Novel Influenza A (such as H7N9)

Novel influenza A is defined as a virus that cannot be subtyped by commercially distributed assays, and is different from current or recently circulating seasonal influenza strains. For example: influenza A (H3N2v) that circulated in swine and sporadically infected humans in the US in 2011, avian influenza A (H5N1), avian influenza A (H7N9) , or influenza A (H2N2) which circulated during 1957–1968, and other subtypes not known to have widely infected humans in the past. The current guidelines focus on influenza A (H7N9), since this virus is currently circulating in China (as of May, 2013), and sporadic cases in travelers from effected countries would require a response by local health departments. **These guidelines will change as the situation evolves; check frequently for the latest version.**

This guideline is intended to be used for 1) investigation of suspected, presumptive, or confirmed cases of novel influenza A that occur sporadically (for example, a suspect case in a traveler returning from a country where a novel influenza strain is causing an outbreak in the human population); or 2) at the earliest stages of a human pandemic (in the event that a pandemic occurs and is widespread, individual case investigation will no longer be feasible).

1. DISEASE REPORTING

A. Purpose of Reporting and Surveillance

1. To identify cases of novel influenza;
2. To prevent the spread of novel influenza;
3. To identify epi-linked cases of novel influenza;
4. To identify contacts of suspected novel influenza cases;
5. To characterize the epidemiology of novel influenza;
6. To clarify the means of novel influenza transmission.

B. Laboratory and Physician Reporting Requirements.

All Oregon physicians, other healthcare providers, and laboratorians are required by law to report any novel influenza case immediately to their Local Health Department (LHD) as an "Uncommon Illness of Potential Public Health Significance." More specific rules may be enacted as the WHO "phase" and United States "stage" of a pandemic evolve. Infection Control Practitioners and others may make initial reports directly to the LHD.

C. Local Health Department Reporting and Follow-up Responsibilities

1. Begin follow-up investigation within 24 hours. Document investigation using the Case Reporting Form appended to this document.
2. Notify the Acute and Communicable Disease Prevention section (ACDP) epidemiologist on-call immediately after basic information is obtained (971 673-1111). The case will be assigned a report number to be used for all subsequent communication and specimen handling. Send a copy of the Case Report Form to ACDP within 1 day of initial report.
3. Initiate special control procedures immediately (see controlling further spread). Ensure that possible cases are isolated whether at home or in health care settings.
4. Diagnostic Specimens: Ensure that appropriate acute specimens are obtained for Novel Influenza testing- See section 3 for details. Specimens from multiple time points may be

required to confirm the diagnosis of novel influenza because sensitivity of testing can not be known ahead of time.

5. Identify contacts of the case during the period of communicability. For the purposes of investigation, a contact is defined as any person who was within about 6 feet of a suspected, probable or confirmed case while the case was symptomatic. (for example: household contacts, co-workers, and health care personnel).
6. Alert infection control practitioners and clinicians at emergency rooms and other health care facilities visited by the patient of the potential for additional cases; encourage them to consider novel influenza in persons with fever ≥100°F (38°C), respiratory symptoms, and exposures similar to the patient under investigation.
7. Alert clinicians, hospital emergency rooms, student infirmaries, and local officials of the potential for additional cases; encourage them to consider novel influenza in persons with fever >100°F (38°C), respiratory symptoms, and exposures similar to the patient under investigation.
8. If indicated, prepare and distribute a press release in conjunction with the ACDP and hospital.

2. THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic agent

Influenza A is a segmented single-stranded, enveloped, RNA virus.

B. Description of illness

Novel influenza is expected to be an acute respiratory illness associated with fever. The initial presentation may be non-specific and some patients, such as children, may have gastrointestinal or central nervous system illness. Clinical presentations of H7N9 infection have generally been severe and have included fulminant pneumonia, acute respiratory distress syndrome (ARDS), respiratory failure, and death. Infections by other novel strains, such as H3N2v, have been clinically indistinguishable from seasonal influenza.

C. Mode of Transmission

Novel influenza is expected to be primarily spread through the droplet route but airborne and contact spread are possible, hence maximal barrier precautions (airborne precautions) are needed when caring for confirmed or suspect cases.

D. Period of communicability.

The details of Novel Influenza virus communicability can not be predicted ahead of time. In adults, annual influenza can be detected in respiratory tract specimens from 0.5-1 day before onset to typically one week later; in children and the immunocompromised, the period of shedding can be much longer.

