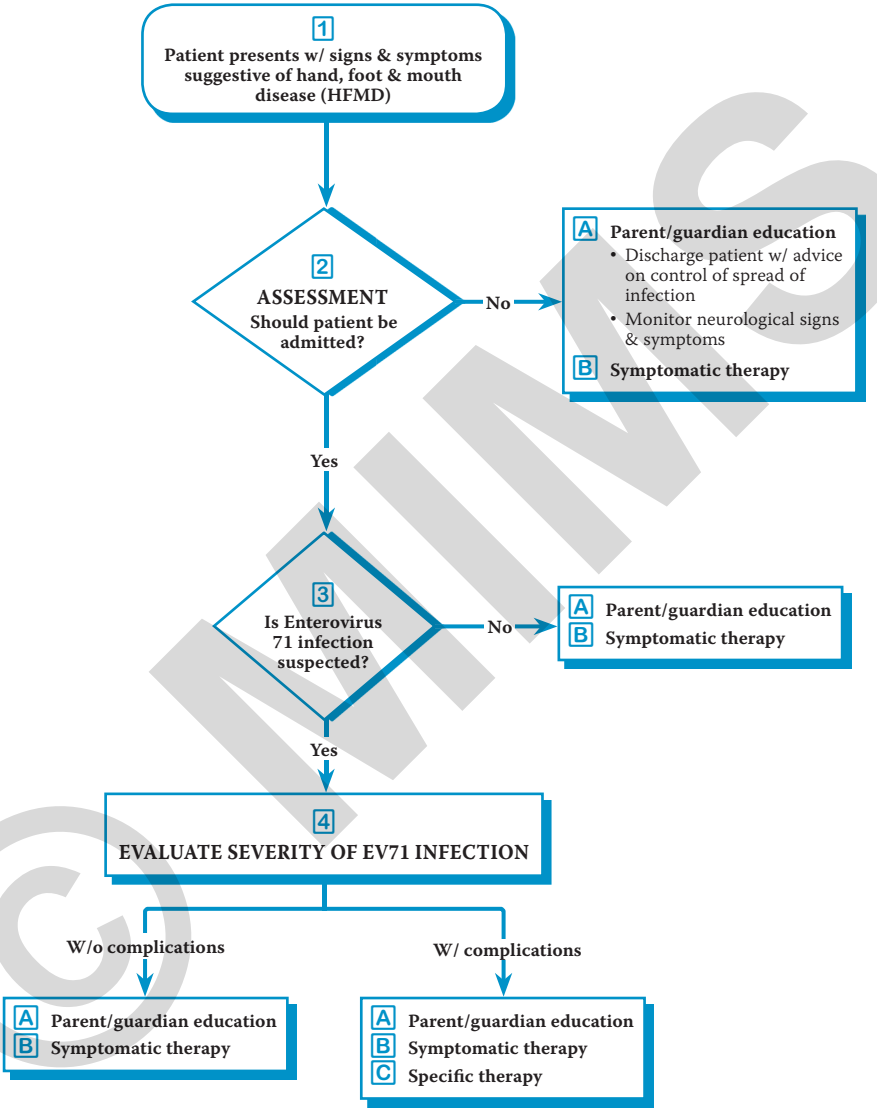
Hand, Foot & Mouth Disease (1 of 4)



1 HAND, FOOT & MOUTH DISEASE (HFMD)

- Characterized by fever, vesicular stomatitis, & papular/vesicular lesions located peripherally (ie palms of hands, knees, soles of feet, buttocks or genitalia)
  - HFMD may present as solely peripheral or oral, or both
- Oral vesicular lesions are 1-3 mm, mostly found on the buccal mucosa, tongue & soft palate
  - Vesicles may have ulcerated at the time of examination
- Each oral lesion is surrounded by erythema & is tender to touch
  - Oral lesions commonly develop 1-2 days after onset of fever
- Patient may complain of sore throat or sore mouth, fever & may be difficult to feed
  - Skin lesions begin as non-itchy rash that develops over 1-2 days
- Infection may spread to household member & close contacts
  - Person to person spread by direct contact w/ unwashed contaminated hands, nasal & throat discharge, saliva, fluid from blisters, stool, or contact w/ contaminated surfaces
  - The 1st wk of illness is the most contagious period
- Most common cause of HFMD is coxsackievirus A16 (CA16)
  - Other possible causes are group A & B coxsackieviruses, & enterovirus 71
  - Enterovirus 71 infection may be accompanied by neurologic complications & has been associated w/ disease outbreaks

2 CRITERIA FOR ADMISSION

- IV rehydration is warranted
- Patient is clinically very ill or toxic-looking
- Temp >38°C for >48 hr
- High suspicion of cardiac or neurologic complications
- Guardian is unable to cope & care for the patient

3 ENTEROVIRUS 71 (EV71)

- Has caused disease outbreaks in Taiwan, Singapore & Malaysia
- Infection usually causes fever w/ temp >39°C & for >3 days
- Causes a more severe infection
- May be accompanied by complications:
  - Meningitis
  - Encephalitis
  - Neurogenic pulmonary edema
  - Myocarditis
  - Acute flaccid paralysis

