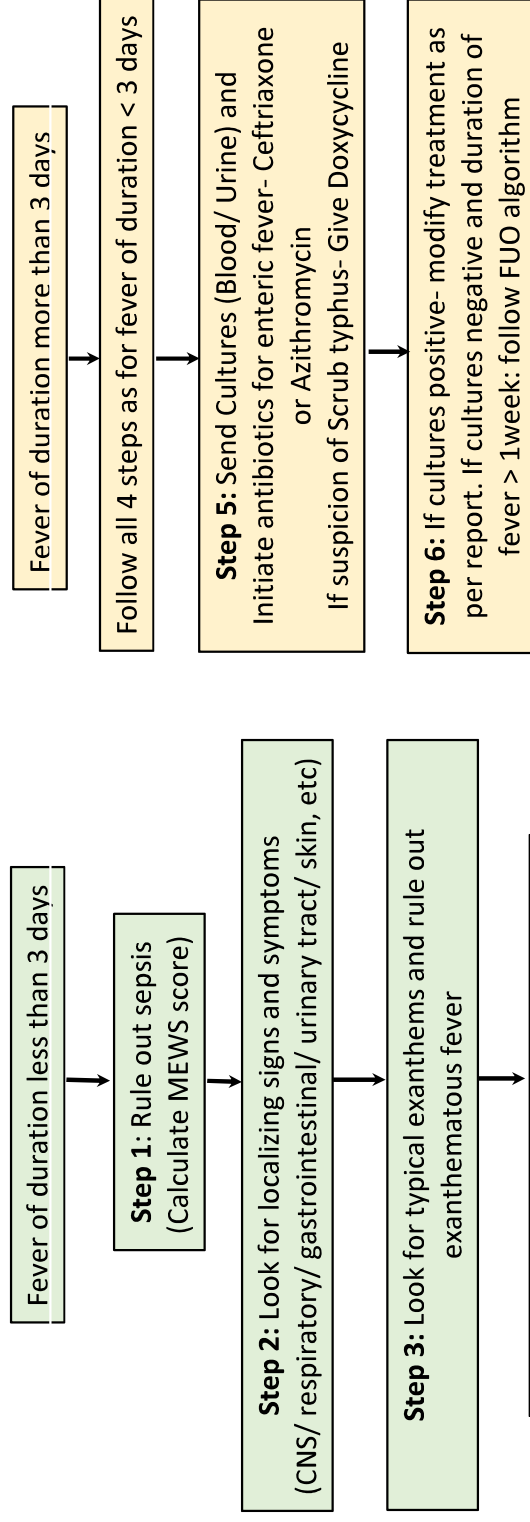


RIGHT DIAGNOSIS – APPROACH TO FEVER

Prasan K Panda, Abhishek Rai

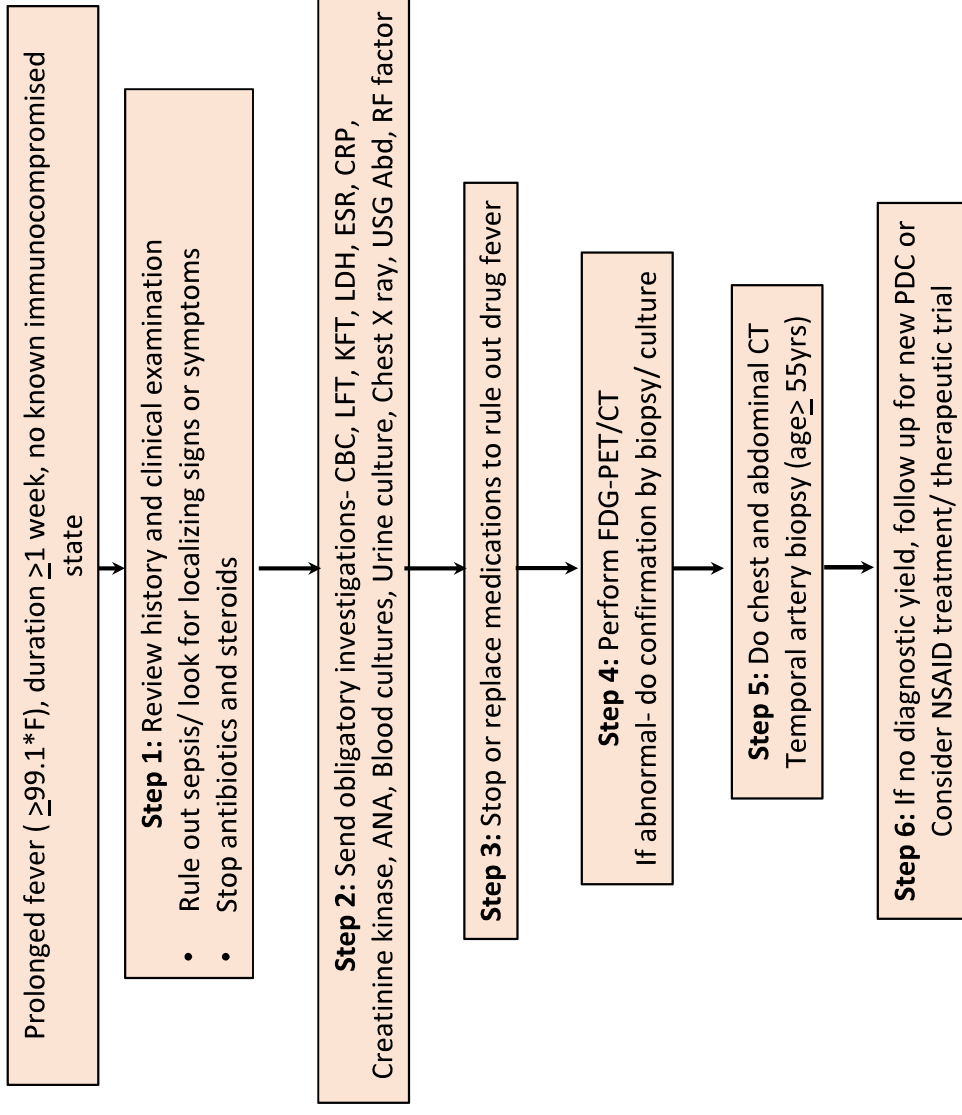


MEWS SCORE	3	2	1	0	1	2	3
SYSTOLIC BP	<70	71-80	81-100	101-199		>200	
HR		<40	41-50	51-100	101-110	111-129	>130
RR		<9		9-14	15-20	21-29	>30
TEMPERATURE		<95F		95-101.2 F		>101.3	
AVPU SCORE				ALERT	VOICE	PAIN	UN-RESPONSIVE

1. Fauci AS et al., editors. Harrison's principles of internal medicine. 21st ed. New York: McGraw Hill; 2022.

2. Gardner-Thorpe et al.(2006). The Value of Modified Early Warning Score (MEWS) in Surgical In-Patients: A Prospective Observational Study. Annals of The Royal College of Surgeons of England, 88(6), 571-575.

RIGHT DIAGNOSIS – APPROACH TO PROLONGED FEVER/FUO



1. Fauci AS et al., editors. *Harrison's principles of internal medicine*. 21st ed. New York: McGraw Hill; 2022.

2. 2 Fernandez, C. et al (2018). Pyrexia of unknown origin. *Clinical Medicine*, 18(2), 170-174. 3. Panda pk, et al. Definition of Fever of Unknown Origin in Indian Patients. *JASPI*. 2024;2(1):1-4.

RIGHT DIAGNOSIS & TREATMENT - ENTERIC FEVER

Prasan K Panda, Rajat Sharma

RIGHT DIAGNOSIS

When to suspect enteric fever?

- Any patient with a history of acute undifferentiated fever, or fever of more than 3 days duration with abdominal symptoms: pain abdomen, initial constipation followed by diarrheal illness
- May present with neuropsychiatric manifestations later in the course of disease

*REMEMBER:

BASU

1. B- Blood culture (1st week)
2. A- Antibody testing or serology (2nd week)
3. S- Stool culture (3rd week)
4. U- Urine culture (4th week)



INVESTIGATIONS

- Blood culture: sensitivity- 50-70%. Should be done in all suspected patients.
- Stool culture: sensitivity 30-40% (mainly in the 3rd week onwards).
- Serology: Includes Widal test and Typhidot. Discouraged by the WHO. If used, paired sera to be tested to look for rising titers. To be done 2nd week onwards.
- Bone marrow culture: sensitivity- >90%. Usually not done due to invasive nature

