Management and Prevention of Pediatric Influenza in Healthcare Settings

Clinician Outreach and Communication Activity (COCA) Webinar
September 18, 2014
Objectives

At the conclusion of this session, the participant will be able to accomplish the following:

- Discuss strategies to assist clinicians in preparing for the 2014-2015 influenza season.
- Identify approaches to reduce influenza disease burden in children.
- Describe how to leverage seasonal influenza action plans to address annual flu surge.
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Joseph Bresee, MD, FAAP
Chief
Epidemiology and Prevention Branch
Influenza Division
National Center For Immunization And Respiratory Diseases
Centers for Disease Control and Prevention
Henry (Hank) Bernstein, DO, MHCM, FAAP
Professor of Pediatrics
Hofstra North Shore – LIJ School of Medicine
TODAY’S PRESENTER (3)

Brent Kaziny, MD, FAAP  
Assistant Professor  
Baylor College of Medicine  
Texas Children’s Hospital
Update on influenza and influenza vaccine strain selection

September 2014

Joseph Bresee
Epidemiology and Prevention Branch
Influenza Division
National Center for Immunization and Respiratory Diseases
CDC
Agenda

• Summary of US National surveillance systems
• Review of 2013-14 influenza season
  – Disease
  – Vaccine effectiveness
  – Program impact
• What we are watching this season
• How the virus strains are selected to be included in the flu vaccine each year
U.S. Influenza Surveillance System

Syndromic Surveillance
ILINet

Geographic distribution
State & Terr. Epi report

Virologic Surveillance
NRVESS

State Health Depts.

CDC

Novel Influenza A

Mortality
122 Cities P&I Ped. deaths

Hospitalization
FluSurvNet

Public Health Officials

Physicians

Media

Public
2009-2010 Influenza Season Week 19 ending May 15, 2010

All data are preliminary and may change as more reports are received.

Synopsis:
During week 19 (May 9 - 15, 2010), influenza activity decreased in the U.S.

- 14 (0.9%) specimens tested by U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories and reported to CDC/Influenza Division were positive for influenza.
- All four subtyped influenza A viruses were 2009 influenza A (H1N1).
- The proportion of deaths attributed to pneumonia and influenza (P&I) was below the epidemic threshold.
- No influenza-associated pediatric deaths were reported.
- The proportion of outpatient visits for influenza-like illness (ILI) was 0.8%, which is below the national baseline of 2.3%. All 10 regions reported ILI below region-specific baseline levels.
- No states reported widespread or regional influenza activity. One state reported local influenza activity. Puerto Rico and 19 states reported sporadic influenza activity. The District of Columbia, Guam, and 30 states reported no influenza activity, and the U.S. Virgin Islands did not report.
Percentage of Visits for Influenza-like Illness (ILI) Reported by the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), Weekly National Summary, 2013-14 and Selected Previous Seasons
Timing of influenza season peaks in the US, 1982-2013 (n=31 seasons)

L. Brammer – personal communication
Influenza Positive Tests Reported to CDC by U.S. WHO/NREVSS Collaborating Laboratories, National Summary, 2013-14

- **A** – 87.4%
- **B** – 12.6%
- **H1** – 90.3%
- **H3** – 9.7%
Predominant (sub)types during last 19 influenza seasons:

- 6 (32%) – A(H1N1)
  - (2 during pH1N1 pandemic)
- 12 (63%) - A(H3N2)
- 1 - no dominant type/subtype
- 0 - B
  - 13 seasons had significant B circulation
    - 8 of last 9 non-pandemic seasons

* 2008-09 season = wk 40, 2008 – wk 34, 2009
** 2009-10 season starts at wk 35, 2009

www.cdc.gov/flu
Influenza-Associated Pediatric Deaths
by Week of Death: 2010-11 season to present

<table>
<thead>
<tr>
<th>Influenza Type</th>
<th># Deaths Since September 29, 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza A (2009 H1N1)</td>
<td>44</td>
</tr>
<tr>
<td>Influenza A (H3N2)</td>
<td>6</td>
</tr>
<tr>
<td>Influenza A (Subtype not Determined)</td>
<td>37</td>
</tr>
<tr>
<td>Influenza B</td>
<td>16</td>
</tr>
<tr>
<td>Influenza A and B Co-infection</td>
<td>2</td>
</tr>
<tr>
<td>Type not Determined</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>107</td>
</tr>
</tbody>
</table>

