1. What is Influenza?

Influenza (or Flu)
- Respiratory illness caused by influenza viruses
- Mild to moderate disease; can be fatal
- In Canada, 5 million (1 in 6) infected
  - Over 50,000 hospitalizations
  - 4,500 deaths influenza-related complications
- In BC, 1,500 deaths influenza and pneumonia
- Usually young, old, or chronic diseases

Subtypes
- Type A subtype
  - Hemagglutinin (H) – 16 subtypes
  - Neuraminidase (N) – 9 subtypes
    - e.g. Influenza A (H1N1), influenza A (H3N2)
  - Strain
    - e.g. Seasonal influenza A (H1N1) vs. pandemic 2009 influenza A (H1N1)
- Type B
  - No subtypes
  - Strains
- Type C (uncommon)

Subtypes
- 3 types:
  - Type A
  - Type B
  - Type C (uncommon)
- Types A and B
  - Responsible for seasonal epidemics
  - New influenza strains pandemics

1. What is Influenza?

Influenza Virus

Outline

Influenza: Back to the Basics
1. What is influenza?
2. What is the swine flu?
3. What is happening in BC?
4. What are prevention strategies?
5. What are treatment strategies?
6. What can we do about it?
1. What is Influenza?

**Nomenclature**
- A/California/7/2009 (H1N1)

**Transmission**
- Droplet
  - Coughing or sneezing (1-2 m)
- Direct contact
  - Hands, tissues (5 min)
  - Hard surfaces (24-48 h)
  - Porous surfaces (8-12 h)
- Contagious period
  - 1 day prior and 5-7 days after symptoms

**Flu-like Symptoms**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Flu-like</th>
<th>Cold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>Common</td>
<td>Rare</td>
</tr>
<tr>
<td>Headache</td>
<td>Common</td>
<td>Uncommon</td>
</tr>
<tr>
<td>Tiredness</td>
<td>Moderate to severe</td>
<td>Mild</td>
</tr>
<tr>
<td>Chills</td>
<td>Fairly common</td>
<td>Uncommon</td>
</tr>
<tr>
<td>Runny or stuff nose</td>
<td>Uncommon</td>
<td>Common</td>
</tr>
<tr>
<td>Sneezing</td>
<td>Uncommon</td>
<td>Common</td>
</tr>
<tr>
<td>Sore throat</td>
<td>Uncommon</td>
<td>Common</td>
</tr>
<tr>
<td>Cough</td>
<td>Dry, unproductive cough</td>
<td>Hacking, productive cough</td>
</tr>
<tr>
<td>Muscle aches</td>
<td>Common; often severe</td>
<td>Uncommon</td>
</tr>
<tr>
<td>Nausea, vomiting, diarrhea</td>
<td>May occur in children</td>
<td>May occur</td>
</tr>
<tr>
<td>Onset</td>
<td>Sudden</td>
<td>Gradual</td>
</tr>
</tbody>
</table>

**SUMMARY:**
- Viral respiratory tract illness caused by influenza types A, B, or C
- Symptoms range mild illness to fatalities; young, elderly, and chronic medical illness more susceptible
- Transmission through droplets or direct contact
- Contagious period 1 day prior to and 5-7 days after symptoms
- Common symptoms
  - Fever, dry cough, severe muscle aches and tiredness
2. What is the Swine Flu?

Timeline
- **March 18:** Cases of influenza-like illness (ILI) noted by health authorities in Mexico
- **April 12:** Outbreak of ILI state of Veracruz, Mexico, east of Mexico City
- **April 23:** 854 cases of pneumonia from ILI reported in Mexico City with 59 deaths
- Healthy young adults; several cases laboratory confirmed as swine-origin influenza A (H1N1) virus same genetic strain as in two children in California
- A/California/7/2009 (H1N1)
- **April 25:** Director-General of WHO, Dr. Margaret Chan, declares Public Health Emergency of International Concern