E. Incubation period.

Seasonal influenza has an incubation period of 1-3 days (usually 2 days). The incubation period for a novel strain might be the same or slightly longer. The incubation period for avian viruses may be up to 7 days (or longer).

F. Reservoir

The reservoir for the new strains of influenza seen in humans in the 20th century was birds either by direct or indirect introduction. However, some avian strains, such H7N9, have adaptation to mammalian cells and reservoir species may be uncertain. The reservoir for the H3N2v strain was swine.

G. Treatment

Therapy for a novel strain of influenza would include supportive care, including mechanical ventilation as needed. For H7N9 infection, antiviral treatment with a neuraminidase inhibitor (oseltamivir or zanamivir) is currently recommended. See the CDC Interim Guidance on the Use of Antiviral Agents for Treatment of Human Infections with Avian Influenza A (H7N9) for further details on treatment regimens for cases.

H. Chemoprophylaxis

Until further notice, CDC guidance on chemoprophylaxis of contacts of confirmed or suspected H5N1 cases should be followed, until guidelines for H7N9 case contacts are available: http://www.cdc.gov/flu/avianflu/guidance-followup.htm. Contacts to a confirmed, presumptive, or suspect case should be administered chemoprophylaxis within 2 days of the last known exposure to the case, where possible. A neuraminidase inhibitor is the recommended chemoprophylaxis at this time.

3. CASE DEFINITIONS, DIAGNOSIS, AND LABORATORY SERVICES

A. Provisional Case Classifications (novel influenza A (H7N9))

Confirmed Case: A patient with novel influenza A (H7N9) virus infection that is confirmed by CDC's Influenza Laboratory or a CDC certified public health laboratory using methods agreed upon by CDC and CSTE.

Probable Case: A patient with illness compatible with influenza for whom laboratory diagnostic testing is positive for influenza A, yet is unsubtypeable (i.e., negative for H1, negative for H1pdm09, and negative for H3 by real-time reverse transcriptase polymerase chain reaction (RT-PCR)).

Case Under Investigation: A patient with illness compatible with influenza meeting either of the following exposure criteria and for whom laboratory confirmation is not known or pending, or for whom test results do not provide a sufficient level of detail to confirm novel influenza A virus infection.

- A patient who has had recent contact (within ≤ 10 days of illness onset) with a confirmed or probable case of infection with novel influenza A (H7N9) virus.

OR

- A patient who has had recent travel (within ≤ 10 days of illness onset) to a country where human cases of novel influenza A (H7N9) virus have recently been detected[2] or where novel influenza A (H7N9) viruses are known to be circulating in animals.

Cases under investigation with severe respiratory illness (including radiographically-confirmed pneumonia, acute respiratory distress syndrome [ARDS], or other severe respiratory illness) of unknown etiology may be prioritized for diagnostic testing.

Case definitions will be updated as the situation evolves.

E. Services available at the Oregon State Public Health Laboratory (OSPHL)

Testing for novel influenza must be performed by OSPHL (or CDC). Reverse transcriptase polymerase chain reaction (RT-PCR) testing for novel influenza types H5 and H7 is available at the OSPHL. Testing criteria are under constant evolution and will be updated as needed. Clinicians may contact OSPHL at 503 693-4100 for additional specific information on submitting specimens. For specific information on collection and submission of influenza specimens for testing at OSPHL: http://public.health.oregon.gov/LaboratoryServices/SubmittingSamples/Pages/submitting-flu.aspx

Clinicians should obtain a nasopharyngeal swab or aspirate from patients, place the swab or aspirate in viral transport medium, and contact their local health department to arrange transport of the specimen to OSPHL. For additional guidance on diagnostic testing of patients under investigation for novel influenza A (H7N9) virus infection, please see *Interim Guidance for Laboratory Testing of Persons with Suspected Infection with Highly Pathogenic Avian Influenza A (H5N1) Virus in the United States at* http://www.cdc.gov/flu/avianflu/guidance-labtesting.htm.

Commercially available rapid influenza diagnostic tests (RIDTs) may not detect avian or variant influenza A viruses in respiratory specimens. Therefore, a negative rapid influenza diagnostic test result does not exclude infection with influenza viruses. In addition, a positive test result for influenza A cannot confirm variant or avian influenza virus infection because these tests cannot distinguish between influenza A virus subtypes (they do not differentiate between human influenza A viruses and avian or variant viruses). Therefore, when RIDTs are positive for influenza A and there is concern for novel influenza A virus infection, respiratory specimens should be collected and sent for RT-PCR testing at a state public health laboratory.

