

Guidance note for treating dengue cases in Hospital

Clinical evaluation of admitted patients should include the following:-

Step 1: Patient's history should include:

- Date of onset of fever onset (date is preferable to the number of days of fever)
- Other symptoms and severity
- **Ask the 3 three golden questions:**
 - Oral fluid intake-quantity and types of fluids
 - Urine output-quantify in terms of frequency and estimated volume and time of most recent voiding
 - Types of activities performed during this illness (e.g., can the patient go to school, work, market, etc?)

These questions, though not specific to dengue, give a good indication of patient's hydration status and how well the patient copes with his illness.

- Other fluid losses-such as vomiting or diarrhoea
- Presence of warning signs, particularly after the first 72 h of fever
- Family or neighbor having dengue or travel to dengue-endemic areas
- Medications (including non-prescription or traditional medicine) in use
- List of medications and the time they were last taken
- Risk factors

Step 2: Physical examination- Assess:

- Body weight [Fluid management depends on it]
- Mental state
- Hydration status; record of oral fluid and urine output
- Temperature; also note pulse rate and BP (record in chart)
- Tachypnoea/ acidotic breathing/ pleural effusion
- Abdominal tenderness/ hepatomegaly/ ascites
- Rash and bleeding manifestations
- **Tourniquet test** (repeat if previously negative or if there is no bleeding manifestation):
Keep pressure of the BP cuff between systolic & diastolic BP. Wait for 5 mins. Test is positive if >10 petechial spots appear on 1 sq. inch skin in cubital area.

Step 3: Investigation

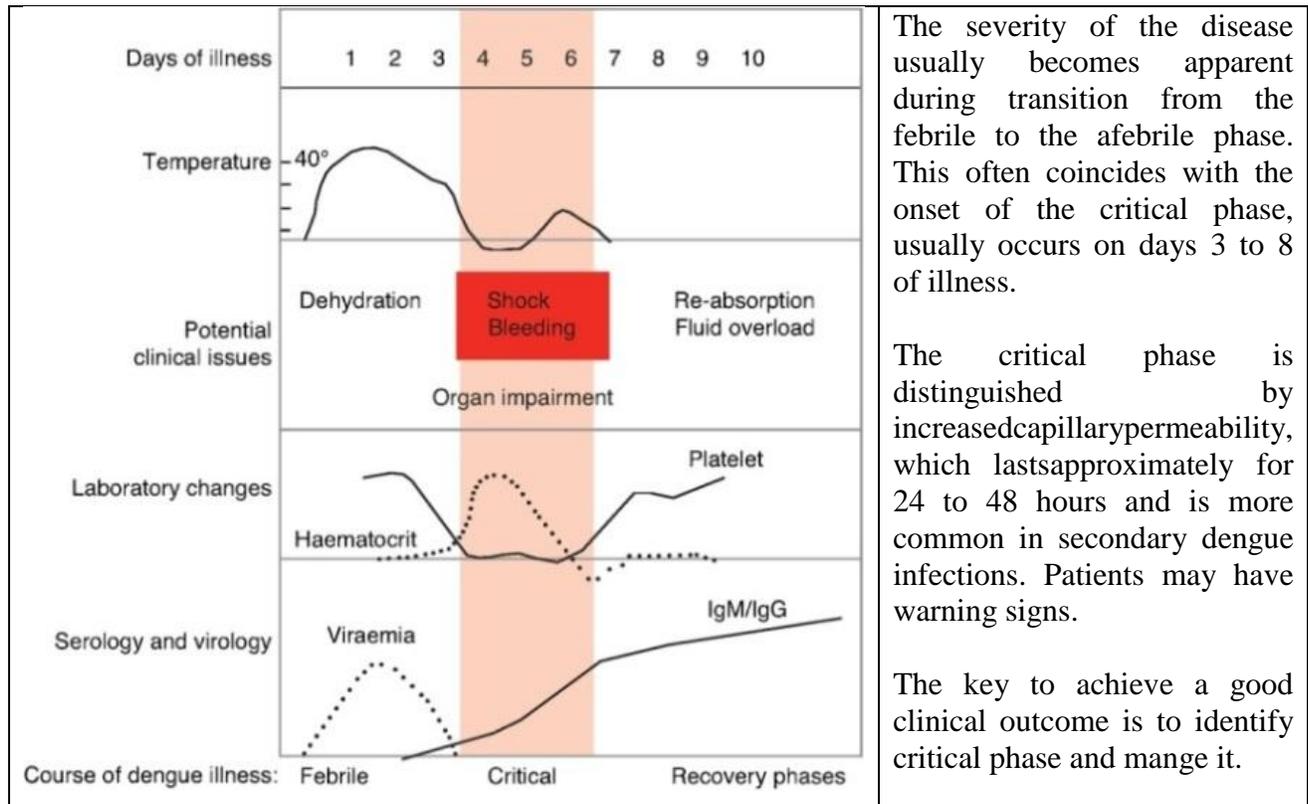
For confirmation of dengue infection, Government of India (GoI) recommends use of **ELISA-based antigen detection test (NS1)** for diagnosing the cases from the first day till the fifth day and antibody detection test **IgM capture ELISA (MAC-ELISA)** for diagnosing the cases after the fifth day of onset of fever.

