Infection Prevention in Ambulatory Care: Meeting CMS Conditions for Coverage

Objectives

- Understand the basic elements of infection prevention and control in the ambulatory setting to ensure patient and worker safety
- Relate the survey process to the elements to ensure a fair, equitable and meaningful survey experience
- Identify gaps in the practice setting that put patients at risk

Basic Elements of Infection Prevention

- Hand Hygiene
- Medication Safety
- Standard Precautions
- Transmission Based Precautions
- Linen, Laundry, Trash and Sharps Disposal
- Refrigarator Monitoring

Infection Prevention and Control: Hand Hygiene

Why we use hand sanitizers

A 64-year-old man who had quadruplets due to a traumatic spinal cord injury was found on routine surveillance cultures to have methicillin-resistant Staphylococcus aureus (MRSA) colonization of the anterior nares. He had no history of MRSA infection or admission to a hospital or healthcare facility for extended periods of time. The MRSA isolate grown from the back of the patient's anterior nares is shown in the inset. The patient was treated with vancomycin, and the infection resolved. The patient was discharged from the hospital and was instructed to maintain good hand hygiene practices to prevent the spread of MRSA.

Why we use hand sanitizers

Because the critical importance of hand hygiene to caring for patients, including those not known to carry antibiotic-resistant pathogens, we use hand sanitizer in clinical settings.
Hand Hygiene

Single most important procedure for preventing healthcare-associated (nosocomial) infections

Underwood MA. APIC Text 2005

CDC Guideline for Hand Hygiene in Healthcare Settings, 2002
http://www.cdc.gov/handhygiene/

Key Concepts

• Contaminated hands spread infection
• Hand hygiene (HH) prevents the spread of infection
• Healthcare workers need to clearly understand when and how to perform HH
• Compliance can be problematic

Definitions

• Antiseptic – antimicrobial substances (e.g. alcohol, CHG, triclosan) applied to the skin to reduce microbial flora
• Alcohol-based hand rub – alcohol-containing preparation applied to the hands to reduce the number of viable microorganisms
• Antimicrobial soap – detergent containing antiseptic agent
• Waterless antiseptic agent – an antiseptic agent that does not require use of exogenous water

Surgical Hand Antisepsis: Two options:

• State of the science: waterless surgical scrub solutions
• Alcohol-based surgical hand-scrub:
  – Prewash hands and forearms with non-antimicrobial soap, dry, then apply per manufacturer’s instructions
• Antiseptic surgical hand-scrub: scrub hands and forearms for 2-6 minutes
  – Use of brush = greater risk of infection

Alcohol Hand Rub Dispensers

• Type
• Location (NFPA Life Safety Code)
  – Corridor width is 6’ or greater, dispensers at least 4’ apart
  – Maximum capacity 1.2 L in rooms and corridors
  – 2.0 L in suites
  – Not installed over/near (6”) electrical outlets/switches
  – May be installed over carpet only in sprinklered smoke compartments
  – Maximum aggregate of 10 gal solution per smoke compartment
  – 5 gal in storage
  – See 6.2 in AAAHC Physical Environment Checklist
  – 6.2.3 access to patients (potential conflict)

Artificial Nails

• HCWs more likely to harbor gram negative pathogens on their fingertips
• Outbreak of Pseudomonas aeruginosa in NICU attributed to artificial fingernails
• Artificial fingernails epidemiologically implicated in several other outbreaks
• Do not wear artificial fingernails or extenders when having direct contact with patients at high risk (e.g., those in intensive-care units or operating rooms) (IA)
Jewelry

- Skin underneath rings is more heavily colonized than comparable areas of skin on fingers without rings (374–376).
- Study: 40% of nurses harbored gram-negative bacilli (e.g., *E. cloacae*, *Klebsiella*, and *Acinetobacter*) on skin under rings & certain nurses carried the same organism under their rings for several months (375).
- In a more recent study involving >60 intensive care unit nurses, multivariable analysis revealed that rings were the only substantial risk factor for carriage of gram-negative bacilli and *S. aureus* and that the concentration of organisms recovered correlated with the number of rings worn (377).
- Rings are not appropriate in the OR.
- Earrings/necklaces must be covered in OR

(CDC Guideline for Hand Hygiene in Healthcare Settings, 2002)

So what do you look for during survey?

