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

Introduction

• 2009: James Walker, CRNA, DNP, AANA President: Let’s re-do the old Infection Control Guide, 1997
• Practice Committee forms task force
• We had NO IDEA WHAT WE WERE GETTING INTO!!!!
• Infection control science has EXPLODED
• Regulation has EXPLODED—it’s HOT!!
So---Mary and Margaret and Chuck and Michele and Mani (NOT TO MENTION EWA AND KYMIKA)

All got (felt like, equivalent to) a DNP in
INFECTION CONTROL!!

ONE MAJOR FORCE DRIVING CHANGE:
Regulatory Agencies’ growing role in infection control!!

Nonprofits and Infection Control

• HONOREform

• Safe Injection Practices Coalition: One and Only Campaign

• AANA is a member organization
Science has exploded

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...

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 were indicted for 2nd Degree Murder for death of endoscopy patient Summer 2012............

A beautiful document

Infection Control Guide
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

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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
  – >60% 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

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
<table>
<thead>
<tr>
<th>Universal (Standard) Precautions</th>
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<tr>
<td>• Hand hygiene before and after patient contact</td>
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<tr>
<td>• Gloves for any patient contact; change after each contact</td>
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<tr>
<td>• Protective eye shields</td>
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<td>• Protective facemasks</td>
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<thead>
<tr>
<th>Transmission-Based Precautions-added to Universal as needed</th>
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<tr>
<td>• <strong>Contact</strong>-Surgical gown any direct contact</td>
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<tr>
<td>• <strong>Droplet</strong>-face mask within 6-10 feet</td>
</tr>
<tr>
<td>• <strong>Airborne</strong>-N95 respiratory 5μ filter</td>
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<tr>
<td>• <strong>Spongiform</strong>-prion destruction measures, e.g. extreme temp</td>
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</tbody>
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<thead>
<tr>
<th>Airway Management and Asepsis</th>
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<tr>
<td>• Double glove—remove outer to adjust gas after intubation or instrumentation</td>
</tr>
<tr>
<td>• Keep contaminated equipment on anesthesia machine shelf</td>
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<tr>
<td>• Keep grossly contaminated equipment covered with impermeable material, separate</td>
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<tr>
<td>• Keep clean stuff on cart, don’t mix</td>
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<tr>
<td>• Same for NG tube insertion</td>
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<td>• Monitor environment, clean afterward</td>
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Ventilator Associated Pneumonia Care Bundles

- Non-invasive ventilation if possible
- Extubate ASAP
- Semi-recumbent
- In-line subglottic suction, sheathed suction catheters
- Cuff 20 cm H20
- Avoid naso-endotracheal route
- Avoid H2 blockers, PPIs 2° to aerodigestive bacteria

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Regional Anesthesia

- ≥ 0.5% Chlorhexidine + 70% alcohol 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

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Epidural Catheters

- Check insertion/dressing daily signs infection, back pain, neurological signs
- Remove within 48 hours, infection risk
- 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
• Maintain sterile field with wide draping

Central Line Access and Care

• Site dressing: clear, transparent adhesive
• Cleanse skin chlorhexidine dressing changes; avoid ointments except for dialysis
• Hand hygiene prior to access; scrub hub alcohol
• 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 and stopcocks with alcohol prior to entry
• 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 fluoroquinolones
• Proper hair removal methods use clippers
• Blood glucose < 200 mg/dL
• Maintain normothermia > 36° C

Injection Practices

—save till the end....

• Big big big big issue for all of us

• We will discuss this aspect of infection control as the last item today, though it is in this section of the Guide
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—LSCOPE BLADES
- KEEP STORED L-SCOPE BLADES COVERED
- Non-critical—contact intact skin—must be clean
- For Joint Commission accreditation, facilities must use evidence-based national guidelines to develop infection control activities
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
- Filter between patient/circuit recommended
- To disinfect each component--Follow manufacturer guidelines--document to help avoid liability
- Consult the Guide for specific recommendations

Heat/Moisture Exchangers

- 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
- Consult the Guide for details
Airway Equipment

- Oral/nasal airways; stylets, bougies, connectors single use or high level disinfection
- LMAs reusable difficult to remove all protein
- Laryngoscopes
  - Handles are contaminated, clean with disinfectant b/t cases
  - Blades: must be disinfected/sterilized, stored in a manner that prevents recontamination—clean, covered, confined—not open in drawer

Anesthesia Circuits and Breathing System Filters: Single Use Items, Re-use?

- Items labeled "SINGLE USE", when reused, impose liability on the individual and institution for proper functioning
- Re-use “multiple-use” circuits with breathing filter is permissible 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 and high level disinfect scrupulously
- Ultrasound probes, sterile covers for contact, may puncture. High level disinfection between uses if sterile tissues contacted
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—do not store or rinse at site of use
- Bag soiled linen using color coded methods—red for biohazardous waste contamination, plastic bag to prevent leakage
- 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
- **DOUBLE GLOVING** decreases risk of needle stick injuries!!!
**Safe Injection Practices!!!**

- Huge and controversial issue
- Route for most outbreaks
- Public scrutiny
- Regulatory focus and proliferation
- COMPLEX PHENOMENON
- Problem is: OUTBREAKS CONTINUE

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The Players in the **Safe Injection Practices** ISSUE

- Patients—vulnerable, high expectations
- Providers—endless education and blame
- Administrators—pressure to cut costs
- Drug Manufacturers—shortages; size matters
- Pharmacy Community—USP Chapter 797
- Regulatory Agencies—under public pressure
- Nonprofits—demanding change

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**WHY DO OUTBREAKS CONTINUE?**

- Pressure to re-use SDVs to cut costs

- Drug Manufacturers: drug shortages continue. SDV sizes are too large.
- Providers may be faced with having insufficient drug unless
- SDVs are re-used for multiple patients.
Why continuing outbreaks?

• Pharmacies sometimes refuse or are unable to produce drugs using hood conditions to meet anesthesia department demands.

The Solution to Safe Injection Practices

• ADMINISTRATORS: stop asking us to be unsafe to save money
• PHARMACY: help us prepare our drugs
• 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
Anesthesia Specific Problems in Asepsis

- Number of clinical contacts and hand hygiene
- Need for speedy intervention is problematic to hand hygiene and aseptic line injections
- Airway management and contamination
- Drug preparation: we administer so many IV drugs. Safest if prepared under hood conditions, not really possible for all necessary drugs during anesthesia care.

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

Conclusions

- Infection Control is an essential part of anesthesia practice, equal in importance to cardiovascular stability
- I.C. --ethical requirement of risk management
- Increased scrutiny from public and regulatory
- Failure to comply poses risks to patients, the profession and your professional future with severe consequences possible
Reference


Questions: practice@aana.com

Thank You
&
Work Safely!!