Infection Control Manual		
UNC HEALTH CARE	Policy Name	**Pregnant and Post-Partum Health Care Personnel: Recommendations from Infection Prevention and Hospital Epidemiology**
	Policy Number	**IC 0046**
	Date this Version Effective	**July 2016**
	Responsible for Content	**Hospital Epidemiology**

I. Description

Describes infection prevention guidelines for pregnant and post-partum health care personnel to reduce the risk of disease transmission for the employee and fetus.

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II. Rationale

Pregnant and post-partum employees may interact with patients who have communicable disease. Certain diseases acquired during pregnancy may lead to complications during fetal development. Strict adherence to the guidelines in this policy can reduce the risk of infection during pregnancy. Additional considerations for post-partum employees regarding safe handling of breast milk at work are included in accordance with infection prevention best practices.

III. Policy

A. Personnel Responsibilities

Pregnant personnel should be immune to the following communicable diseases: rubella, measles, mumps, chickenpox, hepatitis B**,** and pertussis. Immune status can be determined through: 1) a prior history of the disease (physician diagnosed, or for varicella self-diagnosed), 2) prior active immunization, or 3) the presence of serum antibody (e.g., rubella and hepatitis B). Each employee must have provided the Occupational Health Service with an accurate, complete past medical history form which documents their immune status. Documented deficiencies will be assessed prior to employment.

B. Preventive Measures

Personnel should follow the appropriate isolation and/or precaution techniques as indicated. The specific measures required for each disease (mask, gown, gloves, handling of secretions, goggles, etc.) as well as an explanation of the principles of isolation and precaution practices are detailed in the Isolation Precautions Infection Control Policy. Any questions can be directed to the Department of Hospital Epidemiology at 984-974-7500. For urgent questions after hours contact the Infection Preventionist (IP) directly via pager 123-7427.

C. Communicable Disease Exposures

Should an exposure to a communicable disease occur, the employee should report to the appropriate Occupational Health Service with a completed employee incident report form. For a discussion of the Occupational Health Service's role in post-exposure prophylaxis and fetal risk consultation please refer to the Occupational Health Service Infection Control Policy. Exposure workups can be performed by the emergency department when occupational health services are closed, and HCP may also contact their OBGYN physician for recommendations after exposure.

D. Implementation

Implementation of this policy will be through the Medical and Nursing staff.

IV. References

1. Votra EM, Rutala WA, Sarubbi FA. Recommendations for Pregnant Employee Interaction with Patients Having Communicable Infectious Diseases. Am J Infect Control 11:10-19 (83).
2. ACP Guide for Adult Immunization, Third Edition, 1994.
3. Garner JS. Hospital Infection Control Practices Advisory Committee, Guideline for isolation precautions in hospitals. Infect Control Hosp Epidemiol 1996; 17:53-80.
4. Pickering L, ed. Report of the Committee on Infectious Diseases (the Redbook), 27th Edition. Elk Grove Village, IL; Am Acad of Pediatrics; 2006.
5. Bolyard EA, et al. CDC Guidelines for Infection Control in Health Care Personnel. AM J Infect Control. 1998; 26:3; 289-354.
6. Weber DJ, Dolan M, Rutala WA. Management of Infectious Exposures and Infections in Pregnancy in Emergency Care of the Woman, Pearlman M, Tintinalli, JE, Dyne P (eds). McGraw-Hill, New York, 2003.

V. Reviewed/Approved by

Hospital Infection Control Committee

VI. Original Policy Date and Revisions

Revised on October 2010, July 2007, Feb 2005, July 2013, July 2016

Appendix 1: Employee Lactation

Please refer to Human Resources Policy Lactation Support HR 0625 for an explanation of human resource related issues with lactation support in the workplace

Breast Pumps for HCP Use

- There are breast pumping rooms with hospital grade breast pumps available for staff use throughout UNC Hospitals. Main hospital and Off-site locations available via this link.
    - http://www.uncmedicalcenter.org/uncmc/about/human-resources/employee-benefits/maternity-benefits/employee-lactation-program/
    - Staff may also use their own personal breast pump in these locations.
- Each employee will supply her own pump kit for use with the hospital grade breast pump..
- Environmental Services personnel will wipe down the external components of the pumps with an approved disinfectant daily.
- The sink is cleaned as part of routine cleaning of the room by Environmental Services personnel.

