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October 2017 Infection Control learning sheet # 9 - about this year's influenza vaccine.

How is the composition of each annual vaccine determined?
Because both influenza A and influenza B viruses undergo frequent changes in their surface antigens, the composition of vaccines for use is determined annually by the Australian Influenza Vaccine Committee. The 2017 vaccine contains four recommended strains of virus (two influenza A subtypes - H3N1 and H1N1 - and two influenza B subtypes) to represent currently circulating viruses. Infections due to H3N2 strains are more likely to lead to severe morbidity /mortality.

Alternative Vaccines
There has been discussion as to whether Australia should have a vaccine raised in cell culture rather than using eggs- CSL manufactures this in the USA under FDA approval for use there. CDC does not have a preference for either.

How effective was the current vaccine in 2017and possible reasons for this?
A protective antibody response in an immunocompetent person is the aim of all vaccination - whilst 100% is impossible, even the 50 - 80% that the flu may offer is better than nothing to reduce transmission. Infants, the elderly and the very immunocompromised may develop lower protective levels: to protect these groups from serious outcomes, the general population might consider its role in annual immunisation for flu. After three months of monthly data, it was shown that the vaccine strain was a good match to the circulating strain in July, by August it was just moderate - this provides some evidence that the virus was mutating through the outbreak, causing the vaccine to be less effective. Other reasons are that peak antibodies occur about 8 weeks after the vaccine is administered meaning that those who received their vaccine in April may have lost some protection by September when the virus was still peaking. It is possible that the virus mutates during vaccine manufacture and may not have been a good match for the circulating outbreak strain. Regardless of vaccination efficacy, if only 20% of a population are being immunised, transmission is increased.

The long cold winter favours viral circulation and transmission. It is cause for concern when young healthy adults die from influenza - some had underlying conditions that made them susceptible. Numbers were not increased however.

I am unaware if any of the manufacturers have put forward a cell culture flu vaccine for registration/licensing for 2018 or whether all children will be recommended to have the vaccine or whether two doses will be offered to everyone or the concentration of virus in the vaccine will be higher. We do know that 50% more cases presented in General Practice.

References
1.Professor Cheng - The Alfred, professor of Infectious Diseases Sept 8, 2017 The Australian - One of the drug companies has a high-dose vaccine that they are thinking of bringing to Australia that is like getting four doses," he said. Another practice overseas was adding adjuvants to vaccines to better stimulate the immune response.

*2. CDC ref - "*In *August 2016, FDA approved the use of cell-based candidate vaccine viruses* eg. Flucelvax (CSL). *While the use of cell-grown reference viruses and cell-based technology may offer potential for better protection over traditional, egg-based flu vaccines because they result in vaccine viruses that are more similar to flu viruses in circulation, there are no data yet to support this. There is no preferential recommendation for one injectable flu vaccine over another."*

3. (Oct) From the Australian Influenza Surveillance report - The peak week of national influenza activity this season has been at comparable or higher levels than in recent years, with high activity persisting at the peak of the season for a number of weeks. There has been more than two and a half times the number of laboratory confirmed notifications of influenza reported to the NNDSS this year compared with the same period last year. An earlier season onset and introduction of rapid testing have contributed, in part, to this increase. Notification rates this year to date have been highest in adults aged 80 years and older, with a secondary peak in young children, aged 5 to 9 years. This is consistent with previous seasons where influenza A(H3N2) and influenza B, respectively, have dominated.

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