Diagnostic and Treatment Protocol for Vector Borne Diseases

IBD Branch (NVBDCP)
Department of Health & Family Welfare
Government of West Bengal
https://gdmo.sarifudd.in

Contents

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MESSAGE

The Government of West Bengal remains steadfast in its commitment to strengthening public health systems and eliminating Vector-Borne Diseases (VBDs), with a special focus on protecting vulnerable populations.

This Pocket Book, developed under the National Vector Borne Disease Control Programme (NVBDCP), is a commendable and timely initiative. By providing standardized protocols for early diagnosis and effective treatment, it stands as a vital resource for doctors, nurses, and frontline health workers across all levels of care.

I sincerely commend the Department of Health and Family Welfare and all contributors for their dedication to this cause. I am confident that this effort will significantly strengthen our early response mechanisms, enhance the quality of patient care, and further our collective mission to reduce the burden of vector-borne diseases throughout the state.

7/8/2025

(Narayan Swaroop Nigam)
Principal Secretary
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Dr. Swapan Saren

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Date : 07.08.2025

MESSAGE

Vector-borne diseases remain a significant public health challenge in West Bengal, particularly in both endemic rural belts as well as densely populated urban areas. Timely diagnosis and standardized treatment are crucial in mitigating morbidity and mortality. This Pocket Book "***Diagnostic and Treatment Protocols of Vector-Borne Diseases***" is developed as a quick-reference tool for all healthcare professionals across Government hospitals and health facilities to ensure uniform clinical practices, informed decisions, and better patient outcomes.

I hope this handbook becomes a valuable part of every healthcare provider's daily toolkit and supports our shared goal of reducing the burden of these diseases across the state.

Dr Swapan Saren

Director of Health Services

Preface

Vector-Borne Diseases continue to pose serious public health threats in West Bengal, especially during transmission season. Strengthening early diagnosis, timely & complete treatment and following Standard Operating Procedure in case management are the keys for reducing disease burden and preventing complications. In this context, the development of this Pocket Book on "**Diagnostic and Treatment Protocols of Vector Borne Diseases**" is both timely and essential.

The handbook covers six critical diseases e.g. Malaria, Dengue, Chikungunya, Kala-azar, Filaria and AES-JE and their diagnostic criteria, treatment protocols and referral guidelines in a simplified and doable way.

I am confident that this resource book will contribute significantly to our collective efforts toward effective VBD control.

I must thank to my colleagues for their continuous support for publication of this essential Pocket Book on "**Diagnostic and Treatment Protocols of Vector Borne Diseases**".

07/08/2025

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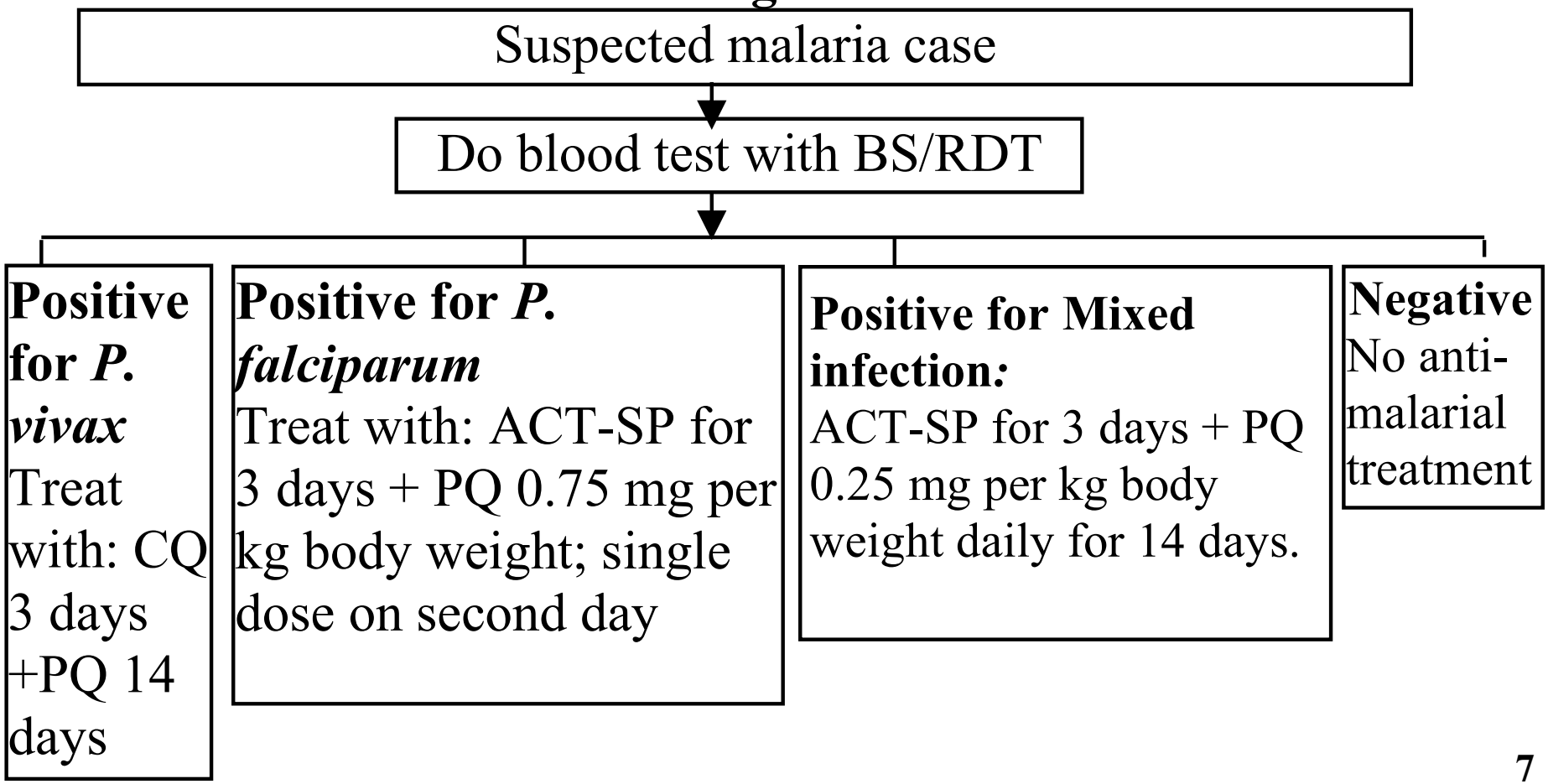
Diagnostic Protocol of Malaria where microscopy results are not available in the same sitting and Bivalent RDT is used



