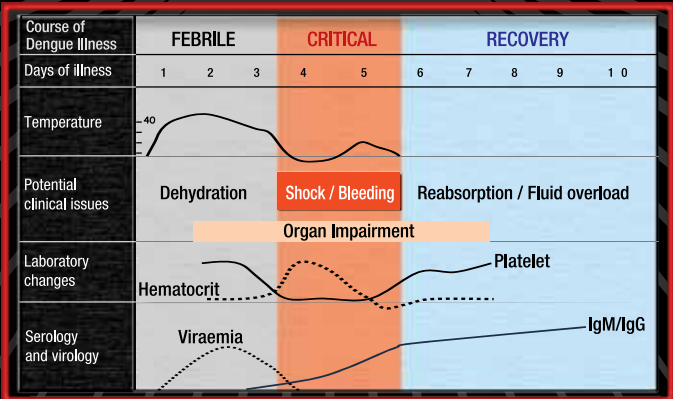


MANAGEMENT OF DENGUE INFECTION IN ADULTS

(Revised 2nd Edition)



QUICK REFERENCE FOR HEALTHCARE PROVIDERS



KEY MESSAGES

- Dengue is a dynamic disease and presented in three phases - febrile phase, critical phase and recovery phase.
- Clinical deterioration often occurs in the critical phase and is marked by plasma leakage and rising haematocrit (HCT).
- Look out for warning signs which may indicate severe dengue or high possibility of rapid progression or shock.
- Recognition of shock in its early stage and prompt fluid resuscitation with close monitoring of fluid adjustment will give a good clinical outcome.
- There is no evidence to support prophylactic use of platelet transfusion.

*SUSPECT A CASE OF DENGUE

A patient has an acute febrile illness with **two or more** features :

- | | |
|--------------|-------------------------------|
| • Rash | • Leucopenia |
| • Myalgia | • Retro-orbital pain |
| • Headache | • Haemorrhagic manifestations |
| • Arthralgia | |

OR

Dengue endemic/hot spot/outbreak area

DISEASE NOTIFICATION

All suspected dengue cases* must be notified by telephone to the nearest health office within 24 hours of diagnosis, followed by written notification within one week using the standard notification form.

LABORATORY INTERPRETATION

- In the absence of baseline HCT, a HCT value of >40% in adult female and >46% in adult male should raise the suspicion of plasma leakage.

DENGUE SEROLOGY TESTS

- If the dengue IgM is negative before day 7, a repeat sample must be taken in the recovery phase.
- Dengue non-structural protein -1 (NS1 Antigen) can be helpful in early phase (< day 5) of dengue infection.

This Quick Reference provides key messages and a summary of the main recommendations in the Clinical Practice Guidelines (CPG) Management of Dengue Infection in Adults (Revised 2nd Edition) (2010).

Details of the evidence supporting these recommendations can be found in the above CPG, available on the following websites:

Ministry of Health Malaysia : <http://www.moh.gov.my>

Academy of Medicine Malaysia : <http://www.acadmed.org.my>

WARNING SIGNS

- Abdominal pain or tenderness
- Persistent vomiting
- Clinical fluid accumulation (pleural effusion/ascites)
- Mucosal bleed
- Restlessness or lethargy
- Tender enlarged liver
- Laboratory : Increase in HCT concurrent with rapid decrease in platelet

Table 1:

STEPWISE APPROACH IN OUT PATIENT MANAGEMENT

Step 1: Overall assessment

1. History

- Date of onset of fever/illness
- Oral intake
- Assess for warning signs
- Diarrhoea
- Bleeding
- Change in mental state/seizure/dizziness
- Urine output (frequency, volume and time of last voiding)
- Pregnancy or other co-morbidities

2. Physical examination

Refer to clinical parameters for disease monitoring (Table 3)

3. Investigations

- i. FBC and dengue serology should be taken (as soon as possible)
- ii. If no facility for HCT, refer patient to the nearest hospital

Step 2 : Diagnosis, disease staging and severity assessment

Based on the above, the clinician should be able to determine:

1. Dengue diagnosis (provisional)
2. Phase of dengue illness if dengue is suspected (febrile/critical/recovery)
3. Hydration and haemodynamic status of patient (in shock or not)
4. Whether the patient requires admission

Step 3 : Plan of management

1. Notification is required
2. If admission is indicated, refer to prerequisites for transfer
3. If admission is not indicated:
 - Daily or more frequent follow up is necessary especially from day 3 onwards until the patient becomes afebrile for at least 24 - 48 hours without antipyretics
 - Serial FBC/HCT must be monitored as disease progresses (Table 3)

Table 2:

WHEN TO REFER FOR ADMISSION

1. Symptoms:

- Warning signs
- Bleeding manifestations
- Inability to tolerate oral fluids
- Reduced urine output
- Seizure

2. Signs:

- Dehydration
- Shock
- Bleeding
- Any organ failure

3. Special Situations:

- Patients with co-morbidity e.g. diabetes, hypertension, ischaemic heart disease, morbid obesity, renal failure, chronic liver disease
- Elderly (>65 years old)
- Pregnancy
- Social factors that limit follow - up e.g. living far from health facility, patient living alone

4. Laboratory Criteria:

- Rising HCT accompanied by reducing platelet count

Prerequisites for transfer to hospital

1. All efforts must be taken to optimise the patient's condition before and during transfer.
2. The Emergency & Trauma Department and/or Medical Department of the receiving hospital **must be informed prior to transfer.**
3. Adequate and essential information must be sent together with the patient and this includes the fluid chart, monitoring chart and investigation results.

PATIENT TRIAGING AT EMERGENCY AND TRAUMA / OUTPATIENT DEPARTMENT

It is recommended to triage all suspected cases of dengue in order to avoid critically ill patients being missed upon arrival.

Triage Checklist:

1. History of fever
2. Abdominal Pain
3. Vomiting
4. Dizziness/fainting
5. Bleeding

Vital parameters to be taken:

Mental state, blood pressure, pulse, temperature, cold or warm peripheries

Table 3:
DISEASE MONITORING FOR DIFFERENT PHASES OF DENGUE ILLNESS

Parameters for monitoring	Frequency of monitoring		
	Febrile phase	Critical phase	Recovery phase
CLINICAL PARAMETERS			
General well being Appetite/oral intake Warning signs Symptoms of bleeding Neurological/mental state	Daily or more frequently towards late febrile phase	At least twice a day and more frequently as indicated	Daily or more frequently as indicated
Haemodynamic status <ul style="list-style-type: none"> • Pink/cyanosis • Extremities (cold/warm) • Capillary refill time • Pulse volume • Pulse rate • Blood pressure • Pulse pressure 	4-6 hourly depending on clinical status	2-4 hourly depending on clinical status In shock- Every 15-30 minutes till stable then 1-2 hourly	4-6 hourly
Respiratory status <ul style="list-style-type: none"> • Respiratory rate • SpO₂ 			
Signs of bleeding, abdominal tenderness, ascites and pleural effusion	Daily or more frequently towards late febrile phase	At least twice a day and more frequently as indicated	Daily or more frequently as indicated
Urine output	4 hourly	2-4 hourly In shock- Hourly	4-6 hourly
LABORATORY PARAMETERS			
FBC	Daily or more frequently if indicated	4-12 hourly depending on clinical status In shock- Repeat before and after each attempt of fluid resuscitation and as indicated	Daily
BUSE/Creatinine Liver function test Random blood sugar Coagulation profile HCO ₃ /TCO ₂ /Lactate	As indicated	At least daily or more frequently as indicated In shock- Crucial to monitor acid-base balance/ ABG closely	As indicated

COMMON PITFALLS IN FLUID THERAPY

- Treating patient with unnecessary fluid bolus based on raised HCT as the sole parameter without considering other clinical parameters
- Excessive and prolonged fixed fluid regime in stable patients
- Infrequent monitoring and adjustment of infusion rate
- Continuation of intravenous fluid during the recovery phase