Risk Factors:

- Age may determine susceptibility to the disease & protective antibody levels
- Close contact (eg household, daycare)
  - Patient may be asymptomatic & may serve as reservoir for spread of infection

Lab Exams:

- Swab specimens
  - Throat & vesicle swabs are the most recommended samples for virus detection &/or isolation
  - Stool samples/rectal swab may also be used
- Cerebrospinal fluid examination
  - Used for patients w/ HFMD w/ suspected CNS involvement
  - May be used for EV71 & CA16 virus detection; also used for detection &/or isolation of enteroviruses
    - Has <5% virus detection rate
- Blood examinations:
  - Complete blood count, blood glucose
  - Blood culture - used to rule out septicemic shock in HFMD w/ cardiopulmonary failure
- Indirect immunofluorescence assay (IFA)
  - A rapid but expensive test used for EV71 identification
- Echocardiography
  - May be considered for patients w/ HFMD w/ suspected CNS & ANS involvement
- Magnetic Resonance Imaging (MRI)
  - Used for patients w/ HFMD w/ suspected CNS involvement

4 SEVERITY OF EV71-ASSOCIATED HFMD

Stage I (HFMD)
- Manifestations:
  - Oral ulcers
  - Vesicles on palms, soles, knees &/or buttocks
  - Herpangina w/ oral ulcers over anterior tonsils, soft palate, buccal mucosa, or uvula
- Systemic symptoms are generally brief & the patient recovers w/in 7 days
- Infection is self-limited & patients spontaneously recover

Stage II (CNS Involvement)
- Manifestations:
  - May be confirmed w/ CSF analysis & isolation in cell culture or PCR
  - Disturbances in motor function may persist for weeks but will slowly resolve
  - Viral meningitis does not lead to long-term neurologic or cognitive sequelae; however, viral encephalitis may lead to neurologic sequelae & deaths are rare but may occur
  - Acute motor neuron disease may occur
    - Transient muscle weakness is more common than flaccid paralysis
    - Temporary paresis
    - Cranial nerve involvement may result in complete unilateral occulomotor palsy

Stage IIIa (Autonomic Nervous System Dysregulation)
- Manifestations:
  - Cold sweating, mottled skin, tachycardia, tachypnea, & hypertension
  - Patients should be treated w/ IV immunoglobulin

Stage IIIb (Cardiopulmonary Failure)
- Manifestations:
  - Pulmonary edema
  - Decreased ejection fraction (EF) of left ventricle
  - Noninvasive hemodynamic monitoring provides information while under intensive care

Stage IV
- Convalescence/recovery phase from cardiopulmonary failure

A PARENT/GUARDIAN EDUCATION

- Inform the parent/guardian of the patient's diagnosis & the possible complications that may occur
  - Infection caused by EV71 are usually accompanied by neurological complications
  - Infection caused by coxsackievirus A16 is the common HFMD disease w/ uneventful clinical course & where full recovery is expected
- Patient should be brought back for consult if any of the following is observed:
  - High fever
  - Lethargy & weakness
  - Child is difficult to feed
  - Urine output is decreased
  - Rapid breathing
  - Vomiting
  - Drowsiness/irritability
  - Unexplained "fits"
  - Myoclonus jerk
  - Limb paralysis
- Advise parent/guardian that there is no specific treatment for HFMD
  - Maintain adequate fluid intake to prevent dehydration
  - No vaccine is available against causative agents of HFMD

Prevention
- Good hygiene
  - Handwashing
  - Clean dirty surfaces & soiled toys & clothing
  - Avoid close contact w/ infected person

B SYMPTOMATIC THERAPY

Antipyretics
- May be given if patient is febrile

Analgesics
- May be given to patients complaining of pain
- Recommended for patients w/ CNS involvement suffering from headaches

Anticonvulsants/Sedatives
- Eg Midazolam, Phenytoin
- May be considered for patients w/ seizures or frequent myoclonic jerks

Mouthwash/sprays
- Soothes oral discomfort & pain

Vaccines
- Enterovirus 71 vaccine
  - A vaccine against EV71 that is currently being developed but needs further studies to prove efficacy
  - One study revealed a 90% efficacy against HFMD & 80.4% efficacy against EV71-associated diseases

C SPECIFIC THERAPY

Intravenous Immunoglobulin (IVIg)
- Recommended for patients w/ encephalitis, acute flaccid paralysis & autonomic nervous system dysregulation
- May be considered for patients w/ brainstem encephalitis

Inotropes
- Eg Dobutamine Dopamine, Epinephrine, Milrinone
- Decreased left ventricular EF & cardiopulmonary failure warrants inotropic agent support
- Dobutamine
  - Cold sweating, mottled skin, tachycardia, tachypnea, & hypertension
  - Patients should be treated w/ IV immunoglobulin
- Milrinone
  - Should be given to patients w/ pulmonary edema because of both inotropic & vasodilator properties

Antibiotics
- May be used for patients w/ suspected bacterial disease until infection has been ruled out