Infection Control – What you Need to Know and Why?

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Hand contamination after patient contact (A) and after washing with an alcohol based sanitizer (B)
Glove Contamination Occurs Regardless of Patient Contact (n=38)

Patient Contact: 65%

No Patient Contact: 42%

Boyce ICHE 1997 18:622
<table>
<thead>
<tr>
<th>Microorganism</th>
<th>Survival Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acinetobacter</td>
<td>3 days – 5 months</td>
</tr>
<tr>
<td>C. difficile</td>
<td>5 months</td>
</tr>
<tr>
<td>E. coli</td>
<td>1.5 hrs – 16 months</td>
</tr>
<tr>
<td>Enterococcus sp.</td>
<td>5 days - 4 months</td>
</tr>
<tr>
<td>Pseudomonas</td>
<td>6 hrs – 16 months</td>
</tr>
<tr>
<td>S. aureus</td>
<td>7 days – 7 months</td>
</tr>
<tr>
<td>HIV</td>
<td>&gt; 7 days</td>
</tr>
<tr>
<td>HBV</td>
<td>&gt; 1 week</td>
</tr>
<tr>
<td>Influenza</td>
<td>1- 2 days</td>
</tr>
</tbody>
</table>

Isolation Precautions

- Isolation precautions can be instituted by MDs or nursing based on known colonization with or suspicion of transmissible infectious pathogen.
- Removal of isolation precautions can only be done via Infection Control.
- Microbiology laboratory will notify MD and floor nurse when patient culture positive for resistant organism – MRSA, VRE, AFB+, etc. and precautions should be instituted at that time if not already in place.
Which type of precautions should be instituted for this patient with an infected “Spider Bite”?
Contact Precautions

- Private room
- Use of hand hygiene
- Gloves and gowns must be donned prior to entry into patient room
- Used to prevent spread of multi-drug-resistant organisms
  - VRE, MRSA, MDR Acinetobacter, etc.
  - Most GI tract pathogens (*C. difficile*)
What kind of precautions should be used for this patient with cough, sore throat and “flu-like” symptoms?
Droplet Precautions

- Isolation of patients infected with organisms that can be transmitted via droplets that can be generated by the patient during coughing, sneezing, talking, or during procedures.
- Private room and a surgical mask must be used before entering the room in addition to hand hygiene.
- Used for Influenza, RSV, Neisseria meningitides.
36 yo male from Ethiopia presents to the ED with complaint of fevers, night sweats, cough, and a 30 lb weight loss over the last 3 months.
Airborne Precautions

- Isolation of patients with organisms that are spread via airborne droplet nuclei <5µm in diameter
- Patient must be in a private room and the isolation area must have >6-12 air changes per hour under negative pressure
- A N-95 mask must be worn by all persons entering the room in addition to standard precautions
- Used for *M. tuberculosis*, measles, and primary infection with *Varicella zoster virus*

N-95 Mask
Multi-drug Resistant Organisms (MRO) Alert Program
Patient and HCW Safety Via Pt Labels

M:00717807  V:010000776
TEST,ABN 09/03/08
DOB:04/22/23  85/M  IC:MRSA
FSC:MC  PT:OUTPAT  LC:UMGF
PROV:SHEPHERD,KANDACE L
Healthcare Associated Infection (HAI) Legislation

- 26 US states have passed HAI related legislation

The Deficit Reduction Act of 2005
- Major change in federal (Medicare) law which went into effect October 1, 2008
- Hospitals will **NOT get paid by CMS** (Centers for Medicare and Medicaid services) for 11 conditions or events which were not “Present On Admission” (POA)

Front line staff – especially nurses and physicians-now have an active role in this major reimbursement change for hospitals
The: “No Pay” (“No Way”) Events

1. Objects left during surgery (retained foreign objects)
2. Air embolism
3. Blood incompatibility
4. Catheter associated urinary tract infections (CA-UTIs)
5. Pressure ulcers
6. Vascular catheter-associated infections
7. Surgical site infections after coronary artery bypass graft (CABG) surgery
8. Falls and Trauma – Fractures, dislocations, intracranial injuries, crushing injuries, and burns
9. Surgical site infections following certain elective procedures, including certain orthopedic surgeries, and bariatric surgery for obesity
10. Certain manifestations of poor control of blood sugar levels
11. Deep vein thrombosis or pulmonary embolism following total knee replacement and hip replacement procedures
Catheter-related blood stream infection (CRBSI)

- Positive blood culture from a peripheral vein in a patient with a catheter and clinical evidence of infection (and no other apparent source)
- Most hospital-acquired BSIs are related to central venous catheter (CVC) use
How To Distinguish Between Pathogen and Contaminant

- Look at the organism
- Look at number of positive cultures
  - If only 1 of 2 bottles are positive with *S. viridans*, *CNS*, *enterococcus*, *Bacillus*, *P. acnes*, etc., likely a contaminant
  - If 2 of 2 bottles positive, important to determine if they were drawn from two separate sites
    - If from the same site, may represent contamination

