Safe Patient Care
“Bugs and Drugs”
The ongoing challenge of MDROs and AMR

2017
@SPC2016Cork
#bugsndrugs

Infection prevention and control management,
Standard Precautions and Hand Hygiene

Jo O’Hara, BPCN – CUH

Principles of Infection Control

• Infection prevention and control principles aim to ensure the protection of those who are vulnerable to acquiring an infection
  i.e. healthcare associated infections - HCAIs
• "The basic principle of infection prevention and control is hygiene" (WHO 2016), hand hygiene and environmental hygiene
• Strict adherence to Standard and Transmission-based precautions
• Prudent antibiotic stewardship “The right drug, for the right bug”
Chain of infection

In order for the spread of infection to take place, the ‘chain of infection’ must be completed.

Breaking the chain

• Break a link or multiple links in the chain so that infection cannot spread

• Action can be taken at all steps in the chain

• Not everybody who carries harmful micro-organisms will show symptoms

• Strict adherence to all the standard precautions (SP)

Key factors in preventing infection

• Modifying patient risk factors for infection:
  Vaccinate, Get the devices out, Prevent surgical site infection, Prevent hospital-acquired pneumonia

• Effective diagnosis of infection

• Preventing transmission of infection

• Effective treatment of infection:
  Get expert advice, Use surgical antibiotic prophylaxis wisely, Treat the patient - not the lab report
STANDARD PRECAUTIONS

...infection control practices used to prevent transmission of diseases that can be acquired by contact with blood, body fluids, non-intact skin (including rashes), and mucous membranes......

1996 – CDC Introduced Standard Precautions

- Blood and Body fluid precautions for all patients regardless of their known or unknown blood-borne infection status
- Work practices required for a basic level of infection prevention and control

Twitter: @SPC2016Cork
Safe Patient Care Conference 2017
#bugsndrugs

Standard Precautions

1. Hand Hygiene
2. Skin Care
3. Personal Protective Equipment (PPE)
4. Respiratory Hygiene and Cough Etiquette
5. Sharps Safety
6. Safe Injection Practices
7. Infection Control Practices for Lumbar Puncture
8. Laundry
9. Patient Care Equipment
10. Patient Environment
11. Patient Placement
12. Management of Blood and Body Fluid Spillages
13. Management of Blood and Body Fluid Exposure

Twitter: @SPC2016Cork
Safe Patient Care Conference 2017
#bugsndrugs

Standard Precautions

Hand Hygiene

Hand hygiene is the single most important measure for preventing and reducing cross infection

- Alcohol based hand rubs (ABHRs) – on physically clean hands - allow to dry naturally
- Hand washing with soap and water
- Hand washing with antiseptic solution and water
- Skin Care: Use a hand moisturiser & barrier cream to protect your hands

Twitter: @SPC2016Cork
Safe Patient Care Conference 2017
#bugsndrugs
Antiseptic hand hygiene

Two ways: alcohol based hand rubs or hand washing with an antiseptic soap product e.g. Hibiscrub

Before and after...
- Invasive procedures
- Transmission based precautions
- Contact with immunocompromised patients
- Contact with wounds
- Burns etc.
- If hands have become heavily contaminated, use antiseptic hand-wash

Social Hand Hygiene

Two ways: alcohol based hand rubs or hand washing with a soap product

- Entering and leaving the hospital
- Entering and leaving a ward
- Before patient contact
- Between each patient contact
- Between different procedures for the same patient
- After patient contact
- After touching patient surroundings
- After bodily functions

WHO “5 Moments of Hand Hygiene” 2009

1. Before patient contact
2. After patient contact
3. After touching patient surroundings
4. After touching patient’s environment
5. After removing patient’s dressings

Standard Precautions

Personal Protective Equipment (PPE)

Definition:
“specialized clothing or equipment worn by an employee for protection against infectious materials” (OSHA)

- Risk assess
- Choose appropriate PPE
- Ensure you have all items needed prior to donning PPE
# PPE Used in Healthcare Settings

**Gloves** – Touching, or where there is a risk touching, blood, body fluids, secretions, excretions, contaminated items, for touching mucous membranes and non-intact skin.

**Gowns/Aprons** – Use during procedures and patient care activities where contact of clothing/ exposed skin with blood/body fluids, secretions, or excretions is anticipated.

**Mask and goggles or a face shield** – Use during activities likely to generate splashes or sprays of blood, body fluids, secretions, or excretions.

**Respirators** – Protect respiratory tract from airborne infectious agents.

---

# PPE Transmission Based Precautions

- **Contact Precautions** – Gown or apron and gloves for contact with patient or environment (e.g., medical equipment, environmental surfaces). Infections spread by contact include: C. Diff., Norovirus, Shingles, and MDR organisms.

- **Droplet Precautions** (large particles) – Surgical masks. Infections spread by droplet include: influenza, mumps, meningococcal disease, and some drug-resistant organisms.

- **Airborne Infection Isolation** – Particulate respirator infections spread by airborne include: pulmonary or laryngeal tuberculosis, rubella, measles and chicken pox, and some drug-resistant organisms.

