Influenza A H1N1 infection

Update: Managing the 2009 Panflu patient

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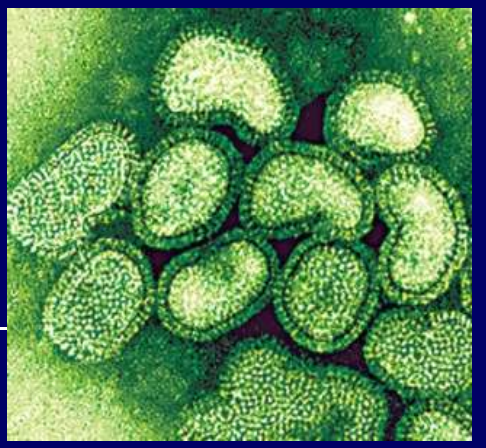
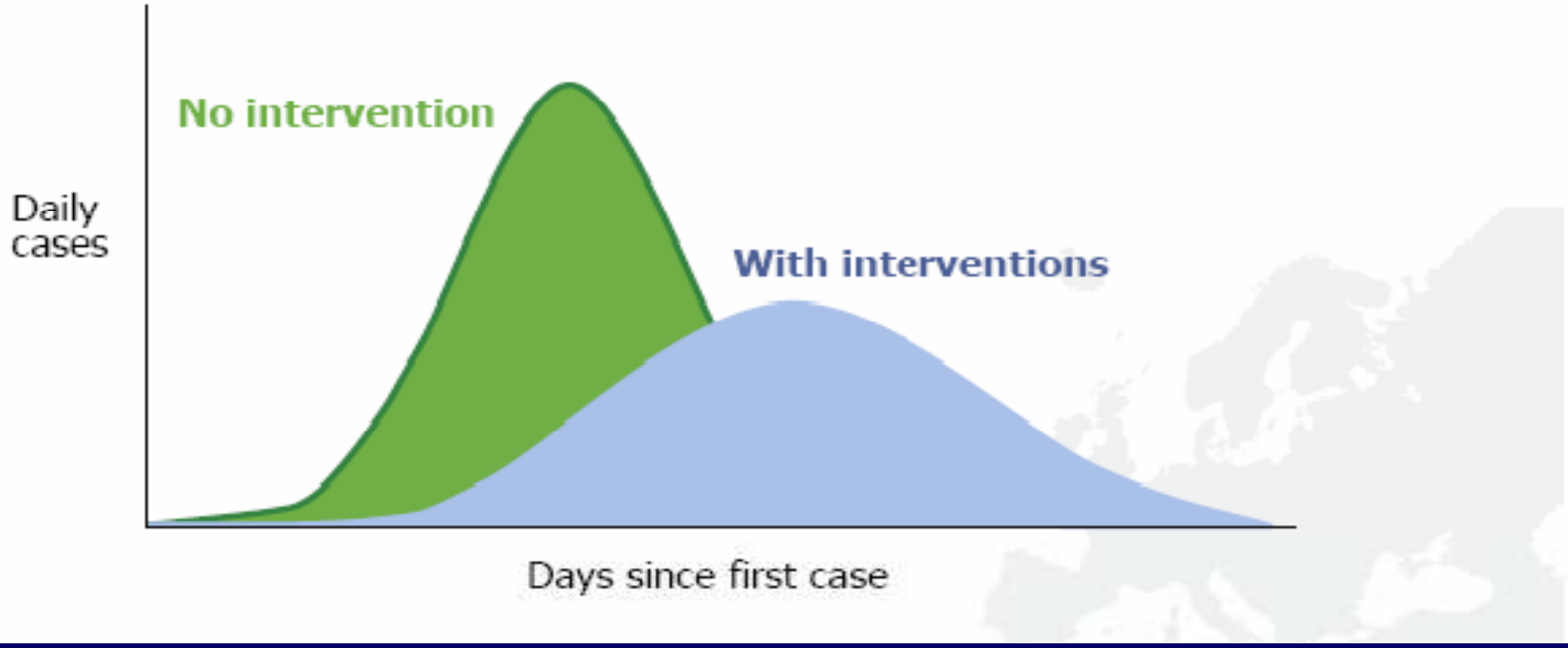


