Biosafety at MUSC

- *Unit 7*
  - **Working with Biohazardous Materials: The role of the PI in informing the laboratorian of potential hazards in the workplace**

Working with Biohazardous Materials: The role of the PI in informing the laboratorian of potential hazards in the workplace

- **The role and responsibilities of the PI with respect to Biosafety and Animals**
  - **The Principal Investigator (PI) is responsible for full compliance with the federal and state regulations, NIH and CDC Guidelines, and institutional requirements for research involving biohazardous materials.**
  - **The PI is also responsible for ensuring that the reporting requirements are fulfilled and will be held accountable for any reporting lapses.**

Working with Biohazardous Materials: The role of the PI in informing the laboratorian of potential hazards in the workplace

- **The PI must:**
  - **Acquaint members of his/her laboratory with risks associated with working with biohazardous materials and agents.**
  - **Develop a biosafety plan which identifies the hazards present in his/her laboratory**
  - **Identify specific practices and procedures that need be followed in order to reduce the risk of working with these biohazardous agents.**

Working with Biohazardous Materials: The role of the PI in informing the laboratorian of potential hazards in the workplace

- **The PI should be familiar with the current MUSC safety policy entitled "Working with Biohazardous Materials"**
  - **It is accepted practice to give *specific training* relevant to requirements for working in an environment with biohazardous materials that may result in deleterious effects to laboratorians, any fetus they may be carrying, or close associates such as household contacts.**
  - **Laboratory personnel should be *advised of specific hazards* and be required to read and to follow the biosafety plan prepared by the PI.**
  - **Special care should be taken to advise at risk populations.**
    - **An at risk population includes, but is not limited to, immunocompromised individuals, those individuals who are pregnant, and individuals of child bearing age.**

Working with Biohazardous Materials: The role of the PI in informing the laboratorian of potential hazards in the workplace

- **The PI should be familiar with current MUSC safety policy entitled "Working with Biohazardous Materials"**
  - **Specific biohazards to pregnant women and their fetuses include, but are not limited to, those agents in the *TORCH* group**
    - **T, *Toxoplasma gondii*, O, *Treponema pallidum* (syphilis), R, rubella, C, cytomegalovirus (CMV), and H, herpes simplex virus.**
    - **However, there is also evidence that a number of other viruses including, but not limited to, *adenovirus*, *coxsackie virus*, *Epstein-Barr virus*, hepatitis B virus, human parvovirus, and varicella-zoster virus may result in adverse pregnancy outcomes.**
    - **Further, bacterial agents of special concern are those classified as BSL3 agents and those BSL2 agents with known consequences to the fetus such as *Streptococcus agalactiae*, group B Streptococcus (GBS) and *Listeria*.**

Working with Biohazardous Materials: The role of the PI in informing the laboratorian of potential hazards in the workplace