**April 26:** CDC reports 20 lab confirmed of swine influenza A/H1N1 across U.S. All mild ILI with no deaths. New subtype of influenza A H1N1

**April 27:** 7 countries report cases of swine influenza A/H1N1 infection, CDC reports 64 cases (0 deaths) and Mexico reports 26 (7 deaths). Other countries reported cases with no deaths: Canada, Spain, New Zealand, U.K., and Israel

**April 29:** 148 lab confirmed cases in 9 countries; most in U.S. (91) and Mexico (26). One new death, in U.S.

**April 30:** 11 countries report cases
- In Mexico, 1,918 suspected, 286 probable and 97 confirmed cases. Total deaths in Mexico: 84 suspected and 7 confirmed

**May 1:** 13 countries: Mexico (156), U.S. (141), and Canada (34). New countries Hong Kong and Denmark

**May 2:** 6 countries report 658 cases.
- U.S. 160 cases and Canada 51 cases. Other countries 15 or fewer cases each. New countries reporting cases Costa Rica, France, and South Korea

**June 11:** WHO declares Phase 6 pandemic

### Epidemic vs. Pandemic

- **Epidemic**
  - Disease localized to a region

- **Pandemic**
  - Epidemic spreads across larger geographic region (worldwide)
  - In general, 3 pandemics within century
  - Transmission from animal to human
  - 3 conditions
    - Emergence of disease new to population
    - Serious illness
    - Spreads easily and sustainably among humans

<table>
<thead>
<tr>
<th>INFLUENZA PANDEMIC</th>
<th>DATE</th>
<th>DEATHS</th>
<th>SUBTYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asiatic (Russian flu)</td>
<td>1889-1890</td>
<td>1 million</td>
<td>Possibly H2N2</td>
</tr>
<tr>
<td>1918 flu pandemic (Spanish flu)</td>
<td>1918-1920</td>
<td>20 to 100 million</td>
<td>H1N1</td>
</tr>
<tr>
<td>Asian Flu</td>
<td>1957-1958</td>
<td>1 to 1.5 million</td>
<td>H2N2</td>
</tr>
<tr>
<td>Hong Kong Flu</td>
<td>1968-1969</td>
<td>0.75 to 1 million</td>
<td>H3N2</td>
</tr>
<tr>
<td>2009 flu pandemic</td>
<td>2009-present</td>
<td>~6,000</td>
<td>Novel H1N1</td>
</tr>
</tbody>
</table>
2. What is the Swine Flu?

Transmission of Influenza from Animals to Humans

- Influenza A in ducks, chickens, pigs, horses, seals
- Influenza B in humans

Swine Flu

- Pandemic H1N1/09, novel influenza A (H1N1), 2009 influenza A (H1N1), pandemic H1N1 (pH1N1), or A/California/7/2009 (H1N1)
- Flu virus of swine origin caused illness in Mexico and U.S. in March and April 2009
- Initially referred as “swine flu” since genes similar to influenza viruses normally in pigs in North America
- Further study showed virus different from normal circulation in North American pigs
  - 2 genes from flu viruses normally in European and Asian pigs (swine)
  - Bird (avian) genes
  - Human genes
  - “Quadruple reassortant” virus

Swine Flu

- Partial immunity if contracted flu before 1957
- Appears more contagious than seasonal influenza
- May have prolonged viral shedding
- Mild symptoms with low mortality rates
- Severe cases respiratory failure
  - Rapid deterioration
  - ? Genetic predisposition

