Health Sciences Centre Winnipeg presents

THE 19th ANNUAL
BUG DAY
Abstracts

Tuesday, October 20, 2015

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

0750 – 0800 Opening Remarks
Fred Aoki, MD

0800 – 0855 Infection Prevention and Control: The Excitement Never Ends!
John Embil, MD
Infection Prevention and Control Unit
Health Sciences Centre Winnipeg
Winnipeg Regional Health Authority

0855 – 0900 Moderator Announcements

Mark Joffe, MD
Section of Infectious Diseases
University of Alberta

0930 – 1000 Exhibits/Nutritional break provided

1000 – 1030 All You Ever Wanted to Know about German, American and Brown Banded Cockroaches
Taz Stuart, MSc
Poulin’s Pest Control

1030 – 1100 Hand to Hand Combat: Hand Hygiene in Action
Mark Joffe, MD
Section of Infectious Diseases
University of Alberta

1100 – 1130 Alphabet Soup of Antimicrobial Resistant Organisms (AROs)
Matthew Gilmour, PhD
National Microbiology Laboratory

1130 – 1200 Mandatory Influenza Vaccination: Controversy or Common Sense?
Eric Bow, MD
Section of Infectious Diseases
University of Manitoba

1200 – 1300 Exhibits/Lunch on your own

1300 – 1315 Moderator Announcements

1315 – 1345 Sepsis: What Doesn’t Kill You Might Not Make You Stronger
Ryan Zarychanski, MD
Department of Internal Medicine, Section of Critical Care and Hematology / Medical Oncology

1345 – 1415 Vaccination Against Human Papilloma Virus, Not Just for Women!
Denise Black, MD
Department of Obstetrics, Gynecology and Reproductive Sciences, University of Manitoba

1415 – 1445 Exhibits/Nutritional break provided

1445 – 1515 Lessons Learned: Ebola Virus – One Year Later
Jim Strong, MD
National Microbiology Laboratory

1515 – 1545 Travel Medicine is More Than Skin Deep
Pierre Plourde, MD
Winnipeg Regional Health Authority

1545 – 1600 Closing Remarks
Moderator
Infection Prevention and Control: The Excitement Never Ends!
John Embil, MD
Infection Prevention and Control Unit
Health Sciences Centre, 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
A Shot in Time Saves Lives: Vaccinate Today!
Mark Joffe, MD
Section of Infectious Diseases
University of Alberta

Abstract:
At the turn of the 20th century, infection was the most common cause of death. Immunization has reduced the burden of disease and death from infectious diseases and contributed to the doubling of life expectancy during the 20th century. Progress is threatened, however, as increasing numbers of individuals choose to opt-out or modify routine childhood vaccine schedules. Measles is one of the most contagious of all infectious diseases, causing serious illness with severe complications and is a major killer of children globally. Recent outbreaks are due to declining vaccination rates. This decline is related, in part, to a preliminary report from 1998 that speculated a link between measles and mumps rubella (MMR) vaccine and autism. The research in that report is now known to have been fraudulent and multiple studies have demonstrated the safety of MMR vaccine. Nonetheless, the damage has been done and there are spin-off effects with reduction in overall vaccination rates. Vaccine programs are now potential victims of their own success as the diseases they prevent have become uncommon, allowing complacency, fear and misunderstanding to compromise the very programs that led to their scarcity in the first place. We are at a crossroads where individual rights will need to be reconciled with the rights of the population.

