

Flu Right By Me!

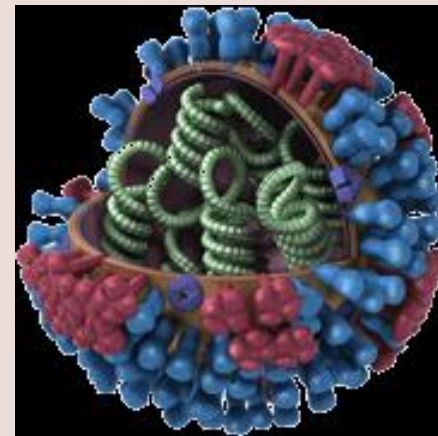
Seasonal Preparedness and Awareness

By: Marcia Zimmerman

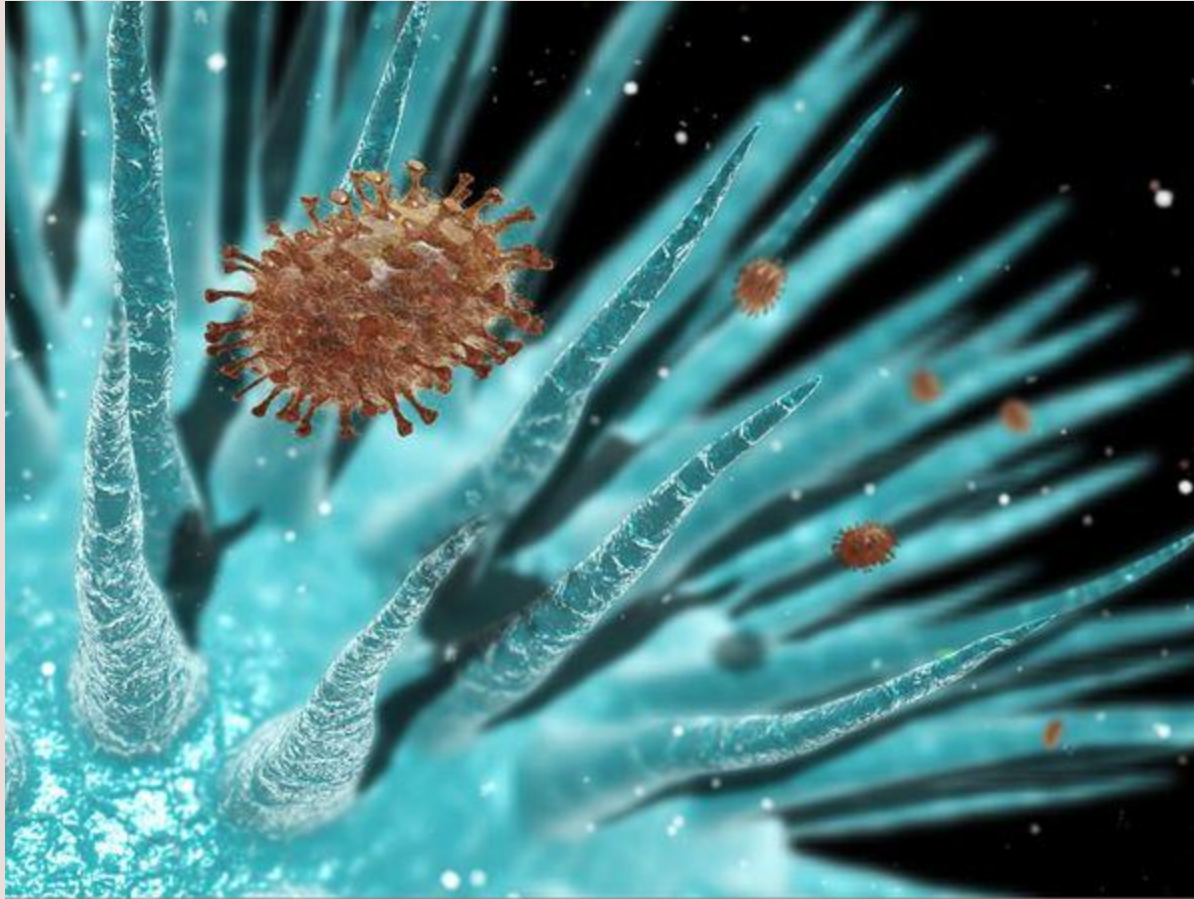


Influenza

- ▶ Acute respiratory illness (fever, muscular aches, headache, sore throat, dry, non-productive cough)
- ▶ Incubation period; 1 - 4 days; sudden onset
- ▶ Caused by influenza type A or B viruses
- ▶ H1N1 (type A) = most widespread epidemics



Flu Virus Infecting Lungs



Flu Virus
Spreading potentially lethal pathogens, influenza virus particles (brown) invade cilia (blue) in the airways of the human lung.

Cultivating Flu Vaccine

Cultivating Flu Vaccine

Armed with the tools for cultivating a flu vaccine, a scientist at the National Institute for Medical Research's World Influenza Center in London starts by drilling minute holes into fertilized chicken eggs. She will then inject the eggs with flu viruses that have most recently been circulating among the area population. After reaching a sufficient concentration, the samples will be tested to determine which strains of flu viruses are present. The strains that are most prevalent in the population will be used to develop flu vaccine for the following season.

Photograph by James King-Holmes/Photo Researchers, Inc.



Bird Flu Transmission

Bird Flu Transmission

Scientists believe the practice of living in close proximity to pigs and—in this woman's case—ducks plays a major role in contracting and spreading the H5N1 bird flu virus in parts of Asia. A flu virus that can attack a bird can rarely infect humans; the virus is unable to attach itself and grow in human cells. But a pig is capable of contracting the flu from birds as well as humans. When the two viruses mix within a pig, they can spawn a hybrid flu virus. If it begins to adapt and spread easily from human to human, the outcome can result in a deadly pandemic.