FLUID MANAGEMENT

Dengue with warning signs

All patients with warning signs should be considered for monitoring in hospitals:

- Obtain a baseline HCT before fluid therapy
- Give crystalloids solution (such as 0.9% saline)
- Start with 5 - 7 ml/kg/hour for 1-2 hours, then reduce to 3 - 5 ml/kg/hr for 2 - 4 hours, and then reduce to 2 - 3 ml/kg/hr or less according to the clinical response
- If the clinical parameters are worsening and HCT is rising, increase the rate of infusion
- Reassess the clinical status, repeat the HCT and review fluid infusion rates accordingly

Non-shock patient

- Encourage adequate oral intake
- Intravenous fluids are indicated in patients who are vomiting, unable to tolerate oral fluids or an increasing HCT despite increasing oral intake.
- Crystalloid is the fluid of choice.

Estimated ideal body weight or IBW (kg)	Normal maintenance fluid (ml/hour) based on Holiday Segar formula
5	10
10	20
15	30
20	60
25	65
30	70
35	75
40	80
50	90
60	100
70	110
80	120

Notes:

For adults with IBW > 50 kg, 1.5 - 2ml/kg can be used for quick calculation of hourly maintenance fluid regime.

For adults with IBW < 50kg, 2 - 3 ml/kg can be used for quick calculation of hourly maintenance fluid regime.

Dengue Shock Syndrome

Refer to algorithm for intravenous fluid management for DSS

WHEN TO SUSPECT SIGNIFICANT OCCULT BLEEDING?

- HCT not as high as expected for degree of shock to be explained by plasma leakage alone
- A drop in HCT without clinical improvement despite adequate fluid replacement (40 - 60 ml/kg)
- Severe metabolic acidosis & end organ dysfunction despite adequate fluid replacement

MANAGEMENT OF BLEEDING

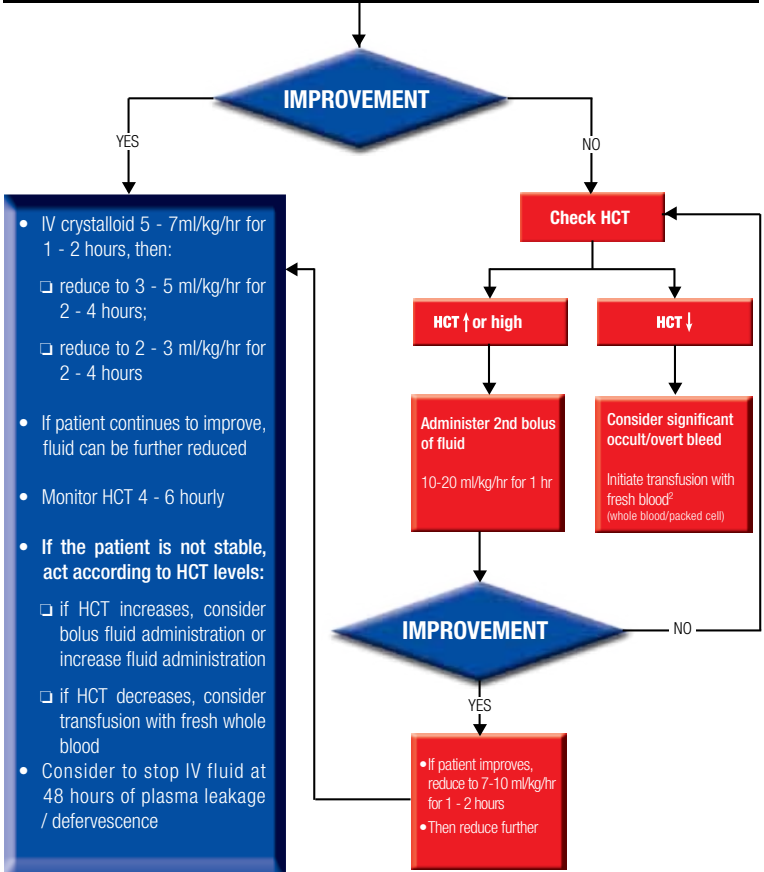
Patients with mild bleeding from the gums, per vagina, epistaxis or petechiae do not require blood transfusion.

