

# HEALTHCARE WORKERS HANDBOOK

## ON

# INFLUENZA

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**Developed by:**  
**The National Institute for Communicable Diseases (NICD)**  
**a division of the National Health Laboratory Service (NHLS),**

**in collaboration with:**

**The South African National Department of Health**  
**and World Health Organization (WHO)**



**DEPARTMENT OF HEALTH**  
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## **Prefix and Disclaimer**

This advice is based on currently available information regarding human infections caused by seasonal influenza viruses. Recommendations are based predominantly on current World Health Organization (WHO) and United States of America Centers for Disease Control and Prevention (CDC) guidelines.

This material is intended for use by healthcare professionals. While the greatest care has been taken in the development of the document, the National Department of Health and the National Institute for Communicable Diseases of the National Health Laboratory Service do not accept responsibility for any errors or omissions. All healthcare professionals should exercise their own professional judgement in confirming and interpreting the recommendations presented in the handbook.

## **Acknowledgements**

- Previous 'Influenza Guidelines for South Africa' issued by the South African Thoracic Society in conjunction with interested stakeholders (published in 1999, revised and published in 2008).
- Expert specialists, including physicians, paediatricians and neonatologists, who provided valuable input in the drafting of these guidelines.

# **1 Background on influenza**

## ***1.1 What is influenza?***

Influenza, commonly known as the "flu", is an acute viral infection of the respiratory tract caused by influenza virus. There are three types of seasonal influenza viruses – A, B and C. Influenza A viruses are further categorized into subtypes. The 2009 pandemic influenza A(H1N1) virus (hereafter referred to as A(H1N1)pdm09) which appeared for the first time in 2009 causing a global influenza pandemic, is now a seasonal influenza virus that co-circulates with other seasonal viruses (namely influenza A(H3N2) and influenza B viruses). Influenza viruses are dynamic and evolve in unpredictable ways. Influenza viruses are further classified into strains based upon antigenic properties. Humoral immunity to influenza viruses is generally thought to be strain-specific and acquired through infection or vaccination. Seasonal influenza epidemics can be caused by new virus strains that are antigenically distinct from previously circulating virus strains to which a population has immunity.

Influenza viruses can cause disease in persons of any age, but overall rates of illness are highest in children. Usually, rates of severe illness and death are highest in persons aged  $\geq 65$  years; children aged  $\leq 2$  years, women who are pregnant or postpartum (within 2 weeks after delivery) and persons of any age with underlying medical conditions (risk factors) which increase the risk for influenza-related complications. It is estimated that approximately 45-60 000 individuals are hospitalised with influenza-associated severe acute respiratory illness and 6300-12700 die in South Africa each year.

## ***1.2 Transmission***

The virus is spread from person-to-person. It can be passed to other people by exposure to infected droplets expelled by coughing or sneezing that can be inhaled, or that can contaminate hands or surfaces.

The incubation period for influenza is 1-4 days (average 2 days). Most persons ill with influenza shed virus (i.e. may be infectious) from a few days before symptoms begin through 5 – 7 days after illness onset. However, very young children can be infectious for >10 days after illness onset; adults with severe disease (e.g. viral pneumonia) may also shed virus for >10 days, and severely immunocompromised persons can shed virus for weeks to months.

# **2 Recommendations for influenza vaccination for South Africa**

## ***2.1 Timing of the influenza season and vaccination***

The South African influenza season falls in the winter months. The average onset of the influenza season over the past 28 years has been the first week of June. However, the season has started as early as the last week of April and as late as the first week of July. Regular surveillance reports on current influenza activity in South Africa are available via the NICD website

([www.nicd.ac.za](http://www.nicd.ac.za)). Influenza vaccines should be given sufficiently early to provide protection for the winter season. A protective antibody response generally takes about 2 weeks to develop following vaccination.

## **2.2 Circulating influenza types and influenza A virus subtypes in 2013**

Seasonal influenza occurs annually, usually with co-circulation of influenza A and B viruses. The influenza season of 2013 was predominated by influenza A (H1N1)pdm09 with circulation of influenza A(H3N2) and influenza B increasing towards the end of the season. It is difficult to predict which type or subtype/s or strain/s will predominate in the 2014 influenza season.

## **2.3 Influenza vaccine strains and vaccination recommendations for 2014**

Vaccination with the trivalent influenza vaccine (TIV) is recommended, where applicable. The formulation for the trivalent vaccine as recommended by the World Health Organization for the 2014 southern hemisphere influenza season is:

- an A/California/7/2009 (H1N1)pdm09-like virus<sup>a</sup>
- an A/Texas/50/2012 (H3N2)-like virus<sup>b</sup>
- a B/Massachusetts/2/2012-like virus.

<sup>a</sup> A/Christchurch/16/2010 is an A/California/7/2009-like virus.

<sup>b</sup> A/Texas/50/2012 is an A(H3N2) virus that following adaptation to growth in eggs has maintained antigenic properties similar to the majority of recently circulating cell-propagated A(H3N2) viruses including A/Victoria/361/2011.

Recommendations available at:

[http://www.who.int/influenza/vaccines/virus/recommendations/201309\\_recommendation.pdf?ua=1](http://www.who.int/influenza/vaccines/virus/recommendations/201309_recommendation.pdf?ua=1)

The TIV is available in both the public sector (at designated clinics and hospitals) and the private sector (at pharmacies, certain healthcare facilities, etc).

“Recommendations pertaining to the use of viral vaccines: Influenza 2014” has been published in the March 2014 edition of the South African Medical Journal (access at <http://www.samj.org.za/index.php/samj/article/view/8010/5832>)

Persons to whom influenza vaccines should be administered:

1. Pregnant women (irrespective of stage of pregnancy)
2. Persons (adults/children) at high risk for influenza and its complications due to underlying medical conditions and who are receiving regular medical care for conditions such as chronic pulmonary and cardiac diseases, chronic renal disease, diabetes mellitus and similar metabolic disorders, individuals who are immunosuppressed (incl. HIV-infected persons with CD4 counts >100 cells/ $\mu$ l) and individuals who are morbidly obese (BMI  $\geq$ 40 kg/m<sup>2</sup>). Residents of old-age homes, chronic care and rehabilitation institutions
3. Children and adolescents on long-term aspirin therapy
4. Medical and nursing staff in contact with high-risk cases
5. Adults and children who are family contacts of high-risk cases
6. All persons over the age of 65 years
7. Any persons wishing to protect themselves from the risk of contracting influenza, especially in industrial settings where large-scale absenteeism could cause significant economic losses.