Treatment protocol of Malaria (National Drug Policy on Malaria, **2016)**

A. Dosage chart for treatment of *P. vivax* Malaria cases:

Age	Day 1		Day 2		Day 3		Day 4 to14
	CQ (150 mg base)	PQ (2.5mg)	CQ (150mg base)	PQ (2.5 mg)	CQ (150mg base)	PQ (2.5 mg)	PQ (2.5 mg base)
<1 year	½	0	½	0	¼	0	0
1-4 years	1	1	1	1	½	1	1
5-8 years	2	2	2	2	1	2	2
9-14 years	3	4	3	4	1½	4	4
≥15 years	4	6	4	6	2	6	6
Pregnancy	4	0	4	0	2	0	0

CQ (250 mg tablet has 150 mg base). PQ is contraindicated in pregnancy, Infants & G6PD deficiency (test not mandatory). PQ should be stopped in case of haematuria, high colored urine & cyanosis. The patient follow up should be ensured up to 14 days of treatment with PQ.

B. Treatment of *P. falciparum* Malaria:

i. Dosage chart for treatment of uncomplicated *P. falciparum* Malaria cases with ACT-SP:

Age Group (Years)	Colour of blister	1st day		2nd day		3rd day
		AS	SP (in mg)	AS	PQ	AS
0 to <1	Pink	25 mg	250 + 12.5	25 mg	Nil	25 mg
1-4	Yellow	50 mg	500 + 25	50 mg	7.5 mg	50 mg
5-8	Green	100 mg	750 + 37.5	100 mg	15 mg	100 mg
9-14	Red	150 mg	1000 + 50	150 mg	30 mg	150 mg
≥15	White	200 mg	1500 + 75	200 mg	45 mg	200 mg
Pregnancy	1st trimester	Tab Quinine 10mg kg bw TDS x 7 days				
	2nd&3rd trimester	one ACT blister Pack for 3 days (No PQ & SP is given)				

Artesunate 4mg/kg bw daily for 3 days plus Sulfadoxine 25 mg/kg bw & Pyrimethamine 1.25 mg kg/bw on Day 1 and Primaquine 0.75 mg /kg bw on Day 2

C. Treatment of uncomplicated mixed infections (*P. vivax* + *P. falciparum)* cases:

Day wise treatment		Day -1	Day-2	Day -3	Day 1-14
All	ACT + PQ	AS+SP	AS	AS	PQ
Pregnancy	1st trimester	Tab Quinine 10 mg /Kg B wt TDS for 7 days			
	2nd&3rd trimester	1 ACT Adult blister pack for 3 days (No PQ & SP)			

D. Treatment of *P. ovale* and *P. malariae*:

P. ovale should be treated as *P. vivax* and *P. malariae* should be treated as *P. falciparum*. In patient with known G6PD deficiency, consider preventing relapse by giving Primaquine base at 0.75 mg/kg body weight once a week for 8 weeks, with close medical supervision for potential primaquine-induced haemolysis.

E. Anti-malarial for severe and complicated malaria cases

Treatment during admission (Choose one)	**Follow-up treatment orally**
Inj Artesunate: 2.4 mg/kg bw IV slowly over 3 to 5 minutes. (3-4 ml/minute) at 0, 12, 24 hours, followed by once a day, Pediatric patients 3.0 mg/Kg BW (When BW is less than 20 Kg)	A full **3-day** oral course of Area-specific Tab ACT is to be given after parenteral therapy. Treat with Tab ACT-SP for **3 days**+ PQ single dose on **Day 2**.
Inj Quinine: 20mg/kg bw IV or IM on admission followed by maintenance dose of 10 mg /kg **8** hourly for 48 hours; Infusion rate (5% dextrose) should not exceed 5mg/kg/ hour. Loading dose of 20mg/kg should not be given, if patient has already received quinine.	**Tab Quinine:** -10mg/kg TDS for 7 days **plus** Tab Doxycycline100 mg OD for 7 days (Contraindicated in pregnancy & children < 8 yr) or, Clindamycin 10 mg /Kg bw in pregnant, lactating women & children< 8 years of age.

Do not use in severe Malaria: 1. Adrenaline, 2. Corticosteroids, 3. Intravenous mannitol, 4. Heparin as anticoagulant, 5. Over hydrate

Criteria for severe malaria are as follows:

1. Persistence of fever even 48 hours after initiating treatment 2. Continuous vomiting & inability to retain oral drugs 3. Headaches continue to increase 4. Severe dehydration seen as dry, parched skin or sunken face 5. Feeling too weak to walk 6. Hypothermia 7. Impaired consciousness 8. Repeated generalized convulsions 9. Renal failure (Serum creatinine >3 mg/dl) 10. Jaundice (Serum Billirubin > 3mg/dl)	11. Severe Anaemia (Hb% <5gm /dl) 12. Pulmonary oedema 13. Hypoglycemia, plasma glucose<40 mg/dl 14. Metabolic acidosis 15. Shock (Systolic BP<80 mm Hg among adult, < 50 among children) 16. Abnormal bleeding, DIC 17. Hemoglobinuria 18. Hyperthermia >106.7^0 F; 41.5^{0}C 19. Hyperparasitaemia: *Pf* parasitaemia >10%

Diagnosis protocol of Chikungunya

Case Definition: Public health authorities should be alerted to small clusters of disease (Fever & Arthralgia or Arthritis) associated with a travel returning from an endemic area or an increase in the number of Hospitalization for fever with Arthralgia or Arthritis occurring in a localized area in a short time period.