- 2010-11: Number of Deaths Reported = 123
- 2011-12: Number of Deaths Reported = 35
- 2012-13: Number of Deaths Reported = 171
- 2013-14: Number of Deaths Reported = 105
CDC Influenza Vaccine Effectiveness

INFLUENZA VACCINE EFFECTIVENESS, U.S. 2013-14
## Preliminary adjusted VE against A and B, 2013-14

<table>
<thead>
<tr>
<th>Any influenza A or B virus</th>
<th>Influenza positive</th>
<th>Influenza negative</th>
<th>Vaccine Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N vaccinated/Total</td>
<td>(%)</td>
<td>N vaccinated/Total</td>
</tr>
<tr>
<td>Overall</td>
<td>352/1134</td>
<td>31</td>
<td>2126/4041</td>
</tr>
<tr>
<td>Age Groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6m–8 y</td>
<td>50/164</td>
<td>30</td>
<td>490/907</td>
</tr>
<tr>
<td>9–17y</td>
<td>27/107</td>
<td>25</td>
<td>208/485</td>
</tr>
<tr>
<td>18–49 y</td>
<td>114/516</td>
<td>21</td>
<td>567/1440</td>
</tr>
<tr>
<td>50–64 y</td>
<td>96/251</td>
<td>38</td>
<td>469/734</td>
</tr>
<tr>
<td>≥65 y</td>
<td>65/96</td>
<td>67</td>
<td>392/475</td>
</tr>
</tbody>
</table>

* Multivariate models adjusted for age group, sex, race/Hispanic ethnicity, health status, presence of a high risk condition, days between illness onset and specimen testing, and calendar time (2 week intervals based on MMWR week of illness onset) For the all ages models, age was represented as categories; age in years was used in age-stratified models. Persons with self reported vaccination that was unverified were excluded.
Effectiveness of Influenza Vaccine Against Life-threatening RT-PCR-confirmed Influenza Illness in US Children, 2010–2012

Objective: Estimate VE against life-threatening influenza illness in children
## Vaccine Effectiveness: Analysis with Test-negative Controls

(n=44 cases, 172 controls)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Odds Ratio (95% CI)</th>
<th>P Value</th>
<th>Vaccine Effectiveness (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full vaccination</td>
<td>0.26 (.09 to .81)</td>
<td>.02</td>
<td>74% (19% to 91%)</td>
</tr>
<tr>
<td>Partial vaccination</td>
<td>1.06 (.33 to 3.43)</td>
<td>.93</td>
<td>–6% (–243 to 67%)</td>
</tr>
<tr>
<td>No vaccination</td>
<td>Ref</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>0.31 (.13 to .75)</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Log of age (mo)</td>
<td>1.76 (1.13 to 2.74)</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>History of moderate to severe chronic respiratory disorder</td>
<td>0.25 (.09 to .70)</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>History of cardiac disorder</td>
<td>8.64 (1.72 to 43.5)</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Pre-influenza peak</td>
<td>0.79 (.26 to 2.42)</td>
<td>.68</td>
<td></td>
</tr>
<tr>
<td>Peak influenza period</td>
<td>Ref</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-influenza peak</td>
<td>0.69 (.24 to 11.4)</td>
<td>.50</td>
<td></td>
</tr>
<tr>
<td>Enrollment outside active recruitment period</td>
<td>3.09 (.32 to 30.3)</td>
<td>.33</td>
<td></td>
</tr>
<tr>
<td>Days between onset and RT-PCR influenza testing</td>
<td>1.37 (1.07 to 1.77)</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>PRISM score (severity of illness at PICU admission)</td>
<td>1.08 (1.01 to 1.15)</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>Contact with a person with confirmed or suspected influenza</td>
<td>4.48 (1.76 to 11.4)</td>
<td>.002</td>
<td></td>
</tr>
</tbody>
</table>

Season and race were not independent predictors of influenza positivity or confounders of the relationship between vaccination and influenza positivity and therefore were eliminated from the final model. Vaccination status was confirmed by medical record or immunization registry for cases and PICU controls.

