MAHARASHTRA COMMUNICABLE DISEASES' PREVENTION & CONTROL TECHNICAL COMMITTEE (MCDPCTC)

Influenza A H1N1 Clinical Management Protocol

October 2018

PUBLIC HEALTH DEPARTMENT, MAHARASHTRA

Hon. Minister of Public Health and Family Welfare, Government of Maharashtra called a meeting on October 4th, 2018 to formulate the guidelines for clinical management of Influenza A H1N1 with special focus on intensive care.

Following experts from related field were present for the meeting –

1. Dr. P.B. Bhoi, Joint Director (NVBDCP)
2. Dr. Aarati Kinnikar, Prof. B J Medical College Pune
3. Dr. Niteen D Karnik, HoD Medicine, SION Hospital
4. Dr. Nadkar Nodkar , HoD Medicine, KEM Hospital
5. Dr. Vishal Gupta AP Medicine, KEM Hospital
6. Dr. Madhukar Gaikwad, Medical Superintendent, Saint George Hospital, Mumbai
7. Dr. Ameya Medhekar, Lilavati Hospital
8. Dr. Prakash Jaindani, Harkisandas Hospital
9. Dr. Abdul Samad Ansari, Nanavati Hospital
10. Dr. Om Srivastava, Infectious Diseases Specialist
11. Dr. Pradip Awate, State Surveillance Officer, IDSP
12. Dr. Santosh Gite, JJ Hospital Mumbai
13. Dr Rajesh Kulkarni Associate Professor Pediatrics at BJGMC Pune*
14. Dr. Shashi Sangle, HoD Medicine, BJ Medical College, Pune*
15. Dr. Dilip Kadam, Dean Sinhgad Medical College, Pune*

(* *Though they were not present during the meeting, they contributed a lot in preparing the final draft of protocol.*)

Committee has drafted the following guidelines-

- Part A- Categories of H1N1 Patients
- Part B- Management of H1N1 infection in Adult
- Part C- Pediatric Guidelines for H1N1 Infection Management.

Part A- Guidelines on categorization of Seasonal Influenza cases during screening for home isolation, testing, treatment and hospitalization (Revised on 18.10.2016)

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In order to prevent and contain outbreak of Influenza virus the following guidelines for screening, testing and isolation are to be followed:

At first all individuals seeking consultations for flu like symptoms should be screened at healthcare facilities both Government and private or examined by a doctor and these will be categorized as under:

Category- A

- Patients with mild fever (less than 38^0 C) plus cough / sore throat with or without bodyache, headache, diarrhoea and vomitting will be categorized as Category-A. They do not require Oseltamivir and should be treated for the symptoms mentioned above. The patients should be monitored for their progress and reassessed at 24 to 48 hours by the doctor.

- No testing of the patient for Influenza is required.

- Patients should confine themselves at home and avoid mixing up with public and high risk members in the family.

Category-B

(i) In addition to all the signs and symptoms mentioned under Category-A, if the patient has high grade fever (Above 38^0 C) and severe sore throat, may require home isolation and Oseltamivir;

(ii) In addition to all the signs and symptoms mentioned under Category-A, individuals having one or more of the following high risk conditions shall be treated with Oseltamivir:

- Children with mild illness but with predisposing risk factors.

- Pregnant women;

- Persons aged 65 years or older;

- Patients with lung diseases, heart disease, liver disease, Kidney disease, blood disorders, diabetes, neurological disorders, cancer and HIV/AIDS;

- Patients on long term cortisone therapy.

- No test for Influenza is required for Category-B (i) and (ii).

- All patients of Category-B (i) and (ii) should confine themselves at home and avoid mixing with public and high risk members in the family.

- Broad Spectrum antibiotics as per the Guideline for Community-acquired pneumonia (CAP) may be prescribed.

Category-C

In addition to the above signs and symptoms of Category-A and B, if the patient has one or more of the following:

- Breathlessness, chest pain, drowsiness, fall in blood pressure, sputum mixed with blood, bluish discolouration of nails;

- Children with influenza like illness who had a severe disease as manifested by the red flag signs (Somnolence, high and persistent fever, inability to feed well, convulsions, shortness of breath, difficulty in breathing, etc).

- Worsening of underlying chronic conditions.

All these patients mentioned above in Category-C require testing, immediate hospitalization and treatment.

Part B-Management of H1N1 infection in Adult
(Experience based Guidelines)

Adult patient with H1N1 infection will present to a clinician in either of the following groups

1. Upper respiratory tract infection alone.
2. Upper respiratory tract infection with lower respiratory tract involvement without tacypnoea / hypoxia.
3. URTI plus LRTI with Tacypnoea but no hypoxia
4. URTI with LRTI with hypoxia -type 1 respiratory failure
5. All above and hypercarbia
6. All above with multi organ dysfunction.

Group 1- Upper respiratory tract infection alone.

