Surviving an Infection Prevention Survey

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Disclaimer

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Objectives

- Discuss work flow processes and barrier procedures that decrease the risk of microbial transmission
- Identify areas for improvement that focus on decreasing healthcare infections
INFECTION PREVENTION

IT’S EVERYONE’S RESPONSIBILITY

Creating a Culture of Safety
For Best Practice
If 99% were good enough....

- There would be a major plane crash every 3 days
- 12 babies would be given to the wrong parents every day
- 20,000 incorrect prescriptions would be written annually
- 16,000 pieces of mail would be lost by the U.S. Postal Service every hour
Questions

- Do you have a staff member identified as IP/QI “champion”?
- Do you conduct regular IP rounds?
- Have you identified areas of risk for infection?
- Are you able to identify/report breaches without retaliation?
- Do you have a committee to address issues for improvement?
- Do you have a quality improvement program in place to monitor IP practices?
- Are we doing the best we can to follow-up with patients for possible HAIs/sentinel events?
ECRI Institute’s White Paper

- Top Health Technology Hazards for 2011:
  - Prioritizing patient safety efforts
  - Increase awareness, prevent risks
- #3 “Cross contamination from flexible endoscopes”
- Failure to perform proper steps
  - Compromises integrity of the process
  - Creates inconvenience and anxiety to patients
  - Potential life threatening infections
- Consistent adherence to instructions
“More HAI outbreaks linked to contaminated endoscopes than any other medical device”

“Clean vs. sterile” procedure mentality
Flexible endoscopes acquire high levels of microbial contamination
Environment is a “mixing pot” of microbes
  • Patients, family, visitors, staff
Trends in Infections

- Changing epidemiology of infectious agents in U.S.
- Increase in community-acquired
- Social and demographic changes
  - Population in community more vulnerable
  - Shorter hospital stays
  - More procedures performed in out-patient facilities
  - Home health care
  - ‘at-risk’ groups in the home
Healthcare Associated Infections (HAIs)

- Definition: Infections patients acquire during course of receiving treatment for other conditions
- Kill more people than AIDS, breast cancer and auto accidents combined
- 2 million infections
- 4th leading cause of death in U.S.
- 8 million excess hospital days
- Up to $30.5 billion in costs
- Death and LOS increased for IBD patients with HAI
- HAIs most frequent in patients with severe liver disease
Healthcare Associated Infections

- Contributing factors
  - Receiving intensive care
  - Increasing rates of antimicrobial resistance
  - Procedure/device related infections
  - Complex medical procedures
  - Invasive medical therapy
  - Increasing elderly population
  - Immune compromised population
Healthcare Worker Misconceptions

- HAI incidence is insignificant
  - (“We don’t have a problem with infections...”)
- Cost of HAI is offset by reimbursement
- HAI is expected outcome
  - Treating older, sicker patients
  - Performing more invasive procedures
Infection Prevention Practices in Ambulatory Surgery Centers

- Surgery centers surveyed
- 67% with at least one infection control lapse
  - Not following instructions for processing equipment
  - Poor medication/injection practices
  - Hand hygiene
  - Non-compliance with PPEs
  - Clean/disinfect procedure rooms between cases
  - Reuse/reprocess single use devices
  - Jewelry
  - Violation of surgical attire protocols
  - Staff lacking IC training
JC Noncompliance Citations
January-June 2010

- 23% did not identify risks for acquiring HAIs
- 22% organizations did not reduce risk of infection
- 27% acute care hospitals did not maintain safe environment
- Patient safety sentinel events
Antimicrobial Resistance

- What is Resistance?
  - Ability of a specific organism to withstand a drug that interferes with its growth function
  - Involves changes in bacteria’s genetic material

- Crisis proportions across U.S.

- Increase in community infections

- New antibiotics NOT being developed

- Why be concerned about resistance?
  - Increased illness severity
  - Longer hospital stays
  - Adverse long term effects
  - Higher mortality rates
Multi-Drug Resistant Organisms
“Superbugs”

- MRSA, VISA, VRSA
- VRE
- Extended Spectrum Beta Lactamases (ESBLs)
- *Acinetobacter baumannii*
- *Klebsiella pneumonia*
- *C. difficile*
- Vancomycin is standard of care but losing effectiveness
- Many MDROs now endemic in hospitals
HOW ARE INFECTIONS TRANSMITTED??
Microorganisms in GI Environment