Abbreviations: CI, confidence interval; PICU, pediatric intensive care unit; RT-PCR, reverse-transcription polymerase chain reaction; Ref, reference group.
Each year between 2005 - 2013, influenza vaccine prevented:
- 1.1 – 9.5 M cases
- 440,000 – 4 M outpatient visits
- 7,700 – 89,000 hospitalizations
- 2.5-20% of influenza-associated health outcomes

Among children <=19 yrs, in 2012-13, influenza vaccine prevented:
- ~3M cases
- 1.8M outpatient visits
- ~15,000 hospitalizations

Sources: Kostova, Reed et al. PlosOne 2013; 8:e66312; Bresee, JS et al, MMWR 2013; 62:997-1000; CDC unpublished data
Other ongoing influenza issues

- Novel influenza A virus detection ands risk assessment
  - H7N9 – China
  - H3N2v – Midwest US
  - Others
- Track oseltamivir-resistant viruses
- New treatments
- “Universal” influenza vaccine development
INFLUENZA VACCINE STRAIN SELECTION
Unique Features of Influenza Vaccines

• Immunity acquired from vaccination is “strain-specific”
  – Broadening cross-protection has remained a challenge
  – Multi-valent seasonal vaccines required

• Various influenza vaccine targets
  – Seasonal viruses & unpredictable viruses with pandemic potential (e.g., H5N1, H9N2, H2N3, and H7N7 viruses)

• Each subtype/type rapidly changing
  – Annual vaccine updates required

• Small window of time to detect the emergence and spread of new influenza variants and to provide vaccine prior to disease
  – February – vaccine decisions
  – August – start of vaccination campaigns
  – November – increased seasonal activity
Time
Respiratory Specimens Positive for Influenza in the US and Vaccine Selection, 2007-08

Week

Vaccine production

H1N1
H3N2
B
WHO’s Global Influenza Surveillance and Response System (GISRS)

National Influenza Centers (NICs)  
[136 Laboratories in 106 Countries]
- Detect and isolate influenza viruses
- Identify viruses and send to International Collaborating Center(s)
- Collect national virologic and epidemiologic information and report to WHO, HQ

International Collaborating Centers  
[Atlanta, Beijing, London, Melbourne, Tokyo]
- Analyze influenza viruses received
- Provide data for annual vaccine strain recommendations
- Prepare and distribute candidate vaccine strains and reagents

World Health Organization  
[Geneva]
- Collect information for the Weekly Epidemiological Record and WWW for distribution
- Make vaccine recommendations for NH and SH vaccines

Vaccine Manufacturers
Considerations for New Vaccine Recommendations

- Are there new antigenic variants?
  - Antigenic and genetic characterization
- Are new variants spreading?
  - Monitoring Influenza activity and virus isolation nationally and globally
- Are current vaccines able to induce antibodies to the new variants?
  - Serological evaluation of vaccinated individuals
- Can new variants be used for vaccine production?
  - Egg isolates required with some exceptions
  - High growth reassortants required for vaccine production by manufacturers
Summary

• Increasing data to demonstrate beneficial effect of vaccines (and antivirals) on reducing severe influenza

• Communication plan will increasingly focus on
  – Severe disease prevention
  – Annual program impact estimates

• Vaccine production is complex and time-sensitive because of annual requirements for updates.