These patients are to be differentiated from common cold by presence of high fever, severe myalgia and less rhinorrhoea . Patients should be treated with Cap. Oseltamivir 75 mg twice a day for 5 days and if symptoms persist after 5 days, extend therapy till 10 days.

Group 2 - Upper respiratory tract infection with lower respiratory tract involvement without tacypnoea / hypoxia.

In addition to above management, brochodilators and mucolytic agents are to be added depending on the requirement

Group 3- URTI plus LRTI with Tacypnoea but no hypoxia

In addition to above, these patients will require oxygen by nasal prongs or mask. Fio2 of 0.4 to 0.6 should be maintained.

Group 4- URTI with LRTI with hypoxia -type 1 respiratory failure

Patients will require Cap. Oseltamivir 150 mg twice daily with bronchodilators and mucolytic agents. Such patients should be looked for presence of ARDS. This can be evaluated by looking at P/ F ratio or S/ F ratio. P/F ratio is PaO2/ FiO2.

a. P/F ratio 300 to 200 - mild ARDS
b. P/F ratio 200-100 - moderate ARDS
c. P/F ratio < 100 - severe ARDS

If ABG is not available S/F ratio can be used for evaluation for ARDS-

a. SaO2/Fio2 ratio 315- 235 -mild ARDS
b. SaO2/Fio2 ratio < 235 -severe ARDS

Once patient has ARDS, maintenance of oxygenation is of prime importance. If Sao2 is more than 90, these patients can be managed nasal prongs and oxygen mask with high flow of 10 to 12 liters per min to keep Sao2 around 95. If Sao2 is between 85 to 90 then these patients should be put on noninvasive ventilation. Patients with SaO2 less than 85, a trial of noninvasive ventilation should be given. If PaO2 is maintained around 60 then

noninvasive ventilation should be preferred irrespective of SaO2 value as SaO2 can be fallacious. Metanalysis has shown less mortality in non invasive ventilation than invasive ventilation.

Only if PaO2 is persistently below 60 inspite of adequate trial of noninvasive ventilation then invasive ventilation is used. Endotracheal intubation should be done with cuffed Endotracheal tube . To start with, tidal volume should be kept at 6 ml / kg of body weight with respiratory rate of 25-30 per min .With these platue airway pressure to be maintained at 25-30 cms of water. Fio2 is to be maintained at the start with 0.6, PEEP is to be maintained according to Fio2 incremental table. ARDS net protocol for ventilator management of ARDS should be followed-

INCLUSION CRITERIA: Acute onset of

1. $PaO_2/FiO_2 \leq 300$ (corrected for altitude)
2. Bilateral (patchy, diffuse, or homogeneous) infiltrates consistent with pulmonary edema
3. No clinical evidence of left atrial hypertension

PART I: VENTILATOR SETUP AND ADJUSTMENT

1. Calculate predicted body weight (PBW)
   Males = 50 + 2.3 [height (inches) - 60]
   Females = 45.5 + 2.3 [height (inches) -60]
2. Select any ventilator mode
3. Set ventilator settings to achieve initial V_T = 8 ml/kg PBW
4. Reduce V_T by 1 ml/kg at intervals ≤ 2 hours until V_T = 6ml/kg PBW.
5. Set initial rate to approximate baseline minute ventilation (not > 35 bpm).
6. Adjust V_T and RR to achieve pH and plateau pressure goals below.

OXYGENATION GOAL: PaO_2 55-80 mmHg or SpO_2 88-95%

Use a minimum PEEP of 5 cm H_2O. Consider use of incremental FiO_2/PEEP combinations such as shown below (not required) to achieve goal.

Lower PEEP/ higher FiO2

FiO2	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7
PEEP	5	5	8	8	10	10	10	12

FiO2	0.7	0.8	0.9	0.9	0.9	1.0
PEEP	14	14	14	16	18	18-24

Higher PEEP / Lower FiO2

FiO2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5
PEEP	5	8	10	12	14	14	16	16

FiO2	0.5	0.5-0.8	0.8	0.9	1.0	1.0
PEEP	18	20	22	22	22	24

PLATEAU PRESSURE GOAL: ≤ 30 cm H2O

Check Pplat (0.5 second inspiratory pause), at least q 4h and after each change in PEEP or VT.

If Pplat > 30 cm H2O: decrease VT by 1ml/kg steps (minimum = 4 ml/kg).

If Pplat < 25 cm H2O and VT< 6 ml/kg, increase VT by 1 ml/kg until Pplat > 25 cm H2O or VT = 6 ml/kg.

If Pplat < 30 and breath stacking or dys-synchrony occurs: may increase VT in 1ml/kg increments to 7 or 8 ml/kg if Pplat remains < 30 cm H2O.

pH GOAL: 7.30-7.45

Acidosis Management: (pH < 7.30)

If pH 7.15-7.30: Increase RR until pH > 7.30 or PaCO2 < 25 (Maximum set RR = 35).

If pH < 7.15: Increase RR to 35.

