

# Portal of Entry - The Missing Link?

Jim Gauthier, MLT, CIC, Providence Continuing Care Centre  
A Webber Training Teleclass

**Portal of Entry  
The Missing Link?**

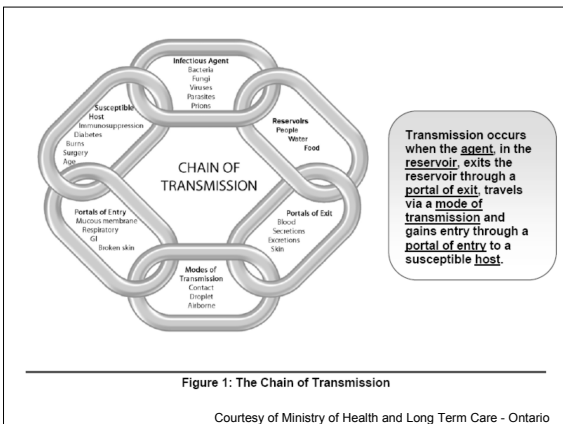
Jim Gauthier, MLT, CIC  
Kingston, ON

Hosted by Paul Webber  
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- ## Objectives
- Have some fun
  - Look at the Chain of Transmission / Infection
  - Discuss where we are failing
  - Focus on a possible solution

- ## What Are We Seeing?
- Increased rates of Methicillin Resistant *Staphylococcus aureus* (MRSA) in most areas
  - Increased transmission of Vancomycin Resistant Enterococci (VRE)
  - Increased transmission of *Clostridium difficile* (CDAD)
  - Other antibiotic resistant organisms (ARO)



- ## Where Do We Spend Our Time?
- Focus on
    - Reservoir
    - Mode of Transmission

- ## Reservoir
- Patient Screening
    - Effective in many cases as patients are isolated if positive
    - Some hospitals do not screen with good success (Edmond, 2008)
  - Isolation
    - Successful in many papers for some organisms

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### Reservoir

- Admission Screening
  - Many American states are passing laws to do admission screening on all patients
  - Targeted screening such as patients who have been in another healthcare facility in the previous 12 months (MOHLTC – Ontario)
  - ?Isolate until screening is done?

### Admission Screening

- MRSA
  - Nares, perianal or groin, wounds, exit sites
- VRE
  - Stool or rectal swab
- CDAD
  - No screening readily available
- Other ARO's
  - Problems with culture media or standardization, what to look for?

### Admission Screening Problems

- Cost
  - PCR can be pricey but quick - \$75
- Turn Around Time (TAT)
  - PCR is quick – same day
  - Some culture techniques can take up to 5 or 7 days if mixed culture
- Snap shot of that day, that site

### Reservoir Problems

- Unrecognized reservoirs could exist or develop
  - Carbapenem resistant Enterobacteriaceae (Lledo 2009)
  - Pan-resistant *Acinetobacter baumannii* (Furuno 2008)
  - *Pseudomonas aeruginosa*
- Family, visitors, and staff could be reservoirs

### Contact Precautions

- Jim has problems with this!

### **CONTACT PRECAUTIONS**

- WE JUST FOUND OUT THAT THIS PATIENT HAS A BUG THAT COULD BE CARRIED TO THE NEXT PATIENT.
- NOW WE **REALLY** MEAN YOU HAVE TO PERFORM HAND HYGIENE AND TRY NOT TO SOIL YOUR UNIFORM!
- WE ARE NOT SURE ABOUT THE GUY NEXT DOOR, YET, SO DO WHATEVER YOU WANT!

