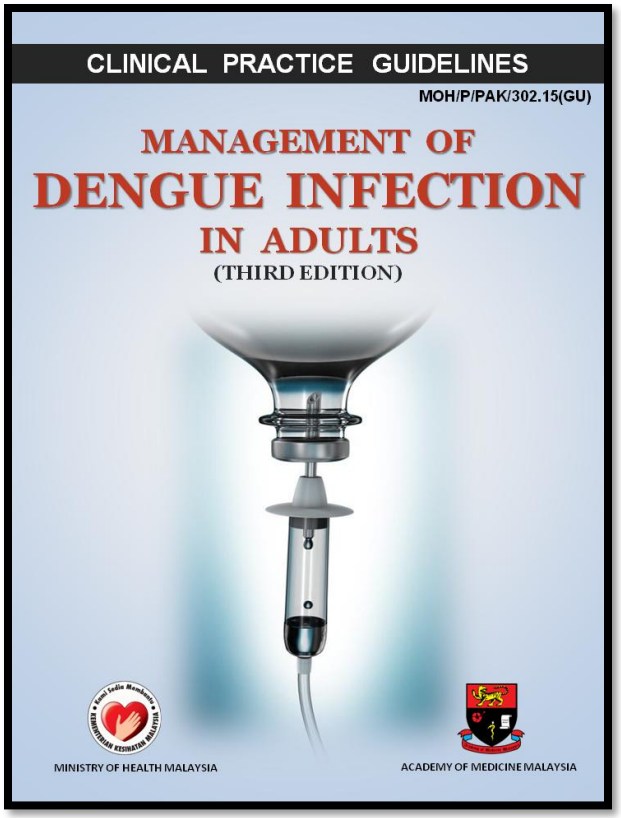


FIRST ENCOUNTER

LEARNING OBJECTIVES

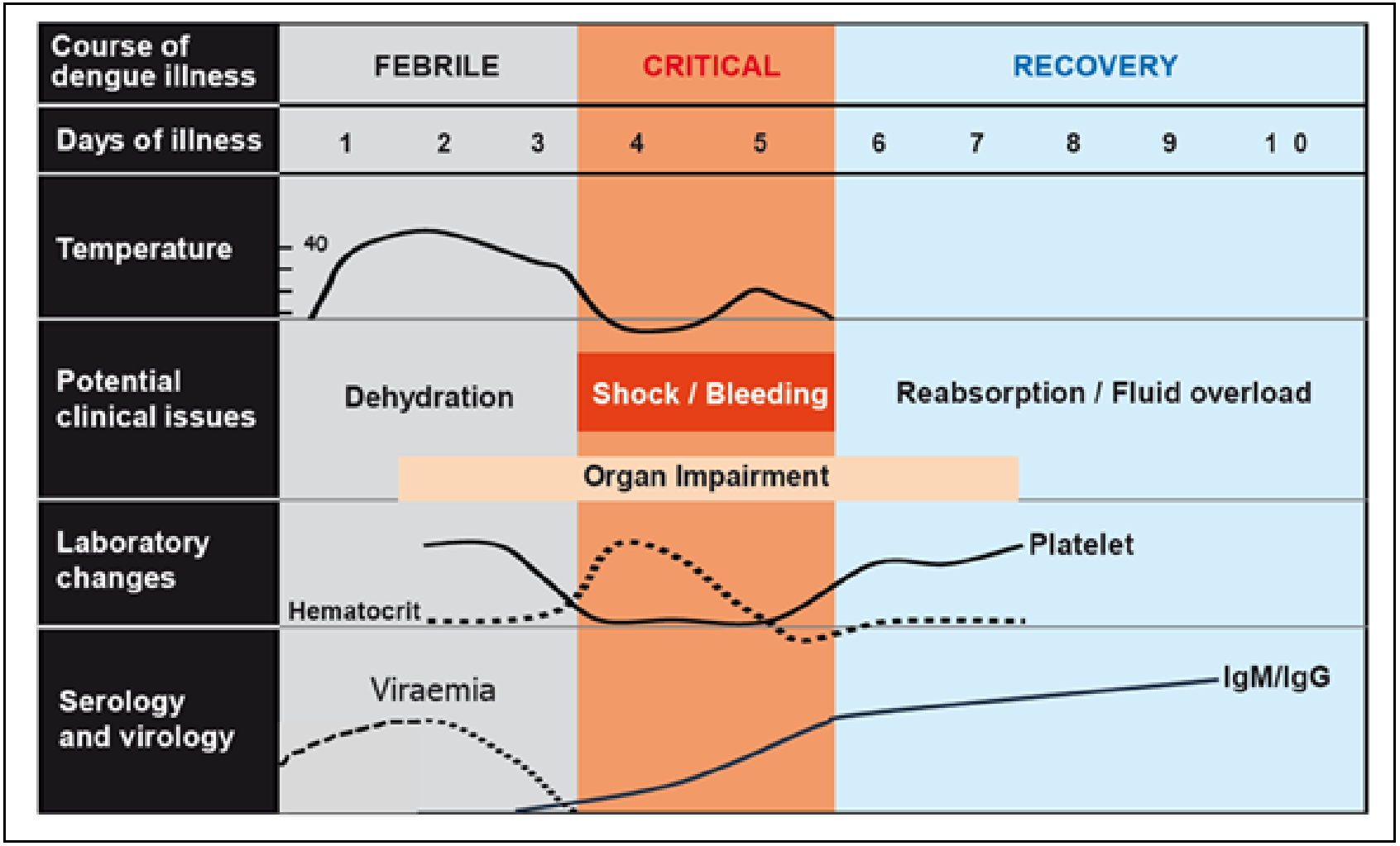
In Outpatient Clinic & Emergency Department

