# Vaccination guidelines for female infertility patients

*The Practice Committee of the American Society for Reproductive Medicine*

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Encounters for infertility care are opportunities to assess and update immunization status. Women of reproductive age are often unaware of their need for immunization, their own immunization status, and the potentially serious consequences of preventable disease on pregnancy outcome. The purpose of this ASRM Practice Committee document is to summarize current recommendations regarding vaccinations for women of reproductive age. (Fertil Steril® 2008;90:S169–71. ©2008 by American Society for Reproductive Medicine.)

Encounters for infertility care are opportunities to assess and update immunization status. Women of reproductive age are often unaware of their need for immunization, their own immunization status, and the potentially serious consequences of preventable disease on pregnancy outcome. In one study, fewer than 60% of surveyed obstetrician-gynecologists routinely obtained any vaccination history, and only 10% offered vaccines currently recommended for adults (1). National standards for vaccinations have been established by the Centers for Disease Control and Prevention (CDC), are available for review on the CDC website (http://www.cdc.gov/nid/recs/adult-schedule.pdf), and have been summarized in a committee opinion published by the American College of Obstetricians and Gynecologists (2). The purpose of the present document is to summarize current recommendations regarding vaccinations for female infertility patients.

## VACCINATION BEFORE INFERTILITY TREATMENT AND DURING PREGNANCY

Ideally, immunizations should be completed before conception, because some recommended vaccinations cannot be administered during pregnancy (1–5). Vaccinations before or during pregnancy protect women from potentially serious illnesses and confer both resistance to intrauterine infections and passive immunity to the newborn. Transport of maternal immunoglobulin (IgG) antibodies to the fetus occurs throughout gestation and increases markedly during the last 4 to 6 weeks of gestation (3–5).

Many physicians are reluctant to immunize pregnant women because of concern that a spontaneous abortion or incidental congenital anomaly might be attributed wrongly to a vaccination. The fear persists despite extensive reassuring experience with polio, influenza, and rubella vaccinations in pregnant women. Vaccinations during pregnancy are indicated when benefits clearly outweigh risks. Special circumstances that may influence the indication for vaccination include military service, travel to high prevalence areas, hazardous occupations, immunocompromise, and chronic illness. Guidelines for vaccinations in individuals with such special indications are outlined in a committee opinion published by the American College of Obstetricians and Gynecologists. (2)

Immunizations generally recommended for women of reproductive age are listed in Table 1, which provides a condensed summary of the *Recommended Adult Immunization Schedule* published by the CDC. Physicians are strongly encouraged to assess the history of immunizations in women before beginning treatment for infertility.

### Measles, Mumps, and Rubella (MMR)

MMR vaccine is recommended for all women without confirmed immunity. MMR vaccine contains live attenuated virus. Vaccination therefore should be administered before pregnancy to avoid the possibility of intrauterine infection, and pregnancy should be avoided for 1 month after vaccination. However, there is no confirmed instance where MMR vaccine has been linked to congenital malformation or significant intrauterine infection. Consequently, inadvertent MMR administration during pregnancy is not an indication for pregnancy termination.

### Varicella

Varicella vaccine contains live attenuated virus. The vaccine should be administered within 96 hours of exposure, and pregnancy should be avoided for 1 month thereafter. Cases of congenital varicella after immunization have been reported.

### Influenza

Influenza vaccination is recommended for women who may be in the second or third trimester of pregnancy during influenza season. The optimal interval for immunization spans the months of October and November because the flu season occurs during January through March. Injectable influenza vaccines contain inactivated virus and therefore may be administered at any time during pregnancy. In contrast, intranasal influenza vaccines contain live attenuated virus and should not be administered during pregnancy. Influenza

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**TABLE 1**

**CDC adult female immunization schedule for ages 19 to 45 years.**

| Immunization | Immunizing agent | Dose schedule | Administer during pregnancy? | Recommended interval for avoidance of pregnancy |
|---|---|---|---|---|
| Measles, mumps, rubella (MMR) | Live attenuated virus | One dose if MMR vaccination history is unreliable or if serology is negative | No | 1 mo |
| Varicella | Live attenuated virus | Two doses for persons with medical indications or exposure | No | 1 mo |
| Influenza | Inactivated virus | One dose in October/November for pregnant women and persons with medical indications or exposure | Yes | None |
| | Live attenuated virus | One intranasal dose in October/November for persons with medical indications or exposure | No | No information |
| Tetanus-diphtheria-pertussis (Tdap)[a] or | Combined toxoid | One dose booster every 10 y | Under review[a] | None |
| Tetanus-diphtheria (Td) | Combined toxoid | One dose booster every 10 y | Yes | None |
| Pneumococcus | Polyvalent polysaccharide | One dose for persons with medical indications or exposure | Yes | None |
| Hepatitis A (HA) | Inactivated virus | Two doses for persons with medical indications or exposure | Yes[b] | None |
| Hepatitis B (HB) | Purified surface antigen produced via recombinant technology | Three doses for persons with medical indications or exposure | Yes[b] | None |
| Meningococcus | Quadrivalent polysaccharide | One dose for persons with medical indications or exposure | Yes | None |