Objectives of applying public health measures during a pandemic

- Delay and flatten epidemic peak
- Reduce peak burden on healthcare systems and threat to other essential systems through high levels of absenteeism
- Somewhat reduce total number of cases
- Buy a little time



Source: Based on an original graph developed by the US CDC, Atlanta

Hospitalized Patients with Novel Influenza A (H1N1) Virus Infection:
California, April–May, 2009

- Of 30 hospitalized patients (~ 9% of total), 26 were confirmed and 4 were probable (confirmatory testing is in progress); onset - April 3 to May 9. Of the 26 patients for whom information on ethnicity was available, 17 (65%) were Hispanic. Ages of 30 patients ranged from 27 days to 89 years, with a median age of 27.5 years; 21 (70%) were female.
- Most common admission diagnoses were pneumonia & dehydration.
- 19 (64%) had underlying medical conditions; the most common were chronic lung disease (e.g., asthma and chronic obstructive pulmonary disease), conditions associated with immunosuppresion, chronic cardiac disease (e.g., congenital heart disease and coronary artery disease), diabetes, and obesity.

MMWR; May 22, 2009 / 58(19);536-541

Hospitalized Patients with Novel Influenza A (H1N1) Virus Infection: California, April–May, 2009

- Most common symptoms were fever, cough, vomiting, and shortness of breath; diarrhea was uncommon.
- Of 25 patients who had CXR, 15 (60%) had abnormalities suggestive of pneumonia, including 10 with multilobar infiltrates & 5 with unilobar infiltrates.
- 6 patients (20%) were admitted to ICU, and 4 required mechanical ventilation. 5 patients were pregnant. 2 of these developed complications, including spontaneous abortion and PROM; the fetuses were at 13 and 35 weeks gestation, respectively.

MMWR; May 22, 2009 / 58(19);536-541

Hospitalized Patients with Novel Influenza A (H1N1) Virus Infection:
California, April–May, 2009

