

### IMMUNIZATIONS DURING PREGNANCY

|                                                     | ANTHRAX                                                                                                                               | BCG                                                                                                           | HEPATITIS A                                                           | HEPATITIS B                                                                                                              | HUMAN PAPILOMAVIRUS                                                                                                                                       | INFLUENZA INACTIVATED                                                                                                              |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>RISK FROM DISEASE TO PREGNANT FEMALE</b>         | Significant morbidity and mortality; not altered by pregnancy                                                                         | Possible increased risk to the health of the mother if she becomes severely ill with tuberculosis             | Undetermined                                                          | Possible increased severity during third trimester                                                                       | HPV may grow faster during pregnancy. If the warts are in the vagina, they rarely can make the vagina less elastic and cause obstruction during delivery. | Increase in morbidity during second and third trimester                                                                            |
| <b>RISK FROM DISEASE TO FETUS OR NEONATE</b>        | No known harm to fetus                                                                                                                | Probably increased risk of abortion. Possible lower birth weight and, rarely, the infant may be born with TB. | None suspected                                                        | Possible increase in abortion rate and prematurity; neonatal hepatitis can occur; high risk of carrier state for newborn | Uncommonly transmitted to fetus during birth; very rarely recurrent respiratory papillomatosis, results                                                   | Possible increased abortion rate. No malformations confirmed                                                                       |
| <b>VACCINE</b>                                      | Cell-free inactivated vaccine                                                                                                         | Live, attenuated vaccine                                                                                      | Inactivated viral antigen                                             | Recombinant vaccine                                                                                                      | Recombinant Vaccine (HPV Types 6, 11, 16, 18)                                                                                                             | Inactivated type A and type B virus vaccine                                                                                        |
| <b>RISK FROM VACCINE TO FETUS</b>                   | None confirmed                                                                                                                        | None suspected                                                                                                | None confirmed                                                        | None suspected                                                                                                           | None confirmed                                                                                                                                            | None suspected                                                                                                                     |
| <b>INDICATIONS FOR VACCINATION DURING PREGNANCY</b> | Use only if potential benefits of vaccination outweigh potential risks to fetus                                                       | Contraindicated                                                                                               | Weigh risk of vaccination against risk of women being exposed to HAV. | Pre- and post-exposure for women at risk of infection                                                                    | Not recommended for use in pregnant women.                                                                                                                | Recommended for women who will be pregnant during influenza season                                                                 |
| <b>DOSE/SCHEDULE</b>                                | Subcutaneous injections at 0, 2, and 4 wks, then 6 mos, 12 mos, and 18 mos. Annual booster injection if immunity is to be maintained. | Not applicable                                                                                                | 2 doses IM 6-12 months apart                                          | 3 doses IM: First dose and second dose 1 month apart; third dose 6 months after first and at least 2 months after second | Not applicable                                                                                                                                            | 1 dose IM annually                                                                                                                 |
| <b>COMMENTS</b>                                     | Vaccine licensed for preexposure use only.                                                                                            | Vaccine not routinely used in the United States.                                                              | Safety in pregnancy undetermined, risk expected to be low             | HBsAg testing of all pregnant women is required by California law                                                        | Report exposure to vaccine during pregnancy by calling Merck at (800) 986-8999.                                                                           | Some experts prefer vaccination in the second trimester to avoid coincidental association of the vaccine with early pregnancy loss |

Prophylaxis During Pregnancy: Immune or hyperimmune globulin can be administered to pregnant women who have been exposed to hepatitis A, B, chickenpox, or measles. There are no known contraindications to their use during pregnancy.