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
Influenza Recommendations 2014-2015

Henry H. Bernstein, DO, MHCM, FAAP
Associate Editor, Red Book Online
American Academy of Pediatrics
Professor of Pediatrics
Hofstra North Shore-LIJ School of Medicine
Key Messages

- Everyone 6 months and older needs flu vaccine every year
- Vaccine strains are unchanged from last season
- Trivalent and quadrivalent influenza vaccines are available
- When readily available, LAIV should be considered for healthy children 2 – 8 years of age
- Dosing algorithm for children 6 months – 8 years reflects that vaccine strains have not changed
- Egg allergic children should be vaccinated
## Estimated Vaccine-Preventable Disease Incidence and Deaths in the US

<table>
<thead>
<tr>
<th>Disease</th>
<th>Annual Cases</th>
<th>Annual Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Influenza</strong>a,b</td>
<td>61,000,000c (‘09)</td>
<td>3,349–48,614 (‘76– ‘07)</td>
</tr>
<tr>
<td>Pneumococcal disease, invasive (bacteremia &amp; meningitis)d</td>
<td>42,000 (‘07)</td>
<td>4,500 (‘07)</td>
</tr>
<tr>
<td><strong>HPV</strong>e (cervical cancer)</td>
<td>10,520 (‘04)</td>
<td>3,900 (‘04)</td>
</tr>
<tr>
<td><strong>Hepatitis B</strong>f</td>
<td>4,519 (‘07)</td>
<td>719 (‘07)</td>
</tr>
<tr>
<td><strong>Meningococcal disease</strong>f</td>
<td>1,077 (‘07)</td>
<td>87 (‘07)</td>
</tr>
<tr>
<td><strong>Hepatitis A</strong>f</td>
<td>2,979 (‘07)</td>
<td>34 (‘07)</td>
</tr>
<tr>
<td><strong>Varicella</strong>f (chickenpox)</td>
<td>40,146 (‘07)</td>
<td>14 (‘07)</td>
</tr>
<tr>
<td><strong>Pertussis</strong>f</td>
<td>10,454 (‘07)</td>
<td>9 (‘07)</td>
</tr>
</tbody>
</table>

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a CDC. Updated CDC Estimates of 2009 H1N1 Influenza Cases, Hospitalizations, and Deaths in the US. April 2009 – April 10, 2010. Available at cdc.gov/h1n1flu/estimates2009_h1n1.htm.

b MMWR. 2010: 59 (22): 1057-62.  c Data based on CDC estimates of 2009 H1N1 cases using statistical modeling.


Influenza – How Does it Spread?
Influenza Disease Burden in the US in an Average Year

- **Infections and illnesses**: 50–60 million
- **Physician visits**: ~25 million
- **Hospitalizations**: 117,000–816,000
- **Deaths**: 3,349–48,614

**Sources**:
Percentage of Visits for Influenza-like Illness (ILI) Reported by the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), Weekly National Summary, 2013-14 and Selected Previous Seasons

- 2013-14 season
- 2012-13 season
- 2011-12 season
- 2009-10 season
- 2007-08 season
- 2002-03 season

% of Visits for ILI

Week

National Baseline
Top chronic medical conditions in children:
1. Asthma (26%)
2. Neurologic Disorder (14%)

43% of hospitalized children were HEALTHY
Number of Influenza-Associated Pediatric Deaths by Week of Death: 2010-11 season to present

- **2010-11**: Number of Deaths Reported = 123
- **2011-12**: Number of Deaths Reported = 35
- **2012-13**: Number of Deaths Reported = 171
- **2013-14**: Number of Deaths Reported = 107
2013-14 US Influenza Season (compared with 2012-2013)

- Influenza A (pH1N1) most common strain
- ↓ outpatient visits for ILI
- ↓ rates of hospitalizations
- ↓ deaths from pneumonia and influenza

*MMMR 2014: 63(22):483-490*
2014-15 Seasonal Influenza Vaccine Strains

**Trivalent**
- A/California/7/2009 (H1N1)-like virus
- A/Texas/50/2012 (H3N2) virus
- B/Massachusetts/2/2012-like virus (B/Yamagata lineage)

**Quadrivalent**
- Adds B/Brisbane/60/2008-like virus (B/Victoria lineage)

All strains are unchanged from last season
All people 6 months of age and older should get flu vaccine every year.
Number of Seasonal Influenza Doses for Children 6 Months – 8 Years

Did child receive ≥1 dose of influenza vaccine last flu season (2013-14)?

