

Health Sciences Centre Winnipeg presents

# THE 18<sup>th</sup> ANNUAL BUG DAY Abstracts

Tuesday, October 21, 2014

Join us at Frederic Gaspard Theatre, Theatres B & C,  
University of Manitoba Basic Medical Sciences Building,  
700 William Ave., Winnipeg, MB or by Manitoba Telehealth



## Bug Day Agenda

0700 - 0750

Complimentary coffee,  
juice, muffins

0750 - 0800

Opening Remarks

Fred Aoki, MD  
Department of Medicine,  
University of Manitoba

0800 - 0855

Medical Grand Rounds  
Infection Prevention and Control:  
We are All in this Together

John Embil, MD  
Department of Medicine  
University of Manitoba  
Arlene Wilgosh, RN  
Winnipeg Regional Health Authority

0855 - 0900

Announcements

0900 - 0930

Swimming Pools: Do You Know  
What Lurks Within?

Christopher Sikora, MD  
Medical Officer of Health  
Edmonton, Alberta

0930 - 1000

Exhibits/Nutrition Break provided

1000 - 1030

*Clostridium difficile*:  
What's Hot, What's Not

Charles Bernstein, MD  
Section of Gastroenterology  
University of Manitoba

1030 - 1100

Honestly, I Caught it from  
a Toilet Seat!

Christopher Sikora, MD  
Medical Officer of Health  
Edmonton, Alberta

1100 - 1130

Medical Device  
Reprocessing:  
Past, Present and Future

Gale Schultz, RN  
Medical Device Reprocessing  
Winnipeg Regional Health Authority

1130 - 1200

Tales of a Virus Hunter:  
Lessons Learned while  
Chasing Lassa, Marburg, and Ebola  
Viruses

Jim Strong, MD,  
National Microbiology  
Laboratory

1200 - 1300

Exhibits/Lunch on your own

1300 - 1315

Announcements

1315 - 1345

Hepatitis C Virus (HCV)  
25 Years from Discovery to Cure!

Kelly Kaita, MD  
Section of Hepatology  
University of Manitoba

1345 - 1415

Tuberculosis? Yes - It Affects You!

Martha Ainslie, MD  
Section of Respiratory Medicine  
University of Manitoba

1415 - 1445

Exhibits/Nutrition Break provided

1445 - 1515

Human Immunodeficiency Virus  
Nondisclosure:  
Human Nature or Criminal Behavior?

Pierre Plourde, MD  
Population and Public Health Program  
Winnipeg Regional Health Authority

1515 - 1545

Did You Have a Nice Vacation? Let Me  
Tell You What's Been Crawling on You!

Shane Silver, MD  
Section of Dermatology  
University of Manitoba

1545 - 1600

Closing Remarks



UNIVERSITY  
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Faculty of Medicine  
Continuing Professional Development



## **Infection Prevention and Control: We are All in this Together!**

John Embil, MD<sup>1,2</sup> and Arlene Wilgosh, RN<sup>2</sup>

<sup>1</sup> Infection Prevention and Control Unit, Health Sciences Centre and

<sup>2</sup> Winnipeg Regional Health Authority

### **Abstract**

There are many different types of healthcare associated infections. Any procedure which violates the patient's protective barriers such as the skin, respiratory and urogenital tract, may lead to an infection. Both healthcare workers and patients come in contact with infectious agents and material in hospital. The "super bacteria" which are frequently encountered in the community and in hospitals are methicillin resistant *Staphylococcus aureus* (MRSA) and vancomycin resistant enterococcus (VRE). The incidence of *Clostridium difficile* associated disease has been rising dramatically over the past few years.

An overview of hospital acquired infections and the situation in Winnipeg with the "super bacteria" will be reviewed.

### **Objectives**

By attending this session the attendee will be able to:

1. Describe the current situation in Winnipeg with methicillin resistant *Staphylococcus aureus*, vancomycin resistant enterococcus, and *Clostridium difficile*.
2. Be able, as a healthcare worker, to protect oneself and your patients from acquiring the "super bacteria".
3. Have fun!

