

## INFORMATION PAPER

DHA-IHB  
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SUBJECT: When Pregnancy Is Discovered After Anthrax Vaccination

1. Purpose. This paper provides information for women who discover they are pregnant after receiving BioThrax® (anthrax) vaccination.
2. Current Recommendations on Vaccination and Pregnancy.
  - a. Department of Defense policy exempts pregnant military women from receiving the anthrax vaccine until after the conclusion of pregnancy. However, as it can be difficult to predict conception or diagnose early pregnancy, some women may inadvertently receive anthrax vaccine before pregnancy is recognized.
3. Receipt of the Vaccine during Pregnancy.
  - a. In a study published in 2008 of more than 115,000 infants born to military women (1998-2004), of whom 3,000 were born to women who were inadvertently vaccinated against anthrax in early pregnancy, birth defects were slightly more prevalent among first trimester-exposed infants, but the association was neither strong nor consistently statistically significant. Despite using an extensive database, the study had several limitations including the inability to control for several well-recognized environmental factors that can impact the development of birth defects such as the use of tobacco and alcohol during pregnancy.
  - b. After reviewing data from previous studies, and a review of the above referenced study and discussions with the study authors, the Advisory Committee on Immunization Practices (ACIP) concluded that the anthrax vaccine is safe to administer during pregnancy but recommended that pregnant women postpone vaccination unless exposure to anthrax poses an immediate risk for disease.
  - c. The conclusions of the ACIP are supported by a more recent study published in 2015 that compared women in the National Smallpox Vaccine in Pregnancy Registry (NSVIPR) who also received anthrax vaccine in pregnancy to those who did not. Rates of adverse pregnancy and infant health outcomes (including birth defects) among the anthrax vaccine-exposed group were similar to or lower than expected when compared with published reference rates and the anthrax vaccine-unexposed population.
  - d. As mentioned previously, the 2008 publication had a number of limitations that resulted in inconsistent findings. To remedy these shortcomings, a follow-up study was performed that used data from more recent years

(2003-2010), updated and validated algorithms for case definitions, and additional data on other potential risk factors. The findings, published in 2017, did not find any strong associations between inadvertent anthrax vaccination at any time during pregnancy and birth defects risk.

#### 4. Changes in Vaccine Dose and Route and Surveillance Requirements.

- a. In December 2008, Emergent BioSolutions received FDA approval to supplement the biologics license for BioThrax® to reflect a change in the vaccination schedule and route of administration. Current immunization with BioThrax® consists of a series of five 0.5 mL intramuscular doses administered at 0 and 4 weeks, and 6, 12 and 18 months. Yearly booster injections of 0.5 mL intramuscularly are recommended for those who remain at risk. Previously the vaccine was given as a subcutaneous injection with an additional dose at 2 weeks, and yearly boosters as described for the current schedule. At the time of the 2008 FDA approval, it was determined that BioThrax® would remain at Pregnancy Category “D”. As acknowledged in the approval, Emergent BioSolutions committed to the development of a Pregnancy Exposure Registry for BioThrax® to prospectively collect data on spontaneously-reported exposures to BioThrax® during pregnancy with the intent to address elements found in the FDA Guidance for pregnancy registries.

#### 5. BioThrax® Anthrax Vaccine in Pregnancy Registry.

- a. The Department of Defense, with funding from the vaccine manufacturer, Emergent BioSolutions, developed the BioThrax® (Anthrax) Vaccine in Pregnancy Registry (BAVPR) to track pregnancies inadvertently exposed to anthrax vaccine. The BAVPR was designed to assess and estimate the rate of serious adverse maternal and pregnancy outcomes among women exposed to BioThrax® during pregnancy, and infant health outcomes among infants born to these women. Active duty military women who received the anthrax vaccine while pregnant were eligible to join the BAVPR beginning in 2012. In October 2018, the FDA agreed to a formal request from Emergent BioSolutions to terminate enrollment in the BAVPR. Participants currently enrolled, however, are continuing to be followed.

#### 6. Resources for Additional Information.

- a. The BAVPR was established to collect important confidential information from women who received anthrax vaccine in pregnancy. Although enrollment in the BAVPR has ended, professionals from the BAVPR can answer many questions from participants and their healthcare providers. The BAVPR may be contacted at:

BioThrax® (Anthrax) Vaccine in Pregnancy Registry  
c/o DoD Birth and Infant Health Research Team,

Naval Health Research Center, MPH Directorate, 140 Sylvester Rd.,  
San Diego, CA 92106

Phone: 619-553-9255 (DSN 553-9255)

Fax: 619-767-4806 (DSN 767-4806)

Email: [NHRC-VaccineRegistry@mail.mil](mailto:NHRC-VaccineRegistry@mail.mil)

b. Additional resources include:

Defense Health Agency- Immunization Healthcare Branch:  
Immunization Healthcare Support Center (24 hours a day, 7 days a  
week)

Phone: 1-877-GETVACC (438-8222) or 761-4245 (DSN), Option 1

[www.health.mil/vaccines](http://www.health.mil/vaccines)

7. References.

- a. Wright JG, Quinn CP, Shadomy S, Messonnier N; Centers for Disease Control and Prevention (CDC). Use of anthrax vaccine in the United States: recommendations of the Advisory Committee on Immunization Practices (ACIP), 2009. MMWR Recomm Rep. 2010 Jul 23;59(RR-6):1-30.
- b. Ryan MAK, Smith TC, Sevick C, Honner WK, Loach RA, Moore CA, Erickson DJ. Birth defects among infants born to women who received anthrax vaccine in pregnancy. AJE 2008;168(4):434-42.
- c. CDC. Advisory Committee on Immunization Practices (ACIP) meeting minutes archive. Available at <http://www.cdc.gov/mmwr/pdf/rr/rr5906.pdf>. Accessed October 28, 2015.
- d. Food and Drug Administration. December 11, 2008 Approval Letter to Emergent BioDefense Operations Lansing Inc., regarding Anthrax Vaccine Absorbed (BioThrax).
- e. Food and Drug Administration Guidance for Industry Establishing Pregnancy Exposure Registries. Last updated August 2002. Available at <http://www.fda.gov/downloads/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/UCM071639.pdf>
- f. Conlin AMS, Bukowinski AT, Gumbs GR. Analysis of pregnancy and infant health outcomes among women in the National Smallpox Vaccine in Pregnancy Registry who received Anthrax Vaccine Absorbed. Vaccine 2015;33(36):4387-4390.

National Capital Regional Vaccine Safety Hub/877-438-8222  
Approved: NHRC Anthrax Vaccine in Pregnancy Registry team