Suspected Case: A patient with acute onset of fever > 38.5° C (101° F) and severe arthralgia or arthritis not explained by other medical conditions and residing or having visited epidemic or endemic areas within 2 weeks prior to onset of symptoms.

Confirmed Case: A clinically suspect case with any of the following Chikungunya specific tests:

- Virus isolation.
- Detection of viral RNA by RT-PCR.
- Detection of IgM in a single serum sample of acute/convalescent patient
- 4-fold increase in Chikungunya specific antibody (2-3 wks apart)

Treatment: There is no commercial Chikungunya vaccine at present. Treatment of Chikungunya is supportive. Acutely infected patients need to be protected against mosquito bites to prevent further disease spread both at home, in the community and in the health care facility.

Diagnostic protocol of Dengue cases:

Case definition of suspected dengue includes the following:

(i) An acute febrile illness of 2-7 days duration,

(ii) Along with two or more from the list:

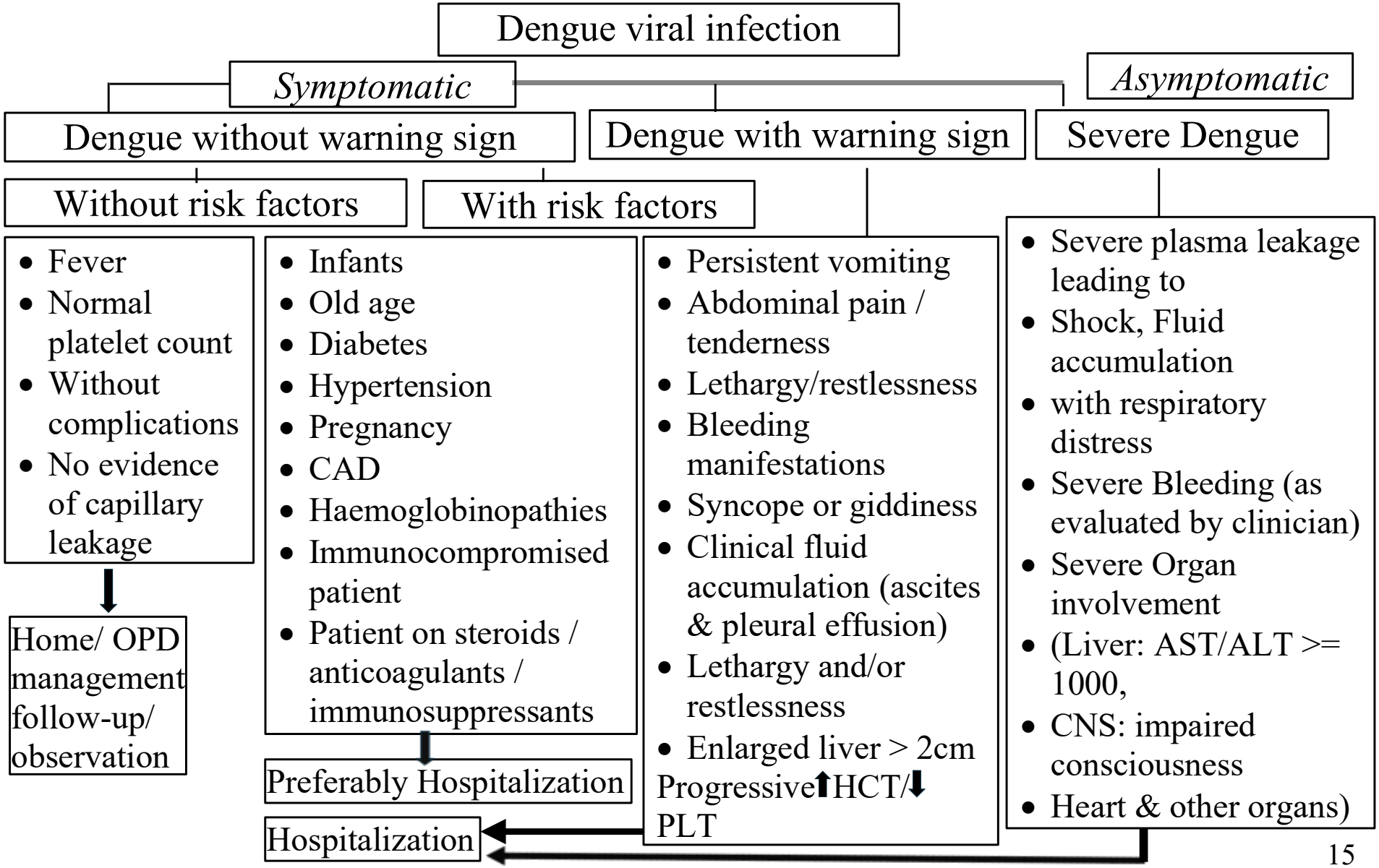
Headache, Myalgia, Arthralgia, Retro-orbital pain, Rash, Hemorrhagic manifestation.

- So, any case fitting into the above clinical case definition must be tested for dengue.
- Keeping Expanded Dengue Syndrome in mind, any case of fever presenting with vital organ dysfunction should have a test for dengue.

Recommended tests are:

1. NS-1 ELISA - for fever up to 5 days.
2. IgM ELISA - for fever more than 5 days.

Either of the above tests is considered as confirmatory for practical purposes. The particular test type (NS-I ELISA/IgM ELISA/ both in borderline cases) need to be indicated; or the fever duration should be mentioned by the clinician so that the Lab can decide the type of test required.


