EPIDEMIOLOGY SECTION

# Connecticut Epidemiologist

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Douglas S. Lloyd, M.D., M.P.H., Commissioner Vol. 5 No. 3

## CASES OF HIB DISEASE FOLLOWING VACCINATION

The Centers for Disease Control (CDC) in collaboration with State health departments is collecting information and diagnostic specimens from children nationwide who have contracted H. influenzae type b (Hib) invasive disease after having received the recently licensed (April, 1985) Hib polysaccharide vaccine. Although a certain number of "vaccine failures" are to be expected even with a highly protective vaccine, systematic collection of information on such cases is necessary to help characterize children who do not respond to the vaccine. If the degree of underreporting and age distribution of vaccinated individuals can also be determined, it might also be possible to make a cautious estimate of efficacy.

We urge practitioners to report any case of Hib invasive disease in vaccinated children, including those cases occurring soon after vaccination, to the Epidemiology Section, Department of Health Services (DHS). Although protection would not be expected until antibodies to the polysaccharide antigen have been produced, accurate reporting of all such cases may help clarify the point at which the vaccine becomes effective. Invasive diseases to be reported include meningitis, bacteremia, epiglottitis, pneumonia (with bacteremia), pericarditis and septic arthritis. Currently, only meningitis is reportable in Connecticut, but beginning in 1987, all invasive Hib disease will be reportable to DHS.

When possible, practitioners should also send the H. influenza isolate and acute and convalescent sera (collected as early as possible in the illness, and 4-6 weeks later) to the State Laboratory. The isolate and diagnostic specimens will be sent on to CDC.

Cases can be reported to the Epidemiology Section, DHS at 566-5058.

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## INFLUENZA AND LABORATORY TESTING

The laboratory plays an important role in the surveillance of influenza. The number of influenza isolates and positive serologic tests for influenza are measures of influenza activity in the community. In order to make decisions concerning amantadine prophylaxis or treatment, it is also important to determine whether or not influenza A is the predominant virus in circulation. This is especially true in nursing homes and other closed populations where outbreaks of influenza A can be stopped by amantadine prophylaxis.

Influenza virus isolation and serologic testing are done at the State Laboratory. Summary statistics for the last four influenza seasons are presented in Table 1. While the level of influenza activity varies from season-to-season, the drop in the number of specimens submitted between 1984 and 1985 may reflect, in part, the new laboratory policy to charge for viral cultures and serologic tests not submitted either from facilities participating in the State's influenza surveillance system or as part of epidemiologic investigations of influenza outbreaks.

Table 1. Influenza virus isolation and serologic testing by influenza season, Connecticut State Laboratory, 1983-1986.*

| | Influenza Season | | | |
|---|---|---|---|---|
| | 1983 | 1984 | 1985 | 1986 |
| No. of specimens submitted for viral isolation | 1097 | 1066 | 564 | 813 |
| No. of isolates | 71 | 22 | 19 | 52 |
| No. of paired sera submitted | 1730 | 1602 | 754 | 603 |
| No. of paired sera positive for influenza** | -- | -- | 79 | 74 |

*Influenza seasons run from October 1 thru May 31 (e.g. 1983= Oct. 1, 1982 - May 31, 1983)]

**Positive test = four-fold or greater rise in HI antibody against influenza A or B but no comparable rise against other respiratory pathogens. Data not available for 1983 and 1984.

In the 1985 and 1986 influenza seasons, 14% (33/243) of the specimens submitted by the Epidemiology Section, DHS yielded influenza viruses; 47% (74/158) of paired sera showed four-fold or greater rises in hemaglutination-inhibition (HI) antibody against either influenza A or B. Most of these specimens were obtained as

part of outbreak investigations in nursing homes and schools. In the same years, 3% (38/1377) of the specimens for viral isolation submitted by health-care providers yielded influenza viruses; 8% (102/1357) of paired sera showed evidence of recent influenza infection.

The Epidemiology Section provides assistance in the investigation of influenza outbreaks. Health-care providers are encouraged to report, as early as possible, clusters of influenza-like illness occurring in nursing homes and other health-care institutions. As part of an investigation, influenza testing can be arranged through the Epidemiology Section at 566-5058.

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## MONOVALENT INFLUENZA A (H1N1) VACCINE, 1986-1987

(Adapted from MMWR 1986;35:517-21.)

These supplemental recommendations of the Immunization Practices Advisory Committee (ACIP) provide guidelines for a monovalent influenza A(H1N1) vaccine for protection against a newly emerged variant of influenza that has recently caused outbreaks among children and young adults in Asia. Guidance is provided for the use of this monovalent vaccine, which contains 15 ug of A/Taiwan/1/86(H1N1) antigen, as a supplement to the standard trivalent influenza vaccine. Recommendations for the use of the standard trivalent influenza vaccine for the 1986-1987 season and the use of antivirals for the prevention and treatment of influenza (MMWR 1986;35:317-26,331) remain in effect and should be referred to in conjunction with this supplemental recommendation. The trivalent vaccine is intended to protect against currently circulating strains of influenza A (H3N2) and influenza B viruses and may provide partial protection against the new influenza A(H1N1) variant.