Transfusion of blood in patients with significant bleeding:

- Transfused 5 - 10ml/kg of fresh packed red cells or 10 - 20 ml/kg of fresh whole blood at an appropriate rate and observe the clinical response
- Consider repeating the blood transfusion if there is further blood loss or no appropriate rise in HCT after blood transfusion

ALGORITHM A - FLUID MANAGEMENT IN COMPENSATED SHOCK**COMPENSATED SHOCK****(systolic pressure maintained but has signs of reduced perfusion)**

- Fluid resuscitation with isotonic crystalloid 5 - 10 ml/kg/hr over 1 hour
- FBC, HCT, before and after fluid resuscitation, BUSEC, LFT, RBS, PT/APTT, Lactate/HCO₃, GXM¹



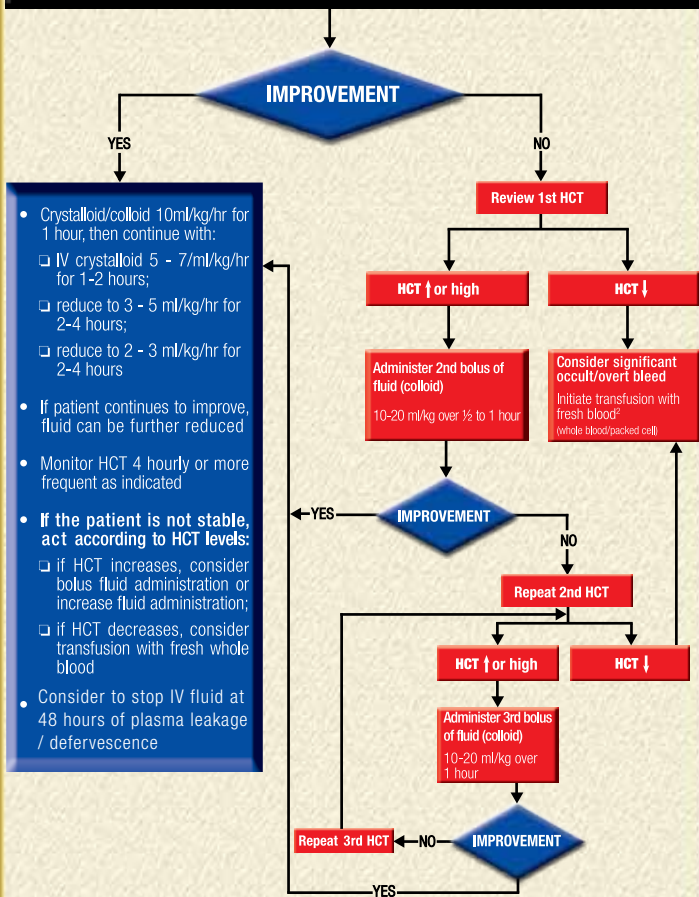
HCT = haematocrit

¹GXM: require first stage cross match or emergency O²fresh blood: less than 5 days

ALGORITHM B - FLUID MANAGEMENT IN DECOMPENSATED SHOCK

DECOMPENSATED SHOCK

- Fluid resuscitation with 20 ml/kg/hr isotonic crystalloid or colloid over 15 – 30 minutes
- Try to obtain a HCT level before fluid resuscitation
- FBC, HCT, before and after fluid resuscitation, BUSEC, LFT, RBS, PT/APTT, Lactate/HCO₃, GXM¹



2

HCT = haematocrit

¹GXM: require first stage cross match or emergency O

² fresh blood: less than 5 days

CLINICAL PRACTICE GUIDELINES SECRETARIAT

Health Technology Assessment Section, Medical Development Division
Ministry of Health Malaysia, 4th Floor, Block E1, Parcel E, 62590 Putrajaya
Tel : 603 8883 1246 E-mail : htamalaysia@moh.gov.my