Infection Control: It’s Everyone’s Business

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Lecture Objectives

✓ Discuss the importance of infection control
✓ Describe the evolution of regulation and science of infection control in the last decade
✓ Present infection control guidelines and recommendations from the AANA *Infection Control Guide for Certified Registered Nurse Anesthetists*, 2012
AANA’s Position

• Standards for Nurse Anesthesia Practice: CRNAs shall adhere to infection control policies and procedures to minimize the risk of infection to the patient, the CRNA, and other healthcare providers

• Position Statement Number 2.13: Safe Practices for Needle and Syringe Use: USE IT ONE TIME............
ONLY ONE TIME!!

ONE patient
ONE needle
ONE syringe
ONE single-dose vial
ONE TIME

http://oneandonlycampaign.org/
• We are not asking the **IMPOSSIBLE**;
  • *(SAFETY FIRST, ALWAYS....)*

• We are asking you to do the **POSSIBLE**....

• **DO WHAT IS REALISTICALLY POSSIBLE**

  **POSSIBLE**

TO REDUCE INFECTION RISK!!!!!!!!!!!!!
ONE of the MAJOR FORCES DRIVING CHANGE:
Regulatory Agencies’ growing role in infection control!!

HHS: Health & Human Services
FDA: Food & Drug Administration
CDC: Centers for Disease Control
CMS: Centers for Medicare & Medicaid Services
HICPAC: Healthcare Infection Control Practices Advisory Committee

AHRQ: Agency for Healthcare Research & Quality
TJC: The Joint Commission
OSHA: Occupational Safety & Health Administration (Protect HCWs)
USP: United States Pharmacopeial Convention
USP Pharmacopeia Chapter 797

- Private non-profit safe drug prep/admin
- 2008 Chapter 797: new rules OR drug prep
- Label it: initials, date, time. Prepare under hood BUT- if we prepare the drugs:
- No batches ahead of time; prepare immed before use.
- Discard within 1 hour
- Many other rules---read the Guide
- We have to decide how to incorporate these rules into anesthesia work flow; many pharmacies are adopting USP 797, each Anesthesia Dept has to work this out.
Nonprofits and Infection Control

• HONOREform founded by the fabulous Evelyn McKnight, helping humanity

• Safe Injection Practices Coalition (partnership of healthcare organizations):
  – One and Only Campaign—public health initiative
  – AANA is a member organization
Outbreaks 49 since 2001; >26 since 2007 Nosocomial CRBSI SSI all at epidemic levels

Infections are a clear and growing danger to our patients........

We have to step up and **do this**!

The world is watching and the stakes are high...

MDR Organisms—not just in ICU, but in communities, increasing in prevalence and virulence......

Greater scrutiny of our practice

Regulatory Organizations
And the consequences...... A bad day for nurse anesthesia

• Fall 2007—cluster of new HCV infections southern Nevada outpatient endoscopy center
• CRNA Re-USE SDV and needles and syringes propofol
• 6 patients were infected with HCV. 40,000+ patients were informed of potential exposure in single largest notification event in USA history
• AANA notified all members of the event. Undertook a national safe injection practices campaign: One Patient, One Needle, One Syringe, One Time
• Two CRNAs and a GI MD were indicted for 2nd Degree Murder for death of endoscopy patient Summer 2012............. The MD was convicted June, 2013
Infection Control Guide
for Certified Registered Nurse Anesthetists

Evidence-based
Updated every 4 years
Filled with links to current websites
Referred to manufacturer guidelines
READ THE GUIDE

Please read the Infection Control Guide

Recommendations? Send to practice@aana.com
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PREVENTIVE MEASURES: PERSONAL

Measures CRNAs can take when working in the clinical setting...
Hand Hygiene—most important

- Before and after as often as safety allows
  - 70% Ethyl Alcohol hand rubs x 15 s—not for grossly contaminated hands.
  - Rub it all over your hand surfaces
- Will not kill spores (C difficile)
- WHY DON’T WE DO HAND HYGIENE......?
  - No. of clinical interventions poses a hand hygiene problem for anesthetists: DO WHAT IS POSSIBLE!!!!!!!