- Yes
  - 1 Dose
- No
  - Has child received 2 or more total doses of any seasonal vaccine since July 1, 2010?
    - Yes
      - 1 Dose
    - No
      - 2 Doses*

*The interval between 2 doses is 4 weeks
Special Populations to Reach

- Children
- Health Care Personnel
- Household Contacts of High Risk Children and All Children <5
- Pregnant Women
LAIIV vs. IIV

- ↑ relative efficacy of LAIV vs. IIV among younger children
- Consider LAIV for healthy children 2 – 8 years of age when available
- Use IIV when LAIV is not readily available
- Do not delay vaccination waiting for LAIV
GRADE Analysis

- Quality of evidence (high to very low)
- Strength of recommendation (strong/weak)
- Balance of health benefits and risks
- Value judgments to be transparent
- Resource allocation/health economics

CDC. New Framework (GRADE) for Development of Evidence-Based Recommendations by the Advisory Committee on Immunization Practices. MMWR. 2012;61(18):327.

Influenza Vaccine Coverage for Children 6 Months to 17 Years

<table>
<thead>
<tr>
<th>Year</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009-2010</td>
<td>44%</td>
</tr>
<tr>
<td>2010-2011</td>
<td>51%</td>
</tr>
<tr>
<td>2011-2012</td>
<td>52%</td>
</tr>
<tr>
<td>2012-2013</td>
<td>57%</td>
</tr>
<tr>
<td>2013-2014</td>
<td>41%</td>
</tr>
</tbody>
</table>

Offer Vaccine Throughout Year

<table>
<thead>
<tr>
<th>Month</th>
<th>August 14</th>
<th>September 14</th>
<th>October 14</th>
<th>November 14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start</td>
<td></td>
<td></td>
<td>Start</td>
<td>Continue</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>as soon</td>
<td>into late</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>as available</td>
<td>spring</td>
</tr>
</tbody>
</table>

Continue into late spring
Make Vaccine Easily Accessible

• Alert families via e-mails, texts, or patient portals

• Create influenza clinics

• Extend office hours during peak vaccination periods

• Administer vaccine during both well and sick visits

• Immunize parents, adult caregivers, and siblings

• Work with other institutions or alternative care sites
Approach to Children With Presumed Egg Allergy

1. History of an allergic reaction to eggs? NO
   - Administer influenza vaccine per usual protocol

   YES

2. Was the allergic reaction severe? NO
   - Mild reaction only (eg, hives)
     - Administer influenza vaccine with preconditions

   YES

3. Anaphylaxis or Severe Reaction
   - Cardiovascular changes (eg, low BP)
   - Gastrointestinal (eg, vomiting)
   - Respiratory (eg, wheezing, throat swelling)
   - Episode required epinephrine

   - Allergy consultation
     (Alternatively, RIV3 may be given if 18-49 years old)

   a Necessary steps for administering influenza vaccine to any child with presumed egg allergy
     - In-office observation for 30 minutes
     - Appropriate resuscitative equipment available
Does Cocooning Make Sense?

Vaccination strategy which aims to protect children from disease by immunizing caregivers:

- Vaccinate Caregiver
- Decreased Infection in Caregiver
- Reduction in Children’s Exposure to Disease
- Decreased Infection in Children
Place of Vaccination for Children and Adults

*Early 2013-14 season, National Flu Survey*

~2/3 of children were vaccinated at a doctor’s office

‡ includes hospitals, clinics or health centers, local health departments, and other.

<table>
<thead>
<tr>
<th>Expected 2014–2015 Viruses</th>
<th>Adamanatanes (Amantadine/Rimantadine)</th>
<th>Oseltamivir (Tamiflu)</th>
<th>Zanamivir (Relenza)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seasonal influenza A (H1N1) virus (derived from 2009 pandemic)</td>
<td>Resistant</td>
<td>Susceptible</td>
<td>Susceptible</td>
</tr>
<tr>
<td>Seasonal influenza A (H3N2) virus</td>
<td>Resistant</td>
<td>Susceptible</td>
<td>Susceptible</td>
</tr>
<tr>
<td>Seasonal influenza B virus (either lineage)</td>
<td>Resistant</td>
<td>Susceptible</td>
<td>Susceptible</td>
</tr>
</tbody>
</table>
## Oseltamivir Dosing for Term and Preterm Infants Younger Than 1 Year