If pH remains < 7.15, VT may be increased in 1 ml/kg steps until pH > 7.15 (Pplat target of 30 may be exceeded).

May give NaHCO3

Alkalosis Management: (pH > 7.45) Decrease vent rate if possible.

I: E RATIO GOAL: Recommend that duration of inspiration be < duration of expiration.

PART II: WEANING

A. Conduct a SPONTANEOUS BREATHING TRIAL daily when:

1. FiO2 ≤ 0.40 and PEEP ≤ 8 OR FiO2 < 0.50 and PEEP < 5.
2. PEEP and FiO2 ≤ values of previous day.
3. Patient has acceptable spontaneous breathing efforts. (May decrease vent rate by 50% for 5 minutes to detect effort.)
4. Systolic BP ≥ 90 mmHg without vasopressor support.
5. No neuromuscular blocking agents or blockade.

If PaO2 is maintained at 60, same settings are to be continued.

If the patient has severe tachypnoea and is fighting with ventilator then sedation and paralysis should be considered. Sedation and paralysis has role in early period of ventilation. After 3 days sedation and paralysis should be weaned off as prolonged use is associated with increased mortality.

If on these settings hypoxia does not respond, then option of increasing Fio2 and PEEP with recruitment maneuvers should be tried. Inverse I: E ratio ventilation should be given a trial. Alternative modes like APRV, assist control mode can be used. Prone ventilation should be tried if patient require Fio2 more 0.8 and PEEP more than 12. (Demo of method of prone ventilation is available on youtube). Prone ventilation should be tried for at least 24 hours to maintain PaO2 at 60. If this fails patient should be considered for HFOV or ECMO. ECMO is more beneficial if patient has additional hypercarbia.

Group 5 - All above and hypercarbia

These patients are more critical. Prone ventilation or HFOV or ECMO should be used upfront.

Group 6- All above with multi organ dysfunction

In addition to respiratory failure these patients have other multi organ system failure. These are related to associated comorbidities, sepsis due to super added bacterial infection and metabolic derangements. Number of organ system involved should be looked for eg hypoxia – respiratory, hypotension- CVS, Glass go coma scale- CNS, RFT- Renal, Icterus- hepatic, thrombocytopenia and leukopenia- haematology . More the number of organ system involved worst is the prognosis. SOFA score should be evaluated daily to assess progress of the patient. Support to organ system failure should be given, eg dialysis in renal failure. MODS is seen is second week and is related to sepsis by nosocomial infection. Septic shock to be managed on the basis of survival sepsis guidelines.

In addition to above, following points should looked upon in the management

1. **Oxygenation** – As described above, those patients who have LRTI but not on ventilator should go for ABG once a daily and SOS. For those on ventilator ABG should be done at least 12 hourly. Any acid base imbalance should be corrected accordingly.
2. **Antiviral Drugs**-

   A. Oseltamivir

   URTI – Cap.Oseltamivir 75 mg BD for 5 days.

   URTI symptomatic on day 6 – extend upto 10 days.

   URTI with LRTI – Cap.Oseltamivir 150 mg BD for 10 days.

   LRTI with Non resolving Pneumonia – Cap. Oseltamivir 150 mg BD extend till 3 weeks.

   In presence of renal failure modified dose of Cap.Oseltamivir 75 mg BD or according to GFR. In presence atrial tachyarrythmia consider dose of 75 mg twice a day.

   B. Zanamivir nebulizer rota caps- Presently not available in India.

   Dose -10 mg BD for 5 days

   Given by inhalation route. It cannot be used in ventilated patient as blocks the expiratory valve.

   C. Injection Peramivir 600 mg single dose in severe infection- Not available in India.
3. **IV fluids**

   Patients with ARDS should be kept dry. If CVP line in place then CVP to be maintain at 10-12 cms of water. If CVP line is not available JVP to be kept mid way between sterno clavicular joint and angle of mandible.

   Fluids to be given according to electrolytes estimation. Avoid Ringers lactate in hepatic and renal failure. If urine output is good then fluids at the rate of 50 ml/ hour. Intra venous lipids solutions should be avoided as it can worsen ARDS.
4. **Blood and blood products –**

   PCV should be used if Haemoglobin is less than 7 gram %. In presence of DIC,FFP /cryoprecipitate can be used. If platelet count is less than 10000 and or bleeding, platelet transfusion is considered.
5. **Antibiotics**

   Amoxy- clav or cefixime is used for antibiotic cover. Additional macrolide Azythromycin or Clarithromycin is considered if atypical Pneumonia is differential diagnosis .