Poor H.H. is “culturally acceptable” in anesthesia???
Artificial fingernails, rings, jewelry

• No artificial nails

• Rings are a source of contamination
  – Can’t effectively clean beneath them

• In the clinical setting:
  – Jewelry turns into fomites
  – ➔ contaminated objects that spread pathogens
Occupational Exposure and Prophylaxis

- HBV: vaccination series, HBig, revaccinate
- HCV: pegylated interferon + ribavirin + 2 other antivirals curative > 50% cases
- HIV: combination of reverse transcriptase and protease inhibitors within 72 hrs
- TB: take antiTB drugs; annual and post-exposure PPD
Universal (Standard) Precautions

- Hand hygiene before and after patient contact
- Gloves for any patient contact; change after each contact
- Protective eye shields
- Protective facemasks
Transmission-Based Precautions-added to Universal as needed

- **Contact** - Surgical gown any direct contact (VRE, C difficile)
- **Droplet** - face mask within 6-10 feet (influenza, Pertussis)
- **Airborne** - N95 respiratory 5µ filter (TB, measles, varicella)
- **Spongiform** - prion destruction measures, e.g. extreme temp, disposable equipment use incinerated after case
Airway Management and Asepsis
Anesthesia Specific Situation!!

• **Double glove**—remove *outer* to adjust gas after intubation or instrumentation
• Keep grossly contaminated equipment covered with impermeable material, separate bins
• Same for NG tube insertion
• Monitor environment, clean afterward
Contaminated Equipment and Drugs

• Keep the CART CLEAN---no contaminated items or drugs

• Keep all drugs exposed to the patient on the machine shelf

• Keep all contaminated/used equipment on the machine shelf or in special separate bin for gross contamination
Ventilator Associated Pneumonia Care Bundles

• Non-invasive ventilation if possible
• Extubate ASAP
• Semi-recumbent
• In-line subglottic suction, sheathed suction catheters
• Cuff 20 cm H2O
• Avoid naso-endotracheal route
• Avoid H₂ blockers, P.P.Inhibitors 2° to ↑pH = ↑aerodigestive bacterial growth
Regional Anesthesia

- **Chlorhexidine (≥ 0.5%) + alcohol(70%) skin prep** solution is superior to povidone-iodine in reducing skin flora
- Package warning: “do not use for lumbar puncture”, may be related to previous animal studies, higher concentration, neurotoxicity
- Masks during neuraxial blocks: documented meningitis outbreaks in parturients
Epidural Catheters (also Peripheral N. Block)

- ✔ insertion site daily: signs infection, back pain, neurological signs; use clear, antibiotic-impregnated, impervious dressing
- Remove w/i 48 hours, ↓ infect risk; ↑40% ea day
- Disconnected catheter:
  - Static fluid has moved >5 in, remove catheter
  - Static fluid: soak catheter in povidone iodine x 3 min
  - Maintain sterile field. Let dry
  - Cut catheter with sterile instrument 10 inches from end, reconnect with sterile connector
Arterial Line Insertion

- First cleanse and infiltrate site with local anesthetic
- Use aseptic technique. **Prep and drape**
- **Sterile gloves. Sterile Field. Sterile Catheter**
- Insert catheter, connect aseptically to infusion system
Central Line Insertion

• Choose site: subclavian>neck>femoral, in order of less likely infection, use ultrasound
• Skin prep to site with chlorhexidine or povidone iodine
• Open sterile tray
• **Full sterile barrier technique: gown, gloves, cap, mask.** Sterile sleeve for PA catheters and ultrasound probes...
• Maintain sterile field with wide draping
Central Line Access and Care

• Site dressing: clear, transparent adhesive
• Cleanse skin chlorhexidine dressing changes
• No ointments (fungal growth, microb resis) except for dialysis (\textarrow{Staph aureus cath infec})
• Hand hygiene prior to access; \textcolor{red}{	extbf{scrub hub alcohol}} \textcolor{red}{	extbf{15 sec prior to access}}
• Antiseptic-impregnated polyurethane catheters
• Avoid unnecessary access or manipulation
• Remove ASAP
Vascular Lines; IV Bags; Ampules

Asepsis

• Per CDC: our old nursing instructors had it right!!  *SCRUB THE HUB*

• Cleanse line ports, ampules, and stopcocks with alcohol prior to entry—replace caps!