- Staff performing hand hygiene at key times
- Staff performing hand hygiene appropriately
  - Soap and water (friction all surfaces, turn off with paper towel)
  - Hand sanitizer (friction all surfaces with adequate amount)
- Hand hygiene stations adequately supplied and working
- Sanitizer placement adequate
- No artificial nails present
- No hand jewelry in OR; other jewelry covered
Growing Concern

- CDC and state and local health departments have investigated an increasing number of outbreaks
  - Unsafe injection practices
  - Other breaches in basic infection control
  - Detection is haphazard
- Outbreaks are occurring across the healthcare spectrum
  - Ambulatory, home and long-term care settings
  - Infection control programs and oversight

Common Themes and Findings in Outbreaks

- Investigations were resource-intensive and disruptive
  - Notification, testing, and counseling of hundreds of patients
- Delayed recognition and missed opportunities
  - Prolonged transmission
  - Growing reservoirs of infected patients
- IC programs lacking or responsibilities unclear
  - Clinic space rented from a hospital (NE)
  - Contractors (NYC and OK)
- Entirely preventable
  - Standard precautions + aseptic technique

APIC Position Paper: Safe Injection, Infusion and Medication Vial Practices in Healthcare

Discusses what is acceptable practice & what not to do:
- Aseptic technique
- IV Solutions
- Flushing
- Syringes
- Vials
- Blood Glucose monitoring
- Employee Health

www.apic.org

What are some of the incorrect practices that have resulted in transmission of pathogens?

- Using the same syringe to administer medication to more than one patient, even if the needle was changed
- Using a common bag of saline or other IV fluid for more than one patient, and
  - Leaving an IV set in place for dispensing fluid
  - Accessing the bag with a syringe that has already been used to flush a patient’s IV or catheter
- Accessing a shared medication vial with a syringe that has already been used to administer medication to a patient

www.cdc.gov/hicpractice/infectioncontrol.html
Maintaining sterility

- Perform hand hygiene before accessing and preparing
- Disinfect (scrub) all vial tops & IV ports/hubs, locks with alcohol for 3 seconds before accessing (includes needleless systems)
- A needle should never be left inserted into a medication vial septum for multiple uses
  - This provides a direct route for microorganisms to enter the vial and contaminate the fluid
- Use a blunt needle to withdraw meds
- Use 5 micron filter needle for ampule

Maintaining Sterility

- A new sterile needle and syringe used for each injection and each entry into vial
- Do not use bags or bottles of intravenous solution as a common source of supply for more than one patient
- Leftover parenteral medications should never be pooled for later administration
- Single-use medication vials (e.g., propofol) should never be used for more than one patient
- Assign multi-dose vials to a single patient whenever possible
- Discard immediately any unused solution in single dose vials, ampules

Expiration

- Medications should be discarded upon expiration or any time there are concerns regarding the sterility of the medication
  - Opened multidose vials discarded at 28 days
  - Unopened vials discarded per manufacturer’s expiration date
  - Opened single dose vial discarded immediately after use on patient
  - Discard prepared syringes at end of procedure-do not save for next case

**USP 797**

Lessons Learned from the ‘Great Clave Experiment…..’

- Scrub **ALL** IV ports with an alcohol prep
- Wash/gel hands prior to handling IV equipment & administering medications

The great clave experiment…..