### **Multiple Choice Questions (Select the best answer)**

1. The best method for preventing the spread of healthcare associated infection is to:
  - a. Use potent antibiotics
  - b. Keep every hospitalized person in a private room
  - c. Wash hands or use a waterless antiseptic handrub before and after touching patients
  - d. Give chronic antibiotic therapy to persons with in dwelling devices
2. Which of the following is true about methicillin-resistant *Staphylococcus aureus*?
  - a. It does not routinely spread easily through healthcare facilities
  - b. It has legs and can walk from room to room
  - c. It's spread in a facility can be minimized if not stopped by adhering to established infection control precautions
  - d. It is easily killed by cloxacillin
3. When entering/exiting the room of a patient in isolation, which of the following is correct?
  - a. Upon entering, read the sign on the door and do exactly as suggested
  - b. Upon entering, read the sign, and interpret according to your needs
  - c. Upon exiting, immediately wash your hands, if you have time
  - d. When in the room, take off your gloves and mask to better communicate with the patient

## Swimming Pools: Do you Know What Lurks Within?

Christopher Sikora, MD  
Medical Officer of Health  
Edmonton, Alberta

### Abstract

Illnesses related to recreational water are a common occurrence. Diarrhea, the most common illness related to recreational water is often caused by microorganisms like *Cryptosporidium spp*, *Giardia lamblia*, norovirus, *Shigella spp*, and *Escherichia coli* O157:H7. Other illnesses can include: skin, ear, respiratory, eye, neurologic, and wound infections. Between 2004 and 2008, the United States experienced a 2.5-fold increase in the number of persons experiencing illness related to *Cryptosporidium spp* cases. Alberta-based rates for *Cryptosporidium spp* related illnesses over the past decade are similar (between 2.07 – 6.13/100,000); with several recreational water-related clusters being reported.

Reducing risk and responding to illness related to recreational water is an essential practice of every public health department. This presentation will address the epidemiology of recreational water related illnesses, describe several outbreaks and explore risk mitigation strategies in place to protect the public.

### Objectives:

By attending this session the attendee will be able to:

1. Describe the prevalence of several organisms that cause recreational water related illness in Canada
2. Appreciate the role of rapid surveillance in the early identification of recreational water illnesses
3. Describe risk mitigation strategies that are commonly implemented at recreational water facilities to protect the public

### Multiple Choice Questions (Select the best answer)

1. The removal or inactivation of pathogenic organisms in swimming pool environments occurs by the following mechanisms:
  - a) Addition of chemicals
  - b) Physical barriers
  - c) Use of radiation (eg. Ultraviolet light)
  - d) All of the above
2. Which of the following organisms is NOT commonly associated with recreational water exposures?
  - a) Syphilis
  - b) Norovirus
  - c) Methicillin resistant *Staphylococcus aureus*
  - d) Hepatitis A virus
3. You are a swimming pool operator, and are managing a diarrheal fecal incident. At a pH of 7.5, temperature of 25C and free chlorine level of 10 ppm, what contact time (CT) must be present to inactivate >99.9% of *Cryptosporidium spp*?
  - a) 150 minutes
  - b) 400 minutes
  - c) 1500 minutes
  - d) 4000 minutes