- Pseudomonas aeruginosa
- Staphylococcus aureus
- Salmonella, Shigella
- Enterobacter, E-coli,
- Klebsiella
- Campylobacter
- H-pylori
- Serratia marcesens
- Clostridium difficile
- Mycobacterium
- Glut-resistant M. chelonae
- Giardia, amebiasis
- HBV, HCV, CMV
- Herpes simplex
- Candida
- Cryptosporidium
CHAIN OF INFECTION

Infectious Agent

Susceptible Host

Portal of Entry

Mode of Transmission

Portal of Exit

Involves All Health Care Professionals = YOU

Reservoir Host
Resistance of Microorganisms

PRIONS (Creutzfeld-Jakob Disease)
- Prion processing

BACTERIAL SPORES
- Clostridium difficile
- Clostridium perfringens
- Cryptosporidium
- Sterilization

MYCOBACTERIUM
- Mycobacterium tuberculosis
- Mycobacterium chelonae
- High Level Disinfection

NONLIPID VIRUSES
- poliovirus -- polio
- rhinovirus -- common cold
- Intermediate Level Disinfection

FUNGI
- Candida albicans -- thrush
- Aspergillus
- Trichophyton fungus -- Athlete's Foot

VEGETATIVE BACTERIA
- Pseudomonas, sp.
- Salmonella, sp.
- Staphylococcus, sp.
- Escherichia coli -- E coli
- Low Level Disinfection

LIPID VIRUSES
- Hepatitis A, B
- Herpes Simplex
- HIV
- MRSA
Transmission of Infection

- Colonized patient’s endogenous flora
- Direct/Indirect contact
  - Contaminated hands of healthcare workers
  - Patients
- Exogenous sources
  - Inanimate environmental surfaces
  - Medical equipment, devices
  - Medications and injection equipment
Devices and Instrumentation

- Pathway for introduction of pathogenic microbes
- Not following manufacturer’s instructions
  - Unable to identify specific model types
- Unsure of intended use
  - Critical, semi-critical, non-critical
- Untrained personnel
- Responsible personnel
  - Receive proper training
  - Undergo initial/annual competency testing
Low Compliance
Hand Hygiene

- Primary contribution to:
  - Increased risk of infection transmission
Contaminated Environmental Surfaces

- Critical source of contamination
- Material capable of supporting growth
- Direct patient contact
- Hand contact
- Contamination with body substances
- Environmental sources
  - Soil, dust, water
Non-Compliance

Personal Protective Equipment

- High levels of noncompliance
  - Uncomfortable
  - Too hot
  - Not readily available
  - Poor fit
  - Unattractive
- Threat to worker health and safety
Poor Awareness of Dirty/Clean
Unsafe Injection Practices

- Administration of anesthetics for outpatient surgical, diagnostic and pain management procedures
- Lapses occur in hospital and outpatient settings
- Same syringe/needle
- Single dose vs. multiple dose vials
- Reuse IV bags
- Anesthesia providers
- Strict adherence to policies and procedures
  - Surveillance, oversight, enforcement
  - Continuing education
Reprocessing Environment

- Many standards/recommended practices in place
  - AAMI ST79
  - AAMI ST 58
  - FDA
  - OSHA
  - CDC
  - SGNA
  - AORN
  - APIC

- Maintaining safe environment
- Limit cross contamination
- Prevent transmission of infection
Delays in Cleaning Lead to Biofilms

- Structured community of cells
- Formed as continuous layers
- Four functional states
  - Attachment
  - Micro-colonization
  - Biofilm formation
  - Detachment
- Implicated in HAIs/AERs/medical devices
INFECTION PREVENTION

Creating a Culture of Safety
Hand Hygiene

- Reduces incidence of infection
- Apply hand hygiene procedures
  - Correct, adequate
  - At correct time
- Hands-free hand equipment
  - Sink
  - Towels
  - Soap dispensers
- Alcohol sanitizers available
- Accompany with education
- Compliance program
Environmental Surfaces

- Surface material withstands frequent disinfection
  - Floors, surfaces, patient equipment
- Contaminated with blood/infectious materials
  - Focus on cleaning, then disinfection
- Vigorous environmental hygiene
  - Hospital grade germicides
- Use germicide correctly
  - Cleaners, sanitizers, disinfectants
  - Mops/buckets, sprays, wipes disinfection products
  - Wet surface contact time

