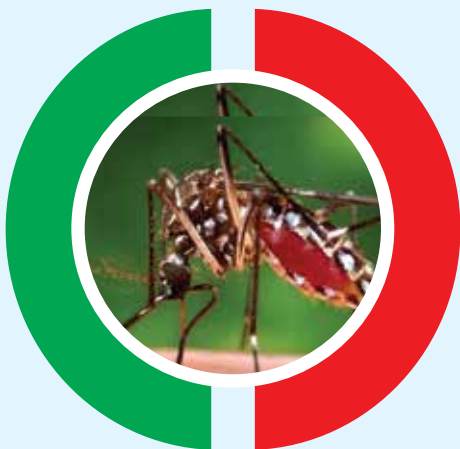




DGHS, MOH&FW  
BANGLADESH

*Pocket Guideline  
for  
Dengue Case Management  
July 2019*



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

# **Pocket Guideline for Dengue Case management**

## **2019**

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# Dengue case classification by severity

Dengue  $\pm$  warning signs

Severe dengue

Without  
with  
warning signs

1. Severe plasma leakage
2. Severe haemorrhage
3. Severe organ impairment

## Criteria for dengue $\pm$ 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 sign

### Laboratory confirmed dengue

(important when no sign of plasma leakage)

### Warning signs\*

- Abdominal pain or tenderness
- Persistent vomiting
- Clinical fluid accumulation
- Mucosal bleed
- Lethargy, restlessness
- Liver enlargement  $>2\text{cm}$
- Laboratory: Increase in HCT concurrent with rapid decrease in platelet count
- *Requiring strict observation and medical intervention*

### 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  $\geq 1000$
- CNS: Impaired consciousness
- Heart and other organs

# Dengue viral Infection

## Symptomatic

## Asymptomatic

### Mild dengue

### Moderate dengue

### Severe dengue

DF with high risk co-morbid conditions

DF with warning signs and symptoms/ DHF-Gr I & II with minor bleeding

- A. Undifferentiated DF
- B. Fever without complication like bleeding. Hypotension and organ involvement
- C. Without evidence of capillary leakage

- Infants
- Old Age
- Diabetes
- Hypertension
- Pregnancy
- CAD
- Hemoglobinopathies
- Immunocompromized patient
- Patient on steroids, anticoagulants or immunosuppressants.

- A. DF with Warning signs and symptoms
  - Recurrent vomiting
  - Abdominal Pain/tenderness
  - General weakness/ letharginess/ restless
  - Mild pleural effusion/ ascites
  - Hepatomegaly
  - Increased Hct > 20%
- B. DHF I & II with Minor bleeds

- A. DF with significant Haemorrhage
- B. (i) DHF with significant haemorrhage with or without shock (ii) DHF III & IV\*\* (DSS)
- C. Severe organ involvement (Expanded dengue Syndrome)
- D. Severe Metabolic Acidosis

Home Management

Close Monitoring\* and possibly Hospitalization

Tertiary level care

## Dengue Fever (Infection)

- Headache
- Retro-orbital pain
- Myalgia
- Arthralgia/ bone pain (break-bone fever)
- Rash
- Hemorrhagic Manifestations
- Leukopenia (WBC < 5,000 cells/ mm<sup>3</sup>)
- Platelet count  $\leq$  150,000 cells/mm<sup>3</sup>
- Rising HCT 5-10%

### Diagnosis :

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

## Dengue Hemorrhagic Fever

### Clinical

- High, continuous fever 2-7 days
- Hemorrhagic manifestations: tourniquet test positive, petechiae, epistaxis, hematemesis, etc...
- (Liver enlargement)
- (Shock)

### Laboratory

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

**Note:** Patients who have definite evidence of plasma leakage, hemorrhagic manifestations and thrombocytopenia might not be present as the exception.

Two hallmarks of (DHF/DSS) are plasma leakage & abnormal Hemostasis that may lead to severe complications and death.