RIGHT TREATMENT

1. Optimal treatment:
 - Inj Ceftriaxone 1g IV BD for 10-14 days OR
 - Inj/Tab. Azithromycin 1g on day 1 f/b 500mg OD for 5 days
2. Other options:
 - Tab Cefixime 400mg BD for 10-14 days
 - Inj Cefotaxime 2g IV q8h for 10-14 days
 - Inj Meropenem 1g IV q8h for 10-14 days (only to be used in XDR typhoid)

PREVENTION- INDICATIONS FOR TYPHOID VACCINE

- Travel to Endemic Areas
- Close Contact with Typhoid Carriers
- Occupational Exposure
- Immunization Programs in Endemic Areas

RIGHT DIAGNOSIS & TREATMENT - SCRUB TYPHUS

Prasan K Panda, Rajat Sharma

RIGHT DIAGNOSIS

- Scrub typhus is a disease caused by the bacteria *Orientia tsutsugamushi*, transmitted through bites of infected chiggers (larval mites).
- Symptoms begin within 10 days after being bitten by the infected larval mite.
- Symptoms and signs:
 - Fever with chills
 - Generalized body aches
 - Eschar- a dark, scab-like lesion at the site of chigger bite
 - Variable Organ involvement:
 - Respiratory- Pneumonitis/ARDS
 - CNS- meningoencephalitis
 - Cardiovascular- myocarditis
 - Acute liver and kidney injury, etc
- Blood tests for antibodies i.e. IgM scrub typhus should be sent after 5 days of illness. (ICT has sensitivity of 60-70% and specificity >90%, ELISA has variable sensitivity, and specificity of 90-100%)

DETERMINING DISEASE SEVERITY:

- **Mild to moderate disease** – Patients with mild to moderate disease typically present with fever, myalgia, and headache as well as a rash (with or without eschar) and/or cough.
- **Severe** – Patients with severe disease typically present with the findings above in combination with clinical or laboratory manifestations that indicate **end-organ damage**. These include hyperbilirubinemia, renal failure, cardiovascular collapse (hypotension/shock), acute respiratory distress syndrome (ARDS), and meningoencephalitis.

RIGHT TREATMENT

- Mild to moderate Disease: Monotherapy with Doxycycline (100 mg BD oral/IV) or Azithromycin (500 mg OD oral/IV) for 7 Days
- Severe Disease: Combination therapy of Inj. Doxycycline 200 mg BD on day 1 f/b 100 mg BD for 6 days. **PLUS** Inj. Azithromycin 500 mg BD on day 1 followed by 500 mg OD for 6 days, Along with supportive measures for organ failures.
- In pregnancy- Azithromycin 500mg OD for 5 days



Varghese GM, Dayanand D, Gunasekaran K, Kundu D, Wyawahare M, Sharma N, et al. Intravenous Doxycycline, Azithromycin, or Both for Severe Scrub Typhus. *N Engl J Med* [Internet]. 2023 Mar 2 [cited 2024 Nov 15];388(9):792–803. Available from: <http://www.nejm.org/doi/10.1056/NEJMoa2208449>

RIGHT DIAGNOSIS & TREATMENT - LEPTOSPIROSIS

Prasan K Panda, Rajat Sharma

RIGHT DIAGNOSIS

- Causative organism – Spirochetes belonging to Leptospira species
- Transmission to humans occur through cuts, abraded skin, or oral mucosa by direct contact with urine, blood, or tissue from an infected animal (cattle, rodent) or exposure to environmental contamination (water in rice fields, ponds, or flood areas).
- Symptoms start within 1 month of the exposure.
- Presentation – Often mild disease- a flu-like illness with fever, chills, myalgia, headache, nausea, vomiting, abdominal pain, and conjunctival suffusion. Usually resolves within 7-10 days.
- Can present as severe form with multiorgan failure: severe bleeding (pulmonary hemorrhage, GI bleeding, etc), AKI, jaundice, shock, or even expanded leptospira syndrome; case fatality in such cases is as high as 50%.
- Investigation: Hyponatremia, Hypokalemia, Thrombocytopenia, elevated creatinine
Specific - Initial febrile phase - PCR testing of blood. Serology - useful after day 7 of illness (sensitivity is very low in the initial phase). Serological tests include MAT (done in specialized labs) and ELISA.

