The Cold, the Flu or INFLUENZA!

Jim Reid

Dept of General Practice and Rural Health
Dunedin School of Medicine
University of Otago

INFLUENZA

- Don’t confuse with the common cold
- Symptoms may be similar BUT

  those with influenza are sick

  those with coryza are unwell!

INFLUENZA

- Fever
- Headache
- Shivering perhaps genuine rigor
- Polyarthralgia and myalgia
- GI symptoms
- Cough (non productive at first)
- Sore throat
- Rhinorrhoea
- Emotional Lability

INFLUENZA

	Common Cold	Influenza
Incubation	12 hrs – 5 days	1 – 3 days
Fever	+ or -	++
Cough	+ or -	+
Rhinitis	+	-
Polyarthralgia	-	+
Toxaemia	-	+

(After J Murtagh)

Influenza Can Be Diagnosed Clinically

- Awareness of local and community symptom clusters and risk groups
- 70% correct diagnosis with

  fever>37.8 : *plus two of*

  myalgia

  sore throat

  headache

  respiratory symptoms

INFLUENZA

Diagnosis depends on

- Symptoms and signs
- Probability - Taloia.

INFLUENZA

- **Don’t Forget……Don’t miss other things that can masquerade.**

INFLUENZA

Complications

- Secondary chest infection
- Pneumonia (Staph or Strep - note mortality)
- Encephalitis

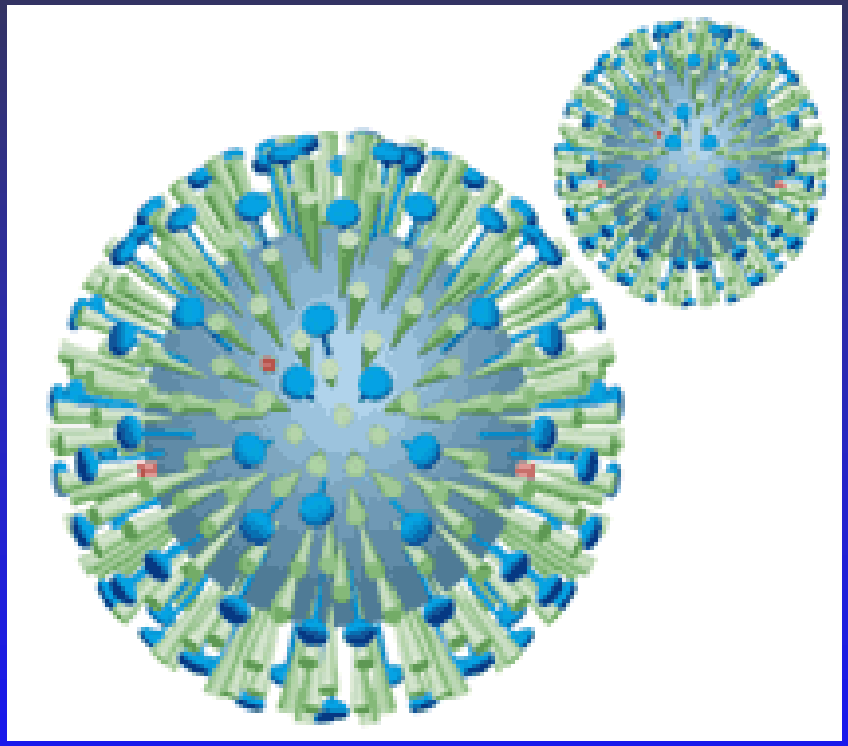
INFLUENZA

Call it INfluenza - Not “flu”

There is “stomach flu”, “Flu”, “Flu Bug” etc but only one

INFLUENZA

What is Influenza



Influenza is

- a respiratory infection
- **caused by type A & type B viruses**
- most common in autumn & winter
- **enters through mucous membranes - mouth, nose, eyes**
- highly contagious - airborne
- **severe season >20% population infected**

No place to hide - we all have to breathe!