15 clave ports from 15 different hospital units were randomly selected and cultured. 11 of the 15 grew Coag Neg Staph or *Staph Epidermidis* plus lots of other nasty stuff. Four cultures grew nothing (but 2 of them were from brand new IV sets…..)
IV Solutions
• Gel hands & wear clean exam gloves for starting IVs, changing IV tubing, filters, and containers
• Keep IV bags in plastic overwrap until ready for use (if out, date & discard in 30 days)
• Begin administration within one hour of spiking IV bag/bottle (USP 797) otherwise discard bag

IV Solution & Syringe Labeling
• NEVER set an unlabeled syringe down or leave it unattended
• NEVER administer a medication from an unlabeled syringe that you did not draw up & have control of from time drawn up to time given
• NEVER draw up an oral or topical liquid into an IV syringe

Irrigating Solutions
• Best if irrigation solutions are discarded between patients
• If used for multiple patients, label with date and time opened & discard within 24 hours
• Warming irrigation solutions:
  – $T_{\text{max}} < 113^\circ\text{F}$, lower ($104^\circ\text{F}$) if IV fluids included (record temp daily)
  – NEVER warm in microwave
• Medication irrigations: obtain from Pharmacy-single patient use

Eye Drops, Ointments, Ear Drops
• Hand hygiene before & after
• Glove if contact with mucous membranes anticipated
• Administer all eye & ear products using "no touch" technique to prevent contamination
• If break in technique occurs or the tip of the container touches the patient, discard the container ASAP

Topicals
• Sanitize hands
• Prevent contamination of bulk containers; use smallest one available.
• Prefer small size so can be dedicated to single patient and then discarded.
• Remove desired amount with a sterile applicator (no double-dipping) in a clean area
Indirect Contact Transmission

- Transfer of an infectious agent through a contaminated intermediate object or person
  - Hands of healthcare personnel
  - Patient care devices/equipment (e.g., glucometers)
  - Instruments (e.g., endoscopes) that are not adequately reprocessed
  - Medications and injection equipment

Transmission of Pathogens

- **Airborne Transmission** - send to hospital
  - Negative air flow & respirator required

- **Droplet Transmission** - reschedule when well

- **Contact Transmission** - contact precautions
  - Direct body-surface-to-body surface physical transfer of microorganisms
  - Indirect transfer of microorganisms by a contaminated intermediate object

Standard Precautions

- Universal Precautions (UP) an OSHA term, blood and OPIM* only
- Standard Precautions apply to all patient care, regardless of diagnosis or presumed infectious status
  - Blood and all other body fluids, including stool
  - Non-intact skin and mucous membranes
- Reduces the risk of transmission of microorganisms from both recognized and unrecognized sources

*OPIM: semen; vaginal secretions; amniotic, cerebrospinal, pericardial, pleural, peritoneal, synovial fluids. DOES NOT apply to tears, sweat, urine or feces, BUT...

Contact Precautions

- Use for patients with large, draining wounds, extensive skin rashes, multidrug resistant organisms like MRSA, VRE, also C. difficile
- Recommend ASC have a contact precaution protocol to identify what is required of various staff from patient admit to discharge
- Gown and gloves for contact with patient OR patient environment; mask/face protection if necessary (irrigations, patient coughing)

Patient Transport

- Contain the route(s) of transmission
  - Respiratory: Mask patient for respiratory pathogens, coughing
  - Contact: Cover wounds, clean patient gown, clean sheet
- Don’t put the chart in bed with the patient
  - Place under gurney
  - Can use plastic bag and turn out onto counter
- Transporter- good hand hygiene, others as needed

Gloves

- If it’s wet/dry and not yours, wear gloves
- Non-sterile contact: exam gloves
- Sterile procedures: sterile gloves
- Latex- many HCWs, patients allergic
- Nitrile- good alternative to latex; chemical protection, good dexterity
- Vinyl- food service; looser fit,
- Housekeeping- for using cleaning chemicals

Gowns/Apron

- If it’s wet and not yours and it’s likely to get on your clothing, wear a gown!
- Should be appropriate to the level of exposure expected (I & D requires gown)
- Single patient use, NEVER hang to reuse!