   Patients on invasive ventilation are usually given with Piperacilin and Tazobactum . For ventilator associated Pneumonia sputum/ tracheal aspirate/ blood culture related antibiotic or Meropenem is preferred.
6. **Inotropes -**If patient has hypotension noradrenalin infusion is preferred. If patient has evidence of sepsis in the form of increased procalcitonin, vasopressin can be added. Procalcitonin should be done in all patients with lower respiratory tract involvement

7. **Steroids**

   In patients with septic shock low dose steroid Hydorcortisone 50 mg 6 hourly should be added. Other use of steroid is in bronchospasm . Bronchospaasm not responding to inhaled bronchodilators should be considered for high dose steroids in the form of Hydrocortisone 100 mg 6 hourly or methyl prednisolone 80 to 250 mg per day. Steroid is indicated in case of myocarditis in the form of tachyarrthymias, ECG abnormalities, raised CPK – MB dexamethasone 4 mg 6 hourly should be started.

8. **Bronchodilator –**

   Inhaled bronchodilator like salbutamol, salmeterol with tiotropium inhalation should be used. Budesonide inhalation can be added as an alternative agent.

9. **Mucolytic agents**

   N-acetyl cystine nebulization should be given 12 hourly. Adequate hydration is the best to prevent mucus plug formation.

10. **Chest physiotherapy**

    Chest physiotherapy is to be done at least twice in a day to prevent hypostatic Pneumonia.

11. **Management of Comorbidities**

    Most important comorbidity is DM . Blood sugar is to be maintained between 120-150 mg/dl by use of insulin infusion in critically ill patients. For other comorbidities adequate pharmacotherapy should be continued.

12. **Renal replacement therapy**

    For patient who develop acute kidney injury with fluid overload, hyperkalemia , encephalopathy and pericarditis, renal replacement therapy should be used. This can be used in the form of CRRT, intermittent haemodialysis or CAVHD . This should be continued till renal functions recover.

13. **Lactate level**

    High lactate levels are associated with high mortality. To prevent high lactate levels adequate oxygenation and perfusion, glucose and thiamine supplementation along with soda bicarbonate should be used.

14. **DVT prophylaxis**

    LMWH once a day subcutaneous should be used in patients who are on prolonged ventilator care.

15. **Nutrition**

    Caloric supplementation 2500 to 3000 calories per day should be given in the form oral / RT / IV hyper alimentation depending on patient's condition

Part C- PEDIATRIC GUIDELINES FOR H1N1 INFECTION MANAGEMENT

Introduction:

In June 2009 the World Health Organization declared the first global influenza pandemic in 41 years.[1] From early in the pandemic, children—particularly those aged under 5 years[2]—were considered a population at higher risk of morbidity and mortality from pandemic H1N1 (pH1N1) infection.

On 10 August, 2010, WHO announced that the world was in postpandemic phase, though fresh cases continued to be reported from India. Pandemic H1N1 2009 infection affected healthy young people more often than the elderly people; 25-50% of cases who were hospitalized or died had no co-morbidities. In India, 33% of cases were reported in 5-19 years of age group and 40% in 20-39 years of age group [2]. Mortality due to pandemic H1N1 2009 has been estimated to be<0.05%.

Apart from H1N1, many other respiratory viruses are in circulation and they may cause significant mortality and morbidity in children.

Data from Sassoon in the last 3 months (01/07/18 to 30/09/18) identified the following viruses in PICU patients with severe respiratory illness (Unpublished data)

Number of swabs sent:62

Number of swabs positive for H1N1: 2

Number of swabs positive for other viruses:30

(RSV: 22,Adeno: 2 ,hMPV: 1 ,H3N2:2 , Rhino: 2, PIV 1:1)

Clinical Manifestations:

Typical Symptoms:

According to the WHO clinical definition, an influenza infection is an acute febrile respiratory illness with influenza-like symptoms including fever, cough, headache, muscle and joint pain, sore throat and runny nose, vomiting and diarrhea.

Common respiratory symptoms include cough, rhinorrhea/congestion, shortness of breath, or sore throat. Gastrointestinal symptoms like vomiting, abdominal pain, or diarrhea may be seen in upto 40% cases and sometimes may be the only symptoms.

Atypical Symptoms:

Neurological: Seizures,encephalopathy,encephalitis.