- **Combinations** of the above used for: some MDR organisms may require a combination of Contact/Droplet, or Contact/Airborne.

*Negative pressure isolation room required.*

---

Twitter: @SPC2016Cork

Safe Patient Care Conference 2017

#bugsndrugs
CDC recommendations for patient placement in Standard Precautions:
- Prioritise for single patient room if patient is:
  • at increased risk of transmission
  • is likely to contaminate the environment
  • does not maintain appropriate hygiene
  • or is at increased risk of acquiring infection
  • or developing adverse outcome following infection
- Risk assess the need for PPE according to the activity and risk of blood and body fluid exposure

Transmission based patient placement is in addition to Standard Precautions:
- Isolation in single room en-suite
- Warning notice re: type of precautions to use on door
- Keep door closed
- Antiseptic hand hygiene and PPE to be donned before entry to the room
- Wear full sleeve gown for close physical contact with patient
- Remove PPE before leaving isolation room and discarded as HCW
- Hand hygiene after removal of PPE
- Remove masks outside the room
- Change as necessary for different care activities for the patient and perform hand hygiene as appropriate

Risk Assessment

Risk assessment to include:
- Diarrhoea
- Draining wounds
- Incontinence of urine or faeces
- Copious respiratory secretions

Lewisham Isolation Prioritisation System (LIPS)
- Used in many acute areas
- Calculates an Isolation score based on the ACPD (Advisory Committee on Dangerous Pathogens)
Example of Lewisham Prioritisation Scoring System (LIPS) (RCPI 2013)

Example for a patient with an MDRO such as VRE:

Patient colonised with VRE who is in treatment of faeces, is catheterised and has no history of hospital with evidence VRE.

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact with VRE patient</td>
<td>5</td>
</tr>
<tr>
<td>Blood contact</td>
<td>5</td>
</tr>
<tr>
<td>Evidence of cross-infection</td>
<td>10</td>
</tr>
<tr>
<td>Significant co-infections</td>
<td>5</td>
</tr>
<tr>
<td>High susceptibility of other patients with serious nosocomial infection</td>
<td>10</td>
</tr>
<tr>
<td>Nasal carriage</td>
<td>5</td>
</tr>
<tr>
<td>Tertiary-care setting</td>
<td>10</td>
</tr>
<tr>
<td>Total score</td>
<td>40</td>
</tr>
</tbody>
</table>

Ref: "Guidelines for the Prevention & Control of MDRO excluding MRSA in the Healthcare Setting".

Multi-drug Resistant Organisms (MDROs)

- **MRSA** = Methicillin Resistant S. aureus
- **VRE** = Vancomycin Resistant Enterococcus
- **CRE/CPE** = Carbapenemase-resistant Enterobacteriaceae
- **MDR KP** = Multi Drug Resistant Klebsiella Pneumoniae
- **ESBL** = Extended Spectrum Beta Lactamase producer

Colonisation V's Infection
Management of MDROs

**Patient Information Management System (PIMS)**

- Patients in the South/South West HSE group
- MDRO history known to the IPCN’s Green Triangle alert
- Alert remains in place
- Trigger for staff to investigate current MDRO status, screen and implement precautions
- Alert system activated by IPCN’s in the South/South West HSE group
- Very important to perform Infection Control Checklist on admission as patient may disclose an unknown history.

**MRSA (Methicillin Resistant S.aureus)**

- Carrier state, asymptomatic, colonised - or infected
- Recent reports of a vancomycin resistant strains of S.aureus
- Cyst to be an increasingly difficult management problem
- Reduce transmission by detecting and treating all infected and colonized patients
- Patients with infection or colonization – CONTACT isolation
- Screening: admission body screens and include previous positive sites, any wounds, medical devices
  - Treatment: (Acute hospitals)
  - Body de-colonisation TX - nasal Bactroban, Chlorhexidine washes and CX body powder
  - Rescreen: 3 days after completing TX, sites as above and repeat twice more at 4 day intervals
  - Any positive site after rescreening: retreat again as above
  - If patient remains positive, maintain isolation with CONTACT precautions and, if not for surgical intervention, do not treat again – to prevent AMR

**VRE Management**

- Patient may be colonized or infected
- Consider patient colonised for duration of hospitalisation
- Ideally, isolate all patients with VRE in a single, en-suite room, with CONTACT precautions
- With limited isolation facilities, local risk assessment in conjunction with the IPCT (consider LIPS)
- High risk areas - Always isolate with CONTACT precautions & use Long Sleeve Gowns for close physical contact
- Low risk areas - If diarrhoea, or VRE + in drain or wound – always Isolate with CONTACT precautions and use Long Sleeve Gowns for close contact

**Success with de-colonisation has not been proven**

**Screening:** rectal swab or faecal swab

- Patients transferred from another Irish hospital, or any hospital abroad
- Where appropriate, ‘at risk’ patients – contacts of known VRE positive patients during an outbreak of VRE

**NB:** the most frequent mode of transmission is via HCWs hands - good hand hygiene is the cornerstone in preventing transmission
**CRE/CPE Management**