Dengue viral infection
Symptomatic
Asymptomatic
Dengue without warning sign
Dengue with warning sign
Severe Dengue
Without risk factors
With risk factors
• Fever
• Normal platelet count
• Without complications
• No evidence of capillary leakage
Home/ OPD management follow-up/ observation
• Infants
• Old age
• Diabetes
• Hypertension
• Pregnancy
• CAD
• Haemoglobinopathies
• Immunocompromised patient
• Patient on steroids / anticoagulants / immunosuppressants
Preferably Hospitalization
• Persistent vomiting
• Abdominal pain / tenderness
• Lethargy/restlessness
• Bleeding manifestations
• Syncope or giddiness
• Clinical fluid accumulation (ascites & pleural effusion)
• Lethargy and/or restlessness
• Enlarged liver > 2cm
Progressive⬆HCT/⬇ PLT
Hospitalization
• Severe plasma leakage leading to
• Shock, Fluid accumulation
• with respiratory distress
• Severe Bleeding (as evaluated by clinician)
• Severe Organ involvement
• (Liver: AST/ALT >= 1000,
• CNS: impaired consciousness
• Heart & other organs)

Fluid therapy in dengue

Ask and check:

A. If there is any of the warning signs of dengue (see list above)

B. If there is shock –

- Compensated, or
- Decompensated (Hypotensive).

NB: Please be cautious to detect dengue shock – latest at the compensated stage. Mind it that the features of shock may be subtle.

A.1. If the patient has no warning sign but cannot tolerate oral fluids or take inadequate amount, admit and give IV fluid as substitute of oral hydration.

A.2. If the patient has any warning sign, IV fluid should be administered irrespective of any obvious dehydration or shock.

- Give isotonic solution e.g. normal saline or Ringer's lactate.
- Start with 5-6 ml/kg/hour for 1-2 hours
- Reduce to 3-5 ml/kg/hour for 2-4 hours
- Reduce to 2-3 ml/kg/hour or less according to clinical condition

⇩

Re-assess clinical status and repeat HCT

⇩

If vital signs worsen and HCT rises rapidly, increase IV fluid. If there is no worsening and HCT remains same/ rises minimally, continue IV fluid 2-3 ml/kg for another 2-4 hours.

B. If there are features of shock – either compensated or decompensated, give IV fluid therapy according to the flow charts given in later pages. Please see the **signs of "Improved Circulation"** mentioned below. Use the same for detection of shock.

Maintenance fluid:

Follow the formula given below. For obese patients, calculate IV fluid amount according to ideal body weight.

Maintenance fluids could be calculated using Holliday-Segar formula as follows:	
Body weight (Kg)	**Maintenance volume for 24 hours**
<10	100 ml/ Kg
10-20	1000 ml + 50 ml/ Kg body weight exceeding 10 Kg
>20	1500 ml + 20ml/ Kg body weight exceeding 20 Kg

NB.: The maintenance fluid includes both oral and IV fluids

Calculation of ideal Body weight:

Female	Male
45.5 Kg + 0.91 (Height–152.4cm) or	50 Kg + 0.91 (Height–152.4 cm) or
45.5 Kg + 2.3 Kg/ inch over 5 ft	50 Kg + 2.3 Kg/ inch over 5 ft

Principle for guiding intravenous fluid therapy in Dengue

Intravenous Fluid Therapy

IV fluid therapy in Dengue

Inadequate

Hypovolemia & decreased tissue perfusion

Compensated shock
Hypotensive shock

- Bleeding
- DIC
- Multi-organ failure

Adequate

Improved Circulation

- Capillary refill <2 sec
- Normal heart rate, BP
- Normal pulse pressure
- Urine 0.5 mi/kg/hr
- HCT to Normal
- Improving acid-base

Excessive

Fluid overload:

- Pulmonary oedema
- Respiratory distress
- Worsening pleural effusion & ascites

Clinical deterioration

Intravenous fluid of choice

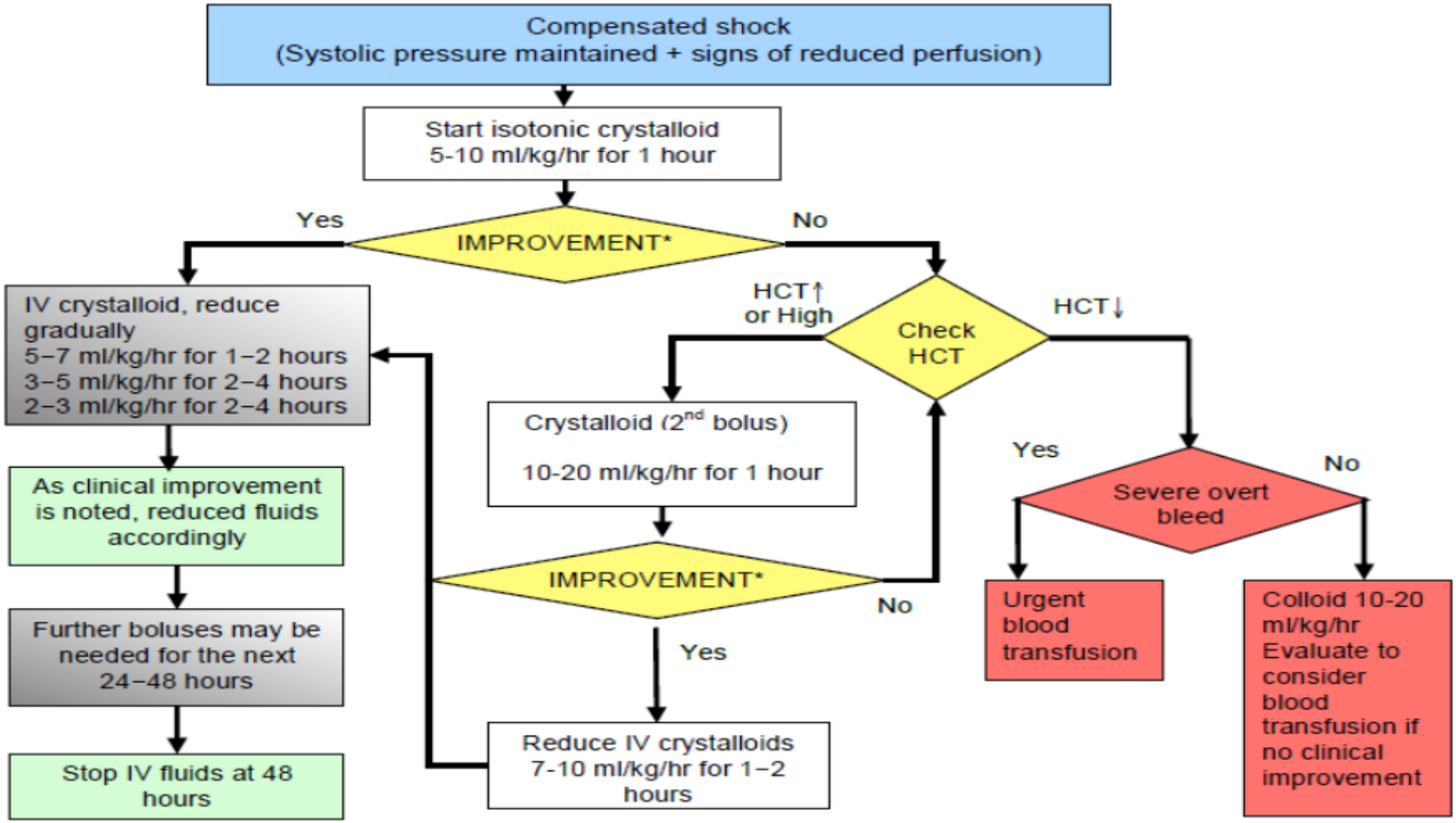
IV Fluids to be given	IV Fluids to be avoided
• Use isotonic osmolar solutions (Normal Saline, Ringer's Lactate, balanced Crystalloid) • Colloids are preferred, if the blood pressure must be restored urgently	• Hypotonic solution, e.g. 0.45% saline, even during the febrile phase • Dextrose containing solutions, but may be used in hypoglycemia with close blood glucose monitoring

