MEMORANDUM
DATE: December 20, 2012
TO: All Medical Staff and House-staff
FROM: Julie E. Mangino, M. D. Medical Director, Department of Clinical Epidemiology
RE: Annual Infection Control Education Program 2013

Guidelines from the Centers for Disease Control and Prevention (CDC), Joint Commission (JC) and the Ohio Department of Health (ODH) require completion of Annual Infection Control Education by all physicians on the Medical Staff for the OSUWMC. An active medical staff member cannot retain privileges; a new medical staff member will not receive privileges in the OSUHS unless he/she is in compliance.

The Annual Infection Control Education is available at two sites:
1- For those who are currently outside the medical center who need to be credentialed for the first time or are completing required (computerized based learning) CBL or HIPAA education: Type http://edr.medctr.ohio-state.edu; click on CBL log-in /Class Registration link. To login please use your Medical Center ID (e.g., smit08). Your password is the 1st 4 letters of your last name and last 2 digits of your Social Security Number (e.g., smit99). If the last name is less than four letters, use the entire last name and the last two digits of the social security number (e.g., xi57). No CME credit granted by this method.

2- For those who are meeting annual education requirement and would like CME credit: type http://ccme.osu.edu; log onto your CCME account. After logging into the website, click on the red "Manage Your Account" button. You will be directed to your account page. On the left-hand side of the screen, you will see the link for 2013 Annual Infection Control. Click the link and you will be directed to the Annual Infection Control webpage. To access the material, scroll down the page to the url link. After reading the educational material, take the test, scroll down to the bottom of the page and click the grey "Post-Test" button. You must complete and pass the post-test online for 1 category 1 CME credit toward AMA Physician’s Recognition Award through December 31, 2013, sponsored by the OSUWMC Department of Clinical Epidemiology.

The completed post-test will be electronically sent to Corporate Credentialing for 1 and 2.

The OSUWMC, Center for Continuing Medical Education is accredited by the Accreditation Council for Continuing Medical Education (ACCME®) to provide continuing medical education for physicians. The OSUWMC designates this educational activity for a maximum of 1 AMA PRA Category 1 Credit ™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Objectives: Upon completion of this educational activity, the participant should be able to:
1- Recall issues related to multidrug resistant organisms, methods to prevent cross transmission and how to clear patients from contact isolation, once colonized or infected.
2- Describe what to do in the event of a blood and body fluid exposure (BBFE), or a potential meningococcus exposure, and appropriate reporting mechanisms.
3- Know practices to prevent healthcare associated infections.

Disclosures: The author, Julie E. Mangino, MD has nothing to disclose regarding any of this material.
HEALTHCARE ASSOCIATED INFECTIONS

- Cause significant morbidity and affects nearly two million individuals annually
  - About 100,000 (i.e. a full football stadium) will die each year
  - Transmission of pathogens occur via contaminated hands of healthcare workers (HCW)
- Hand hygiene is the single most important way to prevent the spread of infection; OSUWMC has implemented a multidisciplinary program to improve hand hygiene.
- Alcohol hand-rub and chlorhexidine gluconate soap are available in all clinical areas.
- Alcohol handrub is near each patient’s bed/bay/room and is the preferred method of hand hygiene except when hands are visibly soiled, after use of a rest room and patient care for C. difficile.
- When washing hands with soap and water, clean hands for 15 seconds prior to rinsing. Use a paper towel to turn off the faucet to avoid re-contaminating hands. See table below.
- Hand lotion compatible with antibacterial soap is available to prevent dermatitis.

**OSUMC Hand Hygiene Policy Summary**

<table>
<thead>
<tr>
<th>Alcohol Hand Rub (Until hand rub dries)</th>
<th>Plain/Antimicrobial Soap and Water (For at least 15 seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upon entering a patient’s room or donning gloves as for contact isolation</td>
<td>same</td>
</tr>
<tr>
<td>Upon exiting a patient’s room</td>
<td>same</td>
</tr>
<tr>
<td>Before having direct contact with patients</td>
<td><strong>IF hands are visibly soiled or contaminated with proteinaceous material, blood or other body fluids</strong></td>
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<tr>
<td>Before donning gloves</td>
<td><strong>Before eating</strong></td>
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<tr>
<td>After contact with patient’s intact skin (i.e., taking a blood pressure, pulse or lifting a patient)</td>
<td><strong>After using the restroom</strong></td>
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<tr>
<td>After contact with body fluids, excretions, mucous membranes, non-intact skin, and wound dressings if hands are not visibly soiled</td>
<td><strong>Suspected or proven exposure to Clostridium difficile or Bacillus anthracis</strong></td>
</tr>
<tr>
<td>If moving from a contaminated-body site to a clean-body site during patient care</td>
<td>same</td>
</tr>
<tr>
<td>After contact with inanimate objects (including medical equipment) in immediate vicinity of patient</td>
<td>same</td>
</tr>
<tr>
<td>After removing gloves</td>
<td>same</td>
</tr>
</tbody>
</table>

“Clean in and clean out” is required upon exit and entering a patient room regardless of whether you touch the patient or the patient’s environment. This promotes good habits, reassures our patients and prepares you for any unanticipated activity that arises after room entry.