The National Department of Health recommends that individuals at higher risk for severe disease be vaccinated against influenza. Influenza vaccines are available in the public health sector targeting groups at higher risk for severe disease, which include:

1. Pregnant women – irrespective of stage of pregnancy.
2. Persons (adults or children) who are at high risk for influenza-related complications because of underlying medical conditions for which they are receiving regular medical care. There is a focus on vaccination of HIV infected persons. Other high-risk conditions include chronic pulmonary (including asthma and tuberculosis) or cardiovascular disease (except hypertension), chronic renal disease, hepatic, haematologic, diabetes mellitus and similar metabolic disorders, individuals who are immunosuppressed, and individuals who are morbidly obese (BMI  $\geq$ 40).
3. Children aged 6 months to less than 5 years (59 months).
4. Persons aged  $\geq$ 65 years.
5. Residents of old-age (nursing) homes and other chronic care or rehabilitation facilities.
6. Children aged 6 months to 18 years on long-term aspirin therapy.

The TIV is an inactivated vaccine, and has a well-established safety record. It is safe for use in pregnancy and in children  $\geq 6$  months of age. Contraindications to the administration of TIV include:

- Persons with a history of anaphylaxis (severe allergic/hypersensitive reactions) following receipt of any vaccine component including eggs
- Persons with a history of severe reaction to previous influenza vaccination
- Children <6 months of age.

Precautions to TIV administration include:

- Persons with moderate to severe illness with or without fever should preferably be immunised after symptoms have resolved
- Person who developed Guillian- Barrè syndrome within 6 weeks of receiving an influenza vaccine.

### 2.3.1 Effectiveness of influenza vaccine

Influenza vaccine effectiveness depends on characteristics of person being vaccinated (age and health) and on whether there is a good match between the circulating viruses and the viruses contained in the vaccine. In general influenza vaccines work best among children older than 2 years and healthy adults. Older people, children <2 years and individuals with severe immunocompromise often have lower protective immune response to TIV compared to younger healthy adults. However, even for these people influenza vaccine still provides some protection. Vaccination of healthcare workers also may decrease the risk of spreading influenza to their patients especially those identified as having an increased risk of severe influenza. Recent influenza vaccination does not preclude a diagnosis of influenza as the vaccine is not 100% effective.

### 2.3.2 Influenza vaccine dosage and administration

The TIV should be administered intramuscularly (IM) as follows:

- Adults and children 6 years and above: Injection into the upper arm (Deltoid)
- Children aged 1 year to <6 years: Injection into the LEFT upper arm
- Infants aged 6 – 11 months: Injection into the LEFT antero-lateral thigh

NB: According to Department of Health recommendations, for children <6 years 13-valent pneumococcal conjugate vaccine (PCV-13) will be administered into the RIGHT arm.

The recommended dosage of influenza vaccine for patients of different age groups is described in table 1.

**Table1: Recommended dosage of influenza vaccine for patients of different age groups**

Age Group	Dose	Number of doses
Adults and children 9 years of age and older	Adult dose (0,5ml) IMI	Single dose
Children 3 years through 8 years	Adult dose (0,5ml) IMI	1 or 2 doses*
Children 6 months through 2 years	0.25ml (half an adult dose) IMI	1 or 2 doses*

\*Children aged 6 months through 8 years of age receiving the vaccine for the first time should receive 2 doses administered 4 weeks apart. Children aged 6 months through 8 years need only 1 dose of vaccine in 2014 if they received a total of 2 or more doses of seasonal vaccine since March 1, 2010. Children who did not receive a total of 2 or more doses of seasonal vaccine since March 1, 2010, require 2 doses in 2014.

- **Note:** Influenza vaccine is not recommended for infants less than 6 months of age

## 3 Clinical presentation and spectrum of illness

Infection due to influenza virus can give rise to a wide range of clinical presentations ranging from asymptomatic infection to severe illness and death. In the majority of people influenza is an uncomplicated illness which is characterised by sudden onset of constitutional and respiratory symptoms such as fever, myalgia, cough, sore throat, rhinitis and headache. However, atypical presentations can occur. In some cases there may be gastrointestinal symptoms (nausea, vomiting and/or

diarrhoea); these are more common in children than adults. Among young children, moderate complications such as otitis media have been reported commonly with influenza illness. Uncomplicated influenza illness resolves after 3-7 days in most persons, although cough and malaise can persist for >2 weeks.

Influenza may be associated with more severe complications which include: viral pneumonia, secondary bacterial or viral infections (including pneumonia, sinusitis and otitis media), multi-organ failure, and exacerbations of underlying illnesses (e.g. pulmonary and cardiac illness). Rare complications include encephalopathy, myocarditis, transverse myelitis, pericarditis and Reyes syndrome.

For purposes of clinical management the influenza disease can be categorised as follows:

- **Uncomplicated influenza:** ILI (Influenza-like Illness) Influenza presenting with fever, coryza, generalised symptoms (headache, malaise, myalgia, arthralgia) and sometimes gastrointestinal symptoms, but without any features of complicated influenza.
- **Complicated/severe influenza:** Influenza requiring hospital admission and/or with symptoms and signs of lower respiratory tract infection (hypoxaemia, dyspnoea, lung infiltrate), central nervous system involvement and/or a significant exacerbation of an underlying medical condition

### **3.1 Risk factors for complicated/severe influenza**

Certain groups of patients with influenza virus infection are at higher risk of developing severe or complicated disease. However, it should be borne in mind that influenza virus infection in any patient can result in severe/complicated illness. There are no early predictors of progression to severe disease. Persistent vomiting, high fever and progressive dyspnoea should alert the physician to this possibility. Patients may deteriorate rapidly.

Risk groups for severe/complicated influenza disease include:

- Infants and young children (particularly <2 years of age)
- Pregnant women (including the first two weeks of the post-partum period)..
- Persons of any age with chronic diseases, including:
  - Pulmonary diseases (e.g. asthma, COPD, tuberculosis)
  - Cardiac diseases, except for hypertension (e.g. congestive cardiac failure)
  - Metabolic disorders (e.g. diabetes)
  - Renal disease
  - Hepatic disease
  - Certain neurologic and neurodevelopmental conditions, including: disorders of the brain, spinal cord, peripheral nerve, and muscle such as cerebral palsy; epilepsy (seizure disorders); stroke; mental retardation; moderate to severe developmental delay; muscular dystrophy; or spinal cord injury.
  - Haemoglobinopathies (e.g. sickle cell disease)
  - Immunosuppression (e.g. HIV, persons on immunosuppressive medication, malignancy)
- Persons ≤18 years receiving chronic aspirin therapy
- Persons aged ≥65 years
- Persons who are morbidly obese (i.e. BMI ≥40).

### **3.2 Influenza in pregnancy and influenza vaccination**

During the influenza season, pregnant women (at all stages including 2 weeks postpartum, and especially those with co-morbidities) are at increased risk for severe or complicated influenza which may be rapidly progressive. Pregnancy related changes to the heart, lungs and immune system predisposes the pregnant woman to more severe influenza disease, leading to increased risk of hospitalisation and severe outcomes including death. In addition influenza has implications for the outcome of pregnancy and the baby and may lead to spontaneous abortion, preterm birth and foetal distress. Infants are also at increased risk of developing influenza associated complications.