- Identify Stage of disease
- Identify Warning Signs
- Ensure appropriate triage
- When to admit/discharge
- Pro active intervention
- Pro active monitoring
- Pro active in communication during hand over

INTRODUCTION

- “First encounter” at frontline health services: emergency dept & outpatient clinic setting
- Detection of warning symptoms & signs
- Ensure timely, safe & appropriate management
- Timely admission for in-hospital care

In the course of the disease : Where is the patient now ?



In the course of the disease : Where is the patient now ?(2)

- Day of fever ?
- Warning signs ?
- Assessment : CCTVR
- Hemodynamic parameters?

- Diagnosis?
  - Dengue infection +/- warning signs
  - Which phase ?
  - Shock/ stable?
  - Severe dengue?

Table 1: A continuum of pathophysiological changes from normal circulation to compensated and decompensated/hypotensive shock

Normal Circulation	Compensated Shock	Decompensated / Hypotensive Shock
• Clear consciousness • Brisk capillary refill time (<2 sec) • Warm and pink peripheries • Good volume peripheral pulses • Normal heart rate for age • Normal blood pressure for age • Normal pulse pressure for age • Normal respiratory rate for age • Normal urine output	• Clear consciousness - shock can be missed if you do not touch the patient • Prolonged capillary refill time (>2 sec) • Cool extremities • Weak & thready peripheral pulses • Tachycardia • Normal systlic pressure with raised diastolic pressure • Postural hypotension • Narrowing pulse pressure • Tachypnoea • Reduced urine output • Intense thirst	• Change of mental state - restless, combative or lethargy • Mottled skin, very prolonged capillary refill time • Cold, clammy extremities • Feeble or absent peripheral pulses • Severe tachycardia with bradycardia in late shock • Hypotension / unrecordable BP • Narrowed pulse pressure (<20 mmHg) • Metabolic acidosis / hyperpnoea / Kussmaul's breathing • Oliguria or anuria

Warning signs

- Any abdominal pain/tenderness
- Persistent vomiting (≥3 times over 24 hours)
- Persistent diarrhoea (≥3 times over 24 hours)
- Third space fluid accumulation (such as ascites, pleural and pericardial effusion)
- Spontaneous bleeding tendency
- Lethargy/restlessness/confusion
- Tender liver
- Raised HCT with rapid drop in platelet:
  - HCT male ≤60 years - 46
  - HCT male >60 years - 42
  - HCT female (all age groups) - 40

*median value of normal HCT in Malaysian population[33,level II-2.]