Colloids are used in the case of:

- Hypotensive Shock
- Repeated shock- 2nd or 3rd shock and onwards
- After >20 to 30ml/kg of crystalloids
- If HCT does not decrease after crystalloid administration in shock
- **DOSE: Limited to 30 to 50 ml/kg/day**

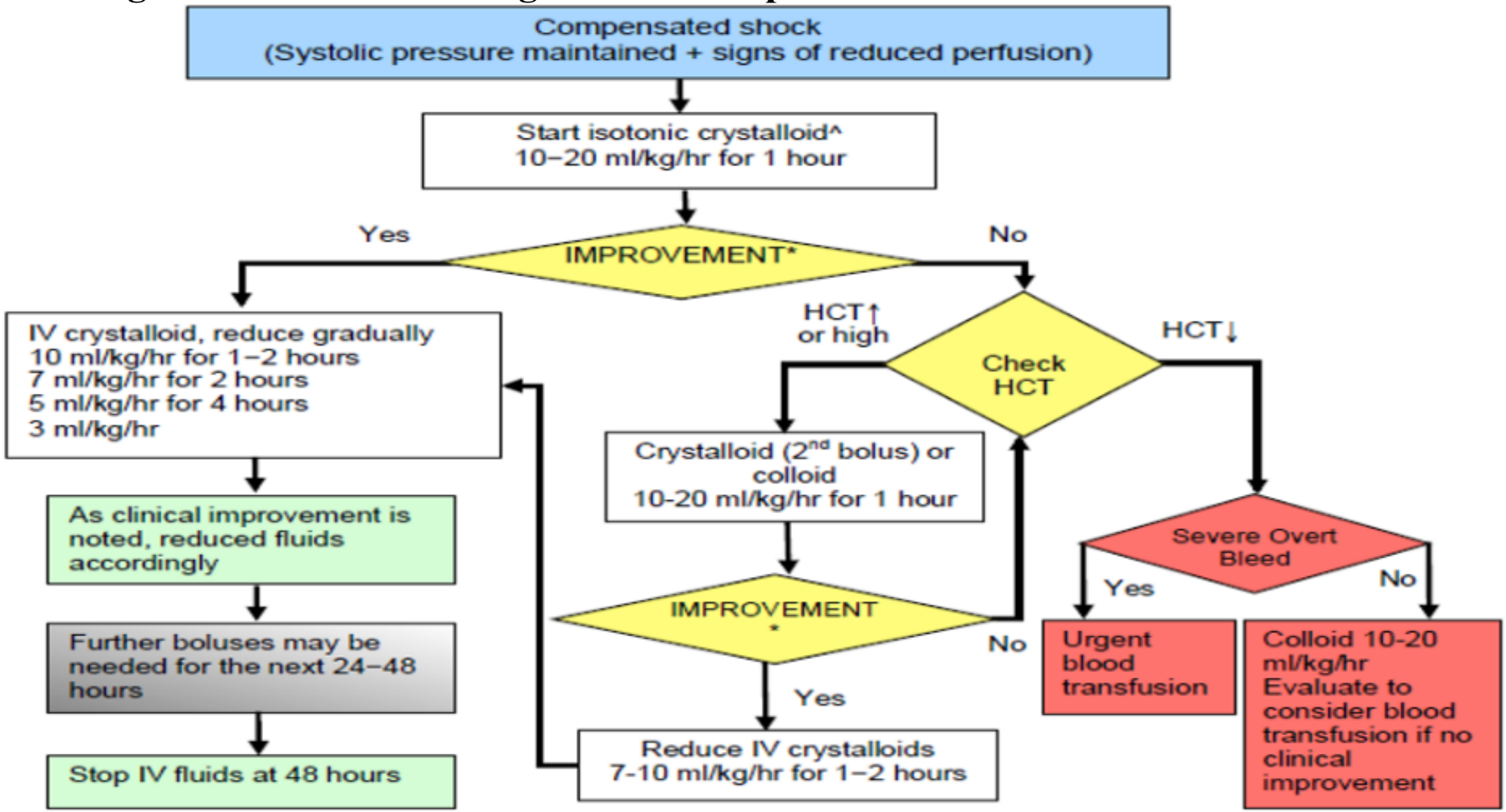
- Usually, IV fluids are not required beyond 36 to 48 hours.
- Usually, change should not be drastic. During any changes, look for signs of under & overhydration.