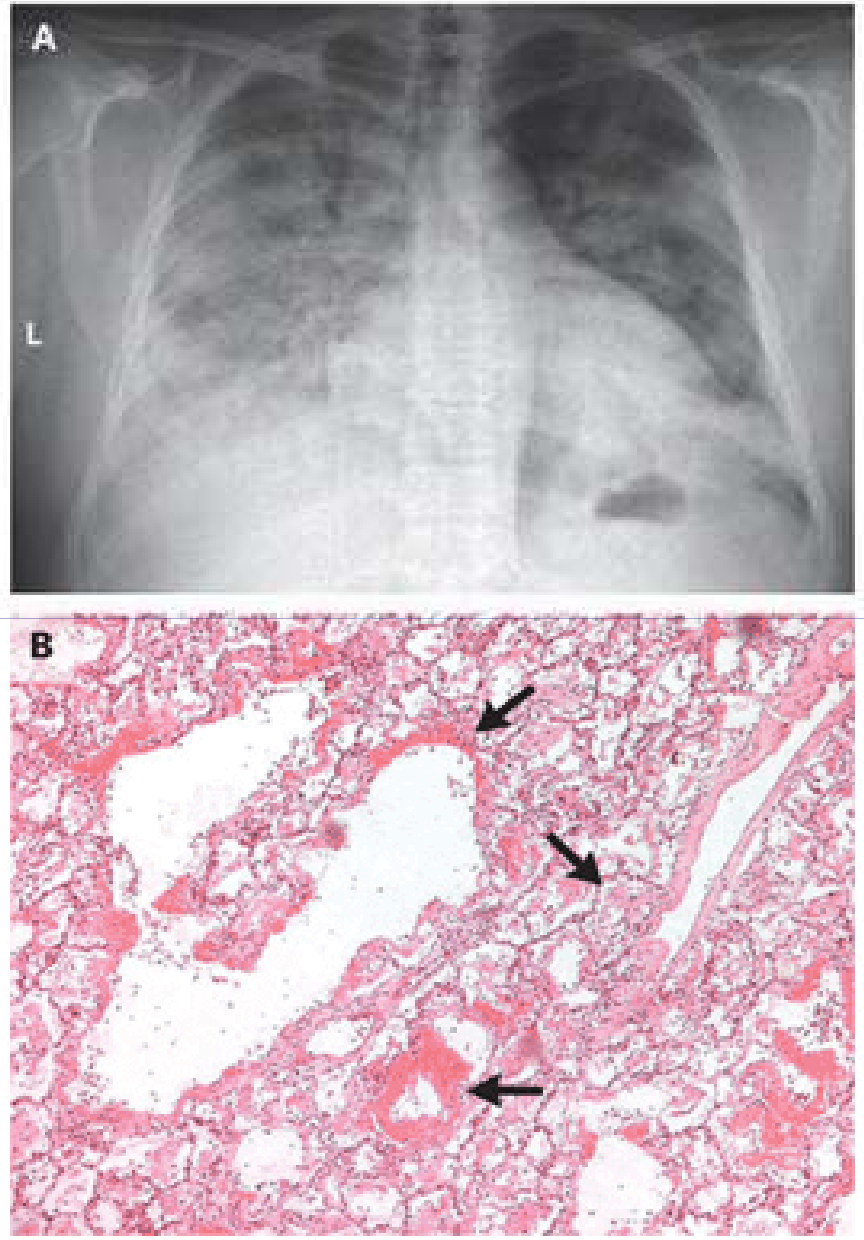
- None had microbiologic evidence of 2° bacterial infection by blood, urine, or sputum cultures (or ETA or BAL cultures). 15 (50%) received antiviral treatment with oseltamivir; for 5 patients, treatment was initiated within 48 hrs of onset of symptoms. Among 15 not treated with antivirals, 6 sought care >48 hrs after illness onset.
- As of May 17, 23 patients had been discharged to home, with a median LOS of 4 days (range: 1–10 days). 7 patients remained in the hospital, with median LOS of 15 days (range: 4–167 days)

MMWR; May 22, 2009 / 58(19);536-541

Canada: In-patient workload

Total Influenza A / H1N1 cases in Canada	
Laboratory confirmed cases	10,156
Hospitalizations	1,115 [10.9%]
Deaths	45 [0.44%]

Summary of laboratory-confirmed cases of Pandemic (H1N1) 2009 virus reported to the Public Health Agency of Canada as of 15 July 2009.



www.nejm.org June 29, 2009 (10.1056/NEJMoa0904252)

Initial Radiograph of the Lung and Lung-Tissue Sample

The CXR shows bilateral alveolar opacities in the base of both lungs that progressed and became confluent. The specimen (H&E stain) shows necrosis of bronchiolar walls (top arrow), a neutrophilic infiltrate (middle arrow), and diffuse alveolar damage with prominent hyaline membranes (bottom arrow). Bacterial cultures were negative on admission, and no evidence of bacterial infection of the lungs was found. The patient ultimately died.

Pneumonia and Respiratory Failure from Swine-Origin Influenza A (H1N1) in Mexico

Hospital Admission policies

- Depending on phase of pandemic, admission policies vary from admitting all probable / suspected cases to only admitting those who are ill or with complications.

As of 27th. April 09

- In early phases; to prevent importation or to reduce viral transmission in the country, all suspect influenza H1N1 cases will be admitted in designated hospitals and kept in isolation.