**IC Management:**
- Single en-suite room with CONTACT Precautions and Closed Door
- PPE before entering room
- Long-sleeved gowns for physical contact with patient
- Local guidance regarding disposable aprons
- Single patient use or dedicated equipment
- Dispose of PPE within room
- Hand Hygiene
- Limited facilities; risk assess
  - Priority:
    - Suspected or confirmed CRE
    - Uncontrolled secretions or excretions

**Screen:** Rectal or faecal sample
- Patients linked to infected case – shared a room or from a unit with an outbreak
- Direct transfers from a HCF in NIreland
- Patients with inpatient HX in another jurisdiction
- Patients admitted to high risk areas: oncology, transplant, CCU, NICU, haematology – on admission and weekly after
- From long term care facilities
- From an Irish hospital with a HX of outbreaks, or from a High risk Unit – local policy or contact IPCT

**IC Management:**
- Single en-suite room with CONTACT Precautions and Closed Door
- PPE before entering room
- Long-sleeved gowns for physical contact with patient
- Local guidance regarding disposable aprons
- Single patient use or dedicated equipment
- Dispose of PPE within room
- Hand Hygiene
- Limited facilities; risk assess
  - Priority:
    - Suspected or confirmed CRE
    - Uncontrolled secretions or excretions

**Screen:** Rectal or faecal sample
- Patients linked to infected case – shared a room or from a unit with an outbreak
- Direct transfers from a HCF in NIreland
- Patients with inpatient HX in another jurisdiction
- Patients admitted to high risk areas: oncology, transplant, CCU, NICU, haematology – on admission and weekly after
- From long term care facilities
- From an Irish hospital with a HX of outbreaks, or from a High risk Unit – local policy or contact IPCT

**ESBL Management**
- Irish guidelines recommend isolation in a single en-suite room and use CONTACT precautions
- Limited facilities; risk assess with IPCT
  - Where has the ESBL been isolated from?
    - Urine, wound or drain
  - Is the patient incontinent or wound oozing
  - Isolate patient with CONTACT precautions
  - Risk assess the need for a long sleeve gown for close contact nursing
- Priority to patients with diarrhoea, faecal/urinary incontinence, copious respiratory secretions and draining wounds
- Decolonization is not recommended

**MDR Gram Negative Bacteria**
- MDR gram negative rods - isolates that are susceptible to no more than one class of antimicrobial agents (excluding colistin)
  - Increasingly problematic
    - Acinetobacter baumannii
    - Stenotrophomonas maltophilia
    - Pseudomonas aeruginosa
    - Klebsiella pneumoniae
- Habitat – GI tract, bowel and respiratory tract.
- **Contact Precautions and Droplet Precautions** if patient has respiratory carriage and aerosol producing procedures are to be carried out; Closed suction advised
**Patient Environment**

The basic principle of infection prevention and control is **HYGIENE**.

Methods for removing and destroying micro-organisms:
- Cleaning
- Disinfection
- Sterilisation

Clean and disinfect surfaces and equipment daily – special attention to bed rails, over bed tables, door knobs, surfaces in and surrounding toilets in patients’ rooms.

Patient-dedicated or single-use disposable noncritical equipment e.g., blood pressure cuff, stethoscope and instruments and devices.

Local policies applied rigorously.

**Patient Environment**

- Prioritize room cleaning of patients on Contact Precautions.
- Focus on cleaning and disinfecting frequently touched surfaces and equipment in the immediate vicinity of the patient.
- Disinfect room after the patient discharge with a chlorine releasing agent, such as hypochlorite.
- Curtains should be removed and laundered if not single-use disposable curtains.
- Pillows and mattress covers should be checked for damage.

- After an MDRO colonisation or infection, the ward environment must be cleaned thoroughly to reduce environmental contamination.
- Documents including the nursing notes and patient’s chart should not be taken into an isolation room.
- Only essential equipment and supplies should be taken into the patient’s room. No stockpiling inside the room.
- Vacate units for environmental assessment and intensive cleaning when efforts to eliminate environmental reservoirs have failed.

**Patient movement and transfer**

- **Communication:** inform the receiving clinical staff of the patient’s MDRO status.
- Maintain patient confidentiality during transportation.
- PPE should be directed by Standard Precautions – usually unnecessary.
- Avoid using unnecessary equipment and linen.
- Patients on stretchers should be covered by a clean sheet before leaving the ward.
- **Ambulance transportation:**
  - Ambulance staff should adhere to Standard Precautions with all patients.
  - If ambulance transfer is required, the ambulance service should be notified in advance of any infection risk by the responsible ward staff.
CONCLUSION

Infection Prevention and Control Management, Standard Precautions and Hand Hygiene

- Good hand hygiene and rigorous environmental cleaning reduce the risk of MDROs spreading.
- Antibiotics should be prescribed only when needed, in the right dose, for the right duration, to reduce the chances of organisms becoming resistant.
- Transmission based Precautions on top of Standard Precautions when a hospital patient is colonised or infected with an MDRO.
- Risk assessment – diarrhoea, draining wounds, incontinence of urine or faeces, copious respiratory secretions – when facilities are scarce.