- A full blood count (FBC) is to be done in the early febrile phase to establish the baseline haematocrit. This should be repeated after the 3rd day of illness and in those with warning signs and with risk factors for severe disease. In the absence of a baseline HCT level, a HCT value of >40% in female adults and children aged <12 years and >46% in male adults should raise the suspicion of plasma leakage.
- Leucopenia (≤ 5000 cells/mm³) usually precedes the onset of the critical phase and has been associated with severe disease. A rapid decrease in platelet count, concomitant with a rising haematocrit compared to the baseline, is suggestive of critical phase of the disease. A decreasing white blood cell and platelet count makes the diagnosis of dengue very likely.
- Additional tests such as LFT, glucose, serum electrolytes, urea and creatinine, bicarbonate or lactate, cardiac enzymes, ECG and urine-specific gravity should be considered in patients with co-morbidities or in patients with clinically severe disease as indicated. Aspartate aminotransferase (AST) levels are higher compared to the levels of alanine aminotransferase (ALT). The degree of rise of AST and ALT are significantly more in DHF and DSS, as compared to DF.

Warning and danger signs and symptoms of dengue fever

- Bleeding: epistaxis, scanty haemoptysis, haematemesis, gum bleeding, black coloured stools, excessive menstrual bleeding, dark-coloured urine or haematuria
- Lethargy and/or restlessness, sudden behavioural changes
- Convulsions
- Difficulty in breathing or palpitation or breathlessness
- Persistent vomiting >3 times a day
- Severe abdominal pain
- Enlarged and/or tender liver
- Clinical fluid accumulation
- Postural hypotension-dizziness
- Pale, cold clammy hands and feet
- Not able to drink and no urine output for 4-6 h/ urine output less than 0.5 ml/kg/h
- Rising HCT (>45%) together with rapid fall in platelet count
- Metabolic acidosis
- Derangement of liver/ kidney function tests
- Pleural effusion/ ascites/ gall bladder oedema on imaging

It is important to note that the warning signs should not be randomly applied without making a clinical diagnosis of dengue.



The severity of the disease usually becomes apparent during transition from the febrile to the afebrile phase. This often coincides with the onset of the critical phase, usually occurs on days 3 to 8 of illness.

The critical phase is distinguished by increased capillary permeability, which lasts approximately for 24 to 48 hours and is more common in secondary dengue infections. Patients may have warning signs.

The key to achieve a good clinical outcome is to identify critical phase and manage it.

Identify when patient is worsening

- Worsening hypovolemic shock manifests as increasing tachycardia and peripheral vasoconstriction. Not only are the extremities cold and cyanosed but the limbs become mottled, cold and clammy.
- Breathing becomes more rapid and increases in depth – a compensation for the metabolic acidosis (Kussmaul’s breathing).
- BP decreases and pulse pressure (difference between systolic and diastolic BPs) becomes narrow. The peripheral pulses disappear while the central pulse (femoral) will be weak.
- The patient becomes restless, confused and extremely lethargic. Seizures may occur and agitation may alternate with lethargy. On the other hand, children and young adults have been known to have a clear mental status even in profound shock. In adults shock may develop all of a sudden in a patient who was apparently stable until then.
- The failure of infants and children to recognize, focus or make eye contact with parents may be an early ominous sign of cortical hypo perfusion, as is the failure to respond to painful stimuli such as venepuncture. Parents may be the first to recognize these signs – but they may be unable to describe them, other than to say something is wrong. Listen to parents! Hypotension is a late finding and signals an imminent total cardiorespiratory collapse.