2009 flu pandemic data

<table>
<thead>
<tr>
<th>Area</th>
<th>Confirmed deaths</th>
<th>Increase in last 7 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worldwide (total)</td>
<td>7,092</td>
<td>+584 (8%)</td>
</tr>
<tr>
<td>European Union and EFTA</td>
<td>515</td>
<td>+101 (20%)</td>
</tr>
<tr>
<td>Other European countries</td>
<td>63</td>
<td>+29 (46%)</td>
</tr>
<tr>
<td>Mediterranean and Middle East Africa</td>
<td>368</td>
<td>+90 (24%)</td>
</tr>
<tr>
<td>North America</td>
<td>1,766</td>
<td>+249 (14%)</td>
</tr>
<tr>
<td>Central America and Caribbean</td>
<td>170</td>
<td>+2 (1%)</td>
</tr>
<tr>
<td>South America</td>
<td>2,760</td>
<td>+18 (1%)</td>
</tr>
<tr>
<td>Southeast Asia and South Asia</td>
<td>762</td>
<td>+91 (12%)</td>
</tr>
<tr>
<td>Northeast Asia and South Asia</td>
<td>366</td>
<td>+2 (1%)</td>
</tr>
<tr>
<td>Australia and Pacific</td>
<td>214</td>
<td>+2 (1%)</td>
</tr>
</tbody>
</table>

Source: ECDC – November 17, 2009

Further information: Cases and deaths by country
2. What is the Swine Flu?

**pH1N1 Symptoms**
- Fever (94%), chills, malaise
- Cough (92%), sore throat
- Diarrhea (25%), nausea, vomiting (25%)
- Elderly (immunocompromised) may not have fever
  - Delirium
  - Decreased LOC

**SUMMARY:**
- Swine flu novel quadruple reassortant virus
- Appears more contagious than seasonal influenza
- Individuals born prior to 1957 may have partial immunity
- Most patients present with mild symptoms
- Severe cases with rapid deterioration

3. What is Happening in BC?

**Counts of pH1N1 hospitalizations and Deaths in BC**
(April – November 2009)

<table>
<thead>
<tr>
<th></th>
<th>Total Cases to November 9’</th>
<th>New Cases Reported to November 16</th>
<th>Total Cases Reported to November 16</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hospitalizations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VCHA</td>
<td>181</td>
<td>42</td>
<td>223</td>
</tr>
<tr>
<td>FHA</td>
<td>205</td>
<td>49</td>
<td>254</td>
</tr>
<tr>
<td>IHA</td>
<td>119</td>
<td>39</td>
<td>158</td>
</tr>
<tr>
<td>NHA</td>
<td>25</td>
<td>6</td>
<td>31</td>
</tr>
<tr>
<td>VIHA</td>
<td>40</td>
<td>15</td>
<td>55</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>611</strong></td>
<td><strong>144</strong></td>
<td><strong>755</strong></td>
</tr>
<tr>
<td><strong>Deaths</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VCHA</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>FHA</td>
<td>11</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>IHA</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>NHA</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>VIHA</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25</strong></td>
<td><strong>6</strong></td>
<td><strong>31</strong></td>
</tr>
</tbody>
</table>

3. What is Happening in BC?

**Hospitalized pH1N1 in BC (n=755)**

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Sex</th>
<th>Race</th>
<th>Education Level</th>
<th>Smoking Status</th>
<th>Underlying conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCHA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FHA</td>
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<tr>
<td>IHA</td>
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<tr>
<td>NHA</td>
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<td></td>
</tr>
<tr>
<td>VIHA</td>
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<td></td>
</tr>
</tbody>
</table>

3. What is Happening in BC?

**pH1N1 Deaths in BC (n=30)**

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Sex</th>
<th>Race</th>
<th>Education Level</th>
<th>Smoking Status</th>
<th>Underlying conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCHA</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>FHA</td>
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<tr>
<td>IHA</td>
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<td></td>
</tr>
<tr>
<td>NHA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VIHA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*excluding pregnancy*
3. What is Happening in BC?

Southern Hemisphere
- Australia and New Zealand
- Previous severe winter influenza activity
- Now passed peak
- Decrease in influenza activity

SUMMARY:
- Number of cases of pH1N1 increasing
  - Reaching peak
- Susceptible population chronic medical illness and adults
- pH1N1 main circulating influenza virus
4. What are Prevention Strategies?
- Wash hands regularly
- Cover nose and mouth with tissue when coughing or sneezing; sneeze into sleeve
- Avoid touching your eyes, nose, or mouth
- Avoid close contact with sick people
- If sick, stay home and limit contact with others
- GET VACCINATED!