As of 8th. July, 2009

- In full pandemic situation, where cases go beyond capacity of health facilities to cope, a policy of surveillance & Tx. at home or the use of non-traditional health facilities may be instituted. Hospital admissions will only be for those with respiratory distress or with assoc complications of influenza or those in high risk groups (ie.with co-morbidities). Such admission policies will be updated as pandemic evolves.

Now in Mitigation

Medical care for patients with novel influenza A (H1N1) virus

- **Not all patients with suspected novel influenza (H1N1) infection need to be seen by a health care provider.** For most people, the illness appears to be mild and self-limiting.
- Minority of people with influenza A(H1N1) has had severe illness with complications. Many, but not all, have **underlying risk factors (co-morbidities)** that are likely to have contributed to the severity of the condition.

Complications of Influenza:

- Respiratory complications are the most common ones (esp secondary infections).
- At times these complications, eg. an exacerbation of COPD, may be the presenting symptom.
- Cardiac events are not uncommon.

Complications of influenza	Major clinical category
Respiratory	Pneumonia: primary viral, secondary bacterial, combined Upper respiratory: otitis media, sinusitis, conjunctivitis Acute laryngotracheo-bronchitis (croup) Bronchiolitis Complication of pre-existing disease
Cardiovascular	Myocarditis Pericarditis
Muscular	Rhabdomyositis Rhabdomyolysis with myoglobinuria and renal failure
Neurological	Encephalitis Reye's syndrome Guillain-Barré syndrome Transverse myelitis
Systemic	Toxic shock syndrome Sudden death

Co-morbidities / Risk factors

Those considered vulnerable to severe outcomes & should be a focus of early identification, assessment and treatment, include the following:

- Chronic respiratory conditions, eg asthma, COPD, OSA
- Pregnant women, esp. in second or third trimester
- Morbid obesity
- Other predisposing conditions, such as chronic cardiac disease (not simple HPT), and chronic illnesses including diabetes mellitus, renal failure, haemoglobinopathies, immunosuppression.
- Adults $\geq$ 65 years of age esp. those with other chronic diseases
- Children under the age of 5 years, esp. those < 2 years

As more epidemiologic & clinical data become available, these risk groups might be revised.

H1N1 and Pregnancy

- Most pregnant women have a typical course of uncomplicated influenza.
- Minority of pregnant women: illness might progress rapidly, & might be complicated by 2° bacterial infections including pneumonia.
- Fetal distress associated with severe maternal illness can occur.
- Case reports of adverse pregnancy outcomes and maternal deaths have been associated with severe illness.
- Treatment should not be delayed pending results of testing as antiviral treatment is most effective when started ASAP after onset of symptoms (i.e. within the first 2 days).

Patient Home Assessment Tool

Patients with ILI are advised to seek medical care should they develop any of the symptoms & signs listed as below :

1	**Respiratory Difficulties: Shortness of breath, rapid breathing or Purple or blue discoloration of lips**
2	Coughing out blood or blood streaked sputum
3	Persistent chest pains
4	Persistent diarrhea and / or vomiting
5	Fever persisting beyond 3 days or recurring after 3 days
6	Abnormal behavior , confusion, less responsive , convulsion
7	Dizziness when standing and/or reduced urine production

RECOMMENDATION

Patients with ILI:

- who have **moderate or severe illness (based on the Home Assessment Tool)**

OR

- who have **significant co-morbidities** and hence are at high risk for complications from influenza

should seek EARLY professional medical assessment (preferably within first 2 days of illness) from the nearest hospital or health clinic (depending on severity of symptoms

RECOMMENDATION

Laboratory testing for Influenza A H1N1 to assist with clinical management is indicated for those who meet the **case definition for ILI** * and are:

- symptomatic **patients with moderate to severe disease** (see clinical assessment tool below)

* **Influenza-like-illness (ILI)** is defined as fever (esp. temperature > 38°C) and a cough and/or a sore throat in the absence of a KNOWN cause other than influenza