• Flip top removal, use alcohol prior to access

• Do not draw any fluid out of the patient bag; use individually wrapped saline syringes for flushes and diluents
Surgical Care Improvement Project (CMS) Measures to Prevent SSIs

• Preop antibiotic within one hour prior to incision, 2 hours for Vancomycin and fluroquinolones

• Proper hair removal methods use clippers

• Blood glucose < 200 mg/dL

• Maintain normothermia > 36° C
Injection Practices

• Though located in this Section of the Guide, we will discuss this important issue LAST.....
Preventive Measures: Procedural

Dealing with the machine and equipment
Disinfection and Sterilization

• Disassemble equipment
• Remove visible contaminants first
• Follow individual manufacturer guidelines
• Proper technique must be followed and documented for each piece of equipment that contacts patients
Infection Risk Spaulding Class

- **Critical items** - contact sterile body tissues - sterilize, keep sterile – vascular catheters

- **Semi-critical** - contact mucous membrane - high level disinfection/sterilization - L-SCOPE BLADES

- **L-SCOPE BLADES Must Be STORED**: clean, COVERED confined...

- **Non-critical** -- contact intact skin — must be cleaned between patients
Anesthesia Workspace Surfaces

• Machine surfaces, knobs, pumps, glucometers, blood/ fluid warmer CONTAMINATED
• Clean b/t cases w. EPA-approved low or intermediate-level disinfectant
• Follow manufacturer recommendations
• KEEP MATERIALS FOR NEXT CASE IN CLEAN PLACE, CONFINED AND COVERED
Anesthesia Machine System

- Assign personnel responsible for regular cleaning on a daily schedule

- YOU MAY Place a **FILTER** between patient/circuit - disinfect machine following **pulmonary contaminated** cases

- To disinfect each component--Follow manufacturer guidelines---document to help avoid liability

- Consult the Guide for specific recommendations
Heat/Moisture Exchangers and Filters

• HMEs may not have filters to prevent infection
• Filtering for infection prevention should commence as a separate intervention at another location between the patient and circuit-
  • HI Efficiency Particulate Aerosol (HEPA)-
  • Traps 99% of .3μm particles
• Consult the Guide for details-
  • Dorsch and Dorsch 5th 2008
Airway Equipment

- Oral/nasal airways; stylets, bougies, connectors single use or high level disinfection
- Reusable LMAs: difficult to remove all protein
- Laryngoscopes
  - Handles (non-critical equipment) are contaminated, clean with low level disinfectant b/t patients
  - Blades (semi-critical): must be disinfected/sterilized, stored in a manner that prevents recontamination—clean, covered, confined—not open in drawer
RE-USE “Single-use” labeled circuits with a filter? FDA says................

• Items labeled “SINGLE USE”, when reused, impose additional liability on the individual and institution for proper functioning

• Permissible to RE-use “multiple-use” circuits with breathing filter if manufacturer recommendations are followed

• Outer surfaces of multiple use circuits must be cleaned with disinfectant between patients
Bronchoscopes, TEE Probes

• Difficult to disinfect—design, fiberoptic materials, tiny passages

• *Pseudomonas* outbreaks

• Clean equipment scrupulously, & perform high level disinfection and sterilization between patients

• **Semi-critical equipment**: Stored clean, covered, confined
Preventive Measures: Environmental

Interacting with the clinical environment and controlling sources of infection
Housekeeping Practices for Environmental Surfaces

- Facility schedule for regular cleaning according to OSHA
- NON-critical surfaces—floors, counters, keyboards, phones, bins, waste receptacles, protective covers—low-level disinfection
- No alcohol or mist-producing agents for large surfaces—approved non-toxic detergents
Laundry

