SWINE FLU Guideline

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To Whom to screen? : ILI/ ARI

- Influenza-like illness (ILI) or flu is defined as fever (temperature of 100°F [37.8°C] or greater) with cough or sore throat in the absence of a known cause other than influenza.

- Cluster cases reported in short time periods.

- Immunocompromised/ high risk patients with respiratory or other abnormal symptoms.
Vomiting or diarrhea (not typical for influenza but reported by recent cases of swine influenza infection)
Risk factors
Cat B2

- Age
- COPD– Asthma
- Immunocompromised state– HIV, Cancers
- DM
- Pregnancy
- Cardiac disease
- Obesity
Other Manifestations: Seriously ill – Cat C

- Tachycardia
- Tachypnoea
- Low O2 sat.
- Hypotension
- Cyanosis
- Acute myocarditis
- Cardiopulmonary arrest
COMPLICATIONS
Seriously ill– Cat C

Similar to those of seasonal influenza
- Exacerbation of underlying chronic medical conditions
- Upper respiratory tract disease (sinusitis, otitis media, croup)
- Lower respiratory tract disease (pneumonia, bronchiolitis, status asthmaticus)
- Cardiac (myocarditis, pericarditis)
- Neurologic (Acute and post-infectious encephalopathy, encephalitis, febrile seizures, status epilepticus)
- Toxic shock syndrome
- Secondary bacterial pneumonia with or without sepsis
Adults Need attention if Present with

- Difficulty breathing or shortness of breath
- Pain or pressure in the chest or abdomen
- Sudden dizziness
- Confusion
- Severe or persistent vomiting
Seek emergency medical care in Children, if:

In children emergency warning signs that need urgent medical attention include:

- Fast breathing or trouble breathing
- Bluish skin color. Not drinking enough fluids
- Not waking up or not interacting
- Being so irritable that the child does not want to be held
- Flu-like symptoms improve but then return with fever and worse cough
- Fever with a rash
Screen patients

WHO?
- Assign a staff member to screen patients

WHAT?
- Acute febrile respiratory illness
- Symptom of cough, cold, coryza.
Screen patients

WHEN?

○ Immediately after patients arrive at facility

HOW?

○ Screening criteria will vary depending on the local setting and patient population
○ Establish a screening checklist for rapid identification of patients with ARD of potential concern
If screening is positive, then we should control the source of infection, educate, separate and provide priority service.
Educate patients on respiratory hygiene and cough etiquette:

- Cover nose and mouth with cloth/tissue when sneezing (provide if necessary)
- Wash hands after contact with respiratory secretions

Place posters emphasizing cough etiquette in waiting areas
LABORATORY FINDINGS

- CBC– leucocytosis/leucopenia
  lymphopenia
- Elevated CPK, LDH
- Elevated UREA, CREATININE
- Elevated AST, ALT
- CHEST RADIOGRAPH– bilateral patchy pneumonia.
H1N1 Pneumonia
TO WHOM TO TEST

Priority for testing should be given to:
Those who require hospitalization and
Those who are at high risk for severe complications –CAT C

No testing if illness is mild or Moderate (Category A & B) and the person resides in an area where positive cases are being regularly reported.
Specimens

- Nasopharyngeal swab, nasal swab, throat swab, combined oropharyngeal/nasopharyngeal swab, or nasal aspirate
- Swabs with a synthetic tip (e.g., polyester or Dacron) and an aluminum or plastic shaft should be used. Swabs with cotton tips and wooden shafts are not recommended.
- The collection vial in which the swab is placed should contain 1 to 3 mL of viral transport media.
Respiratory specimen should be collected within 2 to 3 days of illness.

Specimens should be placed in viral transport media and placed on ice (4°–6°C, upto 48 hrs) or refrigerated (−70°C) till transportation to the laboratory.
TREATMENT

- **Antiviral drugs can be given to treat those who become moderately ill** – **CAT B1&B2**

**OR**

- **Severely ill with influenza** – **CAT C**
Mild Cases

- Supportive: Paracetamol, decongestants, antihistaminics, antibiotics, fluids...sos.

  *NO SALICYLATES IN CHILDREN/ YOUNG ADULTS: REYE'S SYNDROME*

- Control precautions: cough etiquette

- Hand hygiene & Natural ventilation

- Home isolation/ Rest/ Plenty of Liquids.