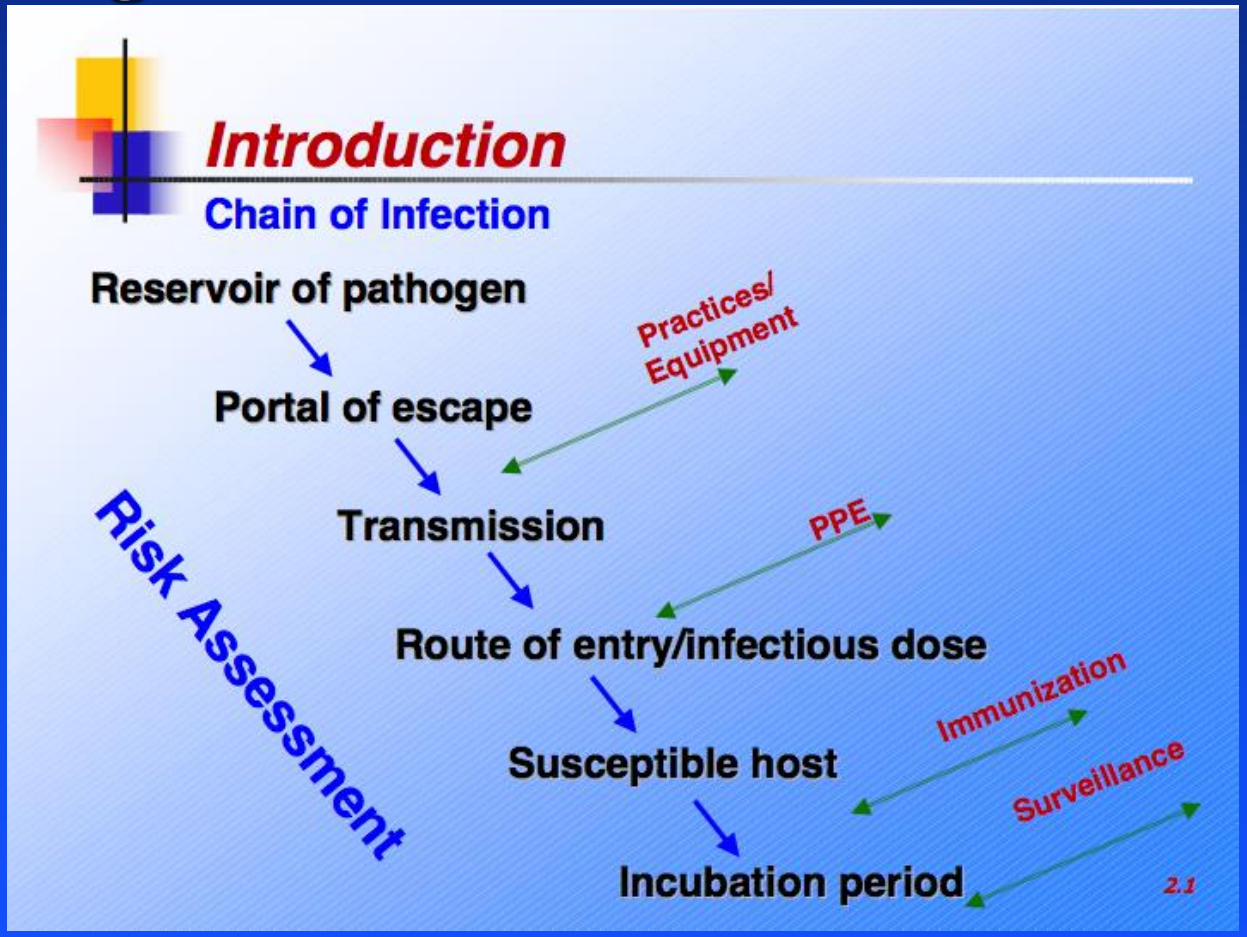
- **The PI should be familiar with current MUSC safety policy entitled "Working with Biohazardous Materials"**
  - **Role of the Laboratorian**
    - **In addition to participating in training, reading and following the biosafety plan, it is also the responsibility of the laboratorian to inform their immediate supervisor of any change in their health status (such as pregnancy, taking medications resulting in reduced immunity etc.).**
    - **Furthermore, the laboratorian may wish to consult with student or employee health and/or their personal physician to seek guidance with respect to how best to manage the risk.**

Working with Biohazardous Materials: The role of the PI in informing the laboratorian of potential hazards in the workplace

- **The PI should be familiar with current MUSC safety policy entitled "Working with Biohazardous Materials"**
  - **Management Plan**
    - **Appropriate action should be taken by the PI /supervisor to safeguard the health of the individual and, if necessary, the developing fetus.**
    - **A written, confidential, signed plan outlining the management of the specific risk shall be placed in the laboratorian's personnel file acknowledging their understanding and acceptance of the management plan.**

Working with Biohazardous Materials: The role of the PI in informing the laboratorian of potential hazards in the workplace