- NEVER THE SWIPE AND THE WIPE!
Scrubs/Uniforms

- It’s all about SAFETY!
  - Promote worker safety
  - Provide a level of cleanliness and hygiene
- Scrubs = uniforms, not PPE
- Infections traced to contaminated apparel
- No home laundering
- Quality assurance monitoring of laundering processes
  - Healthcare-accredited laundry facility
- Regular cleaning of stethoscopes, ID badges
- Jewelry
Waiting Room/Check In

- Is it more for ambiance than prevention of infection?
- Is the furniture
  - Clean/sanitary?
  - No rips/tears?
  - Able to be cleaned?
- Alcohol sanitizers available for use
- Bathroom regularly checked/cleaned?
Patient Care Areas
Admission/Discharge

- High risk patients identified?
- High touch areas identified?
  - Patient furniture, stretchers, rails
  - Door knobs, push plates, light switches, faucet handles
  - Monitoring equipment/accessories
  - Computer keyboards/monitors
- Walls, blinds, curtains
- Floor
- Hand wash sinks
- Stethoscopes, pagers, cell phones
Patient Care Areas
Admission/Discharge

- IV solutions/tubing set-ups
- Medication storage
- Medication vials
- Single use/multi-dose
- Syringes and needles
- Medications, solutions labeled
- Glucose monitoring devices
- Sharps safety/disposal
Procedure Rooms

- Clean/dirty zones
- Sterile/clean supply storage
- Support/ancillary equipment
- Identification for reprocessed endoscope
- X-ray, fluoroscopy equipment
- Turnover times
  - Surfaces cleaned/disinfected
- PPE storage/disposal
- Hand wash sink
- Alcohol sanitizers
- Terminal cleaning at end of day
Transport to Reprocessing

- Responsibilities at point of use
  - Precleaning
  - Correct solution/dilution
  - Discard sharps, disposables
- Prepare for transport
  - Marked as hazardous
- Containment for protection (outside contaminated?)
  - Contained/covered in secure manner
  - Risk of exposure
  - Rigid container minimizes damage
Reprocessing Area

- Separate from patient care
- Barrier/spatial separation of dirty and clean
- Dirty/decontamination area
- Pass-through
- Clean reprocessing side
Decontamination Area

- Physical location
- Adequate size
- Defined work flow
Work Flow

- Defined “dirty to clean”
- Risk of cross contamination
Traffic

- Restricted to personnel working in the area
- Door closed
Ventilation

- Negative pressure over decontamination area
- 10 air exchanges/hour
- Door/windows closed
- No fans
## Controlled Environment

<table>
<thead>
<tr>
<th>Work Area</th>
<th>Temperature</th>
<th>Humidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decontamination</td>
<td>60°F and 65°F (16°C and 18°C)</td>
<td>30 – 60%</td>
</tr>
<tr>
<td>General Work Areas</td>
<td>68°F and 73°F (20°C and 23°C)</td>
<td>30 – 60%</td>
</tr>
<tr>
<td>Preparation &amp; Packaging</td>
<td>68°F and 73°F (20°C and 23°C)</td>
<td>35 – 50%</td>
</tr>
<tr>
<td>Sterile Storage &amp; Personnel Support Areas</td>
<td>May be as high as 75°F (24°C)</td>
<td>≤70%</td>
</tr>
<tr>
<td>Equipment Access Rooms</td>
<td>75°F and 85°F (24°C and 29°C)</td>
<td>30 – 60%</td>
</tr>
</tbody>
</table>
Lighting

- Adequate lighting
  - Overhead
  - Task
- No shadows
Liquid Waste Management
Liquid Waste Management

- Leak proof containers prevent exposure
- Discard disposable liner and tubing after each use
- Liquid waste disposed according to state regulations
  - Solidifier
  - Liquid waste disposal system
  - Pouring down sanitary sewer
- Transported according to state regulations
Emergency Eyewash Equipment

- Accessible within 10 seconds travel time of all chemical usage locations...
- For a strong acid or strong caustic, the eye wash unit should be immediately adjacent to the hazard
- Check eye wash equipment once/week
- Document weekly testing
Personal Protective Equipment

- Appropriate for activity
- Fluid resistant cover gown
- Cap/hair cover
- Protective eye wear/face shield
- Mask
- Gloves
- Remove without re-contamination
Personal Protective Equipment

- Lowers risk of exposure to hazardous chemicals
- Lowers risk of occupational acquired infections
- Reduces transfer of staff flora to equipment and room surfaces
- Minimizes cross-contamination risk to patients
- Increase education, training and monitoring
- Tie compliance to performance evaluation
Leak testing

