Infectious Disease 101
Part 1
Evidence
Based Decontamination
for Manual Providers
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Background
• DC’s and other manual providers have more hands-on contact than many other types of providers
• Chiropractic and massage tables are unusual
  o Frequently, patient is prone on treatment table with face contacting split facial piece and hand contact with hand rests
  o Tables are usually cloth or vinyl with changeable face piece paper roll
• Disinfection methods differ from other medical tables

Background
• A systematic infection control protocol is not in place for manual professions
• Chiropractors are ill-equipped to handle body-borne pathogens in their offices
• Pathogens harmful to patients and doctors have been found on chiropractic tables
• Spreading infection to patients, staff and family when risk reduction measures are known but not practiced is unprofessional and unethical
Terminology

- Cleaning and Decontamination
- Sterilization
- Disinfection

Cleaning and Decontamination

- Removal of visible soil (e.g., organic and inorganic material) from objects and surfaces
- Normally is accomplished manually or mechanically using water with detergents or enzymatic products
- Thorough cleaning is essential before high-level disinfection and sterilization because inorganic and organic materials that remain on the surfaces of instruments interfere with the effectiveness of these processes
- Decontamination is the removal of pathogenic microorganisms from objects so they are safe to handle, use, or discard

Sterilization

- Process that destroys or eliminates all forms of microbial life
- Carried out in health-care facilities by physical or chemical methods
- Steam under pressure, dry heat, EtO gas, hydrogen peroxide gas plasma, or liquid chemicals
- Sometimes "disinfection" is referred to as "partially sterile"
  • Misnomer since sterilization is an absolute term
Disinfection

- Process that eliminates many or all pathogenic microorganisms, except bacterial spores, on inanimate objects
- In health-care settings, objects usually are disinfected by liquid chemicals or wet pasteurization
- Factors that affect efficacy of both disinfection and sterilization
  - Prior cleaning of the object
  - Organic and inorganic load present
  - Type and level of microbial contamination
  - Concentration of and exposure time to the germicide
  - Physical nature of the object
  - Temperature and pH of the disinfection process

OSHA

- Requires all health care professionals who may be exposed to body fluids or wastes to adopt a plan to prevent the exposure of spreading blood or fluid-borne pathogenic microorganisms
- Manual providers are not at great risk for occupational exposure to bloodborne pathogens
- But clinicians should still adopt Universal Precaution guidelines

Universal Precautions Overview

- Assume all individuals you have contact with are potential carriers for blood borne pathogens (bbp)
- Assume all body fluids are infectious for bbp
- Avoid contact whenever possible with blood, body fluid or any areas of local infection
- Do not eat, drink, smoke, handle contact lenses, or apply make-up without washing hands first
- Wear gloves when indicated
- Practitioners should keep open wounds or inflamed dermatitis covered whenever possible
- Handwashing guidelines should be followed
Universal Precautions Overview

- Vaccination for Hepatitis B
- Laundry should be handled minimally
  - No sorting or rinsing (increase the risk of exposure)
  - Linens and towels must be changed between each pt.
  - Store dirty linens in separate, closed container
- Sharps (needles, lancets, glass, etc.) should be treated as if infected
  - Place in puncture resistant, labeled sharps container
Part 2

Universal Precautions Overview

- Disinfect and clean contaminated areas ASAP and between patients
- Personal Protective Equipment (PPE) if anticipated potential of exposure to blood/OPIM gloves, gowns, goggles, face shield, masks, and CPR Micro shields.
- Post Exposure to blood or OPIM internally (puncture, mucous membranes, open areas, etc.) in a work situation, report and seek medical follow up immediately

What's On Those Tables?

- Bifero et al identified several pathogenic microorganisms on chiropractic tables including methicillin-resistant *Staphylococcus aureus* (MRSA) *
  - Almost 1% of people carry MRSA (Flayhart, Clin Microbiol. 2005)
- Chiropractic treatment facilities frequently don't adhere to adequate infection control measures regarding tables


What Else Is On Those Tables?

- 10 treatment tables selected in chiropractic outpatient clinic
- Non-porous, vinyl surfaces and face paper roll
- All tables had gram (-), gram (+) or both types of microbes
- *S. epidermidis, S. saprophyticus* and *S. aureus* and MRSA

What's On Those Tables?

- Infection control is more important than ever
  - pandemic influenza threat
- Reasonable precautions to reduce risks should be taken

Face Paper

- Doesn't prevent microbial growth
- Should still be used whenever face contact with headrest
- Changed after each patient
- Barrier to skin secretions, make-up and discharges from nose and mouth which left on the table can likely support microbial growth

Disinfection Helps

- Post-sanitizing testing demonstrated no pathogenic microbes present on tested tables after use of either of the disinfecting agents:
  - Pre-packaged wipe: 70% isopropyl alcohol and 10% acetone
  - Lysol Brand® sanitizing wipe
- Direct table disinfection several times per day
- Start of the day, mid-day, close of day and any time clinical judgment warrants additional disinfecting

Many Surface Disinfection Products

Look for a CDC or EPA approved spray or wipe.