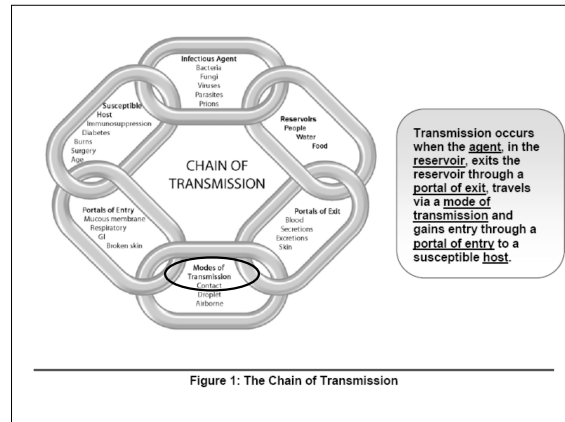
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#### Environment Reservoir Problems

- 87 surfaces cultured outside of patient rooms for CDAD
    - 20 (23%) were contaminated,
    - 9 of 29 (31%) in physician work areas,
    - 1 of 10 (10%) in nurse work areas,
    - 9 of 43 (21%) portable pieces of equipment,
      - pulse oximetry finger probe,
      - medication carts
      - bar code scanners on medication carts
- (Dumford 2008)



#### Mode of Transmission – Contact

- Hand hygiene
  - Alcohol hand rub
  - Soap and water
    - Variety of agents
- Equipment cleaning
  - Single patient use
  - Fomites such as toilets, tubs, etc.

#### Mode of Transmission - Contact

- Hand Hygiene focus
  - Education of Health Care Worker (Capretti 2008)
  - Patient empowerment (Julian 2008, McGuckin 2004)
    - Many patients are uncomfortable asking!

#### Mode of Transmission – Droplet

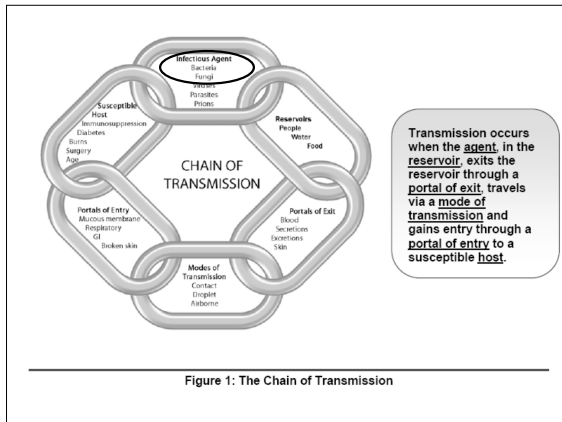
- Febrile Respiratory Illness (PIDAC 2008)
  - Staff to use mask and eye protection
    - ANY coughing patient
    - Suctioning, CPAP, BiPAP
    - Chest Physio

#### Mode of Transmission - Airborne

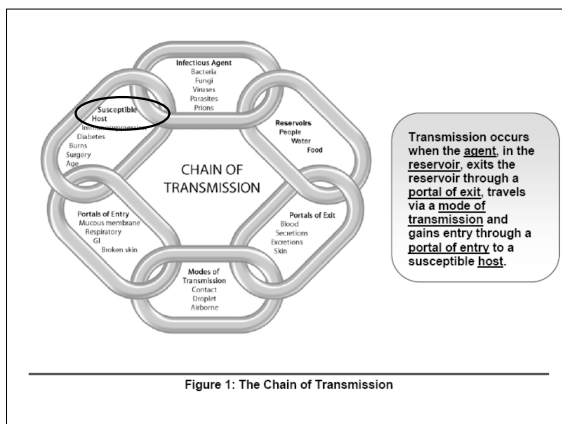
- Use of N95 Respirator or Powered Air Purifying Respirator (PAPR)
- Use of engineering controls
  - Negative pressure rooms

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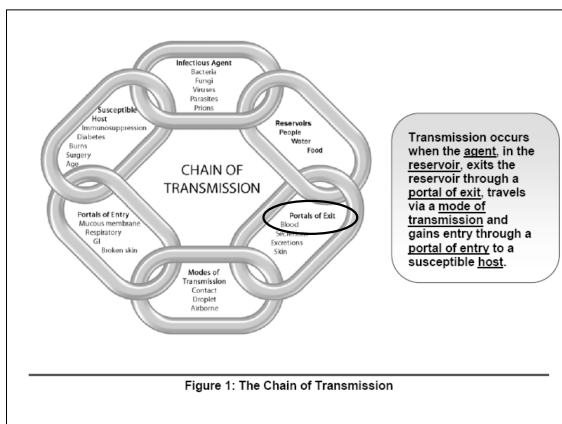
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- ## Infectious Agent
- Bacteria
  - Fungi
  - Viruses
  - Parasites
  - Prions



