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

Editorial Board:

Advisor: Prof Dr. Abul kalam Azad, Director General, DGHS

Chief Patron: Prof Sanya Tahmina, Director, CDC, DGHS

Editor in Chief: Prof Quazi Tarikul Islam

Editors: Prof Md Titu Miah

    Prof Md Jahangir Alam

    Prof Ahmedul Kabir

    Dr. Md Robed Amin

    Dr. Hafez Md Nazmul Ahsan

    Dr. Motlabur Rahman

Managing Editor: Dr. MM Aktaruzzaman Sohel

National Malaria Elimination &
Aedes Transmitted Disease Control Program
Disease Control Division, DGHS, MoH&FW
Dhaka, Bangladesh
Dengue case classification by severity

**Dengue ± warning signs**

**With warning signs**

**Severe dengue**

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

---

**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 signs

**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 >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
Dengue viral Infection

Symptomatic

Mild dengue

DF with high risk co-morbid conditions

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

Moderate dengue

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

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

Severe dengue

DF with significant Haemorrhage

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

Asymptomatic

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

Tertiary level care

Home Management

Close Monitoring* and possibly Hospitalization

* Close Monitoring refers to monitoring patients at home and referring them to hospital if condition worsens.
Dengue Fever (Infection)

- Headache
- Retro-orbital pain
- Myalgia
- Arthralgia/ bone pain (break-bone fever)
- Rash
- Hemorrhagic Manifestations
- Leukopenia (WBC < 5,000 cells/mm³)
- Platelet count ≤ 150,000 cells/mm³
- Rising HCT 5-10%

**Diagnosis:**

Tourniquet test positive + WBC ≤ 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 ≥ 20%, pleural effusion, ascites, hypoalbuminemia (serum albumin < 3.5 gm% or <4 gm% in obese patients), UTZ
- Platelet count ≤ 100,000 cells/mm³.

*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 ≤ 100,000 cells/mm3

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/mm3

Signs of recovery include:  A – Appetite, B – Bradycardia, C – Convalescence rash or Itching, D - Diuresis
<table>
<thead>
<tr>
<th>Day 1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fever</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hematocrit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WBC</td>
<td>Platelet count</td>
<td>Hct</td>
<td>Albumin</td>
<td>Cholesterol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6,000-9,000</td>
<td>200,000</td>
<td>35</td>
<td>≤ 5,000</td>
<td>≤ 100,000</td>
<td>≤ 50,000</td>
<td>&lt; 50,000</td>
<td>45 (rising 20%)</td>
<td>≤ 3.5 gm%</td>
</tr>
</tbody>
</table>

**Natural course of DHF**

- **Day 1:** Fever, Hematocrit
- **Day 2:** Fever, Hematocrit
- **Day 3:** Fever, Hematocrit
- **Day 4:** Fever, Hematocrit, Plasma leakage
- **Day 5:** Fever, Hematocrit, Plasma leakage, Shock
- **Day 6:** Fever, Hematocrit, Plasma leakage, Shock, Pleural effusion, Ascites
- **Day 7:** Fever, Hematocrit, Plasma leakage, Shock, Pleural effusion, Ascites, Stop leakage, Reabsorption
- **Day 8:** Fever, Hematocrit, Plasma leakage, Shock, Pleural effusion, Ascites, Stop leakage, Reabsorption
- **Day 9:** Fever, Hematocrit, Plasma leakage, Shock, Pleural effusion, Ascites, Stop leakage, Reabsorption

**IV fluid:** NSS, DAR, DLR
**Colloid:** 10% Dextran-40
**M + 5% Deficit**
(= 4,600 ml in adult)

**Fluid overload**

**Tourniquet test**

- WBC: 6,000-9,000
- Platelet count: 200,000
- Hct: 35
- Albumin: ≤ 5,000
- Cholesterol: ≤ 100,000
- 38
- < 50,000
- 45 (rising 20%)
- ≤ 3.5 gm%
- ≤ 100 gm%
Figure 2 – OPD Consultation and triage

Fever 1-3 days
Living in endemic areas of Dengue

Do Tourniquet test or look for petechiae

Positive
≥ 10 dots/sq.Inches

1. History suggests Dengue
   Bleedings, Aches & Pain
   Rash (petechiae, MP-Rash)

2. Repeat CBC everyday

3. Advise **Warning signs**
   - No clinical improvement when no fever
   - Severe vomiting, abdominal pain, bleeding
   - Drowsy, refuse to eat & drink
   - Irritable, restless, crying in infants
   - Consciousness change
   - Cold, Clammy sweat
   - No urine 4-6 hours