An Outbreak

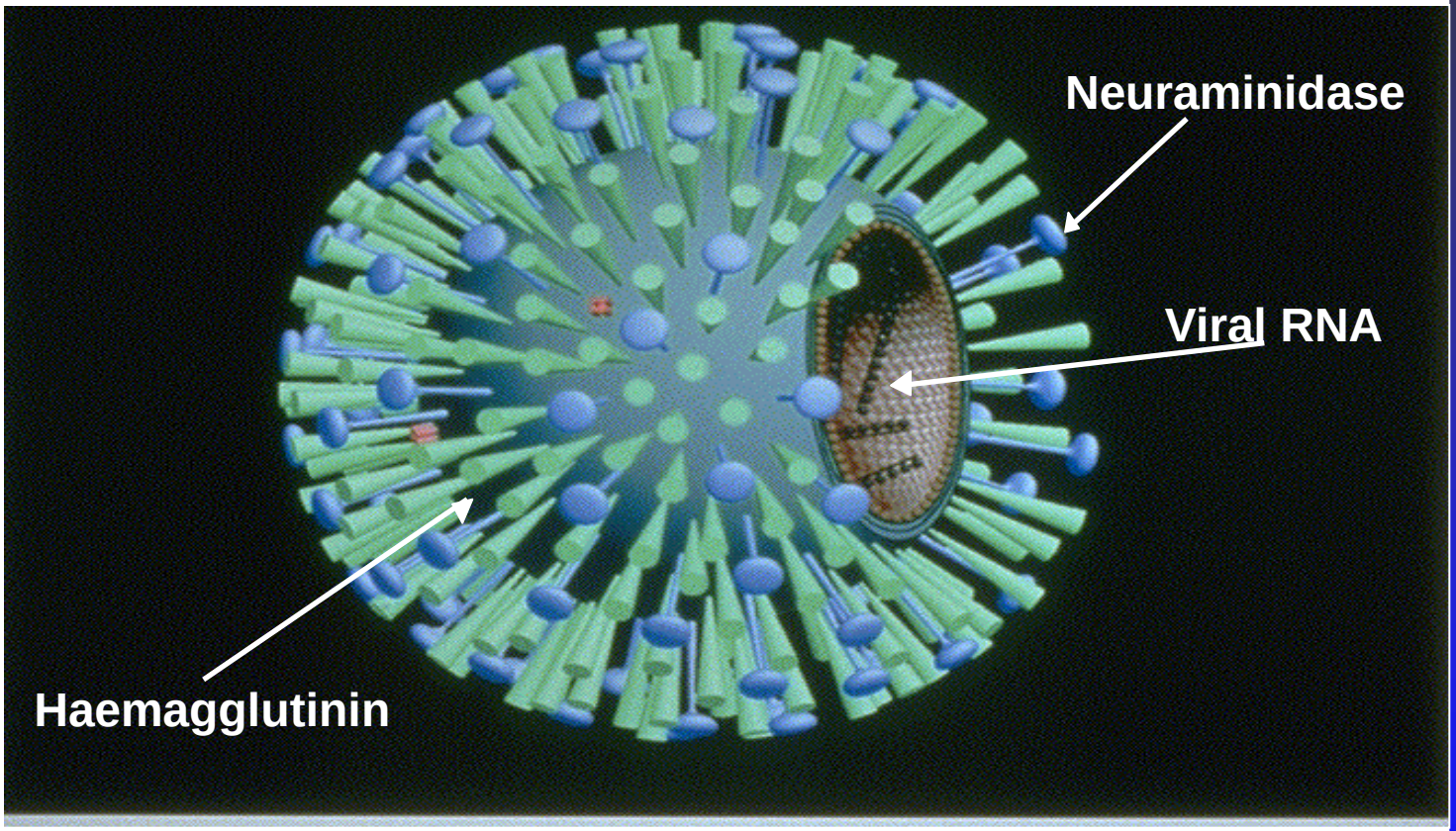
- Responsibility of primary care
- Avoid cross infection as far as possible
- Keep patients away from surgeries
- Isolate them if they arrive
  - Separate waiting area
  - facemask
  - gel for hands (for what it is worth!)

Influenza

Types of influenza

- Clinically relevant strains are divided into type A and B
- **Type A**: Infects many different species (sea mammals, domestic fowl, swine, other farm animals, primates)
  - Responsible for epidemics and pandemics
  - The most highly mutating form
  - Type A viruses are subdivided based on the structure of their surface proteins (eg HxNy)
- **Type B**: Primarily infects humans
  - Less mutable
  - Cause regional epidemics
  - Antigenic drift but not shift

