Infection Control 101:

Back to Basics

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Objectives

- Review the Basic Principles of Infection Prevention & Control
- Review the ‘Chain of Transmission’
- Discuss strategies to Break the Chain!
- Review Routine Practices (i.e. the Basics) and Additional Precautions
- Review different approaches in various of settings (i.e. acute vs. long-term care)
- Tips for Teaching the Basics
What is Infection Prevention & Control?

- Infection Prevention & Control addresses factors related to the spread of infections within the healthcare setting (acute care, long-term care, community settings).
- Include prevention activities such as hand hygiene, cleaning, disinfection & sterilization, and surveillance of Healthcare Associated Infections (HAI).
- Management and interruption of outbreaks/clusters of illness.
True or False?

- HAIs are considered to be the 4th leading cause of death in Canada, behind cancer, heart disease, and stroke.
• Each year in Canada **220,000** healthcare associated infections result in **8000-12000** deaths, and the rates are rising!

• **One in nine** hospital patients in Canada acquire an infection as a result of their hospitalization!

• The direct costs of HAIs in Canada are estimated to be in excess of **$1 billion** annually!!!
Infection Prevention & Control strategies are ultimately aimed at breaking at least one link in the Chain of Transmission.
Infectious Agent

- Bacteria
  - MRSA, C. difficile, Group A streptococcus
- Viruses
  - Influenza, RSV, Hepatitis B
- Parasites
  - Giardia, Malaria
- Fungi
  - Candida, Aspergillus
Reservoir

- These are the hiding places for the Infectious Agents!
Portal of Exit

- The Way Out!

https://www.youtube.com/watch?v=qKiQA5e-fPg
Modes of Transmission

- **Contact**
  - Direct (e.g. hands) & Indirect (e.g. equipment)

- **Droplet**
  - 1-2 metres

- **Airborne**
  - >2 metres

- **Vector**
  - E.g. mosquitoes

- **Vehicle**
  - E.g. medication vial
Portal of Entry

- The Way In!
Susceptible Host
Strategies to Break the Chain!

- Identify/Manage the Agent
- Reduce the Reservoir
- Identify the Mode of Transmission and prevent spread
- Reduce host susceptibility
Routine Practices

- What is the REASON for routine practices?
  - Video
Routine Practices

- Point of Care Risk Assessment
- Hand Hygiene
- Use of Personal Protective Equipment (PPE)
- Cleaning & Disinfection
- Source Control
- Aseptic Technique
- Sharps Safety
- Education of Patients, Families, & Visitors
The first step in the effective use of Routine Practices is to perform a risk assessment:

- What task are you performing?
- What is the risk of exposure to blood, body fluids, excretions/secretions, mucous membranes, contaminated equipment, etc?
- How competent/experienced are you in this task?
- Will the patient be cooperative?
The ‘4 Moments for Hand Hygiene’

1. Before initial patient/patient environment contact
2. Before aseptic procedure
3. After body fluid exposure risk
4. After patient/patient environment contact
Hand Hygiene

How often are healthcare workers cleaning their hands?
January to March 2018

Before initial contact

Cleaned hands before initial patient/patient environment contact.

Provincial Rate: 78.5%

<table>
<thead>
<tr>
<th>Region</th>
<th>Before Initial Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western</td>
<td>71.2%</td>
</tr>
<tr>
<td>Northern</td>
<td>84.6%</td>
</tr>
<tr>
<td>Eastern</td>
<td>81.3%</td>
</tr>
<tr>
<td>Central</td>
<td>70.7%</td>
</tr>
<tr>
<td>+WK</td>
<td>80.0%</td>
</tr>
</tbody>
</table>

After contact

Cleaned hands after patient/patient environment contact.