Photograph by Karen Kasmauski

Swine Flu Outbreak

Swine Flu Outbreak

Photograph by Marco Ugarte/AP

Pigs sniff for food at a farm on the outskirts of Mexico City, where an outbreak of swine flu was blamed for the deaths of more than a hundred people in April 2009. Swine flu is a respiratory virus, spread from person to person. It originally jumped from pigs to humans in close contact with the animals, such as farmers.



Photograph by Marco Ugarte/AP

Influenza Viruses

- ▶ Mutate quickly in vaccine-resistant strains
- ▶ Constant game of “catch-up”
- ▶ 2011–2012 flu season, FDA approved
 - California H1 N1
 - Perth H3N2
 - Brisbane 2008-like virus
- ▶ Vaccine-resistant strain avian (H5N1 2.3,2.1) could become a problem
- ▶ Antibodies against previous strain; limited protection

Influenza Vaccination

- ▶ Flu vaccine; prevents complications (high-risk groups)
- ▶ Not for everyone?
 - 63% aged 66 or older; 36% aged less than 65.¹
 - Elderly, immune compromised may not respond well²
 - Anti-viral drugs may lessen illness but side effects.
- ▶ 2011–2012 flu season, FDA approved³
 - California H1 N1
 - Perth H3N2
 - Brisbane 2008-like virus
- ▶ Vaccine-resistant strain avian (H5N1 2.3,2.1) could become a problem⁴
- ▶ Antibodies against previous strain; limited protection

The Common Cold

- ▶ Mild, self-limiting infection (100 viruses)
- ▶ Gradual symptoms; 1–3 days
- ▶ “Cold” = thermogenesis effect, viruses
- ▶ Rhinoviruses, coronaviruses = 50–70%
- ▶ Most common infection (100 M physician visits/yr, 7.7 billion spent/yr; 1/3 got antibiotics; 3 billion on OTC)
- ▶ Hippocrates described colds in 5th century B.C.; depicted in Egyptian hieroglyphs
- ▶ Walter Kruse, 1914 = viruses not bacteria