## Figure 1 - Natural Course of Dengue syndrome

There are 3 phases in DHF/DSS

1. Febrile phase 2 – 7 days with mean duration of 4 days
2. Critical/Leakage phase 24 – 48 hours – The best simple indicator available is Platelet  $\leq 100,000$  cells/mm<sup>3</sup>
3. Convalescence phase 3 – 5 days – Aware that reabsorption of extravagated plasma occurs about 36 hours after shock and 60 hours after Platelet  $< 100,000$  cells/mm<sup>3</sup>

Signs of recovery include: A – Appetite, B – Bradycardia, C – Convalescence rash or Itching, D - Diuresis

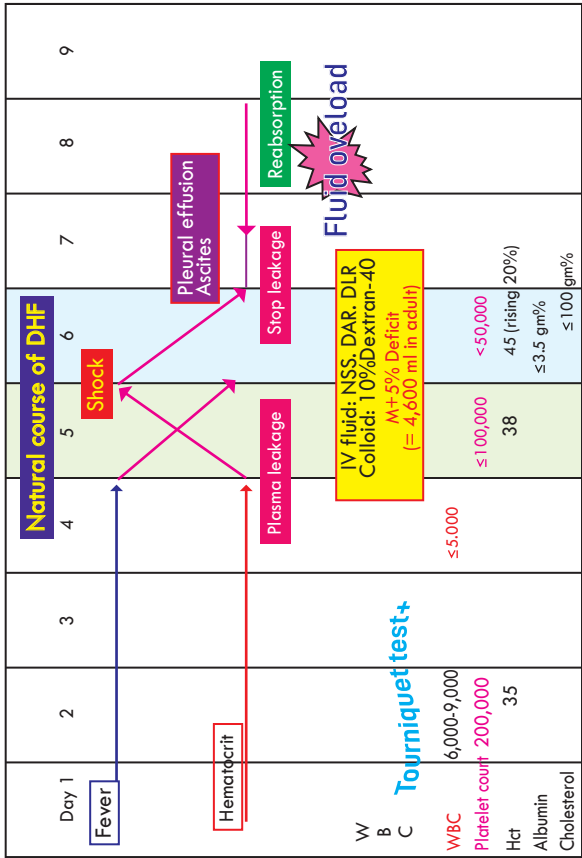
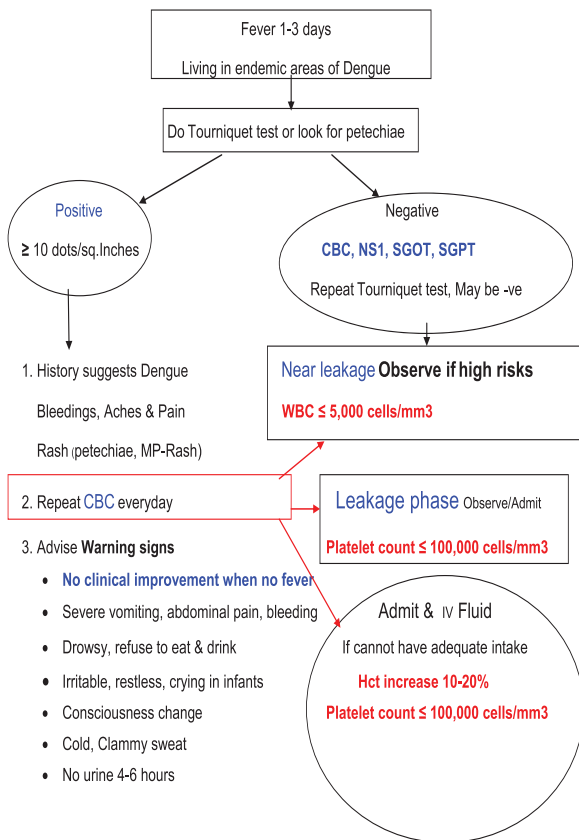


Figure 2 – OPD Consultation and triage





## Indications for Admission

- Very weak, poor appetite or severe dehydration
- **Presence of warning signs**
- Significant bleeding ( especially in female patient, there may be significant PV bleeding or excessive menstrual bleeding)
- $WBC \leq 5,000$  Cells/mm<sup>3</sup> in high risks group (infants, Elderly, Pregnancy, prolonged shock, significant bleeding, underlying diseases, neurological manifestations)
- Platelet count  $\leq 100,000$  cells/mm<sup>3</sup> and presence of weakness, poor appetite, persistent vomiting
- Rising Hct 10-20%
- No clinical improvement and weakness when no fever
- Shock or impending shock
  - No fever but rapid pulse ( in infant without crying)
  - Capillary refill > 2 seconds
  - Cold, clammy extremities, skin mottling
  - Irritable, restless, confusion,
  - Pulse pressure  $\leq 20$  mmHg
  - Fainting, postural hypotension
- Less urine in 4-6 hours
- Extreme family anxiety