Negative

CBC, NS1, SGOT, SGPT
Repeat Tourniquet test, May be -ve

Near leakage **Observe if high risks**
WBC ≤ 5,000 cells/mm3

Leakage phase **Observe/Admit**
Platelet count ≤ 100,000 cells/mm3

Admit & IV Fluid
If cannot have adequate intake
Hct increase 10-20%
Platelet count ≤ 100,000 cells/mm3
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 ≤ 5,000 Cells/mm3 in high risks group (infants, Elderly, Pregnancy, prolonged shock, significant bleeding, underlying diseases, neurological manifestations)
  - Platelet count ≤ 100,000 cells/mm3 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 ≤ 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.
### Figure 3 - Dengue Chart

#### Monitoring Chart for Dengue Patients

**Instructions** - Do CBC daily/bd and PCV 6 hrly. Monitor other parameters 3-4 hrly and when leaking detected monitoring every hour.

**Indications to call for immediate advice**
1. Pulse rate > 120/min with fever or > 100/min without fever.
2. Pulse Pressure 25-20 mmHg or less (in supine position)
3. Postural drop of SBP >20 mmHg.
4. Significant bleeding (Haematemesis, Malena, Bleeding PV etc.)
5. UOP <0.5ml /Kg/hr
6. CRFT >2 sec

<table>
<thead>
<tr>
<th>Case</th>
<th>Options</th>
<th>OPD</th>
<th>Options</th>
<th>IPD</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Refer</td>
<td>Shock</td>
<td>Non Shock</td>
<td></td>
<td>Refer</td>
</tr>
<tr>
<td></td>
<td>Walk in</td>
<td></td>
<td></td>
<td></td>
<td>Walk in</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>BP</th>
<th>Temp</th>
<th>PR</th>
<th>PR</th>
<th>PP</th>
<th>RR</th>
<th>HCT (%)</th>
<th>Clinical/ Lab/ Treatment</th>
<th>Nursing Care/ Signs</th>
<th>INTAKE</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CBC Day of Admission**

- Hct =
- WBC =
- Plt =
- PMN =

- BW = kgs.
- IBW = kgs.
- Maintenance fluid =
- M + 5% Deficit =

**Clinical Data**

- Date of Fever
- Day of Illness
- TT
- Liver
- Bleeding
- Epistaxis
- Abdomen
- Pulse: F = Full, M = Moderate, W = Weak, N = Not Palpable

**Nursing Care**

<table>
<thead>
<tr>
<th>Oral</th>
<th>IV</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Output**

<table>
<thead>
<tr>
<th>Urine/ Stool</th>
<th>Vomit/ Bleed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ward**

**Name**

**Age**

**HN**

**AN**

**Attending Physician**
Monitor parameters in critical/leakage phase (Platelet count ≤ 100,000 cells/mm3) 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
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/mm3, 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 ≥ 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
- 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

Pulse Pressure ≤20 mmHg/hypotension/fainting

Do immediately: Hct, DTX + give oxygen
IV (5%D/NSS) 10ml/kg/hr x 1-2 hrs (OR 500ml/hr in adults)

Improved

Not improved

Reduce the rate of IVF
To 7->5->3->1.5ml/kg/hr
(in adults 250->150->100->80->40->KVO) and then stop at 24 hr

Check ABCS

↑HCT

↓HCT

Colloid/Dextran-40 in NSS
/Plasmasol-10ml/kg/h (500ml/hr
in adults as bolus)

PRC/FWB=5/ 10ml/kg
(OR 1 unit in adults) in
1-2 hrs

↓HCT

Hct ↓>10 points or below baseline

PRC/FWB=5/10ml/kg
(OR 1 unit in adults) in
1-2 hrs

Not improved

Check ABCS again and plan for Dialysis
(Peritoneal/Hemodialysis) or organ support

↓HCT <10 points

Improved

↓HCT

Improved

Reduce the rate of IVF
To 7->5->3->1.5ml/kg/hr
(in adults 250->150->100->80->40->KVO) and then stop at 24 hr
Figure 7 - Flow diagram for profound shock (decompensated shock)

Profound Shock (No BP No Pulse palpable)

Do immediately: Hct, Blood sugar (DTX) and NSS 10-20ml/kg IV bolus (in adults 500ml) in 15-30 min. free flow + oxygen (IVF: NSS, DAr, DLR)
Check ABCS and correct

Profund shock with fluid overload states
Start Colloid-10ml/kg IV followed by IV frusemide

Improve

Not improved

Change IVF to 5%H/NSS: 10ml/kg/hr for 1-2 hr (in adults 500ml/hr)

↓HCT

↑HCT

Colloid/Dextran-40 in NSS /Plasmasol -10ml/kg/h (500ml/hr in adults as bolus)