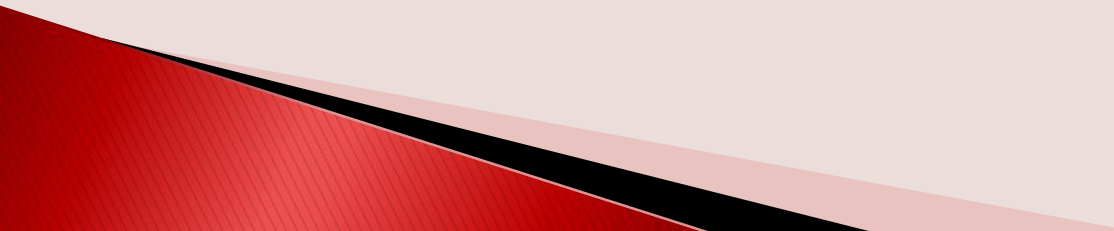
What Can You Do to Protect Yourself?

Some Complimentary Therapies

Roxas, M; Jurenka, J; “Colds and Influenza: A Review of Diagnosis and Conventional, Botanical, and Nutritional considerations” *Altern Med Rev.* 2007;12:25–48.

Guo, R; Pittier MH; Ernst, E; “Complementary Medicine for Treating or Preventing Influenza or Influenza-like Illness” *Am J Med* 2007;120:923–929.

Protecting Yourself

- ▶ Flu epidemics occur during winter
 - ▶ Protective season – fall to spring; peak December – early March
 - ▶ Avoid psychological stress
 - ▶ Allergic symptoms under control
 - ▶ Treatment
 - reducing symptom duration,
 - keeping hydrated,
 - reduce risk of complications
- 

Vitamin C & Colds

- ▶ Reduces duration and intensity of infection
- ▶ Does not prevent common cold
- ▶ Significant physical stress; 50% fewer colds (training in cold environment eg. Skiers, soldiers, marathon runners)
- ▶ Prophylaxis with lower dose Vitamin C (250 – 500 mg) is best¹
- ▶ High dose vitamin C > 8 grams/d at start of cold = shorter duration; some side effects (GI disturbances)
- ▶ Short half-life of vitamin C (30 minutes)²

1. Hemilä, H; et al.; Cochrane Database Syst. Rev. 2004;4:CD00090
2. Anderson TW et al.; CMA Journal 1974;111:30-36.

Zinc & Colds

- ▶ Even mild Zinc deficiency = changes in immune status
- ▶ Zinc gluconate lozenges (zinc 12 mg/every 2 hrs.)
- ▶ Best taken at onset of cold
- ▶ Only until symptoms decrease (copper)
- ▶ May reduce length of illness, severity of symptoms

Hulisz D; "Efficacy of Zinc Against Common Cold Viruses: An Overview"
JAPHA J Amer Pharm Assoc
2004;44:594-603

Selenium Deficiency

- ▶ Flu infection pathology
- ▶ Rate of viral mutation
- ▶ Cellular changes in lung tissue
- ▶ Immune response (cytokine, chemokine expression)
- ▶ Increased oxidative stress

1. Beck, MA et al; "Selenium Deficiency Increases Viral Pathology" *FASEB* 2001 15:1481-83.
2. Nelson HK et al; "Host Nutritional Selenium Status Driving Force for Influenza Mutations" *FASEB* 2001;15:1846-48.
3. Beck, MA et al; "Selenium Deficiency & Viral Infection" *J Nutr.* 2003;133:1463S-1467S.

Nutritionally Induced Oxidative Stress

- ▶ Riboflavin, pyridoxine
- ▶ Vitamin E
- ▶ Selenium
- ▶ Alpha and beta-carotenes
- ▶ Lycopene
- ▶ Zinc, iron, copper balance
- ▶ Vitamin A
- ▶ Vitamin C
- ▶ Vitamin D

1. Beck, MA et al; "Antioxidants & Viral Infections: Host Immune Response & Viral Pathogenicity" *J Amer Coll Nutr* 2001;20:384S-388S.
2. Prentice, AM; "Host-Pathogen Interactions: Can Micronutrients Tip the Balance?" *J Nutr* 2007;137:1334-1337.
3. Beck, MA; "Nutritionally Induced Oxidative Stress: Effect on Viral Disease" *Am J Clin Nutr* 2000;71(suppl):1676S-9.
4. Holick MF; "Sunlight & Vitamin D for Prevention" *Am J Clin Nutr* 2004;80(suppl):1678S-88S.