Algorithm for fluid management of compensated shock: in adults



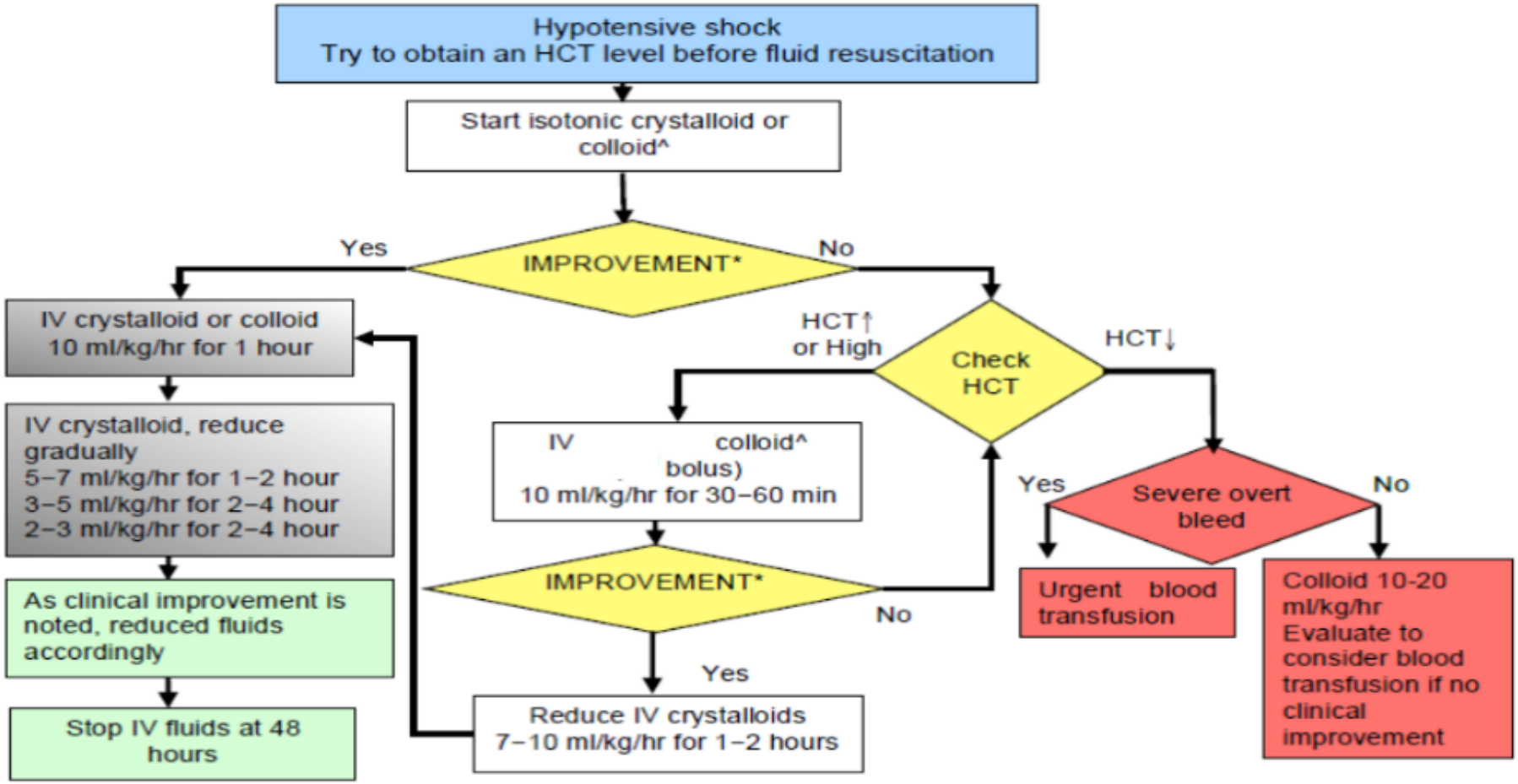
*Reassess the patient's clinical condition, vital signs, pulse volume, capillary refill time and temperature of extremities.
**Colloid is preferable if the patient has already received previous boluses of crystalloid
-IV: intravenous, HCT: haematocrit, ↑: increased, ↓: decreased.

Algorithm for fluid management of compensated shock: in infants and children



^Colloid is preferable if the patient has already received previous boluses of crystalloid
*Reassess the patient's clinical condition, vital signs, pulse volume, capillary refill time and temperature of extremities.IV = intravenous; HCT = haematocrit; ↑ = increased; ↓ = decreased

Algorithm for management of hypotensive shock in infants, children and adults



^Colloid is preferable if the patient has already received previous boluses of crystalloid
*Reassess the patient's clinical condition, vital signs, pulse volume, capillary refill time and temperature of extremities.
IV = intravenous; HCT = haematocrit; ↑ = increased; ↓ = decreased

Kala-Azar

Whom to test for VL?

Any person living-in or having travelled to KA endemic areas suffering from fever for more than 14 days or irregular bouts of fever or chronic fever or prolonged fever and enlarged spleen /&liver or substantial weight loss or having anemia with loss of appetite. All confirmed TB cases and HIV cases having any above signs or symptoms will also be tested for VL by MO.

Whom to test for PKDL?

A patient living-in or having travelled to KA endemic areas, presenting with a typically symmetrical multiple hypopigmented macules, papules, plaques or nodules with or without previous history of visceral leishmaniasis, with no loss of sensation.

Diagnosis protocol of Kala-Azar (1)

- Currently the diagnosis is done by RDT or Biopsy (Splenic, Bone Marrow or Lymph Node).
- Definitive diagnosis by culture/microscopic conf. of parasite.

Diagnosis protocol of Kala-Azar (2)

1. A person living in or having travel history to a kala-azar endemic area/s showing and having fever of > 2 weeks.

⇨ 2. Clinical history & physical assessment (splenomegaly/ Hepatomegaly, Anemia etc.)