4. What are Prevention Strategies?
Immunization Programs
- http://www.hls.gov.bc.ca/pho/physh1n1.html

4. What are Prevention Strategies?
Immunization Programs
- Influenza vaccines
  - Seasonal influenza vaccine
  - pH1N1 influenza vaccine
    - Adjuvanted
    - Non-adjuvanted

4. What are Prevention Strategies?
Seasonal Influenza Vaccine
- Fluviral® (GSK), Vaxigrip® (Sanofi Pasteur)
- Trivalent product (contains 3 strains)
  - A/Brisbane/50/2007(H1N1)
  - A/Brisbane/10/2007(H3N2)
  - B/Brisbane/60/2008
- Recommendations
  - Starting mid-October
  - Ages 65 years and long-term care facilities
  - For high risk* patients only after receipt of pH1N1 vaccine
    - Controversial! Based on unpublished Canadian study show increase in pH1N1 illness if receipt of seasonal vaccine

4. What are Prevention Strategies?
Seasonal Influenza Vaccine Dosing

<table>
<thead>
<tr>
<th>Age</th>
<th>Vaccine type</th>
<th>Dose (mL)</th>
<th>Number of doses required</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-35 months</td>
<td>split-virus</td>
<td>0.25</td>
<td>1 or 2*</td>
</tr>
<tr>
<td>3-5 years</td>
<td>split-virus</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>6-18 years</td>
<td>split-virus</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>10 years</td>
<td>split-virus</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>10 years</td>
<td>split-virus</td>
<td>0.5</td>
<td>1</td>
</tr>
</tbody>
</table>

*Previously unvaccinated children < 9 years of age require two doses of the split-virus influenza vaccine, with an interval of 4 weeks. Eligible children <9 years of age who have previously received one or more doses of TIV in the past are recommended to receive one dose per season thereafter. Additional considerations pertaining to the TIV schedule in young children are described in the section entitled Immunogenicity and Efficacy. See above text for details.
4. What are Prevention Strategies?

**H1N1 Influenza Vaccine**

- Arepanrix™, adjuvanted (GSK)
- Influenza A (H1N1) 2009 Pandemic Monovalent Vaccine (Without Adjuvant) (GSK)
- A/California/7/2009 (H1N1)

**What is an adjuvant?**

- Agent stimulates immune response; not antigenic
- AS03 (proprietary formulation, GSK)
  - Squalene
  - Alpha-tocopherol
  - Polysorbate 80

**What is the difference between the 2 vaccines?**

- **Adjuvant**
  - Pregnancy
    - May use in 2nd half of pregnancy (non-adjuvant preferred)
    - In 1st half or 1st trimester, no basis for concern but discuss theoretical risks as no systematic data
  - Preservative - Thimerosal 5 µg/0.5 mL dose (2.5 µg ethyl mercury)

- **Non-adjuvant**
  - Pregnancy
    - Preferred 1st half of pregnancy when limited supply
    - Preferred all pregnancies when ample supply
  - Preservative - Thimerosal 50 µg/0.5 mL dose (25 µg ethyl mercury)

**Recommendations**

- Week of October 26:
  - <65 years with chronic health conditions**
  - Women in 2nd half pregnancy
  - Residents of remote communities

- Week of November 2:
  - Children 6 months to 5 years
  - Household contacts <65 of babies <6 months and immunocompromised***

- **Health care workers** on priority basis (critical care and front-line services priority)

**Week of November 9 (small supply of non-adjuvanted):**

- All remaining **health care workers**
- Women in 1st half pregnancy (using non-adjuvanted)

**Starting November 13:**

- First responders (police, firefighters)
- >65 years with chronic medical conditions
- Healthy children aged 5 to 18 years