Renal: HUS,hemorrhagic cystitis

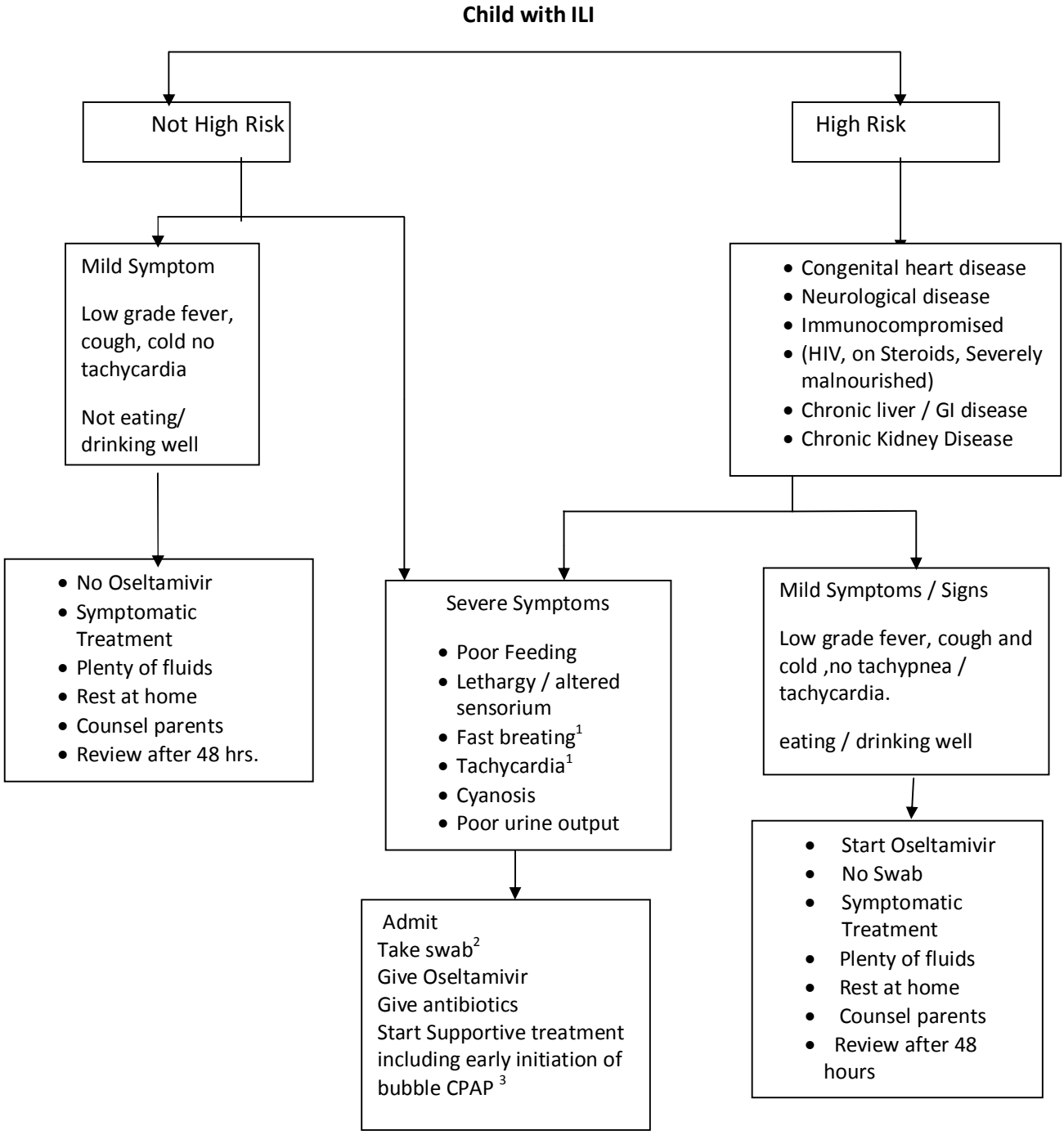
Cardiac: Myocarditis,Cardiac failure

Musculosketal: Myopathy

Endocrine:Transient hyperglycemia

Approach to a child with Influenza Like Illness(ILI)

(ILI : Child with fever, cough, cold, throat pain, fatigue, bodyache, vomiting, diarrhoea)



1.Annexure I:Normal respiratory rate and heart rate values by age.

2. Annexure II :Swab collection and transport

3. Annexure III : You tube video link: How to initiate Bubble CPAP

https://www.youtube.com/watch?v=peNMwC4URsA&t=54s

or Google : Bubble CPAP+ Sassoon+Indigenous

Investigations

Swab for H1N1 only if severe symptoms /signs present (Category C).

No swab for Category A/B. (Mild symptoms with or without high risk).

Additional tests needed in hospitalized children with suspected severe H1N1: CBC, Chest X-ray, ABG, Electrolytes,LFT and RFT.

Treatment

Mild disease: Syp.Paracetamol (10 mg/kg/dose max.6 hourly), plenty of oral fluids, rest

Moderate or Severe disease:

Supportive:

Oxygen by Non Rebreathing Mask (NRM) if child has tacypnoea (flow 10-12 Litre per min).In case of small children ,head box may be used (flow 10 to 12 litres/min)

Non Invasive Ventilation: CPAP(Indigenous or Machine,O2 flow of 2-4 Litres per minute) or HHHFNC(Heated Humidified High Flow Nasal Cannula) to be initiated as soon as possible.

Invasive ventilation: If child has signs of severe respiratory distress (severe tacypnoea, lower chest wall retractions, head bobbing, cyanosis, apnea or bradypnea) or ABG shows severe hypoxemia (Pa02<60 on bubble CPAP, PaCO2>60). P/F ratio and S/F ratio should be monitored and children with P/F ratio<300 or S/F ratio<315 are at higher risk for need of ventilation.

An useful ratio is PF ratio i.e.Pao2/Fio2 ratio e.g. if child is on Fio2 of 0.5 and Pao2 is 60 the P/F ratio is 60 divided by 0.5 =120.Any P/F ratio less than 300 may indicate ARDS and these children may need invasive ventilation and should be managed in a PICU.