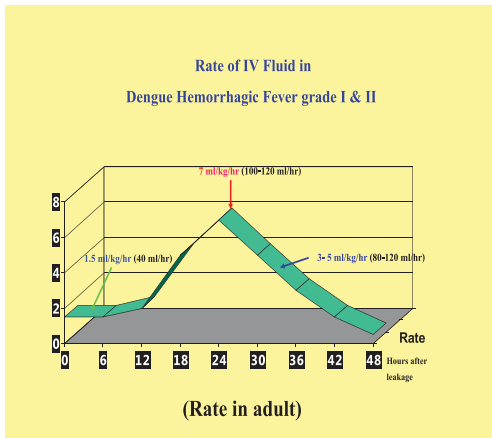
**N.B:** In paediatric patient, features of URTI and diarrhoea and vomiting(features of gastroenteritis) commonly observed in dengue patient.



**Monitor parameters in critical/leakage phase (Platelet count  $\leq$  100,000 cells/mm<sup>3</sup>) are as follows:**

- **Clinical:** - consciousness, appetite, bleeding, abdominal pain, vomiting
- **Vital signs:**
  - a. T every 4-6 hours
  - b. BP, PR, RR every 2-3 hours in non-shock and every 1 hour in shock cases
- **Hematocrit (Hct) :** every 4-6 hours, more frequent if suspected bleeding
- **Urine output :** every 8 hours in uncomplicated case, keep urine output 0.5-1 ml/kg/hr. Keep urine 0.5 ml/kg/hr in infants, obese patients and pregnant women

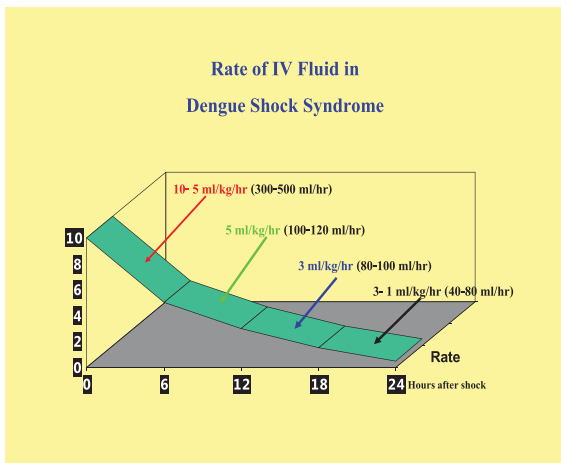
**Figure 4 - Flow diagram for non-shock case**



In non-shock cases, IV rate depends on 2 factors (this amount of IV fluid is including the oral fluid intake)

- Degree of thrombocytopenia: If platelet count between 50,000-100,000 cells/mm<sup>3</sup>, the DHF patients are in the first day of plasma leakage (about half of DF patients can have mild thrombocytopenia)
- Degree of rising Hct:
  - a. If Hct rising  $\geq 20\%$ , start IV at maintenance rate (3 ml/kg/hr in children and 80 ml/hr in adults)
  - b. If Hct rising  $< 20\%$ , start IV less than maintenance rate
  - c. If Hct rising  $> 25\%$ , start IV rate 8-10 ml/kg/hr in children or 350 – 500 ml/hr in adults

Figure 5 - Diagram of IV fluid rate in DSS (compensated shock)