- ## Susceptible Host
- Age
  - Immunosuppression
  - Diabetes
  - Burns
  - Surgery
  - Lines
  - Immunizations



- ## Portal of Exit
- Body Fluids (Blood, etc.)
  - Skin
  - Feces
  - Mucous Membranes
- Standard Precautions
  - Routine Practices

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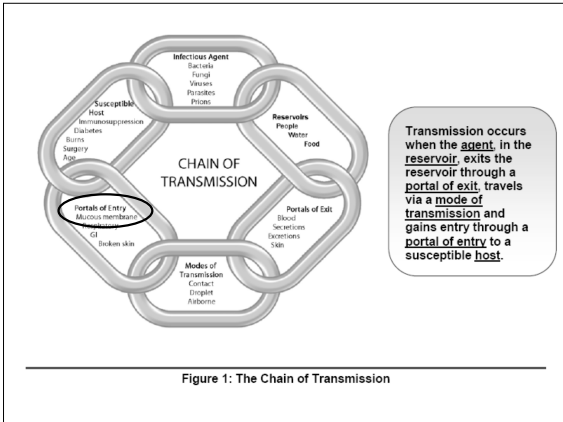
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WARNING!!

This patient has:

- Skin!
- Feces!
- Mucous Membranes!

PERFORM HAND HYGIENE AFTER CONTACT WITH THIS PATIENT OR THEIR ENVIRONMENT!




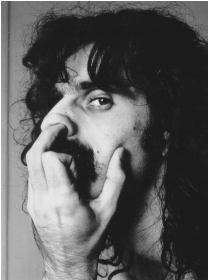
### Portal of Entry

- How do our bugs get into / onto our patients?
  - Hands? (Barbolla 2008, Martinez 2003, Duckro 2005, Enoch 2008)
  - Equipment? (Barbolla 2008)
  - Poor cleaning? (Dumford 2009, Martinez 2003, Boyce 2007, Hota 2009)

### Portal of Entry - MRSA

- Common colonization site of nares
- HOW?
- Healthcare workers and noses?
- Patient and Nose?

### Portal of Entry - MRSA

k53.pbasse.com/ig4/18/490718/2/52042004.fingerupthenose.jpg      www.science.uva.nl/~robertzappa/files/jpg/collier1.jpg

### Portal of Entry - MRSA

- Skin
  - Broken skin – opportunistic with own organism
    - Decolonization and SSI rates (Hacek 2008)
  - Perineum / perianal – GI tract?
    - Tubs
    - Linen
    - Patient hands

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## Portal of Entry - VRE

- Two entrances
  - Rectal or oral
- Rectal
  - Scopes
  - tubs
  - fingers
  - gloves

## Portal of Entry - VRE

- Oral
  - See Physics of Flying Feces
  - <http://webbertraining.com/recordingslibraryc4.php>
  - November 9, 2006
- Is it us?



[http://farm2.static.flickr.com/1276/1199717813\\_2b6e1ef69.jpg?v=0](http://farm2.static.flickr.com/1276/1199717813_2b6e1ef69.jpg?v=0)

## Portal of Entry – CDAD

- Same as previous slides
  - Oral, rectal
  - Possible food based (Rodriguez-Palacios 2007)
    - Might explain some of the community related illness

## Portal of Entry – CDAD

- Proton Pump Inhibitors
  - Possible problem
  - Conclusion: Clean patient's hands! (Metz 2008)
- Rates lower with hand hygiene program for both staff and patients (Drudy 2007)

## Portal of Entry – Our Patients

- Banfield and Kerr – 2005.
- *Could hospital patients' hands constitute a missing link?*
  - J Hosp Infect 2005;61:183–188

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**Our Patients**

They note:

- Not a lot of studies that look at patient hands
- Studies did find potentially pathogenic bacteria on patient's hands
- Outbreak strains present
- Bed-ridden patients have higher numbers