Hand hygiene audits are performed routinely with results routinely shared with all staff. If you are observed/coached about non-adherence to hand hygiene, respond with “thank you for reminding me”. In addition, please provide kind reminders to others. Infractions may be recorded on physician profiles.

In procedural areas, a 3 minute surgical scrub with an antiseptic (chlorhexidine gluconate or povidone iodine) or use of a waterless alcohol handscrub (Avagard) with meticulous adherence to instructions is needed.

**Nails:** HCW (physicians, nurses, technologists, patient care associates) in all patient-care areas are NOT permitted to have artificial nails, appliqués, french tips or extenders affixed to nails. Natural nails should be kept at no more than ¼ inch in length.
Attachments to Stethoscopes: Cloth stethoscope tubing covers, attachments to diaphragms or decorative items are NOT permitted. Stethoscopes/individual personal patient-care items should be routinely decontaminated with alcohol wipe or disinfectant (e.g. Wexcid, Sanicloth) before leaving a patient’s room.

Health & Professional Appearance: If you are sick, or suspect that you may have an infectious condition that puts others at risk, seek prompt testing and treatment. Refrain from providing direct patient care when you know you are infectious. To reduce transmission of pathogens, and to maintain a professional appearance, clothing should be laundered after each shift or work day. White coats are to be laundered frequently and is free for attending and house-staff.

ISOLATION GUIDELINES

Standard Precautions are used to reduce the risk of transmission of bloodborne pathogens and other infectious materials. This applies to blood and body fluids, secretions and excretions, including feces, vomit, urine, tears, saliva, mucus membranes and non-intact skin, whether or not visible blood is present. Standard Precautions are used for all patients and includes:

1. Compliance with hand hygiene
2. Cough etiquette – applies to staff, visitors and patients. Cover cough or sneeze with tissue, into an elbow or by donning a mask if needed to contain secretions. Prior to diagnosis or implementation of isolation, and while patients are in common areas, a coughing patient must don a mask. This protects HCWs and others from exposure to diseases spread via the droplet or airborne route, such as meningococcal meningitis, influenza, pertussis and tuberculosis.
3. Gloves – use when contact with blood, body fluids, mucus membranes, non-intact skin, excretions or secretions is anticipated. Hand hygiene must be performed before donning gloves and after removal.
4. Mask with face shield or mask with goggles – use when inserting central venous catheters, (CVC) accessing epidural spaces or performing lumbar punctures, intubation and extubation, collecting a nasopharyngeal swab and if splashing of blood/body fluids, uncontrolled coughing is anticipated.
5. Gown - if contamination of skin and/or clothing with blood or body fluids is reasonably anticipated.
6. Sharps Safety & Engineering Work Practice Controls – activate the safety device; never bend, recap, break, cut or manipulate needles. Dispose used sharps immediately in a puncture resistant sharps/needle box. Dispose of items saturated with blood or body fluids that can drip or flake off if compressed in a red, biohazardous bag that is labeled with a biohazardous waste symbol. Never eat, drink, apply cosmetics or lip balm or handle contact lenses or touch your eyes when in patient care areas. Label all laboratory specimens and place in zip-lock bags labeled with a biohazardous waste symbol prior to transporting out of the room.

Patients with highly transmissible or epidemiologically important pathogens are isolated to prevent spread. OSUWMC categories are transmission-based: Contact, Enteric Contact, Droplet and Airborne. Isolation orders must be entered ASAP by a physician or nurse in the EPIC.

CONTACT ISOLATION

All organisms requiring contact isolation can be acquired from patients’ own flora or acquired and spread by direct contact (from person to person) or by indirect contact (contaminated items in the environment, such as medical equipment or personal belongings). Controlling the spread of these Multidrug resistant organisms (MDRO) within the health system is a high priority and strict adherence to contact isolation is required. Contact Isolation includes a private room (or cohorting, if needed); use of alcohol hand rub followed by donning of a gown and gloves for all staff and visitors/families before room entry. It is best to remove the white coat to ease donning the gown and to avoid unnecessary contamination of coat within the room. Close the gown at the neck and waist. Dedicated equipment (stethoscope, BP cuff and Nextemp™ or other thermometer) should be left in the room.