Structure of Influenza A virus

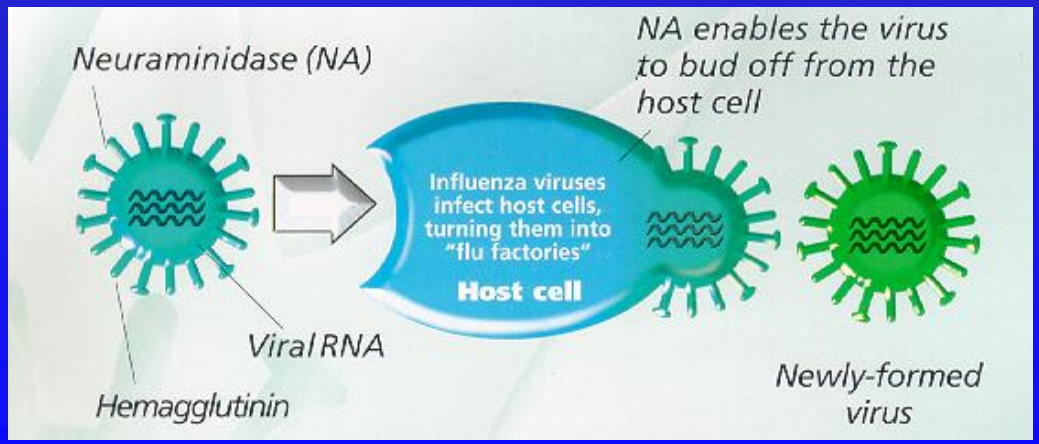


Adapted from Laver et al[6]

Neuraminidase Inhibition - New Directions

How influenza infects you:

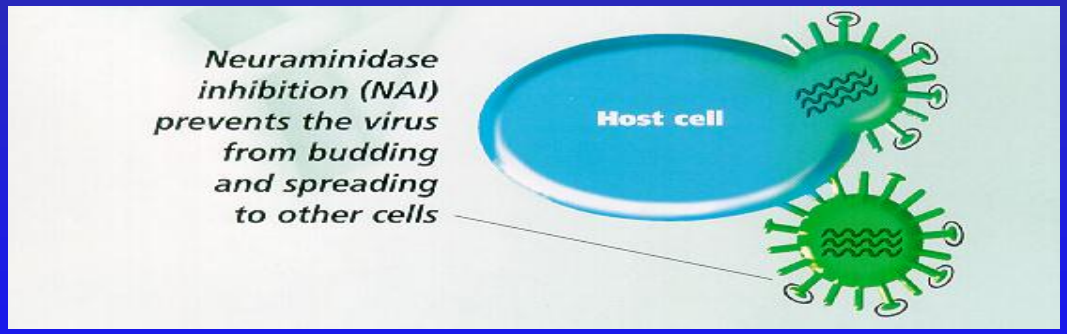
- viruses cannot multiply by themselves - must take over a living cell
- the influenza virus multiplies in the following ways:
  - virus particle lands on cell in respiratory tract
  - particle enters cell, releases genetic material
  - genetic material takes over the cell forcing the production of new influenza virus
  - new virus particles assembled and preparation for release
  - Neuraminidase enables the virus to bud from the host cell



Adapted from Laver et al[6]

Neuraminidase Inhibition

- NAI's inhibit the release of new virus
- Prevent the virus from budding and spreading to other cells



Adapted from Laver et al

Influenza Surface Proteins

Haemaglutinin

- Rod Shaped
- **Most common surface protein**
- Responsible for viral attachment to and penetration of host cells
- **Contains antigenic sites targeted by host immune system**
- 15 sub types identified
- **3 infect humans - H1, H2, H3**

Influenza Surface Proteins

Neuraminidase

- Mushroom shaped
- **Second most common surface protein**
- Plays an essential role in release and spread of virus from infected cells
- **Major target for host antibody**
- 9 sub types identified
  - two infect humans - N1 & N2

Influenza Surface Proteins

- **The influenza viruses are highly variable and each subtype can exist in many different strains**
- Most parts of the surface proteins (haemaglutinin and neuraminidase) vary year by year
- **HOWEVER, the active site of neuraminidase is conserved in all strains**

PREVENTION

- Avoid crowded and confined areas
- Promote handwashing
- Cough and sneeze hygiene

Prevention

THINK PREVENTION

THINK

IMMUNISATION!!!!!!

- **Inactive vaccine - safe**
- **Strains changed regularly.**

Results Each cohort included more than 25,000 persons 65 years of age or older.