Objectives:
By attending this session the attendee will be able to:
1. Understand the spectrum of vaccine preventable illnesses.
2. Appreciate the importance of measles and recent outbreaks.
3. Address the MMR vaccine and autism controversy and spin-off effects on other vaccine programs

Multiple Choice Questions (select the best answer)
1. Which human infections have been eradicated through vaccination?
   a. Smallpox
   b. Rinderpest
   c. Polio
   d. a and c
   e. a, b, and c

2. Measles virus commonly infects which of the following tissues?
   a. Ears
   b. Brain
   c. Lungs
   d. Intestines
   e. All of the above

3. Measles virus or the mercury in MMR vaccine leads to intestinal leak in infants increasing subsequent risk of neurodevelopmental disorder (autism).
   a. True
   b. False
Mandatory Influenza Vaccination: Controversy or Common Sense?
Eric Bow, MD
Section of Infectious Diseases, University of Manitoba

Abstract
In Canada, approximately 5-10% of the population contract influenza virus infection during a given influenza season. Up to 20% of health care workers (HCW) may also develop influenza virus infection with significant absenteeism from the workplace. Over half of physicians fail to receive the annual influenza vaccination. Annual HCW influenza vaccination has been recommended since 1980. Multiple medical societies have endorsed this as a core Patient and HealthCare Personnel Safety Practice and support policies of annual influenza vaccination as a condition of employment and professional privilege. A 90% vaccination rate among HCW is the target set by the US National Healthy People 2020 initiative. Despite these recommendations, vaccine uptake for HCW remains low (30-40%). Three general strategies to enhance HCW vaccination include: enhanced education and availability of free vaccine; mandatory declination; and mandatory vaccination. Health care institutions that make influenza vaccine widely available to its HCW, encourage them to take the vaccine or formally decline (written declination), and impose a consequence (masking during patient contact during flu season) achieve higher HCW vaccination rates; however, only mandatory vaccination policies have been effective in reaching the 90% uptake target. Infringement upon the autonomy of the HCW has remained the primary objection to mandatory HCW influenza immunization. Recent challenges to mandatory HCW influenza vaccination policies in Canada have been unsuccessful in recognition the effect of HCW vaccination on patient outcomes such as all-cause mortality and influenza-like illness. It is time that Manitoban health care employers and employees take steps to reduce the annual threat to the safety of vulnerable patients by adopting a policy of annual influenza vaccination as a condition of initial and continued employment and professional privileges.

Objectives:
By attending this session the attendee will be able to:
1. State the risk of transmission of influenza from HCW to vulnerable patients.
2. State role of HCW influenza virus vaccination on reducing the risk of HCW influenza , HCW absenteeism from the healthcare work place, and the likelihood of transmission.
3. To understand the obligations of the health care employer regarding the influenza vaccine.

Multiple Choice Questions (Select the best answer)
1. Factors that influence the decision of a HCW to receive an annual influenza vaccine include the following:
   a. The financial incentive from the health care employer.
   b. The desire to prevent harm to patients.
   c. Scientific educational materials.
   d. Availability and convenience of free vaccine for administration.
   e. All of the above.

2. Mandatory annual influence vaccination of healthcare workers results in healthcare institution influenza vaccination compliance rates of >90%. What beneficial impact has this had for patients?
   a. Fewer healthcare workers absent from the healthcare institution during influenza season.
   b. Transmission of influenza virus from healthcare workers to patients.
   c. Lower seasonal hospital admission rates for any reason
   d. Lower incidence of influenza-like illness.

3. Influenza-like illness is defined by the following:
   a. Pneumoniae
   b. Fever
   c. Blood in the stool
   d. Cough
   e. Sore throat or headache
Hand to Hand Combat: Hand Hygiene in Action
Mark Joffe, MD
Section of Infectious Diseases
University of Alberta

Abstract
Safe delivery of quality healthcare is the stated aim of most healthcare organizations in 2015. Yet, delivery on this promise remains elusive and healthcare-acquired infections remain a major challenge. In Canada, it has been estimated that 1 in 9 patients in acute care hospitals acquire an infection through the process of their care with up to 12,000 individuals dying per year of complications related to those infections. We have known for well over a century that clean hands reduce deaths and that careful attention to hand hygiene is the most important strategy to reduce transmission of microbes (and infection) in the hospital setting. Yet, our adherence with this simple measure still lags. This presentation will review some of the evidence and background supporting hand hygiene as a critical patient safety strategy. It will highlight some recent experience related to hand hygiene and will challenge individuals and teams to improve on this simple, but critical, patient safety priority.