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|                                              | INFLUENZA LIVE                                               | JAPANESE ENCEPHALITIS                                                                           | MEASLES                                                                                                                      | MENINGOCOCCAL POLYSACCHARIDE                                                                                                                | MENINGOCOCCAL CONJUGATE                                                                                        | MUMPS                                                               |
|----------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| RISK FROM DISEASE TO PREGNANT FEMALE         | Increase in morbidity during second and third trimester      |                                                                                                 | Significant morbidity; low mortality                                                                                         | Significant morbidity and mortality; not altered by pregnancy                                                                               | Significant morbidity and mortality; not altered by pregnancy                                                  | Low morbidity and mortality; not altered by pregnancy               |
| RISK FROM DISEASE TO FETUS OR NEONATE        | Possible increased abortion rate. No malformations confirmed | Can cause intrauterine infection and abortion if acquired during the first or second trimesters | Increase in abortion rate                                                                                                    | Unknown to fetus. Infants can develop disease with significant morbidity and mortality.                                                     | Unknown to fetus; Infants can develop disease with significant morbidity and mortality.                        | Probable increased rate of abortion in the first trimester          |
| VACCINE                                      | Live, attenuated type A and type B virus vaccine             | Inactivated viral antigen                                                                       | Live, attenuated virus vaccine                                                                                               | Purified capsular polysaccharide vaccine (quadrivalent A/C/Y/W-135)                                                                         | Conjugate vaccine (quadrivalent A/C/Y/W-135)                                                                   | Live, attenuated virus vaccine                                      |
| RISK FROM VACCINE TO FETUS                   | None suspected                                               | None confirmed                                                                                  | None confirmed                                                                                                               | None confirmed                                                                                                                              | None confirmed                                                                                                 | None confirmed                                                      |
| INDICATIONS FOR VACCINATION DURING PREGNANCY | Contraindicated                                              | Weigh risk of vaccination against risk of women being exposed to JE.                            | Contraindicated                                                                                                              | Can use if pregnant women is in one of the high-risk groups for infection                                                                   | Not contraindicated; no date on safety during pregnancy                                                        | Contraindicated                                                     |
| DOSE/SCHEDULE                                | Not applicable                                               | 3 doses SC at 0, 7, and 30 days                                                                 | Not applicable                                                                                                               | 1 dose for adolescents and adults in high-risk groups with consideration for revaccination 3-5 years later, if person remains at high risk. | Not applicable                                                                                                 | Not applicable                                                      |
| COMMENTS                                     |                                                              | Vaccine not routinely used in the United States.                                                | Immune globulin to exposed susceptible pregnant females. Vaccination of susceptible women should be part of postpartum care. | Not recommended routinely for non-high-risk individuals                                                                                     | High-risk pregnant women should be vaccinated with the older polysaccharide meningococcal vaccine at this time | Vaccination of susceptible women should be part of postpartum care. |

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|                                              | PNEUMOCOCCAL                                                                                                                                                                                      | POLIOMYELITIS                                                                                                                                        | RABIES                                                                                                                          | RUBELLA                                                                                                                 | Tetanus/Diphtheria                                                                                                                | PERTUSSIS (Tdap)                                                                                                                          |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| RISK FROM DISEASE TO PREGNANT FEMALE         | Significant morbidity; not altered by pregnancy                                                                                                                                                   | Possible increased risk of more severe disease.                                                                                                      | Severe morbidity and mortality (virtually uniformly fatal); not altered by pregnancy                                            | Low morbidity and mortality, not altered by pregnancy                                                                   | Severe morbidity. Tetanus mortality 60%; diphtheria mortality 10%; unaltered by pregnancy                                         | Significant pertussis morbidity; low mortality; not altered by pregnancy. See Tetanus/Diphtheria                                          |
| RISK FROM DISEASE TO FETUS OR NEONATE        | Undetermined                                                                                                                                                                                      | Anoxic fetal damage reported; 50% mortality in neonatal disease                                                                                      | No mother-to-fetus transmission has been described; disease nearly uniformly fatal                                              | High rate of abortion and congenital rubella syndrome                                                                   | Neonatal tetanus mortality 60%                                                                                                    | Neonates at higher risk for severe pertussis disease and complications                                                                    |
| VACCINE                                      | 23 purified capsular polysaccharide antigens                                                                                                                                                      | Enhanced potency inactivated virus vaccine (Live, attenuated virus vaccine no longer available in the United States)                                 | Inactivated viral antigen                                                                                                       | Live, attenuated virus vaccine                                                                                          | Tetanus and diphtheria toxoids                                                                                                    | Tetanus/ diphtheria toxoids and acellular pertussis                                                                                       |
| RISK FROM VACCINE TO FETUS                   | None confirmed                                                                                                                                                                                    | None confirmed                                                                                                                                       | None suspected                                                                                                                  | None confirmed                                                                                                          | None confirmed                                                                                                                    | None confirmed                                                                                                                            |
| INDICATIONS FOR VACCINATION DURING PREGNANCY | Not recommended unless substantial risk exists                                                                                                                                                    | Not recommended routinely; if a pregnant woman requires immediate protection, administer IPV in accordance with the recommended schedule for adults. | Postexposure prophylaxis and if the risk of exposure to rabies is substantial, preexposure prophylaxis might also be indicated. | Contraindicated                                                                                                         | Lack of primary series, or no booster within past 10 years                                                                        | Not contraindicated, but not currently recommended during pregnancy                                                                       |
| DOSE/SCHEDULE                                | Single dose IM or SC.                                                                                                                                                                             | 2 doses of IPV, SC 4-8 weeks apart with the third dose 6-12 months later.                                                                            | 5 doses IM on day 0 (initial), 3, 7, 14, 28                                                                                     | Not applicable                                                                                                          | Primary: 2 doses IM 4-8 weeks apart with the third dose 6-12 months later. Booster: Single dose every 10 years                    | Single dose IM to replace one dose of Td                                                                                                  |
| COMMENTS                                     | Safety of vaccine during first trimester has not been evaluated, although no adverse consequences have been reported among newborns whose mothers were inadvertently vaccinated during pregnancy. | Vaccine indicated for susceptible pregnant women traveling in areas where risk of exposure to wild virus is substantial.                             |                                                                                                                                 | Prenatal rubella testing required by California law. Vaccination of susceptible women should be part of postpartum care | On theoretical grounds, waiting until the second trimester is reasonable; there is no evidence that either toxoid is teratogenic. | Any woman who might become pregnant is encouraged to receive a single dose of Tdap. Offer vaccination in the immediate postpartum period. |