Evans et al (2009)

- Prior studies confirmed pathogenic microbes are present on treatment tables
- No standardized protocols exist in the United States regarding table sanitizing and hand hygiene in chiropractic clinics or education institutions.
- This article reviewed the scientific literature on the subject
- Developed recommendations on hand hygiene and table sanitizing procedures in chiropractic facilities


Table Decontamination Guidelines

1. Remove facepaper to expose headpiece
2. Clean the surface of any visible soils, organic matter or secretions
   - Use soap & water or any safe detergent
3. Spray or wipe surface disinfectant on all surfaces including paper bar, hand rests, chest piece. If sprayed, wipe with paper towel.
   - isopropyl alcohol at least 60–90%
   - phenol
   - sodium hypochlorite including 1:10 dilutions of chlorine bleach
   - chlorhexidine-containing compounds
   - ammonium chlorides
Table Decontamination Guidelines

4. Allow surface to air dry
5. Repeat after each patient

U.S. Department of Health and Human Services (Centers for Disease Control and Prevention CDC). Atlanta, GA.


Contact times

• An important issue concerning use of disinfectants for surfaces
• Contact time specified on the label of the product is often too long to be practically followed
• The labels of most products registered by EPA for use against HBV, HIV, or M. tuberculosis specify a contact time of 10 minutes
  • May not be practical
• Multiple scientific papers have demonstrated significant microbial reduction with contact times of 30 to 60 seconds
• Consider and use products that have the shortened contact time
Part 3
Are Cloth Tables Any Better?

- Cloth tables were found to contain pathogenic microbacteria and allergens
- Numerous microbacteria strains including *Staphylococcus aureus* and *Propionibacterium*
- Allergen-producing molds, including *Candida*
- No other healthcare profession routinely uses cloth treatment tables
- Since cloth tables cannot be as easily disinfected, authors recommended chiropractors discontinue use of cloth-covered treatment tables


Porous Items

- Gowns, towels, hot pack covers, traction harnesses and other devices coming in contact with a patient's skin
  - Wash in hot water and detergent before the next patient use

Disinfecting Fabric Items

- Routine laundry procedures, detergents, and laundry additives should make gowns, towels, and linens safe to use
- Use the warmest temperature allowed on the fabric label
- Bleach when necessary
Handwashing

- CDC: hand washing and sanitizing may be the single most important factor in reducing spread of infection by an individual or health provider
- Especially when doctors have direct patient body contact
- CDC: either anti-microbial soaps or waterless sanitizer after patient contact to prevent spread of *S. aureus-MRSA*
  - Plain soaps remove soils and non-pathogenic bacteria, but not all pathogenic organisms

*Centers for Disease Control and Prevention. MMWR 2002, 51(16):1-34*
Alcohol Hand Sanitizers

- Alcohol-based hand sanitizing gel is acceptable if 70–90% isopropyl alcohol
- CDC considers them more effective than hand-washing for removing bacteria and viruses
  - not for visibly soiled hands
- Compliance rates are higher among health personnel, when they contain lotions or vitamin E
  - less skin drying and dermatitis
- Not all “waterless” sanitizers are created equally
  - use only Alcohol Based ones

Alcohol Hand Sanitizers

- Sanitizing gels should completely cover hands and fingers on each hand and be allowed to dry and should not be wiped off with a towel
- Use about 1/2 teaspoon
- If hands feel dry after rubbing together for 10–15 seconds, an insufficient volume of product was applied
- Avoid strong fragrances -- may be poorly tolerated by staff or patients with respiratory allergies

Placement of Hand Sanitizers

- One in each treatment room where both clinicians and patients can access them
- Restrooms
- Front desk
- Waiting room
- Can be wall mounted or countertop units
- Hand hygiene is influenced by the visible behaviors of co-workers (Lankford et al Emerg Infect Dis 2003) so set a good example
Part 4
How About Gloves?

