



# 2011 Institute of Medicine (IOM) Report generated - Proposals for Updates to the Vaccine Injury Table (VIT)

## Anaphylaxis

Presented on behalf of the following VITU Vaccine Working Groups:  
Influenza, Meningococcal, Varicella, Human papilloma virus

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# Anaphylaxis



## Vaccines to discuss the proposal for adding anaphylaxis as an injury to the Table:

- 1) Trivalent Influenza Vaccine
- 2) Meningococcal Vaccine
- 3) Varicella Vaccine
- 4) Human Papilloma Virus Vaccine



## Summary Justification for Proposed Changes to the VIT

There are multiple, well documented, reports in the literature as well as reports of related laboratory and clinical evidence to support that anaphylaxis occurs after receipt of the trivalent influenza vaccines. Based on these reports the 2011 IOM committee found that the evidence convincingly supports a causal relationship between trivalent influenza vaccine and anaphylaxis. The IOM's conclusion regarding the causal relationship between trivalent influenza vaccines and anaphylaxis was felt to be scientifically and medically credible.



## Listing of Relevant Literature

1. Greene, S. K., M. Kulldorff, E. M. Lewis, R. Li, R. Yin, E. S. Weintraub, B. H. Fireman, T. A. Lieu, J. D. Nordin, J. M. Glanz, R. Baxter, S. J. Jacobsen, K. R. Broder, and G. M. Lee. 2010. Near real-time surveillance for influenza vaccine safety: Proof-of-concept in the vaccine safety datalink project. *American Journal of Epidemiology* 171(2):177-188.
2. Coop, C. A., S. K. Balanon, K. M. White, B. A. Whisman, and M. M. Rathkopf. 2008. Anaphylaxis from the influenza virus vaccine. *International Archives of Allergy and Immunology* 146(1):85-88.
3. Chung, E. Y., L. Huang, and L. Schneider. 2010. Safety of influenza vaccine administration in eggallergic patients. *Pediatrics* 125(5):e1024-e1030.
4. James, J. M., R. S. Zeiger, M. R. Lester, M. B. Fasano, J. E. Gern, L. E. Mansfield, H. J. Schwartz, H. A. Sampson, H. H. Windom, S. B. Machtinger, and S. Lensing. 1998. Safe administration of influenza vaccine to patients with egg allergy. *Journal of Pediatrics* 133(5):624-628.
5. DiMiceli, L., V. Pool, J. M. Kelso, S. V. Shadomy, and J. Iskander. 2006. Vaccination of yeast sensitive individuals: Review of safety data in the US vaccine adverse event reporting system (VAERS). *Vaccine* 24(6):703-707.



## Listing of Relevant Literature (cont.)

6. Izurieta, H. S., P. Haber, R. P. Wise, J. Iskander, D. Pratt, C. Mink, S. Chang, M. M. Braun, and R. Ball. 2005. Adverse events reported following live, cold-adapted, intranasal influenza vaccine. *Journal of the American Medical Association* 294(21):2720-2725.
7. Lasley, M. V. 2007. Anaphylaxis after booster influenza vaccine due to gelatin allergy. *Pediatric Asthma, Allergy and Immunology* 20(3):201-205.
8. Muhammad, R. D., P. Haber, K. R. Broder, Z. Leroy, R. Ball, M. M. Braun, R. L. Davis, and A. W. McMahon. 2011. Adverse events following trivalent inactivated influenza vaccination in children: Analysis of the vaccine adverse event reporting system. *Pediatric Infectious Disease Journal* 30(1):e1-e8.
9. Peng, M. M., and H. Jick. 2004. A population-based study of the incidence, cause, and severity of anaphylaxis in the United Kingdom. *Archives of Internal Medicine* 164(3):317-319.
10. Zheng, W., and S. C. Dreskin. 2007. Thimerosal in influenza vaccine: An immediate hypersensitivity reaction [3]. *Annals of Allergy, Asthma and Immunology* 99(6):574-575.



# Meningococcal– Anaphylaxis



## Summary Justification for Proposed Changes to the VIT

In 2011 the Institute of Medicine, following an extensive review of the scientific and medical literature, concluded that the evidence convincingly supported a causal relationship between meningococcal vaccines and anaphylaxis. The IOM's conclusion regarding the causal relationship between meningococcal vaccines and anaphylaxis was felt to be scientifically and medically credible.



