

Declaring War "The Enemy"



Identifying the Enemy

- MRSA
- VRE
- C. difficile
- ESBL
- ARI
- Enteric illness
- Scabies

Key Concepts: Colonization vs. Infection

- **Colonization** = organism (bug/germ) present in or on the body but is not causing illness
- **Infection** = organism is present in or on the body and is causing illness (disease)

Antibiotic Resistant Organisms

- Bacteria which, over time have mutated and developed a resistance to many or all antibiotics
 - Methicillin resistant Staph aureus (MRSA)
 - Vancomycin resistant enterococcus (VRE)
 - Clostridium difficile
 - ESBL
 - CPE



Routine Practices

- Based on the assumption that all patients are potentially infectious
- Assess your risk of exposure to blood , body fluids, excretions and secretions
- Determine the PPE
 - Gloves
 - Gowns
 - Masks/eye protection

MRSA & VRE

- More resistant to treatment
- A huge problem in Canadian Health Care facilities
- Risk factors include
 - Prior treatment with antibiotics
 - Invasive procedures
 - Prolonged hospital stay
 - Stay in ICU or burn unit
 - Surgical procedures

Methicillin Resistant Staphylococcus aureus (MRSA)

- Resistant to methicillin / cloxacillin
- Causes same infections as sensitive staph
- Can be colonized or infected
- Asymptomatic colonization is far more common than infection
- Treatment of infection may require vancomycin, very expensive!!
- Can be difficult to treat
- S. aureus can remain viable on surfaces for extended periods of time

MRSA - Transmission

- Transmitted from patient to patient primarily via the hands of HCWs
- Hands contaminated after contact with patients/residents, contact with environment, contact with contaminated equipment
 - Easily washed off hands!
 - Easily killed with alcohol!
 - Easily killed with hospital grade disinfectants!

Control of MRSA

In General:

- Routine Practices
- In certain circumstances:
 - Contact precautions in addition to routine practices may be added for example:
 - Outbreak or
 - Epidemiologically linked cases
- Contact precautions generally used in acute care facilities for entry into room
- LTC/ home care - routine practices, contact precaution for direct care

Control of MRSA

- Environmental Cleaning – no special cleaning required, clean and disinfect as per normal protocol between patient transfers
 - Always remember there are patients carrying things that you don't know about
- Clothes and linens may be included in regular laundry – wear gloves when handling linens, hand hygiene
- No special disposal of garbage required

Vancomycin Resistant Enterococci (VRE)

- Enterococci can make up half the flora of the gut
- Resistant to Vancomycin
- Vancomycin resistant enterococcus (VRE) resistant to virtually all antibiotics
- VRE can cause deep seated abscesses and blood stream infections
- Most people who have VRE are colonized with it NOT infected
- Lives for very long periods of time in the environment

VRE - Transmission

- VRE can be transmitted :
 - On the hands of caregivers
 - Through contaminated surfaces and equipment
- Easily washed off hands!
- Easily killed with hospital grade disinfectants!

Control of VRE

In General:

- Routine Practices
- In certain circumstances:
 - Contact precautions in addition to routine practices may be added for example:
 - Outbreak or
 - Epidemiologically linked cases
- Contact precautions generally used in acute care facilities for entry into room
- LTC/ home care - routine practices, contact precautions for direct care

Control of VRE

- Can survive on environmental surfaces easily for long periods of time
- Environmental Cleaning – no special cleaning required, clean and disinfect as per normal protocol between patient transfers
 - **Always remember there are patients carrying things that you don't know about**
- Clothes and linens may be included in regular laundry – wear gloves when handling linens, hand hygiene
- No special disposal of garbage required

Clostridium difficile Infection (CDI)

- Anaerobic, spore forming bacillus
- Produces toxins that cause symptoms
- Wide range of symptoms: simple diarrhea to toxic megacolon and death
- Spore resistant to usual hospital disinfectants
- Twice daily use of sporicidal agent for bathroom cleaning

C. diff - Risk Factors

- Antibiotic usage
- Bowel surgery
- Chemotherapy
- Prolonged hospitalization
- Additional risk factors
 - Increased age
 - Serious underlying illness or debilitation

C. diff -Diagnosis

- **Should be suspected:**
 - in patients with history of antibiotics
 - diarrhea commencing 48-72 hours post admission
- **Diagnostic tests:**
 - stool for *C. difficile* testing
 - CT scan identifying colon wall thickening
 - Endoscopy with/without tissue biopsy
- Specimen must be sent after first liquid stools-
don't wait

Management of C. diff

- Vigilant Antibiotic use
- **HAND HYGIENE**
- Meticulous environmental cleaning
- Contact Precautions
 - Gown and gloves –
 - for room entry in acute care or
 - when providing direct care in LTC setting

ESBLs

- **Extended Spectrum Beta- Lactamases**
- An enzyme that breaks down some antibiotics
- Usually detected on routine culture
- Associated with bacteria that can be colonized in the bowel and cause colonization or infection of urine, blood, wounds, sputum
 - *Klebsiella* spp., -*Escherichia coli*,
 - *Proteus* spp.
- Transmission is via direct and indirect contact

What are CPE?