Objectives:
By attending this session the attendee will be able to:
1. Appreciate the impact of hospital-acquired infections in Canada
2. Understand the critical role of hand hygiene as the most important strategy for reducing healthcare associated infections.
3. Explore opportunities for improvement in hand hygiene.

Multiple Choice Questions (Select the best answer)
1. How many Canadians are estimated to die of hospital acquired infections in Canada each year?
   a. 8
   b. 80
   c. 800
   d. 8,000
   e. 80,000

2. Soap and water are more effective for hand hygiene and safer for hands than alcohol hand sanitizer.
   a. True
   b. False

3. The most recent hand hygiene compliance rate in Winnipeg hospitals is:
   a. 22%
   b. 52%
   c. 72%
   d. 82%
   e. 92%
**Alphabet Soup of Antimicrobial Resistant Organisms (AROs)**
Matthew Gilmour, PhD
National Microbiology Laboratory

**Abstract:**
The successful treatment of infectious disease is complicated by the ever-evolving nature of pathogenic microbes and their acquisition of resistance to antimicrobials (AMR). An antibiogram is a guide to assist prescribers in their empiric selection of antimicrobial therapies, prior to the availability of patient-specific susceptibility data. The antibiogram also provides additional hospital-wide and public health benefits for antibiotic stewardship, monitoring of year-to-year resistance trends, and as an educational tool for prescribers.

Across Canada, clinical and private laboratories conduct daily antimicrobial susceptibility testing on a wide variety of bacterial pathogens. This information provides a unique opportunity to capture, analyze, and integrate laboratory-generated data to support timely, community-level and national AMR surveillance. A pilot study - called AMRNet - was initiated between the Public Health Agency of Canada in collaboration with the British Columbia Centre for Disease Control (BCCDC) and LifeLabs BC.

During the pilot, a web-based application was designed to support AMR data collection and analysis, with capacity for broader implementation across Canada. AMRNet can be queried by any drug/bug combination for defined time periods, and can map and compare resistance data between regions. An expert laboratory group has been established to develop compatible and standard processes for laboratory testing and reporting of AMR data. Long-term, the vision of AMRNet is to include other jurisdictions, expanding to support truly national antibiogram surveillance.

**Objectives:**
By attending this session the attendee will be able to:
1. Describe the national perspective of AMR in Canada.
2. Present current national AMR surveillance data.
3. Present a pilot study that will provide national and community level evidence to monitor AMR.

**Multiple Choice Questions (select the best answer)**
1. My hospital’s antibiogram:
   a. Tells me that a cocktail of vancomycin and ceftriaxone are appropriate treatment choices for every patient.
   b. Summarizes the cumulative susceptibilities of pathogenic microbes to my institution’s formulary antimicrobials over a given time frame – usually the previous calendar year.
   c. Was given to me at some point as a pocket reference, but I can’t find it now.

2. Prior to the release of the Canadian Antimicrobial Resistance Surveillance System (CARSS) report (see suggested reading) and AMRNet, the best source for national AMR data was (or continues to be):
   a. Independently coordinated local and national surveillance projects
   b. Publications from the National Microbiology Laboratory (NML) and their provincial and hospital colleagues
   c. Canadian Nosocomial Infection Surveillance Program (CNISP) reports
   d. All of the above

3. The antibiotic resistant organism that is of most concern to me is:
   a. “Untreatable” Neisseria. gonorrhoea
   b. Carbapenemase-producing organisms/carbapenemase producing enterobacteriaceae
   c. Methicillin resistant Staphylococcus aureus
   d. Vancomycin resistant enterococci
   e. Multiple drug resistant Streptococcus pneumonia
All You Ever Wanted to Know about German, American and Brown Banded Cockroaches
Taz Stuart, M.Sc.
Poulin’s Pest Control