## ***Clostridium difficile*: What's Hot, What's Not**

Charles Bernstein, MD  
Section of Gastroenterology  
University of Manitoba

### **Abstract**

*Clostridium difficile* is a Gram-positive spore forming bacterium and was first described in 1978 as a cause of diarrhea in a patient with pseudomembranous colitis. The incidence of *C. difficile* infection (CDI) has increased in the pediatric population as well as in adults with fewer comorbidities and is now being identified in persons that were previously considered to be low-risk such as children and community dwelling adults who lack traditional risk factors for CDI. Persons with community-acquired CDI are likely to have had recent healthcare exposures other than hospitalization, with up to 94% of these persons having had a recent outpatient or emergency room visit. This suggests that short duration of healthcare exposure is also a risk factor for CDI. Severe-complicated infection is defined by: hypotension, shock and sepsis, which may require intensive care unit level of care; ileus, megacolon and perforation (which may necessitate colectomy); or death secondary to CDI. Stool testing for CDI includes culture, enzyme immunoassay (EIA) to detect toxins A and B produced by *C. difficile*, EIA for glutamate dehydrogenase enzyme and polymerase chain reaction (PCR) used to detect genes *tcdB* (encoding the toxin and/or *tcdC*). In treatment of mild-to-moderate CDI, oral metronidazole is considered equivalent to oral vancomycin. In patients who do not improve within 72–96 hours, an alternative cause of diarrhea should be sought or an alternative treatment may be necessary. Oral vancomycin is recommended for the treatment of severe CDI or for recurrent CDI and, in combination with metronidazole, for severe-complicated infection. Recurrence rates after metronidazole and vancomycin therapy are approximately 25%. Oral fidaxomicin is a nonabsorbed antibiotic with similar cure rates to vancomycin but with lower recurrence rates. There are no strong data to support the use of concomitant probiotics for the treatment of CDI. Fecal microbial transplantation (FMT) is being used as an alternative to standard antibiotic therapy for recurrent CDI due to the ability to restore the colonic flora via infusion of a liquid suspension of intestinal microorganisms from the stool of a healthy donor.

### **Objectives:**

By attending this session the attendee will be able to:

1. State the risk factors for *Clostridium difficile* infection (CDI) and risks for severe CDI
2. State the differences between diagnostic testing in CDI and what is available locally
3. State treatments for CDI including the role of fecal microbial transplantation

### **Multiple Choice Questions (Select the best answer)**

1. Which of the following statements are true?
  - a. Patients with CDI always have antecedent antibiotic use as a risk factor
  - b. While CDI rates have risen among inpatients, they have fallen among outpatients
  - c. Recurrence rates are lower when using metronidazole than vancomycin hence metronidazole is the first line for therapy
  - d. Serious CDI can result in colectomy or even death
2. Which of the following is a proven risk factor for serious CDI?
  - a. Ongoing oral proton pump inhibitor use
  - b. Chronic liver disease
  - c. Inflammatory bowel disease
  - d. Concomitant antibiotic and hypomotility agent use
3. Regarding fecal microbial transplantation in CDI which of the following are true?
  - a. It has now been proven to be safe in long term follow up
  - b. It has been shown to be effective either administered by nasoenteric tube or by colonoscopic administration
  - c. The microbes within the stool that are the ones thought to be effective in the treatment of CDI are known
  - d. FMT has been approved for use within WRHA hospitals.

## **Honestly, I Caught it from a Toilet Seat!**

Christopher Sikora, MD  
Medical Officer of Health  
Edmonton, Alberta

### **Abstract:**

Sanitation is one of the major public health achievements during the 20th century. In 2011, approximately 36% of the world population lack access to a toilet. Diarrhea is a leading cause of death in children under the age of five. In North America, most of the population has access to clean water and toileting facilities. Even with all the advances over the previous century, illnesses related to fecal-oral transmission are still prevalent. Given the high concentration of organisms in fecal material, and occasional geographic proximity of genital organs to the toilet, is there is a risk of person-to-person transmission of disease?

### **Objectives:**

By attending this session the attendee will be able to:

1. State the microbiologic risks associated with using public toilets
2. State effective risk mitigation strategies when using toilets
3. Implement effective strategies to reduce the risk of fecal-oral transmission within hospitals.