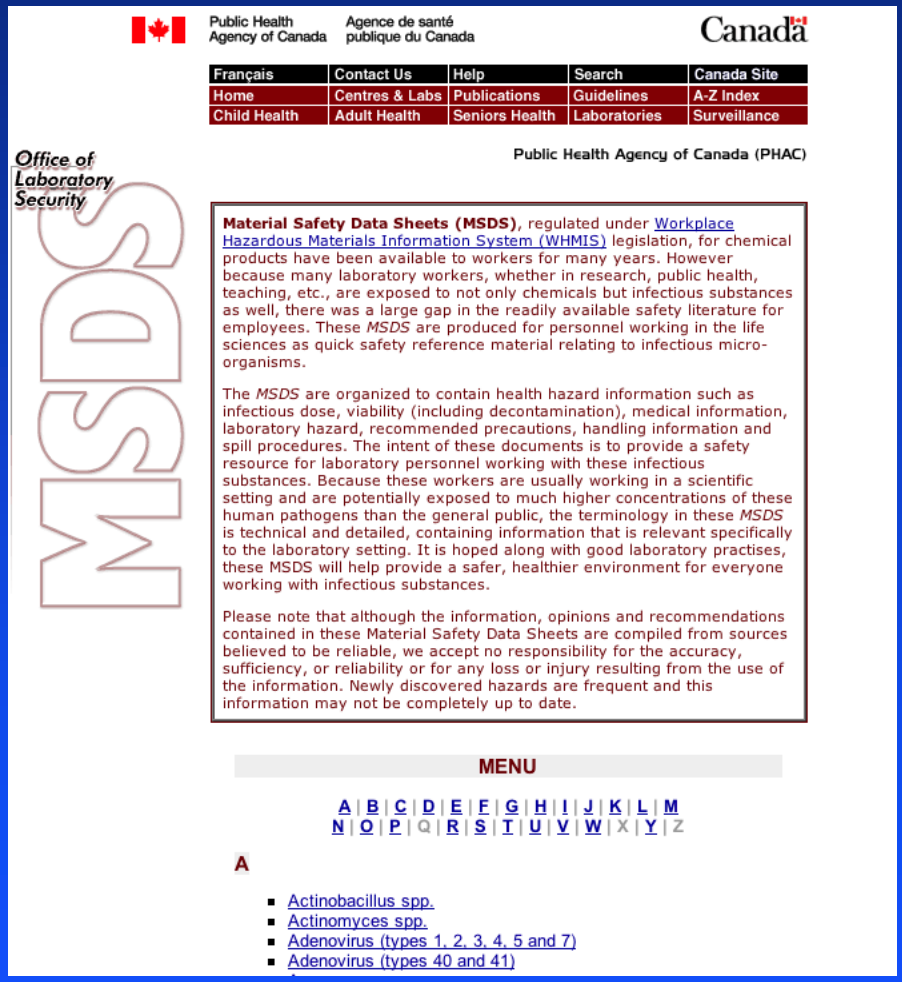
- **Management Plan**



http://www.cdc.gov/od/ohs/pdffiles/ Module%202%20-%20Biosafety.pdf

Working with Biohazardous Materials: The role of the PI in informing the laboratorian of potential hazards in the workplace

