Early Clinical diagnosis of dengue & Management

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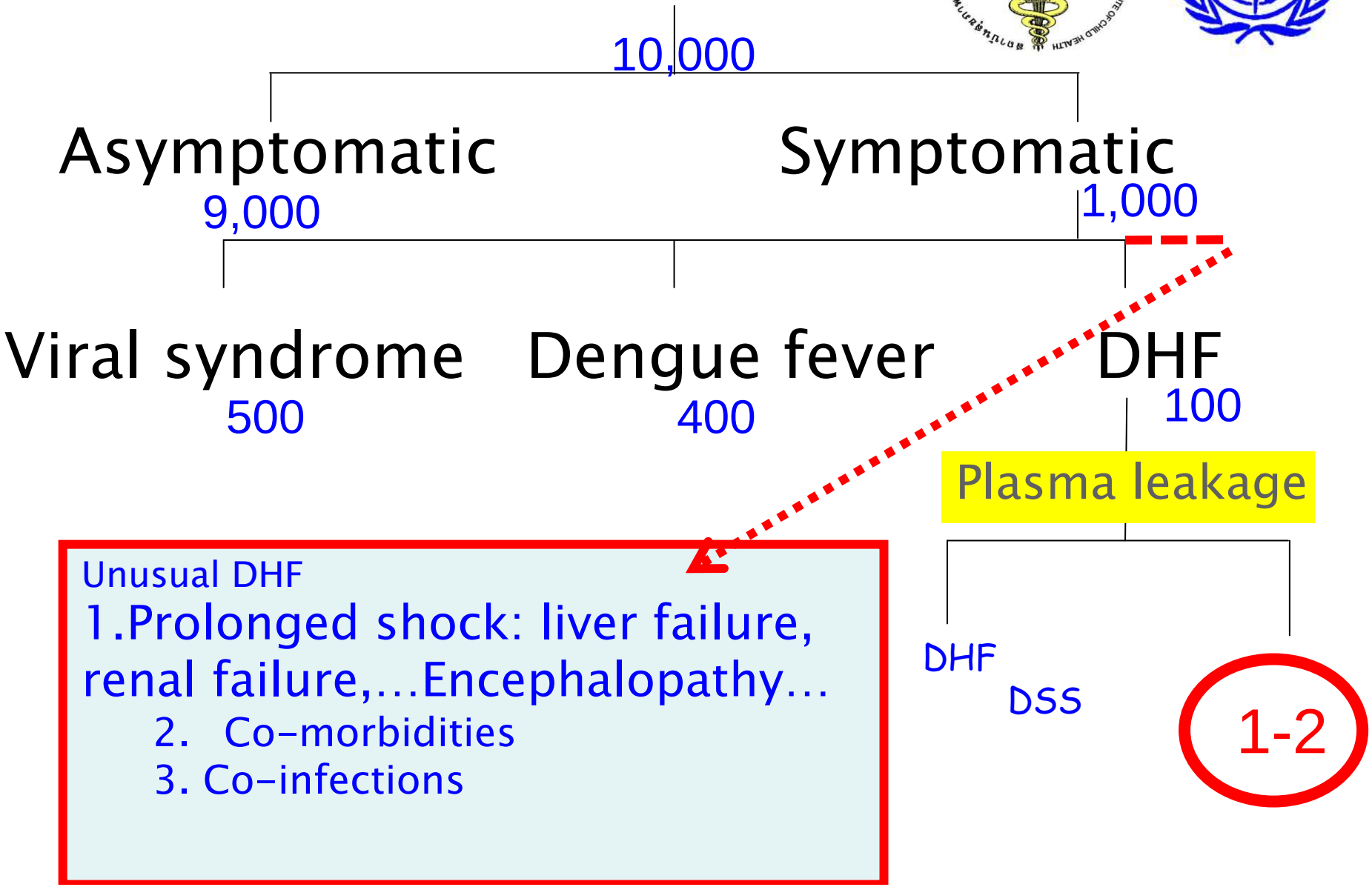
Dengue virus infection