- In compensated shock, start with 5% D/NSS 10 ml/kg/hr in children or 500 ml/hr in adults
- By 6 hours after shock, the IV rate can be reduced to 5 ml/kg/hr or 150 ml/hr in adults (Maintenance + 5% deficit)
- By 12 hours after shock, the IV rate can be reduced to 3 ml/kg/hr or 80 ml/hr in adults (maintenance rate)
- By 18 hours after shock, the IV rate can be reduced to 1.5 ml/kg/hr or 40 ml/hr in adults (half the maintenance rate)
- By 24 hours after shock, the IV rate can be reduced to KVO, 5-10 ml/hr.
- In profound shock (decompensate shock), – start with 0.9% NSS free flow or 10 ml/kg in 15 minutes, when BP is restored, reduce to 10 ml/kg/hr in children or 500 ml/hr in adults

Figure 6 - IV FLUID THERAPY for Compensated Shock

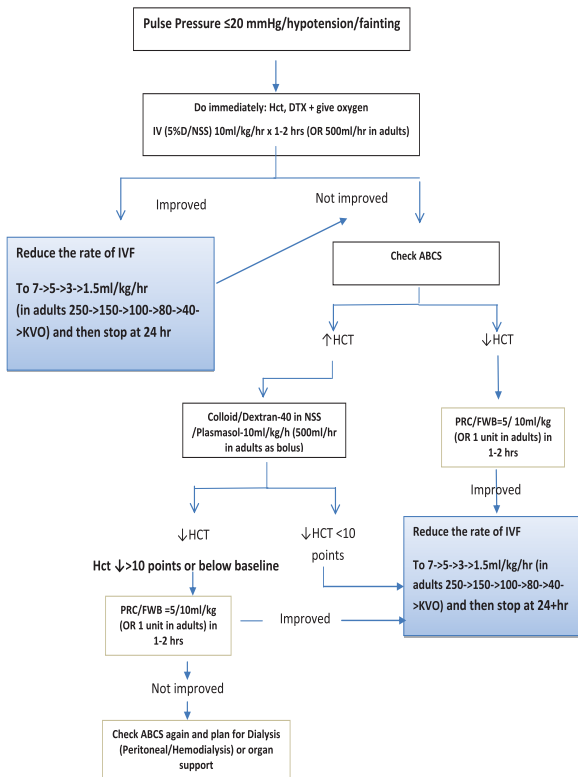
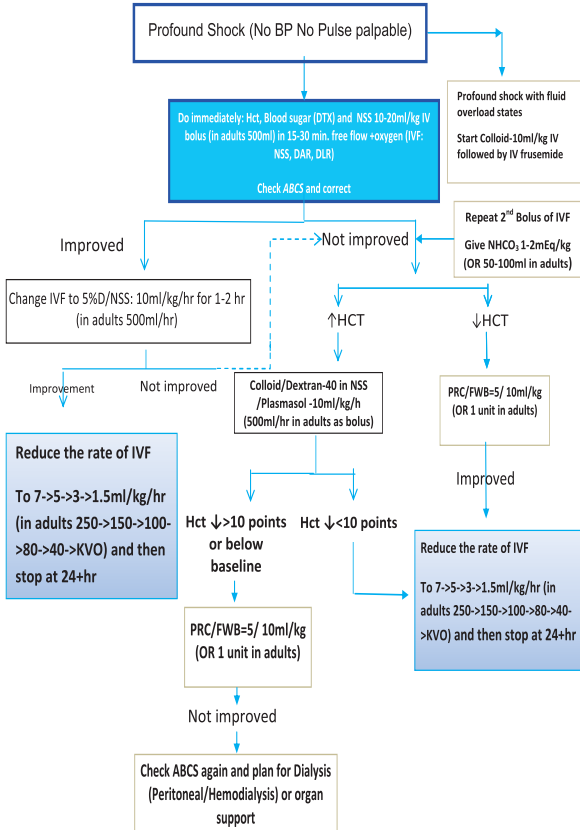


Figure 7 - Flow diagram for profound shock (decompensated shock)



**Table 1 - Rate of IV fluid: Compare Children and Adults**

<b>RATE IV FLUID : COMPARE ADULT AND CHILDREN</b>		
	<b>Child (ml/kg/hr)</b>	<b>Adult (ml/hr)</b>
<b>M/2</b>	<b>1.5</b>	<b>40</b>
<b>Maintenance (M)</b>	<b>3</b>	<b>80</b>
<b>M +5%D</b>	<b>5</b>	<b>100-120</b>
<b>M +7%D</b>	<b>7</b>	<b>150</b>
<b>M + 10%D</b>	<b>10</b>	<b>300 - 500</b>