Storage:

- HCP breast milk ideally is stored in an insulated cooler bag with ice packs (human milk may be stored in this manner for 24 hours) according to the Centers for Disease Control (CDC).
- HCP breast milk may not be stored in any type of patient refrigerators (e.g. nourishment, medication or breast milk storage).
- If HCP breast milk must be stored in the staff refrigerator, it must be stored in breast milk storage containers inside of a leak proof container (e.g. Tupperware) and labeled with the employee's name. Human milk may be stored in this manner for 5 days (according to the CDC).
- Human milk should be stored in the back of the refrigerator to maintain a constant temperature (according to the CDC).

Appendix 2: Quick Reference for Pregnant Healthcare Personnel

Chicken Pox (varicella zoster virus, VZV)*	• Follow airborne precautions: wear an N-95 mask for entry into room. • Follow Contact Precautions: wear gown & gloves when coming in contact with these patients or their environments. • **If past history for chicken pox is negative AND titer is negative AND HCP is not immunized (very rare)** exclude from interaction with infected patients.
Cytomegalovirus (CMV)*	• Follow standard precautions and practice strict hand washing. • A pregnancy precaution sign is NOT necessary and should NOT be used.
Herpes Simplex*	Disseminated HSV Infection • Follow Contact Precautions Mucocutaneous HSV • Follow Standard Precautions
Herpes Zoster (VZV) (Shingles)* • All Patients with Shingles require Contact Isolation • Patient Needs Airborne Isolation o For Immune Competent Patients: Disseminated Shingles (more than 3 dermatomes) o For Immune Compromised Patients: any number of dermatomes o Airborne isolation until zoster lesion(s) are dried and crusted	• Follow Contact Precautions for all patients with Herpes Zoster/Shingles • Follow Airborne isolation according to policy (listed on left) • **If past history for chicken pox is negative AND titer is negative AND HCP is not immunized (very rare)** exclude from interaction with infected patients. o This prevents acquiring Chickenpox
Parvovirus B19 (MMWR, 1989) (Fifth's Disease)	• Follow Droplet Precautions* • Place patient on Droplet Precautions as soon as Parvovirus testing is sent* • Report to Occupational Health for testing if exposed (worked with the patient without a surgical mask) • A pregnancy precaution sign is NOT necessary and should NOT be used
Tuberculosis*	• Practice Airborne Precautions for the duration of illness. • Practice Airborne & Standard Precautions for patients with extrapulmonary open draining lesions (wear gloves, N95 and any other appropriate PPE).
Influenza*	• Pregnant HCW should practice Droplet Precautions with all patients who may have URIs. • Any patient with s/s of URI should be placed on droplet and contact precautions until symptoms have resolved or results of RVP have returned. • All HCP must receive the flu vaccine

*These recommendations apply for ALL health care personnel; there are no differing recommendations for those HCP who are pregnant.