Influenza vaccination during pregnancy has been shown to protect both the mother and her baby (up to 6 months old) against influenza. Influenza vaccination is safe in pregnancy and influenza vaccines have been administered to millions of pregnant women over many years and have not been shown to cause harm to pregnant women or their babies.

## 4 Clinical management and considerations for treatment

Influenza must be considered as an important potential cause of community acquired pneumonia (CAP) in all patients during the influenza season and consideration must be given to including oseltamivir as empiric treatment where indicated. Note that because influenza vaccination is not 100% effective in preventing influenza, a history of influenza vaccination does not exclude the possibility of influenza virus infection in patients with clinical features compatible with influenza. Administration of corticosteroids is associated with prolonged influenza virus shedding (e.g. COPD, asthma).

Not all patients with influenza require treatment and initiation of treatment should be based on clinical judgment taking into consideration patient's disease severity and progression, age, underlying medical conditions, likelihood of influenza, and time since onset of symptoms. When indicated, antiviral treatment should be started as early as possible, ideally within 48 hours, and should not be delayed by waiting for laboratory confirmation of influenza. However, antiviral treatment might still be beneficial in patients with severe, complicated or progressive illness, and in hospitalized patients when started after 48 hours of illness onset.

Antiviral therapy is recommended as early as possible for any patient with confirmed or suspected influenza who

- has complicated or severe illness (including all hospitalised patients)
- is at higher risk for influenza complications (see section 3.1)

### 4.1 Antiviral therapy

Antiviral medications with activity against influenza viruses are an important adjunct to influenza vaccine in the control of influenza. Observational studies suggest that antiviral therapy reduces the risk of hospitalisation and death but this has not been demonstrated in clinical trials. Antiviral treatment is not indicated for treatment of influenza in persons who do not fall in the risk groups for severe influenza-associated disease who present with uncomplicated influenza. It is important to note that Randomised controlled trials (RCTs) of antivirals in outpatients with mild disease do not inform clinical practice of patients with severe influenza or at increased risk of complications of influenza. There are no placebo controlled RCTs evaluating neuraminidase inhibitor treatment for hospitalised influenza patients. However, many observational studies of seasonal and pandemic influenza have consistently found that neuraminidase inhibitor treatment of influenza in hospitalised patients is associated with reduced severe outcomes, including intensive care unit admission and death, especially when treatment is started within two days of illness onset. For this reason the South African guidelines continue to recommend the use of neuraminidase inhibitors for the treatment of patients confirmed or suspected influenza who have complicated or severe influenza or are at higher risk for influenza complications.

#### 4.1.1 Neuraminidase Inhibitors

Oral oseltamivir (Tamiflu®) and inhaled zanamivir (Relenza®) are chemically related antiviral medications known as neuraminidase inhibitors that have activity against both influenza A and B viruses. These two influenza antiviral medications are recommended for use during the 2014 influenza season.

#### 4.1.2 Adamantanes

Amantadine and rimantadine are antiviral drugs in a class of medications known as adamantanes. These medications are active against influenza A viruses, but not influenza B viruses. These are not recommended for use due to high levels of resistance.

### 4.2 Antiviral resistance

Antiviral resistance to oseltamivir and zanamivir among circulating viruses is low, <1%. However antiviral resistance can emerge during or after treatment in certain patients (e.g., immunosuppressed). In contrast there is a high prevalence (>99%) of influenza A(H3N2) and influenza A(H1N1)pdm09 viruses resistant to adamantanes. Therefore, these are not recommended for antiviral treatment or chemoprophylaxis of currently circulating influenza A viruses. Continuous monitoring of the epidemiology, change in severity and resistance patterns of influenza strains may lead to change in guidance

### 4.3 Antiviral medications recommended for treatment

Table 2: Recommended Dosage and Duration of Influenza Antiviral Medications for Treatment

Antiviral Agent	Use	Children	Adults
<b>Oseltamivir (Tamiflu®)</b>	<b>Treatment (5 days)</b>	<p><b>&lt; 1 yr old</b><sup>1</sup>:3 mg/kg/dose twice daily<sup>2,3,4</sup></p> <p>Premature neonates (&lt;38 weeks): 1mg/kg twice a day</p> <p>38- 40 weeks:1.5 mg/kg twice a day</p> <p>0-12 months :3mg/kg twice a day</p> <p><b>If ≥1 year, dose varies by child's weight:</b>≤15 kg, the dose is 30 mg <b>twice</b> a day &gt;15 to 23 kg, the dose is 45 mg <b>twice</b> a day &gt; 23 to 40 kg, the dose is 60 mg <b>twice</b> a day &gt;40 kg, the dose is 75 mg <b>twice</b> a day</p>	75 mg <b>twice</b> daily
<b>Zanamivir<sup>4</sup> (Relenza®)</b>	<b>Treatment (5 days)</b>	10 mg (2 5-mg inhalations) <b>twice</b> daily (FDA approved and recommended for use in children 7 yrs or older) <sup>5</sup>	10 mg (2 5-mg inhalations) <b>twice</b> daily

Sources: Centre for Disease Control and Prevention. Antiviral agents for the treatment and chemoprophylaxis of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP).

1. Although Oseltamivir is not recommended by the manufactures for children < 1 years old it may be needed in very young children as they may develop severe illness which may be life threatening.

2 Oral oseltamivir is approved by the FDA for treatment of acute uncomplicated influenza with twice-daily dosing in persons 14 days and older, and for chemoprophylaxis with once-daily dosing in persons 1 year and older. Although not part of the FDA-approved indications, use of oral oseltamivir for treatment of influenza in infants less than 14 days old, and for chemoprophylaxis in infants 3 months to 1 year of age, is recommended by the CDC and the American Academy of Pediatrics (Committee on Infectious Diseases, 2013).

3 This is the FDA-approved oral oseltamivir treatment dose for infants 14 days and older and less than 1 year old, and provides oseltamivir exposure in children similar to that achieved by the approved dose of 75 mg orally twice daily for adults.

4 Current weight-based dosing recommendations are not appropriate for premature infants. Premature infants might have slower clearance of oral oseltamivir because of immature renal function, and doses recommended for full-term infants might lead to very high drug concentrations in this age group. Limited data from the National Institute of Allergy and Infectious Diseases Collaborative Antiviral Study Group provide the basis for dosing preterm infants using their postmenstrual age (gestational age + chronological age).

5 Inhaled zanamivir is approved for treatment of acute uncomplicated influenza with twice-daily dosing in persons aged 7 years and older, and for chemoprophylaxis with once-daily dosing in persons aged 5 years and older.