Improve

Not improved

Reduce the rate of IVF
To 7->5->3->1.5ml/kg/hr (in adults 250->150->100->80->40->KVO) and then stop at 24+hr

↓Hct ↓>10 points or below baseline

↓Hct ↓<10 points

PRC/FWB=5/ 10ml/kg (OR 1 unit in adults)

Not improved

Check ABCS again and plan for Dialysis (Peritoneal/Hemodialysis) or organ support
Table 1 - Rate of IV fluid: Compare Children and Adults

<table>
<thead>
<tr>
<th></th>
<th>Child (ml/kg/hr)</th>
<th>Adult (ml/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M/2</td>
<td>1.5</td>
<td>40</td>
</tr>
<tr>
<td>Maintenance (M)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M +5%D</td>
<td>3</td>
<td>80</td>
</tr>
<tr>
<td>M +7%D</td>
<td>5</td>
<td>100-120</td>
</tr>
<tr>
<td>M + 10%D</td>
<td>7</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>300 - 500</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>ABREVIATION</th>
<th>LABORATORY INVESTIGATIONS</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A- Acidosis</td>
<td>Blood gas (Capacity or venous)</td>
<td>Indicate prolonged shock. Organ involvement should also look for; Liver function and BUN, Creatinine.</td>
</tr>
<tr>
<td>B- Bleeding</td>
<td>Hematocrit</td>
<td>If dropped compared to the previous value or not rising, cross match for rapid blood transfusion.</td>
</tr>
<tr>
<td>C- Calcium</td>
<td>Electrolyte, Ca++</td>
<td>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.</td>
</tr>
<tr>
<td>S- Blood sugar.</td>
<td>Serum sugar (Dextrostix)</td>
<td>Most severe DHF cases have poor appetite together with vomiting. Those with impaired liver function may have hypoglycemia. Some cases may have hyperglycemia.</td>
</tr>
</tbody>
</table>
Figure 8 - Flow diagram for the Management of Fluid Overload

**Signs of fluid overload:**
- Puffy eyelids, very distended abdomen
- Dyspnea/ Tachypnea
- Positive lung signs: crepitation, wheezing, rhonchi

- Give Oxygen
- Insert urinary catheter
- Check ABCS and correct (Table 2)
- Check Hct
- NCPAP

**Reabsorption phase**
(>36hrs after shock/ >60hrs after onset of leakage)
- Discontinue IV fluid/KVO
- Furosemide 1mg/kg/dose IV (40mg in adults)

**Improved**
With good urine output >1 ml/kg/hr (>50ml/hr in adults)
- Stop IV fluid and follow up vital signs + amount of urine output
- Repeat Furosemide if signs/ symptoms of fluid overload persist

**Critical/ early convalescence phase**
Shock or signs of fluid overload
- Dextran 40 rate 10ml/kg/hr (in adults 500ml/hr)
- Furosemide 1mg/kg/dose IV (in adults 40mg) given midway of Dextran

**Hct ↓<10 points**
**Hct ↓>10 points or below baseline**

**FWB 10ml/kg (OR 1 unit in adults)**
Not improved
With no urine output, still dyspnea/tachypnea
- Check ABCS again, consider mechanical ventilation
  - Pleural and/or peritoneal tapping
  - Plan for dialysis (Peritoneal/Hemodialysis)
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
<table>
<thead>
<tr>
<th>Do’S</th>
<th>Do Not</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Administration of Paracetamol for high fever and myalgia.</td>
<td>Send patients with non-severe dengue home with no follow-up and inadequate instructions</td>
</tr>
<tr>
<td>2 Clinical assessment of the haemodynamic status before and after each fluid bolus</td>
<td>Administer of acetylsalicylic acid (aspirin) or ibuprofen</td>
</tr>
<tr>
<td>3 Give intravenous fluids for repeated vomiting or a high rapidly rising haematocrit</td>
<td>Avoid clinical assessment of patient with respect to fluid therapy</td>
</tr>
<tr>
<td>4 Use the Appropriate isotonic intravenous fluids for severe dengue in appropriate time and dose</td>
<td>Administer of intravenous fluids to any patient with mild dengue (those who can take by mouth)</td>
</tr>
<tr>
<td>5 Avoid intramuscular injections</td>
<td>Give intramuscular injections to dengue patients</td>
</tr>
<tr>
<td>6 Tight Glycemic control</td>
<td>avoid monitoring blood glucose</td>
</tr>
<tr>
<td>7 Give appropriate colloid, PRC or Fresh Whole blood if indicated</td>
<td>give excessive fluid, blood and blood products</td>
</tr>
</tbody>
</table>

**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

**National Guideline link:**