Fever without positive blood cultures **DOES NOT EQUAL** a line infection
Interventions Can Decrease Rates of Infections to Zero

**Table 3. Rates of Catheter-Related Bloodstream Infection from Baseline (before Implementation of the Study Intervention) to 18 Months of Follow-up.*

<table>
<thead>
<tr>
<th>Study Period</th>
<th>No. of ICUs</th>
<th>No. of Bloodstream Infections per 1000 Catheter-Days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Overall</td>
<td>Teaching Hospital</td>
</tr>
<tr>
<td>Baseline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>During</td>
<td></td>
<td></td>
</tr>
<tr>
<td>implementation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–3 mo</td>
<td>96</td>
<td>0 (0–3.0)‡</td>
</tr>
<tr>
<td>4–6 mo</td>
<td>96</td>
<td>0 (0–2.7)‡</td>
</tr>
<tr>
<td>7–9 mo</td>
<td>95</td>
<td>0 (0–2.1)‡</td>
</tr>
<tr>
<td>10–12 mo</td>
<td>90</td>
<td>0 (0–1.9)‡</td>
</tr>
<tr>
<td>13–15 mo</td>
<td>85</td>
<td>0 (0–1.6)‡</td>
</tr>
<tr>
<td>16–18 mo</td>
<td>70</td>
<td>0 (0–2.4)‡</td>
</tr>
</tbody>
</table>

Elements of Central Line Bundle

- Hand Hygiene
- Chlorhexidine Skin Prep (CHG)
- Maximal Barrier Precautions
- Optimal Site Selection – Use of Subclavian Vein and avoidance of Femoral Vein if possible
- Daily Review of Line Necessity
For all Central Line Insertions - Nurses to complete Central Line Checklist in box below only

Date/Time ___________________
Procedure ___________________

PRIOR TO START OF PROCEDURE

Sedation Assessment - If sedation will be used as part of the procedure MD to complete the Assessment, ASA Classification, and Plan for Sedation

Pre Procedure Assessment: SEE DAILY PROGRESS NOTE

ASA Classification
__ P 1 Healthy patient __ No Sedation
__ P 2 Mild systemic disease no functional limitations __ Minimal Sedation
__ P 3 Severe systemic disease defined functional limitations with/without operations
__ P 4 Severe systemic disease that is a constant threat to life __ Moderate Sedation
__ P 5 Morbund patient not expected to survive 24 hours
__ P 6 Any patient of the above class whose procedure is Undertaken in an emergency

Central Line Checklist
Hand Hygiene
Cap
Mask
Sterile gown
Sterile gloves
Wide drape
Chlorhexidrine prep
Apply sterile dressing to site
RN initials

__ Consent obtained (Arterial line placement does not require MD consent)
__ Correct patient, consent, procedure, site, side, position, need for additional safety measures verified according to hospital policy

POST PROCEDURE
Description of Procedures including findings:

Specimens submitted _________________________________________________________________________________________

Estimated Blood Loss EBL NONE or _______________
Complications NONE, or if yes describe _________________________________________________________________________

Physician Signature / Title / GME # / UPI #  
RN Printed Name:  Date:  Time:  
RN Signature:  Date:  Time:
2010 Antibiogram Data
Booklets will be available soon!
UCH- MRSA Data

MRSA as Percentage of Total *Staphylococcal aureus* Isolates

<table>
<thead>
<tr>
<th>Year</th>
<th>Total # S. aureus Isolates</th>
<th>% MRSA of Total S. aureus Isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>340</td>
<td>16%</td>
</tr>
<tr>
<td>1999</td>
<td>400</td>
<td>16%</td>
</tr>
<tr>
<td>2000</td>
<td>464</td>
<td>28%</td>
</tr>
<tr>
<td>2001</td>
<td>516</td>
<td>30%</td>
</tr>
<tr>
<td>2002</td>
<td>508</td>
<td>28%</td>
</tr>
<tr>
<td>2003</td>
<td>592</td>
<td>31%</td>
</tr>
<tr>
<td>2004</td>
<td>620</td>
<td>34%</td>
</tr>
<tr>
<td>2005</td>
<td>741</td>
<td>36%</td>
</tr>
<tr>
<td>2006</td>
<td>770</td>
<td>41%</td>
</tr>
<tr>
<td>2007</td>
<td>727</td>
<td>37%</td>
</tr>
<tr>
<td>2008</td>
<td>733</td>
<td>42%</td>
</tr>
<tr>
<td>2009</td>
<td>830</td>
<td>33%</td>
</tr>
</tbody>
</table>
UCH – VRE Data
% VRE of all Enterococcal Isolates
P. aeruginosa Susceptibility Data at University of Colorado Hospital

% Susceptible Isolates

Antibiotic

100% FQ restriction