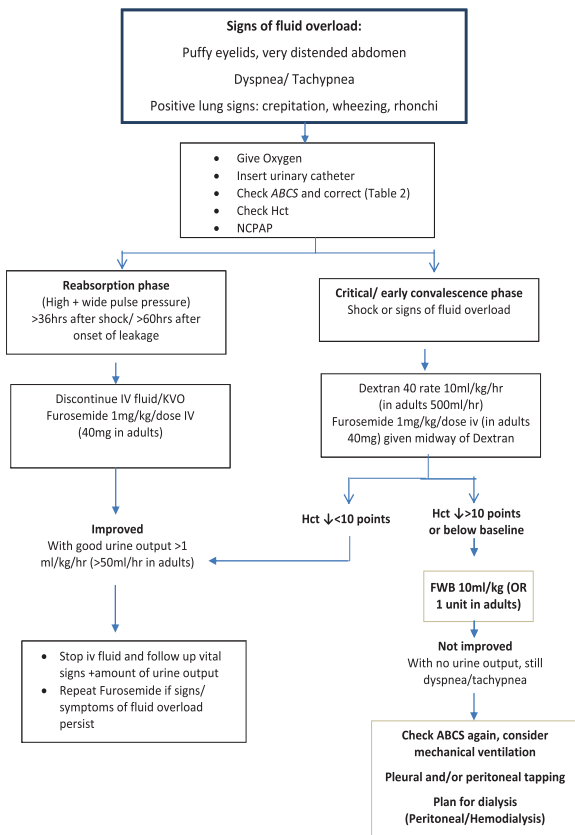
**Table 2 - Investigations and corrections of common complications**

Practical laboratory investigations (ABCS) in cases with prolonged shock (DHF grade IV) or severe / complicated cases (liver, kidney injury, bleeding, fluid overload) or cases with no clinical and vital signs improvement despite adequate volume replacement.

ABBREVIATION	LABORATORY INVESTIGATIONS	NOTES
A- Acidosis	Blood gas (Capacity or venous)	Indicate prolonged shock. Organ involvement should also look for; Liver function and BUN, Creatinine.
B- Bleeding	Hematocrit	If dropped compared to the previous value or not rising, cross match for rapid blood transfusion.
C- Calcium	Electrolyte, Ca <sup>++</sup>	Hypocalcemia is found in almost all cases of DHF but asymptomatic. Ca supplement in more severe/ complicated cases is indicated. The dosage is 1 ml/kg dilute to 2 times IV push slowly, maximum dose 10 ml of Ca gluconate.
S- Blood sugar.	Serum sugar (Dextrostix)	Most severe DHF cases have poor appetite together with vomiting. Those with impaired liver function may have hypoglycemia. Some cases may have hyperglycemia.



**Figure 8 - Flow diagram for the Management of Fluid Overload**



**Table 3 - Indications for using Colloid [(10% Dextran-40 in NSS)/Plasmasol/Human albumin]**

Ideal colloid is 10% Dextran- 40 in Normal Saline Solution (NSS). Plasmasol and human albumin is more available in Bangladesh.

The reason why 10% Dextran-40 in NSS is effective in DHF/DSS patients with severe plasma leakage or those with signs and symptoms of fluid overload because it is hyper-oncogenicity and it has osmolarity is 2.7 times that of plasma. It is a plasma expander and can hold the volume better than crystalloid and other colloids that are iso-oncotic to plasma. Other colloidal solutions including plasma are in the plasma substitution group. 6% Hetastarch (Voluven) may be effective than other colloids in the same group because it has osmolarity about 306 millimole/L when Dextran-40 is not available.

**Indications for Dextran-40**

- Signs of fluid overload
  - Dyspnea, tachypnea, puffy eyelids, tense/distended abdomen
  - Positive lung signs: crepitation, rhonchi, wheezing
- Persistent high Hct, 25 - 30% hemoconcentration for > 4-8 hours.

