Influenza Guideline for South Africa – Update 2009 at a glance

The single best way to protect against the flu is to get vaccinated each year.

A Guideline for Influenza Management in Adults was published in 1999 by the South African Thoracic Society.1 A 2008 update to this Guideline incorporated additional information on current viral strains, new treatment recommendations, influenza in children and the management and treatment of the disease in HIV-infected patients.2

Despite the colloquial use of the term flu for wintertime infections, influenza is a serious infection causing substantial morbidity and mortality worldwide and resulting in approximately 250,000 to 500,000 deaths per year, in those for whom influenza poses a serious risk.3 Influenza vaccination is an important public health objective, particularly in persons older than 65 years as this age group has the highest rate of mortality during influenza epidemics.4 There is evidence of the significant benefits of vaccination, viz. reduction in hospitalizations and mortality due to influenza and heart disease.5

History
Influenza is certainly not a modern disease; the first was recorded in 1580; since this time, various methods have been employed to eradicate its cause. In the world wide pandemic of 1918 during which the influenza viral infection and co-morbidities are thought to have caused the deaths of 50 - 100 million.4 Physicians tried everything they knew, everything they had ever heard of, from the ancient art of bleeding patients, to administering oxygen, to developing new vaccines and sera (chiefly against what we now call Hemophilus influenzae—a name derived from the fact that it was originally considered the etiological agent—and several types of pneumococci). Only one therapeutic measure, transfusing blood from recovered patients to new victims, showed any hint of success.6

The cause of influenza, the orthomyxoviridae was finally discovered by the MRC of the in 1933.7 The influenza vaccines that we know today were first developed by the US military. In 1931, viral growth in embryonated hens' eggs was discovered, and in the 1940s, the US military developed the first approved inactivated vaccines for influenza, which were used during the Second World War. Subsequent advances vaccinology and immunology have seen vaccines become safer and mass-produced. The focus today, as a result of further advances in molecular technology, is on making influenza vaccines through the genetic manipulation of influenza genes.8-11

Overview of the influenza vaccine
The most common human vaccine is the trivalent that contains purified and inactivated material (sub-units) from three different viral strains. The sub-units consist of the surface proteins, haemagglutinin (H) and neuraminidase (N), and only these parts of the virus are needed for effective protection against influenza. The H protein is responsible for attachment to the host’s receptor, while the N protein digests neuraminic acid in the cell surface, thus freeing the virus to infect other cells.

Typically, this vaccine includes material from two subtypes (H1N1 and H3N2) and one strain. These Influenza viruses circulate worldwide in temperate regions, but the prevalence of each varies considerably across countries, and even within a single community. For this reason a vaccine formulated for one influenza season could be ineffective in the following year, since the influenza virus changes rapidly over time, and different strains become dominant. Each year, three strains are chosen for selection in that year's flu vaccination by the WHO. The chosen strains are the H1N1, H3N2, and Type-B strains thought most likely to cause significant human suffering in the coming season.

The WHO was established in 1952, it comprises 4 WHO Collaborating Centres (CCs) and 112 institutions in 83 countries, which are recognized by WHO as WHO National Influenza Centres (NICs). These NICs collect specimens in their country, perform primary virus isolation and preliminary antigenic characterization. They send newly isolated strains to WHO CCs for high level antigenic and genetic analysis, the result of which forms the basis for recommendations on the composition of influenza vaccine for the Northern and Southern Hemisphere each year. The’s selection of viruses for the vaccine manufacturing process is based on its best estimate of which strains will be predominant the next year, amounting in the end to well-informed but fallible guesswork.

