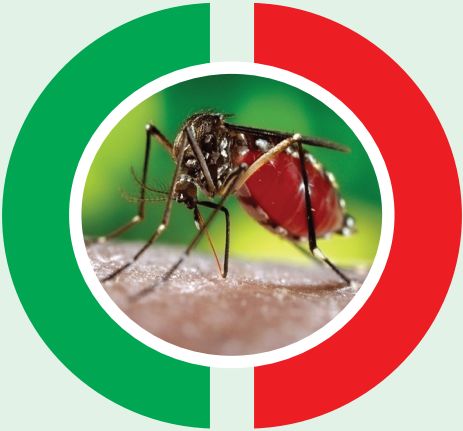
# Pocket Guideline
# for
# Dengue Clinical Case Management
# 2022 (Revised)



**National Malaria Elimination &**
**Aedes Transmitted Diseases Control Program**
**Disease Control Division**
**Directorate General of Health Services**
**Mohakhali, Dhaka-1212**

DGHS.MOHFW BANGLADESH

স্বাস্থ্য ও পরিবার কল্যাণ মন্ত্রণালয়

World Health Organization
Bangladesh

# Pocket Guideline for Dengue Clinical Case Management 2022 (Revised)




**National Malaria Elimination &**
**Aedes Transmitted Diseases Control Program**
**Disease Control Division, DGHS**
**Mohakhali, Dhaka-1212**

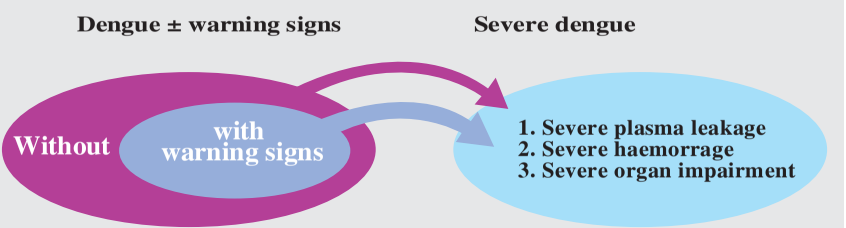
## New revised WHO Dengue case classification by severity

**A) Dengue without warning signs: Group A (Send home).**

**B) Dengue with warning signs: Group B (Referred for in-hospital care).**

**C) Severe dengue: Group C (Require emergency management).**

## Dengue case classification by severity




### Criteria for dengue ±warning signs

**Probable Dengue**
Live in/travel to dengue endemic area. Fever and 2 of the following criteria
- Nausea, vomiting
- Rash
- Aches and pains
- Tourniquet test positive
- Leucopenia
- Any Warning singn

**Laboratory Confirmed dengue**
(important when no sign of plasma leakage)

**Warning Signs***
- Seveere abdominal pain or tenderness
- Persistent vomiting >3 times/ day
- Persistent diarrhoea >3 times/ day
- Clinical fluid accumulation
- Mucosal bleed
- Lethargy, restlessness
- Liver enlargement >2cm
- Laboratory : Increase in Hct. concurrent with rapid decrease in platelet count
- Requiring strict observation and medical intervention

### Criteria for severe dengue

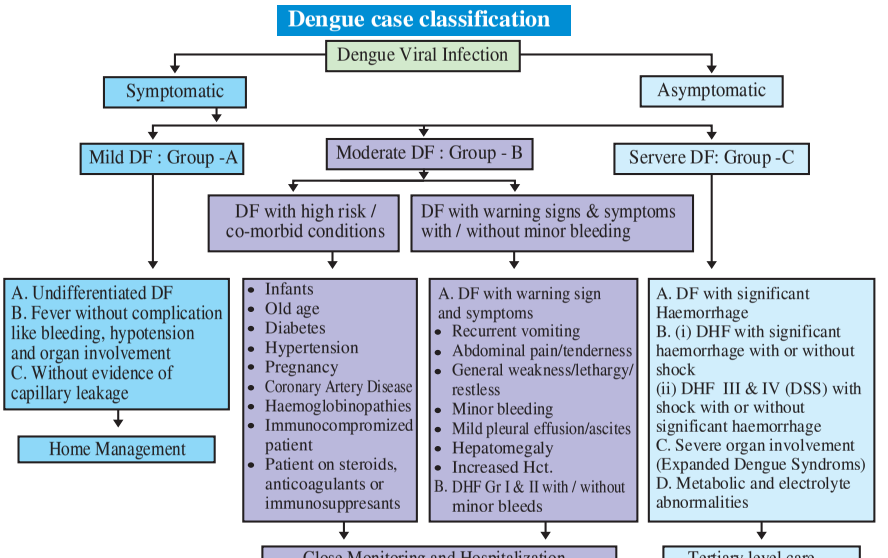
**1. Severe Plasma Leakage**
leading to :
- Shock (DSS)
- Fluid accumulation with respiratory distress