High, continuous fever 2-7 days

Specific history

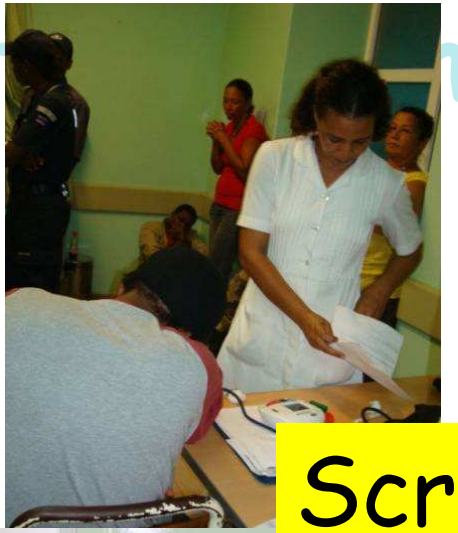
- History
  - Day of illness
  - Bleeding symptoms: epistaxis, bleeding per gum, hematemesis, melena, hematuria, hemoglobinuria, hyper-mennorhea
  - Antipyretic drug taken
  - Nausea/vomiting/abdominal pain
  - Headache/ retro-orbital pain/myalgia/arthralgia
  - Rash

Specific PE

- Consciousness: confusion, restlessness, stuporous
- Vital signs: any signs of shock/ impending shock/ compensated shock
- Capillary refill time
- Petechiae, other bleeding manifestations
- Liver enlargement/ tenderness

Non-specific signs & symtoms

Bleeding manifestations



Screening process

Tourniquet test

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Tourniquet test

- 1st day of fever 50%
- 2nd day of fever 70%
- 3rd day of fever > 90%

False negative Tourniquet test

- Overweight (fat) patients
- Underweight (thin) patients
- Poor technique
- During shock

Headache, retro-orbital pain, Myalgia & Joint pain

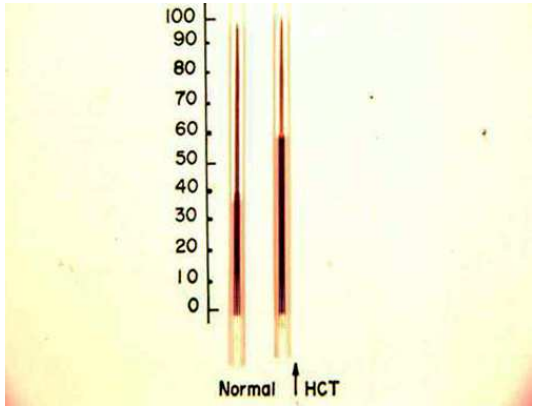
Dengue Fever

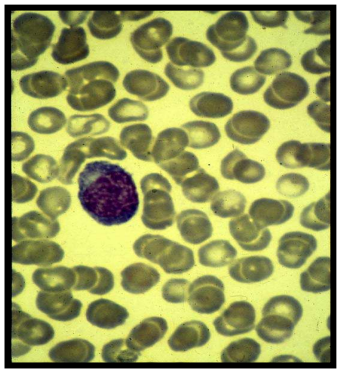
- Acute febrile illness (AFI)
- Viral infection: Chikungunya, Viral exanthem,, enteroviruses, EBV, Influenza, Hepatitis A< hantavirus
  - Viral gastritis, acute gastritis: enteroviruses
- Bacterial infections
  - Acute tonsillitis
  - Acute pharyngitis
  - Rickettsial disease, Meningococcemia, Leptospirosis, Mellioidosis, Typhoid fever, …
- Parasitic diseases: Malaria

% dengue infection :
10 – 60% of AFI

Differential Diagnosis

CBC: WBC Platelet & Hct





Dengue Fever (Infection)