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|                                              | TYPHOID                                                                                                                                                       | VACCINIA<br>(SMALLPOX)                                                                                                 | VARICELLA                                                                                                                                                                                                   | YELLOW FEVER                                                                                                                              | ZOSTER                                                                                                                                                 |  |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| RISK FROM DISEASE TO PREGNANT FEMALE         | Significant morbidity and mortality; not altered by pregnancy                                                                                                 | Severe morbidity and mortality; more severe infection among pregnant women                                             | Increased morbidity; third trimester may cause severe infection, including pneumonia                                                                                                                        | Significant morbidity and mortality; not altered by pregnancy                                                                             | Increased morbidity; third trimester may cause severe infection, including pneumonia                                                                   |  |
| RISK FROM DISEASE TO FETUS OR NEONATE        | Unknown                                                                                                                                                       | Occasionally results in abortion or stillbirth with evidence of lesions on the skin                                    | Rarely congenital varicella syndrome. Maternal infection 5 days before to 2 days after delivery may result in severe, often fatal infection of newborn                                                      | Unknown                                                                                                                                   | Rarely congenital varicella syndrome. Maternal infection 5 days before to 2 days after delivery may result in severe, often fatal infection of newborn |  |
| VACCINE                                      | Killed or live attenuated oral bacterial vaccine                                                                                                              | Live-virus preparation                                                                                                 | Live, attenuated virus vaccine                                                                                                                                                                              | Live, attenuated virus vaccine                                                                                                            | Live, attenuated virus vaccine                                                                                                                         |  |
| RISK FROM VACCINE TO FETUS                   | Not confirmed                                                                                                                                                 | Very rarely, fetal vaccinia infection, which usually results in stillbirth or death of the infant soon after delivery. | None confirmed                                                                                                                                                                                              | Unknown                                                                                                                                   | None confirmed                                                                                                                                         |  |
| INDICATIONS FOR VACCINATION DURING PREGNANCY | Not recommended routinely except for close, continued exposure to travel to highly endemic areas                                                              | Contraindicated unless exposed smallpox virus                                                                          | Contraindicated                                                                                                                                                                                             | Contraindicated except in areas in which transmission in humans is occurring.                                                             | Contraindicated                                                                                                                                        |  |
| DOSE/SCHEDULE                                | Inactivated: Primary: Single dose<br>Booster: Single dose every 2 years.<br>Oral :Primary: 4 doses on alternate days.<br>Booster: 4-dose series every 5 years | Contact Public Health's Immunization Program                                                                           | Not applicable                                                                                                                                                                                              | Single dose SC<br>Booster: Single dose SC every 10 years                                                                                  | Not applicable                                                                                                                                         |  |
| COMMENTS                                     | No data have been reported on the use of typhoid vaccines among pregnant women. ACOG expressed preference for oral vaccine                                    |                                                                                                                        | Manufacturer registry to report inadvertent vaccination of pregnant women or women who became pregnant within 3months of vaccination: (800) 986-8999. Consider vaccination of susceptible women postpartum. | For quarantine officers abroad, letter of contraindication should be given. Postponement of travel preferable to vaccination if possible/ |                                                                                                                                                        |  |

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