Appendix 3: Infectious Diseases Associated with Congenital or Perinatal Transmission

Infectious Disease	Mode of Transmission	Congenital Transmission	Determination of Immune Status	Recommendations
Acquired Immuno-deficiency/ HIV	Intimate (usually sexual) contact and percutaneous route. Epidemiologic evidence has implicated only blood, semen, vaginal secretions, and breast milk ingestion in transmission.	Prospective studies indicate perinatal transmission rates range from 8-30%. Perinatal transmission significantly reduced by treatment of known HIV-positive pregnant women with ART.	Infection may be unapparent for years. Detectable antibody generally develops in 1-3 months after infection. Diagnostic tests (ELISA) are available for antibody testing. A confirmatory Western blot should follow any positive ELISA.	1. Personnel will receive adequate protection from acquiring HIV infection if strict adherence to Standard Precautions and the Exposure Control Plan for Bloodborne Pathogens is followed. 2. Consider postexposure prophylaxis after high risk needlestick exposure.
Chickenpox (Varicella zoster virus, VZV)	Airborne-droplet; close personal contact. Virus shed in droplet secretions, open skin lesions.	1. Low risk (~4%) for congenital abnormalities, prematurity, or spontaneous abortion. 2. High risk of neonatal chickenpox when pregnant woman manifests rash 7 days prior to delivery to 7 days after delivery. 3. Varicella in pregnancy poses risk of severe disease in the mother.	Past history of disease is sufficient evidence of immunity. Most adults raised in urban areas are immune. Antibody titers may be determined if past negative history reported by HCW.	1. If immune status* is negative (by history or titers) it is advisable to exclude from interaction with infected patients in the 3rd trimester of pregnancy. 2. New employees with a negative history of varicella should be screened at employment. Employees with a negative history and negative serology will be immunized. The varicella vaccine should not be given to pregnant women or to a woman contemplating pregnancy in the next 3 months because its risk is unknown. 3. Pregnancy employees who are vaccinated for varicella should wear an N-95 mask for entry into rooms. 4. Pregnant employees entering a varicella positive patient's room will wear gown and gloves – follow Contact Precautions.

* Immunity demonstrated by appropriate vaccine, positive serology, or history of physician diagnosed disease (self-reported history for varicella only).

Infectious Disease	Mode of Transmission	Congenital Transmission	Determination of Immune Status	Recommendations
Coxsackie-virus	Fecal-oral route; droplet via the respiratory tract; close personal contact. Virus shed in stool, oropharyngeal secretions.	1. Some risk of transmission around the time of delivery resulting in severely infected infant. 2. Low risk of transmission during 1st and 2nd trimesters; only a few strains are associated with prematurity or congenital abnormalities; some strains associated with spontaneous abortions.	Not practical to perform.	Practice Contact Precautions for the duration of hospitalization if interaction with patients infected with coxsackievirus is necessary (i.e., hand, foot, and mouth disease). Please see the Isolation Precautions Policy for further information.
Cytomegalo-virus (CMV)	Close personal contact and parenteral route. Virus can be transmitted via transfusion of blood and blood products and it can be shed in urine, particularly in the urine of infants where the titers are highest. A small percentage of newborns can be unrecognized asymptomatic excretors of virus. Persons exposed to children in the community setting may be at increased risk of CMV.	1. Rate of perinatal transmission is 15% after primary maternal infection; symptomatic infection is 5%. 2. Significant congenital abnormalities can occur at any phase of pregnancy but may be more common when transmission occurs during early pregnancy.	Serologic testing is unreliable in predicting immunity. Approximately 50% of women in the childbearing age group are seropositive; however, the presence of antibody does not prevent reactivation of latent virus and may not prevent reinfection.	1. The pregnant employee must practice strict handwashing when interacting with patients infected with CMV. Employee will follow Standard Precautions. A pregnancy precaution sign is not necessary and should not be used. 2. Personnel of childbearing age will receive adequate protection from acquiring CMV if strict adherence to Standard Precautions is followed.

