

SAMPLE PRESENTATION ABSTRACTS

Annual Conference on Vaccine Research

Sample Presentation Summary, Objectives, and References:

Presentation Title: Varicella-Zoster Virus Vaccines

Objective: Discuss the formulation of the varicella vaccine, the clinical experience with the vaccine pre- and post-licensure, and the current guidelines for its administration to children, adolescents, and adults and in high-risk populations.

Varicella-zoster virus is a medically important human herpesvirus that causes varicella as the primary infection in susceptible children and adults. The varicella vaccine is the first live attenuated human herpesvirus vaccine that is licensed for clinical use in several countries. The vaccine virus was derived from a clinical isolate of VZV, the Oka strain (1). Tissue culture propagation attenuated the virus so that vaccine containing as much as 17,000 pfu per dose of infectious virus induces VZV immunity but rarely produces clinical symptoms. Introduction of the varicella vaccine as a routine early childhood vaccine in 1995 has dramatically reduced the risk of life threatening infections in otherwise healthy children. Since this time, based on the observations of breakthrough varicella in young children who had received a single dose, the varicella vaccine regimen is now two doses for susceptible individuals of all ages. Recent studies also indicate that the administration of varicella vaccine as the first dose in a combined measles-mumps-rubella-varicella (MMRV) vaccine was associated with an incremental risk of fever and febrile seizures compared to MMR and varicella vaccines given at separate sites. Whether the original cohort of varicella vaccine recipients will require booster doses of varicella vaccine at a later age requires continued surveillance.

References:

1. Arvin AM. Varicella vaccine: genesis, efficacy, and attenuation. *Virology* 2001; 284:153–158.
2. Michalik DE, Steinberg SP, Larussa PS, et al. Primary vaccine failure after 1 dose of varicella vaccine in healthy children. *J Infect Dis.* 2008 Apr 1;197(7):944-9.
3. Klein NP, Fireman B, Yih WK, et al; Vaccine Safety Datalink. Measles-mumps-rubella-varicella combination vaccine and the risk of febrile seizures. *Pediatrics.* 2010 126(1).
4. Gershon AA, Arvin AM, Levin MJ, et al. Varicella vaccine in the United States: a decade of prevention and the way forward. *J Infect Dis.* 2008 Mar 1;197 Suppl 2:S39-40.

Clinical Vaccinology Course

Sample Extended Abstract and References

Presentation Title: The Effect of Combination Vaccines on the Vaccine Schedule

Extended Abstract:

Clinic practices have many considerations when choosing vaccines. Vaccine safety, efficacy, supply, ease of administration, storage needs, required staff education and documentation are just some of the considerations. Previously, the Advisory Committee on Immunization Practices in its original 1999 statement on combination vaccines used language that *preferred* the use of combination vaccines over separate injections of their equivalent component vaccines. With the changing landscape of newer vaccines

and safety experiences, the preferential language was updated in 2011 to reflect many of the considerations that go into choosing a combination versus single antigen vaccine. The current General Recommendation statement reflects some of those considerations stating:

The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Considerations should include provider assessment (number of injections that visit, vaccine availability, likelihood of improved coverage, likelihood of patient return to clinic, storage and cost considerations), patient preference, and the potential for adverse events.

Combination vaccines must pass a “non-inferiority” assessment compared to their single antigen counterparts. More recent combination vaccines which have been approved include the combination of DtaP-IPV known as “Kinrix” (kindergarten booster age 4-6 years only with similar safety, efficacy and common local side effects as single DtaP and IPV) and DTaP-IPV/Hib combination known as “Pentacel” (approved for 6 weeks of age through 4 years in a 4 dose series at 2, 4, 6 and 15-18 months with similar safety and efficacy profile as individual counterparts; not used for 4-6 year booster dose or for primary series in 5 years and over). Errors with reconstitution of Pentacel have been reported. The DtaP-IPV (sterile liquid comes packaged with and reconstitutes ACtHib which is freeze-dried and lyophilized. They should be stored together, reconstituted and given together. If DTaP-IPV is given alone in error, it can be counted by ActHib cannot be reconstituted with sterile water and given. Documentation of combination vaccines should be done noting it in the individual antigen site on the record rather than by brand name.

Considerations that should be discussed in a clinic setting when choosing combination vaccines new to the market include the following advantages:

- Coverage rates improve when combination vaccines are used routinely
- The number of injections that will be eliminated (pain reduced)
- That extra antigens can be justified when benefits outweigh risks
- Interchangeability
- Reduced shipping costs and storage space
- Allows better “catch-up” when working with patients following a delayed schedule
- Parent/patient satisfaction with less injections

Potential disadvantages with combination vaccines should also be considered such as:

- Adverse events may be more frequently compared to separate antigens at the same visit
- Multiple providers with various products causes confusion when patients change clinics
- Potential for reduced immunogenicity of one or more components
- Possible shortened shelf life for some products

Cost can be both an advantage or disadvantage because of the complexities of direct versus indirect costs, delayed versus missed vaccinations, costs of extra visits due to deferrals if single antigens employed. Reimbursement for vaccines is a continually changing landscape with some plans trying to equalize the administration fees for combination and single antigen vaccines in an attempt to remove financial disincentives to combination vaccines.

Vaccine safety is the paramount consideration and is monitored in a variety of methods including from the manufacturer post-licensure, through the Vaccine Adverse Events Reporting System and the Vaccine Safety Datalink project linking large HMO databases for analysis. MMRV and the slight incidence of febrile seizures were picked up through safety monitoring showing 1 in every 2600 children 12-23 months of age will have a febrile seizure within the first 2 weeks after vaccination with MMRV.

Most products are considered interchangeable except for the 2nd dose of Hepatitis B for teens. For example if a teen started on the 3 dose series they should finish on the 3 dose series versus if they started on the 2 dose series, they should finish on that.

Important conversations with parents include the abilities of the human immune system and the lack of evidence to support such notions as “overloading the immune system” or that babies immune systems are too “weak” to have multiple vaccines simultaneously.

Many administration questions can arise with combination vaccines. Knowing available resources for parents and providers to ask questions is important such as the reliable websites www.vaccines.gov and www.immunize.org

Conversations with parents on important topics such as combination vaccines can take time and patience in a clinic setting and should be factored into clinic operation considerations.

References:

1. Combination vaccines for childhood immunizations: recommendations of the Advisory Committee on Immunization Practices (ACIP), the American Academy of Pediatrics (AAP), and the American Academy of Family Physicians (AAFP). *MMWR Rep.* 1999;48(RR-5):1-15. (original)
2. General Recommendation on Immunization, *Morbidity Mortality Weekly Review*, January,28, 2011; 60(RR02);1-60 (updated)
3. Policy Statement--Prevention of Varicella: Update of Recommendations for Use of Quadrivalent and Monovalent Varicella Vaccines in Children. Committee on Infectious Diseases. *Pediatrics*; originally published online August 28, 2011; DOI: 10.1542/peds.2011-1968
4. CDC. Preventing Tetanus, Diphtheria, and Pertussis Among Adolescents: Use of Tetanus Toxoid, reduced Diphtheria Toxoid and Acellular Pertussis Vaccines: Recommendations of the Advisory committee on Immunization Practices (ACIP).*MMWR* 2006;55(RR-3): 1-41