Abstract
Cockroaches have been on the earth for over 280 million years and there are over 4,000 different species occurring worldwide. Cockroaches have many very unique habits, strategies and stages which will amaze and fascinate you. One such fact is that roaches are cold blooded insects so they can live without food for approximately a month but will only survive seven days without water. Positive identification is key as not all cockroaches have the same habits and the methods to control them are just as varied. As a public health pest, cockroaches can passively transport microbes on their body surfaces including pathogens that are potentially dangerous to humans. For example, cockroaches have been implicated in the spread 33 different kinds of bacteria, including Escherichia coli and Salmonella spp, six parasitic worms, allergic effects and more than seven other types of human pathogens. Determining the best methodology to control cockroaches is to “think like a cockroach” to control them. In this presentation you will be taught the ways to seek, inspect and destroy these public health pests.

Objectives:
By attending this session the attendee should be able to:
1. Identify what German, American and Brown Banded cockroaches are and where they can be found.
2. Determine what conditions, locations and places cockroaches are most likely found and to train you how to “think like a cockroach” to determine their presence.
3. Learn many facts about cockroaches, especially German cockroaches and how they have evolved to become a significant public health pest.

Multiple Choice Questions (Select the best answer)
1. How long can most cockroaches hold their breath?
   a. 1 minute
   b. 10 minutes
   c. 40 minutes
   d. 240 minutes

2. When are German cockroaches most active and why?
   a. At night, when they know people are sleeping
   b. At night, when they are foraging for food, water and mates
   c. During the day, when there are more food sources present
   d. During the day, when they are looking for mates

3. Cockroaches go through which type of life cycle?
   a. Complete metamorphosis: egg, larva, pupa, adult
   b. Complete metamorphosis: egg, nymph, adult
   c. Incomplete metamorphosis: egg, larvae, pupa, adult
   d. Incomplete metamorphosis: egg, nymph, adult
Sepsis: What Doesn't Kill You Might Not Make You Stronger
Ryan Zarychansk MD MSc.
Section of Critical Care and Hematology/Medical Oncology
University of Manitoba

Abstract
Sepsis, defined by infection plus an inflammatory/immune response infection to an invading pathogen, remains the leading cause of global mortality. In the context of an aging population, increasing prevalence of co-morbidities and use of immunosuppressive therapies, the incidence of sepsis in developed countries is increasing. With institution of early antibiotics and advances in supportive care mortality in the most severe forms of sepsis has decreased from 50 to 20%. While eradicating the invading pathogen remains an important primary goal of treatment, strategies to modulate overwhelming host inflammation remain relevant. As a result of improved survival, long-term sequelae of acute illness, such as physical disability, post-traumatic stress disorder, cognitive dysfunction, and decreased earning potential are becoming increasing recognized consequences of severe sepsis.

Objectives
By attending this session, the attendee will be able to:
1. Review the epidemiology and pathogenesis of sepsis.
2. Highlight best practice for management of sepsis, existing knowledge gaps and cutting-edge research to improve outcomes for patients with severe infection.
3. Consider longterm sequelae and potential disability associated with surviving sepsis.

Multiple Choice Questions (Select the best answer)
1. The incidence of sepsis (new cases of sepsis) in the general population is:
   a. Increasing
   b. Decreasing
   c. Staying relatively stable
   d. Not my concern

2. In patients with severe infection, empiric antibiotics should be administered within what time frame?
   a. Within 24 hours
   b. Within 12 hours
   c. Within 6 hours
   d. Within 3 hours
   e. Within 1 hour

3. Which of the following longterm sequelae are common to survivors of septic shock?
   a. Post-traumatic stress disorder
   b. Amputations
   c. Cognitive dysfunction
   d. Financial distress
   e. All of the above
Vaccination Against Human Papilloma Virus, Not Just for Women!
Denise Black, MD
Department of Obstetrics, Gynecology and Reproductive Sciences
University of Manitoba