Dengue Triage

- **The purpose of triaging** patients is to determine whether they require **urgent attention** – to **avoid** critically ill patients being **missed** upon arrival.

Triage Checklist at Registration Counter:

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

Vital parameters to be taken:

Mental state, blood pressure, CCTVR and respiratory rate

Dengue frontline triage

Triage Categories Disposition*

1. Stable vital parameters – send to Non Critical Zone
2. Compensated Shock – send to Semi Critical Zone
3. Decompensated shock/unstable vital parameters – send to Critical Zone

*Triage is ongoing process – patients may deteriorate

Frontline Evaluation

Table 2: Approach to Outpatient Evaluation of Dengue Infection [1-3]

It is important to evaluate every patient for the following:

Overall assessment

1. History
   - Date of onset of fever/ illness
   - Oral intake
   - Assess for warning signs – Refer to Table 3
   - Change in mental state/seizure/dizziness
   - Urine output (frequency, volume and time of last voiding)
   - Other important relevant histories:
     - Family or neighbourhood history of dengue
     - Jungle trekking and swimming in waterfall (consider leptospirosis, typhus, malaria)
     - Travelling
     - Recent unprotected sexual or intravenous drug user (consider acute HIV seroconversion illness)
     - Co-morbidities (consider sepsis particularly in patients with diabetes mellitus)

Frontline Evaluation

2. Physical examination
   i. Assess mental state and GCS score
   ii. Assess hydration status
   iii. Assess haemodynamic status
      - Skin colour (C), capillary refill time (normal <2 seconds) (C), cold/ warm extremities (T), pulse volume (V) and rate (R) - **CCTVR**
      - Blood pressure and pulse pressure
   iv. Look out for tachypnoea/acidotic breathing/pleural effusion
   v. Check for abdominal tenderness/hepatomegaly/ascites
   vi. Examine for bleeding manifestation
3. Investigation
   i. FBC and HCT
   ii. Point of care test for dengue (RCT or NS1 antigen)

Frontline evaluation

- Dengue patients who are managed in the outpatient setting should be provided with an outpatient dengue monitoring record to ensure that relevant informations are available for continuity of care by health care providers.

- Primary care providers with no immediate haematocrit facilities and/or point of care tests should refer patient to the nearest health facility for further management.
- Point of care tests (RCT or NS1 antigen) should be done when dengue infection is suspected.

DENGUE MONITORING RECORD

Patient's name : ..... I/C No. / Passport : .....

Address : ..... Date of onset of fever : .....

.....

Date	Day of fever	Temp (°C)	BP (mmHg)	PR (min)	Hb (g/dL)	Hct (%)	WCC (x10^3/µl)	Platelet (x10^3/µl)	Attending Clinic/Tel. No.	Next Appointment

Frontline evaluation

Diagnosis, disease staging and severity assessment

Based on evaluations in history, physical examination ± FBC, HCT and point of care test, the clinicians should be able to determine:

1. Likelihood of dengue infection
2. The phase of dengue infection (febrile/critical/recovery)
3. Severity of the illness

Frontline Disposition

Plan of management

1. Dengue assessment checklist must be filled **(Appendix 8)**
2. Notify the district health office (refer to Chapter 4 on disease notification) followed by disease notification form
3. If admission is indicated (refer to admission criteria)
   - Stabilise the patient at primary care before transfer (refer to intravenous fluid regime)
   - Communicate with the receiving hospital/Emergency Department before transfer
4. If admission is not indicated (refer to **Table 4**)
   - Daily follow up is necessary especially from day 3 of illness onwards until the patient is afebrile for at least 24-48 hours without antipyretics.
   - Provide the patient with Outpatient Dengue Monitoring Record (**Appendix 7**) and Home Care Advice Leaflet for Dengue Patients (**Appendix 9**)