Mask/Face Protection

- Protects you and the patient
- During invasive procedures, wear a mask to protect the patient from your respiratory droplets
  - This includes lumbar punctures!
- All personnel entering restricted areas of the OR suite should wear a mask when open sterile items and equipment are present.
Hair Covers and Shoe Covers

Hair Covers
- Hair and jewelry (if worn) to be completely covered when in the semirestricted and restricted areas of the surgical suite per AORN
- Chest and beard and sideburns must be covered

Shoe Covers
- Wear when blood or body fluid exposure anticipated

Hair and sideburns exposed

Donning PPE the CDC Recommended Way...
1. Hand hygiene
2. Gown
3. Mask/respirator
4. Goggles/face shield
5. Gloves

Removing PPE the CDC Recommended Way...
Before leaving room:
1. Gloves
2. Goggles/face shield
3. Gown
4. Mask/respirator
5. Hand hygiene
Linen and Laundry

**Linen**
- Store clean linen to minimize contamination
- Bottom shelf of linen cart must be solid to avoid water splatter from mopping

**Laundry**
- Keep soiled laundry away from clothing or clean items
- Place soiled laundry in leakproof bag at point of use, no sorting or pre-rinsing
- Laundry hampers may not need a lid—depends on setting

Regular Trash and Biomedical Waste

**Regular Trash**
- Trash does not spread disease
- Not necessary to have lid on trash in OR/PACU

**Biomedical Waste** (can spread disease)
- By law, items that are blood/OPIM-caked, blood/OPIM-soaked or would extrude or flake blood if compressed must go in a red bag
- State or local laws may be more stringent
- Red bags = infectious waste, don’t use for other purposes!

Biomedical Waste—Sharps

- Sharps CAN cause disease! HBV, HCV, HIV
- Safety sharps are required by law unless there isn’t one—ex. 27g 1.5”
- Dispose of in a rigid, labeled, puncture-proof container located as close to use as possible
- The USER must dispose of, except in OR
- OR must have a Safe Passing process, such as, neutral zone, basin, etc.

Refrigerators and Freezers

- Separate units for food, reagents or specimens and medications, don’t mix
- Record temps of both compartments daily at approximately the same time, twice if there are vaccines
- Follow up if temps out of range. Document actions.
- 24 hour graph, centralized electronic monitoring, or high/low digital thermometers recommended.

Summary

Basic infection prevention/control principles requires a bundle of strategies consistently performed at appropriate times to prevent direct or indirect transmission of pathogens and contamination.

Question 1: Hand sanitizers (alcohol based)

1. Are used when the hands are soiled
2. Damage skin
3. Kills 99.9% of transient pathogens on the hands within 15 seconds of application
4. Not recommended as a surgical scrub
Answer
Question 1: Hand sanitizers (alcohol based)
3. Kills 99.9% of transient pathogens on the hands within 15 seconds of application

Question 2: Hand hygiene must be performed
1. After using the bathroom
2. Before accessing clean supplies
3. Prior to preparing medication
4. Before and after intubation
5. All of the above

Answer
Question 2: Hand hygiene must be performed
5. All of the above

Question 3: MRSA
1. Lives only 3 minutes on surfaces
2. Is easily killed with soap and water
3. Patients or HCWs with colonization can transmit the organism
4. Don't need to use contact precautions in the ASC

Answer
Question 3: MRSA
3. Patients or HCWs with colonization can transmit the organism

Question 4: Medication safety
1. Vials that are single use may be used for more than one patient if all the syringes are filled at one time under aseptic conditions.
2. Hand hygiene doesn’t need to be done prior to accessing the vial and syringe.
3. The top of the vial is sterile when the cap is removed so doesn’t need to be wiped with alcohol.
4. Vials and syringes are stored in a clean manner and hand hygiene performed prior to preparation
Question 4: Medication safety

4. Vials and syringes are stored in a clean manner and hand hygiene performed prior to preparation

Question 5: Ointments used during surgery

1. May be stored on the anesthesia cart with the laryngoscope handle and blade.
2. Stored on the medication cart and dispensed in an aseptic manner to prevent contamination.
3. The tube should be discarded if touched with gloved hands that have touched the patient
4. 2 and 3

Answer

Question 4: Medication safety

4. Vials and syringes are stored in a clean manner and hand hygiene performed prior to preparation

Answer

Question 5: Ointments used during surgery

4. 2 & 3 are correct

2. Stored on the medication cart and dispensed in an aseptic manner to prevent contamination.
3. The tube should be discarded if touched with gloved hands that have touched the patient or other equipment used on the patient.

Any Questions?