Abstract
Human Papilloma Virus (HPV) is a viral infection that can be spread from one person to another through anal, vaginal, or oral sex or through close skin to skin contact during sexual activity. Anyone who is sexually active can come in contact with HPV and develop HPV related conditions. Most of the time, HPV infections resolve without causing any health related problems, however, infection may persist leading to genital warts, cervical cancer, penile cancer and oral pharyngeal cancer. Approximately 90% of anal and cervical cancers are related to HPV and 70% of vaginal and vulvar cancers as well as 60% of penile cancers are also related to HPV. While HPV vaccination in young females is now accepted as a very effective means by which to prevent HPV related disease at a later date, uptake of HPV vaccination in males is currently lagging.

Objectives
By attending this session, the attendee will be able to:
1. State the burden of HPV disease in men
2. State the efficacy of HPV vaccine in preventing HPV related disease
3. Outline the need for advocacy for HPV care for men

Multiple Choice Questions (Select the best answer)
1. Human papilloma virus is transmitted by all of the following means except:
   a. Skin to skin contact
   b. Mucosa to mucosa contact
   c. Vertically to an infant exposed to HPV in the genital tract at the time of delivery
   d. Sharing dirty needles during intravenous drug use.

2. To the best of our knowledge, HPV can cause all of the following cancers except:
   a. Cervical
   b. Anal
   c. Melanoma
   d. Penile

3. In boys, in which ages is there greatest benefit to receiving HPV vaccine?
   a. 1-8
   b. 9-13
   c. 30-45
   d. > 45
Abstract
The worst Ebola virus outbreak in the history began in December 2013 and is still ongoing in some parts of West Africa. The Special Pathogens department of the Public Health Agency of Canada’s (PHAC) has provided diagnostic support via numerous deployments of the mobile laboratory to assist World Health Organization and Médecins Sans Frontières in their disaster responses as well as the developing some of the key medical counter-measures (e.g. Zmapp and VSV-EBOV vaccine) that have been used on some human patients. While we have been preparing for outbreaks such as this, mostly by performing basic and applied research on high consequence pathogens, this outbreak caught many in the high containment field off guard by its size, geography and rapidity of spread. In order for us to prevent Ebola 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 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
Abstract
Skin lesions account for up to 20% of post travel diagnoses in travel medicine clinics. Dermatological conditions in travelers to the tropics may present a diagnostic dilemma considering both the wide variety of common North American dermatoses, as well as conditions related exclusively to the exotic travel destination. A detailed travel history and careful clinical examination will establish a diagnosis in most instances without need for laboratory investigations. Most tropical dermatoses present with such unique manifestations that the diagnosis can be made on visual inspection alone. This presentation will highlight the most common dermatologic presentations seen in short-term travelers to tropical destinations and will present a simple clinical morphologic approach to this diagnostic challenge. Travellers should be advised on simple measures to avoid exposure to the agents and vectors of tropical dermatoses.

Objectives
By attending this session, the attendee will be able to:
1. Recognize the most common dermatologic presentations in travelers returning from tropical destinations.
2. Suggest management strategies for the most common dermatologic presentations in travelers returning from tropical destinations.
3. Avoid common skin conditions while travelling

Multiple Choice Questions (Select the best answer)
1. The most important tool facilitating the diagnosis of tropical dermatologic condition is:
   a. Dermoscopy
   b. Empiric treatment with topical corticosteroid
   c. Physical examination
   d. Skin biopsy
   e. Travel and exposure history

2. Someone returning from a tropical destination with a diffuse maculopapular skin rash that may or may not be itchy most likely has:
   a. Drug allergy
   b. Eczema
   c. Fungal infection
   d. Lyme Disease
   e. Secondary syphilis