- Antivirals: *best within first 48 hours*

  *Early administration in at-risk pts i.e. those with comorbidities/ pregnancy...*
Hospitalized pts:

- **Antivirals** and swab testing
- Pneumonia management with repeated severity assessment (antibiotics, if necessary)
- Resp. Support: early detection of hypoxia
  - Correction of hypoxia with supplemental O2, BiPAP and Mechanical Ventilator as necessary with Critical Monitoring.
In order of preference the best configurations are:

1. Single room for a patient
2. Cohort patients with same known or suspected diagnosis.
3. Maintain spatial separation of at least 1–1.5 meter between patients
During admission of patients with respiratory infections

- Educate patients on cough etiquette and respiratory hygiene
- Ensure adequate disposal of sputum
- Reduce number of visitors
- Review periodically
  - Discharge promptly—do not prolong stay
- Limit access to visitors
Inpatient transport of patients with ARDs of potential concern

- Avoid patient movement outside of the room unless essential
- Alert health care workers receiving the patient in advance about the patient’s diagnosis and relevant infection control measures
- Clean and disinfect surfaces that may have come in contact with the patient or patient’s secretions
Inpatient transport of patients with ARDs

- Place a medical mask on the patient while moving or caring for them outside their room.
- If masks are not available, instruct the patient to cover their mouth/nose when coughing or sneezing.
Entering and Exiting Isolation Rooms or Cohort Areas

Health Care Workers and Visitors
Remember! Use clean water to wash and rinse hands
You can make an alcohol/glycerin solution:

- Use 2–5 ml of solution for each application
- Rub the solution vigorously into hands until dry
Always use standard precautions when providing care, even when patient looks well!!
Health care workers

Before entering:

- Assess the risk of any planned clinical procedures and the expected level of contact with the patient
- Collect all equipment needed
- Perform hand hygiene
- Mask or particulate respirator before entering
- Other PPE as needed either at door or inside room
PPE for standard precautions

Includes any or all of the following:

- Gloves
- Gowns
- Eye protection
- Medical masks
N95 mask: Aerosol-generating procedures that warrant airborne precautions

Aerosol-generating procedures in suspected influenza patients require a particulate respirator N95 plus other PPE as needed:

- Sputum induction, sampling.
- Resuscitation, intubation, suctioning, and/or extubation
- Bronchoscopy
To prevent inhalation of airborne-droplet nuclei by the health care worker

Two examples:
N95
EU FFP2
Check for Seal
Visitors/family members

Recommendations for patient’s visitor/family

- The patient's right to receive visits should be guaranteed
- Encourage parents/legal guardians of pediatric patients to accompany the patient throughout the hospitalization
What kills influenza virus?

- Influenza virus is destroyed by **heat** (167–212°F [75–100°C]). In addition, several chemical germicides, including **chlorine**, **hydrogen peroxide**, **detergents** (soap), **iodophors** (iodine–based antiseptics), and **alcohols**
PPE, including rubber apron, must be worn during cleaning and disinfection.

Key issues about cleaning and disinfection:

- The environment used by the patient MUST be regularly cleaned.
- Cleaning should use proper techniques to avoid aerosolization of dust.
- Only surfaces that enter in contact with the patient's skin/mucosa and surfaces frequently touched by health-care workers require disinfection after cleaning.
- Health-care workers MUST use PPE for cleaning and disinfection of respiratory equipment and hand hygiene must be performed after PPE removal.
Handling linen and waste

- The risk of being exposed to or acquiring an IRD through handling waste or used linen is low
- ALL used linen & waste should be placed in bags/containers which can withstand transportation
- Double bagging is not needed for used linen/waste
Important points to remember

- Avoid aerosolization whenever handling & disposing waste especially faeces
- Wear gloves whenever handling waste
- Perform hand hygiene immediately after removing the gloves
- Keep bins closed and bags tied carefully
INCUBATION PERIOD

1–7 DAYS AFTER LAST DEFINITE EXPOSURE
Contagiousness:

1 day before onset of symptoms
upto 7 days!

Children are contagious for longer periods.
May be upto 2–3 weeks?
Dealing with the Deceased

- Transport of deceased persons with precautions
- Hand hygiene should be performed after completing transport.

For deceased persons with confirmed, probable, or suspect novel influenza A (H1N1):
  - Limit contact with the body in health care settings to close family members
  - Direct contact with the body is discouraged
  - Necessary contact may occur as long as hands are washed immediately with soap and water.
prevention
Avoid close contact

- Avoid close contact with people who are sick. When you are sick, keep your distance from others to protect them from getting sick too.
- Aerosols spread the virus in any environment
Stay home when you are sick.

- If possible, stay home from work, school, and errands when you are sick. You will help prevent others from catching your illness.
Cover your mouth and nose.

- Cover your mouth and nose with a tissue when coughing or sneezing. It may prevent those around you from getting sick.
Avoid touching your eyes, nose or mouth.

- Germs are often spread when a person touches something that is contaminated with germs and then touches his or her eyes, nose, or mouth.
Clean your hands.