### **Multiple Choice Questions (select the best answer)**

1. World toilet day (November 19) was made official by United Nations resolution in 2013
  - a. True
  - b. False
2. You can get a sexually transmitted infection (STI) from a toilet
  - a. True
  - b. False
3. The following are organisms that have do NOT have a potential of being transmitted engaging in typical toilet activities.
  - a. Norovirus
  - b. Hepatitis A virus
  - c. Methicillin resistant *Staphylococcus aureus*
  - d. Human immunodeficiency virus

## **Medical Device Reprocessing: Past, Present and Future**

Gale Schultz, RN

Medical Device Reprocessing  
Winnipeg Regional Health Authority

### **Abstract:**

Infections related to medical devices are a continuing concern and every year we are made aware of incidents where a group of patients may have been exposed to improperly reprocessed instruments. Medical Device Reprocessing (MDR) has changed significantly over the past ten years in order to deal with these concerns and the complexity of the devices.

### **Objectives:**

By attending this session the attendee will be able to:

1. Describe the education required to work in MDR and the ongoing competency assessment requirements.
2. State the impact of manufacturer's instructions and complexity of the devices
3. Describe the best practice guidelines and standards that guide MDR.

### **Multiple Choice Questions (select the best answer)**

1. The education required for to work in MDR is:
  - a. No formal education, learn on the job
  - b. College education i.e. Red River College
2. Immediately after use, the user shall prepare instruments for reprocessing including:
  - a. Keep medical device free of visible soil throughout the procedure
  - b. Flush/soak soiled lumens with sterile water
  - c. Protect tips of fine/sharp medical devices
  - d. Keep medical devices moist during transport
  - e. All the above
3. What standards are used in Medical Device Reprocessing?
  - a. There are no formal standards
  - b. Canadian Standards Association (CSA), Canadian Society of Gastrointestinal Nursing and Associates (CSGNA), Operating Room Nurses Association of Canada (ORNAC) and Accreditation Canada

## **Tales of a Virus Hunter: Lessons Learned while Chasing Lassa, Marburg, and Ebola Viruses**

Jim Strong, MD  
National Microbiology Laboratory

### **Abstract**

Working in Canada's only Containment Level 4 (CL4) facility has its challenges. Viruses such as Ebola, Marburg, Crimean Congo Hemorrhagic fever, Lassa and Nipah can cause zoonotic infections, (capable of infecting animals as well as humans), and cause lethal, thus far untreatable infections in their human victims. While none of these viruses have affected a single Canadian, international travel, laboratory accidents, newly emerged infections and the faint threat of bioweapons count these as real threats. In order for us to prevent these and other viruses from affecting Canadians we must understand their complex lifecycles for which we are just scratching the surface. Specialized training, high containment facilities, the use of animal models and travel to remote regions of the world are expensive challenges but necessary to protect Canadians from these rare but imposing infections.

### **Objectives:**

By attending this session the attendee should be able to:

1. State the reason Canada has a Containment Level 4 (CL4) laboratory and research program.
2. Identify cases of possible viral hemorrhagic fever from returning travelers and be able to protect oneself and others from potential spread.
3. Understand the reason why we do not kiss pigs, mice or monkeys.

### **Multiple Choice Questions (Select the best answer)**

1. As you go further into a CL4 laboratory, what happens to the air pressure?
  - a. It goes up, pushing the viruses out of the lab
  - b. It goes down, holding the viruses inside the lab
  - c. It depends on the weather and atmospheric pressure outside
  - d. It stays the same; otherwise it would be too hard on the ears
2. Outbreaks of infection caused by Ebola virus occur episodically in equatorial Africa and the virus is believed to be a zoonotic agent; so, where does Ebola virus hide between outbreaks?
  - a. In monkeys
  - b. In mice
  - c. In humans
  - d. We don't know
3. As CL4 workers what concerns us most about potential for CL4 infections in Canada?
  - a. Bioterrorism
  - b. Imported cases from known outbreaks
  - c. Newly emerging infections (i.e. unknown viruses)
  - d. Laboratory accidents
  - e. All of the above