The nomenclature used for the viral strains is as follows: Type, subtype (only in the case of type A) followed by strain identifiers viz. the place where it was first characterized, the year of first isolation and a laboratory identifying number:

**WHO Recommended composition of influenza virus vaccines for use in the 2009 southern hemisphere influenza season**

It is recommended that vaccines for use in the 2009 influenza season (southern hemisphere winter) contain the following:

— an A/Brisbane/59/2007 (H1N1)-like virus*
— an A/Brisbane/10/2007 (H3N2)-like virus**
— a B/Florida/4/2006-like virus*
— A/South Dakota/6/2007 (an A/Brisbane/59/2007-like virus) is a current vaccine virus used in live, attenuated vaccines
— A/Brisbane/10/2007 and A/Uruguay/716/2007 (an A/Brisbane/10/2007-like virus) are current vaccine viruses

**WHO should have an influenza vaccine**

— Everyone over the age of 65 years of age
— Anyone (adult or child older than 6 months of age) who is at high risk for influenza and its complications because of an underlying medical condition(s) and who is receiving regular medical care for conditions such as pulmonary and cardiac disease, chronic renal diseases, diabetes and similar metabolic disorders
— Anyone who is immunosuppressed (including HIV-infected individuals (adults with a CD4 count above 100/μl and children with a CD4 count > 15%), as influenza is more prolonged and more severe
— Residents of old-age homes, chronic care and rehabilitation institutions as the infection spreads very rapidly once the virus is introduced into this type of population
• Children on chronic aspirin therapy
• Medical and nursing staff responsible for the care of high-risk cases
• Adults and children who are family contacts of high-risk persons
• Women who would be in their second or third trimester of pregnancy during the influenza season. Pregnant women at risk of influenza complications due to underlying medical conditions, should be immunized at any stage of pregnancy
• Essential services personnel
• Anyone wanting the protective effect of influenza immunization, particularly in workplace settings where large-scale absenteeism could have a significant negative economic impact.

WHO should not have an influenza vaccine
• Anyone with a history of severe hypersensitivity to eggs
• Anyone with an acute febrile illness, immunization should be delayed until symptoms have disappeared as vaccination could possibly exacerbate symptoms
• Women during the first trimester of pregnancy UNLESS there are specific medical indications (as detailed above)

WHEN should the influenza vaccine be given?

Influenza immunization should take place early enough in the year to provide protection for the autumn and winter seasons. The protective antibody response takes about 2 weeks to develop. Optimally the vaccine should be given at least 2 months before the onset of autumn (March in South Africa); the vaccine can however be given at any time during the influenza season, even until late winter.

HOW MUCH should be given?

Vaccines should contain 15μg of each antigen in each 0.5ml dose. The recommended influenza vaccine dosage schedule is:
• Adults: Whole or split-product or subunit vaccine – 1 dose IM
• Children < 9 years or previously vaccinated: Split-product or subunit vaccine – 1 dose IM
• Children 3-5 years who have never been vaccinated: 2 doses, 1 month apart
• Children < 3 years: 0.25ml on two occasions, 1 month apart, when vaccinated for the first time

Adverse reactions to influenza vaccine

The safety profile of intra-muscularly injected trivalent influenza vaccine is well established; the most commonly reported adverse reactions have been observed, hence the contra-indication to this group of persons being vaccinated.

In those individuals with an egg protein allergy, adverse reactions have been observed, hence the contra-indication to this group of persons being vaccinated.

Influenza and HIV

The 2008 Guideline includes specific information about preventing influenza in HIV-infected individuals. Influenza tends to produce more severe and more prolonged disease in these individuals, especially in children.7 Vaccination elicits a T-cell-dependent immune response which manifests as a transient increase in HIV viral load and decrease in CD4 count. Neither is considered to be clinically significant in adults or children.8-15 The safety of influenza vaccination is thus not of concern. On the other hand, in comparison to non-infected individuals, the efficacy of the influenza vaccination in HIV-infected individuals does differ as the protection afforded is modest in comparison.2 However, the cornerstone of prevention is, as for non-HIV-infected individuals, vaccination with the trivalent inactivated vaccine.

Conclusion

The influenza virus continues to be a major cause of respiratory infection and is an important contributor to morbidity and mortality in populations at risk. Prophylaxis with anti-viral drugs is not feasible as the virus tends to develop resistance to the drugs, therefore vaccination with an inactivated influenza vaccine remains the most popular and effective method of controlling the disease through prevention.14,15

References

7. Webster RG, Walker EJ. The world is tentering on the edge of a pandemic that could kill a large fraction of the human population. American Scientist 2000; 91 (2): 122.