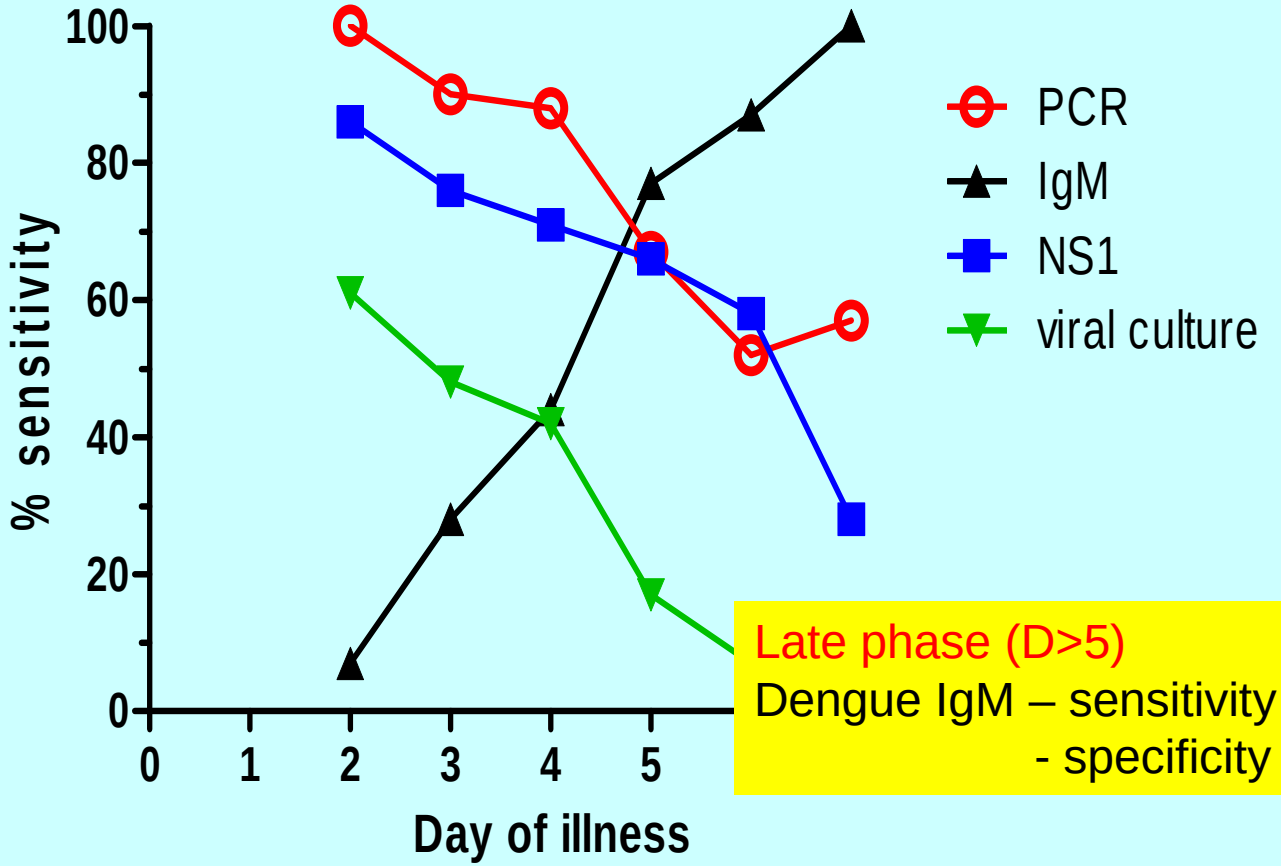
- Headache
- Retro-orbital pain
- Myalgia
- Arthralgia/ bone pain (break-bone fever)
- Rash
- Hemorrhagic Manifestations
- Leukopenia (WBC < 5,000 cells/ mm3)
- Platelet count ≤ 150,000 cells/mm3
- Rising HCT 5-10%

Diagnosis :

Tourniquet test positive + WBC ≤ 5,000/cu.mm
(positive predictive value = 83%)