#### 4.3.1 Oral Oseltamivir

- Doses for treatment are summarised in table 2. Standard adult dose and duration: 75mg twice daily orally for 5 days
- Higher doses of oseltamivir (150 mg twice daily orally in adults with normal renal function) and longer duration of treatment may be appropriate (particularly in critically ill patients and immunocompromised patients), although there is no clinical trial evidence confirming benefit. However, oral or enterically administered oseltamivir has been reported to be adequately absorbed in critically ill adults, with standard doses producing therapeutic blood levels;

and limited data suggests that higher dosing may not provide additional clinical benefit. Limited data suggest that oseltamivir administered orally or by oro/naso gastric tube is well absorbed in critically ill influenza patients, including those in the intensive care unit, on continuous renal replacement therapy, and/or on extracorporeal membrane oxygenation. Clinical judgement should guide decision to prolong duration of treatment in patients with severe and prolonged illness.

- For patients unable to swallow capsules, methods for preparation of an oral suspension are described in instructions from manufacturers (refer to package insert). Where suitable suspending agents or diluents containing preservatives are not available, capsules can be opened and mixed with a measured volume of water (e.g. one teaspoon) immediately before administration. Such suspensions may be administered via nasogastric/orogastric tubes in mechanically ventilated patients. (Reference: Public Health England; Summary of prescribing guidance for the treatment and prophylaxis of influenza-like illness. 18 December 2009. Access at [http://www.hpa.org.uk/web/HPAwebFile/HPAweb\\_C/1243581475043](http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1243581475043)).
- Renal impairment requires a dose adjustment based on creatinine clearance as outlined in table below:

**Table 3: Recommended doses of oseltamivir based glomerular filtration rate**

Glomerular filtration rate (ml/min)*	Recommended dose of oseltamivir treatment
>30	75 mg twice daily
> 10 to 30	75 mg once daily
10	Seek specialist advice
Dialysis patients	Seek specialist advice

#### 4.3.2 Considerations for treatment with oseltamivir:

- Lower doses should be considered for infants who are not receiving regular oral feedings and/or those who have a concomitant medical condition which is expected to reduce renal function significantly.
- Capsule contents can be added to a sweet liquid / soft food immediately before administration to disguise bitter taste; syrup, condensed milk, yoghurt, sugar dissolved in water, or other sweet liquids/foods may be used. Open capsule/s and pour contents into a small amount of the liquid/food (one teaspoon maximum). Stir the mixture and ensure that the entire mixture is given to the patient. The mixture must be given immediately after its preparation. (Reference: Public Health England; Summary of prescribing guidance for the treatment and prophylaxis of influenza-like illness. 18 December 2009. Access at [http://www.hpa.org.uk/web/HPAwebFile/HPAweb\\_C/1243581475043](http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1243581475043)), and Centre for Diseases Control and Prevention; Opening and Mixing Tamiflu® Capsules with Liquids if Child Cannot Swallow Capsules accessed at [http://www.cdc.gov/flu/antivirals/mixing\\_tamiflu\\_qa.htm](http://www.cdc.gov/flu/antivirals/mixing_tamiflu_qa.htm)
- Methods for preparation of an oral suspension using capsules are described in instructions from manufacturers (refer to package insert) and can be accessed at [http://www.tamiflu.com/hcp/resources/hcp\\_resources\\_pharmacists.jsp](http://www.tamiflu.com/hcp/resources/hcp_resources_pharmacists.jsp). Where suitable suspending agents or diluents containing preservatives are not available, capsules can be opened and mixed with a measured volume of water (e.g. one teaspoon) immediately before administration.
- Adverse effects: nausea, vomiting, abdominal pain, diarrhoea, headache and conjunctivitis are the most commonly reported. Rash is uncommon. Other adverse effects that have been reported include: hepatitis, arrhythmias, neuropsychiatric disorders (in children and adolescents), visual disturbances, Stevens-Johnson syndrome and toxic epidermal necrolysis.

#### 4.3.3 Inhaled zanamivir

- Treatment with inhaled zanamivir is indicated in patients where oseltamivir-resistant influenza is demonstrated or highly suspected.
- Standard dose and duration: two inhalations (i.e. 2 x 5mg) twice daily for 5 days
- Zanamivir contains lactose (powder for inhalation) and must NOT be administered by a nebuliser. It may also interfere with ventilator functioning in ventilated patients.

- Adverse effects are very rare and include: bronchospasm, respiratory impairment, angioedema, urticaria, and rash. Neuropsychiatric disorders have also been reported (especially in children and adolescents). Zanamivir is not recommended for people with chronic respiratory disease such as asthma or chronic obstructive pulmonary disease, which increase the risk of bronchospasm.

#### 4.3.4 Considerations for treatment with zanamivir:

- Treatment with zanamivir is indicated in patients where oseltamivir-resistant influenza is demonstrated or highly suspected.
- Zanamivir is only indicated for use in persons aged  $\geq 5$  years.
- Standard dose and duration: two inhalations (i.e. 2 x 5mg) twice daily for 5 days
- Zanamivir contains lactose (powder for inhalation) and must NOT be administered by a nebuliser. It may also interfere with ventilator functioning in ventilated patients.

### 4.4 Additional comments on management

#### 4.4.1 Severely ill patients

- Antiviral therapy
  - Oseltamivir therapy should be started immediately upon admission. Treatment decisions should be based on clinical presentation and should NOT be delayed pending laboratory confirmation of influenza. Higher doses for prolonged duration may be of benefit but optimal doses and duration are uncertain. Decisions on whether to increase duration of treatment and / dose should be based on the clinical assessment and presentation, for example critically ill patients with respiratory failure or immunosuppressed patients may have prolonged viral replication.
  - Dose adjustment according to creatinine clearance is necessary for patients with renal impairment.
- Other issues regarding critical care management of patients with influenza are beyond the scope of this document. A comprehensive review appears in the journal *Critical Care Medicine* 2010 Vol. 38, No. 4(Suppl.) pp e1-e142: H1N1 Novel Influenza: Pandemic Issues for Critical Care Practitioners. Free access is available online at: <http://journals.lww.com/ccmjjournal/toc/2010/04001>

#### 4.4.2 Pregnant patients

- Pregnant women (at all stages including 2 weeks postpartum, and especially those with co-morbidities) are at increased risk for severe or complicated influenza which may be rapidly progressive. Influenza in pregnancy carries an increased risk of adverse pregnancy outcomes, including spontaneous abortion, preterm birth and foetal distress. Consequently, pregnant women with suspected/confirmed influenza warrant closer observation and early antiviral therapy. Treatment decisions should be based on clinical presentation and should NOT be delayed pending laboratory confirmation of influenza.
- Paracetamol is recommended for pain and fever. Salicylates and NSAIDs are contraindicated in pregnancy.
- There is currently no safety data on the use of higher doses of oseltamivir (>75 mg bd) in pregnancy.