⇩

3. Must enquire about past history of Kala-azar

⇩

4. In non-endemic states/districts explore travel history

⇩

5. Lab tests

⇦

- Rule out common causes of fever (Malaria, Typhoid etc.)
- Rapid Diagnostic Test for Kala-azar
- If suspected relapse/RDK negative but with strong clinician suspicion, then **REFER** to Medical College/ District Hospital for confirmation by demonstration of parasites (L.D. body) on splenic/ bone marrow aspirate**.**

Treatment Protocol for VL (Kala-azar/ visceral Leishmaniasis)

Single Dose of Liposomal Amphotericin B infusion in 5% Dextrose solution @10 mg per kg body weight IV over 2-3 hours after administration of test dose

Provide general management for anemia correction and any other opportunistic infection. Consider blood transfusion prior to LAMB administration if Hb<6gm/dl

Patients need to be followed up Medical Officer at 15 days, 1 month, 6 months period after initiation of treatment.

Treatment Protocol for HIV-VL

Liposomal Amphotericin B (up to 30 mg/kg, at 5 mg/kg on days 1, 3, 5, 7, 9, 11) + miltefosine (100 mg/day for 14 days)

Treatment Protocol for PKDL

Treatment of choice

Miltefosine capsule, for 84 days, Oral
2-11 years→2.5 mg per kg body weight/ day
>12 years; <25 kg →50 mg/ day
> 12 years; > 25 kg →100 mg/ day

Supportive management

Give PPI, Antiemitics for first two weeks/ as required.
Ophthalmological evaluation before treatment

Miltefosine is contradicted in pregnant women, lactating women, women in reproductive age group, who refuse contraception during treatment and 2 months post last dose of Miltefosine and in children < 2 years

Diagnostic Protocol of Lymphatic filariasis

The disease spectrum of LF ranges from the initial phase of asymptomatic microfilaraemia to the later stages of acute, chronic and occult clinical manifestations.

1. **Asymptomatic amicrofilaraemia**
2. **Asymptomatic microfilaraemia:** people are asymptomatic but their blood is positive for Mf.
3. **Stage of acute manifestations:**
   - Mild fever
   - Generalized body aches
   - Fatigue and weakness
   - Lymphangitis/ lymphadenitis
   - Bacterial infections of the skin and tissues under the skin are more likely because the worms block the lymphatic vessels which make the immune system less able to defend the skin and adjacent tissues from bacteria. Often, symptoms resolve, and then recur. They are more severe when people are exposed to the infection for the first time.

- Some individuals may experience an acute inflammatory reaction called "acute filarial lymphangitis" during which the lymphatic vessels become inflamed. Symptoms during this stage may include:

i. Severe and recurrent episodes of fever.
ii. Pain and swelling in the limbs, genitalia, breasts, or scrotum.
iii. Redness and warmth of the affected area.
iv. Headaches and migratory joint pains.
v. Skin exfoliation after resolve of acute episode

3. ***Chronic Stage*:** If left untreated, lymphatic filariasis can progress to a chronic stage. It's important to note that symptoms may vary among individuals, and not all infected individuals will develop chronic manifestations. If you suspect lymphatic filariasis or have been exposed to mosquito bites in endemic areas, it is crucial to seek medical attention for proper diagnosis and treatment.

The following steps need to be considered for early screening/identification of lymphatic filariasis based on fever cases and early symptoms:

Step 1: Assess the presence of fever: If the individual exhibit fever and is from LF endemic region or has a travel history to LF endemic area, lymphatic filariasis may be suspected.

Step 2: Evaluate for early symptoms: Check for the presence of mild fever, generalized body aches, fatigue, weakness, and swollen lymph nodes. If these symptoms are present, proceed to the next step.

Step 3: Rule out other potential causes of fever: Since lymphatic filariasis is not the only condition that can cause these symptoms, it is important to rule out other possible causes of fever such as viral infections, bacterial infections, or other inflammatory conditions.

All the fever cases need to be evaluated as per the duration of fever (greater or less than 14 days). Any fever with more than 14 days needs to evaluate for Kala-azar, Tuberculosis, Typhoid etc.

If fever duration is less than 14 days, must undergo a Malaria test and evaluate for the symptoms of other diseases like Dengue, Chikungunya, Japanese Encephalitis, Leptospirosis, Scrub typhus etc. If any disease symptoms are present, proceed with the diagnostic test as applicable.

Step 4: Assess specific indicators of lymphatic filariasis: If the individual has persistent or recurring fever along with pain and swelling in the limbs, genitalia, breasts, or scrotum, it may indicate acute filarial lymphangitis.

Step 5: Seek medical attention: If there are persistent or concerning symptoms, it is important to consult a healthcare professional or visit nearest health facility/ HWC for further evaluation and proper diagnosis. Diagnostic tests, such as **Night Blood test** to detect microfilariae or antigen tests (FTS), can confirm the presence of lymphatic filariasis. All Mf positive cases confirmed by NBS or FTS test would be treated with Directly observed single dose of DA or IDA (Day 1) as per MDA schedule, followed by standard treatment with DEC of dosage 6 mg/kg body weight daily for 12 days to be consumed after the meal.

Each positive case to be followed up, repeat testing and treatment (if positive) to be done till they are Mf negative. This would prevent any chronic manifestations later.

Diagnostic methods for detection of early stages of Lymphatic filariasis:

The diagnosis of filariasis can be done by different methods as follows;

- Blood tests:

✓ Blood smear: In most parts of the world, the parasites have a "nocturnal periodicity" that restricts their appearance in the blood to only the hours of 10 PM – 02 AM. Therefore, the diagnosis of lymphatic filariasis traditionally has depended on the laboratory examination of blood taken between 10 PM and 2 AM when microfilaria is most common in peripheral blood.