Provincial Rate: 88.7%

<table>
<thead>
<tr>
<th>Region</th>
<th>After Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western</td>
<td>80.6%</td>
</tr>
<tr>
<td>Northern</td>
<td>88.1%</td>
</tr>
<tr>
<td>Eastern</td>
<td>94.5%</td>
</tr>
<tr>
<td>Central</td>
<td>84.3%</td>
</tr>
<tr>
<td>+WK</td>
<td>90.0%</td>
</tr>
</tbody>
</table>
○ Appropriate use of Gloves, Gowns and Masks
○ More is not always better!
## Correct Sequence of Putting On and Removing Personal Protective Equipment

<table>
<thead>
<tr>
<th>PUTTING ON Personal Protective Equipment</th>
<th>REMOVING Personal Protective Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td><strong>1</strong></td>
</tr>
<tr>
<td>Perform hand hygiene</td>
<td>REMOVE gloves</td>
</tr>
<tr>
<td><strong>2</strong></td>
<td><strong>2</strong></td>
</tr>
<tr>
<td>PUT ON gown</td>
<td>REMOVE gown</td>
</tr>
<tr>
<td><strong>3</strong></td>
<td><strong>3</strong></td>
</tr>
<tr>
<td>PUT ON mask or N95 respirator</td>
<td>Perform hand hygiene</td>
</tr>
<tr>
<td><strong>4</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td>PUT ON eye protection</td>
<td>REMOVE eye protection</td>
</tr>
<tr>
<td><strong>5</strong></td>
<td><strong>5</strong></td>
</tr>
<tr>
<td>PUT ON gloves</td>
<td>REMOVE mask or N95 respirator</td>
</tr>
<tr>
<td><strong>6</strong></td>
<td><strong>6</strong></td>
</tr>
<tr>
<td>Perform hand hygiene</td>
<td>Perform hand hygiene</td>
</tr>
</tbody>
</table>

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Cleaning & Disinfection

- Reusable non-critical equipment must be low-level disinfected before use in the care of another patient.
- Manufacturer’s instructions should be followed when using products for cleaning & disinfection.
- Sterile and clean supplies should be stored in a designated and separate clean, dry area protected from dust.
- In home care settings:
  - Patients should be educated about the importance of environmental cleaning.
  - Limit the amount of supplies and equipment brought into the home.
- Surfaces that are likely to be touched and/or used frequently should be cleaned and disinfected on a regular schedule (e.g. bedrails, call bells, bathroom surfaces etc.).
Source Control

- Triage in emergency departments and acute assessment settings/community or outpatient settings
- Early diagnosis and treatment
- Respiratory hygiene
- Spatial separation
Aseptic Technique

- Should be used when performing invasive procedures and handling injectable products
- Generally includes:
  - Hand hygiene prior to opening supplies (ABHR)
  - Hand hygiene prior to invasive procedures (e.g., central line placement) using antimicrobial soap and water
  - Opening supplies only when ready to use
  - Skin preparation with antiseptic
  - Not using multi-dose vials/disinfecting stoppers and injection ports with alcohol before entering the port, vial, or bag
  - Use of aseptic barriers
Provincial regulations should be followed regarding the use of safety-engineered sharp devices.

Needles should not be re-capped; should be immediately disposed of in designated puncture proof containers.

First aid should be performed immediately if there has been an exposure to blood or body fluids and incident reported immediately to employer and medical attention obtained.
Additional Precautions

- In addition to Routine Practices, Additional Precautions are necessary for known or suspected pathogens or clinical presentations. These precautions are based on the method of transmission (i.e. how does it spread?)
  - Contact Precautions
  - Droplet Precautions
  - Airborne Precautions
  - Or a combination e.g. Contact/Droplet or Contact/Airborne
### Table 9: Transmission characteristics and precautions