Equipment must be disinfected prior to removal from the room; disinfectant is provided on the hangers/carts with educational material for visitors. System-wide audits are being performed by Epidemiology staff, Link
Nurses; if non-compliant, you will be reminded; for attending physicians, non-adherence will be indicated in your physician profile.

**Pathogen specific issues**

**Methicillin Resistant *Staphylococcus aureus* (MRSA):** is common among hospitalized patients and in the community. About 53% of OSUWMC *Staph aureus* isolates are MRSA: resistant to methicillin/naftcillin, cephalosporins and beta-lactamase inhibitors (e.g., ampicillin/sublactam, piperacillin/tazobactam). *S. aureus* samples from skin and soft tissue infections cultured in the Emergency Departments (ED), are mostly MRSA. An algorithm with recommendations for outpatient management and treatment of suspect MRSA skin and soft tissue infections is located on the Epidemiology website. Regardless of admission diagnosis, patients with prior MRSA colonization or true infection will be re-admitted to Contact Isolation, unless there is documentation of clearance of MRSA. Patients from other facilities who have MRSA require orders for contact isolation.

**Vancomycin Resistant Enterococci (VRE):** colonized or infected patients are represented by those with long hospital stays, gastrointestinal surgery, dialysis or transplant recipients. Patients who are diagnosed with VRE are automatically re-admitted to Contact Isolation, unless there is documentation of clearance of VRE, regardless of admission diagnosis.

To start the process of discontinuing isolation for MRSA or VRE, see the Table 1B. Obtain:

1. Paired screens for MRSA (nares + another site), for VRE (perirectal area + another site).
2. Paired screens are easy to perform in the clinic setting; if negative (x3), the patient will avoid re-admission into contact isolation and/or shorten the isolation period in the inpatient setting.
3. Avoid attempts to screen patients with a new VRE diagnosis as screening is unlikely to be negative.
4. Obtain cultures when the patient is off antibiotics used to treat MRSA or VRE for 48 hours.

**Multidrug Resistant Gram Negatives (MDR-GN)**: include *Acinetobacter baumannii, Pseudomonas aeruginosa*, extended spectrum β-lactamase (ESBL) or carbapenemase producing *Enterobacteriaceae (CRE)*

1- MDR-GN are resistant to ≥2 drugs per class in ≥2 classes. Antibiotic classes include combination penicillins (ampicillin/sublactam, piperacillin/tazobactam), aminoglycosides (gentamicin, tobramycin), cephalosporins (cefepeime), and carbapenens (ertapenem, doripenem).
2- MDR-GN require Contact Precautions and frequently colonize patients and environment and are common causes of ventilator associated pneumonias (VAP). They are transmitted via contaminated hands of HCW and cause serious infections with limited treatment options.
3- Isolation is continued until the infection has resolved or the patient is discharged.
4- *Acinetobacter baumannii* is intermittently a serious problem in ICUs. Outbreaks have been brought under control with scrupulous compliance to infection control precautions such as hand hygiene, contact isolation with gown and gloves and meticulous daily environmental cleaning.

Patients who are colonized or infected with MDROs (MRSA, VRE, MDR-GN) are NOT excluded from any OSUWMC outpatient settings. When patients are known to be infected or colonized with MDROs, standard precautions, with particular attention to hand hygiene is recommended. Use gloves and a gown if anticipating contact with uncontrolled secretions, draining wounds/ulcers, stool, ostomy tubes and drains.

**Clostridium difficile infection (CDI):** is a spore forming rod. Antibiotic use is the primary risk factor for CDI. De-escalation of antibiotics is key to prevent CDI. Patients with uncontrolled diarrhea and those with CDI must be placed in Enteric Contact isolation.

1- Stool specimens should be collected on patients with at least 3 watery stools within 24 hours that conform to the shape of a container and clinical symptoms (i.e. fever, abdominal pain).
2- PCR testing is very sensitive; one test per week is accepted by the Microbiology Lab.
3- Repeat testing post-diagnosis is not recommended, as positive results may persist without diarrhea.
4- Soap and water is required for hand hygiene after having contact with *C. difficile* patients.
**Enteric Contact Isolation:** Preventing transmission of CDI at OSUWMC is one of our high priorities. With the change to PCR testing, an increase in *C. diff* cases occurred due to improved sensitivity. Awareness of these additional infectious patients was a driving force to implementing more stringent cross-transmission strategies in 2012. Enteric contact isolation must be ordered for CDI other high risk, infectious diarrheal conditions (e.g. Rotavirus, Norovirus, uncontrolled diarrhea). Prevention strategies are bundled in the order for Enteric Contact isolation: a private room, hand sanitizer, gown/gloves before room entry. Within the room, CHG soap and water is recommended. A sign is placed over the hand sanitizer dispenser as a reminder about soap and water. A sporicidal agent (bleach or equivalent) is used to disinfect the patient’s environment and all medical equipment.