DENGUE ASSESSMENT CHECKLIST

RECOGNITION			
CRITERIA	Yes	No	Details
Fever	☐	☐	
Aches & pains	☐	☐	
Nausea and/or vomiting	☐	☐	
Rash	☐	☐	
Leucopenia	☐	☐	
Any Warning Signs	☐	☐	*(see below for warning signs)*

Warning Signs	Yes	Details
Persistent vomiting ≥3x/ diarrhoea ≥3x (over the last 24h)	☐	
Any abdominal pain/ tenderness	☐	
Lethargy/ restlessness/ confusion	☐	
Tender liver	☐	
Third space fluid accumulation	☐	
Spontaneous bleeding tendencies	☐	
Raised Hct with rapid drop in platelet	☐	*(In the absence of baseline values)*
		Male age ≤60: Hct >46
		Male age >60: Hct >42
		Female all ages: Hct >40

Other criteria	Yes	Details
Syncope	☐	
Social factor	☐	

Special group	Yes	Details
Obese	☐	
Pregnant	☐	
Heart failure/ CKD/ CLD	☐	
DM	☐	
HPT	☐	
IHD	☐	
COPD	☐	
Age >65	☐	

ADMIT if ANY WARNING SIGNS present or presence of other criteria
CONSIDER admission for patients in the special group even in the absence of warning signs.

Instructions
1. Please notify as DENGUE INFECTION
2. If admitting, please inform the receiving Dr

PATIENT DETAILS

Name :

IC No / MRN :

WCC:	Temp:
Hb:	BP/MAP:
Hct:	HR:
Plt:	CRT:
	RR:

SEVERE DENGUE	Yes	Details
Hypotension SBP<90 or MAP<60 or SBP drop >40mmHg from known baseline	☐	
Shock index: HR > SBP or abnormal CCTVR	☐	
Third space fluid accumulation with respiratory distress	☐	
Altered conscious level	☐	
Any bleed GI/ non-mucosal and non-cutaneous/ non-physiological	☐	
Specific organ dysfunction *(pls specify)*	☐	

CRITICAL CARE REVIEW & FAST-TRACK

Instructions
1. Review features of severe dengue present.
2. Specify start and end times of fluid regimes

Date & Time of:	
Fever onset:	
Critical phase onset:	

Phase:

Febrile	☐	Critical	☐	Recovery	☐

DIAGNOSIS

DENGUE FEVER WITHOUT WARNING SIGNS	☐
DENGUE FEVER **WITH WARNING SIGNS**	☐
SEVERE DENGUE	☐

Signature/Stamp:	
Date:	

Management of Dengue in Adults CPG 3rd Edition

HOME CARE ADVICE LEAFLET FOR DENGUE PATIENTS

Front View

HOME CARE ADVICE FOR DENGUE PATIENTS

WHAT SHOULD BE DONE?

- Adequate bed rest
- Adequate fluid intake (more than 8 glasses or 2 litres for an average person).
  - Milk, fruit juice (caution with diabetes patient) and isotonic electrolyte solution (ORS) and barley water.
  - Plain water alone is not sufficient and may cause electrolyte imbalance.
- Take paracetamol (not more than 4 gram per day).
- Tepid sponging.
- If possible, use mosquito repellent or rest under a mosquito net even during day time to prevent mosquito bites.
- Look for mosquito breeding places in and around the home and eliminate them.

WHAT SHOULD BE AVOIDED?