**Once vaccine supplies ample:**

- 12. Poultry and swine workers
- 13. Healthy adults 19 to 64 years
- 14. >65 years

**Chronic health conditions** includes:

- Cardiac or pulmonary disorders (including bronchopulmonary dysplasia, cystic fibrosis and asthma)
- Diabetes mellitus and other metabolic diseases
- Cancer, immunodeficiency, immunosuppression (due to underlying disease and/or therapy)
- Renal disease
- Chronic liver disease, including hepatitis C
- Cystic fibrosis or bronchiectasis
- Conditions that compromise the management of respiratory secretions and are associated with an increased risk of aspiration, or children and adolescents with conditions treated for long periods with acetylsalicylic acid.

**Immunocompromised**

- Asplenia (functional or anatomic)
- Congenital immunodeficiencies involving any part of the immune system, including B-lymphocyte (humoral) immunity, T-lymphocyte (cell mediated immunity), complement system (properdin, or factor D deficiencies), or phagocytic functions
- Hematopoietic stem cell transplantation (HSCT)
- Human Immunodeficiency Virus infection (HIV)
- Immunosuppressive therapy including corticosteroids, chemotherapy, radiation therapy, post-organ-transplant therapy, and certain anti-rheumatic drugs
- Islet cell transplant (candidate or recipient)
- Chronic kidney & liver disease (including hepatitis B and C)
- Malignant neoplasms including leukemia and lymphoma
- Solid organ transplant (candidate or recipient)
4. What are Prevention Strategies?

**Arepanrix™**

- Indication
  - pH1N1 active immunization
- Administration
  - IM into deltoid or anterolateral thigh
- Contraindication
  - Anaphylaxis to eggs or constituents
- Pediatrics
  - Limited experience in 3 to 9 years; no experience in less than 3, or 10 to 17 years
- Pregnancy and lactation
  - No data
- Interactions
  - No data

---

**Influenza A (H1N1) 2009 Pandemic Monovalent Vaccine (Without Adjuvant)**

- Indication
  - pH1N1 active immunization
- Administration
  - IM into deltoid or anterolateral thigh
- Contraindication
  - Anaphylaxis to eggs, or constituents
- Pediatrics
  - No data
- Pregnancy and lactation
  - No data
- Interactions
  - No data
4. What are Prevention Strategies?

Influenza A (H1N1) 2009 Pandemic Monovalent Vaccine (Without Adjuvant)
- Formulation
  - 1 multidose vial
  - 10 doses
- Stability
  - Store at 2-8°C; protect from light
  - Once punctured, discard after 28 days

4. What are Prevention Strategies?

Special Considerations
- Co-administration
  - Seasonal and pH1N1 vaccine may be administered same time in different limbs or any interval apart
  - If seasonal, pH1N1, and pneumococcal vaccine given, administer seasonal and pneumococcal in 1 limb and pH1N1 in separate limb
  - pH1N1 preferred if only 1 vaccine given
  - Do not administer to children <6 months

4. What are Prevention Strategies?

SUMMARY:
- Wash hands regularly; avoid contact with eyes, nose, and mouth
- Prevent spread of droplets
- Keep informed of vaccination criteria
- Be familiar with influenza vaccine products

5. What are Treatment Strategies?

Antivirals
- Efficacy of antivirals greatest administered soon as symptom onset (within 48 hours if possible)
- When influenza highly suspected, initiate treatment promptly

As of June 2009, the antiviral susceptibilities of circulating viruses are:

<table>
<thead>
<tr>
<th>Virus</th>
<th>Oseltamivir</th>
<th>Zanamivir</th>
<th>M2 inhibitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pandemic A(H1N1) 2009</td>
<td>Susceptible</td>
<td>Susceptible</td>
<td>Susceptible</td>
</tr>
<tr>
<td>Seasonal A (H1N1)</td>
<td>Mostly resistant</td>
<td>Susceptible</td>
<td>Mostly susceptible</td>
</tr>
<tr>
<td>Seasonal A (H3N2)</td>
<td>Susceptible</td>
<td>Susceptible</td>
<td>Resistant</td>
</tr>
</tbody>
</table>

A small number of isolated cases of resistance to oseltamivir have been reported.
5. What are Treatment Strategies?