## **Hepatitis C Virus (HCV) – 25 Years from Discovery to Cure!**

Kelly Kaita, MD  
Section of Hepatology  
University of Manitoba

### **Abstract**

Hepatitis C virus was identified over 25 years ago using molecular techniques while trying to identify an infectious cause of Non A, Non B hepatitis. Since the identification of this novel new virus, many investigators from around the world have been working diligently trying to find the “Golden Chalice.” In the early 90’s the identification of Interferon-alfa was felt to be a major development and milestone. The Achilles heel of interferon based therapies was and will always be the intolerant side effects resulting in upwards of 20% of patients having to discontinue therapy and at least 25% of patients not being eligible because of medical contraindications. The early sustained virological response (SVR) rates were in the 5- 15% range. The addition of Ribavirin came in 1999. This resulted in SVR rates increasing to 35-40% but added a whole new set of problems such as anemia and rash. Using interferon injections three times a week was a major drawback so by 2002 with the addition of a PEG molecule (polyethylene glycol moiety) to interferon, the injections would be reduced to once per week and the overall SVR rates continued to increase to about 45% for genotype 1 infected patients and as high as 80% for those with genotype 2 or 3 HCV. In 2013 we have started a whole new era of HCV therapy with the licensing of the first two DAA’s (Direct Acting Antivirals) for HCV.

### **Objectives**

By attending this session, the attendee will be able to:

1. Review the timelines of HCV
2. Discuss relevant predictors of response and their use for response guided therapy
3. Discuss the rapidly changing world of HCV therapeutics

### **Multiple Choice Questions (Select the best answer)**

1. Is HCV truly curable?
  - a. True
  - b. False
2. Newly licensed therapies for HCV genotype 1 results in sustained virological response rate of:
  - a. 40-50%
  - b. 50-75%
  - c. <40%
  - d. >80%
3. Therapy for infection caused by the Hepatitis C virus is only useful for the treatment of patients who are naïve to prior therapies?
  - a. True
  - b. False

## **Tuberculosis? Yes – It Affects You!**

Martha Ainslie, MD  
Section of Respiratory Medicine  
University of Manitoba

### **Abstract**

Tuberculosis (TB) is still a significant public health issue with an estimated 8 million new cases of active TB diagnosed yearly worldwide despite the availability of curative therapy since the 1950s. Though the rates of TB in Canada are very low, Manitoba continues to have incident rates well above the national average. In Manitoba approximately 60% of the TB infections are reported in First Nation persons with certain communities having very high incidence rates (26-106 cases per 100,000). Factors contributing to these higher incidence rates include the high rates of diabetes and renal failure as well as socioeconomic factors such as poverty, malnutrition, difficulties accessing medical care and inadequate housing. It is important to recognize the disease early and accurately as pulmonary TB, if left unchecked can be highly infectious. The cornerstone of treatment consists of a directly observed multidrug regime to rapidly control the symptoms, render the patient noninfectious and to prevent the development of drug resistance. The social determinants of health will need to be addressed if we want to eliminate this disease completely.

This talk will review the epidemiology of TB in Manitoba, and the appropriate steps to take with respect to diagnosis and management when TB is suspected.

### **Objectives**

By attending this session, the attendee will be able to:

1. Discuss the epidemiology of TB in Manitoba and factors that contribute to the higher incidence rates
2. Recognize clinical features that are suggestive of active TB and initiate appropriate investigations
3. Outline treatment principles for TB

### **Multiple Choice Questions (Select the best answer)**

1. The most common symptom in patients with pulmonary TB is:
  - a. Cough
  - b. Hemoptysis
  - c. Chest pain
  - d. Shortness of breath
2. The most common symptom in patients with pulmonary TB is:
  - a. Cough
  - b. Hemoptysis
  - c. Chest pain
  - d. Shortness of breath
3. A 54 year old patient is diagnosed with pulmonary TB. Past medical history is significant for type 2 diabetes on oral hypoglycemic agents. You would recommend treatment with:
  - a. INH, rifampin, ethambutol and pyrazinamide
  - b. Streptomycin, INH, rifampin
  - c. Moxifloxacin, INH, rifampin and ethambutol
  - d. INH, rifampin and pyrazinamide

## Human Immunodeficiency Virus Nondisclosure: Human Nature or Criminal Behavior?

Pierre Plourde, MD  
Population and Public Health Program  
Winnipeg Regional Health Authority

### Abstract

In 1998 a Supreme Court decision defined nondisclosure of infection with the human immunodeficiency virus (HIV) with non-consensual unprotected sex as a criminal offence. Since 1999, there have been over 100 criminal prosecutions for HIV nondisclosure in Canada, mostly in men.