RIGHT TREATMENT

1. Mild leptospirosis
 - Doxycycline 100mg BD
 - Amoxicillin 500mg TDS
 - Ampicillin 500mg TDS
 2. Severe leptospirosis
 - Penicillin 1.5 million units IV or IM q6h
 - Ceftriaxone 2g/d IV or
 - Cefotaxime 1g IV q6h or
 - Doxycycline loading dose of 200mg IV, then 100mg IV q12h
- (All regimens to be given for 7 days)



RIGHT DIAGNOSIS & TREATMENT - MALARIA

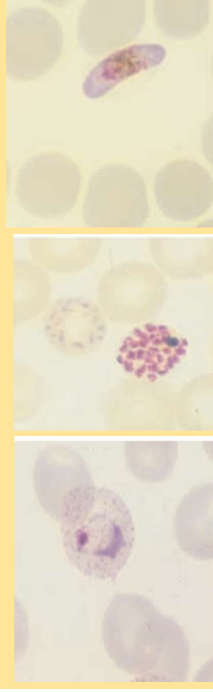
Prasan K Panda, Rajat Sharma

RIGHT DIAGNOSIS

- Symptoms may be mild and include- fever with chills and rigor, headache, myalgia; or may be severe and associated with organ failures.
- Severe malaria – defined by the presence of any one of the following without alternative explanation .

Impaired consciousness GCS < 11	Severe Prostration
Multiple convulsions > 2 in 24 hours	Acidosis- Base deficit >8, HCO3 < 15, Plasma lactate ≥ 5 mmol/L
Hypoglycaemia < 40 mg/dl	
Severe Anaemia < 7 gm/dl (5 in children) with parasite > 10,000/uL	S Creatinine > 3mg/dL or Blood Urea > 120 mg/dL
Bilirubin > 3 mg/dL with parasitemia	Pulmonary edema
Significant bleeding	Shock
Hyperparasitemia	

- Diagnosis is made either by demonstration of one parasite in peripheral blood film or by rapid card tests (PfPR2 or Plasmodium LDH). Rapid card tests are quite sensitive (95%) in detecting malaria.



RIGHT TREATMENT

Uncomplicated malaria: non-severe

- Vivax malaria:** Tab Chloroquine 10mg/kg/day on day 1, and 2 followed by 5mg/kg on day3; with Tab Primaquine 0.25mg/kg/day for 14 days (after G6PD testing).
 - If Patient has G6PD Deficiency: chloroquine prophylaxis (300 mg [base] po once a week) for one year from the acute infection

- Non-Vivax Malaria (i.e. Falciparum malaria and other species):** Artemisinin Combination Therapy (ACT) for 3 days with doses as below with Tab Primaquine 0.75mg/kg single dose on day 2 (G6PD not required)

Examples of ACT: Artemether-lumefantrine (AL)/ Artesunate-amodiaquine (AS+AQ)/Artesunate-mefloquine (ASMQ) /Artesunate + Sulfadoxine-Pyrimethamine (AS+SP)

Other Alternative: Quinine sulfate plus Doxycycline

Dosage of ACT:

Body Weight (kg)	ACT-AL Dose (mg)	FREQUENCY AND DURATION
15 to <25	40 + 240	TWICE DAILY FOR 3 DAYS
25 to <35	60 + 360	
≥35	80 + 480	

Complicated malaria: severe

- Inj Artesunate 2.4mg/kg IV stat followed by 2.4mg/kg at 12 and 24hrs and then daily if necessary.
- OR**
- Inj Quinine dihydrochloride 20mg/kg over 4hr f/b 10mg/kg over 2-8 hrs every 8hourly
- To shift to oral ACT and give full oral regimen once patient can take orally.