• Handle contaminated laundry as little as possible
• Bag soiled linen plastic bag using color coded methods---**red** for biohazardous waste contamination,
• Transport carefully, avoiding environmental contamination
Personal Protective Equipment

- Eye protection
- Gowns
- Gloves
- Masks, Hats
- OR Scrubs—home vs. institutional laundry
- Change GGM between cases/contacts; scrubs if contaminated
Containment Labeling and Disposal of Biological Waste

- Know and follow local/state/federal regulations—appropriate bagging, rigid containers, color coding
- **No recapping sharps**; need many convenient sharps boxes.......really!!!!!!!
- **Double gloving** decreases risk of needle stick injuries!!!
# Medical Waste Management

## Non Hazardous

<table>
<thead>
<tr>
<th>Clear Bag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contaminated:</td>
</tr>
<tr>
<td>Trash - paper, plastic</td>
</tr>
<tr>
<td>Gloves, gowns, masks, goggles, and face shields</td>
</tr>
<tr>
<td>Packaging, wrappers, containers</td>
</tr>
<tr>
<td>Drapes</td>
</tr>
<tr>
<td>Empty tubes, vials, NS</td>
</tr>
<tr>
<td>Dextrose IV bag sets without needles</td>
</tr>
<tr>
<td>Disposable patient items</td>
</tr>
<tr>
<td>Chux / diapers (soiled ok)</td>
</tr>
<tr>
<td>Dressings, not dripping blood or other potentially infectious materials</td>
</tr>
</tbody>
</table>

## Bio Hazardous

<table>
<thead>
<tr>
<th>Red Bag in Red Can</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anything contaminated with dripping blood, body fluids, or other potentially infectious material:</td>
</tr>
<tr>
<td>Blood or blood products (albumin, IVIG) or IV tubing with visible blood</td>
</tr>
<tr>
<td>Containers with fluid blood, body fluid or other potentially infectious material</td>
</tr>
<tr>
<td>Suction canister liners</td>
</tr>
<tr>
<td>Hemovacs</td>
</tr>
<tr>
<td>Pleurevacs</td>
</tr>
</tbody>
</table>

## Sharps - Excluding Pharmaceuticals

<table>
<thead>
<tr>
<th>White Top Sharps Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>All sharps:</td>
</tr>
<tr>
<td>Needles, blades, scalpels, razors, pins, clips, staples, IV spikes</td>
</tr>
<tr>
<td>Sharps from procedures</td>
</tr>
<tr>
<td>Empty syringes, tubexes, carpjests, packaged needles, used needles</td>
</tr>
<tr>
<td>Trocars, introducers, guide wires</td>
</tr>
</tbody>
</table>

## Pharmaceutical / Sharps

<table>
<thead>
<tr>
<th>Purple Top Reusable Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any receptacle with medication:</td>
</tr>
<tr>
<td>Sharps from procedures</td>
</tr>
<tr>
<td>Partially used prescription or over-the-counter medication: vials, tablets, capsules, powders, liquids, creams/lotions, eye drops, suppositories</td>
</tr>
<tr>
<td>All IV bags containing drugs and tubing</td>
</tr>
<tr>
<td>Full or partial syringes</td>
</tr>
<tr>
<td>Glass vials, ampules</td>
</tr>
<tr>
<td>Narcotics, controlled substances</td>
</tr>
<tr>
<td>Narcotic patches, cut in half</td>
</tr>
<tr>
<td>Carpjests, tubexes</td>
</tr>
</tbody>
</table>

## Chemo

<table>
<thead>
<tr>
<th>Yellow Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace chemo including all supplies used to make and administer chemo medication:</td>
</tr>
<tr>
<td>Tubing</td>
</tr>
<tr>
<td>Empty bags</td>
</tr>
<tr>
<td>Bottles</td>
</tr>
<tr>
<td>Vials</td>
</tr>
<tr>
<td>Syringes</td>
</tr>
<tr>
<td>Gloves</td>
</tr>
<tr>
<td>Masks</td>
</tr>
<tr>
<td>Gowns</td>
</tr>
<tr>
<td>Wipes</td>
</tr>
</tbody>
</table>

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Contact: Pharmacy @ 310-267-8500 or Safety Department @ 310-825-4012 if you have any questions
Safe Injection Practices!!!