✓ Eosinophil count

- **Identification of microfilariae in a urine and hydrocele fluid**: This is done by centrifuging the fluids samples, the resulting deposits are put on a slide and examined under the microscope.
- **Antigen detection**: Circulating filarial antigen (CFA) detection should now be regarded as the 'gold standard' for diagnosing the most common *Wuchereria bancrofti* infections using the Filariasis Test Strips, QFAT kit. Some individuals who appear normal also have detectable circulating antigen that disappears after effective treatment.
- **Imaging methods**: USG, X-ray
- **Molecular method**: PCR

Treatment Protocol of Lymphatic filariasis

- A single dose of Albendazole on Day-1
- Diethylcarbamazine (DEC) is the drug of choice for the treatment of Filariasis. It is given 6 mg/kg daily for 13 days.
- Mass Drug Administration in endemic areas:

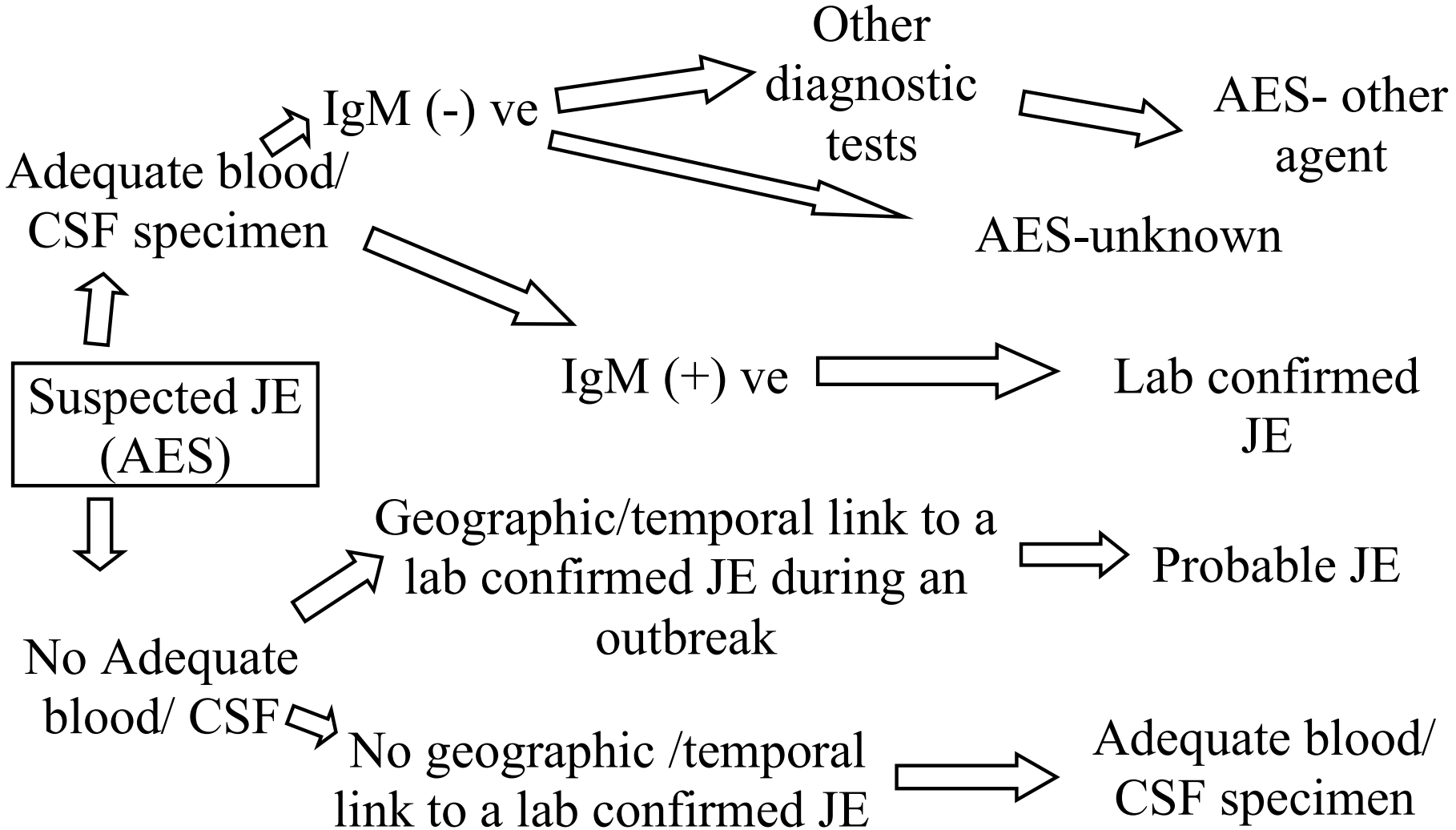
Drug dosage schedule		
Age in years	DEC (mg)	Albendazole (mg)
< 2 years	0	0
2-5 years	100	400
6-14 years	200	400
≥15 years	300	400

Systematic Management of AES including JE

1) Management of Airways and Breathing, during referral proper positioning of the patient must be maintained
2) Management of Circulation
3) Control of Convulsion and Intracranial pressure
4) Control of Temperature
5) Fluid and Electrolytes and Calories/ Nutrition
6) General management
7) Specific treatment of any treatable cause
8) Investigations, Sample Collection & Transportation
9) Reporting of a case
10) Rehabilitation in a holistic approach (attend PMRC unit if required)

Diagnostics: IgM in CSF (more specific)/Serum. MRI, CT of brain, routine hematology, PCR may be helpful. During referral proper positioning as per guideline is needed to save patient's life.

JE Test Algorithm



Notes

Basic introduction with all Vectors causing all six VBDs				
Vector	 *Anopheles* sp.	 *Culex* sp.	 *Aedes egypti* and *Aedes albopictus*	 *Phlebotomus argentipes*
Disease caused	Malaria	1. Lymphatic filariasis 2. JE	1. Dengue 2. Chikungunya	Kala-Azar
Habitat	Clean, flowing water (streams), stagnant, clean water for rural vectors and tanks, wells, and tyres for urban vectors.	Standing, stagnant or polluted water (puddles, ditches, rice fields, barrels, clogged drains).	Peridomestic small containers (plastic cup, mud pot), tarpoline sheet, tyres	moist soil with/ without decaying organic matter.
Causative organism	*Plasmodium vivax*, *Plasmodium falciparum*	1. *Wuchereria bancrofti* (LF) 2. JE virus (JE)	1. Dengue virus (DENV) 2. Chikungunya virus (CHIKV)	*Leishmania donovani*