#### 4.4.3 Children

- Symptoms may be non-specific, therefore clinicians need to maintain a high index of suspicion. Gastrointestinal symptoms (nausea, vomiting and/or diarrhoea) are more common in children than adults, and otitis media has been reported commonly with influenza illness in children.
- Influenza-associated encephalopathy (IAE) is an uncommon but serious complication with high mortality and neurological sequelae, occurring most often in children younger than 5 years. It has been increasingly recognised worldwide in association with influenza A (both H3N2 and H1N1) as well as influenza B virus infections. IAE is a rapidly progressive encephalopathy that usually presents within a few days of onset of typical influenza symptoms, and can manifest with diverse clinical symptoms including: seizures, altered/loss of consciousness, decreased cognitive processing including speech, motor paralysis (mimicking Guillain-Barré syndrome) or sensory loss, abnormal or delirious behaviour, and focal neurological syndromes. CSF findings are usually normal, and

neuroimaging may be normal or abnormal (diffuse abnormalities or focal white matter lesions). The diagnosis of IAE rests on confirmation of influenza virus infection in the absence of other causes of encephalopathy/encephalitis.

Clinical management is generally supportive care. IAE may be accompanied by pneumonia.

- Paracetamol is recommended for pain and fever. No salicylates should be given to children, since there is an increased risk of Reye syndrome with influenza and salicylates in younger children.
- Consider early antibiotic treatment for secondary bacterial infection.
- Lower doses of oseltamivir should be considered for infants who are not receiving regular oral feedings and/or those who have a concomitant medical condition which is expected to reduce renal function significantly.
- Routine childhood vaccination schedule must be kept up to date. Secondary bacterial pneumonia is an important cause of morbidity and death in influenza, and *Streptococcus pneumoniae* is one of the leading causes of secondary bacterial pneumonia. All children aged less than 2 years should be vaccinated with the pneumococcal conjugate vaccine (PCV-13) if not previously done.
- Infant feeding and maternal separation: infants can stay with their mothers and should breastfeed if both are well enough and there are no other contraindications to breastfeeding. If a non-infectious carer is available to administer expressed breast milk to the infant for 7 days then that may be preferable, but is not always feasible. If the mother or infant is too ill to breastfeed, separate the infant from mother but continue to give expressed breast milk if it is available.
- Treatment of neonates and preterm infants should be done in consultation with a specialist in the field.
- Infants born to mothers with influenza DO NOT require antiviral therapy unless the infant has an influenza-compatible illness and requires hospitalisation.

#### **4.4.4 Patients with persistent severe or progressive disease despite appropriate antiviral treatment**

Patients who have laboratory-confirmed influenza where the clinical course remains severe or progressive despite  $\geq 5$  days of appropriate antiviral therapy (correct drug given at the correct dose etc.) should be investigated for the following:

- Bacterial secondary infections (particularly with *S. pneumoniae*, *S. aureus* and *S. pyogenes*) and nosocomial infections or underlying tuberculosis
- Presence of influenza-related complications (e.g. CNS involvement, myocarditis, rhabdomyolysis)
- Complications such as atelectasis or fluid overload
- Ongoing viral replication (as evidenced by laboratory tests): liaise with infectious diseases specialists/virologists regarding appropriate specialised testing. This may indicate infection with oseltamivir-resistant virus. Zanamivir is the treatment of choice for all patients where oseltamivir-resistance is demonstrated or highly suspected.

### **4.5 Chemoprophylaxis of influenza**

Annual influenza vaccination is the best way to prevent influenza because vaccination can be given well before influenza virus exposures occur, and can provide safe and effective immunity throughout the influenza season. Antiviral chemoprophylaxis is currently NOT recommended by the WHO. The WHO recommendations advise that post-exposure presumptive antiviral treatment may be of benefit in some higher risk situations, such as transplant patients, or patients with severe immunosuppression (e.g. those receiving chemotherapy). If such higher risk individuals have been exposed to a patient with influenza, strongly consider presumptive treatment with oseltamivir or zanamivir (dose and duration as per treatment recommendations in section 4.3 above). In other situations, caregivers are advised to monitor exposed, high-risk patients for early signs and symptoms of acute respiratory infection and ILI and to start antiviral treatment promptly (dose and duration as per treatment recommendations in 4.3 above).

In contrast to these recommendations, recent influenza management guidelines issued by the Public Health England (PHE) for use in the United Kingdom, and by the Advisory Committee on Immunization Practices (ACIP) for use in the United States have made provision for the use of oseltamivir/zanamivir as chemoprophylaxis in certain outbreak settings and under certain conditions. However these two sets of guidelines differ as to the intended target groups. Common to both sets of guidelines is the major proviso that chemoprophylaxis must be given within 48 hours of last contact with a person ill with influenza in order to be effective, in addition to other control interventions.

Although CDC does not recommend widespread or routine use of antiviral medications for chemoprophylaxis they do recommend antiviral chemoprophylaxis to control outbreaks among high risk persons in institutional settings and in addition advise that prophylaxis can be considered under the following situations:

- Prevention of influenza in persons at high risk of influenza complications during the first two weeks following vaccination after exposure to an infectious person
- Prevention for people with severe immune deficiencies or others who might not respond to influenza vaccination, such as persons receiving immunosuppressive medications, after exposure to an infectious person
- Prevention for people at high risk for complications from influenza who cannot receive influenza vaccine due to a contraindication after exposure to an infectious person
- Prevention of influenza among residents of institutions, such as long-term care facilities, during influenza outbreaks in the institution.

The PHE recommends antiviral chemoprophylaxis for patients at high risk of complicated influenza and severely immunocompromised patients.

It is therefore advised to follow the WHO guidelines in this regard, and to seek specialist advice when indicated.

## 4.6 Other interventions for management

- **Oxygen therapy:** Monitor Oxygen saturation and maintain SaO<sub>2</sub> >90% (92-95% for pregnant women) with nasal cannulae or face mask. High flow oxygen may be required in severe cases.
- **Antibiotics:** In cases of pneumonia, early empiric treatment for community-acquired pneumonia is advised. Since there is an increased risk of secondary infection with *S. pneumoniae*, *S. aureus* and *S.pyogenes*, co-amoxiclav is a suitable empiric antibiotic. Submit appropriate specimens for microscopy culture & sensitivity (MC&S) to laboratory, and tailor antibiotic/s accordingly. Exclude a diagnosis of tuberculosis.
- **Corticosteroids:** Low doses of systemic corticosteroids may be considered for patients in septic shock who require vasopressors, or when indicated for another reason (adrenal insufficiency, COPD, asthma exacerbation). However, systemic corticosteroids are NOT recommended as adjunctive treatment for severe influenza.
- **Paracetamol / acetaminophen:** Administer for fever or relief of fever-related symptoms.
- **Salicylates (aspirin and aspirin-containing products):** Do NOT use in children and young adults <18 years (increased risk of Reye's syndrome with influenza). Do NOT use in pregnant women (foetal risks and maternal bleeding)
- **Non steroidal anti-inflammatory drugs (NSAIDs):** Do NOT use in pregnant women (foetal risks and maternal bleeding)
- Routine childhood vaccination schedule must be kept up to date. Secondary bacterial pneumonia is an important cause of morbidity and death in influenza, and *Streptococcus pneumoniae* is one of the leading causes of secondary bacterial pneumonia. All children aged less than 2 years should be vaccinated with the 13-valent pneumococcal conjugate vaccine (PCV-13) if not previously done.

