INFLUENZA –
CLINICAL GUIDELINE FOR INFANTS AND CHILDREN

Influenza presents in infancy and childhood as a wide variety of clinical syndromes.

The diagnosis needs to be considered and if any suspicion of influenza exists, appropriate precautions taken to prevent spread.

Presentations may include:-

1. Fever and misery
2. Bronchiolitis
3. Asthma exacerbation
4. Acute otitis media
5. Lower respiratory infection
6. Convulsion with fever
7. Dehydration
8. Fever, lethargy, irritability meningitis not excluded
9. Toxic bacteraemic type illness
10. Aponea
11. Diabetic instability

The focus of care needs to relate to the presenting clinical syndrome and be managed appropriately.

Consult relevant clinical guidelines.

Wherever possible infants and children with uncomplicated influenza should not be seen in hospital or admitted.

Thresholds for admission may be lowered where underlying conditions exist:-

- infants under 6 months
- infants with a history of prematurity especially if any ongoing lung disease
- immunosuppression
- children with cerebral palsy or weakness that may impair coughing
- underlying heart disease
- lung disease

CASE DEFINITIONS FOR NOVEL INFLUENZA A (H1N1)* FOR PANDEMIC 'MANAGEMENT' PHASE

Confirmed case

A confirmed case of novel influenza A H1N1 virus infection is defined as a person with laboratory confirmed novel influenza A H1N1 virus infection by one or more of the following tests:

- real-time RT-PCR
- viral culture
- four-fold rise in novel influenza A H1N1 virus specific neutralising antibodies.

Probable case

A probable case of novel influenza A H1N1 virus infection is defined as a person with an influenza like illness** who has a strong epidemiological link to a confirmed case or defined cluster.

Close contact

Close contact is defined as having cared for, lived with, or had direct contact with respiratory secretions or bodily fluids of a probable or confirmed case.

* Also termed non-seasonal influenza or influenza A H1N1 09.

Influenza-like illness: (i) history of fever, chills, and sweating **or clinically documented fever ≥38°C, **plus** (ii) cough **or** sore throat.

Four Life Threatening Clinical Scenarios that Need Special Attention

Within the high levels of workload generated related with influenza cases these clinical scenarios need to be looked for identified early and managed/treated.

1. **Vulnerable Infant Developing Bronchiolitis Picture** Some infants will develop a bronchiolitis picture with the steady increase in respiratory compromise over 3-5 days. The development of hypoxia is usually marked by slowing feeds, marked pallor and lethargy. Systems need to be in place to identify these risks and manage them.

2. **Early rapidly progressive respiratory distress** This is likely to be an uncommon symptom and seen in young people and older children. It results as a dramatic inflammatory response – "cytokine-storm", follows very quickly (hours) after first epithelial colonization in the respiratory tract. Massive out-pouring of fluid occurs very early in the flu like illness. Supportive care should be offered, possibly including steroids, as well as seeking urgent specialist advice.

3. **Late onset deterioration in respiratory status** Influenza leaves the respiratory tree very vulnerable to secondary bacterial infection because of the epithelial debris, increased secretions and immune compromise. Secondary bacterial invaders are typically streptococcal or staphylococcal. Symptoms may include increasing fever, toxicity, tachycardia, grunting and increasing oxygen requirement typically 3 – 10 days after influenza illness starts. Early treatment with antibiotics can be life saving. The best antibiotic is cefuroxime although in some cases ceftriaxone may be an alternative especially if out of hospital care planned. Amoxicillin clavulanate (Augmentin) is an alternative oral antibiotic.

4. **Influenza Encephalitis** Influenza is often associated with irritability, distress and at times simple febrile convulsions. Where seizures, atypical, prolonged, frequent or difficult to treat or other signs of CNS dysfunction occur. Consideration should be given to the diagnosis of Influenza Ecephalitis a rare complication that will require specialist advice about management.

Antiviral Medication usage in Infants and Children

Antiviral medications have value in reducing:-

1. Duration of illness
2. Severity of illness
3. Duration of viral shedding

Best results occur if treatment begins within 48 hours of symptoms but some benefit may occur out to 72 hours after symptoms start.

Indications for Treatment

a) Infants and children with complications that lead to admission to hospital should be treated with antiviral medications.

b) Infants and children with medical fragility such that they are at higher risk of influenza complications.

Although safety data for infants under one is limited, CDC supports **use with caution**: http://www.cdc.gov/h1n1flu/recommendations.htm#table2 This use should be restricted to those admitted to hospital, or who are otherwise under the supervision of a paediatrician.