Immunization rates ranged from 45 percent to 58 percent. Although the vaccine recipients had more coexisting illnesses at base line than those who did not receive the vaccine, during each influenza season vaccination was associated with a reduction in the rate of hospitalization for pneumonia and influenza (by 48 to 57 percent, P 0.002) and for all acute and chronic respiratory conditions (by 27 to 39 percent, P 0.01). Vaccination was also associated with a 37 percent reduction (P = 0.04) in the rate of hospitalization for congestive heart failure during the 1991-1992 season, when influenza A was epidemic.

The Efficacy and Cost Effectiveness of Vaccination against Influenza among Elderly Persons Living in the Community

K.L. Nichol, K.L. Margolis, J. Wuorenma, and T. Von Sternberg NEJM 331:778-784; Sept22 94

Both years, during peak and total periods, vaccination reduced all causes of death and hospitalization for pneumonia and influenza: hospitalizations were reduced by 19%–20% and 18%–24% for years 1 and 2, respectively, and deaths were reduced by 60%–61% and 35%–39% for the same periods.

Influenza Vaccine Effectiveness in Preventing Hospitalizations and Deaths in Persons 65 Years or Older in Minnesota, New York, and Oregon: Data from 3 Health Plans
James Nordin1, John Mullooly3, Sung Poblete4, et al J Inf Dis 184:6;665-670

We included patients meeting the European Union ILI case definition and swabbed less than eight days after symptom onset. Laboratory-confirmed influenza cases were compared with negative controls. The adjusted vaccine effectiveness was 42.3% (95% CI: –7.3 to 69.0%), suggesting moderate protection of the seasonal vaccine.

Eurosurveillance, Kissling E, Valenciano M .Volume 16, Issue 11, 17 March 2011

Vaccination was associated with a 56% reduction in any complication (95% CI 36–70%), a 54% reduction in hospitalizations (26–71%), and 58% reduction in deaths (13–80%). Among study subjects aged 18–64 years, we observed somewhat higher reductions in the occurrence of any complication than among those aged >65 years (72 vs. 39%).

Clinical Effectiveness of First and Repeat Influenza Vaccination in Adult and Elderly Diabetic Patients
Ingrid Looijmans-Van den Akker, MD1, Theo J.M. Verheij, MD, PHD1, Erik Buskens, MD, PHD1, et al.
Diabetes Care, Aug06; 29:8; 1771-1776

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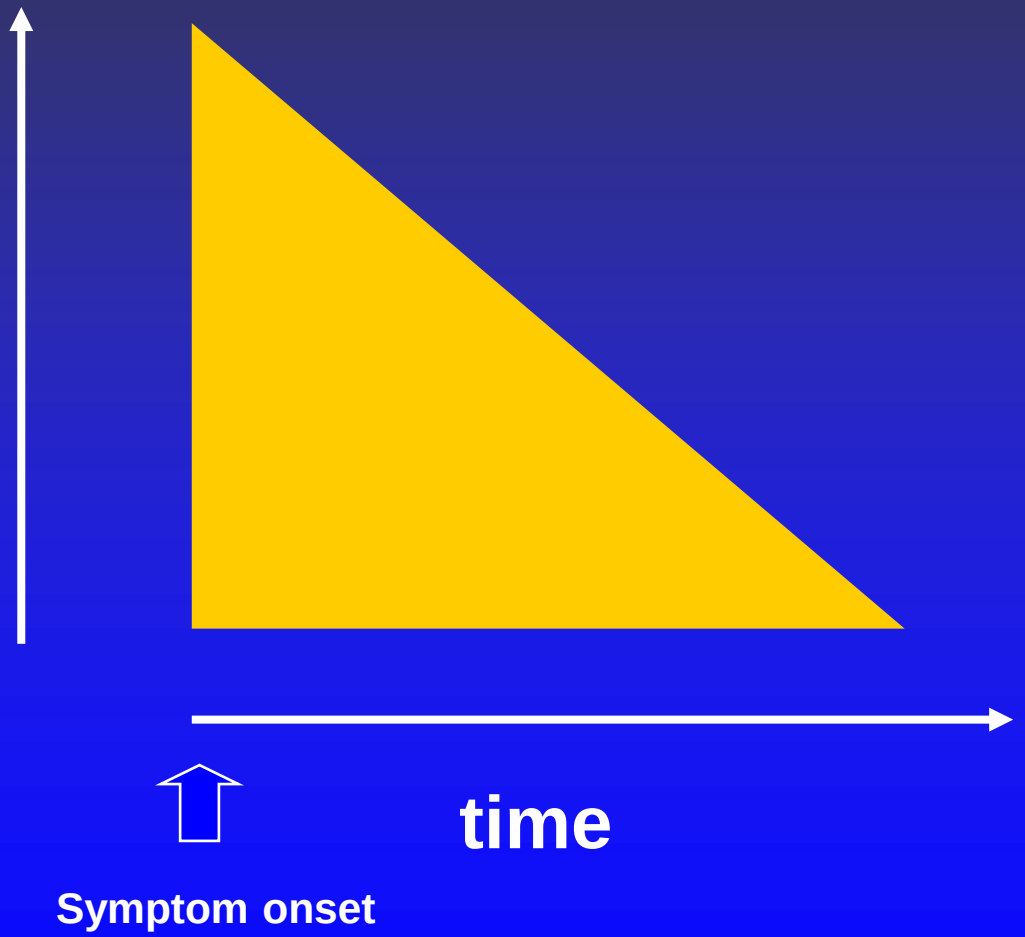
Treatment: the earlier the better



