**HL7 Patient Care Work Group**

 **Allergy/Intolerance/Adverse Reaction Topic Sub-Group**

**Immunization Under Allergic Conditions Use Case**

**Use Case Description**

The purpose of this use case is to illustrate the case where a young patient has to receive a vaccine for yellow fever before going to Africa with his parents. The young patient is known to have allergic sensitivity to eggs. After successful immunization, a report is sent to his pediatrician with a suggestion that a referral is be made to an allergist for further testing.

**Conditions**

A child allergic to eggs must undergo yellow fever immunization under medical supervision.

**Exclusions**

Patient conditions which are not relevant to allergy/intolerance or adverse reaction topics.

**Preconditions**

Patient is brought to a travel clinic for the appropriate yellow fever immunization before traveling to Africa with parents. Mother has with her the medical record summary of her child indicating allergy to eggs. No prior reaction to usual childhood vaccines.

**Sequence of Steps**

1. Mother arrives at travel clinic with her child who is 8 years old
2. Nurse review medical history of child and refers patient to attending immunization specialist physician
3. Physician conduct case history and decides to administer vaccine under his personal supervision
4. Physician assisted by nurse administer yellow fever vaccine, constantly monitoring patient reactions, ready to intervene with proper medication if necessary
5. Nurse monitors patient for a period of time until assured of lack of adverse reactions for one hour.
6. Physician writes a consult note for the patient pediatrician, adds a note to the patient summary record, and signs the International Certificate of Vaccination
7. Physician documents in the medical record the administration of the vaccine, the known contraindication and the decision/rationale to provide the vaccination.

**Post Conditions**

Patient has received the vaccine and has been released without adverse reaction.

Updated patient summary record.

International Certificate of Vaccination filled and signed.

**Use Case Scenarios**

An 8 year old boy with mother requesting yellow fever vaccine

*Medical History*:

Previous adverse reaction to eggs that required emergency medical intervention and hospitalization

Route of exposure: food ingestion

Severity of symptoms: see note below

Type of reaction: hyper-sensitivity symptoms (urticaria, swelling of the mouth and throat, difficulty breathing)

Age: child was 2 year old

Time after exposure before onset of symptoms: symptoms began during meal after a few bites of scrambled eggs

Resolution: all symptoms resolved during a 24 hour hospitalization with no apparent residual

Other allergic or intolerance history: none

*Note: egg allergy is defined as an IgE-mediated hyper-sensitivity causing symptoms like, but not limited to, urticaria, swelling of the mouth and throat, difficulty breathing or hypotension. (CIG, p. 85)*

*Vaccine*

YF-VAX®

*Note: The yellow fever vaccines (a live vaccine) are prepared from virus grown in chick embryos and are the most likely to cause allergic reaction in egg- or chicken-allergic individuals. (CIG, p. 85)*

*Note: YF-VAX®, a live virus vaccine, is prepared in chick embryos from the attenuated 17D strain, is lyophilized and contains sorbitol and gelatin as stabilizers. There is no preservative in the vaccine or the accompanying diluent. (CIG, p. 345)*

*Examinations*:

Individual risk assessment of child by physician

*Blood Tests*:

Not applicable

*Diagnosis*:

Possibility that child has less sensitivity to eggs. Vaccination for yellow fever is more important. Therefore vaccination should be conducted but under close medical supervision.

*Note: Egg allergy is one of the most common food allergies of childhood, with a prevalence of 1%-3% in children under 3 years of age. As most children outgrow their egg allergy, the prevalence in adulthood is much lower. (CIG, page 85)*

*Vaccine administration*

Subcutaneous

Post vaccine supervision

Medication on hand: aqueous epinephrine 1:1000; diphenhydramine hydrochloride (Benadryl®), resuscitative equipment appropriate for children.

*Note: As avoidance is not always possible, every vaccine provider should be familiar with the symptoms of anaphylaxis and be ready to initiate management and administer appropriate medications. Most instances begin within 30 minutes after an injection of vaccine; shorter intervals to onset foretell more severe reactions. Thus vaccine recipients should be kept under supervision for at least 15 minutes after immunization; 30 minutes is a safer interval when there is a specific concern about possible vaccine allergy. (CIG, p. 80)*

*Note: The cardinal features of anaphylaxis are itchy, urticarial rash (in over 90% of cases); progressive, painless swelling (angioedema) about the face and mouth, which may be preceded by itchiness, tearing, nasal congestion or facial flushing; respiratory symptoms, including sneezing, coughing, wheezing, labored breathing and upper airway swelling (indicated by hoarseness and/or difficulty swallowing) possibly causing airway obstruction; hypotension, which generally develops later in the reaction and can progress to cause shock and collapse. Gastrointestinal symptoms like nausea, vomiting and diarrhea may occur with anaphylaxis (CIG, p. 81)*

*Outcomes*

Patient has received the vaccine and has been released without significant adverse reaction

Updated patient summary record

International Certificate of Vaccination filled and signed

Consult note sent to pediatrician

Referral request for allergist examination, testing, and desensitization given to mother

**References**

* CIG- Canadian Immunization Guide, seventh edition, Public Health Agency of Canada, 2006: <http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php>
* Yellow fever- Fact sheet N°100 - January 2011, WHO (<http://www.who.int/mediacentre/factsheets/fs100/en/index.html>) and (<http://www.who.int/vaccines/en/yellowfever.shtml>)
* Reactions to 17D yellow fever vaccine are typically mild.... Immediate hypersensitivity reactions, characterized by rash, urticaria, or asthma, are uncommon (i.e., an estimated incidence of 1/130,000--250,000) and occur principally among persons with histories of allergies to egg or other substances (26). Gelatin is used as a stabilizer in different vaccines, including yellow fever vaccine. Gelatin has been implicated as a cause of allergic reaction related to other vaccines and, therefore, might also do the same regarding yellow fever vaccine (27--29). (Yellow Fever Vaccine Recommendations of the Advisory Committee on Immunization Practices (ACIP), 2002- <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5117a1.htm>)
* The American College of Allergy, Asthma and Immunology and the American Academy of Allergy, Asthma and Immunology issued joint practice parameters in 2011 for influenza immunization in individuals with a history of anaphylaxis after egg ingestion.  Recommendation is for egg allergy less severe than anaphylaxis, give immunization in pediatricians office.  For those with anaphylactic history, administer in allergist office.  They cite a study of 185 individuals with “convincing” history of anaphylaxis after egg in which there were no reactions to routine influenza immunization.  Influenza immunization is admittedly not yellow fever immunization, but I think this is a reflection of diminishing level of risk as manufacturing techniques for vaccines have improved over the years. (Dr. Russell Leftwich)(reference)

<http://www.aaaai.org/Aaaai/media/MediaLibrary/PDF%20Documents/Practice%20and%20Parameters/Egg-Allergy-and-Influenza-Vaccine-112111.pdf>

**Special thanks**

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2012-05-09