<table>
<thead>
<tr>
<th>Age</th>
<th>Treatment (mg/kg/dose po BID x 5 days)</th>
<th>Chemoprophylaxis (mg/kg/dose po QD x 10 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Term</strong></td>
<td>3.0</td>
<td>• 3.0 for infants 3 - 8 mo</td>
</tr>
<tr>
<td>0 to &lt;9</td>
<td></td>
<td>• Not recommended for infants &lt;3 mo</td>
</tr>
<tr>
<td><strong>Term</strong></td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td>9 to &lt;12 mo</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Preterm</strong></td>
<td>Varies based on postmenstrual age*</td>
<td>Not recommended</td>
</tr>
</tbody>
</table>

*Varies based on postmenstrual age.*
Key Messages(2)

• Everyone 6 months and older needs flu vaccine every year

• Vaccine strains are unchanged from last season

• Trivalent and quadrivalent influenza vaccines are available

• When readily available, LAIV should be considered for healthy children 2 – 8 years of age

• Dosing algorithm for children 6 months – 8 years reflects that vaccine strains have not changed

• Egg allergic children should be vaccinated

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
Seasonal Flu Surge and the Emergency Department

Brent D. Kaziny, MD, MA
Assistant Professor
Department of Pediatrics
Section of Emergency Medicine
Baylor College of Medicine
Texas Children’s Hospital
Why Should We Care?
H1N1

• 2009 H1N1 Flu Pandemic
• Spread from outbreak in Mexico
• CDC H1N1 estimates:
  • 59 million Americans contracted H1N1
  • 265,000 hospitalized
  • 12,000 deaths
H1N1 and Children

- Children age 0-24: 72.6% of cases
- Children age 0-24: 56.4% of hospitalizations

- 2/3rds of the 300 children <18 yo who died had underlying pulmonary or neurological conditions
Disaster Planning and Children

• Significant need to improve level of pediatric preparedness in the US

• 2008 survey by the CDC\(^1\):
  - Only 32.4% of hospitals had guidelines for increasing pediatric surge capacity
  - Only 34% of hospitals had plans for reunification of children with families
  - Only 42.6% of hospitals had a tracking system for accompanied and unaccompanied children

Disaster Planning and Children

• AAP Opinion Poll – October 2010

• Telephone survey conducted by Marist College Institute for Public Opinion
  - 1,030 US residents > 18 yo
  - Opinions remained consistent across various demographics, including region, household income, education, age, race, gender and political party

• Majority of people surveyed supported giving higher priority to children and their needs over adults

Marist College Institute for Public Opinion, American Academy of Pediatrics, National Survey, October 2010
Planning Prior to the Surge
Preparing the Institution

• Influenza vaccination among health care workers (HCW)
  - Currently only about 2/3rds of HCWs

• Strategies for improving vaccination rates
  - Improving education for HCW
  - Improving ease of delivery

• Working with HCW who refuse to vaccinate

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Preparing the Institution\(^6\)

- Plan to work without all your available staff
  - Anticipate 20-50% absenteeism
- Protect your HCWs
  - Promote hand hygiene and use of PPE
  - Have PPE available

\(^6\)CDC: Medical Offices And Clinics Pandemic Influenza Planning Checklist
Available at: http://pandemicflu.gov/professional/pdf/medofficesclinics.pdf
Preparing Those at Risk

• Current vaccination rates among at-risk populations
  -> 50%, but needs to be improved upon\(^7\)

• Improving current rates of vaccination among our at-risk populations
  - Using ED encounters to remind parents to vaccinate

• Strategies for improved vaccination rates

\(^7\)http://www.cdc.gov/vaccines/acip/meetings/downloads/slides-oct-2013/03-Influenza-Singleton.pdf
Preparing Our Primary Care Partners

• Identify networks of primary care physicians (PCPs)
  - Both within and outside your home hospital network

• Share CDC and AAP information regarding:
  - Strategies for testing
  - Strategies for treating
  - When to refer to the ED

• Share with PCPs patient and parental expectations for their ED visit should they be referred
Preparing Outside Hospitals

• For the children’s hospital in the region:
  - Share similar information regarding testing and treatment strategies as released via CDC and AAP

• For the general hospital in the region:
  - Find a contact either in the ED or in Infectious Disease (ID) at the children’s hospital that can share with you the latest information regarding these topics and disseminate them to your staff
Building Coalitions

• Ideally, this works best through preexisting coalitions of hospitals throughout the region.