There is insufficient data on efficacy, safety or both for the following agents and their use is therefore not recommended at present: immunoglobulins, intranasal interferons, arbidol, ribavirin, favipiravir.

## 5 Laboratory testing

### 5.1 Who should be tested?

Laboratory testing of uncomplicated illness (patients who fit the ILI case definition) is **NOT** routinely recommended, as it provides very little advantage to the clinical management of individual patients. Testing is recommended for the following patients:

- Patients who meet the criteria for complicated or severe influenza, where a laboratory diagnosis will assist in patient management, or patients hospitalised due to a lower respiratory tract infection where no other explanation for illness is evident and influenza forms part of the differential diagnosis.

- Patients at risk for developing complicated or severe influenza (as per list under section 3.1) AND who are symptomatic should be considered for testing if it will guide clinical management.
- Clusters of cases where a diagnosis of the cause of the outbreak is needed (e.g. within institutions such as healthcare facilities, nursing homes). First 2-3 cases to be tested, thereafter testing not required.
- An individual who has died where influenza is suspected as the cause of death.

**Important note: Initial treatment decisions should be based on clinical presentation and should NOT be delayed pending laboratory confirmation of influenza.**

Note: These recommendations for laboratory testing do not apply to surveillance activities managed by the NICD (e.g. Viral-watch, SARI surveillance programme), and testing should continue as guided by those individual surveillance programmes.

## **5.2 Laboratories conducting testing**

The NICD is no longer offering routine diagnostic tests, including for influenza outside of the established surveillance programmes at specific sites. Diagnostic capacity to test for influenza virus and/or serotyping has now been established in various public- and private-sector laboratories throughout the country.

Clinicians are urged to discuss with their facility's designated laboratory about:

- where specimens should be referred to,
- the specific test that will be conducted by that laboratory and the interpretation  $\pm$  limitations thereof, and
- the cost implications to the hospital/patient/medical aid.

In line with WHO recommendations, molecular diagnostics are currently the method of choice for influenza virus detection. While the specificity is high, the sensitivity of currently available rapid-point-of-care or immunofluorescence tests designed for direct detection of influenza A viruses is low and therefore not recommended at present. False negative results occur commonly with rapid influenza diagnostic tests (RIDT) and a negative RIDT result does **NOT** exclude a diagnosis of influenza in a patient with suspected influenza.

## **5.3 Specimen collection, storage and transportation**

- i. Wear appropriate personal protective equipment, including a medical mask and non-sterile gloves; wear eye-visors or goggles or a face shield if procedures include a risk of splash to the face. When performing specimen-collection procedures that may generate aerosols (e.g. aspiration or open suctioning of the respiratory tract), a particulate respirator (e.g. fit-tested N95 respirator) must be worn, in addition to gloves, eye-visors/goggles or a face shield.
- ii. Combined nasopharyngeal and oropharyngeal swabs in viral transport medium (VTM) are the preferred specimen. Swab each nostril with a single swab, use a second swab to swab the throat.. Use flocked swabs or dacron or rayon swabs if flocked swabs are not available (wooden shaft swabs are not suitable for testing). Place both swabs into the same container of VTM.
- iii. If using the Virocult<sup>®</sup> specimen collection and transport device, remove the swab from its holder and swab the nostrils/throat. Place the swab into the transport tube, secure the cap, and squeeze the end of the tube around the sponge to ensure complete wetting of the swab tip.
- iv. Complete the specimen request form with the following details: patient name, health facility (where appropriate), healthcare worker's name and contact numbers, lab name, contact person, telephone and fax number for receipt of results, and clinical details.
- v. Transport specimens directly to the appropriate laboratory (see section 5.2). The specimens must be transported at 4°C if transport is expected to be delayed.

The following additional information should also be taken into account regarding specimen collection:

- Specimens for virus isolation or for detection of viral nucleic acids or antigens should be taken preferably during the first three days after onset of clinical symptoms, but may be taken up to a week after onset or even later in severely ill or immunocompromised patients or children.
- Specimens should preferably be taken prior to commencement of antiviral agents but can still be taken a few days after initiation of antiviral treatment, especially in patients who are getting worse on antiviral treatment. In these

cases antiviral resistant virus infection should be considered and testing for Oseltamivir resistant virus infection may be considered.

- Combined nasopharyngeal and oropharyngeal swabs may be collected instead of nasopharyngeal aspirates or nasal washes. Swabs pose a lower risk of transmitting infection to healthcare workers than do nasopharyngeal aspirates (NPA) or nasal washes, both of which may generate aerosols. Healthcare workers performing respiratory sample collection should practice appropriate infection prevention and control measures (see section 6.0 below).
- In addition to swabs from the upper respiratory tract, invasive procedures such as bronchoalveolar lavage/ bronchial aspirate or lung biopsy can be performed for the diagnosis of influenza virus infection of the lower respiratory tract where clinically indicated. For an example in patients who are critically ill on mechanical ventilation and who do not have a diagnosis of influenza but in whom influenza is suspected, lower respiratory tract specimens should be collected for testing as these patients may have already cleared the influenza virus from the upper respiratory tract.
- Results of all diagnostic tests for influenza are dependent upon several factors (including specimen type and quality of specimen collection, timing of collection, storage and transport conditions), such that false-negative results may be obtained. When clinical suspicion is high, clinicians must consider repeat/serial testing. Lower respiratory tract specimens may yield the diagnosis when testing of upper respiratory tract specimens is negative. Multiple respiratory tract specimens collected on different days should be tested if influenza virus infection is suspected but a definitive diagnosis has not been made.

### 5.3.1 Post-mortem specimens

A variety of specimens can be collected post-mortem; all specimens (swabs/tissue) need to be placed directly into viral transport medium. Suitable specimens include:

- Nasal, nasopharyngeal and throat swabs
- If consent has been given for a post-mortem, tissues that may be sampled include lung, trachea (proximal and distal), nasopharynx (best done from a supratentorial approach with removal en bloc), liver, brain and kidneys
- If consent for a full post-mortem is not forthcoming, the attending clinician should consider a para-mortem Trucut lung biopsy (following obtaining consent from next-of-kin). Other organs which may be sampled using a Trucut biopsy needle include spleen, bone marrow and liver.