Oseltamivir Treatment Dosing

<table>
<thead>
<tr>
<th>Extrathoracic</th>
<th>Adult Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild to Moderate</td>
<td>75 mg PO bid x 2 days</td>
</tr>
<tr>
<td>Severe Disease</td>
<td>75 mg PO bid x 3 days</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extrathoracic</th>
<th>Pediatric Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 18 kg</td>
<td>30 mg PO bid x 2 days</td>
</tr>
<tr>
<td>&gt; 18 kg</td>
<td>75 mg PO bid x 2 days</td>
</tr>
</tbody>
</table>

For Oseltamivir, patients ≥ 1 year of age: 75 mg PO bid x 2 days dosing.

Oseltamivir

Class – Neuraminidase inhibitor
- Indication:
  - Treatment and prevention of susceptible strains of influenza A and B viruses
- Administration:
  - PO
- Contraindication:
  - Hypersensitivity to excipients
- Pediatrics:
  - Safety and efficacy not established in <1 years
- Pregnancy and lactation:
  - No well-controlled studies
- Interactions:
  - None

Neuraminidase Inhibitors
- Prevents cleaving of sialic acid residue at final stage of viral replication
- Stops release of new viruses from being released; halts viral replication

Oseltamivir
- Adverse events:
  - GI effects (nausea, vomiting, diarrhea, abdominal pain), headache, bronchitis, insomnia, and vertigo
- Formulation:
  - 75 mg capsules
  - 12 mg/mL suspension
- Stability:
  - Store at room temperature
- Reconstituted suspension; store at 2-8°C and discard after 10 days
- Cost:
  - $3.90/capsule ($39/treatment)
  - $39/75 mL bottle

Severe Disease

Complicated or severe influenza
- Presenting clinical (e.g., chest pain, shortness of breath, dyspnea, tachypnea, hypoxia, and/or radiological signs of lower respiratory tract disease), severe or life-threatening conditions, complications requiring intensive care, or gastrointestinal infection, or any other condition requiring hospital admission for clinical management.

Oseltamivir

Class – Neuraminidase inhibitor
- Indication:
  - Treatment and prevention of susceptible strains of influenza A and B viruses
- Administration:
  - PO
- Contraindication:
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- Formulation:
  - 75 mg capsules
  - 12 mg/mL suspension
- Stability:
  - Store at room temperature
- Reconstituted suspension; store at 2-8°C and discard after 10 days
- Cost:
  - $3.90/capsule ($39/treatment)
  - $39/75 mL bottle
5. What are Treatment Strategies?

Compounded Oseltamivir Suspension

- Stability
  - 5 weeks at 2-8°C
  - 7 days at room temperature

- Other vehicles
  - Water containing 0.1% w/v sodium benzoate added as a preservative

Zanamivir

- Class – Neuraminidase inhibitor
- Indication
  - Treatment and prevention of susceptible strains of influenza A and B viruses
- Administration
  - Dry powder for inhalation with diskhaler
- Contraindication
  - Hypersensitivity to lactose; underlying asthma or COPD
- Pediatrics
  - Safety and efficacy not established in <5 years
- Pregnancy and lactation
  - No well-controlled studies
- Interactions
  - None

Adverse events

- Respiratory (bronchospasm)
- Dose
  - 10 mg inhaled BID x 5 days
- Formulation
  - 5 mg/blister
- Stability
  - Store at room temperature
- Cost
  - $35.70/kit

Prophylaxis

- Routine prophylaxis is not recommended (except in outbreak situations by the Medical Health Officer)
- Close contacts of patients with pH1N1, including health care workers, do not require prophylaxis with antiviral agent
5. What are Treatment Strategies?