Public health officials must balance their role as counsellors to the HIV infected person not disclosing their HIV status with their role in protecting the public. In such circumstances, the individual refusing to disclose their HIV status places the public health system into a difficult position. But in order to maintain the ability of the public health system to engage in the prevention of HIV transmission, it is critical that an adversarial role be avoided. Unlike the justice system which must punish criminal activity, the public health system seeks to maintain a therapeutic relationship with individuals in order to successfully counsel behaviour changes, and reduce harm and transmission of HIV. Where attempts to counsel behaviour change fail, intrusive measures (including use of the Criminal Code) may actually impart more harm and no benefit and are rarely justified.

### Objectives

By attending this session, the attendee will be able to:

1. Describe what the *Law* says (and doesn't say) about HIV nondisclosure.
2. Outline guiding principles for managing HIV nondisclosure.
3. Use a graduated case-specific algorithmic response to the management of HIV nondisclosure.

### Multiple Choice Questions (Select the best answer)

1. According to the Canadian Federal Criminal Code, a charge of aggravated sexual assault can be made if someone knowingly exposes their sex partner without informing them of such exposure, to which of the following infections:
  - a. Herpes simplex virus
  - b. Gonorrhoea
  - c. Syphilis
  - d. HIV
  - e. All of the above
2. In order to secure a successful conviction for aggravated sexual assault within the context of HIV nondisclosure, which of the following must be proven:
  - a. That the accused did not always use condoms
  - b. That the accused was not taking their antiretroviral medications
  - c. That the accused transmitted their HIV strain to their partner
  - d. That the accused was tested for HIV
  - e. None of the above
3. According to *The Public Health Act* of Manitoba, health care providers are obligated to do which of the following:
  - a. Report HIV nondisclosure to public health authorities
  - b. Report newly diagnosed HIV infection to public health authorities
  - c. Report HIV nondisclosure to the police
  - d. Warn the spouse of an HIV positive person that they have been exposed to HIV
  - e. Test a patient for HIV against their consent

## Did You Have a Nice Vacation? Let Me Tell You What's Been Crawling on You!

Shane Silver, MD  
Section of Dermatology  
University of Manitoba

### Abstract

Many infectious diseases can manifest on the skin. When travelling there are many communicable diseases which one may acquire. These can have varied presentations. Dermatologic manifestations are very common and can be quite cumbersome. Some infectious diseases can be preventable and some may be inevitable. During the lecture we will go on vacation together and see what we may acquire on our journey.

### Objectives

By attending this session, the attendee will be able to:

1. Recognize and be able to treat scabies
2. Recognize the presentation of bed bugs and ways of finding them
3. Tell family members to not go into the hot tub at the hotel!

### Multiple Choice Questions (Select the best answers)

1. Which of the following locations in adults is not commonly involved with scabies:
  - a. Web spaces of hands
  - b. Face
  - c. Axilla
  - d. Genitals
  - e. Axilla
2. Which is true of hot tub folliculitis?
  - a. It is caused by *Staphylococcus aureus*
  - b. It is extremely pruritic
  - c. It is not necessary to treat as it will resolve on its own
  - d. The oral mucosa is involved
  - e. Everyone in the hot tub will be infected
3. How many mites does the average person have on them with scabies:
  - a. 12
  - b. 50
  - c. 100
  - d. 1000
  - e. 500