Infectious Disease	Mode of Transmission	Congenital Transmission	Determination of Immune Status	Recommendations
Echovirus	Fecal-oral route, or droplet route; close personal contact. Virus shed in stool, oropharyngeal secretions.	1. High risk of transmission around the time of delivery resulting in severely infected infant, particularly in the absence of maternal antibody. 2. No evidence for spontaneous abortion, congenital abnormalities, prematurity or stillbirth.	Not practical to perform.	Practice Contact Precautions for the duration of hospitalization when interacting with patients infected with echovirus. Please see the Isolation Precautions Policy for further information.
Hepatitis B	Parenteral route. Can be transmitted via mucous membrane contact and breaks in skin. Virus is usually transmitted via blood and blood products.	Rate of perinatal transmission of HbeAg seropositive mother is 90% and HbeAg negative 0-25%.	A small percentage of the population is immune to Hepatitis. Immunity (anti-HBs) is conferred through previous infection or vaccination.	1. For all patients, practice Standard precautions. 2. All health care workers who perform tasks which involve contact with blood or blood-contaminated body fluid are strongly encouraged to receive the Hepatitis B vaccine. 3. Pregnancy should not be considered a contraindication for Hepatitis B vaccination of women.

Infectious Disease	Mode of Transmission	Congenital Transmission	Determination of Immune Status	Recommendations
Herpes Simplex	Virus shed from saliva and skin lesions.	1. Rate of perinatal transmission from a primary maternal infection 33-50% or recurrent infection 4%. 2. Potential effects on infant include mucocutaneous lesions, sepsis, encephalitis, congenital malformations (rare).	Degree of protection offered by positive serology currently not well defined. Positive serology against a particular HSV type may correlate with immunity to that type. However, commercially available HSV serologic tests are unreliable for determining type-specific antibody, although they are marketed as such. Following primary infection, the virus remains in a latent state, subject to recurrence.	All employees, including the pregnant employee, must practice Contact Precautions when interacting with patients with disseminated HSV infection and Standard Precautions when interacting with patients with mucocutaneous HSV infection. Note: While the pregnant employee will not develop a work-related HSV-1 or HSV-2 genital infection, it is possible to contract an infection of a finger (herpes whitlow) or oral HSV during contact with infected patients.
Herpes Zoster (VZV) (Shingles)	Close personal contact. Virus shed from infected skin and mucosal lesions.	In non-immune person, exposure can result in clinical chickenpox. Congenital transmission is as described for chickenpox.	Immunity is dependent upon previous history of chickenpox or chickenpox immunization. Initial exposure to VZV results in clinical chickenpox. Past history of chickenpox indicates presence of latent VZV; reactivation results in clinical zoster. Return to latency and recurrence of zoster has been documented.	1. If past history for chickenpox is negative, exclude from interaction with infected patients. 2. If past history for chickenpox is positive, practice Airborne and Contact precautions when interacting with patients infected with disseminated zoster or zoster with immunosuppression until all lesions are dry and crusted over. 3. All HCP, including pregnant employees, who are vaccinated for varicella should wear an N-95 mask for entry into rooms if the patient is on Airborne-Contact isolation.

Infectious Disease	Mode of Transmission	Congenital Transmission	Determination of Immune Status	Recommendations
Measles (Rubeola, Red Measles)	Droplet route and airborne; close personal contact. Virus shed in droplet secretions.	1. Low risk of transmission resulting in prematurity or spontaneous abortion. 2. Extremely low risk for congenital abnormalities.	Past history of active immunization with 2 doses of live attenuated vaccine given after first birthday is sufficient evidence of immunity while past history of disease is not considered sufficient evidence of immunity. Non-immune persons (except pregnant women) may be given the live measles vaccine.	1. If immune status* is negative, it is advisable to exclude from interaction with infected patients. 2. If immune, practice Droplet Precautions when interacting with infected patients. 3. A susceptible person exposed to measles should be given immune globulin intramuscularly within 6 days of exposure.
Mumps	Oral route; close personal contact. Virus shed in saliva, droplet secretions, and urine.	Risk of transmission resulting in spontaneous abortion or congenital transmission is as yet undefined.	Past history of disease or immunization is reliable evidence of immunity. Up to 95% of adults with no known history of disease have been found to be immune.	1. If immune status* is negative, it is advisable to exclude from interaction with infected patients. 2. If immune, practice Droplet Precautions when interacting with patients infected with mumps for 9 days after swelling appears.
Parvovirus B19 (MMWR, 1989) (Fifth's Disease)	Close personal contact. Virus found in droplet (respiratory) secretions.	Rare, 3-9% maximum adverse outcome.	The presence of IgG antibody correlates with a lower risk of infection (approximately 50% prevalence in general population). Levels of risk are still poorly defined. B19 IgM serologic tests are available for reference laboratories for diagnosis of current infection.	All HCP who interacts with a patient with transient aplastic crises or chronic B19 infection (i.e., children with Fifth's disease), must practice Droplet Precautions. Follow exposed individual for developing illness and counsel as appropriate.