**How to give Dextran – 40**

- Always give in a bolus dose.
  - 10 ml/kg/hr in children at a time
  - 500 ml/hr in adults at a time
- Hct before and immediately after
  - If Hct drops > 10 points, indicates significant bleeding
  - If Hct drops below baseline, indicates bleeding

**Then Transfuse PRC ASAP**

- Maximum dose.
  - 30 ml/kg/24 hrs or 60 ml/kg/48 hours of leakage in children.
  - 1500 ml/24 hrs or 3,000 ml/48 hours of leakage in adult
  - With this recommended dose, there are no kidney complications or involvement.

**Table 4 - 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)

1. These complicated patient should be managed by Medicine specialist/Pediatricians for comprehensive care
2. 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.
3. In encephalitis, judicious use of steroids can be given
4. In hepatic encephalopathy in dengue, the management should be done as per protocol of hepatic encephalopathy
5. For AKI, ARDS or multiorgan failure, appropriate supportive care should be provided

	<b>Do'S</b>	<b>Do Not</b>
1	Administration of Paracetamol for high fever and myalgia.	Send patients with non-severe dengue home with no follow-up and inadequate instructions
2	Clinical assessment of the haemodynamic status before and after each fluid bolus	Administer of acetylsalicylic acid (aspirin) or ibuprofen
3	Give intravenous fluids for repeated vomiting or a high rapidly rising haematocrit	Avoid clinical assessment of patient with respect to fluid therapy
4	Use the Appropriate isotonic intravenous fluids for severe dengue in appropriate time and dose	Administer of intravenous fluids to any patient with mild dengue (those who can take by mouth)
5	Avoid intramuscular injections	Give intramuscular injections to dengue patients
6	Tight Glycemic control	avoid monitoring blood glucose
7	Give appropriate colloid, PRC or Fresh Whole blood if indicated	give excessive fluid, blood and blood products

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

**For Query:**

'Health Emergency Operations Center & Control Room'

**Phone number: 9855933, 01759114488**

**email: [controlroomdghs@yahoo.com](mailto:controlroomdghs@yahoo.com)**

**National Guideline link:**

**<http://www.dghs.gov.bd/images/docs/Guideline/NationalGuidelineforDengue2018.pdf>**

**<http://www.dghs.gov.bd/images/docs/Guideline/Chikungunya%20Guideline%202017.pdf>**

# Notes

## ডেঙ্গু প্রতিরোধে করণীয়



বর্ষায় (এপ্রিল-অক্টোবর) ডেঙ্গু জ্বরের ঝুঁকিপূর্ণ বাড়ে। এসময় অধিক সতর্ক থাকুন।

ডেঙ্গু জ্বরের বাহক এডিস মশা পরিষ্কার পানিতে বংশ বিস্তার করে।

অধিন, ঘর ও আপোপাশে পানি জমতে পিবেন না। যে কোন পাত্রে জমিয়ে রাখা / জমে থাকা পানি ৩ দিনের মধ্যে পরিবর্তন করুন।

এডিস মশা সাধারণত দিনের বেলা কামড়ায়। যথাসম্ভব নখা পোশাক পরুন। দিনে যুঝোরে ক্ষেত্রডে মশারী ব্যবহার করুন।



## ডেঙ্গু প্রতিকারে করণীয়

ভিন্ন জ্বর, মাথাব্যথা ও মাংসপেশীতে ব্যথা, শরীরে লালচে দানা ইত্যাদি ডেঙ্গু রোগের লক্ষণ হলেও সাম্প্রতিক কালে এর ব্যতিক্রম পাওয়া যাচ্ছে।

জ্বরে প্যারাসিটামল ব্যতীত অন্য ব্যাথানাশক ঔষধ খাওয়া বিরত থাকুন। রোগীটিকে বেশি বেশি তরল খাবার খাওয়ান।

জ্বর হলে নিকটস্থ হাসপাতালে চিকিৎসকের পরামর্শ গ্রহণ করুন ও ডেঙ্গু জ্বরের পরীক্ষা করুন।

জ্বর তাগো হওয়ার পরও ডেঙ্গুজনিত মারাত্মক জটিলতা দেখা দিতে পারে। তাই সতর্ক থাকুন ও হাসপাতালে চিকিৎসা গ্রহণ করুন।

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