Modified from *Recommended Adult Immunization Schedule United States, October 2005–September 2006.* Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) (www.cdc.gov/nip/recs/adult-schedule.pdf), Appendix 1, 2. Reviewed and approved by the Advisory Committee on Immunization Practices (ACIP), the American College of Obstetricians and Gynecologists, and the American Academy of Family Physicians.

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[a] Approved by ACIP on October 26, 2005. This recommendation is under review to the Director of the CDC and the Department of HHS.

[b] Administer during pregnancy only in patients at high risk for contracting the disease.

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infection may increase risk for medical complications, because heart rate, stroke volume, and oxygen consumption are increased and lung capacity is decreased during pregnancy.

### Tetanus-Diphtheria-Pertussis (Tdap) and Tetanus-Diphtheria (Td)

A tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) was approved by the ACIP in 2005 (still under CDC and HHS review) and was recommended for adults (19 to 64 years of age) who have or who anticipate having close contact with an infant less than 12 months of age. Thus any woman who might become pregnant or is immediately postpartum is encouraged to receive a single dose of Tdap. Although pregnancy is not a contraindication to Tdap or Td vaccination, guidance on the use of Tdap during pregnancy is still under ACIP review. In the interim, women who received their last tetanus toxoid–containing vaccine more than 10 years earlier should receive Td, not Tdap, during pregnancy.

### Pneumococcus

Pneumococcus vaccine is recommended for any person at increased risk for pneumococcal infection. Individuals at high risk include those with asplenia, chronic cardiovascular/pulmonary disease, diabetes, or immunocompromise as may result from Human Immune Deficiency Virus (HIV) infection or systemic malignancy. Ideally, high-risk women should be immunized before pregnancy.

### Hepatitis A (HA)

HA vaccine is recommended for any women at high risk, including those receiving clotting factor concentrates, those with chronic liver disease, women working with HA virus or HA-infected laboratory animals, women traveling to countries with a high prevalence of HA infection, and intravenous drug users. The vaccine contains inactivated virus and poses no known risk to the fetus.

### Hepatitis B (HB)

HB vaccine is approved for any woman at high risk, including those receiving hemodialysis or clotting factor concentrates, healthcare workers exposed to blood and blood products, intravenous drug users, women having a sexually transmitted infection or multiple sexual partners, those traveling to countries with a high prevalence of hepatitis B infection, and women living in the same household with a known infected individual. The vaccine contains noninfectious DNA particles, can be administered during pregnancy if needed, and poses no known risk to the fetus.

### Meningococcus

Meningococcus vaccine should be administered to any person who is at increased risk for meningococcal infection. For pregnant women, its use should be limited to those at high risk who have not been inoculated previously. Individuals at high risk include those who live in high endemic areas, such as sub-Saharan Africa, parts of the Middle East, and college dormitories. Preferably, such high-risk women should be vaccinated before pregnancy, because experience with the vaccine in pregnancy is limited.

## SUMMARY AND RECOMMENDATIONS

- Vaccination in women of reproductive age before or during pregnancy confers resistance to intrauterine infections and provides the newborn with passive immunity to neonatal infections.
- Immunization schedules are best completed before beginning treatment for infertility, because some vaccinations should not be administered during pregnancy.
- MMR vaccine should be administered to all women without proven immunity before pregnancy.
- The Td and influenza immunizations should be completed before pregnancy but can be administered during pregnancy.
- Varicella, pneumococcus, HA, HB, and meningococcus vaccinations are indicated in specific circumstances and are always best administered before pregnancy.
- There is no evidence that inadvertent administration of any of the listed vaccines during pregnancy should be the sole basis for a decision to terminate pregnancy.

*Acknowledgments:* This report was developed under the direction of the Practice Committee of the American Society for Reproductive Medicine as a service to their members and other practicing clinicians. While this document reflects appropriate management of a problem encountered in the practice of reproductive medicine, it is not intended to be the only approved standard of practice or to dictate an exclusive course of treatment. Other plans of management may be appropriate, taking into account the needs of the individual patient, available resources, and institutional or clinical practice limitations. The Practice Committee of the American Society for Reproductive Medicine and the Board of Directors of the American Society for Reproductive Medicine have approved this report.

## REFERENCES

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