## Listing of relevant literature

1. Yergeau, A., L. Alain, R. Pless, and Y. Robert. 1996. Adverse events temporally associated with meningococcal vaccines. *Canadian Medical Association Journal* 154(4):503-507.



# Varicella - Anaphylaxis



## Summary Justification for Proposed Changes to the VIT

There are multiple, well documented, reports in the literature that anaphylaxis occurs after receipt of the varicella vaccines. Based on these reports the 2011 IOM committee found that the evidence convincingly supports a causal relationship between varicella vaccine and anaphylaxis. The IOM's conclusion regarding the causal relationship between varicella vaccines and anaphylaxis was felt to be scientifically and medically credible.





# Varicella – Anaphylaxis



## Listing of relevant literature

1. Black, S., H. Shinefield, P. Ray, E. Lewis, J. Hansen, J. Schwalbe, P. Coplan, R. Sharrar, and H. Guess. 1999. Postmarketing evaluation of the safety and effectiveness of varicella vaccine. *Pediatric Infectious Disease Journal* 18(12):1041-1046.
2. DiMiceli, L., V. Pool, J. M. Kelso, S. V. Shadomy, and J. Iskander. 2006. Vaccination of yeast sensitive individuals: Review of safety data in the US vaccine adverse event reporting system (VAERS). *Vaccine* 24(6):703-707.
3. Fujita, M. Toda, and S. Inouye. 2000b. Minimum estimated incidence in Japan of anaphylaxis to live virus vaccines including gelatin. *Vaccine* 19(4-5):431-436.
4. Ozaki, T., N. Nishimura, T. Muto, K. Sugata, S. Kawabe, K. Goto, K. Koyama, H. Fujita, Y. Takahashi, and M. Akiyama. 2005. Safety and immunogenicity of gelatin-free varicella vaccine in epidemiological and serological studies in Japan. *Vaccine* 23(10):1205-1208



# Varicella – Anaphylaxis



## Listing of relevant literature (cont.)

5. Sakaguchi, M., T. Yamanaka, K. Ikeda, Y. Sano, H. Fujita, T. Miura, and S. Inouye. 1997. IgE-mediated systemic reactions to gelatin included in the varicella vaccine. *Journal of Allergy and Clinical Immunology* 99(2):263-264.
  
6. Sakaguchi, M., H. Miyazawa, and S. Inouye. 2000a. Sensitization to gelatin in children with systemic non-immediate-type reactions to varicella vaccines. *Annals of Allergy, Asthma and Immunology* 84(3):341-344.
  
7. Sharrar, R. G., P. LaRussa, S. A. Galea, S. P. Steinberg, A. R. Sweet, R. M. Keatley, M. E. Wells, W. P. Stephenson, and A. A. Gershon. 2001. The postmarketing safety profile of varicella vaccine. *Vaccine* 19(7-8):916-923.
  
8. Wise, R. P., M. E. Salive, M. M. Braun, G. T. Mootrey, J. F. Seward, L. G. Rider, and P. R. Krause. 2000. Postlicensure safety surveillance for varicella vaccine. *Journal of the American Medical Association* 284(10):1271-1279.



# HPV- Anaphylaxis



## Summary Justification for Proposed Changes to the VIT

There are multiple, well documented, cases in the literature of anaphylaxis occurring following receipt of the HPV vaccines. Based on these reports the 2011 IOM committee found that the evidence convincingly supports a causal relationship between HPV vaccine and anaphylaxis. The IOM's conclusion regarding the causal relationship between HPV vaccines and anaphylaxis was felt to be scientifically and medically credible.



## Listing of relevant literature

1. Brotherton, J. M. L., M. S. Gold, A. S. Kemp, P. B. McIntyre, M. A. Burgess, and S. Campbell-Lloyd. 2008. Anaphylaxis following quadrivalent human papillomavirus vaccination. *Canadian Medical Association Journal* 179(6):525-533.
2. Slade, B. A., L. Leidel, C. Vellozzi, E. J. Woo, W. Hua, A. Sutherland, H. S. Izurieta, R. Ball, N. Miller, M. M. Braun, L. E. Markowitz, and J. Iskander. 2009. Postlicensure safety surveillance for quadrivalent human papillomavirus recombinant vaccine. *Journal of the American Medical Association* 302(7):750-757.