- Do not take non steroidal anti-inflammatory (NSAIDS) eg. aspirin / mefenamic acid (ponstan) or steroids. If you are already taking these medications, please consult your doctor.
- Antibiotics are not required
- Do not take injection
- Do not do massage / cupping / quasa

Back View

THE DANGER SIGNS OF DENGUE INFECTION
(IF ANY OF THESE ARE OBSERVED, PLEASE GO IMMEDIATELY TO THE NEAREST HOSPITAL / EMERGENCY DEPARTMENT)

1. **Bleeding**
   for example :
   - Red spots or patches on the skin
   - Bleeding from nose or gums
   - Vomiting blood
   - Black coloured stools
   - Heavy menstruation / vaginal bleeding
2. **Frequent vomiting and/or diarrhoea**
3. **Abdominal pain / tenderness / diarrhea**
4. **Drowsiness or irritability**
5. **Pale, cold or clammy skin**
6. **Difficulty in breathing**

For home care patient

1. Able to tolerate orally well, good urine output and no history of bleeding
2. Absence of warning signs (refer Table 3)
3. 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
4. Investigation:
   - Stable serial HCT
5. No other criteria for admission (i.e. co-morbidities, pregnancy, social factors)

When to admit / Refer for admission : Holistic Assessment

Referral from primary care providers to hospital

1. ***Symptoms:***

- Warning signs (refer to Table 3)
- Bleeding manifestations
- Inability to tolerate oral fluids
- Reduced urine output
- Seizure

2. ***Signs:***

- Dehydration
- Shock (refer to Table 1)
- Bleeding
- Any organ failure

3. ***Special situations*:**

- Patients with co-morbidity e.g. Diabetes, Hypertension, Ischaemic Heart Disease, Coagulopathy, Morbid Obesity, Renal failure, Chronic Liver disease, COPD
- Elderly more than 65 years old
- Patients who are on anti-platelet and/or anticoagulants
- Pregnancy
- Social factors that limit follow-up e.g. living far from health facility, no transport, patient living alone, etc.

4. ***Laboratory criteria****:* Rising HCT accompanied by reducing platelet count

INTER FACILITY TRANSFER

- **Referral from Hospitals Without Specialist To Hospitals With Specialists**
- Nearest physician should be consulted for all cases of severe dengue, those who are pregnant and patients with comorbidities.

Prerequisites for transfer

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

Emergency Department Intervention

7.3.3 Intervention in Emergency Department

Proactive ongoing clinical reassessment of airway, breathing and circulatory status must be done.

7.3.4 Laboratory tests in the Emergency Department

These tests must be done immediately in cases of suspected dengue infection :

- FBC and HCT
- Point of care testing e.g. Rapid combo test (RCT) or NS1 antigen
- When indicated (suspect severe dengue) :
  - Blood gases and serum lactate
  - LFT/AST and RP
  - Creatine kinase (CK) to detect myocarditis and rhabdomyolysis
  - GXM

Emergency Department Intervention

- **Imaging Investigations in the ED for Patients Requiring Admission:-**

  1. **Chest x-ray and ultrasound** (where available) are required in patients suspected to have vascular leakage. However, it should not delay admission.

  2. **Ultrasonography** may be performed by **trained personal** to look for evidence of:

  - Third space fluid loss such as the presence of pleural effusion, pericardial effusion, gallbladder wall oedema and intraperitoneal fluid collection.
  - Collapsibility of the inferior vena cava (IVC) as an indirect indicator of adequacy of the intravascular fluid compartment & response to intravenous fluids.

Mandatory intervention in Outpatient Clinic & Emergency Department

Recommendation 4

- Dengue assessment checklist should be filled by the attending doctor for all patients with suspected dengue infection (refer to **Appendix 8).**
- All dengue patients requiring admission should be **immediately** started on an appropriate fluid therapy [oral or intravenous (IV)].
  - o When indicated, IV fluid therapy should be initiated and adjusted accordingly.
- In monitoring of dengue patients, the following must be done and documented:
  - o serial monitoring of vital signs
  - o strict monitoring of ongoing fluid losses and hourly fluid input/output charting
- Dengue patients with deteriorating vital signs must be uptriaged accordingly.

TAKE HOME MESSAGE

In Emergency Dept & Outpatient Facility:

- Proper Triage of dengue patients
- Alert to dengue warning signs & criteria for admission
- Appropriate frontline laboratory & imaging investigations
- Prompt IV fluid resuscitation, monitoring & timely readjustment
- Good interfacility & interdepartment communication handover

THANK YOU