**OSUWMC Antimicrobial Stewardship Program:** Resistance to antibacterial pathogens is common and presents many challenges. Development of resistance is linked to antibiotic pressure especially if antibiotics are used indiscriminately. Interventions to assist in the selection of antibiotics through clinical decision support via order sets, and clinical practice guidelines for specific agents/syndromes have been developed. After an antibiotic is prescribed, cases are reviewed to assess if the drug can be de-escalated, switched to an oral agent or stopped. The primary objective is to minimize antimicrobial resistance.

True infection vs. colonization: One way to help differentiate colonization from true infection is to use a red topped dual swab or syringe/cup (for larger volume samples) of infected material. One swab is used for Gram stain (smear) and one for culture. If the culture is positive, but there is no inflammation (WBC), nor organisms on smear, it is more likely to represent contamination/colonization; it may not warrant antibiotics.

**DROPLET ISOLATION** Droplet transmission occurs if large-particle droplets are generated from the respiratory tract of an infected person. Coughing propels droplets a short distance and microorganisms can be deposited on conjunctiva, nasal/oral mucosa of a susceptible host (i.e. “T-ZONE”: eyes, nose, mouth). Illnesses spread by droplets are *Neisseria meningitidis*, pertussis (agent of whooping cough) and influenza. Low white blood cell precautions (Absolute neutrophil count, ANC less than 1000 and dropping) includes a mask and hand hygiene for employees with sniffles, nasal congestion or rhinorrhea. If an employee has a high fever, he/she should not care for any patients, irrespective of white blood cell count.

In all settings, place a procedure mask on any person presenting with a cough or influenza like illness (ILI) and ask them to clean their hands with alcohol handrub prior to placement into a private room, ILI includes a temperature $\geq 100.4^\circ F$, sore throat or cough plus fatigue, headache, stuffy nose, body aches. Once a patient is placed in a private room with a droplet isolation sign on the door, the patient can remove the mask.

Seasonal influenza (H3N2, H1N1), pandemic 2009 H1N1 and influenza B are transmitted by droplets. “Cough etiquette” stations are in place throughout OSUWMC. Masks should be offered to persons who are coughing to contain secretions; alcohol handrub and tissues are located in waiting areas. Coughing into the crease of your elbow prevents hand contamination, "Do it in your sleeve".

The 2012-2013 vaccine appears well matched to the circulating strains.

- If referring patients with flu-like symptoms to OSUWMC, clinicians should instruct patients to put on a mask and sanitize their hands upon entry to the health care facility.
- Treatment is based on clinical assessment and need not wait on PCR result.
- If an inpatient develops ILI symptoms (e.g., fever + cough or shortness of breath, or low oxygen sat)
  - Place the patient in droplet precautions with a surgical mask; if the patient is being transferred communicate to the receiving team.
  - Obtain influenza testing with reflex to PCR; due to false negative results associated with rapid flu testing alone; Influenza A and B PCR testing alone is also acceptable.
  - The OSUWMC influenza plan recommends “enhanced respiratory precautions” (i.e.an N-95 mask, goggles, gown and gloves) for any aerosol generating procedures in those with suspected
influenza: these include: intubation, extubation, bronchoscopy, CPAP, BiPAP, sputum induction, CPR and administration of aerosolized medications.

Acute bacterial meningitis can be caused by *Neisseria meningitides*; which is transmitted by large droplets. If a patient is suspected of acute bacterial meningitis, a mask with a face shield or goggles MUST be instituted immediately by all HCW caring for the patient. Wearing PPE, will decrease HCW exposures and the need for post-exposure prophylaxis (PEP). *Group A Streptococcus* can be spread through direct contact with infected wounds. If necrotizing fasciitis is suspected, wear a mask to perform wound care for 24 following administration of appropriate antibiotics.

**Exposure to DROPLET pathogens:** If an exposure is suspected, Epidemiology is to be notified. If an exposure is confirmed, Employee Health Services provides evaluation and consideration of Post-Exposure Prophylaxis (PEP).

- PEP is recommended for susceptible individuals who have had close contact with an infected patient, while not wearing a procedure mask/face shield.
- Confirmation of *N. meningitidis* is recommended prior to PEP.