• Such coalitions can prove beneficial in multiple settings (mass casualty, pandemic, etc.) but the seasonality and annual nature of flu surge is a good testing ground for these relationships.
Monitoring the Coming Surge
Create an Advance Warning System

• The Big Picture
  - The CDC “Flu View” site\(^8\)

\(^8\)http://www.cdc.gov/flu/weekly/fluactivitysurv.htm
Create an Advance Warning System (2)

• Your Region
  - Use these above mentioned networks of PCPs and Hospitals
  - Buoys out in the water
  - Flu tests being sent and Oseltamivir prescriptions in the community
Create an Advance Warning System (3)

• Your Hospital
  - Random surveillance testing as Flu season approaches
    • Testing patients presenting to the ED in triage at no charge to the patient, choose random days (i.e. every Tuesday)
  - Follow testing being done through your hospital’s lab
  - Monitor percentage of positive tests in an attempt to predict surge
Create an Advance Warning System

• Your Hospital
  - The National Emergency Department Overcrowding Scale (NEDOCS)
  - A real-time early warning sign
  - Shows state of overcrowding
  - Has been validated in general EDs

Scalable Surge Response
Changes to Patient Flow

- Identify ways to restructure current resources to allow for improved efficiency and patient throughput

  - Triage based screening tools
  - Separate waiting rooms for patients with influenza-like illness (ILI)
  - Streamlined charting for patients with ILI
  - Discharge videos reviewing flu basics

Increasing In-House Support

• Surge Staffing
  - Have additional staffing available (if possible)
  - Identify triggers for activating these additional resources
    • Hospital-specific metrics
Coalition Support

• Needs to work as a “two way street”
  - The children’s hospital should provide assistance with patient care remotely as influx of more ill patients may flood outside facilities
  - This could be via telemedicine programs and/or pre-surge educational modules
  - The community hospital must recognize the stress placed on the children’s hospital and attempt to buffer the specialty facility from those “worried-well” and non-critical patients
Massive Response

- Mobile Pediatric Emergency Response Team (MPERT) Model
  - Creation of an additional resource (clinical area, mobile ED, etc)\(^{11}\)
  - Requires significant resources
  - Families and caregivers are both amendable to care in a non-traditional setting\(^{12}\)


Available Resources
Pediatric Preparedness Resource Kit

• Available online as a PDF at:
References

• Three day workshop presented by the CDC
• Multiple children’s hospitals applied
• Primary Children’s Medical Center/ University of Utah selected
• Significant focus on coalition building
• More information and lessons learned to come…
Thank you!

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
References (2)


• Marist College Institute for Public Opinion, American Academy of Pediatrics, National Survey, October 2010


• CDC: Medical Offices And Clinics Pandemic Influenza Planning Checklist Available at: http://pandemicflu.gov/professional/pdf/medofficesclinics.pdf


• http://www.cdc.gov/vaccines/acip/meetings/downloads/slides-oct-2013/03-Influenza-Singleton.pdf

• http://www.cdc.gov/flu/weekly/fluactivitysurv.htm


• Cruz, et al, Outside the Box and Into Thick Air: Implementation of an Exterior Mobile Pediatric Emergency Response Team for North American H1N1 (Swine) Influenza Virus in Houston, Texas, Annals of Emergency Medicine, Vol 55, Iss 1, Jan 2010, Pg 23-21

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- **Using the Webinar System**
  - “Click” the Q&A tab at the top left of the webinar tool bar
  - “Click” in the white space
  - “Type” your question
  - “Click” ask

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  - Press Star (*) 1 to enter in the queue to ask a question
  - State your name
  - Listen for the operator to call your name
  - State your organization and then ask your question
Thank you for joining!
Please email us questions at coca@cdc.gov

Centers for Disease Control and Prevention
Atlanta, Georgia
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