* Immunity demonstrated by appropriate vaccine, positive serology, or history of physician diagnosed disease (self reported history for varicella only)

Infectious Disease	Mode of Transmission	Congenital Transmission	Determination of Immune Status	Recommendations
Poliovirus	Fecal-oral route; possibly droplet route; close personal contact. Virus shed in stool, pharyngeal secretions.	1. Some risk of transmission during early pregnancy resulting in prematurity, low birth weight, stillbirth, or spontaneous abortion. 2. Some risk of transmission around the time of delivery resulting in severely infected infant. 3. No association with congenital abnormalities.	Past history of active immunization with live trivalent vaccine is sufficient evidence of immunity. Immunity being maintained by killed vaccine. Non-immune adults may be given inactivated polio vaccine.	1. No additional screening provided during pregnancy. 2. If immune status is negative, it is advisable to exclude from interaction with infected patients. 3. If immune, practice Contact Precautions when interacting with patients infected with poliovirus for the duration of hospitalization or until six weeks after onset.
Rubella (German Measles)	Droplet route; close personal contact. Virus shed in nasopharyngeal secretions, open skin lesions, urine, stool.	1. Rate of perinatal transmission is 45-50% overall; 90% in first 12 weeks; may result in a variety of congenital abnormalities. 2. Some risk of spontaneous abortion or stillbirth.	1. Demonstration of specific serum antibody (hemagglutination inhibition titer ≥1:8), or a positive ELISA (10 or 15 International Units) is sufficient evidence of immunity. 2. Documented previous history of rubella vaccination is presumptive evidence of immunity but past history of disease is not reliable evidence of immunity. 3. Single dose of live, attenuated Rubella vaccine elicits a significant antibody response in >90% of susceptibles.	1. If immune status* is negative, exclude from interaction with infected patients. 2. If immune, practice Droplet Precautions (masks) when interacting with patients infected with rubella for 7 days after rash appears; practice Contact Precautions when interacting with patients infected with Congenital Rubella Syndrome for the duration of hospitalization.

Infectious Disease	Mode of Transmission	Congenital Transmission	Determination of Immune Status	Recommendations
Syphilis (Treponema pallidum)	Direct contact with infected lesions; direct inoculation by needle prick or handling of infected material.	High risk of spontaneous abortion, stillbirth or infected infant when untreated maternal infection occurs at anytime during pregnancy. The changes recognized as congenital syphilis rarely occur before the 16th week of gestation.	The development of natural immunity following disease is poorly understood.	Employees must practice Standard Precautions when interacting with patients infected with syphilis. Wear gloves when touching non-intact skin or rashes.
Toxoplasmosis (Toxoplasma gondii)	No human to human transmission. Transmission occurs by ingesting raw meat or contact with feline feces.	1. Both congenital and acquired infections are usually asymptomatic. Also, once infected, tissue cysts containing live parasites form in the host, thus the host remains chronically infected with the potential for reactivation. However, congenital toxoplasmosis has only been associated with primary maternal infection. 2. The incidence of congenital transmission is lowest when maternal primary infection is acquired in the first trimester, highest when it is acquired in the third. 3. In the first and second trimesters, spontaneous abortion, prematurity, or stillbirth can occur. 4. In late pregnancy, the organism may pass from mother to fetus via the placenta. Infection in the infant can occur but is often asymptomatic. Overt infection is rare.	Serologic tests are the primary means of diagnosis. For determination of acute and congenital infection, a capture ELISA for IgM antibodies is recommended. IgG-specific antibodies peak 1-2 months after infection and remain positive indefinitely. IgG IFA and ELISA tests are available and both are used.	Employees must practice Standard Precautions when interacting with patients infected with toxoplasmosis. Wear gloves when handing body fluids and excretions.