### Introduction

Influenza A(H1N1) viruses circulated throughout the world from at least the mid-1930s until 1957, and many epidemics during this period were associated with severe illness and excess mortality (1). Influenza A(H1N1) viruses similar to a strain seen in 1950 reappeared in epidemic form in 1977, but outbreaks were detected only among children and young adults. In 1978-1979, when a U.S. epidemic was caused exclusively by type A(H1N1) virus, widespread outbreaks occurred among children and young adults, but no excess mortality was observed at the national level (1).

Influenza A(H1N1) viruses, like other human influenza viruses, have continued to undergo antigenic variation and have caused outbreaks in the United States during several winters, most recently that of 1983-1984. Since 1977, the incidence of illness associated with influenza A(H1N1) infection has been very low among older adults; such illnesses have generally been mild (2); and virtually no outbreaks have been detected among older age groups, even though the post-1977 antigenic variants have differed from those that circulated before 1957 (3). A temporal relationship between the occurrence of influenza A(H1N1) infections in the community and increased hospitalizations of older persons for acute respiratory disease (ARD) has been reported in one investigation (4); however, the severity of ARD (e.g., incidence of pneumonia) and the excess number of hospitalizations for ARD associated with influenza are not known. Furthermore, from 1982 to 1986, the laboratories collaborating in CDC's influenza virus surveillance program reported 1,049 influenza type A (H1N1) virus isolates, of which only six (0.6%) were obtained from persons aged 65 years or older. During the same period, 566 (22%) of 2,635 type A (H3N2) and 169 (9%) of 1,905 type B viruses were isolated from persons in this age group. This indicates that, although older Americans have had repeated exposure to all three currently circulating influenza strains, they do not have the same level of natural protection against illness caused by new variants of type A(H3N2) or type B viruses as they do against new variants of type A(H1N1) virus. Thus, it appears that, in influenza A(H1N1) epidemics since 1977, children and young adults have been particularly at risk of infection and illness and that the frequency of illness has decreased markedly among persons born before the mid-1950s. Nevertheless, some persons born before this time remain susceptible to infection and may have respiratory illnesses requiring medical attention.

Following the 1983-1984 influenza season, A(H1N1) strains were isolated infrequently in most parts of the world. The majority of A(H1N1) isolates in 1984 and 1985 continued to resemble the A/Chile/1/83 strain (which was first included in the trivalent influenza vaccine for 1984-1985), and A/Chile/1/83 was, therefore, chosen to remain the A(H1N1) component for the trivalent vaccine previously recommended for 1986-1987 (5). However, A(H1N1) viruses from influenza outbreaks in several Asian countries during March-May 1986 have recently been found to be poorly inhibited by antibody induced by the A/Chile/1/83 strain. In contrast, these viruses were all well inhibited by antisera to representatives of the new isolates. In addition, tests of antibody response induced by A/Chile/1/83 vaccine among children or adults showed four-to-sixfold lower post vaccination geometric mean titers against representatives of the new variants than against A/Chile/1/83 (6,7).

It is not possible to predict how widely these new A(H1N1) variants will circulate in the United States during 1986-1987, nor the actual level of protection that A/Chile/1/83 vaccine will induce against them. However, it seems prudent to maximize protection of individuals at high risk of serious complications following influenza A(H1N1) infection in the event that these newer A(H1N1) viruses do cause major outbreaks in the United States. Vaccine manufacturers have therefore been requested to initiate production of a supplemental monovalent A(H1N1) influenza vaccine for use before the 1986-1987 season.

Influenza A(H3N2) and type B viruses closely related to the strains in the 1986-1987 vaccine have continued to circulate throughout the world and may also appear in the United States during the 1986-1987 influenza season. The supplemental influenza A(H1N1) vaccine, unlike the 1986-1987 trivalent vaccine, will not contain representative antigens for virus types A(H3N2) and B. It is, therefore, imperative that the trivalent vaccine continue to be used as previously recommended (5). Programs for administration of the 1986-1987 trivalent vaccine to high-priority target groups

should not be delayed, regardless of the time of availability of the supplemental A(H1N1) vaccine.

Recommendation

Individuals under 35 years of age for whom influenza vaccination has been specifically recommended (5) should receive both the standard trivalent vaccine and the monovalent A/Taiwan/1/86(H1N1) vaccine.

Any high-risk person aged 35 years and older, or any other person who wishes to be immunized, may also receive the supplemental vaccine.

Persons Who Should Not Be Vaccinated

Inactivated influenza vaccine of any kind should not be given to persons who have an anaphylactic sensitivity to eggs. Persons with acute febrile illnesses should not be vaccinated until their temporary symptoms have abated. For recommendations regarding the use of influenza vaccine during pregnancy, refer to the previously published recommendations for the control of influenza (5).