Dosing

Table 1. Dosing recommendations for antiviral treatment of children younger than 1 year using oseltamivir.

Age	Recommended treatment dose for 5 days
<3 months	12 mg twice **daily. Not recommended unless situation judged critical due to limited data on use in this age group**
3-5 months	20 mg twice daily
6-11 months	25 mg twice daily

Note: Capsule contents can be mixed with something sweet, e.g. chocolate sauce, honey, or yogurt.

Table 2. Antiviral medication dosing recommendations for treatment or chemoprophylaxis of novel influenza A (H1N1) infection.
(Table extracted from IDSA guidelines for seasonal influenza.)

Agent, group		Treatment	Chemoprophylaxis
Oseltamivir			
Children ≥ 12 months	15 kg or less	60 mg per day divided into 2 doses	30 mg once per day
	16-23 kg	90 mg per day divided into 2 doses	45 mg once per day
	24-40 kg	120 mg per day divided into 2 doses	60 mg once per day
	>40 kg	150 mg per day divided into 2 doses	75 mg once per day

Indications for Prophylaxis

The exact details around indications for pre and post exposure prophylaxis will alter as the pandemic evolves.

Pre exposure prophylaxis may be used in settings where a vulnerable individual will inevitability be exposed to influenza e.g. an oncology patient attending a ward where patients have influenza.

Post exposure prophylaxis for asymptomatic individuals is reserved for infants and children with medical fragility. It should be used with caution as it is likely to prevent immunity developing and recurrent courses may be needed.

Prophylaxis is generally given for 10 days but longer courses can be used in some settings e.g. a child with cystic fibrosis having treatment on a inpatient ward that also manages flu cases. In nursing homes when used for outbreak control it is recommended to continue until 7 days after last known contact with a case.

Parents/Caregivers of Inpatient Children with Influenza

Consideration should be given to treating parents/caregivers of inpatient children with influenza with antiviral agents if they develop of have had influenza-like symptoms for less than 48 hours. The aim is to reduce nursing workload by increasing ability of adults to care for the child and reducing infectious potential.

Cases should be assessed on an individual basis. Adults and siblings not directly involved in care should generally not be spending time on children's ward. Careful hand hygiene remains the primary focus for reducing infection.

Community Assessment Tool for Children with Influenza

This downloadable two-page tool from the Department of Health, England is applicable in New Zealand.
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_100941?IdcService=GET_FILE&dID=197573&Rendition=Web

Hospital Pathways for Children with Influenza

These downloadable one-page clinical pathways (Emergency Department, Inpatient) from the Department of Health, England are applicable in New Zealand.
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_100941?IdcService=GET_FILE&dID=197574&Rendition=Web

See also

http://www.rch.org.au/emplibrary/clinicalguide/Antiviral_drug_doses_in_children_with_influenza.pdf

http://www.cdc.gov/h1n1flu/clinicians/

http://www.influenza.org.nz/

http://www.moh.govt.nz/influenza-a-h1n1

http://flutracker.rhizalabs.com/

Friedman MJ, Attia MW. Clinical predictors of influenza in children. *Arch Pediatr Adolesc Med.* 2004; 158:391-394

Medical Fragility- Conditions Considered to Increase Risks from Influenza (in children and adults)

Cardiovascular disease/cerebrovascular disease

- Congenital heart disease
- Ischaemic heart disease
- Congestive heart failure
- Rheumatic heart disease
- Coronary artery disease
- Angina
- Heart attack
- Stroke
- Or other heart condition and cerebrovascular disease

Chronic respiratory disease

- Asthma if on regular preventive therapy
- Emphysema
- Chronic obstructive airways disease
- Cystic fibrosis
- Chronic bronchitis
- Other chronic respiratory disease with impaired lung function

Diabetes

- Type I & Type II diabetes

Cancer

- Cancer (current), excluding basal and squaemous skin cancers if not invasive

Other Conditions

- Autoimmune disease
- Cerebral palsy
- Children on long-term aspirin
- Chronic renal disease
- Congenital myopathy
- Epilepsy
- Haemaglobinopathies
- Human immunodeficiency virus (HIV)
- Hydrocephaly
- Immune suppression
- Motor neuron disease
- Multiple sclerosis
- Muscular dystrophy
- Myasthenia gravis
- Neuromuscular and central nervous system diseases
- Parkinson’s disease
- Rheumatoid arthritis
- Sickle cell anaemia
- Transplant recipients