Malaria in Pregnancy:

- Falciparum Malaria in all trimesters: ACT-AL with single dose primaquine as above
- Vivax/ Ovale to be treated with Chloroquine and primaquine as above

Fauci AS et al., editors. Harrison's principles of internal medicine. 21st ed. New York: McGraw Hill; 2022
World Health Organization. Guidelines for the treatment of malaria. 2023. Available from: <https://www.who.int/publications/i/item/guidelines-for-the-treatment-of-malaria-2023>

DENGUE FEVER - RIGHT DIAGNOSIS AND CLASSIFICATION Prasan K Panda, Darshan B

CASE DEFINITION

PROBABLE DENGUE FEVER

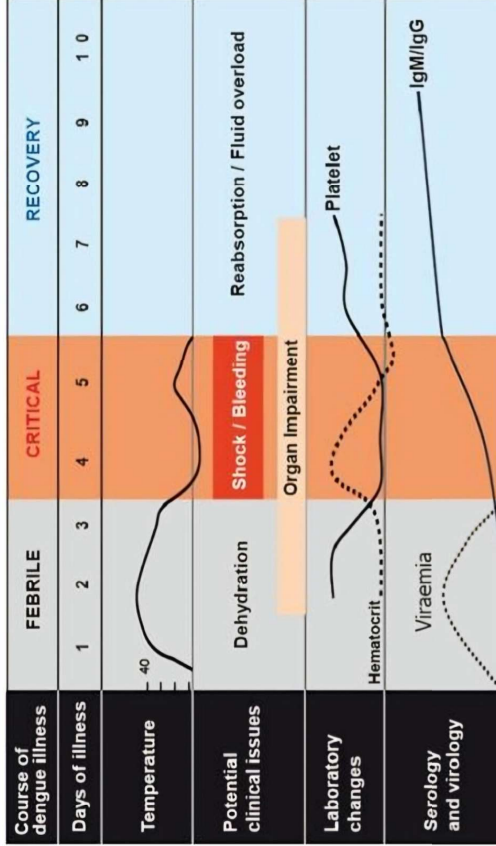
Acute febrile illness of 2-7 days duration with 2 or more of the following-
Headache ,Retro-orbital pain,
Myalgia , Arthralgia, Rash
Hemorrhagic Manifestations, Thrombocytopenia, Leukopenia ,Warning signs and symptoms.

OR

Non-ELISA based NS1 antigen/IgM Positive

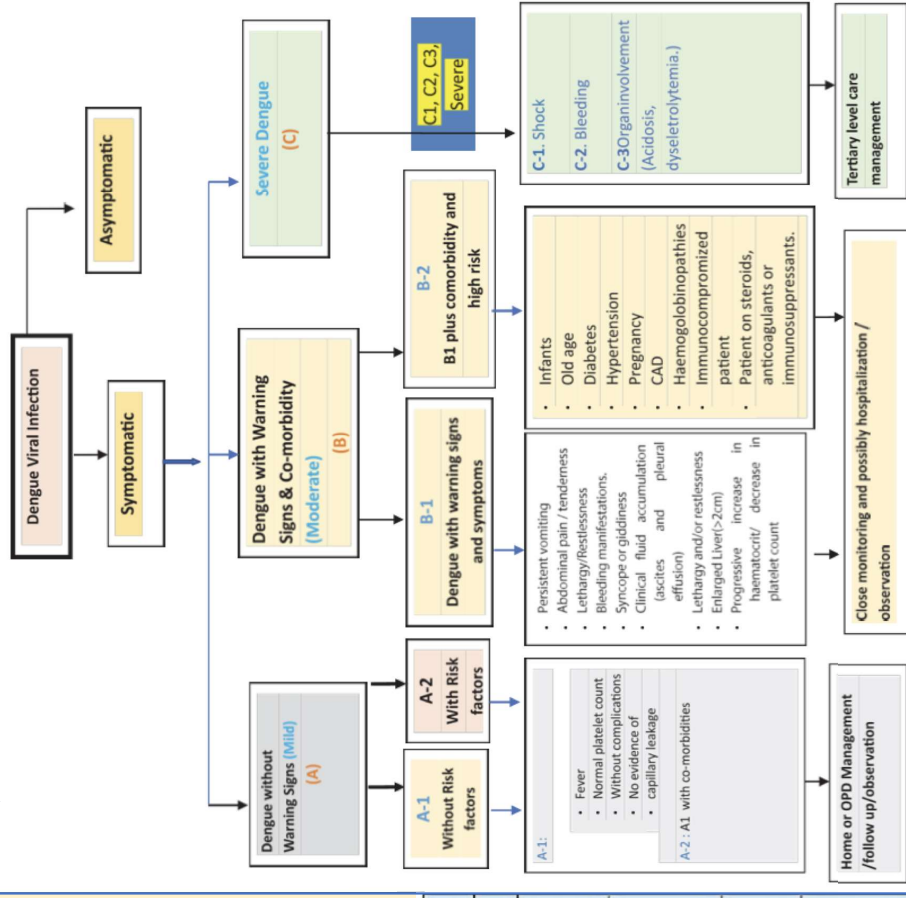
Confirmed Dengue Fever: Probable dengue fever with one of the following