3. Someone returning from a tropical destination with a darkly pigmented macular lesion on the upper leg that is not itchy and not tender most likely needs:
   a. Psychiatric consultation to investigate for possibility of factitious disorder
   b. Reassurance that all they have is “lime disease”(phytophotodermatitis)
   c. Serology to rule out Lyme Disease
   d. Serology to rule out secondary syphilis
   e. Skin biopsy to rule out melanoma
Answers to Multiple Choice Questions

1. Infection Prevention and Control: The Excitement Never Ends
   1. c
   2. c
   3. a

   1. a
   2. e
   3. b

3. Mandatory Influenza Vaccination: Controversy of Common Sense?
   1. b and d
   2. a, b, and d
   3. b, d, e

   1. d
   2. b
   3. c

5. Alphabet Soup of AROs
   1. b or c
   2. a,b,c, or d
   3. a,b,c,d or e

6. All You Ever Wanted to Know about German, American and Brown Banded Cockroaches
   1. c
   2. b
   3. d

7. Sepsis: What Doesn’t Kill You Might Not Make You Stronger
   1. a
   2. e
   3. e

8. Vaccination Against Human Papilloma Virus, Not Just for Women!
   1. d
   2. c
   3. b

9. Lessons Learned: Ebola Virus – One Year Later
   1. b
   2. d
   3. e

10. Travel Medicine is More Than Skin Deep
    1. e
    2. c
    3. b
Bug Day 2015
Websites/Links for Specific Presentations

Medical Grand Rounds: The Excitement Never Ends!

A Shot in Tim Saves Lives: Vaccinate Today!
https://www.youtube.com/watch?v=7UbL8opM6TM

Mandatory Influenza Vaccination: Controversy or Common Sense?
www.cdc.gov/mmwr/preview/mmwrhtml/rr5502a1.htm
www.cdc.gov/flu/healthcareworkers.htm
http://www.cdc.gov/vaccines/adults/rec-vac/hcw.html

Hand to Hand Combat: Hand Hygiene in Action
http://www.who.int/entity/gpsc/en/
http://www.wrha.mb.ca/prog/ipc/hand-hygiene.php
http://www.ihi.org/communities/blogs/_layouts/ihi/community/blog/itemview.aspx?List=0f316db6-7f8a-430f-a63a-
ed7602d1366a&ID=49&utm_campaign=tw&utm_source=hs_email&utm_medium=email&utm_content=17050994&_hsenc=p2ANqtz-_dy-avD5JITnLDL18kAiroZzO0lzAzPaeurylLEpxFznJ-Jg1y7ajDyvmaGr7Z6kaQWWiwLsxzweZ7F0k1K_BRECKEA&hsmi=17050994

Alphabet Soup of AROs
Canadian Antimicrobial Resistance Surveillance System Report 2015
Antimicrobial Resistance and Use in Canada: A Federal Framework for Action

All You Ever Wanted to Know about German, American and Brown Banded Cockroaches
http://www.poulins.ca/pest-library/cockroaches?format=raw&task=download&fid=10
https://books.google.ca/books?id=qU1AAQAAQBAJ&pg=PA171&lpg=PA171&dq=cockroach+combat+manual+ii&source=bl&ots=B4HHXiGCMr&sig=ZwqGjhKcaubipmCWxwegXQJKTq0&hl=en&sa=X&ved=0CDUQ6AEwB2oVChMls83NwuCKxgIYDKKACH2yfgBQ#v=onepage&q=cockroach%20combat%20manual%20ii&f=false

Sepsis: What Doesn’t Kill You Might Not Make You Stronger
http://www.survivingsepsis.org/Pages/default.aspx
http://www.sepsisalliance.org/life_after_sepsis/plrd_explained/

Vaccination Against Human Papilloma Virus, Not Just for Women!
www.hpvandme.org
www.hpvinfo.ca
Lessons Learned: Ebola Virus – One Year Later

Travel Medicine is More Than Skin Deep
http://www.cmajopen.ca/content/3/1/E119.full.pdf+html
http://www.cmajopen.ca/content/suppl/2015/03/31/3.1.E119.DC1/2014-0082-1-at.pdf