**2. Severe Bleeding**
as evaluated by clinician

**3. Severe Organ Involvement**
- Liver: AST or ALT>=1000
- CNS: Impaired consciousness
- Heart and other organs

**4. Metabolic & electrolytes abnormalities**

# Clinical Management



## Clinical Presentation of Dengue

- Dengue fever
- Dengue haemorrhagic fever
- Dengue shock syndrome
- Expanded dengue syndrome

## Dengue fever

- Headache
- Myalgia
- Arthralgia / bone pain (break-bone fever)
- Rash
- GIT manifestations: Nausea, vomiting, diarrhea (seen in recent outbreaks)
- Haemorrhagic manifestations (mild, unusual hemorrhage)
- Leukopenia (WBC <5,000 cells/mm3)
  Platelet count $\leq$ 150,000 cells/mm3
- Rising Hct. 5-10%

## Diagnosis:

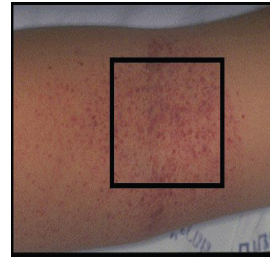
Tourniquet test positive + WBC $\leq$ 5,000 cells/cu.mm
(positive predictive value = 83%)

# Tourniquet Test

The tourniquet test is part of the new WHO case definition for Dengue. The test is a marker of capillary fragility and it can be used as a triage tool to differentiate patients with Dengue fever from other non Dengue febrile illness.

## How to do a Tourniquet Test

- Take the patient's blood pressure and record it, for example, 100/70.
- Inflate the cuff to a point midway between SBP and DBP and maintain for 5 minutes. (100+70)/2= 85 mm Hg
- The pressure is released for at least one minute and the skin below the cuff is examine for petechiae. See image at right
- A finding of 10 or more petechiae in one square inch area considered positive. In DHF, the test usually gives a definite positive result when there is 20 petechiae per 1 inch with a sensitivity of more than 90%



Positive tourniquet test with greater than 10 petechiae per one square inch

## Dengue Haemorrhagic Fever

### Clinical:

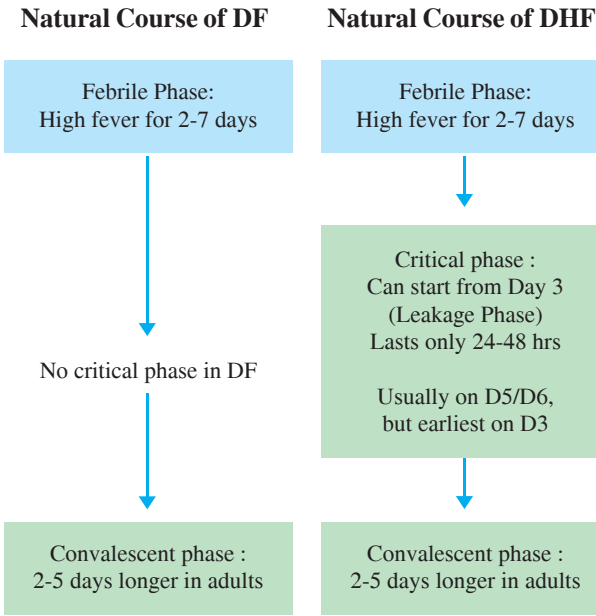
- High, continuous fever 2-7 days.
- Haemorrhagic manifestations; tourniquet test positive, petechiae, epistaxis, haematemesis etc.
- Liver enlargement ±
- Shock ±

### Laboratory:

- Evidence of plasma leakage; rising Hct. ≥20%, pleural effusion, ascites, hypoalbuminemia (serum albumin <3.5 gm% or <4gm% in obese patients)
- Platelet count ≤100,000 cells/$mm^3$.