- Isolation of dengue virus.
- Demonstration of IgM antibody.
- Demonstration of NS1 antigen by ELISA



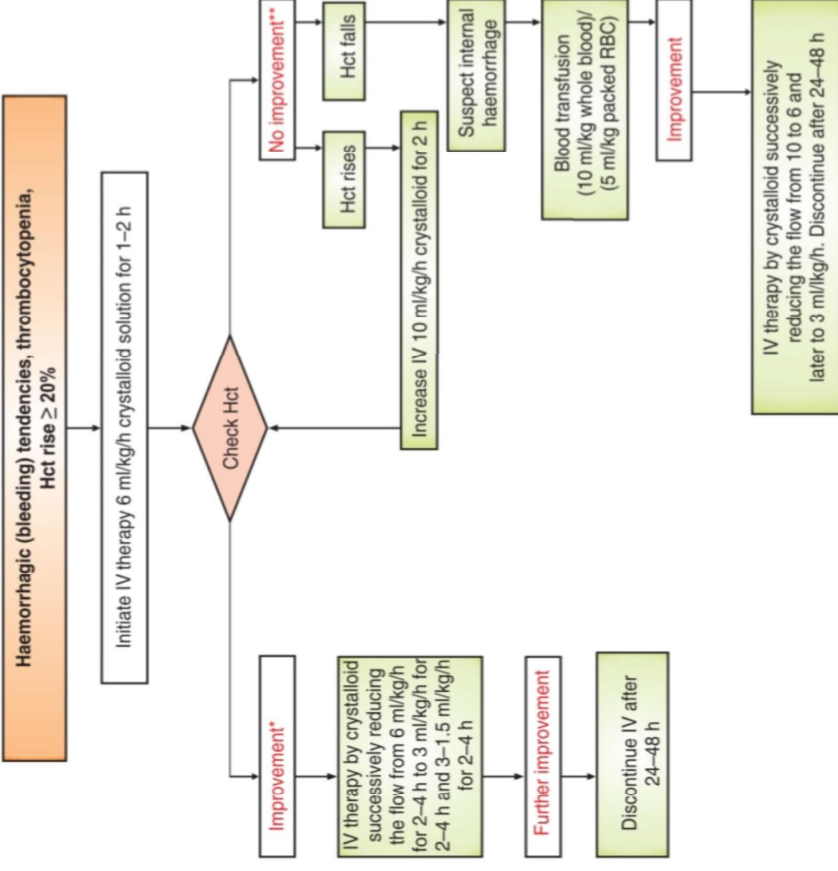
Clinical Phases of Dengue infection

Clinical case classification of dengue:

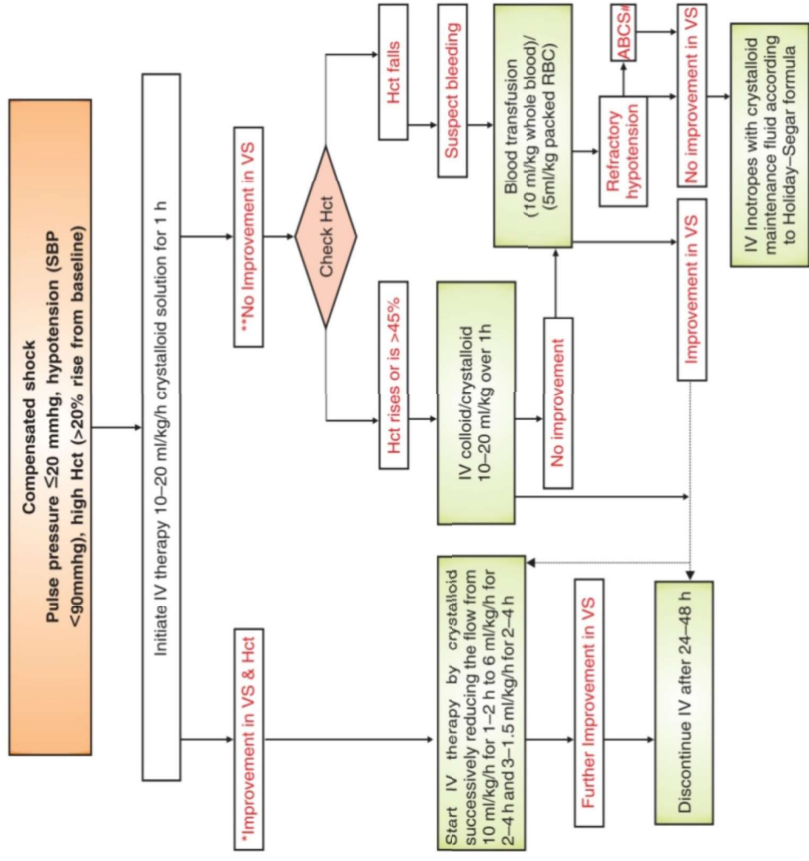


DENGUE - RIGHT TREATMENT

Moderate dengue with warning signs



Severe dengue with compensated shock

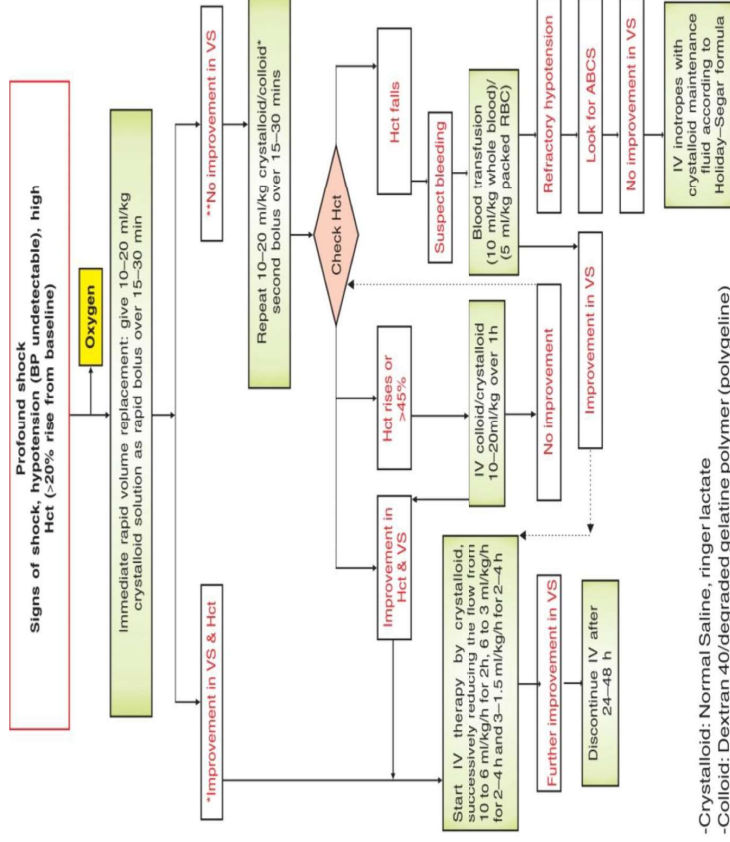


*improvement and **no improvement criteria mentioned in next page

National guidelines for clinical management for dengue fever, 2023

DENGUE - RIGHT TREATMENT

Severe dengue with decompensated shock



When to stop IV Fluids

- 1) Normal blood pressure, pulse and peripheral perfusion
- 2) Decrease in hematocrit
- 3) Apyrexia (without the use of antipyretics) for more than 24–48 hours
- 4) Resolving bowel/abdominal symptoms; Improving urine output.

Indication of platelet transfusion

- 1) Transfuse platelet only if bleeding is present
- 2) Prophylactic platelet transfusion may be considered for counts < 10,000/cumm without bleed and those who may need emergency surgery.

Criteria for discharge

- 1) Afebrile for more than 24 hours
- 2) normal blood pressure, no respiratory distress, adequate urine output
- 3) persistent platelet count >50,000/cu.mm

Indications for blood transfusion

- 1) Loss of blood – 10% or more of total blood volume
- 2) Refractory shock despite adequate fluid administration
- 3) If fluid overload is present PCV is to be given