TREATMENT

AMANTIDINE

- Available in NZ (treatment of Parkinson's Disease)
- Reduces replication of the virus (A only)
- Must be used within 48 hours of onset of symptoms

- Is not cheap
- Is not without side effects
- May induce resistant strains
- And ….. Probably does not work.

TREATMENT

Neuraminidase Inhibitors

- Zanamavir (RELENZA) – inhaled & IV
- Oseltamivir (TAMIFLU) - oral

Effective against both influenza A and B

Neuraminidase Inhibition

- **Zanamivir and** oseltamivir are in this class
- **Block the active site of the NA protein, prevents virus budding and spreading to other cells**
- Fewer infected cells reduces symptom severity
- Effective against type A and B viruses
- **Initial lab studies suggest low incidence of resistance**

Summary of treatment benefits with Oseltamivir

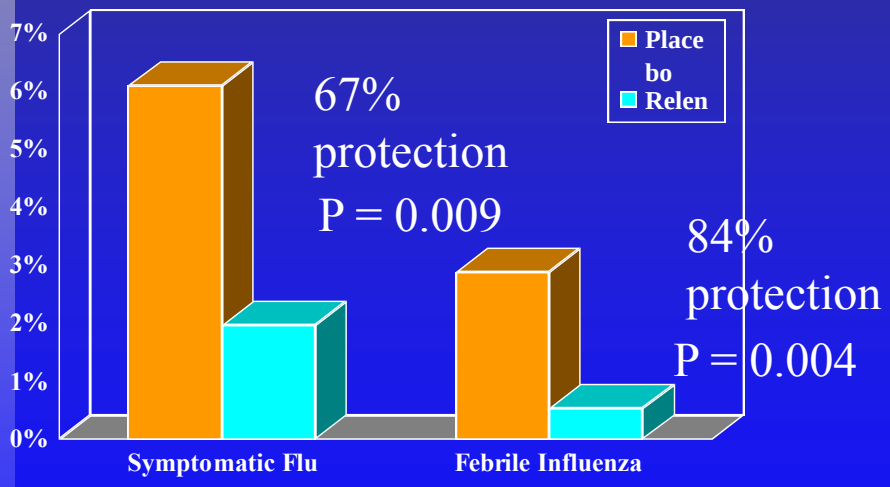
- 30% reduction in illness duration
- 50% less secondary complications resulting in reduced antibiotic use
- Back to usual activities two to three days faster
- 38% reduction in severity of illness

Influenza; Groups at Higher Risk of Complications

- Elderly, especially in residential care units

- Patients with:
  - chronic respiratory disease e.g. asthma, COPD
  - chronic heart disease
  - chronic metabolic disease e.g. diabetes mellitus
  - immunosuppression due to treatment or disease
  - haematological disorders
  - chronic renal failure

Protective Efficacy[1]



- 67% protection from influenza with any symptom
- 84% protection from influenza symptoms associated with fever
- Reduction in duration of fever when it occurred.

[1]ICAAC, 1998. Accepted by JAMA

The Future

412 BC Epidemic described by Hippocrates

1357 Influenza described in Italy

Regular epidemics

1918-19 “Spanish Flu” H1N1

1968-69 “Hong Kong” flu H3 N2 – the last pandemic.

20** - 20** As sure as night follows day it will come. But it isn’t the H5N1.