### 5.4 Swabs and viral transport medium (VTM)

1. Wooden shaft swabs are not suitable for respiratory virus PCR. Please use flocked, dacron or rayon swabs.
2. All specimens must be transported in VTM as instructed above.
3. The appropriate swabs and VTM may be obtained from your local laboratory.
4. Laboratories should stock VTM and the appropriate swabs, which may be obtained through their usual suppliers.

## 6 Infection prevention and control (IPC)

- Human-to-human transmission of influenza viruses occurs either directly or indirectly through close, unprotected contact with large respiratory droplets. The role of smaller droplet nuclei at close-range exposure in transmission of influenza is not known, but may be more important in certain settings (e.g. aerosol-generating procedures associated with increased risk of virus transmission). Therefore, IPC precautions need to be focused on controlling respiratory droplet spread. Practice cough etiquette by covering their mouth and nose with a disposable tissue when coughing or sneezing, then discarding the tissue in a receptacle and performing hand hygiene (washing hands with soap and water or the use of an alcohol-based hand rub)

Stay home when they are unwell and keep some distance from healthy people, as much as possible

### 6.1 IPC precautions

Recommended IPC precautions when caring for patients with suspected, probable, or confirmed infection with influenza viruses, or ILI include the following:

- When working in direct contact with patients, Standard and Droplet Precautions should be applied:
  - Standard Precautions:
    - Hand hygiene: washing hands with soap and water or the use of an alcohol-based hand rub

- Use of personal protective equipment (PPE): this includes facial protection (by means of a medical mask and eye-visor /goggles or a face shield) as well as use of a gown and clean gloves.
  - Droplet Precautions:
    - Wear a medical mask if working within approximately 1 metre of the patient or upon entering the room/cubicle of a patient on Droplet Precautions
    - Perform hand hygiene before and after patient contact and immediately on removal of a medical mask
- IPC precautions when performing aerosol-generating procedures associated with an increased risk of infection transmission (e.g. aspiration/open suctioning of the respiratory tract, including for the collection of respiratory tract specimens, intubation, resuscitation, bronchoscopy, autopsy):
  - Wear a particulate respirator (e.g. fit-tested N95 respirator), a clean non-sterile long-sleeved gown, and gloves.
  - Perform hand hygiene before and after patient contact and after PPE removal
- IPC precautions for patients who are mechanically ventilated or undergoing respiratory therapy:
  - Mechanically ventilated patients: Standard and Droplet Precautions (but when aerosol-generating procedures are performed, particulate respirators need to be worn).
  - Chest physiotherapy: Standard and Droplet Precautions. A medical mask should be worn by the patient if possible.
  - Nebulisation: Standard and Droplet Precautions.

## **6.2 Duration of isolation precautions**

- All patients should remain on Droplet Precautions for a minimum of 7 days following symptom onset.
- Droplet Precautions should be maintained until 24 hours following resolution of fever. However, Standard Precautions remain in effect for all patient care. Certain groups of patients may have prolonged viral shedding which extends beyond resolution of acute symptoms, such that there may still be a risk of influenza transmission in the absence of symptoms. These include:
  - Infants and children
  - Elderly patients
  - Severely immunosuppressed or immunocompromised patients: these individuals may shed more virus for a longer time period and are at increased risk for development of antiviral-resistant virus. For such patients, Droplet Precautions should be maintained for the duration of the illness.

## **6.3 Respiratory hygiene/cough etiquette**

All persons (healthcare workers, patients, and visitors) should cover their mouth and nose with a disposable tissue when coughing or sneezing, then discard the tissue in a receptacle and perform hand hygiene (washing hands with soap and water or the use of an alcohol-based hand rub). Alternatively, if they do not have a tissue, they can cough/sneeze into their upper arm. When possible, patients who are showing signs of an ILI should wear a medical mask in waiting areas etc.

## **6.4 Occupational health**

Monitor healthcare workers (HCW)s in contact with patients who are ill with influenza infection; HCWs with symptoms should stay at home. HCWs at high risk for severe disease and complications of influenza should follow recommended IPC measures carefully.

# **7 Resources for further information**

WHO guidelines:

- WHO guidelines for pharmacological management of pandemic influenza A(H1N1) 2009 and other influenza viruses (revised February 2010):  
[http://www.who.int/csr/resources/publications/swineflu/h1n1\\_guidelines\\_pharmaceutical\\_mngt.pdf](http://www.who.int/csr/resources/publications/swineflu/h1n1_guidelines_pharmaceutical_mngt.pdf)

- Recommended composition of influenza virus vaccines for use in the 2014 southern hemisphere influenza season [http://www.who.int/influenza/vaccines/virus/recommendations/201309\\_recommendation.pdf?a=1](http://www.who.int/influenza/vaccines/virus/recommendations/201309_recommendation.pdf?a=1)
- Clinical management of human infection with pandemic (H1N1) 2009: revised guidelines (November 2009): [http://www.who.int/csr/resources/publications/swineflu/clinical\\_management\\_h1n1.pdf](http://www.who.int/csr/resources/publications/swineflu/clinical_management_h1n1.pdf)
- Infection prevention and control during health care for confirmed, probable or suspected cases of pandemic (H1N1) virus infection and influenza-like illness (Updated guidance, 16 December 2009): [http://www.who.int/csr/resources/publications/cp150\\_2009\\_1612\\_ipc\\_interim\\_guidance\\_h1n1.pdf](http://www.who.int/csr/resources/publications/cp150_2009_1612_ipc_interim_guidance_h1n1.pdf)

Centers for Disease Control and Prevention:

- Prevention and Control of Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices (ACIP) — United States, 2013–14 Influenza Season accessed at [http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6132a3.htm?s\\_cid=mm6132a3\\_w](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6132a3.htm?s_cid=mm6132a3_w)
- Antiviral Agents for the Treatment and Chemoprophylaxis of Influenza available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6001a1.htm>
- Opening and Mixing Tamiflu® Capsules with Liquids if Child Cannot Swallow Capsules [http://www.cdc.gov/flu/antivirals/mixing\\_tamiflu\\_qa.htm](http://www.cdc.gov/flu/antivirals/mixing_tamiflu_qa.htm)
- Influenza Antiviral Medications: A Summary for Clinicians March 21 2014: accessed at <http://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm>
- Treatment- Antiviral drugs accessed at <http://www.cdc.gov/flu/antivirals/index.htm>
- Guidance for the Prevention and Control of Influenza in the Peri- and Postpartum Settings accessed at <http://www.cdc.gov/flu/professionals/infectioncontrol/peri-post-settings.htm>
- Centers for Disease Control and Prevention (CDC, Atlanta): <http://www.cdc.gov/flu/index.htm>