Patients with and any of the following parameters should be considered for admission to the of nearest designated hospital

Respiratory impairment: any of the following

- Tachypnoea, respiratory rate > 24/min
- Inability to complete sentence in one breath
- Use of accessory muscles of respiration, supraclavicular recession
- Oxygen saturation ≤ 92% on pulse oximetry
- Decreased effort tolerance since onset of ILI
- Respiratory exhaustion
- Chest pains

Evidence of clinical dehydration or clinical shock

- Systolic BP < 90mmHg and/or diastolic BP < 60mmHg
- Capillary refill time > 2 seconds, reduced skin turgor

Altered Conscious level (esp. in extremes of age)

- New confusion, striking agitation or seizures

Other clinical concerns:

- Rapidly progressive (esp. high fever > 3 days) or serious atypical illness
- Severe & persistent vomiting and diarrhoea

Clinical assessment tool for moderate to severe influenza

Patients to be hospitalized for novel influenza A / H1N1 virus

The following patients will be admitted to the flu ward / cubicle of the hospital:

- All **patients fulfilling criteria of ILI** with **any of the parameters listed in the clinical assessment tool** for moderate to severe influenza (with or without co-morbidities)

Patients with suspected influenza manifesting with mild disease will not require admission to hospital

Patients should be clinically assessed and the admission decision will be based mainly on the severity of the illness.

Antiviral Treatment for Novel Influenza A / H1N1

RECOMMENDATION:

Antiviral Treatment is recommended for:

- All hospitalized patients (ie. those with moderate to severe disease) with confirmed or suspected novel influenza A H1N1. Empirical therapy for suspected patients with severe disease should be considered if the turnaround time for H1N1 confirmation is prolonged. The antiviral treatment maybe stopped if the results are negative.

Antiviral Chemoprophylaxis for Novel Influenza A / H1N1

Post exposure chemoprophylaxis with either oseltamivir or zanamivir can be considered for the following:

- Close contacts (see definition below) of confirmed cases, who are pregnant (esp. in 2nd. & 3rd. trimester)