- Washing your hands often will help protect you from germs.
- Hand washing proved to be best procedure in prevention of Majority of Communicable diseases.
SOAP & WATER BEST!
Administrative control measures

- Early recognition and reporting of patients with suspected or confirmed disease
- Instruction in cough hygiene: Reducing or eliminating the source of infection
- Cohorting of patients to a separate well-ventilated waiting area
- Adequate provision of services within the isolation areas
- Rapid diagnosis for disease confirmation
- Screening, counselling, followup of contacts.
VACCINATION

- Annual repetition – booster
- Effect starts after 2–3 weeks, 60–70% protection provided
- High risk group
- Health workers
- Injectables / nasal ????
Proper screening/triage, preferably in well-ventilated area

For suspects/patients – ensure safe placement and in-patient transport

Separate designated isolation area (single room or cohorted with same diagnosis)

Maintain >1 meter distance between patient beds

Do not forget infection control measures including cough hygiene, hand hygiene, appropriate level of precaution, use of appropriate PPE as applicable, for staff and visitors.

Reporting of suspected cases/cluster of cases.

Vaccination
Thanks

Created for Awareness on Swine Flu
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Swine Flu:  
Basics & Essentials

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Enveloped Glycoprotein spikes
-- Hemagglutinin
-- Neuraminidase

RNA virus
Segmented genome

M: RNP: } Influenza A, B, C
RNA depdt. RNA polym.
Influenza A:
Multiple species:
Birds; pigs; horses; etc

Influenza B:
Humans only

Influenza C:
Humans only; subclinical

Ordinary strains:
Species barrier

Pandemic strains:
Cross species barrier.
HA & NA in viral infectivity

Flu hemagglutinin binds to sialic acid on other virus particles: virus clumps
OR virus sticks to mucous in respiratory tract

Virus hemagglutinin sticks new virus particle to sialic acid on cell surface
Virus cannot escape from infected cell

Neuraminidase of virus removes sialic acid from cell surface thereby releasing virus
HA: Rod-shaped spikes
Sialic Acid Receptors
Viral Entry

NA: Mushroom-like spikes
Viral Release

HA: Types 1-16
Types 1-3; 5 (Humans)

NA: Types 1-9
Types 1-2 (Humans)
Genetic variations: drift & shift

**Antigenic drift**
- RNA polymerase: Error prone
- Mutations: gradually accumulate
- Immune evasion; no new subtype

**Antigenic shift**
- Two difft. strains coinfecteding a cell
- Gen. Recombn. between segments
- Sudden emergence of new subtype.
Influenza: Antigenic Variation

![Graph showing antigenic drift and shift](image)

- **Influenza A, B, C**
  - Gradual point mutations

- **Influenza A**
  - Sudden reassortment
Influenza A, B, C
• Non-protective antibodies in population
• Immune selection of mutants

• Crossing Species Barrier
• Human-to-human transm

Gradual point mutns

Antigenic drift

Epidemics

Antigenic shift

Influenza A
Sudden reassortment

Pandemics
Wild Water Bird
Pool of all Influenza genes

Virus excreted in water bodies

Domestic birds (Ducks, Chicken)

± Species Restriction

Recombinant strains more likely if:
• Close habitation of poultry, pigs & man, e.g. China

Recombinant strain becomes pandemic strain if:
• Overcomes species barrier
• Human-to-human transmission
Influenza: Genetic Reassortment

H1N2 + H3N1 = H1N1

PIGS: Mixing vessels
Swine flu: Suspect

• Acute febrile (38°C) Respiratory illness
• Epidemiologically suggestive:
  Contact/ Travel/ Residence : 7 days

Swine flu: Confirmed

• RT- PCR
• Viral culture
• 4-fold ↑ in swine influenza A (H1N1) virus- specific neutralizing antibodies
Sampling

At earliest contact with patient
Before antiviral administration

PPE: Gown/ Gloves/ Goggles
Head/ Foot/ Mask: N95

Ambulatory patient
- Throat swab
- Nasopharyngeal swab

Intubated patient
- Lower Respiratory aspirate

CTNS: Combined Throat & Nasopharyngeal Swab

Labels: Name of pt/ Unique ID/ Hospital
Sample Container; Requisition Form
Triple Packaging
Sample Storage & Transportation

< 48 hours: 4°C

> 48 hours: -70°C

Transported in ice in VTM

To avoid freeze-thaw cycles
Simple steps to prevention

- Hand washing: Contact with face/resp. secretions
- Cough etiquette
- Arm’s length from affected people
- Avoiding crowded places
- Avoiding hand-shakes & hugging
Administrative control for prevention

• Reducing waiting time for suspected patients
  — OPD Registration
  — Radiology
  — Lab

• Isolation with airborne precautions for admitted pts
  — Separate room with dedicated AHU
  — Open air ventilation with sunlit illumination
  — 3 feet distance between beds
  — Mopping of patient’s surroundings with Sodium Hypochlorite