- **Carbapenemase-producing *Enterobacteriaceae*** are gram negative bacilli that are resistant to antimicrobials through the production of an enzyme (carbapenemase)
- To date, these enzymes have been found most commonly in *E. coli* and *Klebsiella* spp – but have also been found in other Gram-negative species
- Site of colonization is the lower gastrointestinal tract
- Transmission is via direct and indirect contact

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Management of patients/residents with ESBLs or CPE

- In acute care: many hospitals use Contact Precautions for known patients for duration of stay
- In non-acute care: residents with AROs, including ESBLs, should be managed using Routine Practices and adding Contact Precautions (gown and gloves) for “direct care”
- Routine Practices:
 - Hand hygiene
 - Use of PPE -dependent on risk assessment
 - Cleaning of all equipment used for multiple patients/residents between each patient/resident
- “Direct care: providing hands-on care, e.g., bathing, washing, turning resident, changing clothes, continence care, dressing changes, care of open wounds/lesions, toileting.”

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Transmission of CPE

- To date, the major risk factor appears to be receipt of health care in setting that have CPE
 - Hospitals along the eastern US seaboard - particularly New York City
 - Greece
 - Israel and
 - The Indian subcontinent – people coming from the Indian subcontinent with or without exposure to healthcare are also a risk

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Acute Respiratory Infection (ARI)

- Any new onset acute respiratory infection that could potentially be spread by the droplet route which presents with symptoms of:
 - a new or worsening cough or shortness of breath
 - and often fever (also known as febrile respiratory illness, or FRI).
- It should be noted that elderly people and people who are immunocompromised may not have a febrile response to a respiratory infection.

PIDAC_ Annex B

- Clients/patients/residents in a health care setting with symptoms of an ARI, should be managed using Routine Practices, Droplet and Contact Precautions to protect health care workers, clients/patients/residents and others.



Influenza

- An acute disease of the respiratory tract
- Range of symptoms from mild to severe
- Caused by influenza virus
- 3 types: A,B and C
- Multiple sub-types
- Annual epidemics usually caused by type A and occasionally type B

Influenza Epidemiology

- Incubation period = Time from infection until onset of symptoms
- Period of communicability = Time a case is infectious to others



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Not Just a Cold!!

- Influenza is not just a bad cold
- Cold symptoms are generally much milder
- Flu complications can be very serious and can be fatal in the elderly and immunocompromised population



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Other Common Causes of ARI

- RSV- respiratory syncytial virus
- Rhinovirus
- metapneumovirus
- Parainfluenza
- coronavirus

Enteric illness

- Organism carried in feces is ingested
 - Known as fecal oral transmission
- ALL feces has bacteria in it and is potentially infectious
- Until we know the cause, we have to assume that anyone with diarrhea is infectious



Norovirus

- Was known as Norwalk
- Incubation of 24 – 48 hours
- Illness lasts 24 – 60 hours
- Rapid onset nausea, vomiting, watery non-bloody diarrhea, abdominal pain
- May have headache and low-grade fever
- Best recognized virus for outbreaks
 - Cruise ships
 - Long Term Care
 - Schools



CDC/ Charles D. Humphrey

Other Enteric Pathogens

- Rotavirus
- Salmonella
- Shigella
- E coli
- Campylobacter
- Yersinia
- Aeromonas, Plesiomonas
- Vibrio

SCABIES



- Transmitted by prolonged person to person contact or infested clothing
- Can live in environment for up to 3 days
- *1st time* takes 4-6 weeks for symptoms
- Only 2 – 4 days for subsequent events
- Regular Scabies & Norwegian Scabies
- Wear gloves !!!



Scabies

- Common “hot spots” include: Axilla, groin, hand webbing
- Symptoms include: Itchy red spots or burrows with dark centers
- Itching worse at night
- Use contact precautions for suspect or confirmed cases until after the first treatment

Summary

- Focus on **Routine Practices** – forget the bug (MRSA, VRE)
- Use consistently, diligently
- When we know someone is positive:
 - Consider amount of soiling
 - Add precautions as needed
- **Always remember there are patients carrying things that you don't know about**