4. ROUTINE CASE INVESTIGATION

A. Identify the source of infection

1. Investigate potential exposures during the 10 days prior to onset and especially 4–7 days prior to onset of symptoms. Ask about:
    - Travel to any country with known novel influenza cases in poultry, swine, or humans, or contact with other that have traveled to affected countries;
    - Contact with domestic poultry or wild birds, or swine, included dates, times, type and duration of exposure;
    - Visits to poultry or live animal markets, agricultural fairs, or other venues where animals are displayed;
    - Names, addresses, phone numbers and e-mail addresses of any household member, playmate, or other contact who is or was sick with similar symptoms**;**
    - Any indoor group activities attended, including air travel, churches, theaters, parties, sport events, family gatherings, and the like;
    - Any visit to a health care facility—including doctor's office, clinic or hospital—find out exact times and dates;
    - Any employment in a facility conducting laboratory research on novel influenza
    - Any health care employment.

    For a novel influenza case report form, contact ACDP at (971) 673-1111

B. Identify Potentially Exposed Persons

Initiate identification of a patient's contacts as soon as possible after a diagnosis of novel influenza. Obtain information about the case and any contacts during the case's infectious period (infectious period is 1 day before case's symptom onset until case is placed in isolation) Interview next of kin, workplace representatives, or others with appropriate knowledge of the case-patient's recent whereabouts and activities. Daily follow-up of contacts will be needed to determine whether they become ill (fever equal to or greater than 100.4° F, with either cough or sore throat) and need evaluation for novel influenza.

Use the contact tracing section of the novel influenza case report form and discuss with ACDP epidemiologist the need for daily follow-up of contacts; this will be determined on a case by case basis, depending on the most current information about human to human transmission. Contact tracing and monitoring will require substantial data-management resources. The information technology needs for timely surveillance and management of contacts of novel influenza cases are under discussion among CDC and partners in state and local health departments. ACDP will coordinate database management needs among local health departments and CDC.

C. Environmental Evaluation

For those with wild or domestic poultry, or swine exposure, discuss with ACDP epidemiology regarding environmental investigation.

5. CONTROLLING FURTHER SPREAD

Vaccine is not likely to be available for novel strains (the exception is H5N1 vaccine); however, antiviral agents may be used for prophylaxis, depending on the susceptibility of the virus. Novel influenza A (H7N9) is susceptible to neuraminidase inhibitors, such as oseltamivir and zanamivir. Interim guidance is available from CDC on antiviral use: http://www.cdc.gov/flu/avianflu/h7n9-antiviral-treatment.htm. In the absence of a vaccine, prevention efforts should focus on both **isolation of cases and targeted antiviral prophylaxis of exposed individuals.** Interim infection control procedures recommended by CDC for influenza A (H7N9) infection are available at http://www.cdc.gov/flu/avianflu/h7n9-infection-control.htm . Recommendations may change, depending on the circumstances.

The primary methods of minimizing further spread regardless of setting include

- Isolation of patients during the contagious period;
- Use of personal protective equipment and hand hygiene by those caring for patient
- For suspected novel influenza maximal precautions are recommended for hospitalized patients including gown, glove, N-95 or better mask, eye protection, and single, negative pressure room;
- Proper disposal of waste and soiled articles;
- Monitoring of exposed individuals for development of fever or respiratory symptoms and possible voluntary quarantine;
- Targeted antiviral prophylaxis of exposed individuals to be individualized on a case by case basis.

6. MANAGING SPECIAL SITUATIONS

1. Isolation and Quarantine

In April 2005, novel influenza joined cholera, plague, tuberculosis, diphtheria, yellow fever, viral hemorrhagic fever, SARS and smallpox as Federally "quarantinable communicable diseases" (http://www.whitehouse.gov/news/releases/2005/04/20050401-6.html). The complicated topic of quarantine at the federal level is addressed at the following CDC website. (http://www.cdc.gov/sars/quarantine/index.html). Federal authorities however generally delegate such powers to State and Local Health Officials. The applicable Oregon Revised Statute is in Chapter 433 (http://www.leg.state.or.us/ors/433.html) and includes powers to quarantine individuals, detain conveyances, and designate quarantine hospitals.