• Huge and controversial issue
• Route for most outbreaks
• Public scrutiny
• Regulatory focus and proliferation
• COMPLEX PHENOMENON
• Problem is: OUTBREAKS CONTINUE
The Players in the **Safe Injection Practices** ISSUE

- Patients—vulnerable, high expectations
- Providers—endless education and blame
- Administrators—interested in costs
- Drug Manufacturers—shortages; SDV size
- Pharmacy Community—USP Chapter 797
- Regulatory Agencies—under public pressure
- Nonprofits—demanding change
WHY DO OUTBREAKS CONTINUE?

• Administrators may pressure providers to re-use SDVs to cut costs

• Drug Manufacturers: SDV sizes are too large. Drug shortages continue---why?????

• Providers may be faced with having insufficient drug unless

• SDVs are re-used for multiple patients.
Why continuing outbreaks?

- Pharmacies may refuse / can’t produce anesthesia drugs using hood conditions
- Recent fungal outbreak reveals compounding pharmacies have infection control issues of their own...... New England Compounding Center: 50 dead, 700 still sick/disabled: need more oversight
The Solution to Safe Injection Practices—Educate ALL OF US!!

- ADMINISTRATORS: stop asking us to be unsafe to save money
- PHARMACY: help us prepare our drugs—divide the propofol ampules into syringes
- MANUFACTURERS: stop the drug shortages and give us SDVs of reasonable size

NEED TO GET **ALL** THESE PLAYERS ON BOARD ---

PATIENT SAFETY IS EVERYONE’S RESPONSIBILITY
Right Thing to Do for ALL of US

• Follow CDC Guidelines: ONE patient, ONE syringe, ONE needle

• ONE TIME

• ONE SDV only ONE TIME for ONE PATIENT: CDC 6/2012 re-issued prohibition, no reentry SDV for multiple patients; ASA/AANA support!
Meanwhile, in the real world.... We still have to draw up our own drugs!!!

• Ideal if pharmacies could prepare all of our drugs----
• Never happen: Too many drugs, patient conditions changing.
• Pharmacies can be overloaded and unable to help with even our basic drugs.
Meticulous Asepsis

• WHEN WE PREPARE OUR OWN DRUGS
• STUDIES HAVE SHOWN WIDESPREAD CONTAMINATION IN OR ENVIRONMENT
• STEP UP AND **BE METICULOUS WITH ASEPSIS**
• USE ALCOHOL TO PREP SURFACES
• ONE NEEDLE/PATIENT/SYRINGE/ONCE
• DO THE RIGHT THING AS WE WERE TAUGHT TO DO
And the beat goes on.....

- April 2013 Tulsa OK Oral Surg Clinic
- Radiology Technician multi-state DELIBERATE exposure of patients
- May, 2013 Catskill Hospital, *single-use* insulin pens re-used on *multiple* patients....
- June, 2013 Tri-County Spinal Care Center- South Carolina, 50 pts Hep B + after injections
And on.....

- July, 2013, elderly Korean female suicided-got MRSA from a Pain Clinic in Georgia
- 2011 National hospital survey: many still have no effective infection control policies in place
- CMS beginning **post discharge surveys** for infections: IF WE ARE INFECTING PATIENTS, they will figure it out........................
PRIORITIZE Infection Control

• All anesthesia professionals must prioritize infection control--- MAKE IT PART OF OUR CULTURE

• Infection control is just as important as cardiovascular stability.

• Until we do this, anesthesia-related outbreaks will continue.
Conclusions

- Patient infection during OUR CARE is a CRISIS!!
- Infection Control is a TOP PRIORITY
- Infection Control is an **ethical** requirement of risk management
- Our practice is under increasing SCRUTINY....
- **Failure to comply poses risks to patients, the profession and your professional future with severe consequences possible**
Reference


Centers for Disease Control On-Line Website

Questions: practice@aana.com
Thank You & Work Safely!!