Dengue diagnostic options and sensitivity

Fever phase (D1-5)
NS1Ag – sensitivity 60-70%
- specificity 99%



Late phase (D>5)
Dengue IgM – sensitivity 60% on shock day
- specificity 99%

Courtesy of Armed Forces Research Institute of Medical Sciences

Rapid Diagnostic Tests (RDT)

1. NS1Ag – Early diagnosis of dengue
2. IgG/ IgM – ELISA, Strip Test – confirmed diagnosis
3. Duo or Combo + 1 + 2

NS1Ag Test

- **Sensitivity ranges from 40-60%** depend on the company
- Positive when the patients have fever
- The sensitivity is highest in the first day of fever (90%), then declines as fever days. By day 5 of fever the test is less sensitive and may be negative from day 6 onwards
- The test is likely to be positive in primary infections than secondary
- **Do not guide clinical management**

NS1Ag

- **Use only for surveillance purposes**

For clinical management only in

- Unusual presentations
- VIP person?

IgG/ IgM tests

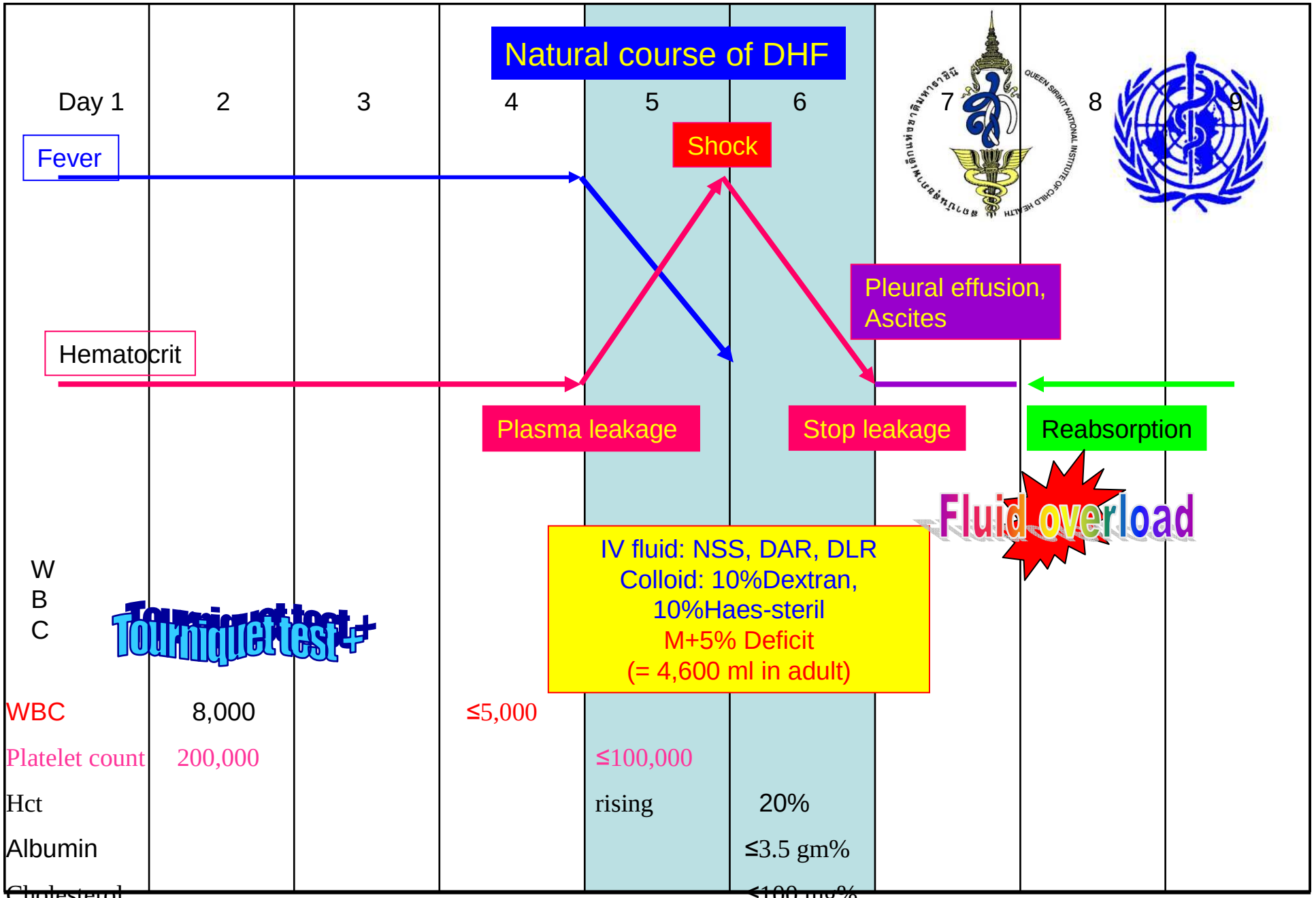
- **Positive after 5 days of fever**
- IgG is more likely to be positive in secondary and past infections. It is positive up to 1-2 years after infections.
- IgM is more likely to be positive in primary infections and indicates acute dengue infections. It persist in 1-2 months