• Gloves should be worn when there is a history of skin lesions or visible lesions present on the patient
• If the clinician has an open cut, sore or skin infection on the hands
  ▪ May use a finger cot over a bandage if just one finger
  ▪ Liquid bandage application is also permitted
• When handling trash
• During disinfection of equipment with bodily fluids
• When entering the oral cavity (internal TMJ TrP's)
• Disinfect hands after removing gloves

Types of Gloves

• Nitrile
  o Pro: Designed for medical use, highest grade protection
  o Con: Expensive
• Latex
  o Pro: Thin, strong, affordable, form fitting
  o Con: High possibility of allergies
• Vinyl
  o Pro: No allergies, won’t break down with oil based products
  o Con: Thicker (less tactile sensation), less conforming, more expensive than latex, not as strong

Body Fluids on Items

• Failure to properly disinfect or sterilize equipment leads to person-to-person transmission via contaminated device
• Items soiled with body fluids, especially by patients who are known to be febrile or sick
  o e.g., used tissues or table face-paper
    ▪ handle with gloves
    ▪ dispose in an appropriate manner or treat with an appropriate germicide
• Items should be placed in appropriate containers and disposed properly
Spaulding Classifications

• Earle H. Spaulding (1968) devised a rational approach for disinfection and sterilization of patient care items and equipment
• Instruments and items for patient care were divided into 3 categories on the basis of the degree of risk of infection involved in the use of the items.
• Critical, semicritical, and noncritical

Critical items

• High risk of infection if the items are contaminated with any microorganism
• Enter sterile tissue or the vascular system and must be sterile
• Surgical instruments, cardiac and urinary catheters, implants, and ultrasound probes used in sterile body cavities
• Heat or gas sterilized only

Semicritical items

• Come in contact with mucous membranes or nonintact skin
• Respiratory therapy and anesthesia equipment, some endoscopes
• These medical devices should be free of all microorganisms
• Require high-level disinfection using chemical disinfectants
Noncritical items

- Come in contact with intact skin but not mucous membranes
- Sterility of items coming in contact with intact skin is not critical
- Blood pressure cuffs, waiting room furniture, floors
- May be decontaminated where they are used

Problems with Spaulding Classes

- Oversimplification
- Does not consider problems with reprocessing of complicated medical equipment that often is heat-sensitive
- Problems of inactivating certain types of infectious agents (e.g., prions: Creutzfeldt-Jakob disease [CJD] agent).
- In some situations, choosing a method of disinfection remains difficult, even after consideration of the categories of risk to patients.
- Particularly for a few medical devices (e.g., arthroscopes, laparoscopes) in the critical category because of controversy about whether they should be sterilized or high-level disinfected
- Processing instruments used in conjunction (critical with a semicritical item)
Part 5
Situation One

A patient comes to your office for care. She has a deep productive cough and blows her nose several times during her visit.

How would you best decontaminate your office after her visit?

Situation One Answer

1. Use proper hand washing technique or adequate alcohol based hand sanitizing gel

2. Disinfect table using disinfecting cleaner paying particular attention to the headpiece and hand rests

3. Use a disinfectant to wipe down all surfaces she may have come in contact with: doorknobs, chair arms, countertop etc.

4. All towels, gowns, hot pack covers etc. should be washed in hot water and detergent before reusing

Situation Two

Your patient brings along her son who is home sick from school to her appointment. During the appointment, the child vomits on the chair and floor of your treatment room.

What is the best way to clean and decontaminate this room?
Situation Two Answer

This involves bodily fluids so observe guidelines for handling of bodily substances. Use universal precautions.

1. The person cleaning should wear gloves and all garbage should be double bagged.

2. Clean the area using a disinfecting cleaner. Wipe all surfaces. Pay attention to walls, sides of tables and carts, and nearby equipment.

3. Mop floor if possible. Fabric chairs should be cleaned and allowed to dry before using again.

Situation Three

Your patient is sitting on the exam table when he experiences a nose bleed. He is able to find the box of tissues but some blood drops on the table and floor.

What steps need to be taken to decontaminate the room?

Presence of blood/bodily fluid

1. Gloves. Garbage should be double bagged.

2. All surfaces should be wiped down with a disinfectant. Check table crevices, knobs, space between cushions etc.

3. The floor should be mopped if possible.
What Do The Schools Teach?

- Students report they favor regular hand washing and hand sanitizing, and recognize the need to disinfect tables.
- Mechanisms not in place for hand sanitizing and table disinfection on a routine basis.
- Sixty-nine percent said they frequently or always washed their hands between contacts. A minority (28%) carried personal hand sanitizers.
- Females were significantly more likely to do so.
- Most (95%) changed face paper on treatment tables, but disinfection of table surfaces was practically non-existent.

Evans MW. Attitudes and Behaviors of Chiropractic College Students on Hand Sanitizing and Treatment Table Disinfection; Results of Initial Survey and Focus Group J Amer Chiropr Assoc 2007 May-June;44(4):13-23

Conclusions

- Require infection control measures be practiced.
- Use alcohol hand sanitizers between every patient.
- Replace or recover all cloth tables and benches.
- Wipe tables with disinfection agent between every patient.
- Consider gloves when clinically indicated.
- Use both active and passive methods of infection control.
- Universal precautions.
- Perform routine surveillance to ensure efficacy.
- Offer workers mandated sick time when ill.
- Offer appropriate vaccine options.

Thank You For Participating

Be sure to look for our other courses!

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&

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