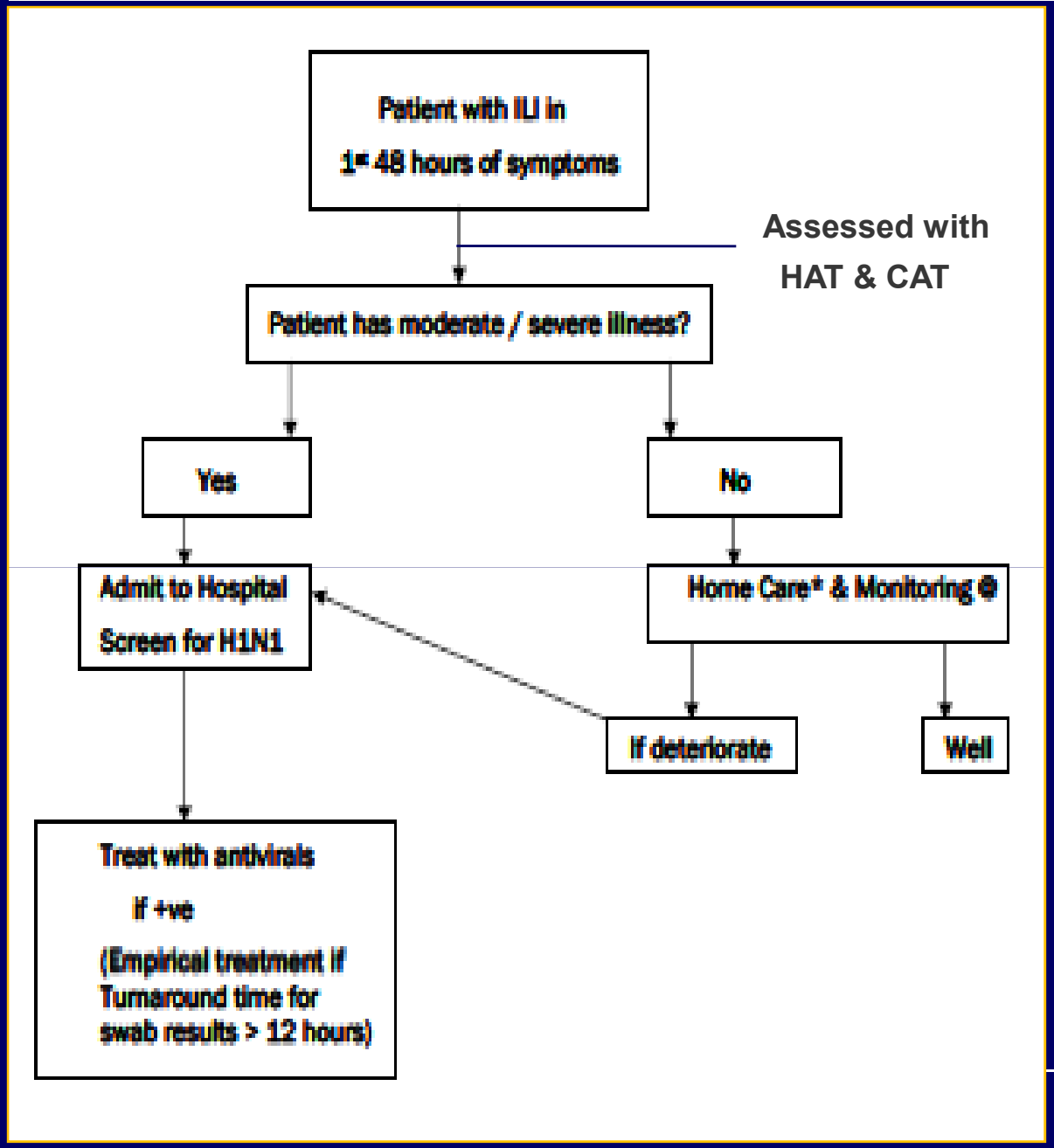
Chemoprophylaxis is best given within 48 hrs of exposure

Close Contacts are defined either:

- as those who live in the same house / premises (household contacts)
- those who have sustained close contact (< 3ft) for at least 4 hrs

Dosage of antiviral prophylaxis is as follows:

- Oseltamivir 75 mg daily for 10 days
- Zanamivir 10 mg (2 puffs) daily for 10 days

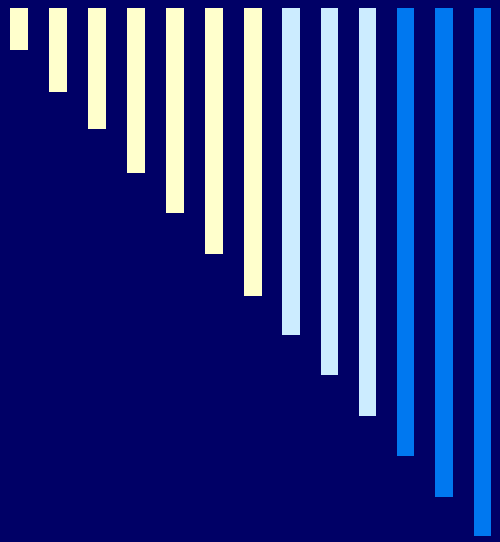


Algorithm for H1N1 management

- **Home Care:** supportive care including adequate fluids, paracetamol, cough mixtures, lozenges, etc.
- @ See Patient Home Assessment Tool
- Antiviral therapy is best given within first 48 hrs of illness. Beyond 48 hrs, antiviral medication may still be indicated on clinical grounds (eg. progressive symptoms)
- If empirical treatment given, treatment should cease if swab result is -ve for H1N1.