Table 2. Timing and dosage schedules for use of the supplemental 1986-1987 monovalent A(H1N1) influenza vaccine in conjunction with the 1986-1987 trivalent vaccine.

| AGE | INFLUENZA VACCINATION STATUS | | ADDITIONAL VACCINATIONS |
|---|---|---|---|
| | Any Influenza Vaccine 1978/1979-1985/1986 | Doses of 1986/1987 Trivalent Vaccine Received | Vaccination Schedule* for Future 1986/1987 Vaccination |
| 6 mos.–12 yrs. | NO (unprimed) | NONE | Trivalent + monovalent simultaneously in 2 sites on each of 2 visits ≥4 wks. apart |
| | | 1 | Trivalent + monovalent simultaneously in 2 sites ≥4 wks. after 1st trivalent |
| | | 2 | Monovalent ≥4 wks. after trivalent |
| | YES (primed) | NONE | Trivalent + monovalent simultaneously in 2 sites |
| | | 1 | Monovalent ≥4 wks. after trivalent |
| ≥13 yrs. | DOESN'T MATTER | NONE | Trivalent + monovalent simultaneously in 2 sites |
| | | 1 | Monovalent ≥4 wks. after trivalent |

*If monovalent vaccine is not available when trivalent vaccine is scheduled, do not delay administration of trivalent vaccine. After at least one dose of the trivalent vaccine has been administered, only one dose of the monovalent vaccine will be needed. This may be given either simultaneously with the scheduled second dose of trivalent vaccine for a child receiving two doses of trivalent vaccine or 4 weeks or more after the last dose of trivalent vaccine administered.

Timing of Influenza Vaccination Activities

Recommendations for the timing of influenza vaccination activities with the trivalent vaccine for use in 1986-1987 have been published (5). Those recommendations remain in effect. Additional recommendations above (Table 2) apply to persons receiving the supplemental A(H1N1) vaccine in conjunction with the 1986-1987 trivalent vaccine.

Children aged 12 years or younger who have never received any influenza vaccine containing type A(H1N1) antigen (i.e., any influenza vaccine since 1978-1979) are considered unprimed and require two doses of the standard trivalent vaccine with an interval of at least 4 weeks between doses. The timing and number of monovalent A(H1N1) vaccine doses required will vary depending on whether the recipient has been primed by prior vaccination or infection and on the timing of doses administered for the current season (Table 2).

If the supplemental monovalent vaccine is not available at the time vaccination programs would normally be undertaken, vaccination with the standard trivalent vaccine should not be delayed.

It is anticipated that the supplemental monovalent vaccine will not be available until November-December 1986. If influenza A outbreaks begin to occur before vaccination, temporary chemoprophylaxis with the antiviral agent, amantadine, may be indicated. Recommendations for amantadine use for prophylaxis and treatment of influenza A infections have been published (5).

Information about the availability of the supplemental vaccine and the occurrence of influenza will be made available to state health officials by electronic communication and will be published in the MMWR.

Recommended Dosage of Supplemental Monovalent Influenza Vaccine

The 1986-1987 supplemental monovalent vaccine contains 15 ug of A/Taiwan/1/86 antigen in each 0.5-ml dose. As with the standard trivalent vaccine, the recommended dosage of the monovalent vaccine should be reduced to 0.25 ml for children 6-35 months of age. Only split-virus vaccine, suitable for use in children or adults, will be manufactured. When administered simultaneously with the 1986-1987 trivalent vaccine, the vaccines should be given in separate sites (e.g., right and left deltoid or thigh). For more specific information, see the recommendations for 1986-1987 (5).

Side Effects and Adverse Reactions

Children aged 6-35 months will receive a total of 30.0 ug of antigen when given both vaccines simultaneously, compared with 22.5 ug when given trivalent influenza vaccine alone; children 3 years of age or older and adults will receive a total of 60.0 ug of antigen when given both vaccines simultaneously, 45.0 ug when given only the trivalent vaccine. Studies of the effect of different doses of influenza vaccine antigen administered to children and adults suggest that the amounts of antigen delivered by simultaneous administration of the trivalent and monovalent vaccines will result in no significant differences in the occurrence or severity of systemic adverse reactions compared with administration of trivalent vaccine alone (8-10).

More information on side effects and adverse reactions associated with inactivated influenza vaccine has been published (5).

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COMMUNICABLE DISEASES REPORTED

CONNECTICUT

WEEKS 1 - 35

(thru August 29, 1986)

| Name | 1986 To Date | 1985 To Date | % Change From 1985 |
|---|---|---|---|
| AIDS | 119 | 56 | +112.50 |
| GONORRHEA | 5966 | 5968 | - 0.03 |
| SYPHILIS P&S | 97 | 144 | - 32.63 |
| MEASLES | 3 | 7 | - 57.14 |
| RUBELLA | 1 | 4 | - 75.00 |
| TUBERCULOSIS | 127 | 106 | + 19.81 |
| HEPATITIS A | 93 | 44 | +111.36 |
| HEPATITIS B | 254 | 190 | + 33.68 |
| SALMONELLOSIS | 657 | 662 | - 0.76 |
| SHIGELLOSIS | 70 | 82 | - 14.63 |



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