**AIRBORNE ISOLATION** Airborne transmission occurs by dissemination of tiny microorganism-laden droplet nuclei, expelled by infectious patients and remains airborne for long periods. A susceptible host inhales airborne microorganisms such as pulmonary / laryngeal tuberculosis, measles.

*Mycobacterium tuberculosis* (*MTB*) is an acid-fast bacillus (AFB) spread through air as small (<5 micron) nuclei. Lungs are affected most often, but brain, kidneys or spine can be involved. Laryngeal/pulmonary MTB is very contagious; symptoms include a chronic productive cough, (+/-blood), fatigue, night sweats, fever, and weight loss. There are about 200-300 new cases in Ohio annually and one third are from Franklin County; many are foreign born. At OSUWMC, at least a dozen new cases are identified annually. High risk groups include: foreign born, those living in inner cities, injection drug users, prisoners, alcoholics or immuno-suppressed patients (malnutrition, diabetes, HIV or organ transplant recipients.)

**Work-up for suspect TB patients includes:**

1.-Isolate all suspect TB patients in negative airflow; 2.-Place a tuberculin skin test or order an interferon gamma release assay (IGRA); the QuantiFERON-Gold-In-Tube test is available at OSUWMC. IGRA is approved for latent TB infection (LTBI) screening, but a negative IGRA does not rule out active TB disease. 3.-Obtain three consecutive sputum samples to rule out MTB as a high priority. All samples can be collected within a 24 hours, with at least one as an early morning specimen. Respiratory therapy performs sputum induction with nebulized saline to assist with sample acquisition. 4.-*M. tuberculosis* PCR is performed on all AFB smear positive specimens in the Clinical Mycobacteria laboratory. If the smears are negative but index of suspicion is high, an Mtb PCR test can be ordered on smear negative sputum samples.

Exposed individuals may develop a LTBI, identified by tuberculin skin testing (TST) intra-dermal skin test or positive QuantiFERON, but not disease and are not infectious to others. Treatment of LTBI can prevent progression of infection to clinical disease. Incubation from primary exposure to a positive TST is ~ 7-12 weeks; thus TSTs are placed 8-10 weeks following a known exposure.

**Occupational exposures** are prevented by early isolation of “suspect TB patients” and prompt treatment. An algorithm is available on the Epidemiology website with a risk assessment for MTB in negative airflow. HCW with a possible occupational exposure to TB should contact Epidemiology and an investigation will be conducted. Names of exposed individuals are forwarded to EHS or Student Health for follow-up.

**Annual documentation** is required for all OSUWMC employees who provide direct patient care: 1) Tuberculin skin testing (TST) or 2) Quantiferon Gold Testing (QGT) for all new hires, or 3) Completion of a questionnaire to assess for TB symptoms (for staff with a positive TST or QGT). **Annual evaluation for MTB exposure** is established by a Clinical Epidemiology risk assessment, based on active cases identified at OSUWMC. As OSUWMC identifies >6 active cases per year, it is considered “intermediate risk”. An RN,
MD or DO must read and document skin tests within 48-72 hours; self-reading is not acceptable. If there is induration, EHS should evaluate.

**Airborne Precautions:**
- Private room with negative airflow; available at all OSUWMC hospitals.
- An N-95 (“duck-bill mask”) or powered air purified respirator (PAPR) are worn on room entry.
- “Fit testing” N-95 masks helps assure masks provide a tight seal to effectively prevent infection.
- OSUWMC provides fit testing for anyone who may care for potential TB patients. If the employee does not pass, a powered air purified respirator (PAPR) is needed. A PAPR has a hood, with a blower motor, filter or cartridges and a breathing apparatus.
A fit tested N-95 mask or a PAPR is effective to prevent MTB transmission.

**USE OF FANS IN PATIENT ROOMS:** OSUWMC does not permit permanent installation of dehumidifiers nor fans in any location, including patient care areas and nursing stations. Requests for mobile cooling units (dehumidifiers) or adjustments to the air handling system must be approved by Facilities Services and Epidemiology. Only Dyson bladeless fans can be approved. If a fan is necessary for a medical need (COPD, air hunger, comfort measures for shortness of breath, etc) an MD order is necessary. Clinical Epidemiology must be notified when a fan is ordered. Fans are to be avoided in isolation rooms or for patients with open wounds. Fans must be turned off during procedures or dressing changes and are to be cleaned daily by staff (e.g. Sanicloth or Wexcide.)

