAIV can now be stored in the refrigerator
- 3 doses in first 2 years of being vaccinated
  - Up until age 9

Future Trends in Vaccines
- Tdap for new parents.
- HPV4 for boys
- Group B strep for women

Questions?

Thank you for Attending the CHAMPS, CCHN, CCIC Immunization Update with Dr. Robert Brayden
- In order to receive CME credit, you must complete the evaluation survey and continuing medical education (CME) credit questions.
- If you are not applying for CME credit, your opinion is still very important to us. Please take a few minutes to complete the evaluation survey.
- Please fax or email the evaluation survey and CME questions to Shannon Kolman at 303-861-5315 (fax) or Shannon@champsonline.org.
- If you have questions about this presentation please contact Brandi Raiford at Brandi@cchn.org.