**Evidence of Plasma Leakage (key differentiating point between Dengue and Dengue Haemorrhagic Fever)**

- Rise in Hct. : 20% (eg. In children 35 → 42 and in adults 40 → 48)
- Circulatory failure: Cold/cold clammy skin, CRFT>2 Sec, tachycardia, weak pulse, narrow pulse pressure <20, hypotension.
- Fluid accumulation – Ascites/ Pleural effusions
- Albumin <3.5 gm/dl


Natural Course of DF
Natural Course of DHF
Febrile Phase:
High fever for 2-7 days
Febrile Phase:
High fever for 2-7 days
No critical phase in DF
Critical phase :
Can start from Day 3
(Leakage Phase)
Lasts only 24-48 hrs
Usually on D5/D6,
but earliest on D3
Convalescent phase :
2-5 days longer in adults
Convalescent phase :
2-5 days longer in adults

## Dengue Shock Syndrome

**Clinical Signs of Dengue Shock Syndrome:**

- Cool extremities, delayed capillary refill time
- Lethargy or restlessness (which may be a sign of reduced brain perfusion)
- Tachypnoea or Kussmaul's breathing
- Tachycardia, weak pulse
- Narrow pulse pressure: Pulse pressure ≤20 mmHg with increased diastolic pressure, e.g. 100/80 mmHg
- Hypotension by age, defined as systolic pressure <80 mmHg for those aged <5 years or 80 to 90 mmHg for older children and adults

## Expanded Dengue Syndrome

- Unusual manifestations with **severe organ involvement such as liver, kidneys, brain or heart associated with Dengue infection** reported in DHF and also in DF who do not have evidence of plasma leakage.

- These unusual manifestations may be associated with co-infections, co-morbidities or complications of prolonged shock.

## Investigations

- 1 to 5 days of fever : CBC, NS1 antigen, SGOT and SGPT (Not mandatory but helpful)
- After day7 : IgM and IgG Antibodies (Day 5-7 window period)
- Follow up testing may be done on 1st afebrile day, but should be done daily when DHF is suspected
- Haematocrit:
  -A regular haematocrit is more important for management than the thrombocytopenia
  -In severe dengue especially with shock hourly haematocrit is crucial for management

## Clinical and Laboratory Criteria for Patients Who Can Be Treated at Home

- Able to tolerate orally well, good urine output and no history of bleeding

- Absence of warning signs

- Physical examination:
  -Haemodynamically stable
  -No tachypnoea or acidotic breathing.
  -No tender liver or abdominal tenderness
  -No bleeding manifestation
  -No sign of third space fluid accumulation
  -No alterations in mental state

- Investigation:
  -Stable serial Hct.

- No other criteria for admission (i.e- co-morbidities, pregnancy, social factors)

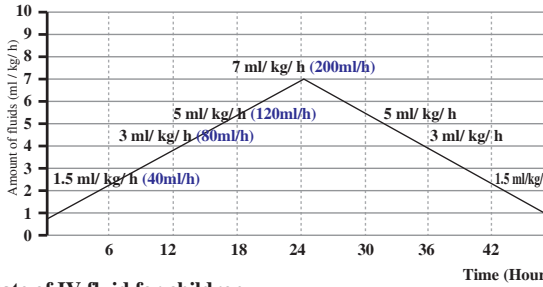
## Management Plan for Group-A Patient

**These patients will be advised for home management**

- Advised for adequate bed rest
- Adequate fluid intake (around 2500 ml or 8-10 glasses for average-sized adults or accordingly in children, around 50ml/kg)-e.g. milk, fruit juice (caution with diabetic patients), oral rehydration solution (ORS) or barley/rice water/coconut water
- Take paracetamol (not more than 3 grams per day for adults; 10-15 mg/kg/dose, not more than 3 to 4 times in 24 hours in children)
- Tepid sponging
- These patients will be advised to avoid Acetylsalicylic acid (aspirin), Mefenamic acid, Ibuprofen or other NSAIDs, Steroids, Antibiotics
- These patients should be immediately taken to the nearest hospital in 1st afebrile day with worsening of the situation or if any warning sign is observed
- Observe urine output. If no urine output for 4–6 hours go immediately to nearby hospital