If ABG is not available SPO2/FIO2 (S/F ratio) ratio may be used.S/F ratios of 235 and 315 correlate with P/F ratios of 200 and 300, respectively, for diagnosing and following up patients with ARDS.

1. Suggested Initial ventilator settings

Rate: Appropriate for age of child
(e.g.Infants 40/min,2 years 30/min,5 years 25/min,8 years 20/min)
PIP may be kept in the range of 12 to 20 depending on age of child.
High PEEP (start with 6 may increase upto 12-14),
FiO2 initially 100 percent, titrate with ABG
Prone position if severe ARDS.inotrope support may be required.

2. Monitoring

Vitals continuous monitoring, SPO2 Monitoring

ABG atleast twice daily

3. Antibiotics

Give first dose of antibiotic within one hour of admission. Antibiotics used are:

a. **Ceftriaxone** 50 to 75 mg/kg/day OD IV

b. **Amikacin** 15 mg/kg/day OD IV (Avoid if evidence of Renal Failure present,renal dose adjustment may be necessary if given)

c.**PiperacillinTazobactam** 300 mg/kg/day in three divided doses(100 mg/kg/dose thrice daily)

d.**Vancomycin** 40 mg/kg/day in four divided doses(10 mg/kg/per dose four times daily) (Avoid if evidence of Renal Failure present ,renal dose adjustment may be necessary if given)

e.Azithromycin 10 mg/kg/dose once daily orally

First Line: Ceftriaxone+ Amikacin

Second Line: PiperacillinTazobactam

4. IV Fluids (Maintenance 0.45% DNS)

According to Holiday Segar formula

100 ml/kg for first 10 kg

50 ml/kg for next 10 kg

20 ml/kg above 20 kg

e.g.

a) 10 kg child will need 1000 ml in 24 hours

b) 15 kg child will need

100x 10= 1000 ml for first 10 kg

50x 5= 250 ml for 10-20 kg and

Total 1250 ml over 24 hours

c) 25 kg child will need

100x 10= 1000 ml for first 10 kg

50x 10= 500 ml for 10-20 kg and

20x 5 =100 ml for 20-25 kg

Total= 1600 ml per day

Specific

Oselatmivir is the drug of choice

Dosage forms: CAPSULE: 30 mg, 45 mg, 75 mg; SUSP: 6 mg per mL

Start within 48 hours of symptom onset

Age and Body weight	**Dosage**
≥ 12 months	
≤ 15 kg	30 mg twice daily
16-23 kg	45 mg twice daily
24-40 kg	60 mg twice daily
>40 kg	75 mg twice daily
< 12 months	
< 3 months	12 mg twice daily
3-5 months	20 mg twice daily
5-11 months	25 mg twice daily

If syrup is not available, 75 mg capsule to be dissolved in 7.5 ml water (1 ml=10 mg) and dose to be given according to child's weight. Syrup may be added to sugar water or fruit juice to mask the taste.

Factors associated with Severe Disease and Mortality in children:

Young age, delay in starting Oselatmivir, presence of chronic/systemic disease are some factors associated with severe influenza in children.

Factors associated with mortality amongst hospitalized children with H1N1 at Sassoon Hospital, Pune in 2009 include presence of diffuse alveolar infiltrate on admission chest radiography , use of corticosteroids in ARDS in children who required mechanical ventilation ,secondary bacterial infection, SpO(2) <80% on admission and presence of ARDS.

Some other studies have suggested presence of seizures, malnutrition, iron deficiency anemia, presence of GI disorders like GERD, elevated CRP levels, higher Absolute neutrophil Counts (ANC counts) as risk factors for severe disease or death.REF

Isolation Poilcy:

Isolation facilities: if dedicated isolation room is not available then patients can be cohorted in a well ventilated isolation ward with beds kept one meter apart.
Manpower: Dedicated doctors, nurses and paramedical workers.
Equipment: Portable X Ray machine, ventilators, large oxygen cylinders, pulse oxymeter
Supplies: Adequate quantities of PPE, disinfectants and medications (Oseltamivir, antibiotics and other medicines)

Transfer Guidelines

Many times children are transferred to tertiary care hospital in very poor condition leading to increased mortality. Some suggestions to improve survival of transferred children include:

1. Early transfer when child has still not decompensated into respiratory or cardiac failure.
2. Giving 1st dose oseltamivir and antibiotic in the referring facility or ambulance if possible.
3. Avoiding hypothermia during transport.
4. If possible, give Oxygen (preferably by indigenous Bubble CPAP)* and IV fluids during transfer.
5. Communication with PICU of tertiary care centre.