Viruses resistant to oseltamivir identified

- 8 JULY 2009 | GENEVA -- WHO has been informed by health authorities in Denmark, Japan & Hong Kong, SAR China of the appearance of H1N1 viruses which are resistant to the antiviral drug oseltamivir based on laboratory testing.
- These viruses were found in 3 patients who did not have severe disease and all have recovered. Investigations have not found the resistant virus in close contacts of these 3 people. The viruses, while resistant to oseltamivir, remain sensitive to zanamivir.



Infection Control H1N1 2009

Infection control guidelines in Mitigation Phase of H1N1 Pandemic 2009

- Standard infection control principles and droplet precautions must be used if patients have / suspected of having influenza. Standard infection control principles are a set of broad statements of good practice to minimize exposure to and transmission of a wide variety of micro-organisms.
- These principles should be applied by **all** healthcare practitioners to the care of **all** patients **all** of the time.

Hand hygiene

- **The single most important practice** needed to reduce the transmission of infection in healthcare settings & is an essential element of standard infection control principles
- Hand hygiene includes:
  - hand washing with soap and water and thorough drying, &
  - the use of alcohol-based products. If hands are visibly soiled (eg with respiratory secretions), they should be washed with soap & water and dried. When alcohol handrub is used to decontaminate hands, the hands should be free of visible dirt and organic material. Handrub must come into contact with every part of hand's surface.

Patient Placement

- Ideally patients with influenza should be placed in single rooms, but during pandemics this may not be possible. Therefore patients can be ‘cohorted’ in a segregated area. Esp. useful while waiting for H1N1 throat swab results. If result is negative, patient maybe transferred back to standard wards.
- Where patients are cohorted on basis of epidemiological & clinical information rather than on lab-confirmed diagnosis, beds should be at least 3 feet apart.
- Special ventilation is not necessary, & doors of segregated areas can remain open. Designated cubicles at ends of wards maybe used so as to minimize exposure from regular patient & staff traffic. (unless a patient is being isolated for another reason in addition to influenza that requires doors to be shut).

Surgical Masks

- **Staff** must wear surgical masks when working in close contact (within 3 feet) with symptomatic patient. Likely to mean wearing a surgical mask at all times within cohorted areas.
- **Patients with ILI** should also wear surgical mask when not in isolation in a single room & stay at least 3 feet distant from others.
- Ensure that surgical masks are worn & disposed of correctly. Make sure mask is correctly fitted by ensuring that it covers nose & mouth & that it is secured at back of head.
- Avoid touching face while wearing mask. Replace mask whenever it is moist. A mask that has been removed should not be reused.
- Remove mask by only touching straps & put used mask in a bin. Perform hand hygiene straight after.

Use of Personal Protective Equipment (PPEs)

	Entry to cohorted area but no contact with patients	Close Contact with patient (within 3 feet)	Aerosol generating procedures ° (see Reference 1 below)
Gloves	No °°	Yes	Yes
Plastic Apron	No °°	Yes	Yes
Gown	No	No	Yes
Surgical mask	Yes**	Yes	No
N95 mask#	No	No	Yes
Eye Protection	No	Risk Assessment@	Yes

Occupational Safety

- Management of HCWs with ILI
  - HCWs who develop ILI should be assessed & treated as recommended for general public. They should be excluded from work for duration of symptoms esp. until fever resolution.
  - Testing for H1N1 is not necessary as a routine. Recommendation for H1N1 screening / testing for public can be applied.

- Surveillance and management of healthcare personnel
  - HCWs should be monitored for illness & those who develop ARI should be instructed not to report to work, or if at work, should cease patient care activities & notify their supervisor & infection control personnel.
  - Surveillance of ILI & work absenteeism among HCWs must be maintained by the Occupational Health Unit.

Thank You

Pandemic Influenza:

"Can we teleconference the next meeting ....?"