# Fluid Management Plan for Group-B Patients

**Guide to rate of fluid intake in Critical Phase-without shock**

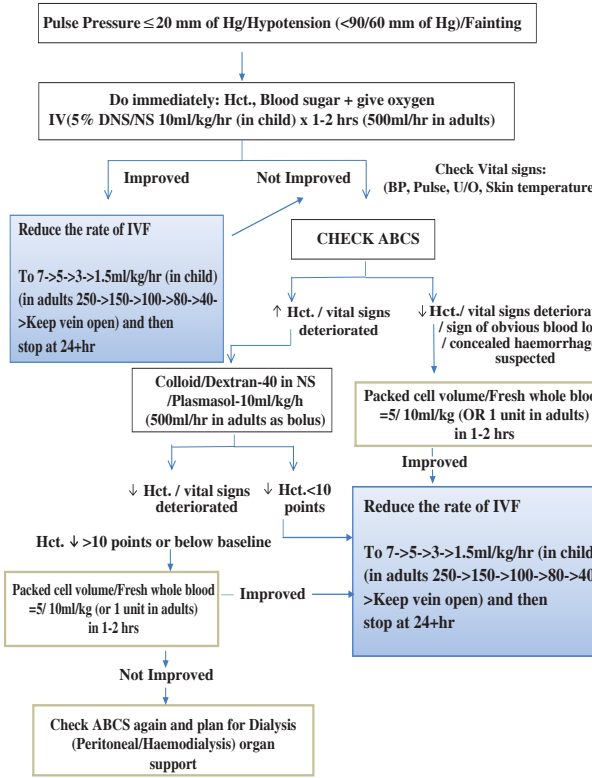



**Rate of IV fluid for children**
**(Fluids for adults are mentioned within brackets)**

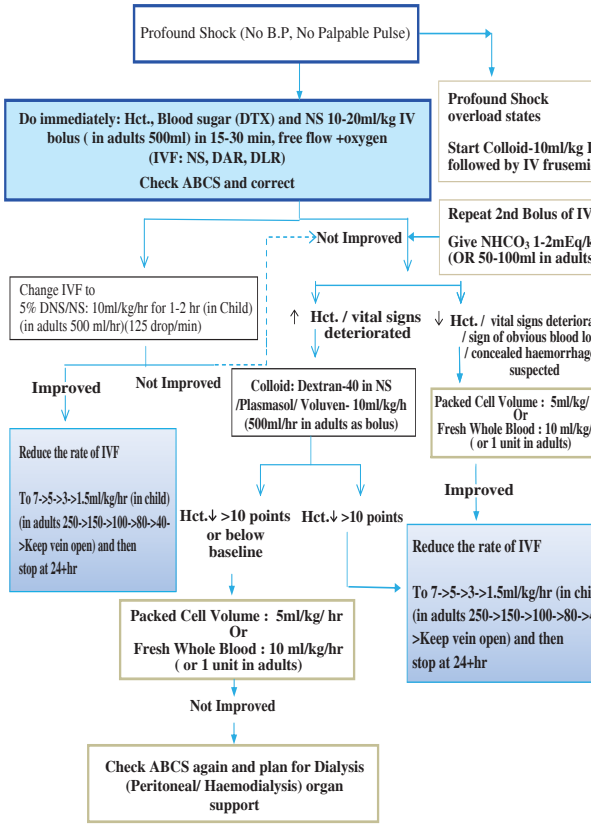
**Starting fluid on the basis of Hct. :**
**Hct. <20:** 1.5 mL/kg/hour for children and 40 mL/hour for adults
**Hct. 20-25:** 3 mL/kg/hour for children and 80 mL/hour for adults
**Hct. >25:** 7 to 10 mL/kg/hour (for children) and 100 to 500 mL/hour for adults

**Drop Calculation :** (ml/h÷4 = drops/min)
40ml/hour = 10 drops/min
80ml/hour = 20 drops/min
100ml/hour = 25 drops/min
200ml /hr = 50 drops/min