<table>
<thead>
<tr>
<th>Condition/clinical presentation</th>
<th>Potentially pathogenic organisms</th>
<th>Precautions</th>
<th>Intensive measures</th>
<th>Route of transmission</th>
<th>Duration of precautions</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute upper respiratory tract infection</td>
<td>N. meningitidis, H. influenzae types b, S. pneumoniae</td>
<td>Droplet and contact</td>
<td>Respiratory isolation</td>
<td>Large droplet, direct and indirect</td>
<td>Initial 7 days of appropriate antibiotics plus 4 weeks of isolation</td>
<td>Non-numeric data not shown with high-risk contacts</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>N. meningitidis, H. influenzae types b, S. pneumoniae</td>
<td>Droplet and contact</td>
<td>Respiratory isolation</td>
<td>Large droplet, direct and indirect</td>
<td>Initial 7 days of appropriate antibiotics plus 4 weeks of isolation</td>
<td>Non-numeric data not shown with high-risk contacts</td>
</tr>
<tr>
<td>Bacterial meningitis</td>
<td>N. meningitidis, H. influenzae types b, S. pneumoniae</td>
<td>Droplet and contact</td>
<td>Respiratory isolation</td>
<td>Large droplet, direct and indirect</td>
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</tr>
<tr>
<td>Tuberculosis</td>
<td>M. tuberculosis</td>
<td>Droplet and contact</td>
<td>Respiratory isolation</td>
<td>Large droplet, direct and indirect</td>
<td>Initial 7 days of appropriate antibiotics plus 4 weeks of isolation</td>
<td>Non-numeric data not shown with high-risk contacts</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>N. gonorrhoeae</td>
<td>Contact isolation</td>
<td>Contact isolation</td>
<td>Direct and indirect</td>
<td>Initial 7 days of appropriate antibiotics plus 4 weeks of isolation</td>
<td>Non-numeric data not shown with high-risk contacts</td>
</tr>
<tr>
<td>Syphilis</td>
<td>T. pallidum</td>
<td>Contact isolation</td>
<td>Contact isolation</td>
<td>Direct and indirect</td>
<td>Initial 7 days of appropriate antibiotics plus 4 weeks of isolation</td>
<td>Non-numeric data not shown with high-risk contacts</td>
</tr>
<tr>
<td>Conjunctivitis</td>
<td>Adenovirus, enterovirus, echovirus</td>
<td>Contact isolation</td>
<td>Contact isolation</td>
<td>Direct and indirect</td>
<td>Initial 7 days of appropriate antibiotics plus 4 weeks of isolation</td>
<td>Non-numeric data not shown with high-risk contacts</td>
</tr>
<tr>
<td>Hand, foot, and mouth disease</td>
<td>Coxsackievirus A16</td>
<td>Contact isolation</td>
<td>Contact isolation</td>
<td>Direct and indirect</td>
<td>Initial 7 days of appropriate antibiotics plus 4 weeks of isolation</td>
<td>Non-numeric data not shown with high-risk contacts</td>
</tr>
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**PART C: TRANSMISSION CHARACTERISTICS AND PRECAUTIONS**
Special Considerations

- Long Term Care Environment – Differs from hospital because it is the residents “home”
  - Group activities both on the floors as well as off the floors
  - Communal Dining
  - Most residents entering LTC are highly functionally impaired.
  - High resident/staff ratio
  - Educational opportunities may be limited with residents
  - Many LTC facilities lack the necessary resources to provide quality Infection Control Programs (ie: ICP’s who are responsible for more than just IPAC, if there is an ICP)
Special Considerations

- **Additional Precautions in LTC**
  - Private rooms/bathrooms are not always available and displacing residents to different rooms is not always an option
  - **Contact Precautions:**
    - ARO’s such as VRE and MRSA are not treated the same in LTC
    - Screening for ARO’s is not recommended for LTCF, however admission assessment should be completed
    - Case by case decisions based on information gathered and risk assessment
    - Gloves are only required for direct care with someone on contact precautions in LTC
Special Considerations

- **Additional Precautions in LTC**
  - **Activities**
    - Residents colonized or infected with ARO’s are not restricted to their rooms and can participate in recreational activities and communal dining.
    - When there is something short term like outbreaks, VRE infected residents with diarrhea, residents symptomatic with C.Diff then residents should be asked to refrain from group activities and may be asked to stay in their room.
  - **Signage**
    - Not required or recommended for residents colonized or infected with an ARO in LTCF.
  - **Droplet precautions** - resident on droplet precautions may share a room with roommate not on precautions. Routine practices still need to be applied.
  - **Airborne** - LTC often don’t have appropriate facility for airborne precautions. Transfer to hospital needed.
Teaching the Basics

- It can be useful to teach routine practices keeping in mind the variety of learning styles of learners.
- Melody Cordoviz ICP Senior Clinical Practice Coordinator with Alberta Health Services created videos to illustrate IPAC in a fun, informative, engaging way.
- Video below was shot with her iPhone.
- Pros vs Joes – YouTube
References

- Public Health Agency of Canada (2012). Infection disease prevention and routine practices and additional precautions for preventing the transmission of infection in health care settings.