Link for you tube video on how to prepare indigenous CPAP:
You tube video link: How to initiate Bubble CPAP
https://www.youtube.com/watch?v=peNMwC4URsA&t=54s
or Google : Bubble CPAP+ Sassoon+Indigenous

Reporting:

Form C and D as mandatory should be filled completely.
If not filled diligently, we miss important information on the time line of events like onset of symptoms,1st ,2 nd doctor consulted and treatment given their along with mobile number of doctor, oseltamivir first dose administration date etc.

Prevention and Chemoprophylaxis:

Vaccination of high risk groups is very important to prevent high morbidity and mortality.

<1 year: Safety and efficacy not established for prophylaxis

>1 year

- <15 kg: 30 mg PO q Day x10 days
- 15-23 kg: 45 mg PO q Day x10 days
- 23-40 kg: 60 mg PO q Day x10 days
- >40 kg: 75 mg PO q Day x10 days

Dosing considerations

- Start within 2 days of exposure

Vaccine:

The influenza vaccine is recommended only for the category of 'high-risk children'. This category contains the following:

- Chronic cardiac, pulmonary (excluding asthma)
- Hematologic and Renal (including nephrotic syndrome) condition,
- Chronic liver diseases
- Congenital or acquired immunodeficiency (including HIV infection)
- Children on long term salicylates therapy

Vaccine given should be Southern hemisphere vaccine, preferably given before rains i.e. April to May.

School Joining:

Children shed virus for average 7 days after onset of fever.Hence they should stay at home and join school after 7 days of onset of fever.

Reporting:

H1N1 is a notifiable disease. As soon as a swab report is positive,the concerned hospital should inform the concerned authority (Public Health) immediately. In case of Pune ,the information also needs to be shared with PMC (Pune Municipal Corporation) along with form C and D .

References:

1.Government of India(MOHFW) guidelines.Available at https://mohfw.gov.in/swine-flu-h1n1-seasonal-influenza

2.WHOguidelines.Avaialble at http://www.who.int/csr/resources/publications/swineflu/clinical_management/en/

3.Kinikar AA[1], Kulkarni RK, Valvi CT, Mave VIndian J Pediatr. 2012 Apr;79(4):459-66. doi: 10.1007/s12098-011-0578-7. Epub 2011 Oct 20.Predictors of mortality in hospitalized children with pandemic H1N1 influenza 2009 in Pune, India.

4.Stuart R Dalzieletal.Predictors of severe H1N1 infection in children presenting within Pediatric Emergency Research Networks (PERN): retrospective case-control study

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ANNEXURE I: NORMAL RESPIRATORY AND HEART RATES IN CHILDREN

NORMAL RESPIRATORY RATES IN CHILDREN

AGE	BREATHS PER MINUTE
Infant	30-53
1-3 years	22-37
4-5 years	20-28
6-12 years	18-25

NORMAL HEART RATES AT REST IN CHILDREN:

AGE	LOWER LIMIT OF NORMAL (beats/min)	AVERAGE (beats/min)	UPPER LIMITS OF NORMAL (beats/min)
Newborn	70	125	190
1-11 months	80	120	160
2years	80	110	130
4 years	80	100	120
years	75	100	115
8 years	70	90	110
10 years	70	90	110

As per IMNCI guidelines following are the respiratory rates per minute above which children are considered to have fast breathing:

0-2 Months: Above 60

2-12 Months: Above 50

>1 year: Above 40

ANNEXURE II: Swab collection and Transport (adapted from MOHFW guidelines)

Collection of Throat Swab:

What sample to be collected?

Respiratory specimens including: bronchoalveolar lavage, tracheal aspirates, nasopharyngeal or oropharyngeal aspirates as washes, and nasopharyngeal or oropharyngeal swabs. Swab specimens should be collected only on swabs with a synthetic tip (such as polyester or Dacron) and aluminium or plastic shaft. Swabs with cotton and wooden shafts are not recommended. Specimens collected with swabs made of calcium alginate are acceptable.

When to Collect Respiratory Specimens?

- As soon as possible after symptoms begin
- Before antiviral medications are administered
- Even if symptoms began more than one week ago

Specimen: before initiating collection of sample a full complement of PPE should be worn**.**

Personal Protective Equipment

- Masks (N-95)
- Gloves
- Protective eye wear (goggles)
- Hair covers
- Boot or shoe covers
- Protective clothing (gown or apron**)**

Throat Swab

- Easy to do
- Highest yield in detecting H1N1 influenza in suspected cases
- Have the patient open his/her mouth wide open.
- The patient should try to resist gagging and closing the mouth while the swab touches the back of the throat near the tonsils.

Label

Specimen No. :

Patient's Name :

Hospital Name :

Unique ID No. :

How to Store Specimens

- Store specimens at 4 °C before and during transportation within 48 hours
- Store specimens at -70 °C beyond 48 hours
- Do not store in standard freezer – keep on ice or in refrigerator
- Avoid freeze-thaw cycles
- Better to keep on ice for a week than to have repeat freeze and thaw

Transportation of specimens

Refer to WHO guidelines for the safe transport of infectious substances and diagnostic specimens

- Follow local regulations on the transportation of infectious material
- Coordinate with the laboratory
  - All samples should be transported after proper packaging using the standard triple packaging system (WHO) and it should accompany with the clinical details.
  - While transportation cold chain should be maintained

Waste Disposal: should be done as per guidelines of your hospital

Maintain adequately stocked specimen collection kits and store them properly when

they are not in use.