Awareness

- Follow up for more severe diseases: DHF/DSS especially in high risk patients
  - o Infants < 1 year of age, Elderly, pregnancy
  - o Prolonged shock
  - o Overweight patients
  - o Massive bleeding
  - o Change of consciousness
  - o Have underlying diseases

Look for

- Day 3 of fever onwards
- Defervescence with no clinical improvement
- Leukopenia (WBC ≤ 5,000/cumm.) and/ or thrombocytopenia (Plt ≤100,000/cumm.)
- Warning signs
- Rising Hct
- Significant bleeding



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Health education for patients and families of suspected dengue cases

General care

- Reduction of fever by paracetamol and tepid sponge. Avoid aspirin and NSAID
- Promote soft diet or fruit juice, milk or electrolyte solution
- Supportive and symptomatic care

Warning signs

Important message

Come back to the hospital ASAP when there are:

- No clinical improvement especially when no fever of lower grade of fever
- Abdominal pain
- Vomiting
- Bleeding
- Restlessness/lethargy
- No appetite/ Thirsty
- Behavior change
- Change of consciousness

Hallmarks of DHF

- Plasma leakage – rising HCT (PCV) > 20 %. pleural effusion, ascites, hypoalbuminemia (serum albumin < 3.5 gm%)
- Abnormal hemostasis – bleeding tendency, thrombocytopenia, prolonged PTT, Prolonged TT, prolonged PT

The end of febrile phase

WBC < 5,000 cells/ cumm.

There will be no fever within the next 24 hours

In DHF/DSS patients

- Entering critical period
- Beginning of plasma leakage
- Near to the time of shock?

Duration of fever in DHF patients
(from 4,595 patients at the QSNICH)

2 Days - 2.16%

3 Days - 10.07%

4 Days - 41.01%

5 Days - 30.94%

6 Days - 11.51

7 Days - 2.16%

> 7Days - 1.44%

Early diagnosis by CBC: Guide for management

Date	HCT	WBC	PLT
Day 2	41	6,500	160,000
Day 3	43	4,200	143,000
Day 4	47	2,300	90,000
Day 5	39		70,000

← BP = 90/70 mmHg, P 118/min

AST/ALT = 62/59

A 20-year-old woman
Good consciousness

Follow up until 24 hours without fever

Prolonged shock

- > 10 hours untreated - Death!!!
- > 4 hours untreated
  - Liver failure- prognosis 50%
  - Liver + Renal failure - prognosis10%
  - 3 organs failure (+respiratory failure) – Prognosis is a miracle!!!

What do we need?

- Rapid, sensitive and specific rapid diagnostic test (RDT)
- Predictors of more severe diseases: DHF/DSS (lactate, LDH?)

Thank you!