# Anaphylaxis



## Current Table injuries and QAI:

There are currently no injuries on the Table for trivalent influenza, HPV, meningococcal or varicella vaccines.



# Anaphylaxis

## Proposed VIT for trivalent influenza, HPV, meningococcal and varicella vaccines

Vaccine	Injury	Time Interval
Trivalent influenza vaccines	A. Anaphylaxis	≤ 4 hours
	B. Any acute complication or sequela (including death) of above event	Not applicable
Meningococcal vaccines	A. Anaphylaxis	≤ 4 hours
	B. Any acute complication or sequela (including death) of above event	Not applicable
Varicella vaccines	A. Anaphylaxis	≤ 4 hours
	B. Any acute complication or sequela (including death) of above event	Not applicable
Human papillomavirus (HPV) vaccines	A. Anaphylaxis	≤ 4 hours
	B. Any acute complication or sequela (including death) of above event	Not applicable

## Current QAI for Anaphylaxis:

Anaphylaxis and anaphylactic shock mean an acute, severe, and potentially lethal systemic allergic reaction. Most cases resolve without sequelae. Signs and symptoms begin minutes to a few hours after exposure. Death, if it occurs, usually results from airway obstruction caused by laryngeal edema or bronchospasm and may be associated with cardiovascular collapse. Other significant clinical signs and symptoms may include the following: Cyanosis, hypotension, bradycardia, tachycardia, arrhythmia, edema of the pharynx and/or trachea and/or larynx with stridor and dyspnea. Autopsy findings may include acute emphysema which results from lower respiratory tract obstruction, edema of the hypopharynx, epiglottis, larynx, or trachea and minimal findings of eosinophilia in the liver, spleen and lungs. When death occurs within minutes of exposure and without signs of respiratory distress, there may not be significant pathologic findings.



# Anaphylaxis



## Proposed QAI for Anaphylaxis

Anaphylaxis is an acute, severe, and potentially lethal systemic reaction that occurs as a single discrete event with simultaneous involvement of two or more organ systems. Most cases resolve without sequelae. Signs and symptoms begin minutes to a few hours after exposure. Death, if it occurs, usually results from airway obstruction caused by laryngeal edema or bronchospasm and may be associated with cardiovascular collapse. Other significant clinical signs and symptoms may include the following: cyanosis, hypotension, bradycardia, tachycardia, arrhythmia, edema of the pharynx and/or trachea and/or larynx with stridor and dyspnea. There are no specific pathological findings to confirm a diagnosis of anaphylaxis.



## Justification for proposed QAI

- “Anaphylactic Shock” to be removed because it is a condition included in the overall syndrome known as “Anaphylaxis”
- The word “allergic” to be removed from the current definition because it would exclude anaphylactoid reactions (nonallergic anaphylaxis). These reactions are a subtype of anaphylaxis and could possibly occur secondary to vaccination but are not considered “allergic”. “Anaphylaxis” includes anaphylactoid reactions.
- The wording regarding pathology findings is simplified in the proposed version since there are no specific autopsy findings for anaphylaxis.



# Anaphylaxis



## Proposed VIT Injuries and QAI for ACCV Vote:

Vaccine	Injury	Time Interval
Trivalent influenza vaccines	A. Anaphylaxis	≤ 4 hours
	B. Any acute complication or sequela (including death) of above event	Not applicable
Meningococcal vaccines	A. Anaphylaxis	≤ 4 hours
	B. Any acute complication or sequela (including death) of above event	Not applicable
Varicella vaccines	A. Anaphylaxis	≤ 4 hours
	B. Any acute complication or sequela (including death) of above event	Not applicable
Human papillomavirus (HPV) vaccines	A. Anaphylaxis	≤ 4 hours
	B. Any acute complication or sequela (including death) of above event	Not applicable

Anaphylaxis is an acute, severe, and potentially lethal systemic reaction that occurs as a single discrete event with simultaneous involvement of two or more organ systems. Most cases resolve without sequelae. Signs and symptoms begin minutes to a few hours after exposure. Death, if it occurs, usually results from airway obstruction caused by laryngeal edema or bronchospasm and may be associated with cardiovascular collapse. Other significant clinical signs and symptoms may include the following: cyanosis, hypotension, bradycardia, tachycardia, arrhythmia, edema of the pharynx and/or trachea and/or larynx with stridor and dyspnea. There are no specific pathological findings to confirm a diagnosis of anaphylaxis.