N-Acetylcysteine (NAC)

- ▶ Potent antioxidant
- ▶ Expectorant and mucolytic properties¹
- ▶ Prophylaxis may reduce occurrence severity of influenza (600 mg.2X/d, 6 months)^{2,3}
- ▶ 262 subjects in study; 65 became infected with influenza. 25% of NAC group were symptomatic; 79% of placebo group had symptoms³

1. Grandjean, EM et al.; Clin Ther 2000;22:209-21.
2. Steurer SC; et al; Eur Respir J 2000 16:253-62
3. De Flora S; et al; Eur Respir J 1997;10.1183/09031936.10071535

Elderberry Extract & Flu

- ▶ 60 people (18 – 54 yrs.) with flu symptoms; multi-center study; not a high-risk group
- ▶ Standardized elderberry extract; 38% flavonoids
- ▶ 15 ml. taken four times a day for 5 days
- ▶ Given within 48 hours of symptom onset
- ▶ 3 – 4 day improvement vs 7 – 8 days¹
- ▶ 2 – 3 days for influenza B/Panama²



Method of Activity

- ▶ May enhance immune response¹
- ▶ Prevent viral adhesion to cells by sticking to the virus¹
- ▶ Anti-inflammatory¹
- ▶ Anti-microbial activity (bacteria, viruses)²
- ▶ Cytotoxic activity²
- ▶ Anti-viral activity (Influenza A & B)²

1. Zakay-Rones Z; "Randomized Study Oral Elderberry Extract Influenza A & B J internatl Med Res 2004;32:132-140.
2. Krawitz C; et al; "Inhibitory Activity Standardized Elderberry Against Bacterial Pathogens & Influenza A & B Viruses" *BMC Comp. Altern Med* 2011;11:16.

Oscillococcinum

- ▶ Homeopathic preparation
- ▶ Extremely dilute 200C
- ▶ May alleviate symptoms in some
- ▶ Take at first signs of exposure
- ▶ Safe; doesn't contain any active ingredient



Echinacea

- ▶ *Echinacea purpurea*
- ▶ Immune support
- ▶ Best known for colds & flu
- ▶ Standardized extract¹
- ▶ Part of plant used, extraction method may determine efficacy²



North American Ginseng

- ▶ *Panax quinquefolium*
- ▶ Native to Ohio, North Carolina, other forested areas
- ▶ May reduce incidence, severity duration of colds & flu¹
- ▶ May enhance effects of flu vaccine²

1. Predy GN; et al.; CMAJ 2005;173:1043-1048
2. McElhaney JE et al; J altern Complement Med 2006;12:153-157.



Fungal Infections

- ▶ Older adults
- ▶ Acquired through inhalation of spores
- ▶ Underlying conditions
 - COPD (34.8%)
 - Diabetes (22%)
 - Solid malignancies (16.5%)
- ▶ Organisms identified
 - Histoplasmosis (13 / 100,000, IN; 12 / 100,000, AK)
 - Coccidioidomycosis (90.5% / 100,000, AZ; 10.1 / 100,000, CA)
 - Blastomycosis (6.4 / 100,000, MS; 5.7 / 100,000, WI)

Symptoms & Diagnosis

- ▶ Similar to flu (cough, shortness of breath, fever, chest pains, muscular aches, joint stiffness, weakness, nodules in skin (Cocci))
- ▶ May become chronic, progressive lung disease
- ▶ Diagnosis difficult
 - Chest X-ray = shows inflammation
 - Sputum analysis (fungal culture & stain)
 - CT = detects complications
 - Bronchoscopy = endoscopy & biopsy