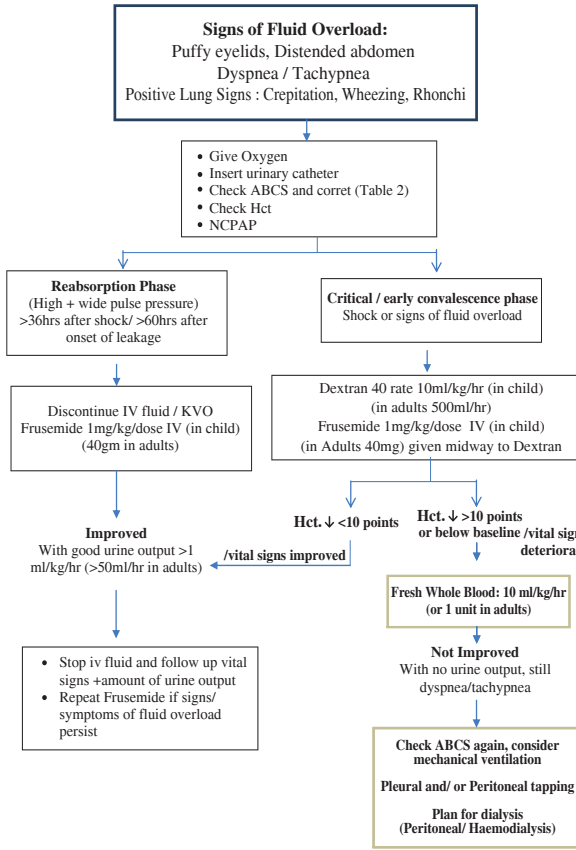
# Figure 1 : IV Fluid Therapy for Compensated Shock



## Figure 2 : Flow Diagram for Profound Shock (Decompensated Shock)



## Figure 3 : Flow Diagram for the Management of Fluid Overload



# IV Fluid in Dengue

**Two types of iv fluids are used in Dengue**

1. Crystalloid (first choice)
2. Colloid

**Indications of iv fluid in Dengue**

- When the patient cannot have adequate oral fluid intake or vomiting
- When Hct continues to rise 10-20% despite oral rehydration
- Impending shock/Shock

**Types of Crystalloid uses in Dengue:**

1) 0.9% NaCl (isotonic normal saline solution) (0.9% NS) (Preferable)

2) 0.45% half strength normal saline solution (0.45% NS) (For children <6 months)

3) 5% dextrose in Ringer's lactate solution (5% DRL)

4) 5% dextrose in acetated Ringer's solution (5% DRA)

5) Hartman solution (Preferable)

## Types of Colloid uses in Dengue:

1) Dextran-based: Dextran 40, Dextran 70
2) Starch based (6% HES):
   - Voluven, Plasmasol (6% hydroxyl ethyl ester with normal saline)
   - Volulyte (6% hydroxyl ethyl ester with balanced electrolyte)
3) Gelatin
4) Human Albumin
5) Plasma
6) Haemaccel
7) Blood and blood components

**Indications of Colloid in Dengue**

- Patients with massive plasma leakage
- Patients with shock with rising Hct.
- Those not responding to the minimum volume of crystalloid
- Those with pulse pressure < 10 mm Hg, who need urgent restore BP

## Indications for Platelet Concentrate

It has been observed that there is very limited role of platelet transfusion. In most of the situation fresh whole blood transfusion is suffice. However it may be required in some special situation. The indication of which may be as follows:

1. Very Severe Thrombocytopania who need urgent surgery
2. Clinical judgement of the treating physician

**Indications for blood transfusion**

- Overt bleeding (more than 10% or 6-8ml/kg)
- Significant drop of Hct. < 40 (<45 for males) after fluid resuscitation
- Hypotensive shock + low/normal Hct.
- Persistent or worsening metabolic acidosis
- Refractory shock after fluid 40-60 ml/kg

## Dengue with Organopathy (Expanded Dengue Syndrome): Management Issue

Severe Dengue can be complicated with Myocarditis, Encephalopathy/ Encephalitis/Acute liver failure, AKI, ARDS and sometimes with multiorgan failure (MOF)

- These complicated patient should be managed by Medicine Specialist/Pediatricians for comprehensive care
- In myocarditis with raised Troponin I and ECG changes (Bradycardia, Tachycardia, ST-T changes) injudicious use of antiplatelet, anticoagulant or intervention (e.g. pacemaker and others) should be avoided (20% fluid is to be reduced)
- In encephalitis, judicious use of steroids can be given. (Dexamethasone: 0.15 mg / kg 6-8 hourly for 3-5 days)
- In hepatic encephalopathy in dengue, the management should be done as per protocol of Hepatic Encephalopathy
- For AKI, ARDS or multiorgan failure, appropriate supportive care should be provided

- **Hepatic Encephalopathy:**

- O2 Therapy
- Fluid: 20% fluid reduction
- Colloid
- Frusemide in fluid overload
- Lactulose
- H2 receptor blocker
- Rifaximin
- FFP

**Monitoring:**
(Hepatic Encephalopathy)

- Blood suger
- Correction of electrolytes
- Bleeding episodes
- I/O chart
- Any convulsion