Infectious Disease	Mode of Transmission	Congenital Transmission	Determination of Immune Status	Recommendations
Tuberculosis (Mycobacterium tuberculosis – TB)	Airborne route; close personal contact. Organism shed in droplet secretions.	1. Although extremely rare, overtly active TB during pregnancy results in increased risk of spontaneous abortion or stillbirth. 2. Active TB at the time of delivery can result in death of the newborn.	A positive tuberculin skin test is evidence of infection but does not necessarily indicate active disease. Also, in most cases, the immunity that accompanies a skin test conversion is adequate to control the pulmonary nidus of infection.	1. Practice Airborne Precautions for the duration of illness when interacting with patients with pulmonary. 2. Practice Airborne and Standard Precautions when caring for patients with extrapulmonary open draining lesions (wear gloves, N95 and any other appropriate PPE). 3. Pregnancy is not a contraindication for PPD skin testing.

Appendix 4: Infectious Diseases Possibly Associated with Increased Severity of Illness During Late Pregnancy

Infectious Disease	Mode of Transmission	Congenital Transmission	Determination of Immune Status	Recommendations
Delta Hepatitis	Parenteral, percutaneous or mucous membrane via blood or blood products.	Transmission from mother to newborn is uncommon. Produces hepatitis only in conjunction with HBV infection.	Test for anti-HDV.	1. Practice Standard Precautions. 2. HbsAg carriers should take extreme care in avoiding exposure to HDV because no currently available immunobiologic exists for prevention of HDV superinfection.
Hepatitis C	Percutaneous exposure via blood and blood products. Person to person and sexual activity as a risk of transmission not well defined.	Rate of perinatal transmission is 2-5%.	A positive antibody test suggests chronic Hepatitis C; in acute disease, there may be a prolonged interval between exposure and detection of antibody.	Practice Standard Precautions.
Hepatitis E	Person to person by fecal-oral route; contaminated water.	Increased severity of disease during late third trimester has been demonstrated in a population of pregnant Indian females.	Not possible to test.	Practice Standard Precautions.
Influenza	Droplet route; close personal contact. Virus shed in oropharyngeal/respiratory secretions.	Primary influenza pneumonia, particularly in the third trimester, can be fatal.	Influenza A virus undergoes mutation (antigenic drift) on a regular basis. Immunity established in a previous year does not imply immunity in the current year. Also, vaccination affords only 80% protection.	1. Pregnant employees may wish to practice Droplet Precautions with all patients who may have upper respiratory tract infections. 2. Influenza vaccine is mandatory at UNC annually. 3. Inactivated influenza vaccine is specifically recommended for pregnant women.

Infectious Disease	Mode of Transmission	Congenital Transmission	Determination of Immune Status	Recommendations
Severe Acute Respiratory Syndrome (SARS)	Respiratory route (most likely droplet, possibly airborne); contact route.	Unknown	Currently unavailable.	Practice Special Airborne Precautions, Contact Precautions, and Eye Protection (goggles, face shield).
Vaccinia a) vaccine site b) adverse vaccine reaction patient (e.g., disseminated vaccinia)	a) Contact route. b) Airborne and contact route.	Risk of transmission low with lethal effects on fetus.	Vaccinia immunization with "take" within 10 years.	Practice Standard Precautions.