**BLOOD CULTURES AND BLOOD STREAM INFECTIONS (BSI)** Blood cultures are obtained as part of a workup for unexplained fevers, meningitis, pneumonia, endocarditis, and if a blood stream infection (BSI) is suspected. When a BSI is in the differential, a set of blood cultures should be obtained from 2 separate sites. Each set has an aerobic and anaerobic bottle.

For those patients with a central venous catheter (CVC) or PICC:
- One set should be obtained from the CVC and labeled with the site (e.g. left subclavian) after a new injection cap is placed to avoid contaminated cultures; A second set can be obtained from periphery after decontaminating the skin with (Chloroprep®).
- If additional catheters are in place, a single aerobic bottle is obtained from each CVC, labeled with the site. This avoids unnecessary phlebotomy.
- A positive blood culture is likely to be “contaminated” when one of two sets is positive for a skin microbe, such as S. epidermidis. When only 1 set is drawn and is positive for a skin organism, it is difficult to differentiate a true infection vs. a contaminant. Contaminated blood cultures are often due to inadequate cleaning of the skin/CVC hub prior to blood draw.
- Always perform hand hygiene and adequately decontaminate the skin and/or “scrub a hub” for at least 15 seconds with an alcohol wipe prior to accessing any line. Contaminated cultures lead to unnecessary antibiotics and increased LOS.

Blood cultures should be drawn from two separate peripheral sites if no CVCs are in place after a 30 second prep (for dry sites) with Chloraprep™ to prevent contamination.

**CENTRAL VENOUS CATHETER (CVC) PLACEMENT**
Multi-disciplinary CLA-BSI prevention strategies to get to near zero infections include:

- Hand hygiene must be performed prior to placing a CVC.
- **Maximal barrier precautions** consist of: mask with face shield, cap, sterile gown (after removal of white coat), sterile gloves and a large drape for CVC placement. Central line associated BSIs (CLA-BSI) risk is 6Xs greater with only a mask and sterile gloves for line placement.
- All CVCs should be placed with an assistant (another physician or nurse) who is also wearing maximal barrier attire, if coming into proximity of the sterile field.
- One gown, mask with face shield and cap are contained within the CVC insertion kits.
- “Sterile barrier kits” with an XL gown, mask w/ face-shield and cap are stocked for an assistant, who should complete the CVC checklist at or near the time of insertion to ensure patient safety.
- Use ChloraPrep® skin preparation prior to line insertion (available in kit); 30 second prep for dry sites, 120 seconds for wet sites (femoral, least desirable site)
  - Procedure notes must be entered electronically to include adherence to universal protocol, use of barrier precautions via the CVC checklist during line insertions with details to capture billing requirements.
  - Temporary triple lumen CVC kits include antiseptic-coated CVCs for prevention of CLA-BSIs. These can decrease catheter colonization and CLA-BSIs. Patients are not exposed to antibiotics with these...
  - A sterile CHG impregnated tegaderm dressing should immediately be placed at the site after insertions.
  - Dressings should always be maintained as clean, dry and intact and is changed at least every 7 days and whenever damp, loose, or soiled. Gauze and tape should be changed at least every 48 hours, and whenever damp loose or soiled. Nursing is responsible for clean dressings.
  - Catheters should be secured with the hubs away from the chin and axilla to prevent contamination.
  - Catheter tips can be sent to microbiology ONLY if the catheter is suspected of causing an infection.
  - Preferred locations for CVCs are: subclavian, internal jugular, the femoral is the least desirable.
  - All CVCs should be assessed for necessity on a daily basis and removed as soon as feasible.
  - Hand hygiene must be performed and cap is to be cleaned with a sterile alcohol pad using friction for at least 15 seconds and air dried, before access or administering medications (i.e. all MDs, RNs).
  - Lines placed emergently are to be tagged and replaced within 24 hours
  - Patients with CVCs are bathed daily with 4% CHG soap or a disposable CHG Sage cloth.