2. Hospital preparedness and surge capacity

This topic is addressed in the document accessible at http://www.cdc.gov/sars/guidance/C-healthcare/index.html . The key activities described include the following:

- Organize a planning committee to develop an institutional preparedness and response plan and a clear decision-making structure.
- Develop surveillance, screening, and evaluation strategies for various levels of novel influenza transmission.
- Develop plans to rapidly implement effective infection control measures and contact-tracing procedures.
- Determine the current availability of infrastructure and resources to care for novel influenza patients and strategies for meeting increasing demands.
- Develop strategies to meet staffing needs for novel influenza patient care and management.
- Develop strategies to communicate with staff, patients, the health department, and the public.
- Develop strategies to educate staff and patients about novel influenza and related control measures.

7. ENHANCED SURVEILLANCE FOR NOVEL INFLUENZA

Enhanced surveillance to identify the onset of a possible pandemic will include targeted specific testing of individual patients as well as syndromic and population-based surveillance for acute respiratory illness. Routine surveillance detailed in the 2006 Oregon Pandemic Influenza plan (http://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/DiseaseSurveillanceData/Influenza/Documents/panfluplan.pdf)will continue.

A. Targeted testing of individuals

1. Travelers

Novel influenza, including a pandemic strain, will ultimately arrive in Oregon via an overtly ill individual, an ill person with minor symptoms, or via an exposed person incubating illness. Since most people arrive in Oregon by interstate highway or air, there are relatively few points at which most vectors of a novel strain of influenza will first enter the state including, but not limited to:

- Interstate 5 (Washington border, California border)
- Interstate 84 (Idaho border)
- Interstate 82 (Washington border)
- Portland International Airport
- Eugene Airport

At airports, local health officials will coordinate distribution of informational flyers and posting of information to include:

- Overview of the situation
- Request to seek care if fever or respiratory symptoms develop
- Instructions to bring information sheet to clinician
- Instructions for clinicians on up-to-date criteria and instructions for testing

The informational flyers will be developed by ACDP and distributed to local health authorities via the Health Alert Network plus other redundant channels including web-posting and email.

2. Ill seeking Care from Clinicians

Should novel influenza begin to spread among humans, the state Acute and Communicable Disease Prevention Program will distribute up-to-date case definitions and testing criteria to Oregon clinicians by blast fax, email, web-posting, and dissemination via professional organizations, hospitals, health systems, and large clinics. Specimens will be tested by the Oregon State Public Health Laboratory by PCR using the Laboratory Response Network recommendations.

3. Healthcare workers

Health care workers may be exposed to individuals ill with a new strain of influenza and, during pandemic stages 2–5, acute respiratory illness among these workers should be evaluated and testing done as above if criteria are met. Clinicians will be informed via the mechanisms listed above to inquire about employment status when evaluating the acutely ill.

4. Contacts of suspected or proven cases

Close contacts of those suspected or proven to be infected with the novel strain of influenza may be at high risk of acquiring the same disease and should be tested during pandemic stages 2–5. These individuals may be identified through contact tracing of early cases or by interview by the treating clinician.

B. Syndromic and Population based surveillance

1. Population-based surveillance

Our existing population-based acute respiratory illness surveillance consists of

- ILINet—a collaboration of ACDP and approximately 20 community-based primary care providers that report influenza-like illness (ILI) and submit specimens to OSPHL for influenza testing (PCR).
- Influenza-associated hospitalization surveillance in Clackamas, Multnomah, and Washington counties (Portland metro area), as part of the CDC Emerging Infections Program (EIP).
- Laboratory surveillance bases on specimens submitted to OSPHL from ILINet. Metro county hospitalizations, and respiratory outbreaks.
- ACDP receives discharge diagnosis codes and reason-for-visit data from OCHIN, inc., a collaborative comprising 22 member organizations of federally qualified health centers (FQHCs) and rural health centers in Oregon. About 103 clinics are represented. OCHIN data are about 1 week behind ILINet data.
- ESSENCE (Electronic Surveillance System for the Early Notification of Community-based Epidemics) is currently under development in Oregon, and will serve as a

statewide, all-hazards biosurveillance system that tracks hospital emergency department visits, and identifies aberrations in the volume of visits based on broad syndrome categories (e.g. influenza-like illness).

UPDATE LOG

May 2013: Due to influenza A (H7N9), the guidelines were changed to reflect the current situation regarding an emerging novel influenza strain (older versions were focused on H5N1). The case definitions are current for H7N9 as of May, 2013. Antiviral treatment section updated and linked to current H7N9 treatment and prophylaxis recommendations. Enhanced surveillance section updated to include current surveillance influenza and ILI surveillance systems. (Matt Laidler)