The Case for Flu Vaccination in the Pediatric Population

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Epidemiology of Influenza

1,200 deaths annually
114,000 hospitalizations annually
7th leading cause of death in the US
8th leading cause of death in Alabama (2003)
Season typically December through March but may extend from October to May, especially in the South
Timing is Everything

- TIV (shot, killed) typically available early October
- LAIV (nose spray, live) can be given earlier, i.e. during back-to-school check ups during the summer
- Takes 2 weeks to be protective
- If vaccine naïve, doses must be given 4 weeks or 6 weeks apart for TIV and LAIV, respectively
Why Immunize All Kids?

- To keep them healthy
- To avoid missed school, parent’s work
- To prevent outpatient visits, hospitalizations and deaths
Pediatric Hospitalization Rates

- 108 hospitalizations per 100,000 patient years in children under 5 years, similar for other high-risk groups including those over the age of 65
Hospitalization rates last four seasons in children under 4 years

NVSN Influenza Laboratory-Confirmed Cumulative Hospitalization Rates for Children 0 - 4 Years, 2007-08 and Previous 4 Seasons

Population-Based Rate per 10,000 Children

2007-2008 Influenza Season/2 Week Reporting Period
Pneumonia and Influenza Mortality for 122 U.S. Cities
Week Ending 05/17/2008
Influenza Deaths In Children

- Fortunately rare in children <5 years
- 92 per year on average in the 1990s
- .4 per 100,000 people
- Represent a substantial proportion of vaccine-preventable deaths
- Not predicted by risk factors
153 lab-confirmed influenza deaths reported to the CDC in 2003-2004

- 96 (63%) were under 5 years
- 61 (40%) were under 2 years
- 100 (67%) didn’t have an underlying health condition that would have led to immunization under the CDC ACIP recommendations at the time
Effectiveness of the Flu Vaccine

- Varies because of drift/vaccine mismatch
- Varies according to outcome measured
- Varies by age group
- Varies by health status of the patient
- Varies by the choice of vaccine
- Varies by the timing of vaccine and the number of vaccines given
Effectiveness of the Flu Vaccine

- Similar to other vaccines
- When first immunized children who get two doses four weeks apart have equal protection to previously immunized
- Depending on age, outcome, drift and vaccine given, effectiveness is between 50 and 90% at preventing clinically significant disease
- Secondary outcomes- decrease in complications- pneumonia, asthma exacerbations and AOM
Immunize Kids - Protect the Community

- Several studies have demonstrated that vaccination of children decreases influenza disease burden in high-risk populations.
- Studies suggest that this may be a better public health strategy than targeting the elderly.
Japanese School Vaccination Program

- 1962 program to vaccinate school children with TIV begins
- 1987 parents allowed to refuse vaccination

Excess Deaths Attributed to Pneumonia and Influenza (per 100,000 population)

Ok, let’s vaccinate. Which vaccine?

• One thing is on the mind of all of our patients in pediatrics...
“Can I get the kind that’s not a shot?”

LAIV has come a long way...but still has limitations
LAIV Limitations in Children

- Not indicated under 2 years due to increase in hospitalizations for wheezing
- Not indicated in kids with asthma or recurrent wheezing because of increased risk of wheezing/hospitalization
Improvements in LAIV

- Price is down but still higher than TIV
- Fridge not freezer
- Lower volume of vaccine to squirt up the child’s nose (.2 ml vs 2ml)
- Age indication is now down to 2 years
Advantages of LAIV over TIV

• More effective, especially in years of vaccine mismatch

• Likely involves more of the immune system in defense- i.e. secretory immunity

• It’s NOT a SHOT
Primary Change In Flu Vaccine Recommendations

The 2008 ACIP recommendations include a big change
New Recommendations

• These recommendations were presented to the full ACIP and approved in February 2008. Modifications were made to the ACIP statement during the subsequent review process at CDC to update and clarify wording in the document. Data presented in this report were current as of July 1, 2008. Further updates, if needed, will be posted at CDC's influenza website (http://www.cdc.gov/flu).
All children should get a flu immunization

- Beginning with the **2008-09** influenza season, annual vaccination of all children aged 5-18 years is recommended. Annual vaccination of all children aged 5-18 years should **begin in September** or as soon as vaccine is available for the 2008-09 influenza season, if feasible, but annual vaccination of all children aged 5-18 years should begin no later than during the 2009-10 influenza season.
Don’t forget the higher risk groups

Annual vaccination of all children aged 6 months-4 years (59 months) and older children with conditions that place them at increased risk for complications from influenza should continue. Children and adolescents at high risk for influenza complications should continue to be a focus of vaccination efforts as providers and programs transition to **routinely vaccinating all children.**
Either TIV or LAIV can be used when vaccinating healthy people ages 2-49 years. Children ages 6 months-8 years should receive 2 doses of vaccine if they have not been vaccinated previously at any time with either LAIV or TIV (doses separated by >4 weeks); 2 doses are required for protection in these children. Children ages 6 months--8 years who received only 1 dose in their first year of vaccination should receive 2 doses the following year. LAIV should not be administered to children ages <5 years with possible reactive airways disease, such as those who have had recurrent wheezing or a recent wheezing episode. Children with possible reactive airways disease, people at higher risk for influenza complications because of underlying medical conditions, children ages 6--23 months, and people ages >49 years should receive TIV.
Summary of Current Recommendations

- All children 6 months to 18 years should be immunized against influenza- goal is to have this done in the 2008-2009 season, meaning starting now

- 2 doses of vaccine for children who haven’t been vaccinated previously or if they only got one dose in the first year of immunization

- Priority for high-risk groups including children 6 months to 59 months and those with chronic disease such as asthma, diabetes and neurological disease that will increase the risk of influenza and its complications.
Practical Bedside Experience

• Parents who are told that their insurance *may cover* the flu vaccine tend to **WAIT**
• Parents who are told that their insurance *covers* the flu vaccine universally **WANT**
Barriers to Protection

- Vaccine has to be ordered in the spring for fall administration. Providers need to know the commitment of insurers to pay for the vaccine months in advance to avoid the expense of unused vaccine.
- Not having a uniform benefit for this universally needed vaccine creates uncertainty among providers and parents that leads to decreased immunization rates.
Summary

• CDC now recommends flu vaccine for all children

• Flu vaccine is similar to other vaccines in effectiveness

• 2 doses of vaccine are needed in children under eight who are being vaccinated for the first time

• LAIV has advantages over TIV but also has limitations
Summary

• Providers need to preorder vaccine in the spring for administration in the fall