**SURGICAL SITE INFECTION (SSI) Prevention**
- Whenever possible, identify and treat all infections remote to the surgical site before elective operations and postpone elective operations until the infection has resolved.
- Hair should not be removed pre-operatively; if it interferes with the site, remove immediately prior to incision with electric clippers.
- Adequately control serum blood glucose levels and avoid hyperglycemia peri-operatively.
- Encourage tobacco cessation, at a minimum, instruct patients to abstain for at least 30 days.
- Patients should bathe with 4% CHG at least twice prior to the operation.
- Thoroughly clean at and around the potential incision site to remove gross contamination before performing antiseptic skin preparation using CHG disposable Sage cloth.
- ChloraPrep® is the recommended skin prep; a 30-second friction scrub with back and forth motion is necessary; 120-second scrub is required for the groin. Allow to dry completely, drying times may be prolonged; refer to manufacturer instructions; avoid pooling due to fire hazards and skin irritation.
- Post-operative incision care should have the sterile dressing left intact until post operative day two; (day of surgery = day zero). If the dressing is manipulated prior to day two use sterile technique.
- Utilize Staph aureus nasal screening for high risk surgical procedures (i.e. implanted materials)
- Appropriate preoperative antibiotics are administered within 60 minutes of surgery, are to be redosed per the OSUWMC Antibiotic grid. Surgical prophylaxis should be stopped at 24 hrs.
- Urinary catheters are to be removed on POD 1 or POD 2 with day of surgery being day zero.
- For more information see: Surgical Site Infection Practice Guideline 12-2012.

**BLOODBORNE PATHOGENS**
- HIV is transmitted through contact with: blood and other potentially infectious materials (OPIM); i.e. semen, vaginal secretions, cerebrospinal, synovial, pleural, pericardial, peritoneal, amniotic fluids and saliva during dental procedures or when accompanied by other body fluids visibly contaminated with blood; and with any body fluids in situations when it is difficult to differentiate body fluids; unfixed human tissue or organs (except intact skin); HIV-containing cell, tissue, or cultures, and HIV/HBV containing culture media or solutions; and organs, or other tissues or blood from experimental animals infected with HIV/HBV. Standard precautions are to be applied. Average risk of HIV infection following percutaneous exposures to HIV-infected blood is about 0.3%. CDC has reported 57 HIV sero-conversions in HCWs due to job-related exposures, none since 2000. Risk increases if the needle-stick injury is deep, visible blood is on the device, device was previously in a vessel, and/or source patient dies within 2 months of exposure (e.g. AIDS).
Immediate action should be taken following an exposure to any potentially infectious material (OPIM). Detailed instructions, including required forms are posted on OneSource home page (blood drop icon) or https://onesource.osumc.edu/departments/Epidemiology/Documents/Exposure/Blood%20and%20Body%20Fluid%20Exposure%20Protocol.pdf. To reduce the risk of acquiring bloodborne pathogens:

1-Administer first aid – vigorously wash or flush the area exposed
2-Report the occurrence – complete required forms
3-Evaluate the nature of the exposure – assess the need for testing source patient & further follow-up
4-Evaluate the source person – not all occurrences require laboratory testing of source patient.
5-Laboratory testing – consent when possible; not required for occupational exposures
6-Counsel, evaluate and consider post exposure prophylaxis after all above steps are complete; evaluation is performed in EHS (8-4:30) or ED if EHS is closed. Post-exposure prophylaxis (PEP) decreases risk of seroconversion in HCW; it should be given ASAP after an HIV+ related exposure as the OSUWMC protocol.

**Viral Hepatitis** signs and symptoms include fatigue, muscle pain, fever, loss of appetite; nausea, vomiting, diarrhea or constipation and the liver may become enlarged or tender. Hepatitis B and C are bloodborne; are transmitted by percutaneous and mucosal exposures.

**Hepatitis B virus (HBV):** is prevented by Hepatitis B vaccination leading to 98% less occupational disease.

**Hepatitis C virus (HCV):** About 3.2 million Americans are chronically infected with HCV. Many develop complications after 20-30 yrs of viremia. HCW are at risk of occupational exposure to HCV.

- Percutaneous transmission rate is ~0.5-10%; primarily from blood to blood transmission.
- CDC does not currently recommend PEP for an HCV exposure. Immune globulin is not effective.
- All HCV + patients are considered infectious; no reliable tests can determine level of infectivity.

**Blood and Body Fluid Exposure (BBFE) Follow-up**

- Complete the OSU Employee Accident Report
- An exposure requires the MD, DO to obtain consent from the source patient for HIV testing immediately. Physicians must consider an “exposed” HCW an urgent matter.
- “BBFE” includes rapid HIV, HB surface antigen (HBsAg) and Hepatitis C antibody and needs two red-speckled top serum separators, 1 on ice and sent "stat." A “BBFE” specimen should go to the lab ASAP, unless blood is already in the lab; order as “BBFE.”
- Do not order tests separately (HIV, Hep BsAg or Hep C antibody) to assure the patient is not billed and appropriate follow-up is conducted.
- The HIV result will help the treating physician and exposed HCW make a decision regarding PEP. Recommendations for PEP include: prompt reporting, evaluation of risk, timely prophylaxis with anti-retrovirals, if indicated. If the patient is known HIV+, blood still must be drawn for hepatitis.
- Employees who have not been successfully vaccinated against Hepatitis B, and are exposed to Hepatitis B via parenteral or mucous membrane contact with HBsAg positive blood (or body fluid), must be evaluated/treated with Hep B immune globulin and/or Hep B vaccine within 7 days.
- Employees exposed to a Hepatitis C + source will be evaluated/followed by EHS. Exposed employees, will get Hepatitis C antibody; HCV quantitative RNA PCR will be done at 6 weeks, and 3 months and Hep C antibody is drawn again at 6 months.
- All exposed HCWs must complete the accident report and undergo an initial assessment for PEP at EHS during the day or ED, after hours. Routine follow-up and treatment is provided by EHS.