General Biosafety Measures

- Clinical samples should be collected by hospital staff and not by the laboratory staff.
- All clinical samples have to be collected wearing complete complement of PPE.
- While taking samples always use N95 mask.
- Use Latex disposable gloves.
- Wear laboratory coat/disposable apron.
- Always cover your hairs with head cover.
- Use protective eye wear (goggles)/face shields

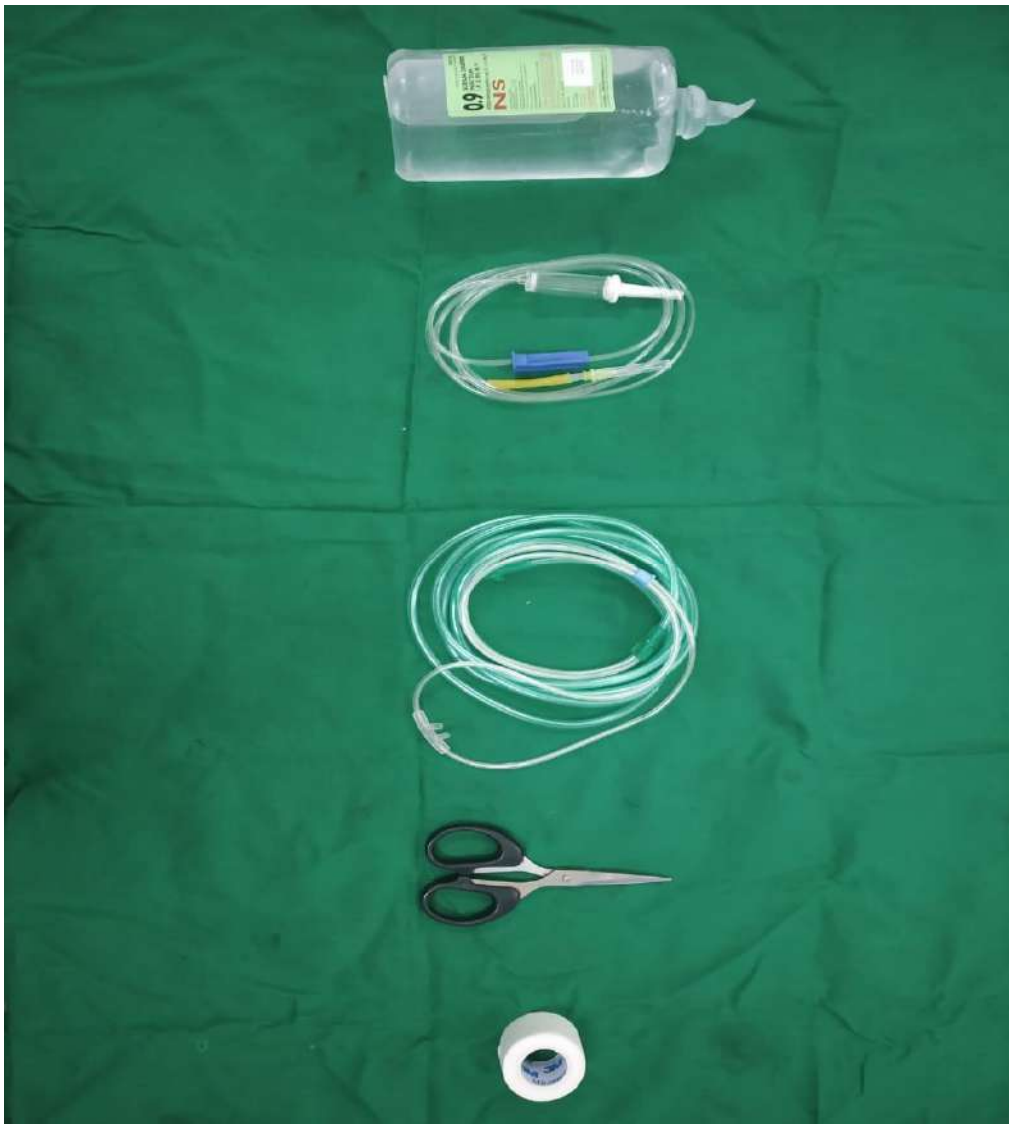
ANNEXURE3 :

REQUIREMENT FOR INDIGENOUS BUBBLE CPAP AND YOU TUBE VIDEO LINK

- Link for you tube video on how to prepare indigenous CPAP:
  You tube video link: How to initiate Bubble CPAP

  https://www.youtube.com/watch?v=peNMwC4URsA&t=54s

  or Google : Bubble CPAP+ Sassoon+Indigenous



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