**Note : Expanded Dengue Syndrome cases should be managed**

**- In tertiary care setting.**

**- Here management of EDS is highlighted above.**

**- For detailed management further reading is recommended**

- **Pregnancy and Dengue Management:**

- Medical termination is to be avoided
- MR should not allow
- Hospital delivery advised
- Blood should be available
- Multi-disciplinary approach
- Avoid elective C/S & induction of labour
- No episiotomy
- No instrumental delivery
- In Preterm labour advice delay in delivery
- Injection steroid I/V to be given for Premature delivery
- Active management in third stage of labour
- Misoprostol / Tranexamic acid can be (1 gm in 10 ml solution administered slowly over 10 minutes)
- All Dengue patients or suspected Dengue patients with pregnancy must get admitted to hospital for close monitoring

- **In case of child:**

- Shock is to be managed by Normal Saline
- After shock managed, 5% DNS is to used for maintenance
- Below 1 year age: Baby saline ( 0.45% NaCl) is to be used

# PEARLS

| No | Do's | Do Not |
|---|---|---|
| 1 | Administration of Paracetamol for high fever and myalgia. | Send patients with non-severe dengue at home without follow-up and inadequate instructions |
| 2 | Clinical assessment of the haemodynamic status before and after each fluid bolus | Administer of NSAIDs (eg. Aspirin or Ibuprofen) |
| 3 | Give intravenous fluids for repeated vomiting or rapidly rising haematocrit | Miss clinical assessment of patient with respect to fluid therapy |
| 4 | Use the appropriate isotonic intravenous fluids for severe dengue in appropriate time and dose | Use intravenous fluids to any patient with mild dengue (those who can take orally) |
| 5 | Avoid intramuscular injections | Give intramuscular injections to dengue patients |
| 6 | Tight glycaemic control | Avoid monitoring blood glucose |
| 7 | Give appropriate Colloid, Packed Red Cell or Fresh Whole Blood if indicated | Give excessive fluid, blood and blood products |

**Overall Preparation of this Pocket Guideline by:**
**Bangladesh Society of Medicine (BSM)**

**National Guideline link:**

**https://dghs.gov.bd/images/docs/Guideline/NationalGuidelineforDengue2018.pdf**

## Annexure

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## ডেঙ্গু প্রতিরোধে করণীয়

- বর্ষায় (এপ্রিল-অক্টোবর) ডেঙ্গু জ্বরের প্রকোপ বাড়ে। এসময় অধিক সতর্ক থাকুন।
- ডেঙ্গু জ্বরের বাহক এডিস মশা পরিষ্কার পানিতে বংশ বিস্তার করে।
- অফিস, ঘর ও আশেপাশে পানি জমতে দিবেন না। যে কোন পাত্রে জমিয়ে রাখা / জমে থাকা পানি ৩ দিনের মধ্যে পরিবর্তন করুন।
- এডিস মশা সাধারণত দিনের বেলা কামড়ায়। যথাসম্ভব লম্বা পোশাক পরুন। দিনে ঘুমানোর ক্ষেত্রেও মশারী ব্যবহার করুন।

## ডেঙ্গু প্রতিকারে করণীয়

- তীব্র জ্বর, মাথাব্যাথা ও মাংসপেশীতে ব্যাথা, শরীরে লালচে দানা ইত্যাদি ডেঙ্গু রোগের লক্ষণ হলেও সাম্প্রতিক কালে এর ব্যতিক্রম পাওয়া যাচ্ছে।
- জ্বরে প্যারাসিটামল ব্যতীত অন্য ব্যাথানাশক ঔষধ খাওয়া বিরত থাকুন। রোগীকে বেশি বেশি তরল খাবার খাওয়ান।
- জ্বর হলে নিকটস্থ হাসপাতালে চিকিৎসকের পরামর্শ গ্রহণ করুন ও ডেঙ্গু জ্বরের পরীক্ষা করুন।
- জ্বর ভালো হওয়ার পরও ডেঙ্গুজনিত মারাত্মক জটিলতা দেখা দিতে পারে। তাই সতর্ক থাকুন ও হাসপাতালে চিকিৎসা গ্রহণ করুন।

জনস্বার্থে: জাতীয় ম্যালেরিয়া নির্মূল ও এডিস বাহিত রোগ নিয়ন্ত্রণ কর্মসূচী রোগ নিয়ন্ত্রণ শাখা, স্বাস্থ্য অধিদপ্তর, মহাখালী, ঢাকা।

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World Health Organization
Bangladesh