- Performed prior to immersion
  - Correctly and accurately
- Identify any loss of integrity
- Defects harbor microorganisms
  - Provide environment for cross-contamination/pseudo-infection
Manual Cleaning

- Minimize any delay in cleaning
- Follow OEM instructions for pre-cleaning
  - Identify specific model type
  - Instructions readily available
  - Access all surfaces, all channels
  - Proper size brushes
- Decreases microbial contamination
- Prohibits formation of biofilms
Manual Cleaning

- Fresh solution
- Correct chemistry
  - Follow label instructions
  - Enzyme detergent
    - Nonabrasive, low foaming
    - Dilution rates
    - Soak times
    - Ensure correct temperature of water
    - Do NOT provide disinfection
- 2 sinks of adequate size
- Flush, brush, flush, rinse thoroughly
- Follow OEM instructions for valves, buttons
Single-Use Items

- Single use means single patient use!
- FDA regulation
  - Device processed by 3\textsuperscript{rd} party or hospital
  - Considered original manufacturer
  - Must meet same regulations as OEM
- Provide scientific evidence
  - Device is as safe and effective as new device
Manual Disinfection

- Record HLD MEC according to manufacturer instructions
- Expiration date
- Timer for immersion
- Adequate rinsing
  - Filtered, sterile, tap (potable) water
  - Meets clean water standards
Automated Endoscope Reprocessing
Disinfection / Sterilization

- Follow manufacturer instructions
- Individual facility policy
- Careful placement in reprocessor
- Use validated adapters as needed
- Standard of practice consistent within facility
Drying

- After each use and before reuse:
  - Purge all channels with air (20 psi max)
  - Flush with 70% isopropyl alcohol
  - Purge with air
- Dry exterior
- Dry all removable parts
- Alcohol flush
  - Drawn up fresh for each use
Documentation

- Computerized tracking
- Product identification and traceability
- Cycle identification and record-keeping
- Release devices for use
  - Parameters for processing met
- Expiration dates
- Traceability to use on patient
  - Endoscope
  - Process
- Recall procedure
Scope Storage

- Closed cabinet with air circulation
  - Surface nonporous
  - Clean/disinfect surfaces when visibly soiled
    - Weekly/monthly
- Remove all caps and valves
- Hang vertically
- Protect from damage
- Protect from contamination until delivered to point of use
- Delivery technique does not result in recontamination
Supply Storage

- Enclosed limited access area
- Temperature/humidity ranges
- Controlled traffic
- Closed or open shelving
- Adequate distance from walls, floor, ceiling
- NO shipping cartons
- Check integrity of sterile packages before opening
Creating a Culture of Safety

- Infection Prevention is Everyone’s Responsibility!
- Identify a team leader (IP and QI)
  - State, federal regulations, standards, guidelines
  - Compliance, monitoring, competencies
- Form a team to include MD, RN, technician
- Perform IP rounds routinely
- Identify deficits
- Set strategies and timelines
- Develop goals = full compliance
  - Obtainable and measurable
Creating a Culture of Safety

- Empower all staff to participate
  - Direct observation
- Identify “breaches” in procedure/practice
- What is the extent of the breach?
- What is the potential impact on patient safety?
  - Let it slide?
  - Discuss later?
  - Correct at moment of breach?
  - Is the patient aware?
IP/QI Examples

- P/P patients with central lines
- Hand hygiene compliance
- Procedure room turnover times
- Breaks/omissions in reprocessing steps
- Identification of “high touch” areas
- Identification of patients at high risk for infection
- Patient follow-up for possible HAI, negative outcome
- Patient/family education/teaching about IP practices
  - *C. difficile* patients/families
APIC’s Achieving “Zero”
(Association for Professionals in Infection Control and Epidemiology)

- Culture of “zero tolerance” for non-compliance
  - Includes best practices by all HC providers
- Dedicated staff meetings for education
- IP policies and procedures
- Process improvements
- Heighten awareness about infection prevention
- Increase awareness of dirty/clean
- Perform assessments, identify gaps, launch initiatives
- Collective efforts toward goal
Preventing Infection

- IS A PRIORITY!
- Increased awareness
- **Personal responsibility** to make choices
  - Improve patient care
  - Eliminate HAIs
- Avoid costly reimbursement losses
- Quality care provides positive outcomes
- Get everyone involved!
Questions?

Thank You!
References

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