Public Health England:

- Pharmacological treatment and prophylaxis of influenza. Version 1.7; 12 January 2011 [http://www.hpa.org.uk/web/HPAwebFile/HPAweb\\_C/1287147812045](http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1287147812045)
- PHE guidance on use of antiviral agents for the treatment and prophylaxis of influenza : Version reviewed December 2013. Accessed at [http://www.hpa.org.uk/webc/HPAwebFile/HPAweb\\_C/1317140512146](http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317140512146)

Additional information is available on the following websites:

- NICD-NHLS Website: [www.nhls.ac.za](http://www.nhls.ac.za) then follow link to NICD,
- Department of Health Website: [www.doh.gov.za](http://www.doh.gov.za)
- World Health Organisation Website: <http://www.who.int/topics/influenza/en/>
- U.S food and drug administration. [http://www.accessdata.fda.gov/drugsatfda\\_docs/nda/2012/021246Orig1s045\\_021087Orig1s062\\_tamiflu\\_toc.cfm](http://www.accessdata.fda.gov/drugsatfda_docs/nda/2012/021246Orig1s045_021087Orig1s062_tamiflu_toc.cfm)
- Recommendations pertaining to the use of viral vaccines: Influenza 2014 has been published in the March 2014 edition of the South African Medical Journal (access at: <http://www.samj.org.za/index.php/samj/article/view/6435/4855> ).

**Further questions from health professionals can be addressed to:**

- The NICD Hotline - 082 883 9920 **\*strictly for use by health professionals only\***

## 8 Appendix 1: Home care guidance: healthcare workers' directions to patients/caregivers

### Home Care Guidance: healthcare workers' directions to patients/caregivers

#### 1. You will probably be sick for several days with fever and respiratory symptoms.

#### 2. Take Medications as Prescribed:

- Take all of the antiviral medication as directed (where applicable).
- Continue to cover your mouth and nose when you cough and wash your hands often (even when taking antiviral medications), to prevent spreading influenza to others.
- Visit the clinic/GP if you experience any side effects; i.e. nausea, vomiting, rash, or unusual behaviour.
- Take medications for symptom relief as needed for fever and pain such as paracetamol or ibuprofen. These medicines do not need to be taken regularly if your symptoms improve.
- Do not give aspirin (acetylsalicylic acid) or products that contain aspirin to children or teenagers 18 years old or younger.
- Do not give aspirin or NSAIDs to pregnant women.
- Children should not be given over-the-counter cold medications without first consulting a healthcare worker.

#### 3. Seek Emergency Care:

If your child experiences any of the following:

- Fast breathing or difficulty breathing
- Bluish or grey skin colour
- Not drinking enough fluids
- Severe or persistent vomiting
- 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

In adults, emergency warning signs that need urgent medical attention include:

- Difficulty breathing or shortness of breath
- Pain or pressure in the chest or abdomen
- Sudden dizziness
- Confusion
- Severe or persistent vomiting
- Flu-like symptoms improve but then return with fever and worse cough

#### 4. Follow These Home Care Recommendations:

- Stay home for 7 days after your symptoms begin
- Drink clear fluids (such as water, broth, sports drinks, electrolyte beverages for infants) to keep from being dehydrated.
- Dishes etc. can be washed with hot soapy water.
- Throw away tissues and other disposable items used by the sick person in the rubbish bin. Wash your hands after touching used tissues and similar waste.
- Have everyone in the household wash hands often with soap and water, especially after coughing or sneezing. Alcohol-based hand cleaners are also effective.
- Avoid touching your eyes, nose and mouth.
- Continue with medication for chronic diseases as prescribed (e.g. ART, TB treatment).

## 9 Appendix 2: Management of patients with suspected or proven influenza virus infection

Category	Clinical Definition	Treatment	Diagnostic Tests
Uncomplicated Influenza-like illness (ILI)	ILI (Influenza-like Illness) Influenza presenting with fever, coryza, generalised symptoms (headache, malaise, myalgia, arthralgia) and sometimes gastrointestinal symptoms, but without any features of complicated influenza.	<b><u>NO RISK FACTORS PRESENT:</u></b> <ul style="list-style-type: none"> <li>■ Symptomatic treatment with paracetamol ± alternative analgesia.</li> <li>■ Avoid aspirin in children and adolescents ≤18 years (risk of Reye's Syndrome).</li> <li>■ Avoid aspirin and NSAIDs in pregnant women</li> </ul>	NOT for routine diagnostic testing
		<b><u>RISK FACTORS PRESENT</u></b> <ul style="list-style-type: none"> <li>■ Oseltamivir orally twice per day for 5 days†</li> </ul>	Consider testing
Complicated or severe influenza	Influenza requiring hospital admission and/or with symptoms and signs of lower respiratory tract infection (hypoxaemia, dyspnoea, lung infiltrate), central nervous system involvement and/or a significant exacerbation of an underlying medical condition <ul style="list-style-type: none"> <li>■ Other conditions/clinical presentations requiring hospital admission for clinical management (including secondary bacterial pneumonia with influenza, most commonly <i>Streptococcus pneumoniae</i>, <i>Staphylococcus aureus</i> and <i>Streptococcus pyogenes</i>).</li> </ul>	<ul style="list-style-type: none"> <li>■ <b>Treatment should be <u>started as soon as any of the clinical criteria are met</u>†.</b></li> <li>■ <b><u>URGENT EARLY REFERRAL to hospital for supportive care and assessment</u></b></li> <li>■ Oseltamivir orally twice per day for 5 days (consider higher doses and prolonged duration for critically ill patients).</li> <li>■ Antibiotics – to cover <i>S. aureus</i>, <i>S. pneumoniae</i> and <i>S. pyogenes</i> (e.g. co-amoxiclav)</li> <li>■ Early oxygen supplementation and close monitoring of oxygen saturation.</li> <li>■ Ensure adequate hydration and monitor renal function.</li> </ul>	Send nasopharyngeal /throat swabs for influenza testing†

\*Risk factors: infants and young children (particularly <2 years of age); pregnant women (including the first two weeks of the post-partum period); persons of any age with chronic diseases including: pulmonary diseases (e.g. asthma, COPD), cardiac diseases (e.g. congestive cardiac failure), metabolic disorders (e.g. diabetes), renal disease, hepatic disease, certain neurological conditions, (neuromuscular, neurocognitive and seizure disorders), haemoglobinopathies, immunosuppression (e.g. HIV, immunosuppressive medication or malignancy), persons ≤18 years receiving chronic aspirin therapy, persons aged ≥65 years, persons who are morbidly obese (BMI ≥40).

‡ All attempts should be made to start oseltamivir within the first 48 hours of symptoms.

† Testing for influenza should NOT delay administration oseltamivir when clinically indicated.