**Our Patients**

- Lack of hand washing facilities
- Point of care issue
  - looking after yourself

**Our Patients**

- Our homes have organisms (Scott, 2008)
- Patient hand hygiene can lower risk of Group A Streptococci in long term care (Jordan 2007)
- Patients will buy in (Tomic 2008)
- Lowers risk of influenza transmission in homes (Cowling 2008)
- Must be part of program in LTC (Smith 2008)

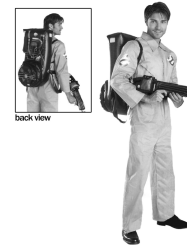
**Our Patients**

- Alcohol hand rub on bedside table?
- Mandatory hand hygiene before meals
- Mandatory hand hygiene after use of bedpan or commode
- Mandatory hand hygiene before and after pet visitation (Lefebvre 2006)



**Our Patients**

- Use of volunteers?
- Family reminders?



<http://images.buycostumes.com/mgen/merchandise/117757.jpg>

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### Our Patients

- Frequency of cleaning / disinfection?
- Frequency of linen changes?

### Bad Press

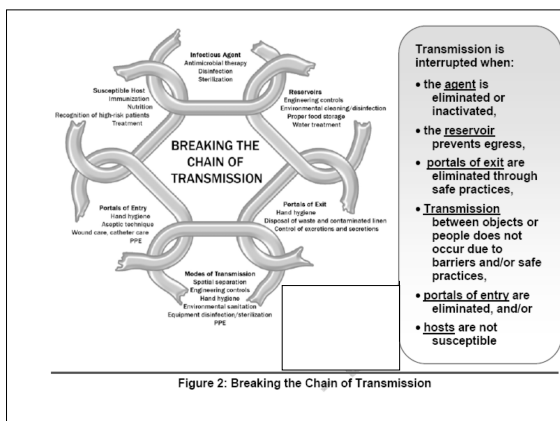
- Hospitals bad places to be
- Hospitals dirty places
- Morbidity and mortality

### Suggestions

- Clean your own hands thoroughly before eating.
- Do not touch your hands to your lips.
- Do not place your food or utensils on any surface except your plate.
- Ask family to bring wipes containing bleach to clean the items around your bed.
- When you leave the hospital, assume any belongings you bring home are contaminated.
  - McCaughey 2008

### Suggestions

- Do not mix clothes from the hospital with the family wash; wash with bleach. Regular laundry detergents do not kill C. diff.
- If you are visiting someone in the hospital, be careful about eating in the cafeteria or a restaurant where the staff go in their scrubs or uniforms. These uniforms could be covered in invisible superbugs.
  - More than 20 percent of nurses' uniforms had C. diff on them at the end of a workday, according to one study.



### Summary

- We need more emphasis on patient hand hygiene
- Percent of patients who can't perform hand hygiene?
- Staff reminders are plentiful...what about our patients?



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## Super Patient Hand Hygiener



## References

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THE NEXT FEW TELECLASSES	
18 Jun. 09	The Pregnant Health-Care Worker and Infection Risk Speaker: Prof. Sotiris Tsioltras, University of Athens Medical School
24 Jun. 09	(South Pacific Teleclass) Tea Tree Oil and Staphylococcal Sepsis Speaker: Prof. Tom Riley, University of Western Australia
16 Jul. 09	(Free Teleclass) ProMED and the Use of Informal Information Sources for Emerging Disease Surveillance Speaker: Dr. Larry Madoff, ProMED Editor, Harvard Medical School
21 Jul. 09	(Free British Teleclass) Fitness for Purpose in Infection Control Speaker: Martin Kiernan, Southport and Ormskirk NHS Trust/View
06 Aug. 09	(Free Teleclass) How Professional Associations Can Best Contribute to Infection Prevention Globally Speaker: Dr. Cathryn Murphy, Bond University
13 Aug. 09	(Free Teleclass) Safe Childbirth: What Can Infection Prevention Contribute? Speaker: Patricia Lynch, Chair, IFIC Safe Childbirth Special Interest Group
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