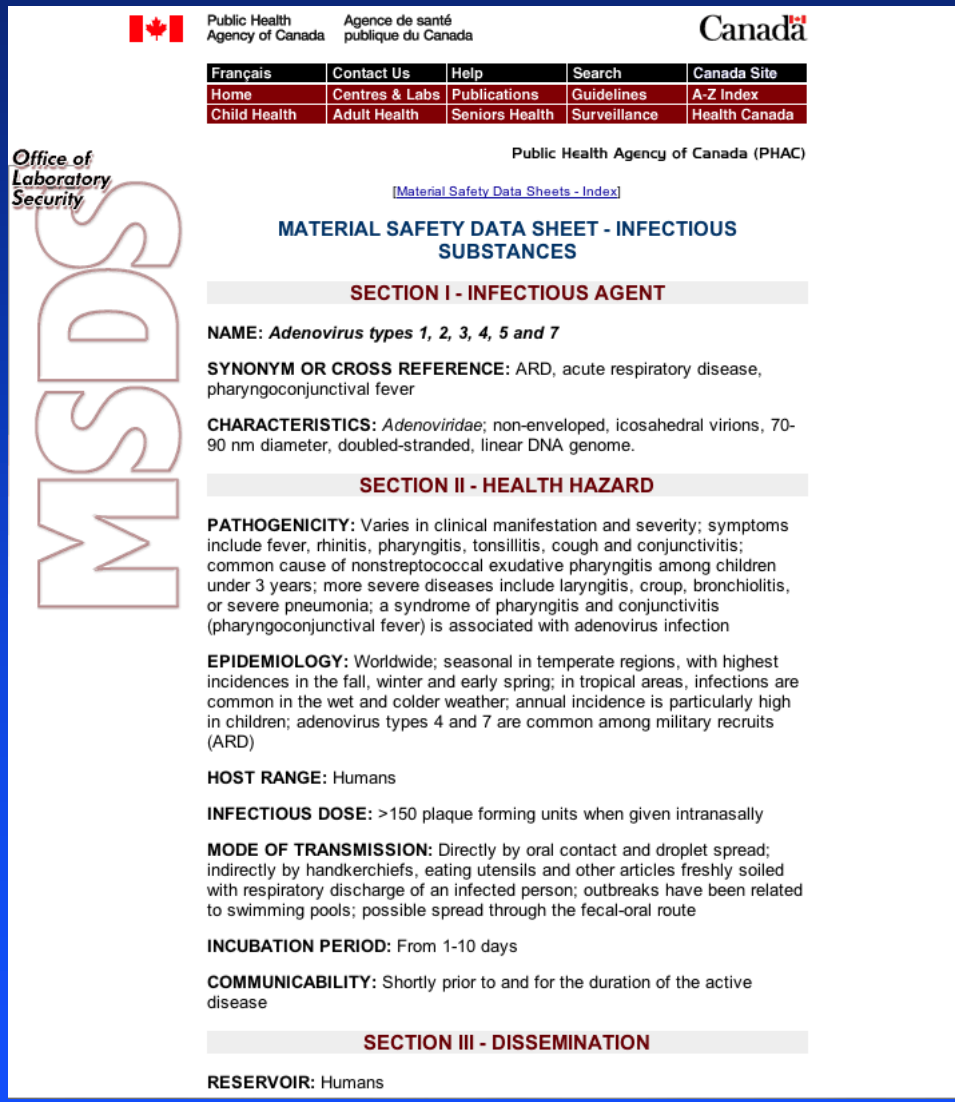
- **Management Plan**
  - **Questions to Ask ?**
    - **Hazard Levels**
    - **MSDS for Microbes**



http://www.hc-sc.gc.ca/pphb-dgspsp/msds-ftss/

Working with Biohazardous Materials: The role of the PI in informing the laboratorian of potential hazards in the workplace

- **Management Plan**
  - **Questions to Ask ?**
    - **Hazard Levels**
      - **MSDS for Microbes**
        - **Issue Aerosol**
        - **150 pfu is infectious intra-nasally**
      - **Incubation**
        - **1-10 days**
      - **Communicability**
        - **Yes**



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Office of Laboratory Security

MSDS

Public Health Agency of Canada (PHAC)

[Material Safety Data Sheets - Index]

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

NAME: ***Adenovirus types 1, 2, 3, 4, 5 and 7***

SYNONYM OR CROSS REFERENCE: ARD, acute respiratory disease, pharyngoconjunctival fever

CHARACTERISTICS: *Adenoviridae*; non-enveloped, icosahedral virions, 70-90 nm diameter, doubled-stranded, linear DNA genome.