## Answers to Multiple Choice Questions

### 1. Infection Prevention and Control: We are All in this Together

1. c
2. c
3. a

### 2. Swimming Pools: Do you Know What Lurks Within?

1. d
2. a
3. c

### 3. *Clostridium difficile*: What's Hot, What's Not

1. d
2. d
3. b

### 4. Honestly, I Caught it from a Toilet Seat!

1. a
2. b
3. d

### 5. Medical Device Reprocessing: Past, Present and Future

1. b
2. e
3. b

### 6. Tales of a Virus Hunter: Lessons Learned while Chasing Lassa, Marburg, and Ebola Viruses

1. b
2. d
3. e

### 7. Hepatitis C Virus (HCV) – 25 Years from Discovery to Cure!

1. a
2. d
3. b

### 8. Tuberculosis? Yes – It Affect You!

1. a
2. d
3. a

### 9. Human Immunodeficiency Virus Nondisclosure: Human Nature or Criminal Behaviour?

1. d
2. a
3. b

### 10. Did You Have a Nice Vacation? Let me Tell You What's Been Crawling on You!

1. b
2. c
3. a

## **Bug Day 2014 Websites/Links for Specific Presentations**

### **Medical Grand Rounds: We are All in this Together**

<http://www.phac-aspc.gc.ca/dpg-eng.php>

<http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/99vol25/25s4/index.html>

<http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/98pdf/cdr24s8e.pdf>

### **Swimming Pools: Do You Know What Lurks Within?**

<http://www.cdc.gov/healthywater/swimming/rwi/>

### ***Clostridium difficile*: What's Hot, What's Not**

<http://www.phac-aspc.gc.ca/id-mi/cdiff-eng.php>

<http://www.phac-aspc.gc.ca/nois-sinp/guide/c-dif-acr-esa/index-eng.php>

<http://www.phac-aspc.gc.ca/nois-sinp/projects/cdad-eng.php>

### **Honestly, I Caught it from a Toilet Seat!**

<http://www.cdc.gov/std/>

### **Medical Device Reprocessing: Past, Present and Future**

<http://www.health.gov.bc.ca/library/publications/year/2011/Best-practice-guidelines-cleaning.pdf>

[http://www.publichealthontario.ca/en/eRepository/PIDAC\\_Cleaning\\_Disinfection\\_and\\_Sterilization\\_2013.pdf](http://www.publichealthontario.ca/en/eRepository/PIDAC_Cleaning_Disinfection_and_Sterilization_2013.pdf)

### **Tales of a Virus Hunter: Lesson Learned while Chasing Lassa, Marburg, and Ebola Viruses**

<https://www.nml-lnm.gc.ca/zsp-zps/dt-eng.html>

<https://www.nml-lnm.gc.ca/zsp-zps/SP-PS-eng.htm>

### **Hepatitis C Virus (HCV) – 25 Years from Discovery to Cure!**

<http://www.phac-aspc.gc.ca/hep/index-eng.php>

<http://www.phac-aspc.gc.ca/hepc/index-eng.php>

### **Tuberculosis? Yes – If Affects You!**

<http://www.ncbi.nlm.nih.gov/pubmed/23717818>

<http://www.respiratoryguidelines.ca/guideline/infectious-respiratory-diseases>

<http://www.winnipegfreepress.com/local/tb-rates-for-aboriginals-soar-261347381.html>

### **Human Immunodeficiency Virus Nondisclosure: Human Nature or Criminal Behavior?**

<http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/05vol31/dr3105-eng.php>

<http://www.aidslaw.ca/EN/publications/index.htm>

<http://web2.gov.mb.ca/laws/statutes/ccsm/p210e.php>

### **Did You Have a Nice Vacation? Let Me Tell You What's Been Crawling on You!**

<http://www.phac-aspc.gc.ca/tmp-pmv/index-eng.php>

<http://www.phac-aspc.gc.ca/tmp-pmv/catmat-ccmtmv/index-eng.php>

<http://www.healthycanadians.gc.ca/environment-environnement/pesticides/bedbugs-punaises-travel-voyage-eng.php>