Secondary Pneumonias

- Some patients with influenza may develop secondary pneumonias
- S. aureus, S. pneumoniae, H. influenzae
- Antibiotics recommended
  1. Patients admitted to ICU
     - Empiric antibiotics as part of management
  2. Patients admitted to acute care (general ward):
     - If moderate or severe influenza, most will receive antibiotics, if there is a lobar infiltrate on chest X-ray or purulent sputum
     - If social reasons, or management of dehydration or worsening of other organ systems rather than pulmonary symptoms, antibiotics might not needed, at least initially (case by case decision, subject to reassessment)

- If MRSA suspected, IV vancomycin or linezolid

SUMMARY:

- Be familiar with circulating strains of influenza and treatment recommendations
- Treat patients with moderate to severe influenza or those at high risk
- Initiate therapy within 48 hours if possible; in severe disease patients may still benefit from treatment after 48 hours
- Consider secondary pneumonias in patients who deteriorate after initial improvement
6. What Can We Do About It?

1. Be educated about influenza
2. Be familiar with the vaccination and treatment guidelines
3. Be familiar with the vaccines and antivirals
4. Be familiar with preventative measures
   - Hand washing, hygiene
5. Be a resource
   - Patients
   - Staff

QUESTIONS?

Egg Allergies

STATEMENT: ADMINISTRATION OF H1N1 AND SEASONAL INFLUENZA VACCINE TO EGG ALLERGIC INDIVIDUALS

- Lower risk category
  - Administer vaccine and observe for 60 minutes
- High risk category or unknown risk
  - Initial test dose with 10% total dose followed by 30 minutes of observation.
  - If no reaction after 30 minutes, remaining 90% given and observe for 60 minutes
  - Children tolerating split dose and require second dose (1st time receiving influenza vaccine) can receive next dose in one injection.

Vaccine

- Autoimmune disorders
  
  Autoimmune disorders: Since the squalene contained in AS03 is designed to improve the immune response to the vaccine, there are some theoretical concerns that it may provoke a hyperactive immune response. Animal studies have shown that arthritis can result when undiluted squalene is injected in large amounts into rats' tails or joints. This has not been observed in clinical trials of human subjects. As well, another squalene containing adjuvant, MF59, has been used in >40 million recipients of the seasonal influenza vaccine called "Fluad® (Novartis)" marketed in Europe and approved for use in elderly individuals, without observed excess rates of autoimmune diseases.

- Guillain-Barre Syndrome

  Guillain-Barre Syndrome (GBS): GBS rates increased during the U.S. swine flu vaccine campaign in 1976. The Taskforce of Medicine ruled that there was no conclusive evidence linking this increase to the vaccine. During the campaign the incidence of this rare neurological disorder went from 1 in 109,000 to 2 in 160,000. This increase led to suspension of the program. To recognize any increase in GBS rates, Canada has established a reporting network of neurologists to actively investigate and assess any and all new cases of GBS that occur to assess any relationship to vaccine receipt (Personal communication, Dr. Barbara Law, Chief of Vaccine Safety, PHAC).

- Gulf War Syndrome

  Gulf War Syndrome: "Gulf War Syndrome" is a non-specific set of psychological and physical ailments difficult to objectively quantify, which was described in returning soldiers from the Gulf War. A hypothetical link was made to anthrax vaccine. Squalene is not a component of the anthrax vaccine. However, when tested, some samples of the anthrax vaccine did contain minute amounts of squalene. Several civilian committees concluded that the minute quantities of squalene found in the vaccine could not have been associated with adverse outcomes.
Resources

- BC Ministry of Health
- BC Centre for Disease Control
  - http://www.bccdc.ca/default.htm
- Center for Disease Control and Prevention
  - http://www.cdc.gov/
- Immunize BC
  - www.immunizebc.ca/ImmunizeHP
- Public Health Agency of Canada
- VCH-PHC Pharmacy Flu Planning
- World Health Organization
  - http://www.who.int/en/