SECTION II - HEALTH HAZARD

PATHOGENICITY: Varies in clinical manifestation and severity; symptoms include fever, rhinitis, pharyngitis, tonsillitis, cough and conjunctivitis; common cause of nonstreptococcal exudative pharyngitis among children under 3 years; more severe diseases include laryngitis, croup, bronchiolitis, or severe pneumonia; a syndrome of pharyngitis and conjunctivitis (pharyngoconjunctival fever) is associated with adenovirus infection

EPIDEMIOLOGY: Worldwide; seasonal in temperate regions, with highest incidences in the fall, winter and early spring; in tropical areas, infections are common in the wet and colder weather; annual incidence is particularly high in children; adenovirus types 4 and 7 are common among military recruits (ARD)

HOST RANGE: Humans

INFECTIOUS DOSE: >150 plaque forming units when given intranasally

MODE OF TRANSMISSION: Directly by oral contact and droplet spread; indirectly by handkerchiefs, eating utensils and other articles freshly soiled with respiratory discharge of an infected person; outbreaks have been related to swimming pools; possible spread through the fecal-oral route

INCUBATION PERIOD: From 1-10 days

COMMUNICABILITY: Shortly prior to and for the duration of the active disease

SECTION III - DISSEMINATION

RESERVOIR: Humans

http://www.hc-sc.gc.ca/pphb-dgspsp/msds-ftss/

Working with Biohazardous Materials: The role of the PI in informing the laboratorian of potential hazards in the workplace

- **Questions to Ask ?**
  - **Current Literature**

Am J. Obstet Gynecol 2003; *189*(3): 758-763

Is adenovirus a fetal pathogen?

Ahmet A. Baschat, MD,[a] Jeffrey Towbin, MD,[a] Neil E. Bowles, PhD,[a] Christopher R. Harman, MD,[a] and Carl P. Weiner, MD[a]

Baltimore, Md, and Houston, Tex

OBJECTIVES: The purpose of this study was to test the relationship between adenovirus genetic material in the amniotic fluid and adverse pregnancy outcome.
STUDY DESIGN: This was a prospective, observational study of women who were referred in the second trimester of gestation for either genetic amniocentesis or evaluation of fetal malformation. A 2-mL aliquot of amniotic fluid was subjected to multiplex polymerase chain reaction for a panel of viruses that included adenovirus and human genome controls. Fetuses with an abnormal karyotype were excluded from analysis.
RESULTS: The prevalence of adenovirus was similar in normal (39/652) and anomalous fetuses (23/364; χ^2 test, $P = .376$). There was significant seasonal variation in the prevalence in both normal and anomalous fetuses (χ^2 exact test, $P < .001$), but no significant difference between groups. The monthly proportion of patients who underwent amniocentesis remained constant throughout the year (mean, 8.3%; χ^2 test, $P = .67$). Central nervous system anomalies and echogenic liver foci were significantly more common among fetuses with positive amniotic fluid polymerase chain reaction results for adenovirus ($P < .005$, respectively).
CONCLUSION: Adenovirus is found in a similar prevalence and seasonal variation in sonographically normal and abnormal pregnancies. Although a specific fetal presentation was not identified, echogenic liver lesions with or without hydrops and neural tube defects were significantly more common in the presence of adenovirus. The significance of these findings deserves further study. (Am J Obstet Gynecol 2003;189:758-63.)

Key words: Adenovirus, amniotic fluid, polymerase chain reaction, fetal infection

Working with Biohazardous Materials: The role of the PI in informing the laboratorian of potential hazards in the workplace

- **Applicability**
  - **Guidance and procedures associated with the policy apply to all MUSC activities and its employees and students who might be exposed to reproductive or developmental hazards in the routine conduct of their actions at MUSC**
    - **Visitors who do not qualify as employees and/or students must involve their home institution in any discussion of accommodations.**
    - **Contractors resident to campus must consult their respective reproductive and developmental safety and health policies of their respective employers for accommodations.**

Biosafety at MUSC

- *Questions for Unit 7*
  - **Working with Biohazardous Materials: The role of the PI in informing the laboratorian of potential hazards in the workplace**