Points to remember while managing Dengue

- i. Follow general management protocol.
- ii. Use only Paracetamol to manage fever & aches. **Do not use Aspirin/ NSAIDS.**
- iii. Encourage frequent small amount of oral fluid intake to replace fluid loss from fever and vomiting. Coconut water, rice water or barley water, ORS, soup, fruit juices etc. may be given to prevent electrolyte imbalance and are preferable to plain water. Commercial cold drinks should be avoided. Sufficient oral fluid intake should result in a urinary frequency of at least 4 to 6 times per day. A record of oral fluid and urine output could be maintained and reviewed daily in the ambulatory setting.
- iv. **Choice of IV fluids & calculation of fluid is very important. Fluid replacement therapy is very important- both initial replacement and maintenance dose. Normally change should not be drastic. Increasing and decreasing the rate should be stepwise manner.**[For details refer to treatment algorithm in pages 13 & 15 to 17 of Medical Officers' Handbook for Clinical Management of Dengue & Malaria; vide: IDSP link in www.wbhealth.gov.in]
- v. The decision about the speed of IV fluid should be reviewed every 1-3 hours. The frequency of monitoring should be determined on the basis of the condition of the patient.
- vi. One should keep a watch for urine output, liver size and signs of pulmonary oedema. Hypervolemia is a common complication, especially during recovery phase (due to fluid reabsorption from tissue spaces).
- vii. Remember inadequate replacement or overloads, both are dangerous. Normally intravenous fluids are not required beyond 36 to 48 hrs.
- viii. Patient with few co-morbidities need detailed evaluation and critical management- Diabetes, hypertension, hepatitis, renal failure. Management of dengue in infants and in pregnancy is critical.
- ix. Admitted patients should be monitored for at least 48 hours after they become afebrile, for development of complications.

Indications for blood transfusion

- Loss of blood (overt blood)—10% or more of total blood volume
- Refractory shock despite adequate fluid administration, and declining Hct
- Replacement volume should be 10 ml/kg body weight at a time and coagulogram should be done
- If fluid overload is present, packed-cell volume (PCV) is to be given.

Indications for platelet transfusion

- Platelet transfusion is not the mainstay of treatment in patients with DF. In general, there is no need to give prophylactic platelets even if at platelet count $>10\,000/\text{mm}^3$.
- Prophylactic platelet transfusion may be given at levels of $<10\,000/\text{mm}^3$ in the absence of bleeding manifestations
- Haemorrhage with or without thrombocytopenia- transfuse platelet
- Prolonged shock with coagulopathy and abnormal coagulogram
- In case of systemic bleeding, platelet transfusion may be needed in addition to red cell transfusion. Whole fresh blood transfusion doesn't have any role in managing thrombocytopenia.

Early signs of developing shock/ deterioration in a patient of dengue:

- Sudden drop of body temperature
- Severe/ increasing pain in abdomen
- Abdominal distension
- Nausea turned into vomiting, specially > 3 times
- Narrowing of Pulse pressure
- Undue tachycardia
- Extreme prostration or lethargy
- Appearance of drowsiness / loss of eye-to-eye contact/ irritability specially in children
- Very little urine output in last 6 hours / High Coloured Urine
- Shortness of breath
- Rising haematocrit (PCV)

Suggested Admission & Discharge criteria

Warning signs	Persistent high grade fever (38.5°C and above) Any of the warning signs including sudden drop of temperature
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Signs and symptoms related to hypotension (possible plasma leakage)	Dehydrated patient, unable to tolerate oral fluids Dizziness or postural hypotension Profuse perspiration, fainting, prostration during defervescence Hypotension or cold extremities Difficulty in breathing/shortness of breath (deep sighing breaths)
Bleeding	Spontaneous bleeding, independent of the platelet count
Organ impairment	Renal, hepatic, neurological or cardiac – enlarged, tender liver, although not yet in shock – chest pain or respiratory distress, cyanosis
Findings through further Investigations	Rising haematocrit Pleural effusion, ascites or asymptomatic gall-bladder thickening
Co-existing conditions	Pregnancy Co-morbid conditions, such as diabetes mellitus, hypertension, peptic ulcer, haemolytic anemias and others Overweight or obese (rapid venous access difficult in emergency) Infancy or old age
Social circumstances	Living alone Living far from health facility Without reliable means of transport

Discharge criteria
The admitted patients who have recovered from acute dengue infection with visible clinical improvement having no fever for at least 24 - 48 hours, normal blood pressure, no respiratory distress from pleural effusion or ascites, improvement in clinical status (general well-being, return of appetite, adequate urine output, no respiratory distress), persistent platelet count >50,000/cu.mm should be discharged from hospital.

N.B. This is suggestive only, and MO should judge on cases to case basis and decide.

For reference you may see the Medical Officers' Handbook for Clinical Management of Dengue & Malaria brought out by the Dept. of Health & FW, Govt. of WB; available from IDSP link in www.wbhealth.gov.in