**Healthcare Worker Immunizations**

OSUWMC follows CDC "Guideline for Infection Control in Healthcare Personnel". EHS requires proof of immunity to measles, mumps, rubella, and VZV (chickenpox). All new employees with potential exposure to blood and body fluids, must show immunity or get vaccinated against Hepatitis B and Tetanus, diphtheria and acellular pertussis (Tdap); a one-time vaccine to increase immunity to pertussis (with tetanus and diphtheria); it is available free for any employee and high risk areas (i.e. Labor/ Delivery or ED).
**Annual influenza vaccines are non-discretionary for HCW:** the vaccine is received or an exemption form and a computerized based learning module must be completed. Exclusions include: severe allergy to eggs or vaccine components, Guillain Barré Syndrome within 6 weeks of a prior influenza vaccine.

**Waterborne Pathogens** OSUWMC has a waterborne pathogen prevention plan in place which includes testing water in high risk areas, as determined by an annual risk assessment. Patient populations who have areas at high risk will be informed upon arrival if precautions such as running the water before a shower and drinking only bottled/canned beverages are necessary. Legionella should be considered in patients with pneumonia. Early testing (ideally prior to day 2 of admission) via a legionella urinary antigen should be considered to assure early administration of a fluoroquinolone (moxifloxacin, ciprofloxacin) or a macrolide (azithromycin) AND allow for accurate differentiation of community vs. healthcare acquired cases.

**Endoscopes and semi-critical instruments** are to be cleaned immediately. If unable to clean at the point of use, spray or moisten the device with an enzymatic solution, place in a biohazardous waste bag and transport it immediately to the decontamination area.

Endoscopes and semi-critical instruments require at a minimum, high level disinfection following use with a chemical high-level disinfectant such as Metricide OPA Plus. Special training for cleaning and high level disinfection is required. Physicians with offices in ambulatory settings where high level disinfection and/or sterilization is performed are advised to contact the Department of Clinical Epidemiology at 293-8556 to assure compliance with annual competency testing and safe practices. A variety of tools, educational materials, safety instructions are available.

**Patient education** materials are available on OneSource/Patient Education. The Joint Commission (JC) requires that patients and family members receive education and that the education provided is documented in the patient’s chart. This helps avoid unnecessary readmissions as well.

1. Hand hygiene – when to clean hands and how; signage and supplies are available
2. Cough etiquette – when and how to perform, availability of supplies
3. MDRO colonization or infection – information about the specific MDRO, reason and anticipated duration of isolation, PPE that visitors and staff are required to wear, safety measures the patient is to follow prior to leaving their room (ambulate in hallways or prior to transport for tests & procedures)
4. Central lines: reason for the CVC and CLA-BSI prevention activities and anticipated duration
5. Patients undergoing surgical procedure - SSI prevention activities, smoking cessation, glucose control, preoperative showering with CHG soap, high risk nasal screenings and mupirocin if indicated and post-operative instructions.

**Exposure Followup:**
When you receive a patient from an outside facility and identify that the patient has an infectious condition through diagnostic testing or workup performed at OSUWMC, you must notify the sending facility, so they take necessary steps to prevent transmission or provide post-exposure prophylaxis as indicated.

In addition, when you transfer an OSUWMC patient to another facility and laboratory results done here become available after transfer, you must notify the receiving facility if it is later determined that the patient had an infectious condition at the time of transfer. These are JC requirements and are designed to protect ALL HCWs treating patients with infectious conditions.

**Questions:**
The OSUWMC Department of Clinical Epidemiology provides consults: on exposures, isolation, PPE, outbreak investigations; patient, education for family, faculty, house-staff, nursing and attending education, reports selected infection statistics and is actively involved in development of the OSUWMC biodefense and influenza planning. Refer to the Epidemiology web site for multiple resources to help prevent infections.
13. MMWR 30 (49) June, 2000, No. RR07: “Prevention & Control of Meningococcal Disease.”